

Small Water System Management Plan

For new and expanding public water systems with fewer than 1,000 connections

October 2020

Water System Name: Whatcom County Water District 13 (ID #959143)



10-30-20

Whatcom County Water District 13

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Acronym	Definition
AC	Asbestos Cement
AC-FT/YR	Acre-feet per Year
A-COMM	Group A Community Water System
ADD	Average Day Demand
AG	Air Gap
ANSI	American National Standards Institute
A-NTNC	Group A Non-Transient Non-Community Water System
APWA	American Public Works Association
A-TNC	Group A Transient Non-Community Water System
AWWA	American Water Works Association
BAT	Backflow Assembly Technician
BTO	Basic Treatment Operator
CCCP	Cross Connection Control Program
CCR	Consumer Confidence Report
CCS	Cross Connection Specialist
CEU	Continuing Education Unit
CF	100 cubic feet or Commercial Forest
CFR	Code of Federal Regulations or Calculated Fixed Radius
CIP	Capital Improvement Plan
CPI	Consumer Price Index
CU	Color Unit
CWSP	Coordinated Water System Plan
CWSSA	Critical Water Supply Service Area
DBP	Disinfectant Byproduct
DCVA	Double Check Valve Assembly
DI	Ductile Iron
DOE	Washington State Department of Ecology
DOH	Washington State Department of Health
DS	Dead Storage
DSL	Distribution System Leakage
EPA	Environmental Protection Agency
ERU	Equivalent Residential Unit
ES	Equalizing Storage
EWRRC	East Whatcom Regional Resource Center
FF	Fire Flow
FPS	Feet per Second
FS	Fire Storage
FSS	Fire Suppression Storage
GC	General Commercial
GFC	General Facilities Charge
GMA	Growth Management Act
gpd	Gallons per Day

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gpm	Gallons per Minute
GROUP A	Group A Water System
GROUP B	Group B Water System
HAA5	Haloacetic Acids
HDPE	High Density Polyethylene
HERB1	General Herbicide
HGL	Hydraulic Grade Line
ILA	Interlocal Agreement
IOC	Inorganic Chemical and Physical
LID	Local Improvement District
LRAA	Locational Running Annual Average
LUST	Leaking Underground Storage Tank
MCL	Maximum Contaminant Level
MDD	Maximum Day Demand
MFL	Millions of Fibers per Liter
MG	Million Gallons
mg/L	Milligrams per Liter
MMAD	Maximum Month Average Demand
MTCA	Model Toxics Control Act
MWL	Municipal Water Law
N	Number of ERUs for Design
N/A	Not Applicable
NMUGA	Non-Municipal Urban Growth Area
NSF	National Sanitation Foundation
NTU	Nephelometric Turbidity Unit
O&M	Operation and Maintenance
OS	Operational Storage
pCi/L	Picocuries per Liter
PEST1	General Pesticide
PGG	Pacific Groundwater Group, Inc.
PHD	Peak Hour Demand
PLC	Programmable Logic Controller
PM	Preventative Maintenance
PRV	Pressure Reducing Valve
PSI	Pounds per square inch
PVC	Polyvinyl Chloride
PVCC	Peaceful Valley Country Club
PWTF	Public Works Trust Fund
Q _a	Maximum annual withdrawal allowed under a water right
Q _i	Maximum instantaneous withdrawal rate allowed under a water right
Q _L	Capacity of Largest Single Source, gpm
Q _{PH}	Peak Hourly Demand, gpm
Q _S	Total Source of Supply Capacity (excluding emergency supplies), gpm
R	Rural

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R5A	Rural 5 Acre Lots
R10A	Rural 10 Acre Lots
RCRA	Resource Conservation and Recovery Act
RCW	Revised Code of Washington
RF	Rural Forest
ROW	Right-of-Way
RPBA	Reduced Pressure Backflow Assembly
RPDA	Reduced Pressure Detector Assembly
SCA	Sanitary Control Area
SCADA	Supervisory Control and Data Acquisition
SMA	Satellite Management Agency
SOC	Synthetic Organic Chemical
SS	Standby Storage
SWSMP	Small Water System Management Plan
t _M	Time of duration for fire flow
TS	Total Storage
TTHM	Total Trihalomethanes
UGA	Urban Growth Area
ULID	Utility Local Improvement District
UR-4	Urban Residential 4 Lots per Acre
UST	Underground Storage Tank
VES	Equalizing Storage, gallons
VFSS	Volume of Fire Suppression Storage, gallons
VOC	Volatile Organic Chemical
VSB	Total Standby Storage, gallons
WAC	Washington Administrative Code
WDM	Water Distribution Manager
WETRC	Washington Environmental Training Resource Center
WFI	Water Facilities Inventory
WHPA	Wellhead Protection Area
WHPP	Wellhead Protection Plan/Program
WLCAP	Water Loss Control Action Plan
WSDOT	Washington State Department of Transportation
WSP	Water System Plan
WTPO	Water Treatment Plant Operator
WUE	Water Use Efficiency
ZOC	Zones of Contribution (aka "Capture Zones")

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Chapter 1 Description of Water System

A. Water System Owner and Operator

Water System Name: **Whatcom County Water District 13**

DOH System ID # (if Applicable): **95914**

Ownership: Name: **Whatcom County Water District 13**
 Address: **532 Sprague Valley Drive**
 Maple Falls, WA 98266
 Phone #(s): **(360) 599-1801**

Registered Agent: Name: **Kelly Wynn**
 Address: **14263 Calhoun Rd.**
 Mount Vernon, WA 98273
 Phone #(s): **(360) 466-4443**

Contact Person: Name: **Kelly Wynn**
 Address: **14263 Calhoun Rd.**
 Mount Vernon, WA 98273
 Phone #(s): **(360) 466-4443**

Operator: Name: **Kelly Wynn**
 Address: **14263 Calhoun Rd.**
 Mount Vernon, WA 98273
 Phone #(s): **(360) 466-4443**

Note: DOH should be notified in writing upon changes of ownership or the designated contact person shown above.

B. History and Purpose of Water System Development

Discuss water systems purpose and development history:

The Water District was originally established in 1975 to serve the recreational development of Peaceful Valley. Since that time the area has been evolving into a full time residential community. The original developer of Peaceful Valley went bankrupt and left the District in a severe financial crisis. The Water District was involved in bankruptcy and associated legal proceedings for several years. A reorganization plan was approved by the court in September 1998, and the District has satisfied all of its bankruptcy related financial obligations. The District is now in sound financial shape and is planning for increased growth in

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the future. A new well was installed and came online in June of 2003, which gives the District capability to meet future demands. There have been no major changes to the system since 1975.

The Engineering Report and Calculations, enclosed in Appendix F, utilizes sewer planning information from 2008, which identified new development in the District. However, the development of new customers has not occurred. The number of existing and projected customers from the 2011 Wastewater Treatment Facility Engineering Report are utilized in this water system plan; therefore, the plan is conservative, with respect to water demand/forecasting.

In 2011, the District replaced eight water valves throughout the system. In 2014 both reservoirs were cleaned and minor repairs were completed. Backflow preventers were added at Wastewater Treatment Plant and Green Valley Lift Station in 2014, and a new commodity water rate structure was adopted in 2017.

The District is requesting approval of this Small Water System Management Plan for a period of 10 years.

C. Service Area Policies

The following is a list of policy subjects that may directly or indirectly affect the provision of water service. Defined policies will guide the growth of the system and firmly establish how the purveyor will respond to requests for water service within the water system's service area. See Appendix C for the District's service area policies. Please summarize each policy below:

Wholesaling Water: The District currently does not wholesale water.

Wheeling of Water: There is no wheeling of water.

Annexation/Membership Policy: Not applicable, the District serves properties within the established service area boundaries.

Design and Performance Standards Policies: The District requires all work to meet the requirements of the Washington State Department of Health, District Standards, and the WSDOT/APWA Standard Specifications for Road, Bridge and Municipal Construction. The District adopted a Developer Extension Manual in 2012, with new design and construction standards, attached in Appendix E.

Surcharge for Outside Customers: There are currently no customers served outside of the District. At such time that service outside the District is requested, policies regarding the same can be determined at that time.

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Late-Comer Agreements: The District includes a sample Late-Comer Agreement in its Developer Extension Manual.

Urban Growth Area Responsibilities: Portions of the District are located within the Columbia Valley Urban Growth Area. Urban Growth boundaries are shown on the maps in Appendix H. Since the District provides both water and sewer service and has capacity for growth and a large area zoned for development, growth could be rapid. Between 2000 and 2008, the population of the UGA increased by more than 50 percent and the portion of the Columbia Valley UGA located within Water District 13 may experience similar growth because of the availability of sewers and the availability of large tracts of undeveloped land. Growth since 2008 has slowed considerable, but two new developments have begun recently – one completed in late 2018 with 25 residential lots, and the other with 29 lots, which began construction in 2019.

Over-sizing Policy: The District has no over-sizing policy.

System Extension Policy: The District requires that developers install extensions to their property line at their expense. Extensions must be approved and inspected by the District and meet the requirements of the Department of Health. This includes design, inspection, and testing, under the direction of a registered engineer. All of this information can be found in the District's Developer Extension Manual.

Timely and Reasonable Policy: Because the Coordination Act and Municipal Water Law use different definitions of "timely" and because neither defines "reasonable," the term timely and reasonable" is defined as follows (in order of priority) in the Whatcom County CWSP, adopted herein by WCWD13:

- *Water service is considered timely when:*
 - *the water utility can provide service within 120 days of receiving all necessary permits to begin installation of required system improvements, if the utility is conducting system installation; or*
 - *the water utility can provide service within 120 days of the applicant installing all necessary system improvements; or*
 - *as otherwise agreed to between the applicant and utility.*

- *Water service is considered reasonable if costs and conditions of service are consistent with the utility's acknowledged standard practice experienced by other applicants requesting similar service.*

In the event that the District cannot provide service in a timely and reasonable manner, construction of a well, or other water source, may be allowed under the

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condition that the property owner(s) served by the well, or other water source, will not protest connection to a future District water main, and will connect to said future water main and pay all applicable fees at the time of connection.

D. Conditions of Service

Conditions of Service are specific requirements that facilitate the implementation of the utility's service area policies. The conditions of service must be met prior to an applicant receiving water service. Please define responsibilities or conditions under each subject.

Purveyor Responsibility as a Water Service Provider: To provide adequate volume of safe drinking water efficiently to our consumers, meeting all state and federal requirements.

Customer Responsibility as a Water Service Customer: To maintain their service lines in a safe condition, free from leaks and cross connections, to avoid contaminating the water supply, and to pay for their service in accordance with District rules.

Water Service Connection Responsibility: It is the District's responsibility to ensure that all customers have approved connections, and to take immediate action in the case of an interruption of service to inform the customer and re-establish service.

Connection Fee: Connection fees are not charged for existing platted lots within the District's boundaries, since they were covered in the original ULID when the District was established. New customers whose property was not in the original ULID pay an assessment of \$1,939.00 per equivalent residential unit (ERU).

Meter Requirements: A meter installation program was completed in 2007. New services are required to install meters. All service meters were replaced in 2018.

Customer Consent for inspection: The District has an inspection clause in the Developer Extension Manual.

Notification Procedures for inspections: The District will notify all customers a minimum of 24 hours in advance by telephone or hand-delivered notice before attempts to inspect a connection or line on their property. Customers will be requested to contact the District to set up an amicable inspection time.

Cross-Connection Control Device Requirements: The District has a Cross-Connection Control Program and policy. See Appendices B and E.

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Developer Extension Policy: *Developer Extension applications and agreements must be completed, a deposit must be paid, and plans must be approved before the connection is permitted.*

Late-Comer/Developer Pay Back Provisions: *The District does not currently have any late-comer or developer pay back provisions. However, the District includes a sample Late-Comer Agreement in its Developer Extension Manual.*

Rate Structure: *The District charges a base rate of \$43.00 bi-monthly per equivalent residential unit or ERU. The District also implemented a tiered block rate for consumption. See Chapter 9 for additional information.*

E. Water Availability Procedures

Define the water systems policy and procedures for issuance of water availability commitments/letters:

The District issues water availability letters to customers within the District's boundaries after meeting with the owner/developer of the property and reviewing in detail the requirements for service.

Define the length of time that a water availability commitment is valid: *It is valid for one year from the date of application.*

Define the systems policy on subdivision development: *The District has a Developer Extension policy. The District includes a sample "Application to Construct Extension to District System" and "Agreement to Construct Extension to District System" in its Developer Extension Manual. A copy of each is provided in Appendix B.*

Chapter 2
Basic Planning Data

A. Service Area Characteristics

Briefly describe the area in which the system proposes to provide service: *The main service area is a housing development with lots of approximately 0.2 acres in size. Other undeveloped acreage in the service area will be developed in accordance with Whatcom County Urban Growth and Zoning policies.*

Topography/Climate: *Topography is hilly and forested. Most of the existing services and future services are or will be located in a relatively flat valley. Climate is typical of Northwestern Washington, with annual totals of rainfall near 60 inches, and snowfall near 14 inches.*

A location map (Figure 1) and service area boundary map (Figure 2) are included in Appendix H.

B. Adjacent Purveyors

List and describe public water systems in the proximity of the proposed water system:

Columbia Valley Water District (formerly Evergreen Water & Sewer # 19) serving the Campers Paradise and Paradise Lakes residential and recreational community is located adjacent to the District, see Figure 3 in Appendix H.

C. Related Plans

Evaluate related plans for consistency with this water system.

Coordinated Water System Plan (CWSP) Consistency:

Design Standards used for this water system are consistent with or more strict than the minimum design standards required in the Local CWSP? Yes No

This system as designed will provide fire flow requirements consistent with local CWSP? Yes No

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Describe any other applicable related plans which may affect the provision of water service by this water system:

This water system is existing. All future development must meet the requirements of Whatcom County. A copy of a Local Government Consistency Determination Form from the Whatcom County Planning Department confirming the District's role in providing water service in compliance with the County's GMA policies is included in Appendix A.

D. Projected Land Use

Current Zoning: The zoning within the District is predominantly urban residential (UR-4), with pockets of rural and commercial forestry (RF & CF), rural (R5A & R10A), and General Commercial (GC). A zoning map (Figure 4) is included in Appendix H.

Future Anticipated Zoning Changes (if available): None.

Describe existing development type(s) (i.e., single family residential, multi-family, commercial, industrial, other?): Existing development is predominantly single-family residential. Within the UGA, the District encompasses approximately 560 acres, of which 170 acres are currently developed as urban residential (UR4), 40 acres are zoned general commercial (GC), 300 acres are undeveloped (UR4), and 50 acres may be restricted due to critical stream/wetland habitat (UR4). A community association with a clubhouse and a decommissioned pool, Whatcom County Regional Resource Center, and a real estate office are also served. The pool at the clubhouse has been inoperative for some time. The total number of properties/lots under current and potential zoning which may be served by the system is estimated to be 1,200 residential units, plus the 40 acres of general commercial.

E. Projected Population and Service Connections

**Table 2.1
Growth Projection Data**

Data	Number
Population per household average (County/Area)	2.56/2.87
Area growth rate based on local land use (if applicable)	1.78%
Area growth projection (based on water system records)	0.3%
Total active residential connections (current year)	369
Total active non-residential connections (current year)	5

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Brief description of non-residential use(s) and population served (if applicable): *Peaceful Valley Clubhouse, Misty Mountain Realty Office, Whatcom County Regional Resource Center, and Water District No. 13 wastewater treatment plant and Green Valley Lift Station. Misty Mountain Realty and the Water District's facilities are considered each as one equivalent residential unit (ERU). The Clubhouse is considered as 1 ERU, and the Resource Center is considered as 4.5 ERUs. The resource center completed Phase 2 in 2020, which included another building, at 1 additional ERU. There have been discussions of a possible commercial development including a grocery store and laundry mat in the future.*

Note: References and applicable calculations are provided in the engineering report in Appendix F.

Fill out Table 2.2 to evaluate and summarize water system growth projections as identified above and non-active water service commitments. Water service commitments are future connections that the utility has committed to serve in writing (Water Availability Letter) or through other formal agreement.

Potential or DOH approved connections/ERUs: 369 current residential connections of 1,338 DOH approved total connections.

**Table 2.2
Water System Growth Projections**

Year	A-Non-active Connections and Commitments (ERU)	B-Active Residential Connections (ERU)	C-Active Non-Residential Connections (ERU)	Residential Population⁽²⁾	Available Service Commitments (Approved # Connections Minus A, B, & C (ERU))
2018	134 ⁽¹⁾	346	8	993	850
2030	61	442	8	1,269	827
2040	0	524	13	1,503	801

(1) Includes 23 inactive connections + 111 new commitments (Balfour Village & Trek Properties).

(2) Based upon 2.87 persons per residential connection.

F. Water Demand Forecasting and ERUs

Water Demand Forecasting must include consideration of projected population, land use, and conservation target savings. The engineering report in Appendix F was used to complete Table 2.3.

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**Table 2.3
Current and Future Demands**

Customer Class/Demand Type	Planning Period		
	2018 ⁽¹⁾ (ERU)	2030 (ERU)	2040 (ERU)
Active Residential	369	442	524
Active Commercial	8	8	13
Total (all classes)	377	450	537
ADD ⁽²⁾	211 gpd/ERU	209 gpd/ERU	209 gpd/ERU
MDD	422 gpd/ERU	418 gpd/ERU	418 gpd/ERU
Total ADD	79,547 gpd	94,950 gpd	113,307 gpd
Total MDD	110 gpm	132 gpm	157 gpm
Total PHD	254 gpm	292 gpm	336 gpm

(1) Reflects all connected ERUs, including inactive accounts.

(2) Includes a 1% reduction in demand by 2030 and an assumed DSL of 20 percent – see Appendix F.

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Chapter 3 System Analysis

A. Local Fire Service and Flow Requirements

Fire hydrant locations are shown in Figure 5, Appendix H. Fire service is provided by:

*Whatcom County Fire District 14
7520 Kendall Rd
Kendall WA 98266.*

Contact Person:

*Jerry Debruin
Phone #: (360) 988-4328*

Proximity to the water system:

Approximately 2 miles

Type of equipment/capabilities:

Engine, tender, aid, utility and rescue.

Summarize local flow requirements for new and existing buildings, per the 2016 Whatcom County Coordinated Water System Plan:

*500 gpm for 60 minutes.
1,000 gpm for 2 hours for commercial buildings*

Indicate the rate and duration of the fire flow which will be used in the analysis of the water system for the following land use designations:

**Table 3.1
Fire Flow Requirements**

Land Use	Rate (gpm)	Duration (mins)
Residential – UR4	500	60
Commercial - GC	1,000	120

Nesting provisions/allowances per local fire officials:

Fire suppression storage is nested within the Standby Storage Requirements.

Additional fire flow design considerations/policies:

Minimum pressure allowed at any point in the system during fire flows is 20 psi.

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B. System Evaluation

1. Water Quality Analysis

Briefly describe results of initial and/or historical monitoring for each source. The required Water Quality Monitoring Schedule and test reports for the District is included in Appendix F.

Total Coliform:

Historically, the District sampled for bacteria at several selected residential hose bibs. Until 2019, the samples consistently tested negative. However, after a sample tested positive for bacteria in November 2019, the District elected to install four sampling stations directly connected to the distribution system, plus two stations at the tanks. This will ensure greater control over the testing sites and prevent positive bacteria results from contaminated facilities. Installation of the sampling stations was completed in February 2020. Subsequent positive tests occurred in February and May 2020.

Inorganic Chemicals:

*Well 1, in compliance 2007 and 2016.
Well 2, in compliance 2007 and 2016.*

Volatile Organic Chemicals (VOC's):

*Well 1, in compliance 2010 and 2016.
Well 2, in compliance 2010 and 2016.*

Synthetic Organic Chemicals (SOC's):

*Well 1, in compliance 2018.
Well 2, in compliance 2018*

Radionuclides:

Well 1 and Well 2 tested in 2015 found to be below MCL.

Asbestos:

N/A. There is no asbestos cement pipe in the system.

Lead and Copper:

Tested in 2016, and all samples found to be below MCL.

Nitrate:

Wells 1 and 2, tested annually, all samples found to be below MCL.

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2. Source of Supply Analysis

Complete Table 3.2 and use the information from the demand analysis to determine source capacity in Table 3.3.

Well logs, protective covenants, pump tests, water rights, source and storage sizing, hydraulic analyses, water facilities inventory form (WFI), and initial water quality information are included in Appendix F.

Table 3.2
Source Assessment

DOH Source No.	Utility Name	Well Depth/ Screen (feet)	Well Diameter (inches)	Distance to Surface Water (feet)	Pump Test Yield (gpm)	Installed Capacity (gpm)	Recorded Annual Use (acre-ft)	Source Metered Yes/No
S01	Well #1 (North)	60/20	12	~3,500	450	450	44.66	Yes
S02	Well #2 (South)	104/15	10	~2,000	475	450	41.46	Yes
				Total	925	900	86.12	

Definitions for Table 3.2:

- **DOH Source No.** – Source number as listed on the Water Facility Inventory (WFI) form (i.e., S01, S02, etc.).
- **Utility Designation** – Name commonly used by the District to describe the well (i.e., Well 1, South Well, etc.).
- **Well Depth** – Distance from the surface to the top of the screen interval in feet.
- **Well Diameter** – Nominal casing diameter in inches.
- **Distance to Surface Water** – Approx. distance to the nearest surface water body such as a lake, stream, or pond.
- **Pump Test Yield** – Rate of flow that was sustained during pump testing performed in accordance with DOH policy.
- **Installed Pump Capacity** – Installed pump capacity at the minimum design pressure.
- **Recorded Annual Use** – Well production in acre-ft for the previous 3 years.

Table 3.3
Allowable ERUs based on Source Capacity Parameters

Source Parameter	Current	10-Year	20-Year
Maximum Pump Installed Capacity	900 gpm, 3,071 ERU	900 gpm, 3,071 ERU	900 gpm, 3,071 ERU

3. Treatment

Treatment type(s): *N/A*

Summarize process goals: *N/A*

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Flow Rates and Capacity (in ERUs if applicable): *N/A*

Summarize process deficiencies and recommended improvements: *N/A*

Note: If it becomes necessary, treatment will require a project report to be submitted to DOH and may involve pilot studies prior to approval of constructions documents and implementation.

4. Storage

Current Usable Storage Capacity: *298,760 gallons in 2 equal sized tanks*

**Table 3.4
Storage Requirements**

Period/Storage Component	2018	2030	2040
ERUs	377	450	537
Operating Storage (O.S.)	15,522 gal	15,522 gal	15,522 gal
Equalizing Storage (E.S.)	N/A	N/A	N/A
Standby Storage (S.S.)	75,400 gal	90,000 gal	107,400 gal
Fire Storage (F.S.)	120,000 gal nested in S.S.	120,000 gal nested in S.S.	120,000 gal nested in S.S.
Total Storage (T.S.)	135,522 gal	135,522 gal	135,522 gal
Storage Provided	298,760 gal	298,760 gal	298,760 gal
Surplus/(Deficit)	163,238 gal	163,238 gal	163,238 gal

5. Booster Pumps/Pressure Storage

The District does not have, nor does it plan to install any booster pumps or pressure storage units at this time. Storage tanks are at an elevation high enough to provide adequate pressure to the entire system.

6. Distribution System

Summarize general distribution system characteristics (such as pipe sizes and material and age):

Most of the pipe in the District is the original 8-inch, 6-inch, and 4-inch PVC pipe and is approximately 42 years old. Hydrants, meter setters, and meter boxes are of similar age. Newer water main pipe installed in the last 10 years consists of 8-inch PVC C900. In 2011, the District replaced eight of their water gate valves and all the service meters were replaced in 2018.

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Summarize areas of known physical deficiencies and routine pipe replacement programs:

None. However, the 6-inch supply main downhill from the tanks between nodes J95 and J93 provides a hydraulic restriction that will limit pressure and fire flow as the District grows. As development occurs in the western portion of the District, a new 8-inch loop will be constructed from node J95 to J145, which will provide two mains from the tanks to the highway crossing at Peaceful Valley Drive.

7. Hydraulic Analysis and Fire Flow Capability – Existing System

The District’s water system is analyzed using Innovyze InfoWater hydraulic modeling software, which operates in ArcGIS environment. The schematics of the model are illustrated in Figure 7, Appendix H. The model has not been calibrated by an actual flow test. However, the system has not changed significantly over the past 30 years and is already a very simple system. The distribution system consists of 12,635 feet of 8-inch PVC pipe, 12,130 feet of 6-inch PVC pipe, and 2,976 feet of 4-inch PVC pipe, with 36 fire hydrants, two reduced pressure backflow assemblies (RPBA), 48 gate valves, and 24 blowoffs or air-vacuum relief valves.

Minimum distribution pressure must be maintained in order to provide a reliable and safe water system, including adequate fire suppression. The water system must be able to provide Peak Hour Demand (PHD) at no less than 30 psi at all service connections throughout the distribution system when all equalizing storage is depleted (WAC 246-290-230(5)). Table 3.5 provides information regarding the system’s ability to meet this requirement, with no system improvements, for the next 20 years.

Table 3.5
Peak Hour Demand (PHD) System Hydraulic Check⁽¹⁾
Existing Water System

Scenario	2019	2030	2040
Tank Water Level ⁽²⁾	631.0	631.0	631.0
PHD, gpm	254	292	336
One Pump Operating, Minimum Pressure	68.0 psi @ Node J78	66.5 psi @ Node J78	65.0 psi @ Node J78

- (1) Assuming operation with existing system infrastructure.
- (2) Bottom of equalizing storage, also bottom of operational storage.
- (3) Node J78 is located at the intersection of Fall Valley Lane and Clear Valley Drive.

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During fire suppression events, the water system must be able to provide 20 psi minimum pressure at ground level at all points throughout the distribution system. Table 3.6 illustrates the system’s performance under fire flow demands. The water system must be able to provide this minimum pressure under fire-flow conditions plus the MDD rate when all equalizing and fire flow storage is depleted (WAC 246-290-230(6)). In addition, DOH recommends a maximum velocity of no more than 8-feet per second under PHD conditions. The following modeling scenarios are run for the District’s water system:

Table 3.6
Residential Fire Suppression System Hydraulic Check⁽¹⁾
Existing Water System

Scenario	2019	2030	2040
Tank Water Level ⁽²⁾	615.5	615.5	615.5
MDD, gpm	110	130	154
One Pump Operating, Minimum Flow	598 gpm @ Node J79	593 gpm @ Node J79	587 gpm @ Node J79

- (1) 500 gpm, assuming operation with existing system infrastructure.
- (2) Bottom of fire flow storage.
- (3) Node J79 is located at the fire hydrant on Fall Valley Lane.

Since a portion of the District is now zoned for General Commercial, a fire flow of 1,000 gpm for two hours duration is required in those areas west of Sumas-Kendall Road and north/northwest of Balfour Valley Road. Modeling was performed for the commercial area with a fire flow demand of 1,000 gpm for years 2019, 2030, and 2040, with one well pump operating. The results are shown in Table 3.7.

Table 3.7
Commercial Fire Suppression System Hydraulic Check⁽¹⁾
Existing Water System

Scenario	2019	2030	2040
Tank Water Level ⁽²⁾	615.5	615.5	615.5
MDD, gpm	110	130	154
One Pump Operating, Minimum Flow	1,328 gpm @ Node J59	1,311 gpm @ Node J59	1,291 gpm @ Node J59

- (1) 1,000 gpm, assuming operation with existing system infrastructure.
- (2) Bottom of fire flow storage.
- (3) Node J59 is located at the fire hydrant in the parking lot for the East Whatcom County Regional Resource Center.

The existing infrastructure within the District meets the minimum peak demand pressure requirements (30 psi) and also fire flow requirements (20 psi minimum with a residential fire flow requirement of 500 gpm and commercial requirement of 1,000 gpm), assuming the growth stays on or near the valley floor. Currently

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the highest elevation served by the District is elevation 490, at the intersection of Fall Valley Lane and Clear Valley Drive. Areas to the west of PVCC, zoned for urban residential development, extend as high as elevation 525. Currently, there are no development proposals for these areas. At such time a proposal is brought forth for these areas, a feasibility study will be required. Depending on the amount and elevation of the proposal, it is likely that infrastructure improvements (booster station, additional storage at higher elevation, etc.) may be required of the development in order to adequately service these areas.

In addition to modeling the existing system configuration, several potential future capital water projects were added to the model and evaluated. These projects are included in Table 3.8 of the 2012 Small Water System Plan:

Project A: Install 8-inch line from existing 8-inch source line (from Well 1) to 6-inch line on Fall Valley Road. This project would provide for a second crossing of the state highway to serve the east side of the District, providing redundancy to the east side of the District.

Project B: Install 8-inch line from 6-inch line on Clear Valley Drive to 6-inch line on Boulder Valley Lane. This project would provide for a second connection to the King Valley Drive/Deep Valley Drive loop, providing additional water to the yet-to-be-developed northeast portions of the District.

Project C: Install 8-inch loop from Peaceful Valley Drive to Sprague Valley Drive across undeveloped land. This project, constructed by private development, would provide a looped system on the west side of the state highway to serve growth. For modeling purposes, this project is not expected to be complete until year 2040.

The following modeling scenarios were run for the District's water system:

Table 3.8
Summary of Modeling Scenarios

Model Scenario	2019	2030	2040
Existing System	X	X	X
Project A	X	X	X
Projects A and B	X	X	X
Project C			X
Projects A and C			X
Projects A, B, and C			X

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Peak Hour Demand Check

Minimum distribution pressure must be maintained in order to provide a reliable and safe water system, including adequate fire suppression. The water system must be able to provide Peak Hour Demand (PHD) at no less than 30 psi at all service connections throughout the distribution system when all equalizing storage is depleted (WAC 246-290-230(5)). Table 3.9 provides information regarding the system's ability to meet this requirement. Minimum distribution system pressure is easily maintained throughout the District, for all modeled scenarios. As expected, the lowest pressure calculated exists at, or near, the intersection of Fall Valley Lane and Clear Valley Drive, the highest elevation served by the District.

Table 3.9
Peak Hour Demand (PHD) System Hydraulic Check⁽¹⁾
Minimum Pressure – Proposed Improvements

Scenario	2019 PHD=254 gpm	2030 PHD=292 gpm	2040 PHD=336 gpm
Existing System	68.0 psi @ Node J78	66.5 psi @ Node J78	65.0 psi @ Node J78
Project A	71.3 psi @ Node J78	70.1 psi @ Node J78	68.5 psi @ Node J81
Projects A and B	70.6 psi @ Node J78	69.3 psi @ Node J78	67.9 psi @ Node J78
Project C	N/A	N/A	62.1 psi @ Node J78
Projects A and C	N/A	N/A	65.0 psi @ Node J81
Projects A, B, and C	N/A	N/A	73.7 psi @ Node J78

- (1) Tank level set at bottom of equalizing storage = 631.0 feet. One well pump operating.
(2) Node J78 is located at the intersection of Fall Valley Lane and Clear Valley Drive.
(3) Node J81 is located at the northern terminus of Clear Valley Drive.

Fire Suppression Check

During fire suppression events, the water system must be able to provide 20 psi minimum pressure at ground level at all points throughout the distribution system. The water system must be able to provide this minimum pressure under fire-flow conditions plus the MDD rate when all equalizing and fire flow storage is depleted (WAC 246-290-230(6)). For residential areas, the required minimum fire flow is 500 gpm for 1 hour and for commercial areas, 1,000 gpm for 2 hours. At the current time, all nodes are capable of meeting the assigned fire flow rates under the modelled system conditions. Hydrants providing the lowest flow rate

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under each scenario are shown in Table 3.10.

Table 3.10
Fire Suppression System Hydraulic Check⁽¹⁾
Lowest Flow – Proposed Improvements

Scenario	2019	2030	2040
Existing System	598 gpm @ Node J79	593 gpm @ Node J79	587 gpm @ Node J79
Project A	876 gpm @ Node J76	830 gpm @ Node J141	825 gpm @ Node J141
Projects A and B	876 gpm @ Node J76	862 gpm @ Node J141	857 gpm @ Node J141
Project C	N/A	N/A	606 gpm @ Node J79
Projects A and C	N/A	N/A	875 gpm @ Node J141
Projects A, B, and C	N/A	N/A	876 gpm @ Node J76

- (1) Tank level set at bottom of fire flow storage = 615.5 feet. One well pump operating.
- (2) Node J79 is located on Fall Valley Lane.
- (3) Node J76 is located on Blackbird Valley Lane.
- (4) Node J141 is located at the northern terminus of Gold Run Drive.

Under all scenarios, the completion of Project A results in a significant increase (greater than 20 percent) in flow to Clear Valley Drive, Blackbird Valley Lane, and Fall Valley Lane, with smaller increases throughout the east side. The completion of Projects A and B, results in an increase in flow to Boulder Valley Lane and Deep Valley Drive, with moderate increases throughout the east side. However, the inclusion of Project B adds only minor improvements above Project A alone. The completion of Project C alone, results in significant increases in flow to Flair Valley Drive, Balfour Valley Lane, Boulder Valley Lane, Balfour Valley Road, and the commercial area. Completion of Projects A and C, or A, B, and C results in significant increases in flow throughout the District, except at dead-end lines, as expected. Again, Project B adds little improvement.

Are the current water system facilities capable of delivering 30 psi to all customers at PHD under:

Current Demand conditions?	YES	<input checked="" type="checkbox"/>	NO	<input type="checkbox"/>
10-year demand conditions?	YES	<input checked="" type="checkbox"/>	NO	<input type="checkbox"/>
20-year demand conditions?	YES	<input checked="" type="checkbox"/>	NO	<input type="checkbox"/>

Are the current water system facilities capable of providing 20 psi to all customers during fire flows during MDD:

Current Demand conditions?	YES	<input checked="" type="checkbox"/>	NO	<input type="checkbox"/>
----------------------------	-----	-------------------------------------	----	--------------------------

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10-year demand conditions? YES NO
 20-year demand conditions? YES NO

If any of the above responses are NO, summarize necessary distribution system improvements:

8. Instrumentation and Control Systems

Well Pump Control: *The well pumps are controlled by the water elevation in the storage tanks, with information transmitted via hard wire.*

Storage Level Control (If Applicable): *There are two float switches in the reservoirs that control the well pumps.*

Other Telemetry (If Applicable): *N/A*

Summary of proposed instrumentation and control system improvements: *None*

C. Water Rights Analysis

A summary of the District’s water rights is provided on the following page in the Water Rights Self-Assessment Form, Table 3.11. Between the two wells, the District has withdrawal rights for 1,150 gpm and 484 acre-feet per year.

D. Physical Capacity Summary

**Table 3.12
Physical Capacity Summary**

Current Physical Capacity (ERU’s)			
Source (water rights – annual volume)	2,048		
Source (water rights – rate)	3,924		
Existing Pump Capacity	3,071		
Treatment	N/A		
Storage	1,416		
Limiting Physical Capacity	Storage		
Demand (ERUs)			
	2019	2030	2040
Total Demand	377	450	537
Limiting Physical Capacity	1,416	1,416	1,416
Surplus/(Deficit)	1,039	966	879

Table 3.11 Water Right Self-Assessment Form for Water System Plan

Mouse-over any link for more information. Click on any link for more detailed instructions.

<u>Water Right Permit, Certificate, or Claim #</u> <small>*If water right is interruptible, identify limitation in yellow section below</small>	<u>WFI Source #</u> <small>If a source has multiple water rights, list each water right on separate line</small>	<u>Existing Water Rights</u> <small>Qi= Instantaneous Flow Rate Allowed (GPM or CFS) Qa= Annual Volume Allowed (Acre-Feet/Year) This includes wholesale water sold</small>				<u>Current Source Production – Most Recent Calendar Year</u> <small>Qi = Max Instantaneous Flow Rate Withdrawn (GPM or CFS) Qa = Annual Volume Withdrawn (Acre-Feet/Year) This includes wholesale water sold</small>				<u>10-Year Forecasted Source Production (determined from WSP)</u> <small>This includes wholesale water sold</small>				<u>20-Year Forecasted Source Production (determined from WSP)</u> <small>This includes wholesale water sold</small>				
		<u>Primary Qi</u> <small>Maximum Rate Allowed</small>	<u>Non-Additive Qi</u> <small>Maximum Rate Allowed</small>	<u>Primary Qa</u> <small>Maximum Volume Allowed</small>	<u>Non-Additive Qa</u> <small>Maximum Volume Allowed</small>	<u>Total Qi</u> <small>Maximum Instantaneous Flow Rate Withdrawn</small>	<u>Current Excess or (Deficiency) Qi</u>	<u>Total Qa</u> <small>Maximum Annual Volume Withdrawn</small>	<u>Current Excess or (Deficiency) Qa</u>	<u>Total Qi</u> <small>Maximum Instantaneous Flow Rate in 10 Years</small>	<u>10-Year Forecasted Excess or (Deficiency) Qi</u>	<u>Total Qa</u> <small>Maximum Annual Volume in 10 Years</small>	<u>10-Year Forecasted Excess or (Deficiency) Qa</u>	<u>Total Qi</u> <small>Maximum Instantaneous Flow Rate in 20 Years</small>	<u>20-Year Forecasted Excess or (Deficiency) Qi</u>	<u>Total Qa</u> <small>Maximum Annual Volume in 20 Years</small>	<u>20-Year Forecasted Excess or (Deficiency) Qa</u>	
1	G1-22158	S01 – Well #1	450 gpm		484 ac-ft		450 gpm	0	40.6 ac-ft	407.3 ac-ft	450 gpm	0	53.2 ac-ft	377.6 ac-ft	450 gpm	0	63.5 ac-ft	357 ac-ft
2	G1-22178	S02 – Well #2	700 gpm		See notes		450 gpm	250 gpm	36.1 ac-ft	See notes	450 gpm	250gpm	53.2 ac-ft	See notes	450 gpm	250 gpm	63.5 ac-ft	See notes
3																		
4																		
TOTALS =			1150 gpm		484 ac-ft		900 gpm	250 gpm	76.7 ac-ft	407.3 ac-ft	900 gpm	250 gpm	106.4 ac-ft	377.6 ac-ft	900 gpm	250 gpm	127 ac-ft	357 ac-ft

Column Identifiers for Calculations: A B C =A-C D =B-D E = A-E F =B-F G =A-G H =B-H

PENDING WATER RIGHT APPLICATIONS: Identify any water right applications that have been submitted to Ecology.						
Application Number	New or Change Application?	Date Submitted	Quantities Requested			
			Primary Qi	Non-Additive Qi	Primary Qa	Non-Additive Qa

INTERTIES: Systems receiving wholesale water complete this section. Wholesaling systems must include water sold through intertie in the current and forecasted source production columns above.															
Name of Wholesaling System Providing Water	Quantities Allowed In Contract		Expiration Date of Contract	Currently Purchased <small>Current quantity purchased through intertie</small>				10-Year Forecasted Purchase <small>Forecasted quantity purchased through intertie</small>				20-Year Forecasted Purchase <small>Forecasted quantity purchased through intertie</small>			
	<u>Maximum Qi</u> <small>Instantaneous Flow Rate</small>	<u>Maximum Qa</u> <small>Annual Volume</small>		<u>Maximum Qi</u> <small>Instantaneous Flow Rate</small>	<u>Current Excess or (Deficiency) Qi</u>	<u>Maximum Qa</u> <small>Annual Volume</small>	<u>Current Excess or (Deficiency) Qa</u>	<u>Maximum Qi</u> <small>10-Year Forecast</small>	<u>Future Excess or (Deficiency) Qi</u>	<u>Maximum Qa</u> <small>10-Year Forecast</small>	<u>Future Excess or (Deficiency) Qa</u>	<u>Maximum Qi</u> <small>20-Year Forecast</small>	<u>Future Excess or (Deficiency) Qi</u>	<u>Maximum Qa</u> <small>20-Year Forecast</small>	<u>Future Excess or (Deficiency) Qa</u>
1															
2															
3															
TOTALS =															

Column Identifiers for Calculations: A B C =A-C D =B-D E =A-E F =B-F G =A-G H =B-H

INTERRUPTIBLE WATER RIGHTS: Identify limitations on any water rights listed above that are interruptible.		
Water Right #	Conditions of Interruption	Time Period of Interruption
1		
2		

ADDITIONAL COMMENTS:

1. Total permitted annual withdrawal for both wells is 484 acre-feet
2. 2018 water use is down from 2016: Well #1 = 46.1 ac-ft & Well #2 = 45.6 ac-ft
3. Future volume of annual withdrawal is split evenly between both wells

Chapter 4 Water Use Efficiency Program

A. Requirements

The Department of Health adopted Part 8 of WAC 246-290 in 2007 to implement RCW 70.119A.180, requiring water systems to evaluate and implement water use efficiency measures. Per WAC 290-246-800, water purveyors are required to collect water use data, forecast water demand, evaluate water use efficiency measures, calculate distribution system leakage (DSL), set goals for water use, and implement a program to accomplish those goals.

Water is lost or wasted from the system in two distinct areas: supply and demand. Losses in the supply side include leaks (DSL) and unaccounted for water use such as firefighting, theft, flushing, etc. Losses on the demand side include customer leaks, waste, theft, and inaccurate metering. In accordance with WAC 246-290-810(4)(d)(i), the District is required to evaluate or implement one water use efficiency measure now, but will have to evaluate or implement four measures when the number of connections reach 500.

The District must develop and implement a water use efficiency program which includes sufficient cost-effective measures to meet the goals established by the District. The water use efficiency goals must be designed to enhance the efficient use of water by the District's customers. The water use efficiency goals must be set in a public forum, with a minimum of two weeks' notice prior, and the public must be provided specific information regarding the District's current program to assist in their understanding of the program. The Board must review and consider all comments received, before adopting the water use efficiency goals.

In addition, the District is required to determine and report their distribution system leakage (DSL) annually and demonstrate compliance with the DSL standards per WAC 290-246-820(4), or develop and implement a Water Loss Control Action Plan (WLCAP), if the District is not compliant.

B. Existing Water Use Efficiency Program

The District's existing water use efficiency program, since 2009, includes the following demand elements:

- Goal to reduce consumption by 1 percent over 6 years (set in 2011). More specifically, to reduce average day demand to 205 gpd/ERU and

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- annual withdrawal to 93 acre-ft/year (30.3 million gallons).
- Distribution of water use efficiency education materials in two newsletters and the annual consumer confidence report.
- Notification to high water users of potential leaks.
- Website to include water savings tips, since 2012.
- District offers water savings kits to customers upon request, since 2012.
- Leak forgiveness policy, if repaired, since 2014.
- Implementation of commodity rate structure in 2017.
- Replacement of all customer meters in 2018.

And includes the following supply elements:

- Added isolation valves to system in 2009, 2010, and 2011 to assist in finding distribution leaks.
- Determine and report DSL monthly.
- Investigate for leaks in distribution system when DSL exceeds 10 percent.
- Repair leaks in distribution system, when found.
- Monitor and calibrate source meters - replaced failed source meter for Well 1 in 2010 and Well 2 in 2018.
- Implemented new policies to reduce inconsistencies in meter reading/recording in 2019.

The success of the existing program has been mixed. Water production has decreased since 2011, from a 3-year average of 30.2 million gallons per year to 28.1 million gallons per year in 2018. Likewise, water consumption per customer has dropped dramatically since 2008, from an average daily demand (2007-2010) of 215 gpd/ERU to 176 gpd/ERU for 2016-2018.

However, distribution system leakage (DSL) continues to be a problem, varying between 7.3 percent in 2013 to 23.0 percent in 2017, with the 2016-2018 average at 20.2 percent. Per WAC 246-290-820(4), the District is required to develop and implement a water loss control action plan (WLCAP). It should be noted that a series of problems with the solenoid for Well 1 in August and September of 2017; and with the source meter for Well 2 in late 2017 and into early 2018; plus inconsistent readings of customer meters has brought into question the accuracy of the DSL calculations. Observing the 3-year period from July 2017 through July 2020, DSL is calculated at 19.6 percent. In fact, more recent data from January 2020 through August 2020 indicates an average DSL below 13 percent. Therefore, the District believes with the corrections and measures undertaken since 2018 that the actual DSL is between 10 and 20 percent and is requesting that the

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requirement to develop and implement a WLCAP be deferred until at least data is collected through 2021.

C. Goals and Implementation

The stated goal of “reduce consumption by 1 percent over 6 years,” which has been reported on the District Water Use Efficiency reports since 2009 has been achieved, but can remain as a demand side goal. However, reducing demand to less than 176 gallons per ERU/day will be challenging to achieve since this is already a low demand.

The District’s focus is in reducing DSL. A public meeting was held on October 27, 2020 to review the Whatcom County Water District 13 Small Water System Management Plan and establish goals for water use efficiency. There was only one member of the public present and he did not have any questions or comments on the Plan or WUE goals. Various goals and measures were presented and discussed, with the following goal established by the Board:

1. Reduce customer demand, currently at 176 gpd/ERU, by 1 percent by 2030.

This goal can be achieved by implementing the following water use efficiency measures during the 10-year planning period:

1. Continue to provide educational materials on the District’s website, in regular newsletters, and in the consumer confidence report regarding using water wisely. Provide historical water use information on customer bills.
2. Continue to notify customers of potential leaks based upon metering data and continue to implement a leak forgiveness policy to encourage customers to repair leaks.
3. Continue to implement a commodity rate structure and evaluate its effectiveness at reducing consumption. Evaluate rate structure every 5 years.
4. Continue to train personnel and implement policies to ensure accurate and timely customer and source meter reading.
5. Continue to monitor and replace customer meters as required to maintain accurate readings. Since all the customer meters were replaced in 2018, and the manufacturer of the meters recommends

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replacement or recalibration every 10 to 15 years, this plan assumes that all meters will be replaced in 2033. However, inaccurate meters will be replaced as needed.

6. Continue tracking DSL every month.
7. Continue to utilize leak detection equipment to locate distribution main line leaks, until DSL drops below 10 percent. For budgeting purposes, it is assumed that professional leak detection will be required every year.
8. Repair distribution main line leaks, when found. For budgeting purposes, it is assumed that a leak will be repaired every year.
9. Continue to evaluate fire hydrants for leaks.
10. Fire Department Coordination. The District will coordinate with the fire department to document all firefighting and training activities to acquire an accurate estimation of water used and also to educate personnel on the proper way to fully close a fire hydrant valve.
11. Training. Train District personnel to accurately measure water used for flushing and provide additional inspection of water tanks to check for signs of leaking or overflows.

Table 4.1 describes the WUE 10-year implementation schedule and estimated costs:

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Table 4.1
WUE Implementation Schedule and Cost

Measure Number	Measure	Schedule	Cost⁽¹⁾
1	Customer Water-Wise Education	Annually	\$0
2	Customer Leak Notification & Forgiveness	Bi-Monthly	\$0
3	Commodity Rate Structure Update	2021 & 2026	\$20,000
4	Meter Reading Policies	Annually	\$3,000
5	Replace Customer Meters	2033	\$50,000
6	Track and Monitor DSL	Monthly	\$0
7	Leak Detection	Annually	\$12,000
8	Leak Repair	Annually	\$100,000
9	Evaluate Hydrants	Annually	\$0
10	Fire Department Coordination	Annually	\$0
11	Training	Annually	\$6,000
Total			\$191,000

(1) Costs represent total 10-year cost. A cost of \$0 implies measure can be completed through regular operations.

The estimated savings from these selected water use efficiency measures is significant. A reduction in customer consumption of 1 percent will reduce annual water consumption by approximately 284,000 gallons by 2030. A reduction in DSL of 1 percent will reduce annual water production by approximately 240,000 gallons.

D. Components of Plan

Public Education:

The Washington State Department of Health publications on water conservation shall be distributed to all new customers at the time of application for water service and periodically thereafter with the water bills. Future similar AWWA, state, and county publications, may also be distributed.

The District will direct mail a District newsletter at least on an annual basis. These newsletters describe how an individual customer can use water more efficiently and alert the District of a potential leak (surface water present during dry periods, hydrant use, low pressure, spike in usage, failing pavement, etc.).

Currently the District promotes voluntary conservation. Any abnormal increase in the customer's consumption initiates an inquiry into a possible leak in the customer's plumbing system. Any major ongoing increase initiates a check into the accuracy of the water meter.

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Over the last several years, the District has observed a significant reduction in average daily water use, not including DSL, from 264 gpd/ERU in 2007 (87.6 acre-feet withdrawal) to 151 gpd/ERU in 2018 (76.7 acre-feet withdrawal). The exact reasons for this reduction are not understood, but one opinion is that the District's notification to customers with suspected leaks, plus a leak forgiveness program (requiring the leak to be repaired), combined with an improving economy, has resulted in an increase in repairs to customer plumbing.

Conservation Water Rate Structure:

Water rates, after completing a rate study in 2016, now include a surcharge for excess use to encourage conservation. *The District charges a base rate of \$43.00 bimonthly per equivalent residential unit or ERU. The District also implemented a tiered block rate for consumption: 0-19,000 gallons included in bi-monthly base rate, 19,001-25,000 gallons charged at \$1.00 per 1,000 gallons, 25,001+ gallons charged at \$3.00 per 1,000 gallons.*

Metering:

To measure Distribution System Leakage (DSL - unauthorized water use and leakage), the District has installed a meter at each well source and at each service connection. All service meters were replaced in 2018. All meters are read once per month, on the same day.

Water Audit:

Every month a calculation of Distribution System Leakage (DSL) is made by comparing the source (well) meters and the sum of residential and non-residential consumption, system flushing, and fire hydrant usage. Should unauthorized water use and leakage exceed 10 percent of the source production, a cursory water audit is performed to determine if the difference is due to an unusual occurrence, such as a water main break.

If the unauthorized water use and leakage exceeds 10 percent of production in a subsequent comparison review, the water audit will be extended to include a check of meter calibration and a leak detection survey. If the water loss cannot be accounted for by an extended audit, a professional leak detection service will be called in to conduct a leak detection survey.

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Low Water Use Plumbing Fixtures:

For new construction, all plumbing and related fixtures shall comply with current state and local laws and regulations establishing water conservation performance standards.

Water for Lawn Irrigation:

Customers are encouraged to adopt landscaping schemes to utilize water efficiently. The use of drip or mechanically-timed irrigation systems, drought tolerant plantings, and small lawn areas is encouraged.

Lawn Sprinkling and Other Water Use Restrictions:

Through the insert of a notice with the water bill, and/or during periods of warm, dry weather, customers will be requested to comply voluntarily with restricting lawn irrigation to once per week and watering lawns during mornings and late evenings, etc. as outlined in public education materials described herein.

E. Evaluation of Effectiveness

The effectiveness of the program will be evaluated by tracking and observing water consumption and DSL over the planning period. Prior to the end of each calendar year, the District will evaluate the program and implement additional measures to be carried out in subsequent years, as necessary to meet the goals of the program.

Chapter 5 Wellhead Protection Program

A . Background

The District withdraws water from the highly permeable aquifer that lies beneath the floor of the Columbia Valley. Based upon past hydrogeologic studies, this shallow, unconfined aquifer supplies the District, and others in the valley, with an abundant amount of clean drinking water. These studies indicate that water in the aquifer moves quickly from north to south through the valley. Figure 6 identifies the aquifer recharge areas within the District.

The Wellhead Protection Program will give the District and the general population within the wellhead protection area insight as to possible contaminants and contamination prevention measures.

B . Wellhead Protection Area Delineation and Inventory

Completed susceptibility assessment forms are included in Appendix G.

Well 1 is located in the northern portion of the District, approximately 600 feet west of Kendall Road. The well, valves, flow meter, controls, and electrical panel are located inside a small wood framed building, inside a chain link fence. The area surrounding the well was used as a golf course years ago and is now privately owned and vegetated with grass. A 100-foot radius sanitary control area (restrictive covenant) was granted to the District in 1982.

Well 2 is located approximately 100 feet west of Kendall Road and approximately 100 feet north of Peaceful Valley Drive. The well, valves, flow meter, controls, and electrical panel are located inside a small wood framed building, inside a chain link fence. The area surrounding the well is owned by the Peaceful Valley Country Club. The area around the well is mostly forested, with the gravel driveway to the clubhouse approximately 100 feet to the west of the well house. A 100-foot radius sanitary control area (restrictive covenant) was granted to the District in 1996.

No new sources of contamination have been constructed or discovered within the sanitary control areas, or the well capture zones, as very little change has occurred in the surrounding areas.

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Table 5.1
Wellhead Protection Areas - Well 1

Time of Travel	Zone of Contribution Radii
6 month	
1 year	1530'
5 year	3380'
10 year	4800'

Source: 2005 Whatcom County Water District 13 Water System Plan

Table 5.2
Wellhead Protection Areas - Well 2

Time of Travel	Zone of Contribution Radii
6 month	440'
1 year	620'
5 year	1390'
10 year	1970'

Source: 2005 Whatcom County Water District 13 Water System Plan

Based on the information in Tables 5.1 and 5.2, and as shown in Figure 6, the inventory of potential contaminant sources is summarized as follows:

Within the 1-year zone of contribution: Well 1 – Paradise Lakes Country Club maintenance yard and individual septic drain fields in Columbia Valley Water District. Well 2 – Whatcom County Water District 13 sewage effluent disposal field. Effluent disposal field is downstream of both wells.

Within the 5-year zone of contribution: Well 1 – Whatcom County Water District 13 sewage effluent disposal field. Effluent disposal field is downstream of both wells.

Within the 10-year zone of contribution: Well 1 – Whatcom County Water District 13 sewage treatment plant, an abandoned gravel pit, and hard rock mining site. Well 2 – individual septic drain fields in Columbia Valley Water District.

It should be noted that the wellhead protection zones for Wells 1 and 2 shown in Tables 5.1 and 5.2 and Figure 6 were taken from the 2005 Whatcom County Water District 13 Small Water System Plan and have not been updated. Information in both tables appear to be generated using the Calculation of Fixed Radius (CFR) method recommended by DOH as an initial estimation of the 1-, 5-, and 10-year travel distances for water to be drawn to the wells. The CFR method is typically not very accurate in highly permeable, shallow, unconfined aquifers. Since water in the aquifer moves quickly to the south, in all likelihood, the wells' capture zones extend only a short distance (~100-200 feet) to the south, but may

Whatcom County Water District 13

extend several thousand feet to the north. It is recommended that the District hire a hydrogeologist to use hydrogeologic mapping and an analytical groundwater model to calculate more accurate capture zones.

C. Management Program for the Wellhead Protection Area

A summary of the wellhead protection area management program is provided below (*See Appendix G*):

Public education/notification:

All customers within the wellhead protection area will be direct mailed or hand delivered information about the areas outlined in the Wellhead Protection Plan, possible sources of contamination in the area, and suggested action to prevent contamination.

Summarize emergency spill response:

The District will notify identified emergency responders immediately once a spill has been detected. (see Chapter 6 for a complete list of responders)

D. Summary of WHPP Needs

The following table identifies the wellhead protection program needs which require development and carryover to the Financial Program.

Table 5.3
WHPP Program Needs

Description	Purpose	Year	Cost	Financing
WHPA Delineations	Greater Accuracy	2025	\$8,000	Rates

Chapter 6
Operation and Maintenance Program

A. Water System Management and Personnel

Person(s) Responsible for day-to-day Operations & Management:

Name: *Kelly Wynn*
Address: *14263 Calhoun Road*
Mount Vernon, WA 98273
Phone #: *(360)466-4443*

Applicable maintenance contracts are included in Appendix B.

B. Operator Certification Requirements

Is the system required to have a certified operator? Yes No

Level Required: *Water Distribution Manager I (WDM I)*

If yes, who will be the certified operator?

Name: *Kelly Wynn*
Phone #(s): *(360)466-4443*
Certification level: *WDM I*
Certification #: *007816*

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C. Routine Operation and Preventative Maintenance Procedures

Specific routine operation and maintenance activities are included in Table 6.1:

Table 6.1
Routine Operations and Preventative Maintenance Schedule

Daily	Weekly	Monthly	Quarterly	Annually
Site Visits	Clean well houses	Inspect storage tanks	Take samples for bacteria testing from source wells	Flush main through hydrants and blowoffs
Record flow meter readings at wells		Meter inspection Read meters		Collect required routine annual samples
Inspect storage tanks		Collect required routine monthly samples		Inspect water tanks and clean as needed
Inspect pump houses and pumps		Measure & record well depths		Exercise all main line valves
Inspect distribution system, including hydrants		Service well pumps and motors		Test backflow devices
Record reservoir levels				

Provide a summary of complaint response procedures:

Complaints are directed to the operator. Operator assesses the nature of the complaint. If the complaint concerns public health, the DOH Regional Engineer is notified and action is coordinated with the agency. If complaint concerns loss of pressure or service, maintenance personnel are sent to the site to assess and repair the facilities. Outside contractors may be required.

D. Water Quality Monitoring

Detailed sampling requirements are found in WAC 246-290-300. Table 6.2 identifies parameters and monitoring locations. The District added four new sampling stations to the distribution system in February 2020, plus two stations at the tanks. More detailed requirements can be found in WAC 246-290-320.

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A copy of the updated Coliform Monitoring Plan is included in Appendix D.

**Table 6.2
Monitoring Procedures**

Parameter	Sample Location	Frequency if MCL is Not Exceeded	Next Sample Date
Coliform	Representative sampling stations in the distribution system.	See Coliform Monitoring Plan in Appendix D.	Monthly
Radionuclides	From source after treatment.	Every 6 years	Both Wells, 2021
VOCs (IIN)	From source after treatment.	Every 6 years	Both Wells, 2022
IOCs (WV)	From source after treatment.	Every 9 years	Both Wells, 2026
Nitrate	From source after treatment.	Every year	Both Wells, Oct., 2020
Asbestos	Representative points in the distribution system.	Every 9 years	Waiver through 2028
Lead and Copper	10 distribution sites.	Every 3 years	July 2022

Actual sampling methods are directed by laboratories currently involved in processing samples. Since frequency of a majority of the samples is small, it is recommended that the actual sampling methods are determined through the lab at the time of sampling.

If a primary MCL is exceeded, per WAC 246-290-320, the District is required to take the following actions:

- Notify the appropriate DOH Regional office
- Notify the customers
- Determine cause of contamination
- Take action as directed by DOH

If a secondary MCL is exceeded, the District is required to notify DOH and take action as directed.

E. Future Monitoring and Regulatory Requirements

Susceptibility Waiver Status: *Asbestos waived through 2028.*

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Area Wide Waiver Status: *N/A*

F. Vulnerable Facilities

The following table indicates certain types of facilities, normal failure mode, and anticipated repair time for each.

Table 6.3
Vulnerable Facilities

Facility	Failure Mode	Repair Time/Comments
Well	Collapse/ Contamination	Manually set controls to operate an unaffected well. Replace failed well in 1 to 3 months
Well Pump	Seals/Motor/ Impeller	Manually set controls to operate an unaffected well. Replace failed pump in 2 weeks
Electrical Power	Outage	Approximately 3 days storage in tanks, W/O fire flow. Rent generator for well, 1 day.
Transmission Main	Leaks	Notify customers, locate leak, call contractor, repair 4 hours
Distribution Main	Leaks	Notify customers, locate leak, call contractor, repair 4 hours
Reservoir	Contamination	Isolate bad reservoir, operate on second reservoir, clean, disinfect contaminated reservoir, 1 week
Distribution System	Contamination	Notify customers and DOH, repeat samples, determine source, flush and disinfect system
Reservoirs	Earthquake damage	Inspection & testing within 2 days, repair, 1 month
Other:		

Summarize the most critical concerns: *Power failure, well pump failure.*

Most vulnerable system facilities and estimated cost to replace/repair is:

Table 6.4
Most Vulnerable System Facilities

Facility	Cost
Well and pump	\$40,000

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G. Emergency Response Program

In case of emergency which may cause or threaten lack of continuous water service, customers will be instructed through mass email, phone, and local social media sites to contact the following people in order:

<u>Name</u>	<u>Phone #</u>
Kelly Wynn	(360) 466-4443 (office) (360) 661-0930 (cellular)
Emergency cell	(360) 630-0970

Provide a brief description of the water system response to failure of the following facilities:

Source: If contaminated, shut well down, switch to second well, notify DOH, take appropriate action to notify customers, flush and disinfect system if necessary. If well or pump is out of service, call driller or pump service company.

Treatment: N/A

Transmission: Staff will locate break or problem, isolate the leak and call contractor to schedule repairs.

Storage: Call staff to monitor tank levels, and take generator to source pumps if necessary. If problem is contamination, call DOH, notify customers if required, isolate tank, locate problem and repair, flush and disinfect tank.

If emergencies are not readily fixed by simple operation procedures, the water system representative will call one of the emergency contacts listed on the following emergency call-up list:

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**Table 6.5
Emergency Call-Up List**

Contact	Phone Number
Fire/Police/Medical	911
County Emergency Services: Sheriff's Department	360-676-6650
Electric Utility: Puget Sound Energy	1-888-225-5773
Pump Service: Water & Wastewater Services	360-466-4443
Pipe Service: Howard Denson	360-988-4910 - office 360-410-7499 - cell
Electrician: Ackermann Electric	360-336-6188
DOH Engineer: Richard Rodriguez	253-395-6771
County Environmental Health Contact: Health and Human Services	360-676-6724
System Owner: Whatcom County Water District 13 Office	360-599-1801
System Operator: Kelly Wynn/Water & Wastewater Services	360-466-4443 - office 360-661-0930 - cell
Emergency Phone: Kelly Wynn/Water & Wastewater Services	360-630-0970
System Engineer: Roger Kuykendall, PE	206-284-0860 – office

H. Cross-Connection Control Program

See Appendix B for the Cross-Connection Control Program.

The District has prepared a Cross-Connection Control Program (CCCP) in accordance with WAC 246-290-490. The District will require all new applicants for service to sign an agreement allowing inspections for cross connection purposes. The agreement also requires that the District be notified of any potential cross connection prior to construction. Approved backflow prevention devices may be required and, if so, are to be installed at the customer's expense.

Priority service for potential cross connection control: *Commercial first, then residential.*

Record keeping and tracking: *The operator will keep track of all backflow devices and schedule inspection and/or maintenance.*

CCCP Implementation Status: *Implemented beginning in 2004*

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I. Record Keeping and Reporting

Summarize water system record keeping and reporting activities: *Operator schedules all testing, meter readings, maintenance and other required maintenance and operating activities. Operator records, files and forwards reports to appropriate agencies. In case of contamination or unsatisfactory water samples, operator notifies DOH and customers. All records are kept on file in District office.*

J. O&M Program Improvements

Summarize O&M program deficiencies and recommended improvements: *The District is working to acquire a portable generator to power the wells during an extended power outage. In order to safely connect the generator to the wells, each pumphouse must be equipped with a receptacle, a manual transfer switch, and replacement of the motor starters with a reduced voltage soft starter (RVSS). This project will be added to the capital improvement plan.*

Chapter 7
Distribution System Design & Construction Standards

A. System Design Standards

List any deviation from the DOH Design Standards in regard to design, sizing or analysis of facilities:

The District's Standards are in conformance with the DOH Standards. A copy of the Standards is included in Appendix E.

List any other references or local standards used in the design or sizing of this water system:

None.

B. Standard Construction Materials and Specifications

The water system shall adopt the current version and any amendments to the “WSDOT/APWA Standard Specifications for Road and Bridge Construction” by policy upon DOH approval of this WSP. Other standards adopted by reference for this water system include:

None.

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Chapter 8 Capital Improvement Plan

A. System Deficiencies

As described in the preceding chapters, the District's water system is simple and operates with few problems. The system is adequate for all system demands now and into the foreseeable future. However, there are some recommended improvements to the water system to improve reliability, provide redundancy, improve water quality, improve operations, improve system performance, accommodate growth, and remedy a high distribution system leakage (DSL).

B. Capital Improvement Program

Table 8.1 identifies the recommended capital projects for the next 10 years. Figure 7 provides the approximate locations of the projects. Cost estimates are included in Appendix J. The District has included a distribution water main replacement project every 7 years as a means to begin replacing aging assets.

Table 8.1
Capital Improvement Program Summary

Description	Purpose	Year	Cost	Financing
Leak Detection ⁽¹⁾	DSL	Annual	\$12,000	Rates
Leak Repair ⁽¹⁾	DSL	Annual	\$100,000	Rates
WUE Programmatic Tasks ⁽¹⁾	Conservation	Annual	\$9,000	Rates
Rate Study	Update	2021	\$10,000	Rates
Equip Well 1 for Portable Generator	Reliability	2025	\$35,000	Rates/GFCs
Analytical Model for WHPA	Water Quality	2025	\$8,000	Rates
Rate Study	Update	2026	\$10,000	Rates
Replace Distribution Lines – 1,000 LF	DSL, Asset Replacement	2028	\$399,000	Rates
Project A: Install 8-Inch Loop from 8-Inch Source Line (Well 1) to 6-Inch Line on Fall Valley Road	Reliability/ Performance/ Redundancy	2030	\$284,000	Rates/GFCs
Total			\$867,000	

(1) Represents total 10-year cost

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Chapter 9 Financial Program

See Table 9.1 for the 20-year financial model.

A. Operating Budget

Revenues meet or exceed expenses for the entire ten year projected budget? Yes No

If NO, explain how cost is recovered:

B. Operating Cash Reserve

Operating cash reserve meets or exceeds 1/8 of annual O&M and general expenses? Yes No

If NO, explain how the operating cash reserve will be funded:

C. Emergency Reserve

Emergency reserve meets or exceeds cost of most vulnerable system component? Yes No

If NO, explain how the emergency reserve fund will be funded:

D. Water Rates

Billing schedule: Monthly Bi-monthly other

Current water rates: Basic Charge: \$43.00 per bi-month
Commodity Charge: \$1.00 per 1,000 gallons over 19,000
\$3.00 per 1,000 gallons over 25,000
Connection Fee: None for existing platted lots.
\$1,939.00 for others.

Proposed water rates: Basic Charge: _____
Commodity Charge: _____
Connection Fee: _____

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E. Median Household Income Index Test

Are water rates greater than 1.5 percent of the median household income for the area?

Yes No

APPENDIX A



Whatcom County Coordinated Water System Plan Update

September 2016

Prepared For:

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Section 3 – Population, Water Demand, and Existing Water Systems

Section 3 – Population, Water Demand, and Existing Water Systems

3.0 Introduction

Washington State has given certain mandates on land use plans and utility services to individual counties as part of the Growth Management Act (GMA). The link between growth management and responsible water resource management for Whatcom County (County) exists when population and industrial/agricultural/fisheries water demands occur simultaneously. As the County population continues to grow, the demand for water will increase, as will the competition for water from the various out of stream and instream uses. The County places a high priority on water resources management to ensure a secure and sustainable supply of water for all future uses. This Coordinated Water System Plan (CWSP) update is one part of the County’s comprehensive water resource management efforts.

3.1 Population Forecasts

As required by Revised Code of Washington (RCW) 36.70A.110, the Washington State Office of Financial Management (OFM) developed a range of population projections for the County and its cities (including their urban growth areas (UGAs)) from 2013 through 2036. The GMA requires the County to plan for population growth that is consistent with OFM population projections. The County’s 2016 *Comprehensive Plan* presents a population projection of 275,450 people in 2036, which is within OFM’s range of projections. The County and each city plan for the distribution of this growth within and outside of the UGAs through the comprehensive planning processes.

For this CWSP, population projections over the planning period were developed by linear interpolation of the County’s distribution of the existing and projected population presented in the 2016 *Comprehensive Plan*. The County’s population estimates developed for the 2016 *Comprehensive Plan* are shown in **Table 3-1**. The projections in **Table 3-1** indicate that the proportion of the County’s population that resides in urban areas is expected to increase from approximately 68 percent in 2013 to 72 percent in 2036.

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Represents an annual growth rate of 1.58%

**Table 3-1
Population by County Areas**

	Estimated 2013 Population (cities include Urban Growth Areas)	Forecasted 2036 Population (cities include Urban Growth Areas)
Bellingham	92,660	123,710
Birch Bay	7,540	12,822
Blaine	5,171	9,585
Columbia Valley	3,103	4,448
Everson	2,665	3,907
Ferndale	12,758	19,591
Lynden	12,872	19,275
Nooksack	1,435	2,425
Sumas	1,449	2,323
City/UGA Total	139,653	198,086
Unincorporated Whatcom County Non UGA	66,147	77,364
Whatcom County Grand Total	205,800	275,450

Source: Whatcom County 2016 Comprehensive Plan.

Note: The Cherry Point UGA population of 43 people is included in the Unincorporated Whatcom County Non UGA population. No additional population growth is anticipated in the Cherry Point UGA.

Longer term projections, up to 50 years into the future, are made in this CWSP update to plan for future water supply needs. The average annual growth rates presented by the OFM were used to develop the three population projections shown in **Table 3-2**. Each population projection applies an annual growth rate of either 0.4 percent (low projection), 1.3 percent (medium projection), or 2.1 percent (high projection) to the population data presented in **Table 3-1** to project future population growth to the year 2065.

**Table 3-2
County-wide Population Forecast**

	2015	2020	2030	2040	2050	2060	2065
Low Projection	212,300	216,500	225,400	234,500	244,100	254,000	259,200
Med. Projection	212,300	226,400	257,600	293,200	333,600	379,600	404,900
High Projection	212,300	235,500	289,900	356,900	439,300	540,800	600,000

While future uncertainties exist, for water planning purposes, the medium projection will be utilized as the forecast or most likely scenario. **Table 3-3** shows the estimated distribution of population in urban and rural areas. The values in the table were developed by linear interpolation of the change in the County’s ratio of urban to rural population shown in **Table 3-1**. For years beyond 2035, it is assumed that the proportion of people who will reside in urban areas will continue to increase. It is the intent of the policies in the 2016 *Comprehensive Plan Update* to encourage a greater share of urban growth in the future.

Section 5 – Minimum Design Standards

Section 5 – Minimum Design Standards

5.0 Introduction

The Coordination Act requires development of minimum design standards applicable within the CWSSA. Unless otherwise noted, the minimum design standards included in this section shall apply only to new or expanding public potable water systems. However, existing water systems are encouraged to meet these minimum design standards to support the provision of safe, reliable, and high quality drinking water throughout the CWSSA.

In addition to design standards, the Washington State Department of Health (DOH) approval procedure for WSPs encourages the development of standard construction specifications by larger water utilities. Construction specifications are more detailed than the design standards included in this CWSP update. Construction specifications are typically used by contractors for reference during construction of system improvements, whereas design standards are typically referenced by the design engineer during planning or design of system improvements. Construction specifications are typically included or referenced in the technical specifications for improvement projects. The construction specifications and the design standards contained in individual WSPs shall not be less stringent than the standards described in this section per WAC 246-290-200.

Throughout this update, the words “must,” “will,” “shall,” or “required” are used when design practices are sufficiently standardized to permit specific delineation of requirements, or where safeguarding the public health justifies definitive criteria or action (such as state statute or rule requirements). Where requirements are spelled out in statutes or rules, an attempt has been made to cite the relevant source.

“Should” or “recommend” indicate procedures, criteria, or methods that are accepted as standard practices but are not required by law and that can be approached with some degree of flexibility. In such cases, managers need to explain the basis of the altered approach or, in some cases, why another approach may be more applicable. The words “should” or “recommend” indicate procedures, criteria, or methods that are not required and can be approached with some degree of flexibility.. Unless specifically noted, the WUCC has determined this flexibility should be retained and the related recommendations should not be codified.

In cases where the WUCC has determined that certain actions, standards, or procedures are sufficiently important to warrant adoption into the Whatcom County Code, it has been noted and those changes are identified later in **Section 9 – Implementation Plan**. The Implementation Plan specifies what the WUCC recommends the County Council amend in the existing code.

5.1 Rural and Urban Levels of Standards

"Urban" levels of service are provided within the urban growth area (UGA) boundaries and, conversely, "rural" services occur outside the UGA. Without further definition by local government, the legislature has determined that rural services include those public services and public facilities historically and typically delivered at an intensity usually found in rural areas, and may include domestic water systems, fire, and police protection services.

The GMA also mandates that each county develop county-wide planning policies (CWPP) that shall serve as written policy statements used solely for establishing a county-wide framework from

SECTION 5

which county and city comprehensive plans are developed and adopted. These policies are companions to any existing non-conflicting land use policies already in place.

The CWPPs developed for Whatcom County specify in Section F that cities will not extend water and sewer utilities without an adopted program for annexation and an adopted capital facilities plan. Exceptions may be made in cases where human health is threatened. The CWPPs require that, if water extensions are made, they must be consistent with the service area boundaries and other provisions of the CWSP. Outside of UGAs, cities and other public and private utilities may extend water only at rural levels of service. If rural levels of service are extended, availability of pipeline capacity to meet local supply needs shall not be used to justify development counter to county-wide land development patterns, and shall not be considered in conversions of agriculture land, forestry, or rural lands.

The following goals and policies are specified in Chapter Five – Utilities of the Whatcom County *Comprehensive Plan*. These strategies aim to provide adequate water supply for new developments consistent with the County's future growth and demands.

Goal: Resolve county water issues through proactive participation in processes leading to a solution of water-related conflicts.

- Plan for interlocal agreements with other agencies to manage failing water associations that fall into receivership.
- Encourage and actively participate in forums, workshops, and other water-related planning activities.
- Discourage extension of urban levels of water service to areas not designated as urban growth areas or Rural Communities, except in those limited circumstances shown to be necessary to protect basic public health and safety and the environment and when such services are financially supportable at rural densities and do not permit urban development.
- Investigate the opportunity for multiple solutions to other issues such as flood management when looking towards acquiring additional water supplies/rights.
- Evaluate and, where feasible, support alternative supplies of water such as desalinization, re-use of treated wastewater, and storage of flood water. Investigate reservoir holding ponds that take advantage of flood water when needed for beneficial uses such as fisheries, agriculture, domestic and industrial water supplies.

Goal: Work with water purveyors to provide service to all existing and designated urban growth or industrial areas.

- Work with the appropriate jurisdictions to ensure adequate water rights and supplies to the Urban Growth Areas and designated industrial areas in Whatcom County. Consider all options, including but not limited to, extension of water service areas, conjunctive management of surface and groundwater, artificial storage and recovery and reclamation of wastewater.

- Ensure provision of urban levels of water service to urban growth within areas designated for urban growth.
- Periodically review Urban Growth Areas to ensure adequate water supplies.
- Encourage annexation of areas zoned for urban densities concurrent with extension of urban level services.
- The County should work closely with purveyors and the State Department of Health in the development and review of Comprehensive Water Plans to ensure consistency with land use and urban growth area needs.
- The County will work with the Department of Ecology, City of Bellingham, the Port of Bellingham, the PUD, and local, regional, and state economic development agencies to ensure an adequate water supply to areas planned for industrial development.

Goal: Ensure that potable water supplies required to serve development are available at the time the development is available for occupancy and use.

- Building permit applicants, new subdivisions, short plats, and binding site plans will be required to provide evidence that adequate and legal (in consultation with the Department of Ecology) supplies of water are available prior to their approval by the County.
- Work with purveyors to assist them in modifying their systems as required to support the land use element of the comprehensive plan.

The design standards presented herein have been reviewed by the WUCC to ensure compliance with the policies of the County's *Comprehensive Plan*.

5.2 Minimum Design Standards

5.2.1 Purpose

The purpose of these standards is to set a base level of utility planning and design for public water utilities. Once the CWSP update is approved by the DOH, these standards will apply to expanding public water systems or to the construction of new public water systems. The base-level planning must provide for development consistent with adopted land use plans of the agencies with jurisdiction per WAC 246-290-100. Uniformity and consistency in standards will, in the long-term, reduce costs to consumers as system interties and/or consolidation of utilities takes place. Reliability of water supply will also be improved.

Subject to certain exceptions contained in the Coordination Act, each utility must adopt minimum design standards as a part of its WSP (WAC 246-290-100). It is intended that a utility may adopt the minimum design standards described herein or more stringent standards, provided such standards are not inconsistent with applicable land use plans. As discussed, the development and submittal of standard construction specifications for larger utilities is encouraged by the DOH and is separate from these minimum design standards.

The WUCC found that the minimum design standards from the 2000 CWSP were generally acceptable in their current state. Additional clarification was requested from the County Fire

SECTION 5

Marshal and local fire district authorities regarding fire protection requirements and hydrant placement. These standards incorporate this clarification and are discussed in **Section 5.3**.

5.2.2 Application of Standards

Existing Water Systems

Existing water systems are not required to utilize these minimum standards for connection of new retail customers to existing mains (infill), repair or replacement of facilities, or distribution system extensions in an existing service area identified in a current and approved WSP or project report, so long as they are not an expanding system that will increase in size its existing service area and/or its number of approved service connections. However, adherence to these standards in all cases is encouraged to provide better public water service throughout the County. If existing facilities must be repaired or replaced to serve an expanded service area, the new construction shall meet these minimum standards (Chapter 246-290 WAC).

The newly proposed DOH definition of an expanding water system is a public water system that increases the existing service area or approved number of service connections. For the purposes of this CWSP, when a public water system increases its existing service area, it shall be considered an expanding water system.

When a water system proposes to increase the approved number of service connections within its existing service area, PDS shall convene a meeting of PDS staff, DOH staff, and representatives of the water system to determine the appropriate level of planning for the proposed increase in connections, with the goal of mutually agreeing on whether the proposed change constitutes an expansion of the water system. For example, if the system already has infrastructure in place and is now able to serve more connections because of improvements in their water use efficiency or development of a new source, DOH may consider that as in-filling and not system expansion. However, if the utility needs to install new infrastructure to serve that area, that may constitute expansion of the system. Such a determination is appropriately made on a case-by-case basis through a collaborative effort by the parties listed above. In the event a determination is made and any party disagrees, they may seek resolution through the DOH appeals process.

Indian Tribes and Nations

Since the tribal lands on the Nooksack and Lummi Indian reservations are excluded from the CWSSA, the standards contained herein are not binding upon public water systems owned and operated by the tribes or tribal members and serving exclusively tribal lands.

Water System Plans and Applicable Land Use Plans

New, expanding, and other utilities required to meet the water system planning requirements under WAC 246-290-108 shall use land use designations as prescribed in the Whatcom County *Comprehensive Plan* for their service area, zoning codes, city comprehensive plans, and any related interlocal agreements. Such designations shall be identified in the utility's WSP and used to establish design standards.

The WSP and capital improvement schedule shall provide the anticipated level of service within the utility's designated water service area, consistent with the land use plan (WAC 246-290-100). When the utility that is required to meet the water system planning requirements under WAC 246-290-108 is requested to provide water service, it will identify that portion of planned capital facilities, as well as other installations, that are necessary to provide the service requested.

As growth occurs, the full level of water service will eventually be provided throughout the service area of the utility through implementation of a capital improvement schedule that meets County or municipal requirements.

Once a utility's WSP is approved, the utility should be consulted by the land use planning agency with jurisdiction regarding any proposed land use changes which impact the required level of water service. The water service related cost of said impacts, as determined by the utility, should be fully considered by the planning agency in acting on the proposed land use change.

5.2.3 General Provisions

Source Development

New sources must be designed and developed to meet the Washington State Department of Ecology (Ecology) and DOH regulations and design guidelines, including Chapter 173-160 WAC, "Minimum Standards for Construction and Maintenance of Wells," as administered by Ecology, and Chapter 246-290 WAC, "Group A Public Water Supplies," as administered by the DOH.

All test and production wells must be drilled in accordance with state and local drilling and testing specifications. Wells used for domestic supply must meet the minimum requirements and must obtain written source approval from DOH in accordance with Chapter 246-290 WAC.

Source Abandonment

Any well that is unusable, abandoned, or whose use has been permanently discontinued, or that is in such disrepair that its continued use is impractical or is an environmental, safety, or public health hazard shall be decommissioned in accordance with WAC 173-160-381. If a water source is abandoned, the water system should notify both Ecology and DOH of the abandonment of that source and should make the appropriate changes to their WSP and related water rights.

Water Quality

Water quality must be proven to conform to the federal Safe Drinking Water Act (SDWA), and DOH criteria specified in Chapter 246-290 WAC.

Design Standards

Standards Incorporated by Reference – The existing standards listed below, or as may be modified by the appropriate authorities, are hereby incorporated by reference. Priority for application of these standards is in the order listed, but the most stringent applies. Except as otherwise superseded by the County standards described herein, these standards will apply to water system design, installation, modification, and operation.

- Group A Public Water Supplies (Chapter 246-290 WAC), *Water System Design Manual*, DOH publication no. 331-123.
- Applicable County or city rules, regulations, ordinances, and standards.
- *Standard Specifications for Road, Bridge, and Municipal Construction*, as published by the Washington State Department of Transportation/American Public Works Association (WSDOT/APWA), latest edition.
- Standards of the American Water Works Association (AWWA).

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General Standards – Selection of materials and construction of water system facilities in the County shall conform to the provisions outlined above, with the additional provisions:

- All owners/operators of water systems that have water mains in County road rights-of-way must comply with franchise requirements outlined in ordinances passed by the County Council authorizing such use of the road and rights-of-way (Whatcom County Code Chapter 12.27);
- Construction within incorporated areas remains subject to municipal permitting requirements; and
- All projects requiring design by a registered professional engineer shall be inspected by the utility or its designated representative before closure of any excavation.

Hydrostatic Pressure Test

A hydrostatic pressure leakage test will be conducted on all newly constructed water mains, fire lines, fire hydrant leads, and shutoffs in accordance with WSDOT/APWA Section 7-11.3(11) or AWWA C-600 specifications, unless otherwise specified by the designated utility.

Disinfection and Bacteriological Testing

All pipe, reservoirs, and appurtenances shall be flushed and disinfected in accordance with the standards of AWWA C651-86 and C652-86, or WSDOT/APWA Section 7-11.3(12), unless otherwise specified by the designated utility.

Utility Interties

When a utility or utilities are planning to install new or replacement water mains, the utility should evaluate the feasibility of emergency or permanent interties with nearby water systems as a potential means of improving efficiency and reliability of their water supplies.

Flow Measurements

All new groundwater wells used as water sources for new and expanding public water supplies shall be provided with an access port for measurement of depth to water (WAC 173-160-291), and measuring devices for determining flow rate and total production (WAC 246-290-496). Installation of these devices is also recommended for existing groundwater sources. Water users are advised to examine their water right documents to determine whether metering requirements are included as a condition of their water right.

Cross-connection Control

Where the possibility of contamination of the supply exists, water services shall be equipped with appropriate cross-connection control devices in accordance with WAC 246-290-490. The designated utility shall determine the need, size, kind, location, maintenance, and testing requirements of the device as specified in WAC 246-290-490.

5.2.4 Specific Provisions

If a public water system has adopted specific design standards that have been approved by DOH, those standards shall apply instead of the specific provisions discussed below, and shall be at least as stringent (WAC 246-290-200).

Pressure Requirements

All public water systems shall be designed to maintain a minimum residual pressure of 30 pounds per square inch (psi) at the meter, or property line if there is no meter, under peak hourly demand flow conditions, excluding fire demand. For water systems providing fire flow capability, the design shall be adequate to maintain, under fire flow plus maximum daily demand flow conditions, a residual pressure of 20 psi throughout the system (Chapter 246-290 WAC). **Section 5.3** contains additional details relating to the fire flow provisions.

Pipe Sizing and Materials

For new systems or expansions to existing systems, the minimum pipe diameter for distribution mains should be 8 inches within UGAs, rural community, urban, and rural business land use designations. These land use designations are as defined in the County's current *Comprehensive Plan*. For all other designations, the minimum diameter shall be 6 inches, unless it can be justified hydraulically that all other service conditions can be maintained (WAC 246-290-230). Exceptions to the 6-inch minimum diameter requirement may be granted by the appropriate agency (DOH or Whatcom County Health Department) under the following conditions:

- a) Fire flow is not required under current land use; or
- b) A system is to be developed within a designated service area, there is not a direct connection to the designated utility, and the designated utility has entered into a water service agreement with the developer that includes provisions for eventual direct connection of the development. Fire protection requirements, if any, must be met during the interim by the system to be developed.

Water main size shall be adequate to deliver the required fire flow (if applicable) and maintain pressure requirements. Water mains serving fire hydrants, either as part of new construction or planned phased improvements, shall not be less than 8 inches in diameter for dead-end lines, or less than 6 inches in diameter if looped. Hydrant leads extending less than 50 feet or across a street should be of a suitable size to carry the required fire flow, but shall not be less than 6 inches in diameter. In a dead-end cul-de-sac, smaller diameter mains may be installed from the last hydrant to remaining residences.

All water mains shall meet applicable engineering and health standards adopted by DOH and the water purveyor, including Chapters 246-290 and 246-293 WAC. Maximum flow velocities shall be consistent with WAC 246-290-230(9) and Chapter 8.1 of the DOH *Water System Design Manual*.

All pipe material shall be equal to or greater than AWWA standard specifications unless previously approved by the appropriate agency. All pipe material for new water systems shall be constructed with lead-free materials in accordance with Chapter 246-290 WAC.

Isolation Valves

Valves should be installed in a configuration that permits isolation of water mains and minimizes the number of customers out of service when the water system turns the water off for maintenance, repair, replacement, or additions. A valve is not required for short block lines of less than 100 feet. Valves should be installed at main intersections with normal maximum spacing, as listed in **Table 5-1**. The zoning designations are as defined in the County's current *Comprehensive Plan*. The general zoning classification may be referenced for zoning within incorporated areas.

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**Table 5-1
Isolation Valve Spacing**

Zoning Classification	Valve Spacing
Industrial (HII, LII, GM, GI, RIM, AO)	500 feet
Commercial (RGC, GC, TC, NC, STC, RC)	500 feet
Urban Residential (URMX, URMX10-24, URMX6-12, URMX6-10, URM24, URM18, URM12, URM6)	500 feet
Urban Residential (URM6, UR6, UR4, UR3)	800 feet
Rural Residential (RR3, RR2, RR1)	800 feet
Rural Residential (RR5A, RR10A, RRI, TZ)	0.50 mile
Rural (R2A, R5A, R10A)	0.50 mile
Resources (AG, CF, RF, MRL)	0.50 mile
Other (ROS, EI)	0.50 mile

Air and Air-vacuum Relief Valves

To minimize problems associated with air entrapment, the purveyor should install air valves or combined air-vacuum relief valves at appropriate points of high elevation in the system.

Blow-off Valves

A hydrant or blow-off assembly should be installed in accordance with each water system's design standards at low points and dead-ends in the distribution system to allow sufficient flushing and proper disinfection of distribution mains. The blow-off assembly should be installed in the utility right-of-way, except where an access and construction easement is provided for in writing to the water utility. In no case should the location and construction be such that there is a possibility of back-siphoning into the distribution system.

Pressure Reducing Stations

Pressure reducing stations should include a manifold system that provides for a redundant pressure reducing valve, a bypass valve, or other suitable device that ensures reliability and continuity of service.

Storage

The design of each storage tank shall adhere to the design considerations, provisions, and appurtenant design details discussed in Chapter 9 of the DOH *Water System Design Manual* per Chapter 246-290 WAC. Storage facility requirements are based upon the following five components.

- a) Equalizing Storage: required to supplement production from water sources during high demand periods.
- b) Standby Storage: required as backup supply in case the largest source is out of service.
- c) Fire Storage: required to deliver the level of fire flow service for the required duration identified in the utility's approved WSP.
- d) Operational Storage: the volume of distribution storage associated with source or booster pump normal cycling times under normal operating conditions.
- e) Dead Storage: the volume of stored water not available to all consumers at the minimum design pressure.

As a minimum, sizing of storage tanks shall be adequate to provide for equalizing storage plus the larger of standby or fire storage requirements (nesting). Nesting of standby and fire storage is allowed only where not prohibited by local ordinance, the local fire protection authority, or the county fire marshal (WAC 246-290-235). Equalizing and standby storage volumes shall be determined using the DOH *Water System Design Manual*. Fire storage volumes shall be determined using the fire flow and duration as provided in the levels of service requirements of the County or municipal ordinance and the utility's approved WSP. Siting of storage facilities should consider locations that provide gravity flow. Ground-level, partially-buried, and underground reservoirs should be designed to minimize the potential for contamination in accordance with the DOH *Water System Design Manual*.

General Facility Placement

Facilities shall be located in accordance with applicable municipal or county ordinances. Where no ordinance applies, water mains should be installed at a location that is compatible with the existing water system, terrain, and location of other utilities. In new subdivisions, binding site plans, and short plats water mains should be installed parallel to the center line on the north or east sides of the street, wherever practical.

In addition, all piping, pumping, source, storage, and other facilities should be located on public rights-of-way or dedicated utility easements. Utility easements should be a minimum of 15 feet wide, unless the easement is contiguous and parallel to an access easement or public right-of-way. In such cases, the minimum easement width should be 10 feet. Piping should be installed no closer than 5 feet from the edge of an easement. Unrestricted access should be provided to all public water system lines and their appurtenances, and public fire hydrants that are maintained by public agencies or utilities.

Pipe Cover

The depth of trenching, installation of pipes, and backfill should be such as to give a minimum cover of 36 inches over the top of the pipe for transmission and distribution lines, and 24 inches over service piping. Backfilling up to 12 inches over the top of the pipe should be evenly and carefully placed. The remaining depth of trench is to be filled in accordance with applicable construction standards identified in **Section 5.2.3 – General Provisions**. Materials capable of damaging the pipe or its coating should be removed from the backfill material.

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Concrete Thrust Blocking

Concrete thrust blocking should be placed at bends, tees, dead ends, and crosses in accordance with the utility's standards. Blocking should be concrete poured in place. Concrete blocking should bear against solid undisturbed earth at the sides and bottom of the trench excavation and should be shaped so as not to obstruct access to the joints of the pipe or fittings.

Water and Sewer Line Separation Distances

Whenever possible, transmission and distribution water piping should be separated at least 10 feet horizontally from on-site waste disposal piping, drain fields, and/or wastewater gravity or force mains. The bottom of the water main should be 18 inches above the top of the sewer. Where local conditions prevent such horizontal and/or vertical separation, closer spacing is permissible where the separation is mitigated in the design and construction, and meets the special requirements of Ecology's *Criteria for Sewage Works Design*.

5.3 Fire Hydrants and Fire Flow

The goal of these standards is to prevent or minimize the loss of life, loss of property, and damage to the environment from the adverse effects of fire.

5.3.1 New Fire Hydrants

For new or expanding systems, new fire hydrants within the unincorporated areas of the County shall comply with the minimum design criteria set forth in Whatcom County Code 15.04.040, and shall be compatible with local fire department standards and the design criteria adopted by each purveyor. Fire hydrants shall adhere to the specific design criteria and standards utilized by the utility but may not be less stringent than the Whatcom County Code.

5.3.2 Fire Hydrant Location

Fire hydrants shall be located in unincorporated areas in accordance with Whatcom County Code 15.04.040. Within municipalities, the location specifications provided in the city fire ordinance or water system design standards shall apply, but shall not be less stringent than the Whatcom County Code.

Actual location of hydrants should be identified in the development site plan and should be approved by the water purveyor and fire marshal prior to construction. Placements should be made to provide unhindered access for fire hose connections, testing, and maintenance.

5.3.3 Fire Hydrant Maintenance

It is the determination of the WUCC that the responsibility for maintenance and testing of fire hydrants primarily rests with the water systems that own the infrastructure. For non-municipal corporations, a description of the hydrant maintenance procedures must be kept on file to be eligible for liability protection under RCW 70.315.060 for damages that may arise out of a fire event. Within all water systems, fire hydrants that are permanently inoperative or unusable shall be repaired or removed. Fire hydrants that are temporarily inoperative or unusable shall be wrapped or otherwise provided with temporary indication of their condition and the local fire authority notified when they are unavailable. Fire hydrants that are temporarily inoperative or unusable shall be repaired as soon as possible (WAC 246-293-650).

Public water systems are encouraged to communicate with their local fire authorities regarding the location, operation, and status of their fire flow facilities. Where appropriate, a written agreement that identifies responsibilities for maintenance and testing of fire hydrants should be negotiated between the fire department or district and the water utility (WAC 246-293-650(8)). Such agreements could establish operation, maintenance, and testing policies that are mutually beneficial to both the fire authority and the water utilities and would clarify each party's respective roles and responsibilities. Communication is seen as being most important in the unincorporated areas and/or where County fire districts exist with dynamic boards of commissioners and local fire district chiefs.

The tasks itemized in **Table 5-2** should be carried out in a responsible manner by the assigned party at the specified frequency. The utility should notify the local fire authority in advance before any changes are made to hydrant installation or relocation. The local fire authority should notify the utility in advance of testing any fire hydrants.

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**Table 5-2
Fire Protection Facility Operation, Maintenance, and Testing**

Water Utility Responsibility	Frequency
Review of location, installation, and type of hydrant, ports, and valves	At time of permitting
Inspection of new facility	At time of construction
Painting, numbering, and coding of hydrants	As needed
Hydrant testing, maintenance, and recordkeeping	As needed
Communications (emergency, alert system, faulty hydrant, etc.)	As needed
Clear vegetation and brush from hydrant	Seasonally or more often as needed
Backflow prevention between potable and fire protection systems	Annually
Estimate volume and time of use of hydrants for Water Use Efficiency reporting	Monthly
Fire District Responsibility	Frequency
Review of location, installation, and type of hydrant, ports, and valves	At time of permitting
Notify water utility in advance when hydrants are used for training or testing	As needed
Communications (emergency, alert system, faulty hydrant, flow tests, etc.)	As needed
Install and check reflector location, if used	As needed
Private hydrant and fire system testing	Annual
Estimate volume and time of use of hydrants	Per occurrence

5.3.4 Fire Flow Requirements

Water supply facilities for new developments and new or expanding public water systems shall be designed to meet the minimum fire flow requirements set forth in **Table 5-3**. The WUCC defers to the Fire Marshall's expertise and believes that the recommended fire flow requirements in **Table 5-3** are an appropriate level of fire flow to meet the goal of this section of preventing or minimizing the loss of life, loss of property, and damage to the environment from the adverse effects of fire. Although typical fire flow requirements established for individual structures during the development review process are based on building type, construction, and other factors,

Table 5-3 presents fire flow recommendations based on zoning to assist water purveyors in planning for fire protection within their service areas. The recommended fire flow requirements shown in **Table 5-3** were developed in coordination with the County Fire Marshal and the WUCC, and includes flows that are typically required by the fire marshal for development within the zoning designations. The zoning designations in **Table 5-3** are as defined in the County's current *Comprehensive Plan*. The general zoning classification may be referenced for zoning within incorporated areas.

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**Table 5-3
Minimum and Recommended Fire Flow Requirements**

Zoning Classification	Minimum Fire Flow Requirement (gallons per minute (gpm))	Recommended Fire Flow Requirement (gpm)
Industrial (HII, LII, GM, GI, RIM, AO)	1,000 gpm for 2 hours	2,000 gpm for 2 hours
Commercial (RGC, GC, TC, NC, STC, RC)	1,000 gpm for 2 hours	1,500 gpm for 2 hours
Urban Residential (URMX, URMX10-24, URMX6-12, URMX6-10, URM24, URM18, URM12)	750 gpm for 1 hour or commensurate with standards of the adjacent municipal corporation, whichever is greater	1,500 gpm for 1 hour
Urban Residential (URM6, UR6, UR4, UR3)	500 gpm for 1 hour or commensurate with standards of the adjacent municipal corporation, whichever is greater	750 gpm for 1 hour
Rural Residential (TZ)	500 gpm for 1 hour	500 gpm (residential)/ 1,000 gpm (commercial) for 1 hour
Rural Residential (RR3, RR2, RR1)	500 gpm for 1 hour	500 gpm for 1 hour
Rural Residential (RR5A, RR10A, RRI)	No fire flow requirement	500 gpm for 1 hour
Rural (R2A, R5A, R10A)	No fire flow requirement	500 gpm for 1 hour
Resources (AG, RF, MRL)	No fire flow requirement	500 gpm for 1 hour
Resources (CF)	No fire flow requirement	No fire flow requirement
Other (ROS, EI)	No fire flow requirement	500 gpm for 1 hour for parks with structures, otherwise no fire flow requirement

Notes:

- (1) Fire protection may be provided by means other than hydrants supplied by a water utility's distribution system provided that such alternative methods are fully documented in the utility's WSP and approved by the local fire protection authority (WAC 246-293-670, Whatcom County Code 15.04.040).
- (2) Projected density based upon designated land use in adopted County or city comprehensive plans.
- (3) Whenever existing land use densities are greater than the comprehensive land use designation density, the fire flow rate will be determined on the basis of existing density or per the determination of the fire marshal.
- (4) Within a designated service area, a utility that has fire flow capability shall extend existing water mains to provide flows whenever feasible. When main extension is not feasible, a remote system may be developed that is designed to accommodate fire flows in accordance with a jointly developed plan between the water utility and fire marshal's office. The plan shall be incorporated in the utility's WSP.
- (5) A greater flow rate may be required for certain developments as determined by the fire marshal.
- (6) Fire flow requirements for churches, schools, and labor camps will be established by the County Fire Marshal, but in no case will the required fire flow be less than that specified in the table above.

Table 5-3 presents zoning-based fire flow requirements. However, the actual fire flow requirement for individual structures will be determined during the development review process and may be higher than those stated in **Table 5-3**. Utilities shall develop their capital improvement programs for meeting their fire flow objectives in consultation with the appropriate local fire authorities. It is the intent that said programs may be scheduled to be phased-in over a specific period of time

considered to be reasonable for the individual circumstances. The program and schedule shall be described in the utility's comprehensive water system plan, which is subject to DOH approval.

5.3.5 Fire Flow Mitigation Alternatives

The fire marshal and building official may consider any combination of alternative strategies to mitigate in part or in whole the lack of adequate or available fire flow water and/or reduce the minimum required fire flow storage volume or flow for a given project proposal (Whatcom County Code 15.04.040). Such strategies may include, but are not necessarily limited to:

- Provide an automatic sprinkler system throughout the building or fire area when not otherwise required by the International Fire Code (IFC) or International Building Code (IBC).
- Upgrade the proposed building construction type from combustible to non-combustible and/or fire-rated. For example, upgrade from Type VB to Type VA or Type IIB construction.
- Provide fire walls or fire barrier walls to divide the building into smaller fire areas or to provide isolated storage of combustible packaging supplies and/or hazardous materials.
- Provide enhanced setbacks from property lines and other buildings on the site.
- Partner with an existing water purveyor to provide approved upgrades to the delivery capability of the existing purveyor system, such as upsizing sections of the piping system, providing a station or satellite pump, providing an additional system storage tank, or similar approved system upgrades.
- Provide additional fire hydrants at approved locations with adequate, parking-prohibited staging areas for the fire district.
- Provide a monitored fire alarm system when not otherwise required by the IFC or IBC.
- Where appropriate, provide additional exits from the building to adequate, accessible exit discharge areas.
- Reduce high-piled storage racking systems.
- Other approved strategies that reduce risk to building occupants and emergency responders.

Approval of such strategies is at the discretion of the fire marshal in cooperation with the Building Official. They are to be considered on a case-by-case basis, and based on the specific characteristics of a given project. The fire marshal may require system strategies be analyzed, evaluated, and/or designed by an approved Fire Technician or licensed Fire Tech/System Design Engineer.

5.3.6 Phased Fire Flow Plan

If water service is requested of a utility in an area where only limited fire flow is currently provided, the cost of installing all improvements at once to meet the required level of fire flow may be prohibitive. In this case, the utility and developer may reach an agreement to provide the desired service through a schedule of improvements over a reasonable period of time. Until the schedule of improvements is fully implemented, the required level of fire flow may not be available in all

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areas of the development. This phased plan must be approved by the County for service in unincorporated areas, or the city agency with jurisdiction within corporate limits, and must be consistent with the approved WSP of the utility (Chapter 246-293 WAC).

If fire hydrants are not initially installed as part of the phased fire flow plan, a tee shall be installed at least every 900 feet where fire hydrants will be located (WAC 246-293-650(1)) or at approved hydrant location intervals per applicable sections of the current adopted edition of the IFC Section 507, Fire Protection Water Supplies; IFC Appendix C, Fire Hydrant Locations and Distribution; and as amended per Whatcom County Code 15.04.040.

A phased fire flow plan shall be applicable when the following conditions are met:

- a) If the proposed new service is within the utility's designated service area, the utility shall have an approved WSP that contains a capital improvement schedule that provides the full level of water service to the phased fire flow plan area. If the new service is proposed outside of a designated service area and the utility intends to provide service, or if it is to be developed by a Satellite Management Agency (SMA), the utility or SMA shall submit an amendment to its WSP that addresses the needs of the new service area.
- b) A written agreement between the utility and developer setting forth the phased fire flow plan is submitted and approved by the city or County prior to issuing a development permit (subdivision, binding site plan, plat, short plat, etc.). The plan must identify the fire flow to be initially provided, projected growth expected in the proposed development, additional capital facilities required, a schedule of construction, and eventual fire flow to be provided. The phased construction schedule must provide for compliance with design standards within a reasonable period of time agreed to by the County.
- c) All water mains and other permanent facilities installed during the phased development period shall be in accordance with the eventual system design identified in the capital improvement schedule of the utility's WSP.

If land use changes occur, or if growth does not occur as anticipated, the utility may submit a revised plan that identifies the reasons for variation from the original plan and a fixed date for compliance to be achieved.

5.3.7 Low Flow Hydrants (For Existing Systems)

While not all public drinking water systems in Whatcom County provide fire flow, it is recognized that some water systems have installed fire hydrants that do not meet fire flow standards. Connection to these systems for fire suppression can result in negative pressures and possible cross contamination of the system.

Public water systems that are not required to comply with minimum fire flow standards shall coordinate with the local fire control authorities to ensure that any hydrants on the system, if they can possibly be used in the course of fire suppression activities, do not create adverse pressure problems within the water system as a result of fire control actions (WAC 246-290-221).

In order to safeguard public health, drafting (pulling water from a hydrant) of fire hydrants is prohibited unless otherwise agreed between the purveyor and the fire authority. Hydrant connections may only be made with collapsible hose unless the utility informs the local fire control authority otherwise. For all water systems in the unincorporated portions of the County, the caps on all hydrants must be color-coded RED when:

- The effects of supplying fire flow are unknown;
- Fire flow is less than 500 gallons per minute (gpm); or
- Fire flow would reduce system pressures to less than 20 psi;

The reason for this measure of safety is that most existing rural water systems are not designed to meet minimum fire flow standards, even if they have fire hydrants, while maintaining 20 psi throughout the entire system during fire flow conditions. It is a common misconception that a fire hydrant can be used (drafted/pulled) for its maximum flow capacity as long as the pressure at that fire hydrant does not drop below 20 psi. In fact, an individual hydrant may free flow large quantities of water while maintaining in excess of 20 psi. However, the assumption is false that more water is available to be drawn from a hydrant by drafting (pulling) down to 20 psi. Drafting or pulling from a hydrant beyond what freely flows is likely to reduce the pressure elsewhere in the system below 20 psi and create negative pressure, which can cause contamination through backflow, failure of residential plumbing, and even catastrophic failure of water system facilities. The WUCC believes it is the responsibility of a water system to take steps to retard free flow of water from its system hydrants to maintain system pressures above 20 psi. These steps may include installation and operation of valves, orifices, or other flow restriction methods.

5.3.8 Water Rights and Fire Flow

The diversion or withdrawal and use of water for **firefighting**, such as containing, suppressing, and extinguishing a fire, including the use of water from hydrants, is essential to the public welfare and does not require a water use authorization from Ecology. However, use of water for some **fire protection** purposes does require a water right permit.

The following definitions of firefighting facility, firefighting water use, and fire protection are taken from Ecology Policy POL-2015:

Firefighting facility means any building or place that provides firefighting service and is used primarily for storing and maintaining firefighting equipment and/or housing firefighting personnel. Water may be used within the facility for training firefighting personnel, and testing and maintaining firefighting equipment. A water right is required for such uses.

Firefighting water use means the use of water to contain, suppress, and extinguish a fire that is an immediate threat to persons or property. It also includes temporary use of water for drinking and sanitation by firefighting personnel as needed during the act of fire suppression and extinguishment. A water right is not required for this use.

Fire protection is a beneficial use of water associated with the ongoing use of water to reduce fire risks. It includes irrigating buffer areas, storing water for fire use, and supplying fire hydrants within developments. Fire protection water use also includes the use of water within a firefighting facility for training firefighting personnel, and testing and maintaining firefighting equipment. A water right is required for such uses (emphasis added).

When a water right permit is required, it must be obtained in accordance with Ecology regulations and procedures (Chapter 173-160 WAC). Copies of water rights documents, correspondence, and other records are to be maintained on file by the purveyor. Water used for firefighting facilities

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and for fire protection purposes, if not a permit exempt use of water, also requires a water right. Any water right issued for these purposes will identify “fire protection” as the beneficial use.

Groundwater withdrawals of not more than 5,000 gallons per day, as authorized under the groundwater permit exemption (RCW 90.44.050), may be used to serve a firefighting facility, or up to 1/2-acre lawn or noncommercial garden may be irrigated as a buffer area for fire protection purposes..

5.4 Standards Review Subcommittee

A Standards Review Subcommittee (Subcommittee) shall be established by the WUCC and should be convened by the Whatcom County Executive’s Office, or his/her designee, at least annually to review these standards and their implementation. The Subcommittee shall seek input from the County Fire Marshal, city fire departments, and the County Fire Chiefs Association in matters related to fire protection standards. The Subcommittee should also include representation from engineering firms and other technical staff, as required. Recommendations of the Subcommittee shall be submitted to the WUCC and, if revisions are approved, they shall be forwarded to the County Council for adoption.

5.5 Severability

If any provisions of these standards or their application is found to be invalid, the remainder of the standards and their implementation should not be affected.

Whatcom County Comprehensive Plan



Adopted August 9, 2016
Whatcom County Planning and Development Services

updated May 2018



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**Whatcom County
Comprehensive Plan**

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Chapter One Introduction and Growth Projections

How the Plan was Created

Whatcom County's Comprehensive Plan is intended to guide growth in unincorporated areas for the next 20 years in coordination with city comprehensive plans. The fundamental purpose of the Comprehensive Plan is to establish a framework of goals and policies to guide growth, land use, capital facility and transportation planning, and environmental protection.

The plan identifies urban growth area (UGA) boundaries, rural areas, agricultural lands, forestry lands and mineral resource lands. The majority of the county's growth will be located within the UGAs. Several factors influenced the development of the adopted goals and polices contained in the Whatcom County Comprehensive Plan.

First, this plan has been reviewed for consistency with the requirements of the Growth Management Act (GMA), the goals of the GMA (RCW 36.70A.020 and .480), and mandatory plan elements (RCW 36.70A.070). GMA goals are set forth below:

- (1) Urban growth. Encourage development in urban areas where adequate public facilities and services exist or can be provided in an efficient manner.
- (2) Reduce sprawl. Reduce the inappropriate conversion of undeveloped land into sprawling, low-density development.
- (3) Transportation. Encourage efficient multimodal transportation systems that are based on regional priorities and coordinated with county and city comprehensive plans.
- (4) Housing. Encourage the availability of affordable housing to all economic segments of the population of this state, promote a variety of residential densities and housing types, and encourage preservation of existing housing stock.
- (5) Economic development. Encourage economic development throughout the state that is consistent with adopted comprehensive plans, promote economic opportunity for all citizens of this state, especially for unemployed and for disadvantaged persons, promote the retention and expansion of existing businesses and recruitment of new businesses, recognize regional differences impacting economic development opportunities, and encourage growth in areas experiencing insufficient economic growth, all within the capacities of the state's natural resources, public services, and public facilities.
- (6) Property rights. Private property shall not be taken for public use without just compensation having been made. The property rights of landowners shall be protected from arbitrary and discriminatory actions.

- (7) Permits. Applications for both state and local government permits should be processed in a timely and fair manner to ensure predictability.
- (8) Natural resource industries. Maintain and enhance natural resource-based industries, including productive timber, agricultural, and fisheries industries. Encourage the conservation of productive forest lands and productive agricultural lands, and discourage incompatible uses.
- (9) Open space and recreation. Retain open space, enhance recreational opportunities, conserve fish and wildlife habitat, increase access to natural resource lands and water, and develop parks and recreation facilities.
- (10) Environment. Protect the environment and enhance the state's high quality of life, including air and water quality, and the availability of water.
- (11) Citizen participation and coordination. Encourage the involvement of citizens in the planning process and ensure coordination between communities and jurisdictions to reconcile conflicts.
- (12) Public facilities and services. Ensure that those public facilities and services necessary to support development shall be adequate to serve the development at the time the development is available for occupancy and use without decreasing current service levels below locally established minimum standards.
- (13) Historic preservation. Identify and encourage the preservation of lands, sites, and structures that have historical or archaeological significance.
- (14) Shoreline Management. Per RCW 36.70A.480 Shorelines of the State, the goals and policies of the Shoreline Management Act, as set forth in RCW 90.58.020, are added as one of the goals of the Growth Management Act.

Second, through inter-jurisdictional cooperation, Whatcom County has coordinated planning and decision making with various levels of government to ensure compatibility of goals and consistency of plans.

Third, extensive citizen participation was facilitated through meetings, presentations, public hearings, and written comments made throughout this process.

Countywide Planning Policies

The Whatcom County Council, in conjunction with the cities, previously adopted a set of Countywide Planning Policies (see Appendix C). The framework provided by the adopted Countywide Planning Policies ensures that local planning efforts will be consistent with one another and supportive of regional goals.

Original Adoption and Amendments

The County Council adopted the Whatcom County Comprehensive Plan in May of 1997. Since then, amendments have been made on an annual basis. Additionally, a comprehensive plan update took place in 2005, a UGA review occurred in 2009 and a combined comprehensive plan update and UGA review occurred in 2016 as required by RCW 36.70A.130.

Introducing Whatcom County

Whatcom County lies in the northwest corner of both the State of Washington and the coterminous United States. It is bounded on the north by the Canadian border, on the east by Okanogan County, on the south by Skagit County, and on the west by the Strait of Georgia and Bellingham Bay. These borders enclose large parts of the Mount Baker National Forest and the North Cascades National Park, which take up about two-thirds of Whatcom County's total area. All but a few residents live in the western third of the county. Bellingham is Whatcom County's largest city. Other cities include Blaine, Everson, Ferndale, Lynden, Nooksack, and Sumas, and there are three unincorporated UGAs and several smaller unincorporated communities.

Two Indian reservations and associated trust lands are located within Whatcom County's borders. The Lummi Nation reservation is on the Lummi Peninsula and Portage Island on the western side of the county; the Nooksack Tribe reservation and trust lands include parcels along the Nooksack River in the west-central area of the county.

Whatcom County Government

Whatcom County's mission statement is to “promote, enrich and enhance the freedoms, opportunities, health and safety of its citizens. We will provide essential and desirable public services in a cost effective and accountable manner. We will conduct the public’s business and treat all members of our diverse community in a courteous and professional manner. We will provide vision, leadership and responsiveness while addressing community issues and conducting the business of the people. We will encourage community involvement in public issues while protecting the rights of the individual and encouraging respect for diversity. We will serve as an active catalyst for individuals and other entities to participate in achieving a positive future for Whatcom County.”

Ensure good government through transparency, robust public involvement and ongoing process and performance improvement.

Goal 1A: Ensure that government activities, regulations and policies are transparent, accountable and easy to understand.

Policy 1A-1: Integrate and simplify all documents using the “Federal Plain Language Guidelines” available at www.plainlanguage.gov to make them more understandable and user-friendly.

- Policy 1A-2: Benchmark the County's performance against itself and other comparable jurisdictions. Develop and publish reports on key performance metrics.
- Policy 1A-3: Ensure all acronyms and abbreviations used in public documents have clearly defined and readily accessible explanations.
- Policy 1A-4: Maintain a user-friendly, intuitive, and helpful website.
- Policy 1A-5: Ensure forms, permits, applications, and similar documents are readily available to the public and are updated often to reflect changes to regulations and contact information. These documents should be present on the County website and cross-referenced appropriately so the public can easily find and access them.
- Policy 1A-6: Use technological tools, such as Geographic Information Systems (GIS), to make information easily accessible to the public.
- Policy 1A-7: Respond to inquiries from the public in a timely, professional, and courteous manner.
- Policy 1A-8: No rule, regulation, restriction, or requirement shall be imposed by the County that is not embodied in local, state, or federal law.

Population

Population growth in Whatcom County since the arrival of the first Euro-American immigrants in the 1850s has been driven largely by in-migration of people from other sections of the state and country. **Table 1** displays the growth of population in Whatcom County from 1910 to 2010, and **Table 2** shows the estimated growth figures for each year of the current decade. These tables indicate a steady increase in population over time, with varying rates of growth often driven by factors external to Whatcom County such as international events or changes in technology and transportation. Approximately 73% of the population growth between 1980 and 2013 was due to in-migration of people from outside the area seeking jobs, life styles, and/or amenities found in Whatcom County. **Figure 1** below shows net migration fluctuating significantly over time.

It should be noted that the first decade of planning under the Growth Management Act (1990-2000) accompanied the reversal of a 30-year trend from 1960-1990 where unincorporated areas grew faster than cities. From 1990 to 2000, cities grew at a more rapid rate than unincorporated areas for the first time since the 1950s. The trend of faster city growth continued between 2000-2010.

Table 1. Population Growth in Whatcom County, 1910-2010

YEAR	TOTAL COUNTY POPULATION	AVERAGE ANNUAL RATE OF GROWTH	UNINCORPORATED POPULATION	AVERAGE ANNUAL RATE OF GROWTH	COMBINED POPULATION OF CITIES*	AVERAGE ANNUAL RATE OF GROWTH
1910	49,511		20,183		29,328	
1920	50,600	0.2%	19,621	-0.3%	30,979	0.5%
1930	59,128	1.6%	23,112	1.7%	36,016	1.5%
1940	60,355	0.2%	25,860	1.1%	34,495	-0.4%
1950	66,733	1.0%	26,462	0.2%	40,271	1.6%
1960	70,317	0.5%	25,990	-0.2%	44,327	1.0%
1970	81,983	1.5%	34,004	2.7%	47,979	0.8%
1980	106,701	2.7%	48,622	3.6%	58,079	1.9%
1990	127,780	1.8%	59,187	2.0%	68,593	1.7%
2000	166,826	2.7%	74,231	2.3%	92,595	3.0%
2010	201,140	1.9%	87,065	1.6%	114,075	2.1%

Source: US Census

*Cities include Bellingham, Blaine, Everson (since 1930), Ferndale, Lynden, Nooksack (since 1920), and Sumas

Table 2. Estimated Population Growth in Whatcom County, 2010-2013

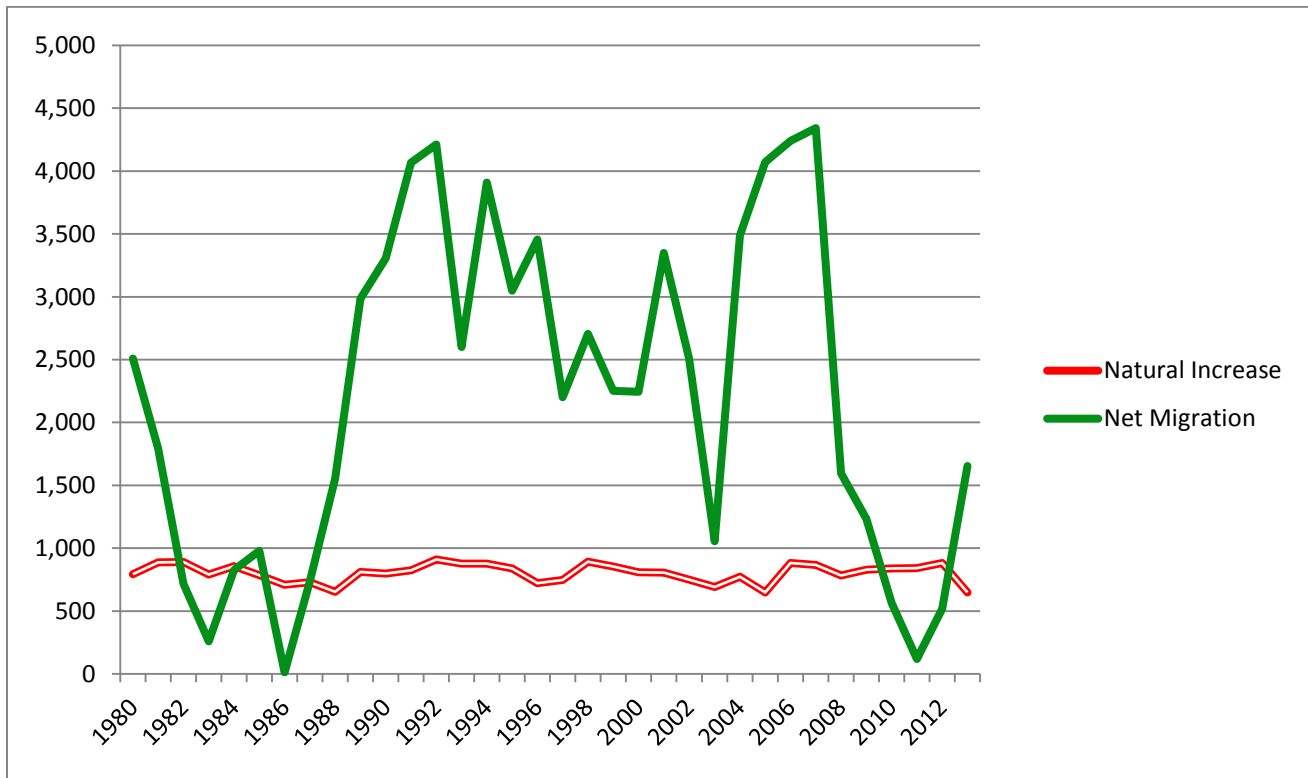
YEAR	TOTAL COUNTY POPULATION	ANNUAL RATE OF GROWTH	UNINCORPORATED POPULATION	ANNUAL RATE OF GROWTH	COMBINED POPULATION OF CITIES*	ANNUAL RATE OF GROWTH
2010	201,140		87,065		114,075	
2011	202,100	0.48%	87,535	0.54%	114,565	0.43%
2012	203,500	0.69%	87,921	0.44%	115,579	0.89%
2013	205,800	1.13%	88,276	0.40%	117,524	1.68%

Source: Washington State Office of Financial Management (2013)

*Cities include Bellingham, Blaine, Everson, Ferndale, Lynden, Nooksack, and Sumas.

More than half of all Whatcom County residents live in cities. **Map 1-1** displays the 2010 population density for Whatcom County. The highest densities are in and around cities, though there are other centers of medium to high population density such as the ones at Sudden Valley, Birch Bay, Columbia Valley, and along the Guide Meridian. Approximately 68% of the Whatcom County population lived in cities and urban growth areas in 2013.

Figure 1. Natural Increase and Net Migration in Whatcom County



Source of information: Washington State Office of Financial Management (2013)

Population Projections

Projections of future population size are an essential component of land use planning. As required by RCW 36.70A.110, in 2012, the Washington State Office of Financial Management (OFM) developed a 20-year population projection for Whatcom County. The OFM projections for 2036 are provided in Table 3 below:

Table 3. OFM Population Projections for Whatcom County

	OFM Population Projections for 2036	Average Annual Growth Rate 2013-2036	Average Annual Population Growth 2013-2036	Total Population Growth 2013-2036
Low	225,580	0.4%	860	19,780
Medium	273,911	1.3%	2,961	68,111
High	330,869	2.1%	5,438	125,069

Source: OFM (2012) and *Whatcom County Population and Employment Projections and Urban Growth Area Allocations – Phase I Technical Report*, Berk (2013)

The Growth Management Act requires the County to plan for population growth based upon OFM population projections. The county and each city must include areas and densities sufficient to permit the urban growth that is projected to occur for the succeeding twenty-year period.

The County's 2036 population projection of 275,450 is within OFM's range and therefore requires no further justification. The rationale for using this figure, which is close to OFM's medium projection, include: ensuring an adequate land supply to accommodate growth, the need to plan for growth, and the need to protect the quality of life and natural resources in Whatcom County. This population projection is selected for planning purposes only and does not obligate the County to encourage growth. Given past population trends and the requirements of GMA, planning for population growth—whether it occurs or not—is critical for the quality of life, protection of natural resources, and economic health of Whatcom County.

Table 4 shows how the total projected 2036 population would be distributed to UGAs and the area outside UGAs.

Outside the UGAs there is a large number of undeveloped tax parcels. While it is not clear exactly how many of these tax parcels are legally buildable lots, the total number of potential new dwelling units could theoretically accommodate population growth in excess of the rural population projection. However, because adequate land capacity is available for growth within urban growth areas, growth is not forced into the rural areas. Through the monitoring process described in Policies 2S-5 and 2DD-1 of this plan, the County will evaluate development activity in comparison with these urban and rural growth projections and take action as necessary to address discrepancies if any are identified.

Table 4. Whatcom County Population Projections and Distribution

	2013 UGA Population	Projected 2036 Population	2013-2036 Net Growth
Bellingham	92,660	123,710	31,050
Birch Bay	7,540	12,822	5,282
Blaine	5,171	9,585	4,414
Columbia Valley	3,103	4,448	1,345
Everson	2,665	3,907	1,242
Ferndale	12,758	19,591	6,833
Lynden	12,872	19,275	6,403
Nooksack	1,435	2,425	990
Sumas	1,449	2,323	874
Subtotal	139,696	198,129	58,433
Area outside UGAs	66,104	77,321	11,217
Total Whatcom County	205,800	275,450	69,650

Source: The 2013 total Whatcom County population is from OFM. The Cherry Point UGA, which is not shown in the chart above, had an estimated 2013 population of 43 people.

Employment Projections

The Growth Management Act requires that comprehensive plans and/or development regulations provide sufficient capacity of land suitable for development within their jurisdictions to accommodate employment growth. In 2009, the Act was amended to ensure that the employment growth accommodated

medical, governmental, educational, institutional, commercial and industrial facilities.

The employment forecasts considered the various sectors of the labor force in Whatcom County, including construction, finance, government, manufacturing, retail, services, transportation, and wholesale trade. The forecasts also considered the labor participation rate as the proportion of labor to the total population of all ages. For the purpose of Urban Growth Areas, non-agricultural labor force was considered in the forecasts.

Employment allocations were based largely on the local request recognizing the incentives that cities have for larger employment areas (sales tax, property tax). Due to the challenge in designating lands for commercial or industrial development, the allocation of employment allowed for these optimistic scenarios. Table 5 shows the allocation of employment to the Urban Growth Areas and the area outside UGAs.

Table 5: Whatcom County Employment Projections and Distribution

	2013 Employment	2013-2036 Growth Allocation	2036 Employment
Bellingham UGA	52,359	22,641	75,000
Birch Bay UGA	595	545	1,140
Blaine UGA	3,062	2,097	5,159
Cherry Point	1,993	890	2,883
Columbia Valley UGA	85	359	444
Everson UGA	710	602	1,312
Ferndale UGA	5,372	4,000	9,372
Lynden UGA	4,946	2,157	7,103
Nooksack UGA	254	115	369
Sumas USA	700	445	1,145
Area outside UGAs	13,156	3,201	16,357
Totals	83,232	37,052	120,284

Source: The 2013 non-farm employment is from the Whatcom Council of Governments (2010 and 2013) and BERK Consulting (2014).

Demographics

The culturally diverse demographic makeup of the county's population has an effect on land use patterns. For example, Whatcom County residents with children may choose different kinds of transportation and recreation than retired people. Single-parent families and large extended families need different kinds of housing. Another influence on county demographics is the cyclical influx of seasonal residents, primarily from Canada, who maintain recreational homes in parts of the county. Areas most influenced by seasonal residency include Point Roberts, Birch Bay, and the Foothills Subarea.

Table 6 below shows the Whatcom County population in the following generalized categories: school age, college age, working age and retirement age. All categories have seen an absolute increase in population between 2000 and 2010. However, as

a percentage of total population, the school age children category has declined, the college age category has remained steady, and the working age and retirement age categories have increased. OFM projects that the retirement age population (65 and over) will continue to increase over the planning period.

Table 6. Population and Age Groups

Age	2000	Census	2010	Census
0-19	47,175	28.28%	50,566	25.14%
20-24	16,776	10.06%	20,277	10.08%
25-64	83,463	50.03%	103,657	51.54%
65-over	19,400	11.63%	26,640	13.24%
TOTAL	166,814	100.00%	201,140	100.00%

Land Use History

When Euro-American immigrants first arrived on Bellingham Bay in the 1850s, the landscape of Whatcom County was comprised of mature conifer forests, winding streams and rivers, numerous lakes and wetlands, and small natural meadows.

Lummi and Nooksack people inhabited villages near the coast and along the rivers and lakes at strategic fishing locations. The Nooksack Indian people cultivated root crops they had developed along the Nooksack Valley where sub-irrigated meadows were ideal sites for such plants as camas and "Indian carrot." They emphasized the use of root crops, perhaps much more than other native peoples along the Pacific Coast.

The abundance of high-quality timber and easy accessibility to water for milling and transport were the principal reasons Euro-American immigrants first came to Whatcom County in the 1850s. Small communities grew along Bellingham Bay and the Nooksack River as more immigrants arrived in Whatcom County. They began clearing the forests and draining the wetland areas for farmsteads. Between 1890 and 1925, 130,000 acres of lowland Nooksack Valley forests were cleared for farms. In addition, logging companies sold logged-over land to their employees and to immigrants from the East Coast for small farmsteads. As a result of the sale of small parcels of logged-over lands, the average farm size in Whatcom County is relatively small—about 68 acres—compared to the statewide average of 396 acres (2012 Census of Agriculture, USDA).

Many lumber and shake mills and other industrial plants were built in Bellingham, on Lake Whatcom, and in other areas of the county, while new commercial and residential buildings were being developed in all communities. Coal mining was taking place at several locations in Whatcom County at this time, and major fish processing plants were constructed on Bellingham Bay. Whatcom County's population in 1910 was 49,511.

Between 1925 and 1950, there was little change in the land use patterns that had been developed during the previous fifty years. Some land, which had been cleared for agriculture was abandoned and naturally regenerated into second-growth forests. Most areas that were harvested for timber had re-seeded and were growing mixed forests of conifers and deciduous trees. Residential and industrial

development continued to grow, but at a slower pace than during the previous fifty years. Commercial centers remained within the core of the major cities. By 1950, Whatcom County's total population had grown to 66,733, with the majority of the growth occurring in the cities.

Between 1950 and 2000, the amount of land devoted to commercial activity gradually increased in response to population growth. Expanded use of the automobile encouraged commercial activities and residential development outside city centers. Coal mining ceased, but sand and gravel mining grew in importance. Farming became increasingly competitive, and the economic pressure tended to concentrate agricultural resources on the most productive soils. The trend toward abandonment or conversion of farmland to other uses continued. Some lands in the Nooksack Valley, which were formerly cleared for agriculture, reverted back to native forest cover. Residential, commercial, and industrial uses continued to expand into agricultural areas. These changes picked up speed during the 1960s and 1970s as Whatcom County experienced a population boom. Rapid population growth also occurred in the 1990s and from 2004-2007. The total population for Whatcom County in 2010 had grown to 201,140, an increase of approximately 145% in 40 years.

Current Land Use

Whatcom County covers 1,378,446 acres, or approximately 2,154 square miles. A significant portion of this total (850,980 acres or 62%) is under federal management. Cities cover 31,577 acres or 2.3% of the total Whatcom County land area.

Resource land uses, which include agriculture, forestry, marine and minerals, are the largest category of land use in Whatcom County. Agricultural land use predominates throughout the western lowlands of the county and in the South Fork Nooksack Valley. Forest land use is concentrated on the uplands of the county. (See Chapter 8, "Resource Lands," for more detailed information on each of these land uses.)

The majority of commercial land uses occur next to major transportation routes, such as the Guide Meridian, or within cities. There are also concentrations of commercial uses in the Birch Bay UGA and Point Roberts. The majority of industrial parcels are also located in the cities, their UGAs or at the Cherry Point industrial area. The locational pattern of commercial and industrial uses indicates the importance of transportation connections to these land uses. (See Chapter 6, "Transportation," and Chapter 7, "Economics.")

The majority of single-family homes are concentrated in the cities and the major urban and intensely developed rural portions of the county such as Sudden Valley, Columbia Valley, Glacier, Lake Samish, Lake Whatcom (north end), Cain Lake, Birch Bay, Sandy Point, and Lummi Island. Lower density residential development is scattered throughout the rural areas of the County. As may be expected, single-family homes are also located along the valley floors of the three forks of the Nooksack. The Cherry Point industrial area, the agriculturally dominated area north

of Lynden and the forested foothills in the eastern part of the county have very low to zero residential density.

A prominent characteristic of Whatcom County housing is the high number of vacation, resort, and second-home units found throughout the county. In 2010, approximately 55% of the "vacant" units were actually occupied part of the year for seasonal, recreational or occasional use.

The majority of multifamily residential units are located in the urban areas of the county, primarily in and around Bellingham, Ferndale, Lynden, and Blaine. Within the unincorporated area of Whatcom County, multifamily housing units are found near Birch Bay, Sudden Valley, Glacier, Point Roberts, and in the area between Bellingham and Lynden.

Other Topics

Background information on other topics including land use, housing, utilities, transportation, economics, natural resources and the environment can be found in the following chapters of the Comprehensive Plan.

APPENDIX B

STATE OF WASHINGTON
Public Water System
Operating Permit

The Department of Health Office of Drinking Water issues a permit to operate:

WHATCOM COUNTY WATER DIST 13 (ID# 95914 3)

to owner: WHATCOM COUNTY WATER DISTRICT #13 County: WHATCOM

WHATCOM COUNTY WATER DISTRICT #13
532 Sprague Valley Dr
Maple Falls, WA 98266

This Permit is valid through: August 2021

PERMIT CATEGORY: **** Green ****

The permit category may be modified or the permit revoked subject to water system compliance with applicable State of Washington drinking water rules and regulations and the following statements.

The system operating permit color category is based on information on file with the Department at the time this permit was printed.

System is substantially in compliance with applicable drinking water requirements.



**WHATCOM COUNTY WATER DISTRICT NO. 13
APPLICATION TO CONSTRUCT
EXTENSION TO DISTRICT SYSTEM**

_____WATER _____SEWER

Project: _____

- 1) The undersigned "Developer" (also referred to as "Owner"), hereby makes application to the Commissioners of Whatcom County Water District No. 13, ("District"), for permission to construct and connect a private "Extension" to the District's existing system as herein provided. The Extension is subject to the approval of the District. The term "Extension" (also referred to as "Project") shall apply herein whether Developer is extending the District water system or the District sewer system or both.
- 2) **Attach a check for \$2,500 as a guarantee deposit.** The deposit shall be held by the District until all fees are paid to the District for the administration, feasibility study and/or fire flow analysis, review, design (where applicable), inspection, legal fees, the total of connection fees for all the units and any other services required by the District for the Project to be accepted. It is understood that the District is entitled to claim the deposit if the Project is not completed and accepted within the time limits established in the contract with the District.
- 3) The proposed Extension will be installed in roads and/or easements of the property hereinafter legally described as follows:

Common Street Address _____

Legal Description of all Properties (which owners warrant they are legal owners thereof (attach full legal if necessary).

All Property Tax Account Numbers:

- 4) **Property Description**
 - a) **Describe the type of improvement planned, if any, for the above described real property, i.e. number of single family residences, other individual residential units or commercial usage (include number of units to be served).**

b) **Attached to the application shall be three copies of each of the following:**

- i) Legal Description(s) of property if not able to fit in Item 3 (above).
- ii) Title report, current within 30 days of application and concurrent with the signatories at time that DEA is executed.
- iii) A preliminary plan setting for the proposed development, if any. The plan shall include property boundary, indication of type of development, if any, location of roads, building and/or other important features, type of building construction, including the number of units.
- iv) Final or preliminary plat map at a scale of 1 inch = 100 feet, where applicable.
- v) A contour map of the area with a five foot contour interval or less at a scale of 1 inch = 100 feet. Datum to be based on NAVD 1988 per the Whatcom County aerial survey. Location of benchmarks are to be shown. Datum used must be explicitly stated.
- vi) Existing and proposed roadway profiles.

5) Contact person and address for billing purposes:

Contact Person: _____ **Phone:** _____
Company: _____
Address: _____

6) **Set forth the proposed date for construction start and completion for the Project:**

Start of Construction: _____ Complete Construction: _____

7) **Set forth all of the current property owner's names and common street addresses. Please also attach a title report 30 days current.**

Name _____	Name _____
Address _____	Address _____
City _____ State _____ Zip _____	City _____ State _____ Zip _____

8) **Land Use Information**

a) Have you made application to Whatcom County for a building permit or for approval of a plat, short plat, rezone, or a planned unit development? If yes, set forth the name of the agency and type of action required.

Agencies	Application Date
_____	_____
_____	_____

b) **Has it ever been requested that you prepare an environmental checklist, negative declaration, or an EIS?**

Yes _____ No _____

If yes, name of agency _____

Date of Application: _____

If an EIS, negative declaration or checklist has been completed, please enclose a copy.

c) **Have you ever been required to prepare a wetland delineation map for the property?**

Yes _____ **If yes, please enclose two copies** No _____

9) **Please advise if there are any items on our Developer Extension Checklist with which you have a question or feel you cannot comply.**

10) Please provide contact information for the Project (please print):

Project Manager: _____ Phone _____

Address: _____ Fax _____

_____ Email _____

Engineer: _____ Phone _____

Address: _____ Fax _____

_____ Email _____

Geotechnical Engr: _____ Phone _____

Address: _____ Fax _____

_____ Email _____

Surveyor: _____ Phone _____

Address: _____ Fax _____

_____ Email _____

Prepared by: _____ Date: _____

Name Printed: _____

Cross-Connection Control Program Plan for Whatcom County Water District # 13 Water System

A. Requirement for Program

Whatcom County Water District # 13, ID # 95914, hereinafter referred to as “the Purveyor”, has the responsibility to protect the public water system from contamination due to cross connections. A cross connection may be defined as “any actual or potential physical connection between a potable water line and any pipe, vessel, or machine that contains or has a probability of containing a non-potable gas or liquid, such that it is possible for a non-potable gas or liquid to enter the potable water system by backflow.”

All public water systems are required to develop and implement cross-connection control (CCC) programs. The CCC requirements are contained in Washington Administrative Code (WAC) 246-290-490 of the Group A Drinking Water Regulations. The minimum required elements of a CCC program are:

1. Establishment of legal authority and program policies;
2. Evaluation of premises for cross-connection hazards;
3. Elimination and/or control of cross connections;
4. Provision of qualified personnel;
5. Inspection and testing of backflow preventers;
6. Quality control of testing process;
7. Response to backflow incidents;
8. Public education for consumers;
9. Record keeping for CCC program; and
10. Special requirements for reclaimed water use.

Other CCC program requirements include:

1. Prohibition of the return of used water into the public water system (PWS) distribution system; and
2. Inclusion of a written CCC program in a Water System Plan (WSP) or a Small Water System Management Program (SWSMP).

Note: Throughout the example CCC program plan the term customer is used. Customer as used herein means the property owner and/or occupant of the premises served by the PWS (i.e., whoever interfaces with the PWS regarding water service). Also, unless otherwise defined, all CCC-related terms used in this example program have the same definitions as those contained in WAC 246-290-010 of the Washington State Drinking Water Regulations.

B. Program Objectives

The objectives of the CCC program are to:

1. Reasonably reduce the risk of contamination of the public water distribution system; and
2. Reasonably reduce the Purveyor's exposure to legal liability arising from the backflow of any contaminant originating from the customer's plumbing system and then supplied to other customers; and

C. Summary of Program Decisions

The following table summarizes the major policy and program decisions adopted for the **Whatcom County Water District # 13** water system. The items in the table represent CCC program areas that have more than one acceptable approach or option.

**CCC Program Decision Summary Table for the
Whatcom County Water District # 13**

Decision Item	Decision
1. Type of Program [General, WAC 246-290-490(2)(e)]	
a. Premises isolation only	
b. Premises isolation and in-premises protection (combination program)	
2. Extent of Coordination with LAA [WAC 246-290-490(2)(d)]	
a. Information exchange	
b. Interaction	
c. Joint program	
3. Relationship with Customer [Element 1]	
a. Signed service agreement or contract	
b. Ordinance/resolution; implied service agreement	
4. Enforcement of Corrective Action [Element 1]	
a. Rely upon shut-off of water service	
b. Rely upon purveyor-installed premises isolation	
5. Assessment and Re-assessment of Hazard [Element 2]	
a. By purveyor's staff or equivalent	
b. By cross-connection control specialist (CCS) employed by customer; report reviewed by purveyor's CCS	
6. Location and Ownership of Premises Isolation Assembly [Element 3]	
a. On purveyor's service line	
b. On customer's service line	
7. CCS Option – Purveyor's Program Management [Element 4]	
a. Purveyor's staff member certified	
b. Inter-agency agreement or use other agency's CCS	
c. Contract with consultant CCS	
8. Testing of Assemblies [Element 5]	
a. By purveyor's staff or purveyor-employed backflow assembly tester (BAT)	
b. By customer-employed (contractor) BAT	
9. Cost Recovery [WAC 246-290-100(4)(h) and -105(4)(p)]	
a. Borne by all customers (general water rates)	
b. Assessed to specific class (commercial meters)	
c. Each customer directly bears cost	

D. Required Elements of Program

The drinking water regulations for Group A public water systems in Washington, WAC 246-290, require CCC programs to include certain minimum elements. The elements are listed in WAC 246-290-490(3). This section describes how the water system intends to comply with each of the required program elements. Elements are numbered the same as they appear in the WAC.

Element 1: *Adoption of a written legal instrument authorizing the establishment and implementation of a CCC program.*

The **Whatcom County Water District # 13** water system has adopted a resolution (Resolution No. _____), reproduced as Exhibit _____, which authorizes the Purveyor to implement a CCC program. The resolution also authorizes the system to terminate water service to consumers who do not comply with the resolution. However, the primary method for protection of the distribution system will be the installation of a backflow preventer by the customer, at the customer's expense.

The attached service contract referred to in the resolution shall be the primary enforcement authority for all new customers.

For customers supplied prior to the adoption of the attached resolution, an implied service contract allows the Purveyor to protect the distribution system from contamination through a Purveyor-installed backflow preventer on a customer's service.

The written and implied contract terms are discussed further under Element 3.

<i>Legal Instrument Status</i>	<i>Schedule</i>
<i>Preparation of proposed legal instrument</i>	
<i>Introduction of the legal instrument to governing body</i>	
<i>Adoption of legal instrument</i>	
<i>Legal instrument becomes effective</i>	

Element 2: Development and implementation of procedures and schedules for evaluating new and existing service connections to assess the degree of hazard.

Initial Cross-Connection Hazard Surveys

The procedures for evaluating the backflow prevention requirements for new and existing customers are as follows:

1. For all ***new non-residential services***, the Purveyor will require that the customer submit with the application for water service an evaluation (performed at customer's expense) by a DOH-certified cross-connection control specialist (CCS) of the hazard posed by the proposed plumbing system, with recommendations for the installation at the meter of either a double-check valve assembly (DCVA) or a reduced-pressure principle backflow assembly (RPBA).
2. As an alternative to the above requirement for a survey by a CCS, the customer may agree to install an approved air gap (AG) or RPBA for premises isolation as a condition of service.
3. For all ***new residential services***, the Purveyor will require that the customer submit with the application for water service a completed "Water Use Questionnaire" (copy shown on page **{PWS insert page number here}**). If the customer's questionnaire indicates special plumbing, such as a lawn sprinkler system, or hazardous water use on the premises, the customer shall submit to the Purveyor an evaluation by a DOH-certified CCS of the hazard posed by the proposed special plumbing system, with recommendations for the installation at the meter of either a DCVA or an RPBA.
4. As an alternative to the above requirement for a survey by a DOH-certified CCS, the Purveyor, at his/her discretion, may specify the backflow preventer required to be installed as a condition of service.
5. For all ***existing non-residential services***, the Purveyor will require the customer to submit to the Purveyor, within nine months of notification, an evaluation by a DOH-certified CCS, of the hazard posed by the plumbing system, with recommendations for the installation at the meter of either a DCVA or an RPBA.
6. As an alternative to the above requirement for a survey by a DOH-certified CCS, the customer may agree to install an AG or RPBA for premises isolation within 90 days of notification by the Purveyor or an alternate time period acceptable to the Purveyor.
7. For all ***existing residential services***, the Purveyor will require the customer to submit to the Purveyor, within four months of notification, a completed "Water Use Questionnaire." If the customer's reply indicates special plumbing or water use on the premises, the customer shall submit an evaluation by a DOH-certified CCS of the hazard posed to the water system by the customer's plumbing system, with recommendations for the installation at the meter of either a DCVA or an RPBA.

As an alternative to the above requirement for a survey by a CCS, the Purveyor may specify the backflow preventer required to be installed as a condition of service. The Purveyor's CCS will provide guidance on the type of backflow preventer to be installed.

5. For all existing services, should the customer fail to supply the required information for a hazard assessment or fail to submit a completed "Water Use Questionnaire," the Purveyor may have the assessment made by a CCS employed by the Purveyor, require the installation of an RPBA for premises isolation, or take other such actions consistent with the previously stated policies and bill the customer for the associated costs.

Cross-Connection Hazard Survey Schedule for Initial Hazard Assessments

The schedule for initial hazard assessment is outlined in the following table. The schedule starts from the date the CCC program is established.

Initial Assessment Task	Schedule
Assessment of all new connections	At time of application for water service
Identification and assessment of high-hazard premises which are listed on Table 9 of Washington Administrative Code (WAC) 246-290-490	Within nine months
Identification and assessment of hazardous premises supplemental to Table 9 of WAC 246-290-490	Within 12 months
Identification of residential connections with special plumbing facilities and/or water use on the premises	Within 15 months

Cross-Connection Hazard Survey Schedule for Subsequent Hazard Re-Assessments

For subsequent cross-connection hazard surveys, procedures for evaluating the backflow prevention requirements are:

1. For **residential services**, the Purveyor will require the customer to submit to the Purveyor, within two months of purveyor notification, a completed "Water Use Questionnaire." The procedure used for evaluating the hazard re-assessment and the potential change in the required backflow prevention will be the same as used for the initial hazard assessment.
2. For all **non-residential services**, the Purveyor will require the customer to submit to the Purveyor, within two months of purveyor notification, a hazard re-assessment (at the customer's expense) by a DOH-certified CCS.

The frequency of hazard re-assessments will be as shown in the table below:

Type of Service	Frequency of Re-Evaluation
Any services with reduced-pressure principle backflow assembly (RPBA) installed for premises isolation	None required as long as the RPBA passes annual tests and inspections
Commercial services with double-check valve assembly (DCVA) installed for premises isolation	Every two years and upon change in use or ownership
Residential services with special plumbing where the purveyor relies upon compliance with Uniform Plumbing Code (UPC)	Every 2-3 years (questionnaire)
Residential services with DCVA installed for premises isolation	Every 4-5 years (questionnaire)
Residential services with no known special plumbing or water use on the premises	Every 4-5 years and upon change in use, ownership, or plumbing system (questionnaire)

The Purveyor will inform the customer that the Purveyor's survey of a customer's premises (whether by a representative of the Purveyor or through the evaluation of a questionnaire completed by the customer) is for the sole purpose of establishing the Purveyor's minimum requirements for the protection of the public water supply system, and that the required backflow protection will be commensurate with the Purveyor's assessment of the degree of hazard.

The Purveyor will also inform the customer or any regulatory agencies that the Purveyor's survey, requirements for the installation of backflow prevention assemblies, lack of requirements for the installation of backflow prevention assemblies, or other actions by the purveyor's personnel or agent do not constitute an approval of the customer's plumbing system or an assurance to the customer or any regulatory agency of the absence of cross connections.

Element 3: *Development and implementation of procedures and schedules for elimination and/or control of cross-connections.*

Backflow Preventer Requirements

The following service policy shall apply to all new and existing customers:

1. The Purveyor will require that water service to all **non-residential customers** be isolated at the meter by a DOH-approved DCVA or RPBA acceptable to the Purveyor. All high-hazard connections of the type described in Table 9 of WAC 246-290-490 shall be isolated with an RPBA.
2. The Purveyor will require all **residential customers** with facilities of the type described in Table 9 of WAC 246-290-490 to be isolated with an RPBA. All other residential customers with special plumbing or water use on the premises will be isolated with a DCVA. "Special plumbing" includes, but is not limited to, the following:
 - a. A lawn irrigation system;
 - b. A solar heating system;
 - c. An auxiliary source of supply, e.g., a well or creek;
 - d. Piping for livestock watering, hobby farming, etc.;
 - e. Residential fire sprinkler system; and
 - f. Property containing a small boat moorage.
3. **For all customers that have a written service contract with the Purveyor**, the required premises isolation DCVA or RPBA shall be:
 - Purchased and installed by the customer (at the customer's expense) immediately downstream of the water meter in accordance with the Purveyor's standards described hereinafter; and
 - Maintained, tested, and inspected in accordance with the Purveyor's standards described hereinafter.

For new customers, the Purveyor will not turn on water (except for testing purposes) at the meter until the customer complies with the above requirements.

The failure of the customer to comply with the Purveyor's installation and maintenance requirements shall constitute a breach of contract by the customer. The Purveyor may then proceed with corrective action provisions stipulated in the contract.

4. **Customers without written contracts** are considered to have an implied contract that requires the customer to bear all reasonable costs of service. The Purveyor will install the required DCVA or RPBA on the service, upstream of the meter, and charge the customer for the cost of the initial installation, and all future maintenance, testing, and repair, as set forth in the Purveyor's schedule of rates and charges. The failure of the customer to pay

these costs shall constitute a breach of contract by the customer, and the Purveyor will proceed with the established delinquency of payment procedures. As an alternative, the customer may sign a service contract and install the required backflow preventer downstream of the meter in accordance with the Purveyor's installation standards described hereinafter.

5. Approved Backflow Preventers and Installation

All backflow preventers relied upon by the Purveyor to protect the public water system shall meet the definition of "approved backflow preventer" as contained in WAC 246-290-010. The Purveyor will obtain and maintain a current list of assemblies approved for installation in Washington State from the DOH Office of Drinking Water.

All backflow preventers will be installed in:

- The orientation for which they are approved;
- A manner and location that facilitates their proper operation, maintenance, and testing or inspection;
- A manner that will protect them from weather-related conditions such as flooding and freezing; and
- Compliance with applicable safety regulations.

Installation standards contained in the most recently published edition of the Pacific Northwest Section, American Water Works Association (PNWS-AWWA) CCC Manual or "Installation shall conform to standard construction drawings and specifications of the Purveyor."

The Purveyor has no regulatory responsibility or authority over the installation and operation of the customer's plumbing system. The customer is solely responsible for compliance with all applicable regulations and for prevention of contamination of his plumbing system from sources within his/her premises. Any action taken by the Purveyor to survey plumbing, inspect or test backflow prevention assemblies, or to require premises isolation (installation of DCVA or RPBA on service) is solely for the purposes of reducing the risk of contamination of the Purveyor's distribution system.

The Purveyor will inform the customer that any action taken by the Purveyor shall not be construed by the customer as guidance on the safety or reliability of the customer's plumbing system. The Purveyor will not provide advice to the customer on the design and installation of plumbing other than through the general public education program discussed in Element 8.

Except for easements containing the Purveyor's distribution system, the Purveyor will not undertake work on the customer's premises.

8. Schedule for Installation of Backflow Preventers

The following table shows the schedule that the Purveyor will follow for installation of backflow preventers when they are required (based on the hazard evaluation).

Type of Service	Schedule
New connections with cross-connection hazards	Before service is initiated
Existing connections with Table 9-type hazards and other high cross-connection hazards	Within 90 days after notification
Existing connections with other than Table 9 of WAC 246-290-490 or high cross-connection hazards	Within 180 days after notification (suggested)
Existing fire protection systems using chemicals or supplied by unapproved auxiliary water source	Within 90 days after notification
Existing fire protection systems not using chemicals and supplied by purveyor's water	Within 1 year after notification (suggested)

The Purveyor may consider granting an extension of time for installation of backflow preventer for an existing connection if requested by the premises owner.

Element 4: *Provision of qualified personnel, including at least one person certified as a CCS, to develop and implement the CCC program.*

1. **Program Administration:** The responsibility for administration of the CCC Program rests with the Purveyor. General policy direction and risk management decisions are established by the **board of commissioners**.
2. The Purveyor will employ or have on staff at least one person certified by DOH as a CCS to develop and implement the CCC program. As an alternative, or when no staff or employees are properly qualified, the Purveyor may retain a DOH-certified CCS on contract to provide the necessary expertise and services.
3. The following cross-connection related tasks will be performed by or under the direction of the Purveyor's certified CCS (on staff or under contract):
 - Preparation of and recommendations regarding changes to the CCC program;
 - Performance of and/or reviews of CCC hazard evaluations;
 - Recommendations on the type of backflow preventer to be installed;
 - Recommendations on schedules for retrofitting of backflow preventers;
 - Inspections of backflow preventers for proper application and installation;
 - Reviews of backflow preventer inspection and test reports;
 - Reviews of backflow testing quality control information;
 - Recommendations and/or the granting of exceptions to mandatory premises isolation;
 - Participation in or cooperation with other water utility staff in the investigation of backflow incidents and other water quality problems;
 - Completion of Backflow Incident Reports; and
 - Completion of CCC Activity and Program Summary Reports.
4. The Purveyor may delegate other CCC program activities to other personnel who are not certified CCSs, including clerical support staff. These activities include:
 - Administration of paperwork associated with service agreements;
 - Mailing, collecting, and initial screening of hazard evaluation/water use questionnaires;
 - Mailing of assembly testing notices;
 - Receiving and screening of assembly testing reports;
 - CCC program database administration and record keeping;

5. The following table identifies the current CCS employed or retained on contract by the Purveyor to manage the Purveyor's CCC program and/or act as the CCC technical resource for the Purveyor:

Name of CCS	Dylan Herndon
Address	14263 Calhoun Road
City, State, Zip	Mount Vernon, WA 98273
Telephone Number	360-661-0933
CCS Certification Number	14108

Element 5: *Development and implementation of procedures to ensure that approved backflow preventers are inspected and/or tested (as applicable).*

1. Inspection and Testing of Backflow Preventers

All backflow preventers that the Purveyor relies upon for protection of the water system will be subject to inspection and, if applicable, testing

Inspection and testing of backflow preventers will be as follows:

- The Purveyor's DOH-certified CCS will inspect backflow preventers for proper application (i.e., to ensure that the preventer installed is commensurate with the assessed degree of hazard).
- Either a DOH-certified CCS or backflow assembly tester (BAT) will perform inspections of backflow preventers for correct installation.
- A DOH-certified backflow assembly tester will test all assemblies relied upon by the Purveyor to protect the public water system.

2. Frequency of Inspection and Testing

Inspection and testing of backflow preventers will be conducted:

- At the time of installation;
- Annually after installation;
- After a backflow incident; and
- After repair, reinstallation, relocation, or re-plumbing.

The Purveyor may require a backflow preventer to be inspected and/or tested more frequently than once a year, when it protects against a high-health hazard or when it repeatedly fails tests or inspections.

3. Responsibility for Inspection and Testing

The Purveyor will be responsible for inspection and testing of all purveyor-owned backflow preventers.

The Purveyor will require the customer to be responsible for inspection and testing of backflow preventers owned by the customer. The customer shall employ, at customer expense, a DOH-certified BAT, pre-approved by the Purveyor to conduct the inspection and test within the time period specified in the testing notice sent by the Purveyor. The test report shall be completed and signed by the BAT, then countersigned and returned by the customer to the Purveyor, before the due date specified by the Purveyor. The customer may request an extension of the due date for returning a test report by submitting a written request to the Purveyor. The Purveyor may grant one extension up to 90 days.

4. Approved Test Procedures

The Purveyor will require that all assemblies relied upon to protect the public water system be tested in accordance with DOH-approved test procedures as specified in WAC 246-290-490(7)(d). Any proposal to use alternate test procedures must be approved by the Purveyor's CCS.

5. Notification of Inspection and/or Testing

The Purveyor will notify in writing all customers who own backflow preventers that are relied upon to protect the public water system to have their backflow preventer(s) inspected and/or tested. Notices will be sent out not less than 30 days before the due date of the inspection and/or test. The notice will also specify the date (up to 30 days after the due date of the inspection and/or test date) by which the inspection/test report must be received by the Purveyor.

6. Enforcement

When a customer fails to send in the inspection/test report within 15 days after the due date specified, and the Purveyor has not approved an extension to the due date, the Purveyor will take the following enforcement action:

- The Purveyor will send a second notice giving the customer an additional 15 days to send in the inspection/test report.
- If the customer has not sent in the inspection/test report within 10 days of the due date given in the second notice, the Purveyor will send a third notice, by or hand delivery, giving the customer an additional 15 days to send in the report. The notice will also inform the customer that failure to satisfactorily respond to this notice will result in water service shut-off.
- The Purveyor will send copies of the third notice to the owner and occupants of the premises (if different from the customer). If the owner and/or occupants have not

responded satisfactorily to the Purveyor within 10 days of the due date specified in the third notice, the Purveyor will implement water service shut-off procedures.

Element 6: *Development and implementation of a backflow prevention assembly testing quality assurance/quality control program.*

1. The Purveyor will maintain a list of local, DOH-certified BATs that are pre-approved by the Purveyor to perform the following activities:

- Backflow preventer inspection for proper installation; and
- Backflow assembly testing.

The Purveyor will also maintain a list of local DOH-certified CCSs that are pre-approved by the Purveyor to perform the following activities:

- Cross-connection hazard evaluations;
- Backflow preventer inspection for proper application; and
- Backflow preventer inspection for proper installation.

The list(s) will be revised annually or more frequently if necessary.”

2. Quality Assurance

The Purveyor’s CCS will review within 30 days of receipt the backflow preventer inspection/test report forms submitted by the customer.

The Purveyor’s CCS will provide follow up on test reports that are deficient in any way.

The Purveyor’s CCS will report incidences of fraud or gross incompetence on the part of any BAT or CCS to DOH Operator Certification program staff.

Element 7: *Development and implementation (when appropriate) of procedures for responding to backflow incidents.*

1. Backflow Incident Response Plan

The Purveyor's CCS will participate in developing a backflow incident response plan that will be part of the water system’s emergency response program as required by WAC 246-290-415(2). The incident response plan will include, but will not be limited to:

- Notification of affected population;
- Notification and coordination with other agencies, such as DOH, and the local health jurisdiction;
- Identification of the source of contamination;
- Isolation of the source of contamination and the affected area(s);

- Cleaning, flushing, and other measures to mitigate and correct the problem; and
- Apply corrective action to prevent future backflow occurrences.

Element 8: *Development and implementation of a cross-connection control public education program.*

1. Customer Education

The Purveyor will distribute with water bills or some other means, at regular intervals, public education brochures to system customers. For residential customers, such brochures will describe the cross-connection hazards in homes and the recommended assemblies or devices that should be installed by the homeowner to reduce the hazard to the public water system. The education program will emphasize the responsibility of the customer in preventing the contamination of the public water supply. The Purveyor's staff will produce the public education brochures or the Purveyor will obtain brochures from:

- PNWS-AWWA;
- Spokane Regional Cross-Connection Control Committee (SRC4);
- Western Washington Cross-Connection Prevention Professionals Group (The Group);
- USC FCCCHR;
- Other national backflow prevention associations, such as the American Backflow Prevention Association (ABPA); and/or
- Other water utilities.

The information distributed by the Purveyor will include, but not be limited to, the following subjects:

- Cross-connection hazards in general;
- Irrigation system hazards and corrective actions;
- Fire sprinkler cross-connection hazards;
- Importance of annual inspection and/or testing of backflow preventers; and
- Thermal expansion in hot water systems when backflow preventers are installed for premises isolation.

The Purveyor will distribute information brochures to all customers every two to three years, and to every new customer at the time the service agreement is signed.

Element 9: *Development and maintenance of cross-connection control records.*

1. Types of Records and Data to be Maintained

The Purveyor will maintain records of the following types of information required by WAC 246-290-490:

- Service connections/customer premises information including:

- Assessed degree of hazard; and
- Required backflow preventer to protect the public water system.
- Backflow preventer inventory and information including:
 - Air gap (AG) location, installation and inspection dates, inspection results and person conducting inspection;
 - Backflow assembly location, assembly description (type, manufacturer, make, model, size, and serial number), installation, inspection and test dates, test results and data, and person performing test; and
 - Information on atmospheric vacuum breakers used for irrigation system applications, including manufacturer, make, model, size, dates of installation and inspections, and person performing inspections.

The Purveyor will maintain records on all assemblies that protect the public water system from contamination. At a minimum, the Purveyor will maintain records on all premises isolation assemblies required to protect the public water system.

2. Reports to be Prepared and Submitted to DOH

The Purveyor will prepare the following reports required by WAC 246-290-490 including:

- Cross-connection control program activities report for the calendar year, to be sent to DOH when requested;
- Cross-connection control program summary information, when required, or when there are significant policy changes;
- Backflow incident reports to DOH (and voluntarily to the PNWS-AWWA CCC Committee); and
- Documentation when exceptions to mandatory premises isolation are granted.

At a minimum, the Purveyor's CCS will prepare and sign the exceptions reports.

The manager of the public water system shall sign the CCC reports before submission to DOH.

F. Relationship to Other Planning and Operations Program Requirements

The Purveyor will consider the requirements and consequences of the CCC program on the utility's planning and operations requirements. Such considerations include, but are not limited to ensuring:

- And promoting adequate communication between CCC program personnel and other water utility staff;
- That adequate training is provided to all staff to recognize potential cross-connection control problems;
- That cross-connection issues be considered in water quality investigations;
- That the design of the water distribution system makes adequate provisions for expected head losses incurred through the installation of backflow assemblies;
- That CCC program personnel be consulted in the design of water and wastewater treatment facilities and when proposals are made to receive or distribute reclaimed water;
- That operations under normal and abnormal conditions do not result in excessive pressure losses; and
- That adequate financial and administrative resources are available to carry out the CCC program.

**WHATCOM COUNTY WATER DISTRICT NO. 13
AGREEMENT TO CONSTRUCT
EXTENSION TO DISTRICT SYSTEM**

_____ **WATER** _____ **SEWER**

Project: _____

Developer: _____

The undersigned "Developer" (also referred to as "Owner"), has made application to the Commissioners of Whatcom County Water District No. 13, ("District"), for permission to construct and connect a private "Extension" to the District's existing system as herein provided. The term "Extension" (also referred to as "Project") shall apply herein whether Developer is extending the District water system or the District sewer system or both systems. The undersigned, in consideration of the mutual promises and covenants herein contained, agrees to the terms and conditions of this Developer Extension Agreement as follows:

1. Location of Extension.

Developer and the owners of the property acknowledge and agree that connection to District utility systems may be contingent on construction and extension of utility systems by other private parties or by District. District does not warrant infrastructure will be available to this Project in a timely manner. Developer and owner construction of onsite or off site utility facilities prior to District system being extended to allow connection is done so at their own risk.

Developer knows and understands that connection of the Extension to District water and sewer systems is likely to be subject to payment for reimbursement of fair pro rata share of costs of construction of "system area facilities" constructed by others that benefit Developer's project. Such "reimbursement payments" will be determined in the sole discretion of the District Board of Commissioners, ("Board"). Such "reimbursement payments" are due and payable to the District at the time Developer's extension is accepted by the District. On receipt of the payments, the District will make payments to others who have constructed the "system area facilities."

A. Water

The proposed water system Extension shall be installed in streets and other approved rights-of-way and/or easements and shall be for the use and benefit of the property hereinafter described, which property is owned by Developer and/or other owners for whom Developer is acting as agent. Any such owners have joined in this application and are designated on the signature page hereof.

B. Sewer

The proposed sewer system Extension shall be installed in streets and other approved rights-of-way and/or easements and shall be for the use and benefit of the property hereinafter described, which property is owned by Developer and/or other owners

for whom Developer is acting as agent. Any such owners have joined this application and are designated on the signature page hereof.

C. Owner's Property

The legal description of the owner's real property is attached hereto as Exhibit A. Sewer and water facilities contemplated under this Agreement will be constructed on the property or on easements or other property to be approved and accepted by District. Developer shall provide to District a Vicinity Map with Project location, along with the legal description.

2. Warranty of Authority.

Developer and owners of the property warrant that they are the owners of the real property described in this Agreement. Developer shall provide to District a title report establishing that the parties executing this Agreement are the owners of the real property described in this Agreement.

3. Description of Extension.

A. Water

The Extension shall consist of approximately _____ lineal feet of water pipe and appurtenances and shall be installed in accordance with this Agreement and in accordance with such Plans as Developer's Engineer may prepare in conformity with District Standards, and approved by District.

B. Sewer

The Extension shall consist of _____ and _____ lineal feet of sewer pipe and appurtenances and shall be installed in accordance with this Agreement and in accordance with such Plans as Developer's Engineer may prepare in conformity with District Standards, and approved by District.

4. Preparation of Plans.

Developer shall retain its own engineer to prepare the Plans and Specifications for the Extension according to District Standards. The following requirements apply:

(a) Prior to preparation of the Plans, Developer shall:

- (1) Obtain official preliminary plat approval (or other land use approval documents) for Developer's project using a minimum scale of one (1) inch equals fifty (50) feet;
- (2) File with the District the road and storm sewer plans and profiles for the Project;
- (3) File with the District a contour map of the Pproject with contour intervals of five (5) feet or less and using a scale of one (1) inch equals fifty (50) feet. All data to be based on NAVD88 datum;

- (4) Obtain the fire flow requirements from the Fire Marshal for multi-family and commercial projects (all projects other than single family residential);
- (5) Should a Reimbursement Agreement be requested, file with the District a plan that shows all the properties and area that can be served by the Extension and the documentation necessary for the District to determine the viability of any reimbursement agreement.

(b) Upon completion of (b) above, at the election of District, a pre-design meeting shall be held with District and with Developer and Developer's Engineer in attendance. It is expected that this meeting will occur approximately ten (10) working days after completion of (b) above. It is the obligation of Developer to arrange for the meeting and the attendance of concerned parties.

(c) At the pre-design meeting, Developer's Engineer shall submit to District a conceptual plan for the utility development of the Project.

(d) Upon preliminary review of the conceptual plan, Developer's Engineer shall prepare and submit to District a preliminary design and Plans for review and approval by District. Water and sewer plans shall be on separate sheets. Plans shall include a general vicinity map depicting the Project location. District shall have the right to require changes in the preliminary design and Plans as may be deemed necessary. All designs and plans prepared by Developer's Engineer shall be prepared in accordance with District Standards.

(e) Upon approval of the preliminary design and Plan by District, Developer's Engineer shall prepare a proposed final Plan and submit three (3) copies of the proposed final Plan, together with an electronic file of the Plans on AutoCAD Release 13 or 14, or as updated to be compatible with District's system, to District for review. Upon receipt of the proposed final Plan, District shall have the right to require such changes to the proposed final Plan as may be deemed necessary.

(f) Upon completion of all required changes to the final Plan, the Board will consider the final Plan for approval. The Board shall have the right to approve, reject, or require changes to the final Plan as may be deemed necessary.

(g) Upon approval of the final Plan by the Board, the District Manager, or designee, will indicate his approval of the Plan on the original Mylar Drawings.

(h) Upon approval of the original Mylar Plan Drawings, Developer's Engineer shall submit copies of the approved Plan so that District can procure the Whatcom County right-of-way construction permits for the Plan as may be necessary. Developer's Engineer shall notify District of any permits required. Developer shall be responsible for procuring all other necessary and applicable permits. Should changes to the Plan be required in order to receive the permits and approvals, Developer's Engineer shall make all changes as required.

5. Warranties of Developer -- Water and Sewer

(a) Before commencement of work, Developer shall agree to District approved plans and specifications and a schedule of work. Developer shall reimburse

District for all costs of plan review, inspection, and other work on the Project done by District staff or consultants.

(b) All public and private property which is disturbed by the construction of the Project improvements shall be restored to as good a condition as it was prior to the commencement of the construction.

(c) All design and all work shall be in conformance with requirements of the District, the State of Washington Department of Ecology, and regulations or controls or conditions of any other governmental agency charged with the responsibility of permitting, inspecting, accepting or approving design and construction of the Project improvements.

(d) **INSURANCE REQUIREMENTS, SUMMARY OF COVERAGE & INDEMNITY:** The Developer shall carry liability and property damage insurance covering all work during Project construction, including that done by Developer's Contractor and the Contractor's subcontractors. This insurance shall also protect District from any contingent liability prior to Project acceptance.

Developer shall obtain from an insurance company, with an A.M. Best rating of "AVII" or better approved by the Insurance Commissioner of the State of Washington pursuant to Title 48 RCW, commercial general liability and automobile liability insurance against claims to Developer, District and its elected and appointed officials, officers, employees, agents and volunteers for injury to person or property which may arise from any act or omission by anyone directly or indirectly employed by the Developer from or relating to the performance, supervision, or inspection of the work. The insurance policy(s) shall specifically name and include District and its elected and appointed officials, officers, employees, agents and volunteers as additional insured's under such policy(s) with regards to damages and defense of claims arising from: (a) activities performed by or on behalf of Developer; (b) products and completed operations of Developer, or (c) premises owned, leased or used by Developer for the work proposed under this Agreement. Proof of the existence of such insurance shall be provided to District in a form acceptable to District prior to the Pre-Construction Meeting.

Developer shall not begin work under this Agreement or under any special condition until all required insurance has been obtained and until such insurance has been reviewed and accepted by District. Developer shall file with District either a certified copy of all insurance policies or a certificate of insurance with the endorsements in the form included herein as are necessary to comply with these specifications.

The minimum limits of coverage shall be as follows:

General Aggregate	\$2,000,000.00
Products-Comp/OPS Aggregate	\$2,000,000.00
Personal Injury	\$2,000,000.00
Each Occurrence	\$2,000,000.00
Automobile	\$2,000,000.00

Policies shall be kept in force until the project is accepted by District. District shall be given at least forty-five (45) days written notice of cancellation, non-renewal, material

reduction, or modification of coverage. District may increase these limits if the scope of the proposed work warrants additional coverage.

Failure of Developer to fully comply with the requirements regarding insurance will be considered a material breach of this Agreement and shall be cause for immediate termination of this Agreement and any and all District obligations, regarding same.

The coverage provided by the insurance policies shall be primary to any insurance maintained by District, except with respect to losses attributable to the sole negligence of District. Any insurance that might cover this Agreement which is maintained by District shall be in excess of the Developer's/Contractor's insurance and shall not contribute with it.

The insurance policy shall protect each insured in the same manner as though a separate policy had been issued to each. The inclusion of more than one insured shall not affect the rights of any insured with respect to any claim, suit or judgment made or brought by or for any other insured or by or for any employee of any other insured.

The general aggregate provisions of the insurance policy shall be amended to show that the general aggregate limit of the policies apply separately to this Project.

The insurance policy shall not contain a deductible or self-insured retention in excess of \$10,000 unless approved by District.

Providing coverage in the stated amounts shall not be construed to relieve Developer from liability in excess of such limits.

Developer shall indemnify, defend and hold District and its elected and appointed officials, officers, employees, agents and volunteers harmless from and against all losses and all claims, demands, payments, suits, actions, recoveries, and judgments of every nature and description brought or recovered against District by reason of any act or omission of Developer, Developer's agents or employees, in connection with the work performed under this Agreement, or caused or occasioned in whole or in part by reason of the presence of Developer, Developer's Contractor or Sub-contractors, or their property, employees or agents, upon or proximity to any property upon which work is being performed under this Agreement.

For the purpose of applying RCW 4.24.115 to Developer's project, Developer and District agree that the term "damages" applies only to the finding in a judicial proceeding and is exclusive of third party claims for damages preliminary thereto.

Developer agrees to indemnify, defend and hold harmless District, and its elected and appointed officials, officers, employees, agents and volunteers from all claims for damages by third parties, including costs and reasonable attorney's fees in the defense of such claims for damages, arising from performance of the work under this Agreement. Developer waives any right of contribution against District.

It is agreed and mutually negotiated that in any and all claims against District or any of its agents or employees by any employee of Developer, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, the indemnification obligation hereunder constitutes Developer's and its Contractor's and

Sub-Contractor's waiver of immunity under Title 51 RCW, solely for the purposes of this indemnity.

District and Developer agree that all third party claims for damage against District for which Developer's insurance carrier does not accept defense of District may be tendered by District to the Developer who shall, if so tendered by District, accept and undertake to defend or settle with the Claimant. District retains the right to approve claims investigation and legal counsel assigned to said claim and all investigation and legal work product regarding said claim shall be performed under a fiduciary relationship to District. In the event that District agrees or a court finds that the claim arises from the sole negligence of District, this indemnification shall be void and District shall be responsible for all damages payable to the third party claimant. In the event that District and Developer agree or a court finds that the claim arises from or includes negligence of both the Developer and District, Developer shall be responsible for all damages payable by Developer to the third party claimant under the court finding, and, in addition thereto, Developer shall hereunder indemnify District for all damages paid or payable by District under the court finding an amount not to exceed the percentage of total fault attributable to Developer. For example, where Developer is 25 percent negligent, Developer shall not be required to indemnify District for any amount in excess of 25 percent of the claimant's total damages.

Nothing contained in these insurance requirements is to be construed as limiting the extent of Developer's and its contractor's responsibility for payment of damages resulting from operations under this Agreement.

(e) Upon completion of the construction, and after acceptance of the facilities by District, Developer shall convey the facilities to District by means of a bill of sale. The bill of sale to be provided by Developer to District shall contain the following warranties with District as beneficiary:

(1) Developer is the owner of the Extension, the same is free and clear of all encumbrances and Developer has good right and authority to transfer title thereto to District and shall defend the title of District against the claims of all third parties claiming to own the same or claiming any interest therein or encumbrance thereon; and

(2) That all bills and taxes relating to the construction and installation of the Extension have been paid in full and that there are no lawsuits pending involving this Project. The undersigned further warrants that in the event any lawsuit is filed as a result of, or involving, this Project Developer and Owner shall undertake to defend the lawsuit and shall accept responsibility and pay for all costs of litigation, including District's costs, and reasonable attorneys fees and shall hold District harmless on any judgment rendered against District in accordance with provisions set forth in more detail in the District Standards; and

(3) That all laws and ordinances respecting construction of this Project have been complied with, and that the Extension is in proper working condition, order and repair, and is fit for its

intended purpose and that it has been constructed in accordance with the District Standards; and

(4) For a period of two (2) years from the date of final acceptance of the Extension by District, the Extension and all parts thereof shall remain in proper working condition, order and repair; and Developer shall repair or replace, at Developer's expense, any work or material which may prove to be defective during the period of the warranty.

(f) Developer shall notify District of the date work on the construction of the facilities described in this Agreement will commence. In the event of interruption of work for any reason for more than seven (7) consecutive calendar days, Developer shall give District notice of not less than twenty-four (24) hours before resuming work.

(g) After the work is commenced or recommenced, Developer shall vigorously and consistently continue the work in a first class manner until completion.

(h) Upon completion of construction, Developer shall deliver to District all Mylar originals of as-built drawings, together with an electronic file of the Plans on AutoCAD Release 13 or 14 or as updated to be compatible with District's system, and such other engineering records and data as may be required by District.

In addition, Developer shall obtain warranties and guaranties from its subcontractors and/or suppliers where such warranties or guaranties are specifically required in this Agreement. When corrections of defects occurring within the warranty period are made, Developer shall further warrant corrected work for two (2) years after acceptance of the correct work by District.

6. Correction of Defects Occurring Within Warranty Period.

When defects in the Extension are discovered within the warranty period, Developer shall start work to remedy any such defects within seven (7) calendar days of notice by District and shall complete such work within a reasonable time. In emergencies, where damages may result from delay or where loss of service may result, corrections may be made by District upon discovery, in which case the cost thereof shall be borne by Developer. In the event Developer does not commence and/or accomplish corrections within the time specified, the work may be accomplished by District at its option, and the cost thereof shall be paid by Developer.

Developer shall be responsible for any expenses incurred by District resulting from defects in Developer's work, including actual damages, costs of materials and labor expended by District in making repairs and the cost of engineering, inspection and supervision by District or District Consultants.

7. Performance Guarantee.

Developer shall furnish to District prior to the pre-construction conference a performance guarantee of a type and in a form as determined by District, in its sole discretion, in an amount equal to the Developer's Engineer's estimated cost of the Extension or contractor bid price. The performance guarantee shall require completion of all work in accordance with this Agreement, the Plans and Specifications, District Standards and other requirements of District within a period of twenty-four (24) months

from the date of acceptance of the Plans by District. District in its sole discretion may also require a payment bond of a type and in a form as determined by District requiring the payment by Developer of all persons furnishing labor and materials in connection with the work performed under this Agreement, and shall hold District harmless from any claims there from. Any payment bond required by District shall be provided to District prior to the pre-construction conference as a condition of District granting final acceptance of the work referenced herein. No third person or party shall have any rights under any performance guarantee. District may require from Developer and such performance guarantee is provided entirely for the benefit of District and Developer and their successors in interest.

8. Maintenance Bond.

Acceptance by District shall not relieve Developer of the obligation to correct defects in labor and/or materials as herein provided and/or the obligations set forth in applicable paragraphs hereof. Prior to acceptance of the Extension by District and the transfer of title to such extension(s) as set forth herein, Developer shall furnish to District a maintenance bond (cash or bond) which shall continue in force from the date of acceptance of said Extension for a period of two (2) years. The bond shall be in a form as prescribed by District and shall require Developer and the bonding company to correct the defects in labor and materials which arise in the Extension for a period of two (2) years from the date of acceptance of the Extension and transfer of title. The maintenance bond shall be in an amount equal to fifteen (15) percent of the cost of the Extension, but not less than five thousand dollars (\$5,000.00). The District shall review the submitted construction costs and determine the amount of the maintenance bond.

9. Limitation of Period of Acceptance.

The Extension shall be completed and accepted within twenty-four (24) months of the date of acceptance of the Plans by District.

If the Extension is not completed and accepted within the twenty-four (24) month period, then this Agreement and all of Developer's rights herein shall terminate and cease. Extension of the time for completion of this Agreement shall be allowed only at the election of the Board. In the event this Agreement terminates, Developer shall be required to make a new pre-application and new application for extension agreement to District. Any such new agreement entered into between District and Developer pursuant to a new application shall be subject to any new or amended Resolutions, construction policies, standards and specifications which have taken effect since the execution of the terminated agreement. Nothing herein shall be construed to convey any rights or privileges to Developer except as explicitly set forth in this agreement.

If Developer abandons the Extension during twenty-four (24) months or shall fail to complete the Extension within that period, Developer may be deemed, at District's sole option and election, to have transferred and conveyed to District any portion of the Extension which has been completed.

10. Final Acceptance - Conditions Precedent.

Compliance with all terms and conditions of this Agreement, the Plans and Specifications prepared hereunder, District Standards, and other District requirements shall be a condition precedent to District's obligation to allow connection to District's system, to accept the Bill of Sale to the Extension, and to District's agreement to

maintain and operate the Extension and to provide service to the real property that is described in this Agreement.

District will not be required to allow any connection to District's system any portion of the real property described in this Agreement if there are any fees or costs unpaid to District under this Agreement or there are other fees arising under other District requirements which are unpaid.

District will not be obligated to provide service to the property described in this Agreement if construction by third parties of facilities to be deeded to District has not been completed and title accepted by District if such third-party facilities are necessary to provide service to the property described in this Agreement.

District will not be obligated to allow service connections to its system until all General Facilities (water) and Connection (sewer) charges in effect on the date of application for service have been paid. Developer understands and specifically agrees that General Facilities and Connection charges required by District to connect to District's system will be determined by District at time of connection. Developer understands and agrees that any and all fees and charges of the District may be adjusted by District prior to the time of connection to District system and Developer waives actual notice of any hearing by the Board of Commissioners to consider adjustment of any such fees and charges.

District will accept title to the Extension at such time as all work which may, in any way, affect the lines constituting the Extension has been completed, and any damage to the Extension which may exist has been repaired, and District has made final inspection and given its approval to the Extension as having been completed in accordance with this Agreement, the Plans and Specifications, District Standards, and other requirements of District.

11. Procedure for Acceptance.

Acceptance of title to the Extension will be made by District. Prior to such acceptance, an executed bill of sale in a form approved by District and containing the warranties required by this Agreement shall be executed by Developer and any additional owners and delivered to District. There will be no conditional acceptance or acceptance for use and operation.

12. Effect of Acceptance.

Acceptance by District shall cause the Extension to be a public system subject to the control, use and operation of District and all regulations, conditions of service, and service charges as District determines to be reasonable and proper, and subject to the laws of the State of Washington.

13. Rates and Charges.

The property described in this Agreement shall be subject to all rates and charges established by District, as now exist or hereinafter amended or adjusted.

14. Subcontracting.

Developer shall be fully responsible for the acts and omissions of subcontractors and persons employed, directly or indirectly, by subcontractors, as well as the acts and commissions of persons directly employed by Developer.

15. No Assignment without District Approval.

Developer's rights and responsibilities arising out of this Agreement shall not be assignable unless District's prior consent is obtained. Written documents as required by District of any District approved assignment shall be filed with District by Developer herein at the time of any assignment.

16. District Standards.

The District Standards, as currently adopted or hereafter amended, are incorporated herein by this reference.

17. Remedies Available to District.

In the event Developer fails to pay any of the extension fees and charges and fines referenced herein when due as determined by District, the charge or fine shall then be delinquent and shall accrue interest at the highest legal rate per annum until paid. In addition to any other remedies available to District, District shall be entitled to file a lien against the Real Property described in this Agreement in the event of nonpayment and to foreclose such lien pursuant to RCW 57.08.080-090, as revised or amended.

18. Reimbursement Agreement

Developer may request, as provided for in this section, reimbursement for costs of constructing sewer or water system offsite of the proposed development by adjacent properties that subsequently connect to or use the Extension and that did not contribute to the original cost of the Extension.

If requested by Developer, District and Developer shall enter into a Developer Reimbursement Agreement consistent with the terms and conditions of Chapter 57.22 RCW.

District will not accept the Bill of Sale for the Extension or accept the development as complete until all property owners within the benefited area have been notified of the latecomer's charges as described in the Reimbursement Agreement. The District takes no responsibility to defend legal challenge to a Reimbursement Agreement with Developer. Any challenge to District's authority or process for a Reimbursement Agreement will not be defended by District. District may tender defense of the reimbursement agreement to Developer.

The Developer shall make his request for such agreement at the time of submitting the application for the Developer Extension Agreement by signing the following declaration:

Yes, I request a Reimbursement Agreement _____

No, I do not request a Reimbursement Agreement _____

Developer agrees that Developer's costs for the sewer/water improvements to be constructed by Developer hereunder have been factored into the feasibility of the Project and that Developer's decision to proceed with the Project is not contingent or in any way dependent on receipt of latecomer payments or payments from other property owners or developers that may connect to or use sewer/water facilities constructed by Developer under this Agreement. Developer agrees and acknowledges that District reserves the right to direct water/sewer flows and to contract for the construction of other sewer/water facilities, regardless of whether future flows and future facilities constructed under other contracts affect anticipated receipt of latecomer payments hereunder.

19. Notice.

Any notice required by this Agreement to be given by District to Developer shall be given as follows:

Name: _____ Phone: _____

Address: _____

20. Complete Agreement.

This Agreement, and the plans approved by District, constitutes the entire agreement between Developer and District with respect to the rights and responsibilities of both parties in regard to project referred to herein. For purpose of identification, this Agreement shall be assigned a number by District, which number shall be endorsed on the first page of this Agreement. This Agreement may be changed in writing only upon mutual agreement of the Commissioners of District and Developer.

ACCEPTANCE OF THIS AGREEMENT BY DISTRICT CONSTITUTES A CONTRACT WITH DEVELOPER, THE TERMS OF WHICH ARE EACH PARAGRAPH OF THIS AGREEMENT, THE DISTRICT STANDARDS, AND THE EXTENSION DESIGN PLANS APPROVED BY DISTRICT.

DATED this _____ day of _____, 20____.

BY _____
Developer

Its _____

FOR INDIVIDUAL OWNER/DEVELOPER

STATE OF WASHINGTON)
) ss
COUNTY OF)

I certify that I know or have satisfactory evidence that _____ signed this instrument and acknowledged it to be a free and voluntary act for the uses and purposes mentioned in the instrument.

Dated: _____

NOTARY PUBLIC in and for the
State of Washington

My Commission Expires: _____

FOR CORPORATION OR PARTNERSHIP

STATE OF WASHINGTON)
) ss
COUNTY OF)

I certify that I know or have satisfactory evidence that _____ signed this instrument, on oath stated that _____ was authorized to execute the instrument and acknowledged it as the _____ of _____, to be the free and voluntary act of such corporation for the uses and purposes mentioned in this instrument.

Dated this ____ day of _____, 20____

NOTARY PUBLIC for the State of Washington
Printed Name: _____
Residing at: _____
My Commission Expires: _____

THE FOREGOING AGREEMENT OF _____ accepted this
____ day of _____, 20_____.

Water & Wastewater Services

Wastewater & Water System Management and Admin Services Agreement Whatcom County Water District #13

This agreement is made and entered into as of September 28, 2017, by and between **Water & Wastewater Services (WWS)**, a Washington company and **Whatcom County Water District #13**, hereinafter referred to as the "Customer". In consideration of the mutual covenants and representations contained in this Agreement, the parties hereby agree as follows:

- I. **Agreement Period.** The term of this Agreement is for a period of five years from September 28, 2017 through September 27, 2022. Upon expiration of this Agreement, the parties may extend the terms hereof for an additional five (5) years by written amendment to this Agreement at a price to be negotiated by the parties. In the event of such a five (5) year extension, the parties intend that an annual cost review will occur each year.
- II. **Purpose.** The purpose of this Agreement is to set out the intent of WWS and Customer to enter into a relationship whereby WWS provides water system management, or other services, to Customer.
- III. **Scope of Work.** The work to be performed by WWS under this Agreement is described in Exhibit A.
- IV. **Changes/Modifications to Agreement.** WWS shall make a good faith effort to implement any changes or modification to this Agreement that may be requested by Customer. Customer recognizes, however, that any changes or modifications to the Agreement may cause WWS difficulties and delays in the fulfillment of its obligations pursuant to this Agreement. WWS reserves the right, therefore, in its sole discretion, to refuse to incorporate such changes and modifications, or to charge Customer at the current hourly rate published for such services.
 - a. WWSVC has the authority in case of emergencies to preform work or provide services outside of the scope of work described in Exhibit A without prior consent from District's Board of Commissioners. Any services provided, with the exception of emergency services, outside the scope of work described in Exhibit A shall have prior consent from District's Board of Commissioners.
- V. **Acceptance of Work.** WWS shall deliver certain portions of the work in accordance with the schedules attached as Exhibits, and hereby incorporated into this Agreement, or as required by Washington State Department of Health regulations.
- VI. **Payment.** In consideration for the services and work described above Customer shall pay to WWS an amount in U.S. funds as set out in Exhibit B. The monthly contract amount will be due the 10th day of the month following the month of service. For example, for services provided in May, the payment is due June 10th. Payment for

services provided outside the scope of the contract is due within 10 days of receipt of invoice.

- VII. **Termination.** The contract may be terminated by either party at the end of the five year term with sixty (60) days prior written notice. Upon termination, each party shall be fully and forever released and discharged from any and all obligations, covenants or liabilities of whatsoever kind or nature in law, or equity, or otherwise, arising out of, or in connection with, the Agreement, or any other agreements by and between WWS and Customer, except for any obligation or liability accrued before the date of termination.
- VIII. **Warranties and Representations.** Each party hereby represents and warrants as follows:
- a. **Corporate Power.** Each party is duly organized and validly existing under the laws of the state of its incorporation and has full corporate power and authority to enter into this Agreement and to carry out the provisions hereof.
 - b. **Due Authorization.** Such party is duly authorized to execute and deliver this Agreement and to perform its obligation hereunder.

The representations and warranties and covenants in this Section are continuous in nature and shall be deemed to have been given by each party at execution of this Agreement and at each stage of performance hereunder.

- IX. **Binding Agreement.** This Agreement is a legal and valid obligation binding upon it and enforceable with its terms. The execution, delivery and performance of this Agreement by such party does not conflict with any agreement, instrument or understanding, oral or written, to which it is a party or by which it may be bound, nor violate any law or regulation of any court, governmental body or administrative or other agency having jurisdiction over it.
- X. **Compliance with Law.** Each party's operations will be conducted in compliance with all applicable laws and regulations of the State of Washington.
- XI. **Hold Harmless and Indemnification.** Both WWS and Customer shall mutually save, keep and hold harmless the other's officers, agents, employees and volunteers from all damages, costs or expenses in law or equity, including attorney's fees, costs and expenses, that may at any time, arise or be set up because of damages to property or personal injury received by reason of, or in the course of performing work, which may be occasioned by any willful or negligent act or omissions.
- XII. **Applicable Law; Jurisdiction; Venue.** The Agreement shall be governed and construed in accordance with the laws of the State of Washington. The parties agree that Whatcom County in the State of Washington shall be the proper venue for any action brought under the Agreement.
- XIII. **Modifications, Amendments or Waivers.** No modifications or amendments to the Agreement, and no waiver of any provisions hereof shall be valid unless in writing

signed by duly authorized representative of the parties. The failure of either party to this Agreement to insist upon performance of any of the terms and conditions of this agreement, or the waiver of any breach of any of the terms and conditions of this Agreement, shall not be construed as thereafter waiving any such terms and conditions, but the same shall continue and remain in full force and effect as if no such forbearance or waiver had occurred.

- XIV. **Force Majeure.** WWS shall not be responsible for any failure to perform due to unforeseen circumstances or due to a cause beyond WWS' control, including but not limited to acts of God, war, riot, embargoes, acts of civil or military authorities, fire, floods, accidents, strikes, or shortages of transportation facilities, fuel, energy, labor or materials.
- XV. **Independent Contractor Relationship.** Nothing contained herein shall be construed to imply a joint venture, partnership, or employer and employee relationship between the parties. Neither party shall have any right, power or authority to create any obligation, expressed or implied, on behalf of the other except as defined in the Agreement or as mutually agreed to under the terms of the Agreement. The employees or agents of one party shall not be deemed or construed to be the employees or agents of the other party for any purpose whatsoever.
- XVI. **Non-Compete. Whatcom County Water District #13** agrees to not solicit nor offer employment to the staff of **Water & Wastewater Services LLC**, without the approval in writing from the Human Resource Department of WWS.
- XVII. **Vehicles.** WWS will supply a vehicle used for routine operation and maintenance during the contract period.
- XVIII. **Binding Effect.** Subject to the limitations herein before expressed, this Agreement will inure to the benefit of, and be binding on, the parties, their successors, administrators, heirs, and permitted assigns.
- XIX. **Compliance/Government Approvals.** WWS and Customer will, at its own expense, obtain and arrange for the maintenance in full force and effect of all government approval, consents, licenses, authorizations, declarations, filings and registrations as may be necessary or advisable for the performance by such party of all of the terms and conditions of the Agreement.
- XX. **Entire Agreement; Modification; No Offer.** The parties hereto agree that this Agreement constitutes the entire Agreement between the parties with the respect to the subject matter hereof. Any modification of this Agreement or additional obligation assumed by either party in connection with this Agreement shall be binding only by a written agreement dated subsequent hereto signed on behalf of WWS and Customer by their duly authorized representatives. Neither this Agreement nor any written or oral statements related hereto constitute an offer, and this Agreement shall not be legally binding until executed by both parties hereto.

Description of Services Provided

Wastewater System Management

The Contractor will provide professional management, consultant services, testing, inspections, certifications, reports, training, emergency response, operation and maintenance of Whatcom County District #13 wastewater treatment facility and collection system. The Contractor will be responsible for the following services:

1. The Contractor will initiate, coordinate, and be responsible for operation and maintenance of the Group I Wastewater Treatment System at Whatcom County District #13.
2. The Contractor will provide separate management of the wastewater system by an operator certified for the classification of Customer's Plant as required by the State of Washington WAC 173-230. An operator certified for at least a Class I Plant or as otherwise required by state regulations shall be on site during regularly scheduled shifts.
3. Contractor will schedule calibration and maintenance of instrumentation and telemetry systems. Contractor will be responsible for operating wastewater treatment plant processes and solids handling, treatment, and disposal.
4. The Contractor will initiate, coordinate, and be responsible for all procedures required for management, operation, and maintenance of the wastewater collection system and treatment plant. The wastewater system will be operated in accordance with all requirements of the Department of Ecology, Whatcom County Health Department, county, state and federal standards as required by Chapter 90-48 RCW Water Pollution Laws as amended, and National Pollutant Discharge Elimination System Waste Discharge (NPDES).
5. The Contractor will insure compliance with the provisions of Chapter 173-50 WAC. Contractor will collect and deliver all NPDES required water analysis to an accredited lab.
6. The Contractor will monitor day-to-day operation, insure appropriate test samples, monitoring, and testing of the wastewater system.
7. The Contractor will be responsible for all permit application, reports and other documentation required by the operation of the wastewater facilities including preparing and submitting acceptable monthly reports to Washington State Department of Ecology Northwest Region. The District will be provided copies of pertinent documentation.
8. The Contractor will meet with the Whatcom County District Board of Commissioners up to twice monthly to review operation status of the wastewater collection and treatment facilities, as well as, planning for capital improvement of the depreciating equipment and facilities.

9. The Contractor will initiate, coordinate, and be responsible for all equipment maintenance required at the Whatcom County District #13 wastewater facilities. Contractor will interface with other companies and agencies to insure proper operation. All routine equipment maintenance projects will be approved in advance by District's designated representative, office manager. The Contractor will be responsible for response to emergency equipment repair that is required for safe and appropriate operation of the wastewater collection and treatment facilities.
10. The Contractor will be available for work 24-hours per day in the event of an emergency. Personnel should be at the worksite within 90 minutes of notification of a problem that requires on-site operation and maintenance (O & M).
11. The Contractor will operate and maintain the facilities in a safe and professional manner. All OSHA and WISHA rules shall be followed.

Water System Services

The Contractor will provide professional management, consultant services, testing, inspections, certification, reports, training, emergency response, operation and maintenance of Whatcom County District #13 water treatment facility and distribution system. The Contractor will be responsible for the following services:

Daily:

1. Provide 24 hours per day, 7 days per week emergency paging service, along with an emergency operator phone contact list.
2. Availability by phone to consult with Commissioner and system customers (Toll free phone number is provided).
3. Receive Underground Utilities Location Center (UULC) notification. It will be a requirement that Customer join if not already a member. UULC costs depend on the number of locates received (estimated fee of \$25.00).
4. Site visits.
5. Record flow meter reading at the well & pump house, maintain logs.
6. Inspect water tank.
7. Inspect pump building and all pumps, maintain logs.
8. Distribution system inspection.
9. Keep water system areas neat & clean.
10. Record reservoir levels.

Monthly:

1. Collect WA State required routine water samples (testing fee not included).
2. Measure and record all well depths.
3. Service all pumps and motors.
4. Provide written report of system operation and maintenance.
5. Maintain repair parts inventory.
6. Bi-monthly meter reading

Annually:

1. Flush distribution system
2. Flush all mains through hydrants and blow-offs.
3. All state required reporting and sampling.
4. Inspect water tanks for cleaning & clean if needed.
5. Exercise all main line valves.
6. Provide & mail Consumer Confidence Report (one time setup fee, postage & mailing fees not included).
7. Attend annual meeting & report to community.
8. Administer cross connection control program and test back-flow devices.

Department Of Health Requirements To Be Provided By WWS On An As Needed Basis:*

1. Ensure all of the water system's daily operational and maintenance activities are completed according to acceptable public health practices and water industry standards.
2. Perform water quality monitoring, maintain adequate records and take follow-up action, if necessary, to comply with state and federal drinking water regulations.
3. Implement preventative maintenance programs; and inspect treatment and other system components for malfunctions; keep adequate records; and make needed repairs.
4. Analyze and review recording-instrument readings and laboratory tests; determine sites and causes of any malfunctions; adjust various treatment processes or other components accordingly; and maintain a record of these.
5. Implement a cross-connection control program.
6. Determine and implement remedial actions in emergencies. This includes following directives DOH issues to address the situation.

*Please note since these are requirements from the Department Of Health there may be additional charges to implement these requirements.

Office Management and Professional Services

General Duties:

1. Staffing of the District Office, 8:00 am to 4:00 pm, Tuesday & Thursday weekly. Office would be open to the public between the hours of 9:00 am and 4:00 pm. During the hours that the office is closed to the public, staff would conduct County business, i.e. banking, deposit, ect.
2. Attend monthly District meetings.

Accounting:

1. Follow established accounting principles in completing accounting functions.
2. Establish accounts & post to the general ledger.
3. Provide A/P. (Processes, records & making payments as authorized by the Commissioners)
4. Coordinate the preparation of the 5-year Capital Improvement Plan.
5. Prepare financial reports
6. Prepare journal entries and accounts.
7. Reconcile and balance bank statements.
8. Work directly and indirectly with Commissioners and management preparing reports & editing registers for general ledger entry.
9. Prepare sales tax documents or payment and refunds.
10. Work directly with auditor. Prepare reports and audit papers.
11. Petty cash transactions.
12. Administration of the working fund, including the general fund checking account.

Budgeting:

1. Review and/or prepare departmental budget report requests.
2. Provide consultation and guidance to staff on budget matters

Financial Management:

1. Assist Commissioners in managing & investing monies.
2. Evaluate financial control systems & recommend changes as needed.
3. Maintain accounting & financial records.
4. Perform internal audits as needed.

5. Perform other related duties as required.

Office/Meeting Management:

1. Secretary to the Board of Commissioners.
2. Schedule and post meeting as required in the Public Meetings Act & maintain compliance with act.
3. Maintain compliance with the Public Information Act and issue documents, collect fees for copies, and make records for District files for referencing of said released documents.
4. Maintain confidentiality, maintaining all non-public information confidential.
5. Provide condensed versions of minutes of all Commissioner meetings for approval to the Board.
6. Maintain the District office in a professional manner
7. Perform other duties as required.

Fees

Maintenance & Management Services

The contract fee for all services described shall be at the annual fee of **\$112,797.36** paid in monthly installments of **\$9,399.78**.

Labor Rates

Any additional labor charges for services performed outside of the scope of work as described in Exhibit A shall be charged at the rate of \$60.00 per hour per person plus sales tax for work performed Monday through Friday between the hours of 8:00 a.m. and 5:00 p.m. Work done after hours or on weekends will be billed at \$90.00 per hour. Work done on holidays will be billed at \$120.00 per hour. There will be a minimum 2-hour charge for any call-out work.

- Clerical work will be charged at \$55.00 per hour.
- Technical writing will be charged at \$70.00 per hour.
- Project Management will be charged at \$100.00 per hour.
- Any supplies necessary for the execution of the services listed in Exhibit A will be billed at invoice plus twenty percent (20%)

Price increases from independent third parties, such as certified laboratories and supplies, will be passed on as and when incurred.

XXI. **Insurance.** WWS agrees to obtain liability insurance in an amount not less than \$1,000,000.00 to cover all work performed under the terms of this contract. The insurance policy shall expressly include the Customer as a named insured and loss payee. Upon request, WWS shall provide the customer with evidence of such insurance.

XXII. **Attorney Fees.** In the event that any action is filed in relation to this Agreement, the unsuccessful party shall pay to the successful party, all sums that may be called on to be paid, together with the costs and fees associated with the arbitration or legal action, including reasonable attorney fees.

XXIII. **Damages.** The Customer hereby grants to WWS a license to go onto the property, with reasonable prior notice, and to have WWS' agents go onto the property to complete any and all work under the terms of this contract. WWS hereby agrees to leave the property in the condition in which it finds it and to defend, indemnify and hold the Customer harmless from any and all liens and liability that may attach to the property by reason of WWS' activities. WWS shall be responsible for all damages resulting from any and all activities on the property performed by WWS or WWS agents.

XXIV. **Facsimile Transmission.** Facsimile transmission of any signed original document, including any notice to be provided hereunder, and retransmission of any signed facsimile transmission, shall be deemed the equivalent of transmission of an original.


XXV. **Counterparts.** This Agreement may consist of two or more separately ratified counterparts, each of which shall constitute a duplicate original of this Agreement.

 ORIGINAL

Signed _____

Kelly Wynn, Owner
Water & Wastewater Services
14263 Calhoun Road
Mount Vernon, WA 98273

Date 9/26/17


Commissioner Signature

Phil Howard
Print Name

Whatcom County Water District #13
532 Sprague Valley Dr.
Maple Falls, WA 98266

Date 9/26/17

APPENDIX C

Whatcom County Water District # 13

APPENDIX C

Service Area Policies Worksheet

The worksheet is for the purpose of assisting the water system manager/owner and systems engineer in determining service area policies and conditions of service for the water system. The following policy subjects are presented in a question type format for the water system manager/owner to work through. Once the worksheet is completed the systems engineer shall present the policies and conditions of service in Chapter 7 - Sections C and D.

Service Area Policies

Wholesaling Water: The Water system will ___ will not X allow wholesaling of water.

Wheeling Water: The Water system will ___ will not X allow the wheeling of water.

Inertie: The Water system will X will not ___ consider inerties with other water systems.

If yes, for: emergency purposes X additional supply _____ or both _____

Annexation: Applicants for water service which are located outside the corporate limits are required ___ are not required X to sign an annexation agreement so as to not protest annexation at the time it may occur.

Direct Connection: Are new developments required to directly connect to the water system:
Yes X No or

Are satellite or remote systems allowed in the service area: Yes No

If yes, what design standards are remote systems required to meet:

Water Systems X
Department of Health X
Other _____

Design and Performance Standards: All extensions and service connections shall be constructed in accordance with the water systems design and performance standards presented in the Chapter 5 of the water system plan. Yes X No

Surcharge: If no, explain what standards extensions must apply
Connections outside of corporate or district limits will be ___ will not be X assessed a surcharge for outside services. If yes, surcharge will be ___ and based on _____

Formations of LID's: The water system has the ability to form local improvement district (LID)
Yes X No _____

If yes, will the system consider LID's and work with property owners to formulate an LID for financing construction of water facilities

Whatcom County Water District # 13

- Customer Responsibilities: The Customer shall be responsible for paying **monthly** ___ **bi monthly** ___ service fees and complying with the conditions of service delineated on the service application form.
- Connection Fee/Rates: *Connection to the system requires a connections fee in the sum of \$1,200.00* for the purpose of buying into existing water system facilities and capacity. *Applies only to currently unplatted lots within the District's service area boundaries.*
- Meter and Material Requirements: Service meters **are X are not** ___ required for new service connections?
If no, please explain:
If yes, please explain responsibilities for fees, installation and types of materials which will be used: *Customers must install at their own cost, meters and service lines from the meter to their homes in accordance with District Standards.*
- Consent for inspection, maintenance and repairs: The water customer consents to inspections, maintenance and repairs which may be necessary to assure safe and reliable water service. **Agree X**
- Connections: No other service connections shall be tapped onto the connection supplied in this agreement. **Agree X**
- Cross Connection Control Requirements: Cross connection control devices shall be installed consistent with the systems Cross Connection Control Program prior to water service being supplied.
Agree X
- Extensions: Prior to service being supplied to developer extensions all connection fees shall be paid in full and the extension shall be designed constructed, tested and inspected consistent with the systems developer extension policy and design and construction standards. **Agree X**
- Failure to Pay: Failure to pay water bill within 30 days of due date shall result in the termination of water service. Notice of termination shall be supplied to the customer 14 days in advance of actual termination.

APPENDIX D

Coliform Monitoring Plan for: Whatcom County Water District #13

A. System Information

Plan Date: 09/14/2020

Water System Name Whatcom Co Water District #13	County Whatcom	System I.D. Number 959143
Name of Plan Preparer Ryan Wynn	Position Water Supervisor	Daytime Phone 360-466-4443 ext 203
Sources: DOH Source Number, Source Name, Well Depth, Pumping Capacity	S01 & S02	
Storage: List and Describe	300,000	
Treatment: Source Number & Process	None	
Pressure Zones: Number and name	<u>1 Gravity</u>	
Population by Pressure Zone	<u>384</u>	
Number of Routine Samples Required Monthly by Regulation:	<u>1</u>	
Number of Sample Sites Needed to Represent the Distribution System:	<u>6</u>	
*Request DOH Approval of Triggered Source Monitoring Plan?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	

*If approval is requested a fee will be charged for the review.

B. Laboratory Information

Laboratory Name Edge Analytical	Office Phone 360-757-1400 After Hours Phone
Address <u>1620 Walnut St. Burlington WA. 98233</u>	Cell Phone 360-770-0154 Email: <u>edge.burlington@gmail.com</u>
Hours of Operation <u>8am – 5pm Monday thru Friday</u>	
Contact Name Larry Henderson	
Emergency Laboratory Name Edge Analytical	Office Phone 360-757-1400 After Hours Phone 360-770-0154
Address <u>1620 Walnut St. Burlington WA. 98233</u>	Cell Phone - - Email <u>edge.burlington@gmail.com</u>
Hours of Operation <u>8am – 5pm Monday thru Friday</u>	
Contact Name Larry Henderson	

C. Wholesaling of Groundwater

	Yes	No
We are a consecutive system and purchase groundwater from another water system.	<input type="checkbox"/>	X
If yes, Water System Name: Contact Name: Telephone Numbers Office - - After Hours - -		
We sell groundwater to other public water systems.	<input type="checkbox"/>	X
If yes, Water System Name: Contact Name: Telephone Numbers Office - - After Hours - -		
If yes, Water System Name: Contact Name: Telephone Numbers Office - - After Hours - -		
If yes, Water System Name: Contact Name: Telephone Numbers Office - - After Hours - -		
If yes, Water System Name: Contact Name: Telephone Numbers Office - - After Hours - -		
If yes, Water System Name: Contact Name: Telephone Numbers Office - - After Hours - -		

D. Routine, Repeat, and Triggered Source Sample Locations*

Location/Address for Routine Sample Sites	Location/Address for Repeat Sample Sites	Groundwater Sources for Triggered Sample Sites**
X1. 531 Flair Valley	1R1 521 Flair Valley	SO1
	1R2 541 Flair Valley	SO2
	1R3	
X2. 2341 Clear Valley Dr	2R1 2351 Clear Valley Dr	SO1
	2R2 2041 Clear Valley Dr	SO2
	2R3	
X3. 572 Sprague Valley Dr	3R1 612 Sprague Valley Dr	SO1
	3R2 562 Sprague Valley Dr	SO2
	3R3	
X4. 1121 Deep Valley Dr	4R1 941 Deep Valley Dr	SO1
	4R2 1051 Red Valley Ct	SO2
	4R3	
X5.	5R1	
	5R2	
	5R3	
X6.	6R1	
	6R2	
	6R3	

*NOTE: If you need more than three routine samples to cover the distribution system, attach additional sheets as needed.

**** When you collect the repeats, you must sample every groundwater source that was in use when the original routine sample was collected.**

Important Notes for Sample Collector:

E. Reduced Triggered Source Monitoring Justification (add sheets as needed):

F. Routine Sample Rotation Schedule

Month	Routine Site(s)	Month	Routine Site(s)
January	1	July	3
February	2	August	4
March	3	September	1
April	4	October	2
May	1	November	3
June	2	December	4

G. Level 1 and Level 2 Assessment Contact Information

Name Ryan Wynn	Office Phone 360-466-4443 ext 203 After Hours Phone 360-661-0931
Address 14263 Calhoun Rd Mt. Vernon, WA 98273	Email: ryanw@wwsvc.com
Name Kelly Wynn	Office Phone 360-661-0930 After Hours Phone - -
Address 14263 Calhoun Rd Mt. Vernon, WA 98273	Email: kellyw@wwsvc.com

E. coli-Present Sample Response

Distribution System <i>E. coli</i> Response Checklist				
Background Information	Yes	No	N/A	To Do List
We inform staff members about activities within the distribution system that could affect water quality.	X	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
We document all water main breaks, construction & repair activities, and low pressure and outage incidents.	X	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
We can easily access and review documentation on water main breaks, construction & repair activities, and low pressure and outage incidents.	X	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Our Cross-Connection Control Program is up-to-date.	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
We test all cross-connection control devices annually as required, with easy access to the proper documentation.	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
We routinely inspect all treatment facilities for proper operation.	X	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
We identified one or more qualified individuals who are able to conduct a Level 2 assessment of our water system.	X	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
We have procedures in place for disinfecting and flushing the water system if it becomes necessary.	X	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
We can activate an emergency intertie with an adjacent water system in an emergency.	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
We have a map of our service area boundaries.	X	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
We have consumers who may not have access to bottled or boiled water.	<input type="checkbox"/>	X	<input type="checkbox"/>	<input type="checkbox"/>
There is a sufficient supply of bottled water immediately available to our customers who are unable to boil their water.	X	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
We have identified the contact person at each day care, school, medical facility, food service, and other customers who may have difficulty responding to a Health Advisory.	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
We have messages prepared and translated into different languages to ensure our consumers will understand them.	<input type="checkbox"/>	X	<input type="checkbox"/>	<input type="checkbox"/>
We have the capacity to print and distribute the required number of notices in a short time period.	X	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Policy Direction	Yes	No	N/A	To Do List
We have discussed the issue of <i>E. coli</i> -present sample results with our policy makers.	X	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If we find <i>E. coli</i> in a routine distribution sample, the policy makers want to wait until repeat test results are available before issuing advice to water system customers.	<input type="checkbox"/>	X	<input type="checkbox"/>	<input type="checkbox"/>
(Cont.)				

Distribution System *E. coli* Response Checklist

Potential Public Notice Delivery Methods	Yes	No	N/A	To Do List
It is feasible to deliver a notice going door-to-door.	X	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
We have a list of all of our customers' addresses.	X	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
We have a list of customer telephone numbers or access to a Reverse 9-1-1 system.	X	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
We have a list of customer email addresses.	<input type="checkbox"/>	X	<input type="checkbox"/>	<input type="checkbox"/>
We encourage our customers to remain in contact with us using social media.	<input type="checkbox"/>	X	<input type="checkbox"/>	<input type="checkbox"/>
We have an active website we can quickly update to include important messages.	<input type="checkbox"/>	X	<input type="checkbox"/>	<input type="checkbox"/>
Our customers drive by a single location where we could post an advisory and expect everyone to see it.	<input type="checkbox"/>	X	<input type="checkbox"/>	<input type="checkbox"/>
We need a news release to supplement our public notification process.	<input type="checkbox"/>	X	<input type="checkbox"/>	<input type="checkbox"/>

Distribution System *E. coli* Response Plan

If we have *E. coli* in our distribution system we will immediately:

1. Call DOH.
2. Collect repeat and triggered source samples per Part D. Collect additional investigative samples as necessary.
3. Notify water users to boil water.
4. Chlorinate water system and flush.
5. Collect follow up bacti post chlorination.
6. Notify water users of lift boil notice.
7. Discuss with DOH whether to issue a Health Advisory based on the findings of steps 3-6.

***E. coli*-Present Triggered Source Sample Response Checklist –
All Sources**

Background Information	Yes	No	N/A	To Do List
We review our sanitary survey results and respond to any recommendations affecting the microbial quality of our water supply.	X	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
We address any significant deficiencies identified during a sanitary survey.	X	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
There are contaminant sources within our Wellhead Protection Area that could affect the microbial quality of our source water, and If yes, we can eliminate them.	<input type="checkbox"/> <input type="checkbox"/>	X	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
We routinely inspect our well site(s).	X	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
We have a good raw water sample tap installed at each source.	X	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
After we complete work on a source, we disinfect the source, flush, and collect an investigative sample.	X	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Public Notice	Yes	No	N/A	To Do List
We discussed the requirement for immediate public notice of an <i>E. coli</i> -present source sample result with our water system's governing body (board of directors or commissioners) and received direction from them on our response plan.	X	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
We discussed the requirement for immediate public notice of an <i>E. coli</i> -present source sample result with our wholesale customers and encouraged them to develop a response plan.	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
We have prepared templates and a communications plan that will help us quickly distribute our messages.	X	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

E. coli*-Present Triggered Source Sample Response Checklist – Source S__

Alternate Sources	Yes	No	N/A	To Do List
We can stop using this source and still provide reliable water service to our customers.	<input type="checkbox"/>	X	<input type="checkbox"/>	<input type="checkbox"/>
We have an emergency intertie with a neighboring water system that we can use until corrective action is complete (perhaps for several months).	<input type="checkbox"/>	X	<input type="checkbox"/>	<input type="checkbox"/>
We can provide bottled water to all or part of the distribution system for an indefinite period.	<input type="checkbox"/>	X	<input type="checkbox"/>	<input type="checkbox"/>
We can quickly replace our existing source of supply with a more protected new source.	<input type="checkbox"/>	X	<input type="checkbox"/>	<input type="checkbox"/>

Temporary Treatment	Yes	No	N/A	To Do List
This source is continuously chlorinated, and our existing facilities can provide 4-log virus treatment (CT = 6) before the first customer. If yes, at what concentration? _____ mg/L	<input type="checkbox"/>	X	<input type="checkbox"/>	<input type="checkbox"/>
We can quickly introduce chlorine into the water system and take advantage of the existing contact time to provide 4-log virus treatment to a large portion of the distribution system.	X	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
We can reduce the production capacity of our pumps or alter the configuration of our storage quantities (operational storage) to increase the amount of time the water stays in the system before the first customer to achieve CT = 6.	<input type="checkbox"/>	X	<input type="checkbox"/>	<input type="checkbox"/>
We can alter the demand for drinking water (maximum day or peak hour) through conservation messages to increase the time the water is in the system prior to the first customer in order to achieve 4-log virus treatment with chlorine.	X	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

*NOTE: If your system has multiple sources, you may want to complete a separate checklist for each source.

***E. coli*-Present Triggered Source Sample Response Plan – Source**

If we have *E. coli* in Source water we will immediately:

1. Call DOH.
2. Collect repeat samples.
3. Notify water users to boil water.
4. Chlorinate water system & flush.
5. Collect follow up bacti post chlorination.
6. Notify water users of lift boil notice.

H. System Map

APPENDIX E

WHATCOM COUNTY WATER DISTRICT NO. 13

DEVELOPER EXTENSION MANUAL

FOR THE CONSTRUCTION OF:

- **WATER SYSTEMS**
- **SANITARY SEWER SYSTEMS**
- **SEWAGE LIFT STATIONS**

FEBRUARY 2012



WHATCOM COUNTY WATER DISTRICT NO. 13

Whatcom County, Washington

Commissioners

Phil Cloward
Tom Watkins
Richard Whitson
Robert Vandenhaak
Johnnie Frieson

Water System Operator

Kelly Wynn
Water & Wastewater Services LLC
14263 Calhoun Road
Mount Vernon, WA 98273
Telephone: (360) 466-4443
Fax: (360) 466-1713

Office

WHATCOM COUNTY WATER DISTRICT NO. 13
532 Sprague Valley Dr.
Maple Falls, WA 98266
Telephone: (360) 599-1801
Fax: (360) 599-

Engineer

Gray & Osborne, Inc.
3710 168th Street NE, Suite 210
Arlington, WA 98223
Telephone: (360) 454-5490
Fax: (360) 454-5491

Attorney

Inslee Best, Doezie & Ryder, PS
Symetra Financial Center, Suite 1900
777 108th Avenue NE
Bellevue, WA 98009-9016
Telephone: (425) 455-1234
Fax: (425) 635-7720

WHATCOM COUNTY WATER DISTRICT NO. 13

Whatcom County, Washington

The standards within are presented to inform the Developer/Contractor/Customer of the general minimum requirements necessary in the construction and acceptance of water and sewer facilities within the Whatcom County Water District No. 13 service area.

Whatcom County Water District No. 13 does not assume responsibility for keeping this material current. The District should be consulted in case of doubt on the applicability of an item(s) within. Some of the information contained within is based on governmental codes and ordinances, and industry standards and are subject to change in the event that such governing codes and ordinances are changed.

WHATCOM COUNTY WATER DISTRICT NO. 13 DEVELOPER EXTENSION MANUAL

INDEX

DEVELOPER EXTENSION CHECKLIST

SECTION 1: GENERAL CONDITIONS

SECTION 2: WATER SYSTEMS

SECTION 3: SANITARY SEWER SYSTEMS

SECTION 4: SEWAGE LIFT STATIONS

SECTION 5: CROSS CONNECTION CONTROL

SECTION 6: STANDARD DETAILS

APPENDICES

- Sample Agreement to Perform a Feasibility Study
- Sample Application to Construct Extension to District System
- Sample Agreement to Construct Extension to District System
- Sample Bill of Sale
- 23-Month Inspection Form
- Release of Encumbrance
- Sample Latecomers Agreement
- General Drafting Requirements
- Standard Plan Notes
- Plans and Construction Checklist
- Preconstruction Checklist
- Sample Easement Documents
- Sample Performance, Payment, and Guaranty Bond
- Sample Maintenance Bond
- Sample Assignment of Funds in Lieu of Maintenance Bond
- Sample Easement Restoration Release Form

WHATCOM COUNTY WATER DISTRICT NO. 13
Whatcom County, Washington

DEVELOPER EXTENSION CHECKLIST

LOCATION: _____
PROJECT NAME: _____ PHONE: _____
DEVELOPER: _____ PHONE: _____
ENGINEER: _____ PHONE: _____
CONTRACTOR: _____ PHONE: _____

- | A. PRE-APPLICATION | DATE |
|--|-------|
| 1. Pre-Application Meeting held with District. | _____ |
| 2. Preliminary plans submitted to District. | _____ |
| 3. Feasibility Application with \$2,500.00 | _____ |
| 4. Feasibility Study completed. | _____ |
| | |
| B. APPLICATION | |
| 1. Application submitted to District. | _____ |
| 2. Deposit Paid: \$2500 Guarantee Deposit. | _____ |
| 3. Board hearing if application is rejected by Board. | _____ |
| 4. District review and approval of application. | _____ |
| 5. District prepares Extension Agreement and Resolution. | _____ |
| | |
| C. PRELIMINARY | |
| 1. Extension Agreement signed by Developer. | _____ |
| 2. Preliminary plans submitted to District. | _____ |
| 3. SEPA compliance submitted to District by Developer. | _____ |
| 4. Extension Agreement approved by Board. | _____ |
| 5. Extension Agreement executed and recorded. | _____ |

D. BEFORE PLAN REVIEW OR DESIGN	DATE
1. Pre-Design meeting held with Developer.	_____
2. Preliminary plat provided by Developer.	_____
3. Contour map submitted to District.	_____
4. Road profiles provided by Developer	_____
5. Fees Paid: Department of Ecology Review Fee.	_____
6. Fees Paid: Department of Health Review Fee.	_____
7. Notice to proceed to District's engineer.	_____
 E. PLAN REVIEW	
1. Plans submitted to District for review.	_____
2. Plans and specifications approved by District.	_____
3. Plans and specifications sent to DOH by District. (Water)	_____
4. Plans and specifications sent to Ecology by District. (Sewer)	_____
5. Plans approval letter from Fire Marshall. (Fire)	_____
6. Plan approval letter sent to Developer.	_____
7. Latecomers Agreement approval by District.	_____
 F. REQUIRED BEFORE CONSTRUCTION BEGINS	
1. Plan and specifications sent to Whatcom County.	_____
2. Approval of contractor by District.	_____
3. DOH approval received.	_____
4. Ecology approval received.	_____
5. Performance Bond submitted by Developer.	_____
6. Certificate of Insurance submitted by Developer.	_____
7. Proposed construction schedule submitted by Developer.	_____

DATE

- 8. Bonds submitted for work in County right-of-way. _____
- 9. Permits received from County/other agencies. _____
- 10. Hold harmless letter submitted to District if construction is to start prior to agency approvals _____
- 11. Material and equipment list submitted by Developer. _____
- 12. Preconstruction meeting held by Developer. _____
- 13. Property boundary stakes in place by Developer. _____
- 14. Third party easements secured and submitted to District. _____
- 15. Construction stakes in place by Developer. _____
- 16. General facilities charge paid by Developer. _____

G. CONSTRUCTION

- 1. District approves construction start. _____
- 2. District inspects project. _____
- 3. Pressure test and bacteria test completed and passed - Water. _____
- 4. Air leak TV'd, and mandrel testing completed and passed - Sewer. _____
- 5. Punch list submitted to Contractor and Developer. _____
- 6. Final inspection and approval. _____
- 7. Letter to Developer requesting as-builts, easements, bills of sale (incl. costs), etc. _____
- 8. Memo to file that project is "construction complete". _____

H. AFTER CONSTRUCTION

- 1. Easement restoration releases signed and submitted. _____
- 2. Backflow Prevention Assembly Test Reported received. _____
- 3. District authorizes system tie-in (remove plugs for sewer). _____

DATE

4. District authorizes system tie-in (open valves for water). _____
 5. Reproducible as-built construction drawings and final easements submitted to District. _____
 6. Developer submits final plat to District. _____
 7. Developer submits final as-builts & easements. _____
 8. Easements recorded by District. _____
 9. Developer submits executed bills of sale. _____
 10. Project cost submitted to controller for inclusion in Plant-In-Service. _____
 11. Pick up billing on A/R. _____
 12. Developer expenses brought current and paid. _____
 13. District accepts title to system extension. _____
 14. Execute Maintenance bond. _____
 15. Release of Performance bond. _____
 16. Begin two-year warranty. _____
- I. PROJECT CLOSEOUT
1. Warranty inspection completed by District. _____
 2. District makes final acceptance. _____
 3. Release excess fee to Developer by District. _____
 4. Release of Maintenance Bond by District. _____
 5. Board executes/records release of Encumbrance. _____
 6. Letter sent to Developer stating project has been completed. _____

PROJECT COMPLETE

PRESIDENT _____

SECRETARY _____

BOARD
MEMBER _____

BOARD
MEMBER _____

SECTION I
GENERAL CONDITIONS

GENERAL CONDITIONS

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I. GENERAL CONDITIONS:

1. DEFINITIONS:

To make clear the meaning and intent of the words: District, District’s Engineers, Developer, Contractor, and Contract Documents, as used in these standards, the following definitions are given:

District: Whatcom County Water District No. 13, Whatcom County, Washington, a Water – Sewer District existing under and by virtue of the laws of the State of Washington.

District’s Engineers: The District Engineer or the engineering firm and that firm’s representatives retained and assigned by the District to act as the Engineer for the work to be performed on the project.

Developer: The person, persons, firm, owner, or corporation entering into agreement with Whatcom County Water District No. 13 for the installation and/or extension of a water or sewage facility. The term also includes the Developer's agents and employees and Contractor.

Contractor: The person, persons, firm, or corporation employed by the Developer to perform the work required by project plans and specifications to construct the water or sewage facility within the District’s service area. The term also includes the Contractor's agents and employees.

Developer/ Contractor: Use of either word “Developer” or “Contractor” in this document shall be understood to be interchangeable, one for the other, wherein both are responsible for compliance, and the developer assumes full and final responsibility unless a division of responsibility through the use of a contract, performance bond, insurance, etc., is established.

Contract Documents: These shall consist of the following and in case of conflicting provisions, the text material shall have precedence:

- a) Developer Agreement for Water or Sewer Facility Extensions
- b) Plans
- c) Standard Details
- d) Specifications-Conditions and Standards of the Contract to include system testing

I. GENERAL CONDITIONS - Continued

- e) Addenda
- f) Change Orders
- g) General Conditions
- h) "As Built" Documents

These documents shall form the Contract.

2. ENGINEER'S STATUS:

The District's Engineer shall serve as an agent of the District and in conjunction with the District, have the authority to accept or reject the work performed by the Developer for facilities within the District's service area.

3. INSPECTION OF WORK:

The Developer shall give the District timely notice that the work, or any part thereof, which has been constructed within the District's service area, is ready for inspection. In no event shall the work, or any portion thereof, be covered up or placed into operation until the District has completed the inspection.

If any work should be covered up without prior inspection by the District, it shall be uncovered for examination at the Developer's expense.

The District and its representatives shall at all times, have access to the work whenever it is in preparation or progress and the Developer shall provide proper facilities for such access and for such inspection.

The Developer shall perform tests of the work, at the Developer's expense.

If the specifications, laws, ordinances, or any public authority shall require any work to be specially tested or approved, the Developer shall give the District timely notice of its readiness for inspection and, if the inspection is by other authority than the District, the date fixed for such inspection.

All inspections by the District will be made with all reasonable promptness but, in no event, shall the lack of prompt inspections be construed to allow the Developer to cover up the work or any portion of it without inspection.

The District's review of the Contractor's work plan, safety plan, construction sequence, schedule or performance does not and is not intended to include review or approval of the adequacy of the Contractor's safety measures in, on or near the construction site. The District does not purport to be a safety expert, is not engaged in that capacity, and has neither the authority nor the responsibility to enforce construction safety laws, rules, regulations, or procedures, or to order the stoppage of work for claimed violations thereof.

I. GENERAL CONDITIONS - Continued

4. FINAL INSPECTION AND ACCEPTANCE:

All materials and completed work shall, before acceptance by the District, be subject to final inspection by the District. The District shall have the right to subject all machinery, equipment and work to all tests necessary to assist in determining whether the contract has been faithfully performed.

5. MATERIALS AND FACILITIES:

Unless otherwise stipulated, all materials utilized for water or sewage system construction within the District's service area, shall be new and both workmanship and materials shall be of good quality. The Developer shall furnish evidence as to the kind and quality of materials.

The Developer shall at all times enforce strict discipline and good order among his employees, and shall not employ on the work any person not skilled in the work assigned to him.

6. ROYALTIES AND PATENTS:

The Developer shall pay all royalties and license fees. He shall defend all suits and claims for infringement of any patent rights and shall save the District harmless from loss on account thereof.

7. SURVEYS, PERMITS AND REGULATIONS:

The Developer shall furnish and pay for all surveys, licenses, permits, easements, and rights-of-way.

The Developer shall give all notices and comply with all laws, ordinances, rules, and regulations bearing on the conduct of the work.

The Developer shall carefully preserve bench marks, reference points and stakes, and in case of destruction, he shall be charged with the resulting expense and shall be responsible for any mistakes that may be caused by their absence or disturbance.

8. PROTECTION OF WORK AND PROPERTY:

The Developer shall continuously maintain protection of all his work from damage and shall protect the property of others from injury or loss arising in connection with his work. He shall make good any such damage, injuries, or loss. He shall protect the adjacent property as provided by law and the Contract Documents. He shall provide and maintain all passage ways, guard fences, traffic control, detours, road closures, barricades, signs, flaggers, lights, and other facilities for protection required by public authority or local conditions. The

I. GENERAL CONDITIONS - Continued

Developer shall bear the risk of loss or damage for all finished or partially finished work until the entire project is completed and accepted by the District.

9. EXISTING UTILITIES:

The Developer shall investigate and locate all buried utilities or obstructions in the construction area prior to construction of new water or sewage facilities. The Developer shall coordinate with the District, power, telephone, cable television, gas companies, and all other affected utilities for field location of the respective existing facilities.

The Developer shall call for utility locates (1-800-424-5555) two full working days prior to construction for aid in locating any existing underground utilities as applicable.

10. REPLACING IMPROVEMENTS:

Whenever it is necessary in the course of construction to remove or disturb culverts, driveways, roadways, pipelines or other existing improvements, they shall be replaced to a condition equal or superior to that existing before they were so removed or disturbed. If it is necessary to trench through lawns, the sod shall be removed before trenching and replaced with new sod after backfilling.

11. ACCESS:

Bridging shall be provided across private driveways and roadways, during the period that trenches are open, in such a manner as not to constitute a hazard to the people who use them. All construction operations shall be conducted in such a manner as to interfere as little as possible with the normal procedure of traffic.

12. DEFECTS AND THEIR REMEDIES:

If the work or any part thereof performed by the Developer, shall be deemed by the District as not in conformity with the District's Standards, the Developer shall forthwith rebuild or otherwise remedy such defects prior to being accepted by the District.

The Developer shall be responsible for correcting all defects in workmanship and material appearing within two years after completion and acceptance of his project. The Developer shall start work to remedy such defects within 7 days of notice of discovery thereof by the District and shall complete such work within a reasonable time. In emergencies, where damage may result from delaying or where loss of service may result, such corrections may be made by the District in which case all costs shall be borne by the Developer. In the event the Developer does not accomplish corrections at the time specified, the work shall be otherwise accomplished and the cost of same shall be paid by the Developer.

13. USE OF COMPLETED PORTIONS:

The District shall have the right to take possession of and use any completed or partially completed portions of the work, notwithstanding that the time may not have expired for completing the entire work or such portions, which will not interfere with the Developer performing the remaining work. Such taking possession and use shall not be deemed an acceptance of any work not completed and inspected in accordance with the Contract Documents or District Standards.

14. INSURANCE REQUIREMENTS, SUMMARY OF COVERAGE AND INDEMNITY:

The Developer shall carry liability and property damage insurance covering all work during Project construction, including that done by the Developer's Contractor and the Contractor's subcontractors. This insurance shall also protect the District from any contingent liability prior to Project acceptance.

The Developer shall obtain from an insurance company, with have an A.M. Best rating of "AVII" or better approved by the Insurance Commissioner of the State of Washington pursuant to Title 48 RCW, commercial general liability and automobile liability insurance against claims to the Developer, the District and its elected and appointed officials, officers, employees, agents and volunteers for injury to person or property which may arise from any act or omission by anyone directly or indirectly employed by the Developer from or relating to the performance, supervision, or inspection of the work. The insurance policy(s) shall specifically name and include the District and its elected and appointed officials, officers, employees, agents and volunteers as additional insureds under such policy(s) with regards to damages and defense of claims arising from: (a) activities performed by or on behalf of the Developer; (b) products and completed operations of the Developer, or (c) premises owned, leased or used by the Developer for the work proposed under this Developer Extension Agreement. Proof of the existence of such insurance shall be provided to the District in a form acceptable to the District prior to the Pre-Construction Meeting.

The Developer shall not begin work under the agreement or under any special condition until all required insurance has been obtained and until such insurance has been reviewed and accepted by the District. The Developer shall file with the District either a certified copy of all insurance policies or a certificate of insurance with the endorsements in the form included herein as are necessary to comply with these specifications.

I. GENERAL CONDITIONS - Continued

The minimum limits of coverage shall be as follows:

General Aggregate	\$2,000,000
Products - Comp/OPS Aggregate	\$2,000,000
Personal Injury	\$2,000,000
Each Occurrence	\$2,000,000
Automobile Liability	\$2,000,000

Policies shall be kept in force until the project is accepted by the District. The District shall be given at least 45 days written notice of cancellation, non-renewal, material reduction, or modification of coverage. The District may increase these limits if the scope of the proposed work warrants additional coverage.

Failure of the Developer to fully comply with the requirements regarding insurance will be considered a material breach of contract and shall be cause for immediate termination of the developer extension agreement and any and all District obligations, regarding same.

The coverage provided by the insurance policies shall be primary to any insurance maintained by the District, except with respect to losses attributable to the sole negligence of the District. Any insurance that might cover this Agreement which is maintained by the District shall be in excess of the Developer's/Contractor's insurance and shall not contribute with it.

The insurance policy shall protect each insured in the same manner as though a separate policy had been issued to each. The inclusion of more than one insured shall not affect the rights of any insured with respect to any claim, suit or judgment made or brought by or for any other insured or by or for any employee of any other insured.

The general aggregate provisions of the insurance policy shall be amended to show that the general aggregate limit of the policies apply separately to this project.

The insurance policy shall not contain a deductible or self-insured retention in excess of \$10,000 unless approved by the District.

Providing coverage in the stated amounts shall not be construed to relieve the Developer from liability in excess of such limits.

The Developer shall indemnify, defend and hold the District and its elected and appointed officials, officers, employees, agents and volunteers harmless from and against all losses and all claims, demands, payments, suits, actions, recoveries, and judgments of every nature and description brought or recovered against the District by reason of any act or omission of the Developer, the Developer's agents or employees, in connection with the work performed under this contract, or

I. GENERAL CONDITIONS - Continued

caused or occasioned in whole or in part by reason of the presence of the Developer, the Developer's Contractor or Subcontractors, or their property, employees or agents, upon or proximity to any property upon which work is being performed under this contract.

For the purpose of applying RCW 4.24.115 to the Developer's project, the Developer and the District agree that the term "damages" applies only to the finding in a judicial proceeding and is exclusive of third party claims for damages preliminary thereto.

The Developer agrees to indemnify, defend and hold harmless the District, and its elected and appointed officials, officers, employees, agents and volunteers from all claims for damages by third parties, including costs and reasonable attorney's fees in the defense of such claims for damages, arising from performance of the work under this contract. Developer waives any right of contribution against the District.

It is agreed and mutually negotiated that in any and all claims against Whatcom County Water District No. 13 or any of its agents or employees by any employee of the Developer, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, the indemnification obligation hereunder constitutes Developer's and its Contractor's and Subcontractor's waiver of immunity under Title 51 RCW, solely for the purposes of this indemnity.

District and Developer agree that all third party claims for damage against District for which Developer's insurance carrier does not accept defense of District may be tendered by District to the Developer who shall, if so tendered by District, accept and undertake to defend or settle with the Claimant. District retains the right to approve claims investigation and legal counsel assigned to said claim and all investigation and legal work product regarding said claim shall be performed under a fiduciary relationship to Whatcom County Water District No. 13. In the event that District agrees or a court finds that the claim arises from the sole negligence of District, this indemnification shall be void and District shall be responsible for all damages payable to the third party claimant. In the event that District and Developer agree or a court finds that the claim arises from or includes negligence of both the Developer and District, the Developer shall be responsible for all damages payable by the Developer to the third party claimant under the court finding, and, in addition thereto, the Developer shall hereunder indemnify District for all damages paid or payable by District under the court finding an amount not to exceed the percentage of total fault attributable to the Developer. For example, where the Developer is 25 percent negligent, the Developer shall not be required to indemnify District for any amount in excess of 25 percent of the claimant's total damages.

I. GENERAL CONDITIONS - Continued

Nothing contained in these insurance requirements is to be construed as limiting the extent of the Developer's and its contractor's responsibility for payment of damages resulting from operations under this agreement.

15. RIGHTS OF VARIOUS INTERESTS:

Wherever work being done by the District's employees or agents or by other developers is contiguous to work performed by the Developer, the respective rights of the various interests involved shall be established by those involved to secure the completion of the various portions of the work in general harmony.

16. SANITATION:

Necessary sanitation conveniences for the use of workmen on the job, secluded from public observation, shall be provided and maintained by the Developer.

17. CLEANUP:

The Developer shall keep the construction site reasonably clear during the progress of the work.

The Developer shall backfill the trenches, clean out ditches that may have been filled during the work, replace damaged surfacing, remove surplus materials and trash, dispose of brush, repair all damages, and otherwise leave the job in a neat, orderly and workmanlike condition.

18. CONSTRUCTION CONFORMANCE:

In addition to meeting the standards and conditions of the Whatcom County Water District No. 13, all construction shall be in conformance with the requirements of the Departments of Health and Ecology, Whatcom County, Washington State Department of Transportation, American Public Works Association, and American Water Works Association.

The Developer shall plan, design, and construct the sewer and/or water extension between the point of connection to the existing utility, to and through the proposed development to provide sewer and/or water service to the Developer's property and to existing adjacent properties that can be served. This extension include mainlines to the far side of the property where future extension may occur. It also includes installing side sewers, water service, and fire hydrants in areas where water and sewer main improvements from the existing utility to the development are needed, as determined by the District, to serve existing properties along the alignment of the extension.

Additional District requirements may be mandated, on a case-by-case basis, due to site specific conditions.

I. GENERAL CONDITIONS - Continued

19. PREDESIGN MEETING:

A predesign meeting shall be held at the District offices prior to preliminary design of the proposed improvements. As a minimum, the Developer and the Developer's Engineer shall attend the meeting. This meeting should be used to clarify District Standards, resolve conflicts and to facilitate expeditious review of plan submittals.

20. PRECONSTRUCTION MEETING:

A preconstruction meeting shall be held at the District offices prior to any construction work being performed as part of the Developer Extension. As a minimum, the Developer and/or the Developer's Representative responsible for completion of the work, and the Developer's Contractor and Project Foreman shall attend the meeting. The Developer shall coordinate a meeting time which is convenient with the District's schedule and shall be scheduled a minimum of 5 working days prior to construction.

21. EASEMENTS:

The Developer shall obtain all necessary easements without cost to the District, using the District's standard easement form. Wherever a water or sewer main is to be laid other than in a public right-of-way, a permanent easement of not less than 7-1/2 feet on each side of the centerline of the main shall be provided. In addition, the Developer shall provide a temporary construction easement not less than 25 feet in width adjacent to the permanent easement. The Developer shall supply the District with the supporting data necessary to verify the location of the easement. If legal services are required by the District in connection with the easement, the cost of such services shall be reimbursed by the Developer to the District on demand and before acceptance of the extension.

The District shall be named as a beneficiary, with respect to both water and sewer facilities, in all general utility easements created in connection with the project.

Permanent easements shall also be provided for all water meters, fire hydrants, and backflow assemblies required to protect the public potable water system located outside the public right-of-way.

No permanent structures shall be allowed to be constructed within the permanent easement.

Landscaping and plantings shall be restricted to non-root intrusive low growing shrubs, grass, and surface coverings.

Vehicle access, as approved by the District, shall be provided to all manholes and

I. GENERAL CONDITIONS - Continued

facilities. Access to any fenced easement shall be provided via a duplex gate (12-foot opening width) of matching construction, to be approved by the District.

All offsite easements shall be obtained by the Developer and reviewed by the District prior to approval of the construction Plans. All other easements shall be provided and reviewed by the District prior to acceptance of the work performed under the Contract. When the form of required easements are approved by District, the Developer shall record the easement with the County Auditor and provide a record easement document to the District as a condition of acceptance.

An easement shall be provided to the District for access to all backflow assemblies required to protect the public potable water supply from possible contamination.

22. POLLUTION AND EROSION CONTROL:

The Contractor shall exercise all necessary precautions throughout the life of the project to prevent pollution, erosion, siltation, and damage to property.

Erosion and sediment control throughout the project including abutting and downstream properties shall be the responsibility of the Developer.

The Developer shall determine the appropriate temporary erosion and sediment control necessary for the construction time of the year and shall furnish and install the necessary controls as the first order of work. Such erosion control shall be fully maintained during the course of construction, modifying the control when necessary.

Temporary erosion and sediment control shall consist of and be installed in accordance with the more stringent conditions of Requirements of Endangered Species Act, Whatcom County Best Management Practice or Department of Ecology's Storm Water Management Manual for Western Washington.

The Developer shall bear sole responsibility for damage to completed portions of the project and to property located off the project caused by erosion, siltation, run-off, or other related items during construction of the project. The Developer shall also bear sole responsibility for any pollution of rivers, streams, groundwater, or other waters, which may occur as a result of construction operations.

Upon failure of the Developer to provide immediately such erosion control, the District shall be at liberty, without further notice to the Developer to provide and/or remove the necessary erosion control. The Developer shall reimburse the District for any costs incurred on account thereof.

I. GENERAL CONDITIONS - Continued

23. ENCASEMENT/CARRIER PIPES:

All state highway stream crossings, and other locations determined by the Developer and/or the District shall be encased with steel casing. Steel casing shall be of sufficient diameter, size, and strength to enclose the carrier pipe and to withstand maximum highway loading. Sizing and wall thickness of casing is subject to approval by the District. The carrier pipe shall be ductile iron, Class 52, restrained joint pipes unless otherwise approved by the District. Casing spacers shall be installed at each 10 feet of the pipeline. The spacers shall be Uni-Flange Series UFRCS 1300 or approved equal. Sand backfill between the casing and the carrier pipe shall be required. In order to prevent the sand from being washed from the casing, the ends of the casing shall be bricked and cemented after installation, backfill and testing of the pipe are completed.

24. FINISHING AND CLEANUP:

After all other work on the project is completed and before final acceptance, the entire roadway, including the roadbed, planting, sidewalk areas, shoulders, driveways, alley and side street approaches, slopes, ditches, utility trenches, and construction areas shall be neatly finished to the lines, grades and cross sections of a new roadway consistent with the original section, and as hereinafter specified.

On construction where all or portions of the construction is in undeveloped areas, the entire area which has been disturbed by the construction shall be shaped so that upon completion the area will present a uniform appearance, blending into the contour of the adjacent properties and hydroseeded. All other requirements outlined previously shall be met.

Slopes, sidewalk areas, planting areas and roadway shall be smoothed and finished to the required cross section and grade by means of a grading machine insofar as it is possible to do so without damaging existing improvements, trees, and shrubs. Machine dressing shall be supplemented by handwork to meet requirements outlined herein, to the satisfaction of the District.

Upon completion of the cleaning and dressing, the project shall appear uniform in all respects. All graded areas shall be true to line and grade. Where the existing surface is below sidewalk and curb, the area shall be filled and dressed out to the walk. Wherever fill material is required in the planting area, the finished grade shall be elevated to allow for final settlement, but nevertheless, the raised surface shall present a uniform appearance.

All rocks in excess of 1 inch diameter shall be removed from the entire construction area and shall be disposed of the same as required for other waste material. In no instance shall the rock be thrown onto private property. Overhang on slopes shall be removed and slopes dressed neatly so as to present a uniform,

I. GENERAL CONDITIONS - Continued

natural, well-sloped surface.

All excavated material at the outer lateral limits of the project shall be removed entirely. Trash of all kinds resulting from clearing and grubbing or grading operations shall be removed and not placed in areas adjacent to the project. Where machine operations have broken down brush and trees beyond the lateral limits of the project, the Developer shall remove and dispose of same and restore said disturbed areas at his own expense.

Drainage facilities such as inlets, catch basins, culverts, and open ditches shall be cleaned of all debris that results from the Developer's operations.

All pavements and oil mat surfaces, whether new or old, shall be thoroughly cleaned. Existing improvements such as Portland cement concrete curbs, curb and gutters, walls, sidewalks, and other facilities, which have been sprayed by the asphalt cement, shall be cleaned to the satisfaction of the District.

Castings for monuments, water valves, vaults and other similar installations, which have been covered with the asphalt material, shall be cleaned to the satisfaction of the District.

25. RECORD DRAWINGS:

Upon completion of construction and prior to acceptance, the approved construction drawings shall be corrected to reflect "As-Built" conditions, in accordance with the District's General Drafting Standards, and shall be returned to the District. The record drawing submittal when approved shall include an electronic file on disk of the scanned "As-Built" drawings, and the required signatures. For drawings created in electronic form, the submittal shall also include an AutoCAD file (Release 2010, Civil 3D or earlier version) "As-Built" drawing information in accord with the District GIS provisions on disk, and all related "As-Built Survey" files.

26. GENERAL GUARANTEE AND WARRANTY:

The Developer shall be required, upon completion of the work and prior to acceptance by the District, to furnish the District a construction guarantee covering all material and workmanship for a period of 2 years after the date of final acceptance and shall make all necessary repairs during that period at his own expense, if such repairs are necessitated as the result of furnishing poor materials and/or workmanship. The Developer shall obtain warranties from the contractors, subcontractors, and suppliers of material or equipment where such warranties are required, and shall deliver copies to the District upon completion of the work.

The form of this guarantee shall be mutually agreeable to the District and the Developer. The guarantee shall be an amount not less than 15 percent of the cost

I. GENERAL CONDITIONS - Continued

of the facility constructed as listed on approved bill of sales documentation and shall be for a duration not less than 2 years from the dated of acceptance of the constructed facilities by the District.

A separate warranty to allow for final adjustment of surface features to accommodate final pavement will be allowed. Amount to be based on estimated construction cost to adjust.

In no case shall a bond for construction warranty be less than \$5,000.

27. CROSS-CONNECTION PROTECTION:

Backflow assembly tests, certification and verification of locations, if applicable, shall be completed and reviewed by the District prior to project acceptance.

All on-site wells or auxiliary water system shall be disconnected and decommissioned prior to connecting to the District's water or sewer systems. Confirmation that the on-site wells have been decommissioned in accordance with WAC 173-160-381 shall be provided to the District prior to the District selling a water or sewer connection permit.

SECTION II
WATER SYSTEMS

WATER SYSTEMS

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II. WATER SYSTEMS - GENERAL STANDARDS:

1. OBJECTIVE:

Section II is intended to present information and provide an outline of the minimum general standards required by Whatcom County Water District No. 13 for Developer constructed water main extensions and improvements which are to be acquired and operated by the District.

2. GENERAL:

Detailed plans shall be submitted for the District's review which provide the locations, size, and type of the proposed water system and points of connection. These plans shall be separate from Sewer Plans and shall conform to the District Drafting Standards.

Project plans shall have a horizontal scale of 1-inch = 50 feet, unless approved by the District. Plans shall show:

- Locations of streets, right-of-ways, existing utilities, and water system facilities.
- Ground surface, dimensions, pipe type and size, water valves, fittings, hydrants and appurtenances.
- All known existing structures, both above and below ground that might interfere with the proposed construction, particularly sewer lines, gas mains, storm drains, overhead and underground power lines, telephone lines, and television cables.
- All utility easements.
- District Approval Block.

Computations and other data used for design of the water system shall be submitted to the District for approval.

The water system facilities shall be constructed in conformance with the current WSDOT Standard Specifications for Road, Bridge, & Municipal Construction and amendments thereto, revised as to form to make reference to Local Governments and as modified by the District's requirements and standards.

Material and installation specifications shall contain appropriate requirements that have been established by the industry in its technical publications, such as ASTM, AWWA, WEF, and APWA standards. Requirements shall be set forth in the specifications for the pipe and methods of bedding and backfilling so as not to damage the pipe or its joints.

II. WATER SYSTEMS - GENERAL STANDARDS - Continued

Except as otherwise noted herein, all work shall be accomplished as recommended in applicable American Water Works Association (AWWA) Standards, and according to the recommendations of the manufacturer of the material or equipment concerned.

All piping and plumbing installed to provide water for human consumption that is connected to the District's water system shall be lead free.

The location of the water mains, valves, hydrants, and principal fittings including modifications shall be staked by the Developer. No deviation shall be made from the required line or grade. The Developer shall verify and protect all underground and surface utilities encountered during the progress of this work.

All pipelines shall be tested and disinfected to District and AWWA Standards prior to acceptance.

Before acceptance of the water system by the District, all pipes, assemblies, and other appurtenances shall be cleaned of all debris and foreign material. After all other work is completed and before final acceptance, the entire roadway, including the roadbed, planting, sidewalk areas, shoulders, driveways, alley and side street approaches, slopes, ditches, utility trenches, and construction areas shall be neatly finished to the lines, grades, and cross sections for a new roadway consistent with the original section.

3. GENERAL REQUIREMENTS:

1. Work shall be performed only by contractors experienced in installing public water mains.
2. Prior to any work being performed, the Developer shall contact the District's Engineer to set forth his proposed work schedule.
3. All materials shall be new and undamaged.
4. Developer shall obtain approval of materials to be used from the District prior to ordering of materials.
5. Water mains shall be delivered to the site with wrapping to cover the ends of the pipe or with pipe plugs. Either method used shall remain in unbroken condition until the pipe is installed.
6. Water mains shall be laid only in dedicated rights-of-way or in easements that have been granted to the District. Water mains may be laid within a plat or property identified in the developer extension agreement, subject to dedication of appropriate rights-of-way and recording of appropriate easements at the time the plat and/or warranty bill of sale is filed with the County Auditor.

II. WATER SYSTEMS - GENERAL STANDARDS - Continued

7. Dead end lines are not permitted except where the District is satisfied that it would be impractical to extend the line at a future date. Water mains shall extend to the plat line of developable neighboring property for a convenient future connection, and a 2-inch blow off assembly shall be provided on mains 8-inches and smaller. A fire hydrant shall be installed on larger size mains to accommodate flushing velocities.
8. If a service line to a lot is over 200 feet (not including panhandle), the Developer shall install a 6-inch water main to within 200 feet of the structure being served with a 2-inch blow off at the end in an easement granted to the District. If multiple lot services are required, the 200-foot distance will include the panhandle distance.
9. All 8 inch and smaller water mains shall have minimum 3'-6" cover from finished grade except 4'-0" cover in easements. All 12-inch and larger water mains shall have a minimum of 4'-0" cover from finished grade. The maximum shall be 7'-0" cover unless approved by the District. Mains shall generally be located parallel to street centerline, per Whatcom County Road Standards.
10. Valves shall be installed at intervals not to exceed 1,000 feet. Valves shall be installed on each leg of all tees and crosses, except fire hydrant tees unless required by the District, and at each end of easements.
11. Valve markers shall be installed and marked with the distance to valve being referenced for all valves in unpaved areas.
12. Fire hydrants are required approximately every 600 feet in residential areas and/or located no more than 350 feet from the back of any proposed lot. Fire hydrants are required every 300 feet in commercial areas, or as required by the Fire Marshal. Distances required herein shall be measured linearly along street or road.
13. Only one fire hydrant shall be installed on any dead-end 8-inch run.
14. Pipes connecting hydrants to mains shall be at least 6 inches in diameter, restrained and not longer than 50 feet.
15. Provide bends in field to suit construction and in accordance with pipe manufacturer's recommendations so as not to exceed allowable deflection at pipe joints.
16. Provide thrust blocking or restrained joints at all fittings and bends in accordance with the District standards and conditions. Restrained joint systems required in areas of fill or if installed in previously disturbed soil and where indicated on District Standard Details.

II. WATER SYSTEMS - GENERAL STANDARDS - Continued

17. Provide anchor blocking at all up-thrust vertical bends in accordance with District standards.
18. Water services shall be HDPE or polyethylene tubing rated to minimum of 200 psi from water main to meter (no joints) for 1-inch and 2-inch services. Larger service lines shall be the type and style shown in the Standard Details.
19. Minimum size service lines between the water main and the water meter shall be 1 inch for single-family use and 2 inch for commercial and multi-family use. All meters and private service lines shall be the minimum size by the County Plumbing Code in accordance with fixture units, unless otherwise specified.
20. Meter services and meter boxes shall be set to final grade and all adjustments shall be made prior to final pressure testing of the system, except as approved by the District. Developer shall furnish two neoprene gaskets and one dual check valve for each service installed. Service inlet shall be centered at inlet end of box and faced toward outlet end of box parallel with long sides.
21. All water services shall end within road right-of-way or easements.
22. All 3/4" x 5/8" and 1-inch meters will be installed by the District, and the property owner shall pay the current meter installation charge. Meters greater than 1 inch and up to 2 inches in size shall be installed by the District and paid by the property owner on a time and material basis. The Developer shall furnish all meters larger than 2 inches in size installed by the Developer and locked off by the District until approved for service.
23. All services other than single family residential shall be provided with Washington State-approved backflow prevention located immediately behind and on the property side of the water service box. Irrigation, residential single-family fire meters, duplex, and multi-family residential connections shall require double check valve assemblies (DCVA). All other connections shall require reduced pressure backflow assemblies (RPBA). Commercial fire sprinkler system, if unmetered shall require reduced pressure detector assemblies (RPDA).
24. All irrigation using chemical feed, or water features, including decorative ponds, pools and fountains requiring make-up water shall be protected from backflow into the public water supply by a **minimum** of an approved air-gap to be located at the fill point of the pond or water feature. This "air-gap" shall be inspected by the District prior to filling. In all instances, the water supply used for filling purposes shall be protected by a double check valve assembly (DCVA) installed behind the meter for new construction or retrofitted as close as practical on modified systems.

II. WATER SYSTEMS - GENERAL STANDARDS - Continued

25. All service connections shall comply with the current "Accepted procedure and practice in Cross Connection Control Manual" as published by the Pacific Northwest Section of the American Water Works Committee and the District "Cross-Connection Control Manual." A copy of such is available for review at the District office.
26. Developer shall notify the District and obtain approval prior to any water shut-off or turn-on, affecting the water system, a minimum of 48 hours in advance.
27. Cut in connections and wet taps shall not be made on Fridays, the day before a holiday, holidays, or weekends (unless approved by the District). Monday connections may be allowed at District sole discretion.
28. Developer shall use only District approved hot tap vendors to perform work in the District.
29. All tapping sleeves and tapping valves shall be pressure tested prior to making connection to existing mains.
30. Road restoration shall be per Whatcom County, City and/or State design and construction standards. Developer shall become familiar with all County, City, and State conditions of required permits, and shall adhere to all conditions and requirements.

4. MATERIALS:

WATER MAINS AND FITTINGS

Water mains to be installed shall be PVC C900 pipe for all sizes, unless specifically noted otherwise. All water pipe shall be delivered to the site with wrapping to cover the ends of the pipe or with pipe plugs. Either method used shall remain in unbroken condition until the pipe is installed.

The ductile iron pipe shall conform to AWWA C151 and shall be Class 52. Grade of iron shall be a minimum of 60-42-10. The pipe shall be cement lined to a minimum thickness of 1/16" meeting NSF standards for potable water and the exterior shall be coated with an asphaltic coating.

Each length shall be plainly marked with the manufacturer's identification, year, thickness, class of pipe and weight. The pipe shall be furnished with mechanical joint or push-on type joint, except where plans call for flanged ends.

Restrained joint pipe shall be as directed and approved by the District.

II. WATER SYSTEMS - GENERAL STANDARDS - Continued

All pipe shall be joined by the manufacturer's standard coupling, be all of one manufacturer, and be carefully installed in complete compliance with the manufacturer's recommendations.

Joints shall be "made up" in accordance with the manufacturer's recommendations. Standard joint materials, including rubber ring gaskets, shall be furnished with the pipe. Material shall be suitable for the specified pipe size and pressures.

All fittings shall be short-bodied, ductile iron complying with AWWA C110 or C153 for 350 psi pressure rated mechanical joint fittings and 250 psi pressure rated flanged fittings. All fittings shall be cement mortar lined per the ductile iron pipe specifications and either mechanical joint or flanged.

Fittings in areas requiring restrained joints shall be mechanical joint fittings with a mechanical joint restraint device. The mechanical joint restraint device shall have a working pressure of at least 250 psi with a minimum safety factor of 2:1 and shall be EBAA Iron, Inc., MEGALUG, Star Pipe Products, or approved equal.

All couplings shall be ductile iron mechanical joint sleeves.

The pipe and fittings shall be inspected for defects before installation. All lumps, blisters and excess coal tar coating shall be removed from the bell and spigot end of each pipe, and the outside of the spigot and the inside of the bell shall be wire-brushed and wiped clean and dry, and free from oil and grease before the pipe is laid.

Every precaution shall be taken to prevent foreign material from entering the pipe while it is being placed in the line. After placing a length of pipe in the trench, the spigot end shall be centered in the bell and pipe forced home and brought to correct line and grade. The pipe shall be secured in place with select backfill tamped under it. Precaution shall be taken to prevent dirt from entering the joint space. At times when pipe laying is not in progress, the open ends of pipe shall be closed by a water-tight plug. If water is in the trench when work resumes, the seal shall remain in place until the trench is pumped completely dry. No pipe shall be laid in water or when trench conditions are unsuitable.

The cutting of pipe for inserting fittings or closure pieces shall be done in a neat and workmanlike manner, without damage to the pipe or cement lining, and so as to leave a smooth end at right angles to the axis of the pipe. When a pipe length is cut, the outer edge of the cut shall be beveled to prevent damage to the gasket during jointing of the pipes.

Pipe shall be laid with bell ends facing in the direction of the laying, unless approved otherwise by the District. Wherever it is necessary to deflect pipe from

II. WATER SYSTEMS - GENERAL STANDARDS - Continued

a straight line, the amount of deflection allowed shall not exceed pipe manufacturer's recommendations.

For connection of mechanical joints, the socket, plain end of each pipe and gasket shall be cleaned of dirt before jointing, and shall be jointed according to manufacturer's directions. Bolts shall be tightened alternately at top, bottom, and sides, so pressure on gasket is even.

For connection of push-on type joints, the jointing shall be done according to manufacturer's recommendations, with special care used in cleaning gasket seat to prevent any dirt or sand from getting between the gasket and pipe. Lubricant to be used on the gasket shall be non-toxic and free from contamination.

Valves, fittings, plugs, and caps shall be set and jointed to pipe in the manner as required. All dead ends on new mains shall be closed with dead end M.J. caps.

Fittings shall be "blocked" with poured-in-place concrete, with a firm minimum bearing against an undisturbed earth wall. Timber blocking will not be permitted. Thrust blocks shall be poured as soon as possible after setting the fittings in place to allow the concrete to "set" before applying the pressure test. The concrete thrust blocks shall be in place before beginning the pressure test. Anchor blocks shall be allowed to set sufficiently to develop the necessary bond strength between the reinforcing rods and the concrete anchor before beginning the pressure test. A visqueen barrier shall be provided to protect glands, bolts and other miscellaneous materials required for this type of connection from the connector.

Fittings and adjacent pipe lengths that cannot be blocked against an undisturbed earth wall shall be restrained. Concrete blocking is required and shall be installed as if blocked against undisturbed earth.

All of the new piping, valves and blocking shall have been installed, disinfected, and tested up to the point of cutting into existing lines before the crossover is made. The crossover to the existing system shall be in full readiness, including the cut and sized specials. Forty-eight hour notice shall be given the District in advance of the planned "cut-ins."

All backfill in roadway sections shall be placed and compacted in accordance with Whatcom County, City and/or State requirements and copies of the compaction results shall be provided to the District. All backfill in easements shall be placed and compacted to a minimum of 90 percent of modified Proctor dry maximum density per ASTM D1557. Copies of compaction results for all water system trenches shall be provided to the District.

II. WATER SYSTEMS - GENERAL STANDARDS - Continued

VALVES

All valves 14 inches and larger shall be butterfly valves. All valves 12 inches and smaller shall be resilient seat gate valves.

Resilient-Seated Gate Valves

The gate valves shall be ductile iron body valves, iron disk completely encapsulated with polyurethane rubber and bronze, non-rising stem with “O” ring seals conforming to AWWA C509 or C515. The valves shall open counter-clockwise and be furnished with 2-inch square operating nuts except valves in vaults shall be furnished with handwheels. All surfaces, interior and exterior shall be fusion bonded epoxy coated, acceptable for potable water.

For applications with working pressure above 175 psi, a valve rated as 250 psi or higher shall be used.

Valves shall be Clow, M&H, Kennedy, U.S. Pipe, Mueller, American Flow Control, or approved equal.

Butterfly Valves

Butterfly valves shall be ductile iron body of the tight closing rubber seat type with rubber seat either bonded to the body or mechanically retained in the body with no fasteners or retaining hardware in the flowstream. The valves shall meet the full requirements of AWWA C504, Class 150B except the valves shall be able to withstand 150 psi differential pressure without leakage. The valves may have rubber seats mechanically affixed to the valve vane. Where threaded fasteners are used, the fasteners shall be retained with a locking wire or equivalent provision to prevent loosening. Rubber seats attached to the valve vane shall be equipped with stainless steel seat ring integral with the body, and the body internal surfaces shall be epoxy coated to prevent tuberculations buildup, which might damage the dismounted rubber seat. Use of butterfly valves are a special case and shall only be allowed with District approval.

No metal-to-metal sealing surfaces shall be permitted. The valves shall be bubble-tight at rated pressures with flow in either direction, and shall be satisfactory for applications involving valve operations after long periods of inactivity. Valve discs shall rotate 90 degrees from the full open position to the tight shut position.

Valves shall be Henry Pratt Company “*Groundhog*,” Dresser “450” or Mueller “*Linesal III*.”

II. WATER SYSTEMS - GENERAL STANDARDS - Continued

Tapping Sleeves and Tapping Valves

The tapping sleeves shall be rated for a working pressure of 250 psi minimum and furnished complete with joint accessories. Tapping sleeves shall be constructed in two sections for ease of installation and shall be assembled around the main without interrupting service.

Mechanical joint style sleeves shall be ductile iron or fabricated steel style sleeves. Ductile iron mechanical joint style sleeves are required for all size-on-size connections. Mechanical joint sleeves shall be cast by Clow, Dresser, Mueller, Tyler, U.S. Pipe or approved equal.

Fabricated steel style sleeves shall be fusion bonded epoxy-coated, acceptable for potable water. Fabricated steel style sleeves will not be allowed for size-on-size connections.

The tapping sleeve and valve shall be tested to 100 psi (air) prior to tapping the main.

The installation contractor for the tapping sleeves and valves shall be approved by the District.

All Valves

The valves shall be set with stems vertical. The axis of the valve box shall be common with the axis projected off the valve stem. The tops of the adjustable valve boxes shall be set to the existing or established grade, whichever is applicable.

All valves with operating nuts located more than 4'-0" below finished grade shall be equipped with extension stems to bring the operating nut to within 18 inches of the finished grade.

At the top of the extension stem, there shall be a 2-inch standard operating nut, complete with a centering flange that closely fits the 5-inch pipe encasement of the extension stem. The valve box shall be set in a telescoping fashion around the 5-inch pipe cut to the correct length to allow future adjustment up or down. Cast iron soil pipe shall be used to extend the top valve box section to grade in deep areas.

Each valve shall be provided with an adjustable two-piece cast iron valve box of 5-inches minimum inside diameter. Valve boxes shall have a top section with an 18-inch minimum length. The valve boxes and covers shall be Olympic Foundry No. 940 or equal. The District may require locking valve covers in traffic areas. Locking covers shall be Olympic Foundry No. 045 DT or equal.

II. WATER SYSTEMS - GENERAL STANDARDS - Continued

Valves located in easements or outside of paved areas shall have concrete collars with a minimum size of 2'-0" diameter by 4-inches thick.

Valve Markers

Provide a blue Carsonite valve marker post for each valve outside of asphalt.

Markers shall be placed at the edge of the right-of-way opposite the valve and set so as to leave 2'-0" of the post exposed above grade. The distance in feet and inches to the valve shall be clearly stenciled on the side facing the valve in black numerals 2 inches in height.

FIRE HYDRANTS

All fire hydrants shall be approved by the National Board of Fire Underwriters and conform to AWWA C502, break-away type, in which the valve will remain closed if the barrel is broken. The hydrant barrel shall have a diameter of not less than 7-inches, and the valve diameter shall be not less than 5-1/4-inches. Each hydrant shall be equipped with two 2-1/2-inch hose ports (National Standard Thread), and one 4-1/2-inch pumper connection (National Standard Thread). A permanent anodized short profile style Storz hydrant adapter and anodized Storz blind flange shall be installed on the pumper port. The size of the adapter shall be 4 inches. Each hydrant shall be equipped with a suitable positive acting drain valve and 1-1/4-inch pentagonal operating nut (counter-clockwise opening).

Fire hydrants shall be Mueller Centurion, Clow Medallion, M&H Style 929 or Waterous Pacer.

The holding spools between the gate valve and fire hydrant shall be made from 6 inch Class 52 ductile iron pipe. The hydrant and gate valve shall be anchored in place using holding spools and mechanical joint restraint device. Holding spools shall be one piece unless the length is in excess of 17 feet or if approved by the District. The joints shall be supplied with a mechanical joint sleeve and mechanical joint restraint device, or with Field Lok gaskets.

The fire hydrants shall be painted with two coats of Kelly-Moore 6100-516 yellow enamel paint. Distance to the hydrant valve shall be clearly stenciled in black numerals 2-inches in height on the fire hydrant below the pumper port. Align the stenciled distance on the hydrant to face the hydrant valve. Top of fire hydrant shall be painted as per service level (See Detail VI-W2).

Between the time that the fire hydrant is installed and the completed facility is placed in operation, the fire hydrant shall at all times be wrapped in burlap, or covered in some other suitable manner to clearly indicate that the fire hydrant is not in service.

II. WATER SYSTEMS - GENERAL STANDARDS - Continued

BLOW OFFS AND AIR RELIEF ASSEMBLIES

A 2-inch blow off assembly shall be installed at the terminus of all dead end water mains 8-inch diameter and smaller. Water mains greater than 8-inch diameter shall have a fire hydrant assembly installed at the terminus of dead end mains.

A 1-inch or 2-inch air and vacuum release valve (as approved by the District) shall be installed at principal high points in the system.

The installation of these items shall include connection piping, gate valve, valve box, and all accessories. Valve markers shall be optional with the District.

SERVICE CONNECTIONS

Individual services to each property shall be installed and connected to the new water mains. New service 2 inches and smaller will be installed by the District. New services from existing mains will be installed by the District. The Developer shall be responsible for permitting, traffic control, excavation to expose main, shoring to protect District employees, backfilling trench, and completion of all restoration.

Upon completion of the installation of the water main (before testing and disinfection) services shall be installed by connecting to the water main and extending the service line to the property line as shown on the Standard Details or approved equal. Service lines for residential property up to 2-inch meter installation shall be HDPE or polyethylene. Larger service lines shall be of the type and style as designated in the Standard Details and shown on the Plans.

Projects that require meters larger than 1-inch shall be installed per the District Standards and shown on the Standard Details.

All services other than single family residential shall be provided with Washington State-approved backflow prevention located immediately behind and on the property side of the water service box. Irrigation, residential single-family fire meters, duplex, and multi-family residential connections shall require double check valve assemblies (DCVA). All other connections shall require reduced pressure backflow assemblies (RPBA). Commercial fire sprinkler system, if unmetered shall require reduced pressure detector assemblies (RPDA).

All irrigation using chemical feed, or water features, including decorative ponds, pools and fountains requiring make-up water shall be protected from backflow into the public water supply by a **minimum** of an approved air-gap to be located at the fill point of the pond or water feature. This "air-gap" shall be inspected by the District prior to filling. In all instances, the water supply used for filling purposes shall be protected by a double check valve assembly (DCVA) installed behind the meter for new construction or retrofitted as close as practical on modified systems.

II. WATER SYSTEMS - GENERAL STANDARDS - Continued

Corporation stops and the single meter shut-off valves shall be Mueller, Ford, or A.Y. McDonald with the type and style noted on the Standard Details or approved equal. Included as a part of the service connection shall be the furnishing and installation of the meter box complete with lid, set flush with the proposed finished grade of the lot in the designated location near the property line, all as shown on the Standard Details. The angle type of shut-off valve and angle type dual check valve shall be set inside the meter box in a proper position for installation of a future meter by the District.

Service lines between the main and the property line shall be placed at a trench depth sufficient to maintain a 3'-0" cover over the top of the service line for its full length, taking into consideration the final finished grade of the proposed street and the final finished grade of any storm ditches.

Upon completion of each service line as indicated herein, the Developer shall flush the service line to remove the debris that may interfere with the future meter installation, and further verify that the service line has full pressure and flow to the meter box.

METERS GREATER THAN 2 INCH

If extensions require water meters greater than 2 inches, then such entire meter installation, including valves, piping, vaults or meter boxes, drain lines and meters shall be furnished and installed by the Developer conforming to District standards. Activation of meter is subject to conformance with District requirements and payment of connection fees.

PRESSURE REDUCING VALVES

If extensions require main line pressure reducing valves as determined by the District, then such entire installation, including strainers, valves, piping, vaults, and drain lines shall be installed by the Developer conforming to District Standards.

The pressure reducing installation shall be a prefabricated and plumbed vault and shall include two Cla-Val globe type pressure reducing valves, sized for the area to be served downstream of the installation.

5. WATER PIPE TESTING AND DISINFECTING:

All pipelines shall be tested and disinfected prior to acceptance of work. A water hydrant meter shall be required and procured from the District for all water utilized for flushing pipelines. All pumps, gauges, plugs, saddles, corporation stops, miscellaneous hose and piping, and measuring equipment necessary for performing the test shall be furnished, installed and operated by the Developer. The Developer shall provide an oil-filled pressure gauge with a range of 0 to 300 psi.

II. WATER SYSTEMS - GENERAL STANDARDS - Continued

In all instances, the Developer shall utilize a Washington State approved double check valve type backflow prevention device to protect the potable water supply while filling, flushing, and disinfecting the particular water main.

The pipeline shall be backfilled sufficiently to prevent movement of the pipe under pressure. All thrust blocks shall be in place and time allowed for the concrete to cure before testing. Where permanent blocking is not required, the Developer shall furnish and install temporary blocking.

As soon as pipe is secured against movement under pressure, it may be filled with water. Satisfactory performance of air valves shall be checked while the line is filling. A temporary air vent will be required if the fill point is higher than the line being filled.

The Developer shall preflush all water mains after water has remained in the main for 24 hours and before pressure testing the main.

After the pipe is filled with water and all air expelled, it shall be charged by a pump to a hydrostatic test pressure of 250 psi, measured at the high point on the pipeline and this pressure shall be maintained for a period of not less than 30 minutes to ensure the integrity of the thrust and anchor blocks. All tests shall be made with the hydrant auxiliary gate valves open and pressure against the hydrant valve. Hydrostatic tests shall be performed on every complete section of water main between two valves, and each valve shall withstand the same test pressure as the pipe with no pressure active in the section of pipe beyond the closed valve.

Feed for the pump shall be from a clean container wherein the actual amount of "makeup" water, so that it can be measured periodically during the test period.

A separate 250 psi pressure test will be required after all water services are cut to grade with angle stops or setters installed in the meter boxes.

In addition to the hydrostatic pressure test, a leakage test shall be conducted on the pipeline. The leakage test shall be conducted at 200 psi for a period of not less than 1 hour. The allowable leakage rate per thousand feet of each size pipeline is as follows:

Pipe Size	Allowable Leakage
	Gal. per Hour per 1,000 Ft. @ 200 psi
6"	0.32
8"	0.42
10"	0.53
12"	0.63

II. WATER SYSTEMS - GENERAL STANDARDS - Continued

Defective materials or workmanship discovered as a result of the tests, shall be replaced by the Developer at his expense. Whenever it is necessary to replace defective material or correct the workmanship, the tests shall be rerun at the Developer's expense until a satisfactory test is obtained.

Before pipelines are placed in service, the water mains and appurtenances shall be disinfected in accordance with AWWA C651 and in conformance with the requirements of the State of Washington Department of Health Services.

In the process of chlorinating newly laid water pipe, all valves, fire hydrants and other appurtenances shall be operated while the pipeline is filled with the chlorinating agent.

Chlorine shall be applied in one of the following manners, listed in order of preference, to secure a concentration in the pipe of at least 50 ppm is maintained for a period of 24 hours.

- 1) Injection of chlorine-water mixture from chlorinating apparatus through corporation cock at beginning of section after pipe has been filled, and with water exhausting at end of section at a rate controlled to produce the desired chlorine concentration;
- 2) Injection similarly of a hypochlorite solution;
- 3) Placement of dry chlorinated lime throughout pipeline, as constructed, in proper quantities to produce the desired dosage. Filling of pipeline with this method should be at a very slow rate. Pipeline should be filled within 2 days of placing sterilizing agent.

The Developer shall be responsible for flushing all water mains prior to water samples being acquired under direction and supervision of the District. The water mains shall be flushed at a rate to provide a minimum 2.5 feet per second velocity in the main. Water mains shall be flushed such that a minimum of five exchanges of pipeline volume will occur.

In all disinfection processes, the Developer shall take particular care in flushing and discharging the chlorinated water from the mains to ensure that the flushed and chlorinated water does no physical or environmental damage to property, streams, storm sewers or any waterways. Flushing water must be disposed of in accordance with Washington State Department of Ecology Standards. Flushing water shall require dechlorination to prevent damage to the affected environment, particularly aquatic and fish life of receiving streams. Discharge of chlorinated flush water to the sanitary sewer system is prohibited, except with District approval.

After the pipeline has been flushed and the system residual chlorine concentration has been obtained throughout the section of line, the water in the line shall again

II. WATER SYSTEMS - GENERAL STANDARDS - Continued

be left standing for a period of 24 hours. Following this, a water sample will be collected and tested. The line shall not be placed in service until a satisfactory bacteriological report has been received.

If disinfection of mains by the above methods proves unsatisfactory and the lab report indicates any type of bacteria count, then the Developer shall re-chlorinate using other methods in accordance with AWWA C651, approved by the District.

Only District representatives will be allowed to operate existing and new tie-in valves. The Developer's personnel are expressly forbidden to operate any valve on any section of line, which has been accepted by the District.

SECTION III
SANITARY SEWER SYSTEMS

SANITARY SEWER SYSTEMS

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III. SANITARY SEWER SYSTEMS - GENERAL STANDARDS

1. OBJECTIVE:

Section III is intended to present information and provide an outline of the minimum general standards required by Whatcom County Water District No. 13 for Developer constructed sanitary sewerline facilities and improvements which are to be acquired and operated by the District.

2. GENERAL:

Detailed plans shall be submitted for the District's review, which provide the location, size, type and direction of flow of the proposed sewers and the connection with existing sewers. These plans shall be separate from Water Plans and shall conform to District Drafting Standards.

Project plans should have a horizontal scale of 1-inch = 50 feet and a vertical scale of 1-inch = 5 feet. Plan and profile views for any give section of gravity sewer or force main shall be drawn on the same sheet. Plans and profiles shall show:

- Locations of streets, right-of-ways, existing utilities, and sewers.
- Ground surface, pipe type, class and size, manhole stationing, invert and surface elevation at each manhole, and grade of sewer between adjacent manholes. Elevations shall be based on the NAVD 88 datum, with a conversion factor to the NGVD 29 datum noted on the plans, as further described in the General Drafting Standards. All manholes shall be numbered on the plans and correspondingly numbered on the profile. Where there is any question of the sewer being sufficiently deep to serve any residence, the elevation and location of the basement floor, if basements are served, shall be plotted on the profile of the sewer that is to serve the house in question. The Developer shall state that all sewers are sufficiently deep to serve adjacent basements, except where otherwise noted on the plans.
- All known existing structures, both above and below ground, which might interfere with the proposed construction, particularly water mains, gas mains, storm drains, overhead and underground power lines, telephones lines, and television cables.
- All utility easements.
- District Approval Block

III. SANITARY SEWER SYSTEMS - GENERAL STANDARDS - Continued

- Details in scale drawings, which clearly show special sewer joints and cross-sections, and sewer appurtenances such as manholes and related items.

Construction of new sewer systems or extensions of existing systems will be allowed only if the existing receiving system is capable of supporting the added hydraulic load.

Collection and interceptor sewers shall be designed for the ultimate development of the tributary areas.

Sewer systems shall be designed and constructed to achieve total containment of sanitary wastes and maximum exclusion of infiltration and inflow.

Computations and other data used for design of the sewer system shall be submitted to the District for approval.

The sewage facilities shall be constructed in conformance with the current WSDOT Standard Specifications for Road, Bridge, & Municipal Construction, and current amendments thereto, revised as to form to make reference to Local Governments, and as modified by the District's requirements and standards.

Material and installation specifications shall contain appropriate requirements that have been established by the industry in its technical publications, such as ASTM, AWWA, WEF, and APWA standards. Requirements shall be set forth in the specifications for the pipe and methods of bedding and backfilling so as not to damage the pipe or its joints, impede cleaning operations and future tapping, nor create excessive side fill pressure or deformation of the pipe, nor seriously impair flow capacity.

All sewers shall be designed to prevent damage from superimposed loads. Proper allowance for loads on the sewer because of the width and depth of trench should be made. When standard-strength sewer pipe is not sufficient, extra-strength pipe shall be used.

After all other work is completed and before final acceptance, the entire roadway, including the roadbed, planting, sidewalk areas, shoulders, driveways, alley and side street approaches, slopes, ditches, utility trenches, and construction areas shall be neatly finished to the lines, grades and cross sections for a new roadway consistent with the original section.

3. GENERAL REQUIREMENTS:

1. Prior to construction, the sewer plans shall be reviewed and approved by the Department of Ecology with an affidavit stating such on file at the District's office, unless the review and approval is waived by Ecology.

III. SANITARY SEWER SYSTEMS - GENERAL STANDARDS - Continued

2. Work shall be performed only by contractors experienced in laying public sewer mains.
3. Prior to any work being performed, the Developer shall contact the District's Engineer to set forth his proposed schedule.
4. All materials shall be new and undamaged.
5. Developer shall obtain approval of materials to be used from the District prior to ordering of materials.
6. Sewer mains shall be laid only in dedicated streets or in easements that have been granted to the District. A street is normally not considered until the plat, which created it, has been filed with the County Auditor.
7. All service connections to the District sewer system shall be a gravity connection. If service lines to structures or lots to be served are over 200 feet (not including panhandle), the Developer shall install an 8-inch sewer main within 100 feet of the farthest lot with a manhole at the end in an easement granted to the District. Parallel side sewers shall be separated by a minimum of 5 feet horizontally from each sewer service and 10 feet from parallel water services.
8. The sewer mains shall run parallel to and 5 feet southerly or westerly of street centerline where possible. The sewer main shall maintain a minimum 10 foot horizontal separation from proposed or existing water mains.
9. The minimum slope for 8-inch gravity mains shall be 0.5 percent (except the minimum slope for dead end runs shall be 1.0 percent for 8-inch gravity mains). The minimum slope for 6-inch side sewer laterals shall be 2.0 percent and the maximum shall be 100 percent (45°).
10. The maximum distance between manholes shall be 400 feet unless approved by the District.
11. Manholes shall be a minimum of 5-1/2-feet deep unless approved by the District.
12. Manholes greater than 20-feet deep shall be a minimum of 54 inches inside diameter.
13. Manholes greater than 25-feet deep should not be submitted for review without prior approval of deep design concept by the District. Deep

III. SANITARY SEWER SYSTEMS - GENERAL STANDARDS - Continued

designs will not be approved if alternative service can be provided with shallower gravity service, even if the property developing will have to delay development.

14. Manholes shall be provided with a 0.10 foot drop across the channel.
15. Terminating manholes, where sewer extension may occur, shall be provided with knock-outs and channeled accordingly.
16. Locking lids shall be provided for all manholes and all manhole lids shall have the word "sewer" cast integrally onto its surface.
17. All manholes shall be accessible to maintenance vehicles.
18. Manholes in easements shall be provided with a green fiberglass locator marker post with the footage to the manhole stenciled on with 2-inch letters.
19. All side sewer laterals shall be of the same material as the main line unless approved by the District.
20. Front lot corners and a property line stake shall be staked prior to construction for side sewer tee location.
21. All side sewers shall be extended to the lowest property corner and located a minimum of 10 feet from the side lot line and extend a minimum of 15 feet past the street right-of-way line (or property line).
22. Side sewer connections allowed directly into manholes shall be constructed to match the sewer main crown and the manhole channeled accordingly.
23. All commercial, industrial or school food establishments shall be equipped with an approved grease interceptor located outside the building, as required by the District, prior to discharging to the sewer main. Sizing to be confirmed by a Professional Engineer licensed in the State of Washington.
24. Provide the District a copy of the cut sheets prior to construction.
25. Pipe trenches shall not be backfilled until pipe and bedding installation has been inspected by the District.
26. Final air testing shall not be accepted until all underground utilities have been installed, compaction is completed, and the lines have been flushed, cleaned, deflection tested and television inspected.

III. SANITARY SEWER SYSTEMS - GENERAL STANDARDS - Continued

- 27. Road restoration shall be per Whatcom County, City and/or State design and construction standards. The Developer shall become familiar with all County, City and State conditions of required permits, and shall adhere to all conditions and requirements.
- 28. Manhole rim, sewer location, and invert elevations shall be field verified after construction by the Developer’s engineer(s) and the “as constructed” drawings individually stamped by a Professional Engineer licensed in the State of Washington which shall attest to the fact that the information is correct.

4. MATERIALS:

SEWER MAINS AND LATERALS

(See sewage lift station Section IV for force mains.)

Sewer mains to be installed shall be of material noted below:

<u>Purpose</u>	<u>Material</u>	<u>Cover</u>	<u>Max. Slope</u>
Gravity Sewer & Laterals	PVC	5'-18'	18%
	Ductile Iron	3' - 5'	--
	Ductile Iron	≥ 18'	--
	PVC AWWA C900		
	Class 200	≥18'	18%
Force Mains	Ductile Iron	≥4'	--

PVC pipe shall be a minimum Class S.D.R. 35 and be manufactured in accordance with ASTM D3034. The pipe and fittings shall be furnished with bells and spigots, which are integral with the pipe wall. Pipe and fittings shall be of the same material. Pipe joints shall use flexible elastomeric gaskets conforming to ASTM D3212. Nominal laying lengths shall be 20 feet and 13 feet. PVC C900 pipe shall conform to AWWA C900 and will be allowed in deep trench construction at the discretion of the District.

The ductile iron pipe shall conform to AWWA C151 and shall be Class 52. Pipe and fittings shall be of the same material. Grade of iron shall be a minimum of 60-42-10. The pipe shall be polyethylene or epoxy lined to a nominal thickness of 40 mils. Minimum lining thickness shall be 30 mils. Products meeting the standard are US Pipe “Polylined,” “Protecto 401,” and American Pipe “Polyband,” or equal. The exterior shall be coated with an asphaltic coating.

Each length shall be plainly marked with the manufacturer’s identification, year cast, thickness, class of pipe and weight. The pipe shall be furnished with

III. SANITARY SEWER SYSTEMS - GENERAL STANDARDS - Continued

mechanical joint or push-on type joint, except where plans call for flanged ends. Joints shall conform to AWWA C111.

Restrained joint pipe shall be push-on joint pipe with FIELD LOK® or TR FLEX® gaskets as furnished by U.S. Pipe.

All pipe shall be jointed by the manufacturer's standard coupling, be all of one manufacturer, be carefully installed in complete compliance with the manufacturer's recommendations.

All fittings shall be short-bodied, ductile iron complying with AWWA C110 or C153 for 350 psi pressure rated mechanical joint fittings and 250 psi pressure rated flanged fittings. All fittings shall be polyethylene or epoxy lined per the ductile iron pipe specifications and either mechanical joint or flanged, as indicated on the Plans.

Fittings in areas requiring restrained joints shall be mechanical joint fittings with a mechanical joint restraint device. The mechanical joint restraint device shall have a working pressure of at least 250 psi with a minimum safety factor of 2:1 and shall be EBAA Iron, Inc., MEGALUG, Star Pipe Products, or approved equal.

All couplings shall be ductile iron mechanical joint sleeves.

The sewer pipe, unless otherwise approved by the District shall be laid upgrade from point of connection on the existing sewer or from a designated starting point. The sewer pipe shall be installed with the bell end forward or upgrade. When pipe laying is not in progress, the forward end of the pipe shall be kept tightly closed with an approved temporary plug. Wherever movable shoring (steel box) is used in the ditch, pipe shall be restrained by use of a winch mounted in the downstream manhole and a line of sufficient strength threaded through the pipe and set tight before each move. Any indication that joints are not being held shall be sufficient reason for the District to require restraints, whether or not movable shoring is being used.

All gravity pipe shall be laid in straight lines and at uniform rate of grade between manholes. Variance from established line and grade shall not be greater than 1/2 inch, provided that such variation does not result in a level or reverse sloping invert; provided, also, that variation in the invert elevation between adjoining ends of pipe, due to non-concentricity of joining surface and pipe interior surfaces, does not exceed 1/64 of an inch per inch of pipe diameter, or 1/2-inch maximum. Any corrections required in line and grade shall be reviewed with the District and shall be made at the expense of the Developer.

All extensions, additions and revisions to the sewer system, unless otherwise indicated, shall be made with sewer pipe jointed by means of a flexible gasket,

III. SANITARY SEWER SYSTEMS - GENERAL STANDARDS - Continued

which shall be fabricated and installed in accordance with the manufacturer's specifications.

All joints shall be made up in strict compliance with the manufacturer's recommendations and all sewer pipe manufacture and handling shall meet or exceed the ASTM recommended specifications.

Pipe handling after the gasket has been affixed shall be carefully controlled to avoid disturbing the gasket and knocking it out of position, or loading it with dirt or other foreign material. Any gaskets so disturbed shall be removed, cleaned, relubricated if required, and replaced before the rejoining is attempted.

Care shall be taken to properly align the pipe before joints are entirely forced home. During insertion of the tongue or spigot, the pipe shall be partially supported by hand, sling or crane to minimize unequal lateral pressure on the gasket and to maintain concentricity until the gasket is properly positioned. Since most flexible gasketed joints tend to creep apart when the end pipe is deflected and straightened, such movement shall be held to a minimum once the joint is home.

Sufficient pressure shall be applied in making the joint to assure that it is home, as described in the installation instructions provided by the pipe manufacturer. Sufficient restraint shall be applied to the line to assure that joints once home are held so, until fill material under and alongside the pipe has been sufficiently compacted. At the end of the work day, the last pipe laid shall be blocked in an effective way to prevent creep during "down time."

For the joining of dissimilar pipes suitable adapter couplings shall be used which have been approved by the District.

All gravity sewer pipe shall be bedded with pea gravel. The PVC pipe shall be bedded from a depth of 4-inches below the pipe to 12-inches above the pipe and ductile iron gravity sewer pipe shall be bedded from a depth of 4-inches below the pipe to the springline of the pipe. The bedding material shall extend across the full width of the trench and shall be compacted under the haunches of the pipe.

Special concrete bedding shall consist of a pipe cradle constructed of Portland cement concrete containing not less than four sacks of cement per cubic yard. Sand, gravel and water proportions are subject to approval by the District. Maximum aggregate size shall be 1-1/2 inches. Maximum slump shall be 4 inches. The bottom of the trench shall be fully compacted before the placement of pipe cradle. The Developer shall protect pipe against flotation and disturbing the horizontal alignment of the pipe during the pouring of the concrete.

III. SANITARY SEWER SYSTEMS - GENERAL STANDARDS - Continued

Clay or Bentonite dams shall be installed across the trench and to the full depth of the granular material in all areas of steep slopes, stream crossings and wetland to prevent migration of water along the pipeline.

All backfill in roadway sections shall be placed and compacted in accordance with Whatcom County, City and/or State requirements and copies of the compaction results shall be provided to the District. All backfill in easements shall be placed and compacted to a minimum of 90 percent of the Modified Proctor dry maximum density per ASTM D1557. Copies of compaction results for all sewer system trenches shall be provided to the District.

MANHOLES

Manholes shall be of the offset type and shall be precast concrete sections with either a cast in place base, or a precast base made from a 3,000 psi structural concrete. Joints between precast wall sections shall be confined O-ring or as otherwise specified.

The minimum diameter for manholes shall be 48 inches to a depth of 20 feet, and 54 inches for depths of 20 feet and greater. The District may require the diameter to be increased beyond the minimum based on future needs.

For connections to existing systems, a concrete coring machine, suitable for this type of work, shall be utilized in making the connection. The existing manhole shall be rechanneled as required. The new pipe connection shall be plugged (water tight) until the new pipe system has been installed and approved. The Developer shall be responsible for any existing defects in the existing manhole unless these defects are witnessed by a representative of the District prior to any work being performed to make the connection. The Contractor shall be required to remove any and all deleterious material in the existing manhole and downstream reaches as a result of this work.

Manholes located in easements or outside of paved areas shall have concrete collars with a minimum size of 48 inches diameter by 12 inches thick and marked with a green carsonite marker.

Manhole Sections

Manhole sections shall be placed and aligned so as to provide vertical sides and vertical alignment of the ladder steps. The completed manhole shall be rigid, true to dimension, and be water tight. Rough, uneven surfaces will not be permitted.

Manhole Steps and Ladders

Manhole steps shall be polypropylene, Lane International Corp. No. P13938 or equal.

III. SANITARY SEWER SYSTEMS - GENERAL STANDARDS - Continued

Ladders shall be polypropylene Lane International Corp. or equal, and shall be compatible with steps.

Grade Adjustment

The manhole shall be set to provide not less than 14 inches or more than 26 inches of adjustment between the top of the cone or slab and the top of the manhole frame.

Masonry units (manhole adjusting rings) shall conform to the ASTM C2, Grade MA. The outside and inside of manhole adjusting rings and the joints of precast concrete sections shall be plastered and troweled smooth with 1/2 inch (minimum) of mortar in order to attain a watertight surface. No wood shall be used for adjustment.

Channels

Channels shall be made to conform accurately to the sewer grade and shall be brought together smoothly with well rounded junctions, satisfactory to the District. The channels shall be field poured with concrete, no other fillers are permitted, after the inlet and outlet pipes have been laid and firmly grouted into place at the proper elevation. Allowances shall be made for a 0.1 foot drop in elevation across the manhole in the direction of flow. Channel sides shall be carried up vertically from the invert to three-quarters of the diameter of the various pipes. The concrete shelf shall be warped evenly and sloped 3/8 inch per foot to drain. Rough, uneven surfaces will not be permitted. Channels shall be constructed to allow the installation and use of a mechanical plug or flow meter of the appropriate size.

Drop Manholes

Drop manholes require District approval and shall be constructed with outside drop(s). Approval will be limited to future extensions from deep sewers. Where extension from deep sewers is concurrent with deep sewer construction, drop manholes will not be allowed. Drop manholes shall, in all respects, be constructed as a standard manhole with the exception of the drop connection.

Lift Holes and Steel Loops

All lift holes shall be completely filled with expanding mortar, smoothed both inside and outside, to insure water tightness. All steel loops shall be removed, flush with the manhole wall. The stubs shall be covered with mortar and smoothed. Rough, uneven surfaces will not be permitted.

III. SANITARY SEWER SYSTEMS - GENERAL STANDARDS - Continued

Frames and Covers

Frames shall be cast iron and covers shall be ductile iron. Castings shall be free of porosity, shrink cavities, cold shuts or cracks, or any surface defects, which would impair serviceability. Repair of defects by welding, or by the use of "smooth-on" or similar material, will not be permitted. Frames and covers shall be machine finished or ground on seating surfaces so as to assure non-rocking fit in any position and interchangeability of covers. Frames and covers shall be provided with three bolt locking lids. Rings and covers shall be positioned so one of the three locking bolts is located over the manhole steps and shall be adjusted to conform to the final finished surface grade of the street or easement to the satisfaction of the District. Manhole frames and covers shall be as manufactured by East Jordan Iron Works Model 370063, Olympic Foundry Model MH30AD/T, or equal.

Manhole Marker Posts

A fiberglass manhole marker post shall be located adjacent to all manholes located in easement areas. The marker post shall be green in color, 3.75-inches wide (flat), 60-inches long and furnished with a 3-inch by 3-inch high intensity white reflector (250 Candle Power) and a flexible anchor barb. Each post shall include the following decal: "Caution Sewer Manhole. Before digging, Call 1-800-424-5555, Utility Underground Location Center." Manhole markers shall be Carsonite Utility Marker CUM 375.

The marker posts shall be set so as to leave 36 inches of the post exposed above grade.

Distance from the marker to the manhole shall be stenciled on the marker with 2-inch letters.

5. SIDE SEWER LATERAL:

A side sewer lateral is considered to be that portion of a sewer line that will be constructed between a main sewer line and a property line or easement limit line.

All applicable specifications given herein for sewer construction shall be held to apply to side sewer laterals.

Side sewers shall be for a single connection only and be a minimum 6-inch-diameter pipe. Side sewers shall be connected to the tee, provided in the sewer main where such is available, utilizing approved fittings or adapters. The side sewer shall rise at a maximum of 45 degrees and a minimum of 2 percent, from the sewer main.

III. SANITARY SEWER SYSTEMS - GENERAL STANDARDS - Continued

Where there are no basements, the minimum side sewer depth shall be 6 feet below existing curb line and 5 feet below ground at the property line, except where existing improvements, proposed improvements or topography may dictate additional depth. The elevations of the side sewer connections shall be of sufficient depth to serve all existing and potential future basements.

Each 6-inch side sewer service shall be provided with a 12-foot long 2 x 4 wooden post, which extends from the invert of the end of the 6 inch pipe to above the existing ground. The exposed area of this post shall be painted white and shall have stenciled thereon in 2-inch letters (black paint) "SEWER" and shall also indicate the total length of the 2 x 4. A 12-gauge (minimum) wire shall be wrapped around and stapled the full length of the 2 x 4.

Where no tee or wye is provided or available, connection shall be made by machine-made tap and saddle. Inserta Tee, Fowler Manufacturing Company or approved equal may be utilized on concrete pipe only. Romac Style "CB" Sewer Saddle shall be utilized on PVC pipe.

The maximum bend permissible at any one fitting shall not exceed 45 degrees. The maximum bend of any combination of two adjacent fittings shall not exceed 45 degrees (one-eighth bend) unless straight pipe of not less than 3 feet in length is installed between such adjacent fittings, or unless one of the fittings is a wye branch with a cleanout provided on the straight leg.

Standing side sewers shall be constructed only with preapproval of the District. Standing side sewers may be required, or allowed, at the sole discretion of the District. When allowed, standing side sewer tees will be constructed of the same material as the main line sewer.

6. TESTING GRAVITY SEWERS FOR ACCEPTANCE:

The Developer shall furnish all facilities and personnel for conducting tests. Methods other than Low Pressure Air Test shall be subject to the approval of the District.

Preparation for Testing for Leakage

The Developer shall be required, prior to testing, to clean and flush all gravity sewer lines with an approved cleaning ball and clean water. The completed gravity sewer, including side sewer stubs, after completion of backfill and cleaning shall be televised. This will be permitted prior to paving. The sewer shall then be tested by the low pressure air test method and/or an infiltration test. Except, however, that in certain conditions an exfiltration test may be required by the District.

III. SANITARY SEWER SYSTEMS - GENERAL STANDARDS - Continued

The first section of pipe not less than 300 feet in length installed by each crew shall be tested, in order to qualify the crew and/or the material. A successful installation of this first section shall be a prerequisite to further pipe installation by the crew. At the Developer's option, crew and/or material qualification testing may be performed at any time during the construction process after at least 2 feet of backfill has been placed over the pipe.

Low Pressure Air Test

The sewer pipe shall be tested for leaks through the use of air (unless exfiltration test is approved) in the following manner:

Following the pipe cleaning, utility installation, and paving, the pipe installation shall be tested with low pressure air. Air shall be slowly supplied to the plugged pipe installation until the internal air pressure reaches 4.0 pounds per square inch greater than the average back pressure of any ground water that may submerge the pipe. 0.4 pounds per square inch to be added per 1 foot of water table over the pipe to a max. of 6 psi. At least two minutes shall be allowed for temperature stabilization before proceeding further.

The rate of air loss shall then be determined by measuring the time interval required for the internal pressure to decrease from 3.5 to 2.5 pounds per square inch while maintaining the stipulated pressure greater than the pipe section's average adjacent groundwater back pressure.

The pipeline shall be considered acceptable if the total rate of air loss from any section tested in its entirety between manholes, cleanouts or pipe ends does not exceed the following table:

		Length of 6" Pipe (ft)								
		0	50	100	150	200	250	300	350	400
Length of 8" Pipe (ft)	0	0	0:40	1:20	1:58	2:38	3:18	3:58	4:38	5:16
	50	1:10	1:50	2:30	3:10	3:48	4:28	5:08	5:48	5:56
	100	2:20	3:00	3:40	4:20	5:00	5:38	6:14	6:12	6:08
	150	3:32	4:10	4:50	5:30	6:10	6:30	6:26	6:22	6:18
	200	4:42	5:22	6:00	6:40	6:44	6:38	6:34	6:30	6:26
	250	5:52	6:32	6:48	6:58	6:50	6:44	6:40	6:36	6:32
	300	7:02	7:20	7:10	7:02	6:56	6:50	6:44	6:40	6:36
	350	7:34	7:22	7:14	7:06	7:00	6:54	6:50	6:44	6:42
	400	7:34	7:24	7:16	7:08	7:02	6:58	6:52	6:48	6:44

Test time in minutes and seconds

Test times will be provided by the Engineer for combinations other than 8-inch mains and 6-inch laterals.

III. SANITARY SEWER SYSTEMS - GENERAL STANDARDS - Continued

If the pipe installation fails to meet these requirements, the Developer shall determine at his own expense the source or sources of leakage, and shall repair (if the extent and type of repairs proposed by the Developer appear reasonable to the District) or replace all defective materials or workmanship. The completed pipe installation shall meet the requirements of this low pressure air test or the alternative water exfiltration test before being considered for acceptance.

Plugs used to close the sewer pipe for the air test shall be securely braced to prevent the unintentional release of a plug. Gauges, air piping manifolds and valves shall be located at the top of the ground. No one shall be permitted to enter a manhole where a plugged pipe is under pressure. Air testing apparatus shall be equipped with a pressure release device such as a rupture disk or a pressure relief valve designed to relieve pressure on the pipe under test at 6 psi.

Deflection Test

Deflection tests shall be performed on all ASTM D3034 PVC gravity sewer mains by pulling a mandrel through the pipe. The allowable deflection test limit shall be 5.0 percent of the base inside diameter in accordance with APWA test procedures and the nominal mandrel size shown in the following table.

Nominal Pipe Size (in.)	Base Inside Diameter (in.)	Mandrel Size, Diameter (in.)
6	5.74	5.45
8	7.67	7.28
10	9.56	9.08
12	11.36	10.79

Deflection testing is not required for AWWA C900 PVC or ductile iron pipe. Deflection testing is also not required for pipe diameters 15 inch and greater.

The sewer lines shall be thoroughly cleaned prior to the deflection test.

7. TELEVISED INSPECTION:

After the gravity sewer lines have been cleaned, flushed and manhole channeled, the Developer shall provide a complete televised inspection.

The Developer shall perform a complete televised inspection of the sewer pipe and appurtenances and shall provide to the District, a narrated DVD color audio-visual recording of the inspections together with a written log of the television inspection. The camera shall be a pan and tilt type equipped with adequate light and focusing to allow inspection of sewer main, side sewers and full circumference inspection of main line joints and fittings. The District shall determine if the quality of the televising is acceptable.

III. SANITARY SEWER SYSTEMS - GENERAL STANDARDS - Continued

Immediately prior to the televised inspection, the Developer shall run water through each sewer line for 5- to 10-minutes to provide water for detection of any adverse grade sections visible by the presence of ponded water. The camera shall be stopped periodically at the ponded areas and the depth of water shall be measured with a ball of known diameter on the pull line. During the inspection, all tees and other fittings shall be logged as to exact location within 1 percent maximum error in measurement, wherein accuracy is checked with various fittings and the terminating manhole.

The District shall be notified 48 hours prior to any television inspection and this work shall be performed on a schedule to allow the District to witness the inspection.

Any defects in material or installation identified by the television inspection shall be repaired as required by the District at the Developer's expense.

8. ADJUSTMENT OF NEW AND EXISTING UTILITY STRUCTURES TO GRADE:

This work consists of constructing and/or adjusting all new and existing utility structures encountered on the project to finished grade.

Asphalt Concrete Paving

On asphalt concrete paving projects, the manholes shall not be adjusted until the final pavement is completed, at which time the center of each manhole lid shall be relocated from references previously established by the Developer. The pavement shall be cut as further described and base material removed to permit removal of the cover. The manhole shall then be brought to proper grade.

Prior to commencing adjustment, a plywood and visqueen cover as approved by the District shall be placed over the manhole base and channel to protect them from debris.

The asphalt concrete pavement shall be cut and removed to a neat circle, the diameter of which shall not exceed 48 inches or 14 inches from the outside diameter of the ductile iron frame, whichever is smaller. The ductile iron frame shall be brought up to desired grade, which shall conform to surrounding road surface.

Adjustment to desired grade shall be made with the use of concrete adjustment rings or bricks. No cast or ductile iron adjustment rings will be allowed. An approved class of mortar (one part cement to two parts of plaster sand) shall be placed between adjustment rings or bricks and ductile iron frame to completely fill all voids and to provide a watertight seal. No rough or uneven surfaces will

III. SANITARY SEWER SYSTEMS - GENERAL STANDARDS - Continued

be permitted inside or out. Adjustment rings or brick shall be placed and aligned so as to provide vertical sides and vertical alignment of manhole steps and ladder. Adjustments in excess of 26 inches of depth of the 24-inch manhole neck shall require manhole section rings to raise the eccentric cone to within the adjustment ring tolerances.

Check manhole specifications for minimum and maximum manhole adjustment and step requirements. Special care shall be exercised in all operations in order not to damage the manhole, frames and lids or other existing facilities.

The annular spaces of the manhole frames shall be filled with 5/8-inch minus crushed gravel and compacted with hand tamper to within 2 inches of the top of the frame. Asphalt concrete patching shall not be carried out during wet ground conditions or when air temperature is below 50 degrees F. Asphalt concrete mix shall be at required temperature when placed. Before making the asphalt concrete repair, the edges of the existing asphalt concrete pavement and the outer edge of the casting shall be tack coated with hot asphalt cement. The remaining 2 inches shall then be filled with HMA and compacted with hand tampers and a patching roller.

The completed patch shall match the existing paved surface for texture, density and uniformity of grade. The joint between the patch and the existing pavement shall then be carefully painted with hot asphalt cement or asphalt emulsion and shall be immediately covered with dry paving sand before asphalt cement solidifies. All debris such as asphalt pavement, cement bags, etc., shall be removed and disposed of by Developer.

Prior to acceptance of a project, manholes shall be cleaned of all debris and foreign material. All manhole steps and ladders shall be cleaned free of grout. Any damage occurring to the existing facilities due to the Developer's operations shall be repaired at his own expense.

Adjustment of Manholes in Easements

Manholes in easement areas shall be adjusted to ensure drainage away from the manhole frame and cover. Pour a 4'-0" diameter by 12-inch-thick broom finished concrete collar around the manhole frame and cover, and marked with a green carsonite marker.

Adjustment of Monuments

Monuments and monument castings shall be adjusted to grade in the same manner as for manholes.

III. SANITARY SEWER SYSTEMS - GENERAL STANDARDS - Continued

Adjustment of Valve Box Castings

Adjustment of valve box castings shall be made in the same manner as for manholes.

9. FINAL ACCEPTANCE:

Prior to final inspection, all pipelines shall be flushed and cleaned and all debris removed.

At the District's discretion, gravity sewer lines shall be inspected for line and grade by checking each section between manholes for alignment. A full circle of light shall be seen by looking through the pipe at a light held in the manhole at the opposite end of the section of sewer line being inspected. Any corrections required in line and grade shall be made at the expense of the Developer. Visual confirmation will require confined space entry compliance and will normally be considered where settlement is suspected.

10. PRIVATE SIDE SEWERS:

Private side sewers are the extension of side sewer laterals located outside of the public rights-of-way or easements granted to the Whatcom County Water District No. 13.

1. All sewer service connections to District facilities shall be gravity service.
2. The sewer pipe in the street right-of-way and District easements shall be 6-inch diameter, and shall have a 2 percent minimum grade. Construction in street rights-of-way shall be performed by a licensed side sewer contractor and requires a right-of-way use permit.
3. Private side sewer pipe for residential property shall be 4 inches or larger. Side sewer pipe for duplexes, multi-family, industrial, commercial, etc., shall be 6 inches or larger. Pipe material shall be ductile iron or PVC ASTM D3034, and shall be installed at 2 percent minimum grade (1/4 inch fall per foot). Construction on private property may be performed by owner, but requires a permit.
4. Pipe shall be bedded with pea gravel or clean free draining sand.
5. Side sewer shall be inspected by the District prior to backfilling. Side sewer shall be plugged and tested in the presence of the District Inspector by filling with water. Leakage rate shall not exceed 0.31 gal./hr. for 4-inch pipe and 0.47 gal./hr. for 6-inch pipe, per 100 feet of pipe. Existing homes served by septic systems converting to District sewer service are to demonstrate proper abandonment of septic tank to Whatcom County

III. SANITARY SEWER SYSTEMS - GENERAL STANDARDS - Continued

Health Department Standards and WAC 246-272A-0300. The Contractor shall provide a copy of documentation regarding sewage pumping to the District.

6. On private property, minimum cover shall be 18-inches over top of pipe from a point 30 inches out from house and continuing to the connection with the District sewer system.
7. Parallel water and sewer lines shall be 10 feet apart horizontally wherever possible and have a vertical separation of 18 inches if a vertical crossing is necessary.
8. No more than 100 feet is allowed between cleanouts. Cleanouts are required for bends equal to or greater than 90 degrees. Cleanout shall be a plugged tee or plugged wye lateral.
9. All pipe joints shall be rubber gasket type.
10. When required, "grease interceptor" to be outside the building and be of a size and type certified by a professional engineer licensed in the State of Washington and reviewed by the District.
11. Backwater valves are required on all side sewers where potential occurs for flow to back into the private service. These valves shall be installed in a riser pipe, meter box, vault or manhole as necessary to allow access for maintenance.
12. Dwelling units defined by food preparation, bedroom and bathroom areas contained in a structure are primary connections. Secondary connections require preapproval by the District before sewer service can be offered.
 - a. Auxiliary dwelling units constructed on an existing served property within an existing structure may be allowed subject to payment of connection charges.
 - b. Auxiliary dwelling units constructed on an existing served property in separate structures require separate side sewer connections to District mainline facilities.
 - c. Recreational vehicle dumps are not allowed.
 - d. Small utility sink and toilet facilities in out buildings may be allowed to connect to existing side sewers.

III. SANITARY SEWER SYSTEMS - GENERAL STANDARDS - Continued

13. Side sewer installs to existing District mainline facilities in right-of-way are subject to special requirements:
 - a. Right-of-way permit required. Owner to pay all costs of obtaining the permit and for any costs associated with full compliance with all permit obligations.
 - b. Owner to pay all costs of installation of side sewer.
 - c. The Owner shall enter into a Developer Extension Agreement (DEA) with the District, and will be required to meet the following conditions:
 - i. All District or District incurred inspection fees are to be paid prior to and as a condition of connection.
 - ii. Comply with all District Standards, Conditions, Specifications, and requirements are applicable.
 - iii. Comply with all state, local and federal requirements apply.
 - iv. Preconstruction meeting with owner, owner contractor, and District is to be scheduled with the District prior to initiation of construction.
 - v. No connection to District facilities can be made without District or District Representative on site.

SECTION IV
SEWAGE LIFT STATIONS

SEWAGE LIFT STATIONS

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IV. SEWAGE LIFT STATIONS - GENERAL STANDARDS

1. OBJECTIVE:

Section IV is intended to present information and provide an outline of the minimum general standards to be accomplished in planning a sewage lift station installation within the Whatcom County Water District No. 13 service area.

The Developer shall submit to the District for review and approval, complete sewage lift station plans and design which provide for the lift station, electrical service, SCADA controls, and auxiliary generator/transfer switch together with all accessories for a complete, automatically operating installation.

Design material and drawings shall provide all civil, mechanical and electrical details and align with all applicable codes and regulations, and good engineering practice.

2. DESIGN CALCULATIONS:

The Developer shall perform a study and make the determination to assure that the lift station installation is sized to serve the overall sewage flows generated within the potential service area. The flow study shall include the Developer's plat boundary area as well as adjacent and future service areas. The service areas shall be the areas within that which could be served by the installation of the lift station(s).

The station's design flow capacity shall be based on an average daily per capita flow with related peaking factors and inflow/infiltration allowances.

Documentation of present and future service area flow rates for lift station size and capacity determination shall be provided to the District.

The effects of the minimum flow conditions shall be estimated to be sure that retention of the sewage in the wet well will not create a nuisance and that pumping equipment will not operate too infrequently. The wet well shall be sized to limit pump cycles to a maximum of four cycles per hour per pump, with two pumps alternating at pump design capacity.

Lift station capacity shall meet the maximum rate of flow expected. At least two pumping units shall be provided at each lift station installation. The pump shall have sufficient capacity and capability to efficiently handle the peak design flow with one pump out of service and to ensure a minimum velocity of 3 feet per second velocity in the force main.

The force main shall be sized for a minimum velocity of 3 feet per second and a maximum of 8 feet per second. The minimum diameter of the force main shall be 6 inches.

IV. SEWAGE LIFT STATIONS - GENERAL STANDARDS - Continued

The capacity of the receiving sewer shall exceed the flow expected.

Two copies of the Design Report shall be submitted to the District for review. As a minimum, the report shall include.

1. Project description
2. Projected flows
3. Connection point with downstream capacity
4. Wet well sizing
5. Run time calculation and cycle time
6. Pump station head calculation
7. Pump selection
8. Force main size, length and material
9. Electrical load study
10. Generator sizing
11. Odor potential calculations
12. Wet well buoyancy calculations
13. Force main surge calculations

The Design Report shall be approved by the District prior to starting the design of the lift station.

3. LOCATION:

The Developer shall furnish a site layout for the lift station installation.

The lift station shall be located as far as practicable from present or proposed built-up residential areas, and an asphalt concrete access road shall be provided. Sites for sewage lift stations shall be of sufficient size for future expansion or addition, if applicable.

The legal description for the lift station site shall be submitted to the District for review prior to construction of the lift station. Lift station sites shall be deeded to the Whatcom County Water District No. 13.

The Developer shall coordinate electrical power required to the site with the electrical utility.

As a minimum, the site shall provide for the following:

1. Lift station
2. Auxiliary power, including automatic transfer switch
3. Electrical
4. Telemetry

IV. SEWAGE LIFT STATIONS - GENERAL STANDARDS - Continued

5. 1-inch water service with reduced pressure backflow preventor and hose bib installed in an above ground hot box enclosure on concrete. Furnish 50 feet of 3/4-inch heavy-duty rubber hose.
6. Odor control, as applicable for location and capacity.
7. Cuts and fills to provide level site for maintenance.
8. Asphalt concrete pavement for access and maintenance areas.
9. Safety system mount. See Detail VI-LS7.
10. 6 foot high black powder coated frame and posts together with black vinyl chain link fence with vertical vinyl slats in-laid for screening and three strands of barbed wire on top of the fence, enclosing the site with 3-foot-wide access man gate and separate vehicle access gate 12-foot wide minimum opening. Fence to be located in the asphalt, 6 inches from the edge. A gate button will be used for the center gate post.

4. LIFT STATION:

GENERAL

The sewage lift station shall be submersible as approved by the District. Construction shall be in compliance with OSHA, UL, ASTM, NEC, WAC, and other applicable codes and regulations. The station shall be designed, constructed and anchored to comply with current IBC standards.

The lift station shall have, as a minimum, two sewage pumps. The pumps shall have sufficient capacity and capability to efficiently handle the peak design flow with one pump and to ensure a minimum velocity of 3 feet per second in the force main. Design calculations and pump curves indicating the same shall be provided with the submittal information.

The sewage lift station supplier shall check the station during installation to determine if the installation is correct. Written confirmation of each visit and recommendations shall be provided to the District.

The sewage lift station supplier shall provide a minimum of 4 hours of training for District personnel at the station site during start-up.

The sewage lift station supplier shall provide four complete copies of maintenance and operation material to the District.

MOTORS

The pump and motor shafts shall be the maximum diameter available for these units.

Pump motors shall be 3-phase, 60-cycle, 480-voltage inverter rated, TEFC. Motors 40 hp and larger shall be furnished with soft start or variable frequency drives (VFDs). VFDs shall comply with the latest ANSI, IEEE, and NEC codes.

IV. SEWAGE LIFT STATIONS - GENERAL STANDARDS - Continued

VFD load circuits from starter to motor shall be shielded power cables in RGS conduits.

The motors shall have 1.15 service factor and be non-overloading for the full range of the curve unless otherwise approved by the District.

5. WET WELL:

GENERAL

The wet well shall be precast concrete manhole sections. Joints between precast wall sections shall be confined O-ring or as otherwise approved.

The wet well shall be provided with polypropylene manhole steps as specified for manholes.

The wet well shall be checked to ensure all joints are watertight to prevent infiltration and exfiltration of the wet well.

The wet well floor, walls and underside of the top shall be coated to comply with the following:

Surface Preparation:

Allow a minimum of 28 days cure time for concrete. Sweep blast to provide a surface profile. Surface shall be clean, dry and free of contaminants.

Exterior Surfaces:

The exterior surface of the wet well shall be coated with 30 mils minimum of coal tar epoxy.

Interior Surfaces:

- **Filler and Surfacer:** Tnemec Series 218 Filler and Surfacer. Applied as needed. After the application of the prime coat, the bugholes and surface voids shall be filled to ensure that the finish coat is monolithic and pinhole free.
- **Finish:** Tnemec Series 435 Perma-Glaze Applied in two coats at 15 mils dry film thickness each. Color light gray.
- **Total System:** 30 mils dry film thickness.

Comply with all conditions of the manufacturer's specifications for preparation and application.

IV. SEWAGE LIFT STATIONS - GENERAL STANDARDS - Continued

6. CONTROLS:

The control panel shall include:

1. Main disconnect.
2. Panel mounted running light for each pump.
3. Panel mounted ammeter for each pump to read percentage of load.
4. Panel mounted running time meter for each pump.
5. Panel mounted Cutler Hammer HOA switches for each pump.
6. Mounting bracket for telemetry sub panel in station (size: 13-1/2" L x 10" W x 6-1/2" Deep).
7. Local/Remote contact for the following alarms:
 - a) Low Level
 - b) High Level
 - c) Power/Phase Failure (single & 3-phase)
 - d) Pump Failure
 - e) High Water (dry well)
 - f) Pump On
 - g) Intrusion
8. Panel mounted wet well gauge. Minimum 2.5-inch dial and read for depth of wet well in inches.
9. Phase monitor to protect the pump motors from single-phase reversal and low voltage.
10. Discharge check valve limit switches (each).
11. Pump alternator, each cycle.
12. High water float pump control.

7. ELECTRICAL SERVICE/CONTROLS AND TELEMETRY SYSTEM:

GENERAL

Codes and regulations exist at the federal, state, and local level dictating minimum acceptable requirements for electrical systems. The following standards shall be used as a basis for design and review.

1. National Electric Code (NEC)
2. Occupational Safety & Health Act (OSHA)
3. State & Local Building Codes
4. National Electrical Code (NEC)
5. National Electrical Manufacturers Association (NEMA)
6. Underwriters' Laboratory (UL)
7. Insulated Power Conductor Engineering Association (IPCEA)
8. American National Standards Institute (ANSI)
9. Institute of Electrical & Electronic Engineers (IEEE)

IV. SEWAGE LIFT STATIONS - GENERAL STANDARDS - Continued

ELECTRICAL SERVICE

The local electric utility will be the primary source of electrical power. The Developer shall ascertain proper coordination between the nominal secondary delivery voltage supplied by PSE and the connection to the lift station equipment. The electrical service shall be 480/277V 4-wire, 3-phase, 60 hertz, with a solid neutral terminal at the disconnect or as may otherwise be required by PSE. This shall be confirmed with the PSE and confirmed by the suppliers.

All installation shall be approved by PSE and shall be in conformance with the NEC (current issue) UL, OSHA and County and State electrical codes.

The District shall be furnished with a certificate of final inspection by the inspecting agency.

All wire shall be stranded copper.

All conduit shall be rigid galvanized (RGS). All underground RGS conduits, elbows, and fittings shall be coated with 20 mils (minimum) of PVC coating or a half-lapped wrap of Scotchwrap No. 51. See Detail VI-LS4.

All underground conduits shall be covered with a strip of yellow polyethylene tape placed 6-inches below finished grade and directly above the conduit.

All conduit shall have a minimum of 2'-0" of cover.

Instrumentation conduits, elbows and fittings shall be RGS over their entire length.

Heating strips shall be provided for outside electrical enclosures.

A service entrance shall be provided with a pedestal on which shall be mounted, as a minimum, the following equipment:

1. Meter and meter can (as required by the PSE)
2. Meter C.T.S. (as required by the PSE)
3. Main disconnect SUSE-rated circuit breaker in a NEMA 3R, enclosure, with padlock to District standards.
4. Service voltage shall be 480/277 volts, 3 phase, 4-wire, except as required by PSE.
5. Single phase services shall be 240/120 volt, 3 wire. Panels shall conform with NEMA 3R.

IV. SEWAGE LIFT STATIONS - GENERAL STANDARDS - Continued

6. A 120-volt duplex in NEMA 3R enclosure with padlock to District standards on the electrical rack.
7. Ground rod and connector wire in conduit to NEC standards.
8. Mount equipment per Detail VI-LS3
9. Provide a complete electrical plan set including the following minimum documents:
 - a) Electrical plan view showing equipment and interconnecting conduits
 - b) A cable and conduit schedule
 - c) A one-line diagram
 - d) Motor starter control schematics
 - e) Panelboard schedule
 - f) Main control panel schematics
 - g) PLC I/O tables
 - h) Associated electrical details
10. The District shall be provided with a complete reproducible set of as-constructed plans and details showing final location of all equipment, conduit and wire.

CONTROLS

Control and instrument system plans shall thoroughly and completely depict system design. The plans, in conjunction with the specifications, shall define the type of control system, the type of components in the system, set points and the interface between the instrumentation and control system and the lift station system. To accomplish this, the control and instrument plan(s) shall include, as a minimum, the following:

1. Control and instrumentation system legend and general notes
2. Control, instrumentation and distribution diagram
3. Plans showing location of all control, instrument, and distribution system equipment and components, both electrical and pneumatic
4. All equipment and installation details

The power, control and instrumentation systems shall be designed with both operational reliability and maintainability. Use standard products wherever possible.

IV. SEWAGE LIFT STATIONS - GENERAL STANDARDS - Continued

Electrical equipment and devices shall be connected using separate power, control, and instrumentation conduits. Electrical gutters or fabricated raceways shall not be used.

All components within the lift station system, including both internally and face-mounted instruments and devices, shall be clearly identified with phenolic nameplates of black background with white letters reverse engraved from the backside (smooth front surface).

Intrinsically safe electrical circuits shall be installed in the main control panel in compliance with NEC, not in the motor starters.

All wiring between cabinet, equipment and components shall be labeled and color coded where applicable.

All pump motors shall have an independent lockable circuit breaker located within the lift station and the lift station shall have a lockable main circuit breaker located outside the lift station.

Lead and lag pump functionality shall alternate between pumps on each cycle change.

The pump controls shall be float switches or air bubbler type with two compressors alternating on timer control, and shall provide for both pumps to operate at high water conditions. The control elevations shall be indicated on the plans, i.e., on-off, first pump on, second pump on, and high water alarm. The air compressors shall not be located in electrical cabinets or enclosures.

The wet well shall be equipped with a high water redundant float to override the bubbler pump control and start the pumps and send high wet well level alarm.

A complete set of spare fuses shall be provided for all fused equipment.

TELEMETRY

All new lift stations shall be equipped with a programmable logic controller (PLC) with an operator interface unit for site control and a modem and telephone line or radio for transmitting station information to the wastewater treatment plant.

The equipment shall be provided in enclosures with auxiliary equipment to facilitate connection of external signals, and to monitor voltage, intrusion, and similar status signals. Communication shall be via leased telephone lines to the District's office at the treatment plant.

For each new lift station, the Developer shall provide the necessary equipment along with an enclosure, power supply, relays, surge protection devices for power

IV. SEWAGE LIFT STATIONS - GENERAL STANDARDS - Continued

and telephone lines, and other auxiliary devices as required for proper operation of the system. Typical discrete inputs for a station include:

1. Utility Power Fail
2. Three Phase Power Fail (phase reversal, phase imbalance, phase loss, undervoltage, and overvoltage)
3. Generator Run
4. Generator Fail
5. ATS in Standby
6. Intrusion Alarm
7. Wet Well High Level
8. Wet Well Low Level
9. Pump No. 1 Run
10. Pump No. 2 Run
11. Pump No. 1 Fail
12. Pump No. 2 Fail
13. Flow Meter Totalizer
14. All exterior transfer switches will be NEMA 3 enclosure with keyed switch for access to controls.

Typical discrete outputs include:

1. Start Generator

Typical analog inputs include:

1. Pump No. 1 Amperes
2. Pump No. 2 Amperes
3. Wet Well Level
4. Flow Rate

Provisions shall also be made for additional I/O signals by providing terminals from each I/O point on the PLC to terminals within the telemetry panel.

The Developer shall also be responsible for correct set-up of the PLC with respect to the existing system configuration.

The Developer shall coordinate with the telephone utility and the District for obtaining proper telephone service to the site. The Developer shall be responsible for obtaining, installing, and starting up the PLC for the new lift station. The Developer shall coordinate obtaining, installing and starting up the PLC with the District to ensure that the station is properly configured and functions correctly in conjunction with the existing system.

All major components, including relays, timers, and power supplies shall be identified using phenolic or vilam engraved labels.

IV. SEWAGE LIFT STATIONS - GENERAL STANDARDS - Continued

A line (surge) protector unit shall be provided for the telemetry equipment. The unit shall protect the equipment from transient and electrical surges on the telephone line. Protection shall include line fuses and clamps for voltages over 25 volts, gas tubes shall be provided as an integral part of the lighting protection unit.

8. STANDBY POWER SYSTEM:

GENERAL

Standby power generation equipment shall be provided at the lift station site, which will operate the lift station in the event of a commercial power outage.

The standby system shall be designed with capacity and rating to safely start and operate the entire connected lift station load, including all pumps and ancillary loads unless otherwise approved by the District. All applicable codes shall be followed, including NEC and UPC.

The generator set shall be complete in every respect and shall include, but not be limited to the following:

1. Generator, control panel & circuit breaker.
2. Engine, radiator & exhaust system.
3. Fuel tank. (Capacity for 7 days at 25 percent load.)
4. Generator set enclosure providing noise attenuation in compliance with Washington State Administrative Code, Chapter 173-60, and lockable to District Standards.
5. Automatic transfer switch – single electric motor style.
6. Block heater.
7. Battery & rack.
8. Battery charger.
9. Conduit, wire and piping.

The generator set and transfer switch shall be Cummins/Onan complying with the latest edition of Onan Corporation standard specifications and District Standards or a District approved equal generator set and transfer switch.

The generator set shall be 60 Hertz, 1,800 rpm, 3-phase, 480/277 volt standby power diesel as approved by the District.

The generator set shall include the following:

Engine

1. Single phase, 1500 watt block heater (115 Vac)

IV. SEWAGE LIFT STATIONS - GENERAL STANDARDS - Continued

Generator Set

1. Mainline circuit breaker
2. 5-year basic power warranty

Accessories

1. Batteries
2. Battery Charger, 2 amp, 12 VDC, 120 Vac Input
3. Vibration Isolators, Pad Type

Control Panel

1. Annunciator relays (12)
2. Run relay package (3)
3. Low coolant level shutdown
4. Anti-condensation space heater, 120 Vac
5. Oil temperature gauge
6. Wattmeter
7. Emergency stop switch

Fuel Systems

1. Diesel unless approved by the District. All piping shall be black iron, except for flexible vibration isolation connections at pipe ends with shut off ball valves.

Alternator

1. Anti-condensation heater, 120 Vac

Control Features

1. Run-stop-remote switch
2. Remote starting, 12-volt, 2 wire
3. Coolant temperature gauge
4. Field circuit breaker
5. DC voltmeter
6. Running time meter
7. Lamp test switch
8. Oil pressure gauge
9. Fault reset switch
10. Cycle cranking
11. 12-light engine monitor with individual 1/2 amp relay signals and a common alarm contact for each of the following conditions:
 - Run (Green Light)
 - Pre-Warning For Low Oil Pressure (Yellow Light)

IV. SEWAGE LIFT STATIONS - GENERAL STANDARDS - Continued

- Pre-Warning For High Coolant Temp (Yellow Light)
- Low Oil Pressure Shutdown (Red Light)
- High Coolant Temperature Shutdown (Red Light)
- Overcrank Shutdown (Red Light)
- Overspeed Shutdown (Red Light)
- Switch Off (Flashing Red Light- Indicates Generator Set Not In Automatic Start Mode)
- Low Coolant Temperature (Yellow Light)
- Low Fuel (Yellow Light)
- Two Customer Selected Faults (Red Light)

AC Meter Package

Order with NFPA 110 monitor to meet code requirements.

1. AC voltmeter (dual range)
2. AC ammeter (dual range)
3. Voltmeter/ammeter phase selector switch with an off position
4. Dual scale frequency meter/tachometer
5. AC Rheostat (panel mounted) for + 5 percent voltage adjust

The transfer switch shall include the following:

1. Sized for full station and auxiliary equipment load plus 25 percent.

Pole Configuration

1. Poles - 3 (Solid Neutral)

Frequency

1. 60 Hertz

Application

1. Appl - Utility to Genset

System Options

1. Three phase, 3-wire or 4-wire

Enclosure

1. Generator will be installed in a 12-gauge galvanized welded steel, insulated, sound attenuated, NEMA 3R weather-protective, walk-in drop over acoustical enclosure. The enclosure will meet the

IV. SEWAGE LIFT STATIONS - GENERAL STANDARDS - Continued

requirements of ASTM A-653 and the current IBC. The sound pressure level will average not more than 45 dBA at 110 feet in a free-field condition, or 53 dBA at 23 feet, or will meet more stringent sound requirements as specified by the District.

Listing

1. Listing - UL 1008

Programmed Transition

1. Program Transition, 1-60 sec.

Applications Modules

1. Monitor - Phase Sequence/Balance

Suitable guards shall be provided on all electrical parts to minimize the personal shock hazard.

Generator shall be broken-in sufficiently to permit application of full load immediately upon installation.

Generator supplier shall provide all tools for the generator set as recommended and required by the manufacturer.

Generator installation shall be checked by the supplier after installation to determine that the installation is correct. Written confirmation shall be provided to the District. Generator supplier shall perform a full load test for 2 hours after installation is complete. Provide resistive load bank for this test.

Generator supplier shall provide a minimum of 4 hours of training for District personnel at the station site during start-up.

Generator manufacturer shall provide four copies of the maintenance and operation manual. These manuals shall be complete and shall include all information necessary to allow District personnel to maintain the generator.

Generator mounting pad shall be reinforced concrete to carry the weight of the unit and shall extend a minimum of 3 inches beyond generator housing. All formed edges to be 1/2 round or 3/4-inch chamfer.

Diesel tanks shall be Convault AST, or approved equal, equipped with external fuel shutoff valve.

IV. SEWAGE LIFT STATIONS - GENERAL STANDARDS - Continued

9. FORCE MAIN:

The force main shall be a minimum 6-inch-diameter ductile iron Class 52 polyethylene or epoxy lined or high-density polyethylene (HDPE) if approved by the District and provided with a continual positive slope. There shall be no intermediate high point between the lift station and the force main discharge point, unless properly protected with sewage air and vacuum release assembly. Minimum cover over the force main shall be 4'-0". All pipes (gravity and pressure) entering and leaving the wet pit or dry pit shall have flexible couplings within 18 inches of the structure. Install force main location boxes as required, shown on Detail VI-S4.

Discharge of the force main to the gravity sewers shall be made at a manhole with the force main penetration core drilled and the force main aligned to discharge towards the downstream pipe. The invert of the force main shall be 0.1 foot above the invert of the downstream pipe. Channel the manhole as required.

A bypass pump connection equipped with a Cam Lock fitting and cap shall be located near the wet well in a location specified by the District. See Detail VI-LS2.

A surge valve shall be installed on the force main to discharge into a manhole or the wet well if high head conditions will occur as determined by the District.

10. TESTING FORCE MAIN:

CLEANING

All force mains shall be cleaned prior to connection of force main to pumping facilities. Contractor to provide cleaning plan for District review and approval.

TEST SPECIFICATIONS

All force mains shall be tested prior to acceptance of work. All pumps, gauges, plugs, saddles, corporation stops, miscellaneous hose and piping, and measuring equipment necessary for performing the test shall be furnished, installed and operated by the Developer. Feed for the pump shall be from a barrel or other container within the actual amount of "makeup" water, so that it can be measured periodically during the test period.

The pipeline shall be backfilled sufficiently to prevent movement of the pipe under pressure. All thrust blocks shall be in place and time allowed for the concrete to cure before testing. Where permanent blocking is not required, the Developer shall furnish and install temporary blocking.

IV. SEWAGE LIFT STATIONS - GENERAL STANDARDS - Continued

The pipeline shall be subjected to a pressure and leakage test of a minimum of 200 pounds per square inch for a period of not less than 1 hour. The test pressure shall be applied at the low end of the section tested.

Prior to calling for the District to witness the pressure test, the Developer shall first perform a satisfactory pressure test. The allowable leakage rate per thousand feet of each size pipeline is as follows:

Pipe Size	Allowable Leakage
	Gal. per Hour per 1,000 Ft. @ 200 psi
6"	0.64
8"	0.85
10"	1.06
12"	1.28

Defective materials or workmanship, discovered as a result of the tests, shall be replaced by the Developer at the Developer’s expense. Whenever it is necessary to replace defective material or correct the workmanship, the tests shall be re-run at the Developer’s expense until a satisfactory test is obtained.

PRELIMINARY TESTS

Developer shall conduct preliminary tests and assure himself that the section to be tested is in an acceptable condition before requesting the District to witness the test.

THRUST BLOCKS AND ANCHOR BLOCKS

Fittings shall be “blocked” with poured-in-place concrete, with a firm minimum bearing against an undisturbed earth wall. Timber blocking will not be permitted. Thrust blocks shall be poured as soon as possible after setting the fittings in place to allow the concrete to “set” before applying the pressure test. The concrete thrust blocks shall be in place before beginning the pressure test. Anchor blocks shall be allowed to set sufficiently to develop the necessary bond strength between the reinforcing rods and the concrete anchor before beginning the pressure test. A visqueen barrier shall be provided to protect glands, bolts and other miscellaneous materials required for this type of connection from the concrete. Fittings that must be blocked against an undisturbed earth wall shall be restrained with restrained joint pipe and fittings.

11. LIFT STATION TEST PROGRAM:

The Developer shall perform, as a minimum, the following tests and provide the District written documentation of the date performed and results obtained. Pump tests shall meet or exceed specified capacity. The District shall be informed of the testing schedule 48 hours prior to the test and shall be present during testing.

IV. SEWAGE LIFT STATIONS - GENERAL STANDARDS - Continued

1. Pump capacity by drawdown test
2. Control panel operation
3. Generator load test
4. Automatic transfer reconciled to auxiliary power and back to utility power
5. Telemetry control to terminal strip
6. Pump vibration analysis

Fill water for testing shall be obtained in accordance with District cross-connection practices.

SECTION V
CROSS-CONNECTION CONTROL

CROSS-CONNECTION CONTROL

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V. CROSS-CONNECTION CONTROL:

1. DEFINITIONS:

- A. Unless a different meaning plainly is required, the definitions found in WAC 246-290-010 now in effect or as subsequently amended or reenacted are hereby adopted by reference as if set forth in full herein.
- B. CCS is defined as the Cross Connection Control Specialist of the Whatcom County Water District No. 13 or delegated representative.
- C. Owner is defined as any person or entity with interest in the title to the property and/or a customer of the District.

D. Acronyms for Backflow Assemblies:

AG: Air Gap
AVB: Atmospheric Vacuum Breaker
DCVA: Double Check Valve Assembly
RPBA: Reduced Pressure Backflow Assembly
RPDA: Reduced Pressure Detector Assembly (fire systems)
SVBA: Spill Resistant Vacuum Breaker Assembly
PVBA: Pressure Vacuum Breaker Assembly

E. Other definitions:

(the) District: The Whatcom County Water District No. 13
BAT: Backflow Assembly Tester
RCW: Revised Code of Washington
WAC: Washington Administrative Code
WSDOH: Washington State Department of Health
USC/FCCCHR: University of Southern California Foundation for Cross Connection Control and Hydraulic Research
AHJ: Authority Having Jurisdiction
UPC: Uniform Plumbing Code
TI: Tenant Improvement

2. PURPOSE AND SCOPE:

- A. This Section establishes minimum standards for the District to protect the public potable water supply from possible contamination or pollution due to backflow or backsiphonage from an owner's private internal system into the public potable water system.
- B. This Section establishes minimum cross-connection control operating policies and requirements for installation, testing, and maintenance of

V. CROSS-CONNECTION CONTROL - Continued

approved backflow assemblies and describes (other) annual inspection requirements for existing and new backflow assemblies.

- C. The purpose of this Section is not to create or otherwise establish or designate any particular class or group of persons who will or should be especially protected or benefited by the terms of this Section. This Section is applicable to all connections to the Whatcom County Water District No. 13 water system.

3. AUTHORITY:

- A. This Section is authorized by The Federal Safe Drinking Water Act of 1974 (and Amendments of 1996), the statutes of the State of Washington Title 43 RCW and WAC 246-290-490.

4. RESPONSIBILITY:

- A. The District CCS will be responsible for administering the provisions of this Section.
- B. Proper installation of required backflow assemblies shall be a condition of water service from the District's water supply system to any premises upon which the potential for backflow into the District system exists. Water service may be discontinued or refused until corrective action is taken in accordance with this Section.
- C. Upon installation of an approved backflow assembly, the owner shall contact the District requesting inspection of said assembly or assemblies.
- D. Upon approval of the installation by the District, the owner shall have the assembly or assemblies tested by a State of Washington certified BAT and shall submit a copy of the test report to the District in accordance with this Section.
- E. The owner shall be subject to all applicable inspection and permitting fees. All tests and reporting by a certified BAT shall be at owner's expense.

5. FAILURE TO COMPLY – VIOLATIONS – PENALTIES:

- A. Any person, firm, or corporation who willfully violates any provisions or requirements of this Section shall be subject to discontinuance of supply of District water to the service connection to the site where the violation exists and discontinuance of service shall remain in effect until corrective action has been completed in accordance with District standards.

V. CROSS-CONNECTION CONTROL - Continued

6. **REQUIREMENTS:**

GENERAL

- A. Compliance with the provisions of this Section shall be a condition of receiving or to continue receiving the District's water supply. It is unlawful for any person to allow any contaminants or pollutants to backflow from their facility and/or property into the District distribution system.
- B. All domestic connections, except for single-family and multi-family connections shall require the installation of an approved RPBA at the service connection or alternate location as approved by the District. The RPBA shall be installed, inspected and tested in accordance with the provisions of this Section.
- C. All multi-family (other than duplexes) connections require at a minimum, the installation of a DCVA at the service connection or alternate location as approved by the District. The DCVA shall be installed, inspected, and tested in accordance with the provisions of this Section.
- D. All fire service connections except for single-family residences and duplexes shall require the installation of an RPDA or RPBA at the service connection or alternate location as approved by the District. The RPDA or RPBA shall be installed, inspected, and tested in accordance with the provisions of this Section. All fire service connections shall be a dedicated and metered connection to the water main. Fire service connections shall be equipped with either an RPDA or RPBA depending upon service size (see II-4 General Standards). A DCVA may be allowed for single-family fire systems if the District CCS determines that a low hazard exists.
- E. All irrigation services, other than single-family (private) systems shall be a dedicated and metered connection to the water main. A minimum of a DCVA shall be installed at the service connection. Any irrigation system, including single-family, that uses chemical injection of any kind shall be isolated from the District's water system by an approved RPBA at the service connection (no exceptions). All backflow installations shall be installed, inspected, and tested in accordance with the provisions of this Section.
- F. Single-family residences having hard plumbed irrigation systems shall apply one of the following means of backflow protection to protect the District's water supply: DCVA, AVB, PVBA, or SVBA. Protection shall be installed, inspected, and tested in accordance with the provisions of this Section.

V. CROSS-CONNECTION CONTROL - Continued

- G. The District requires that the public water supply be protected from contamination from cross connections. The owner shall be responsible for water quality beyond the District service meter. This responsibility includes proper installation, annual testing and maintenance of required backflow assemblies as provided in this Section. Fixture isolation assemblies shall be installed in accordance with the UPC and/or AHJ as a condition of service.

TENANT IMPROVEMENTS

- A. All TIs that require any modification of the potable water or sewer internal plumbing shall require upgrade of the water and sewer systems to current District standards at the service connection, or alternate location as approved by the District that shall be installed, inspected, and tested in accordance with the provisions of this Section.

WHATCOM COUNTY WATER DISTRICT NO. 13

- A. For premises existing prior to the start of this program, the District will perform evaluations and inspections of plans and/or premises and inform the owner by letter of any corrective action deemed necessary, the method of achieving the correction and the time allowed for the correction to be made. A maximum of 60 days will be allowed; however, this time period may be adjusted by the District CCS depending upon all reasonable factors including but not limited to the performance history of the backflow assembly and the degree of hazard involved.
- B. Premises are subject to inspection on or after the expiration date of required action to correct a cross-connection. Water service to premises that fail to comply with the District's request shall receive written notice, via registered mail and regular mail, postage prepaid, that water service to the premise will be terminated within a period not to exceed 30 calendar days. In the event the owner informs the District of extenuating circumstances as to why the correction has not been completed, the District may grant a time extension up to but not exceeding an additional 30 days.
- C. If the District determines at any time that a serious threat to the public health exists; the water service may be terminated immediately, provided, however, that notice will be posted on the premises affected at the time said service is terminated and the proper AHJ is notified of the action.
- D. Inspection may be done during the initial installation and during on-site reviews of existing installations.

V. CROSS-CONNECTION CONTROL - Continued

OWNER

- A. An easement shall be provided to the District for access to all backflow assemblies required to protect the public potable water supply from possible contamination.
- B. When a test identifies a backflow assembly is not properly functioning, the owner shall correct the malfunction and have the assembly inspected and re-tested or replaced until proper backflow protection is restored.
- C. The owner shall be responsible for the elimination or protection, of all cross-connection on their premises.
- D. The owner after notification by the District shall, at their expense, install any and all required backflow assemblies.
- E. The owner shall, at their expense, be responsible for having all backflow assemblies tested:
 - 1. At the time of installation;
 - 2. Annually after installation or more frequently in cases of repeated failure to meet test criteria;
 - 3. After an assembly is repaired, reinstalled or relocated; or
 - 4. An air gap is re-plumbed or replaced by a District approved assembly. The test shall be performed by a Washington State certified BAT. The results of the tests shall be reported within 30 days to the District CCS on a form provided by or approved by the District.
- F. The owner shall immediately notify the District CCS of any malfunction of the approved backflow assembly that is revealed by periodic testing. The required repair or replacement of said assembly(ies) shall be completed within 30 days.
- G. The owner shall inform the District of any proposed modifications to their plumbing that creates a possible cross-connection and also any existing cross-connections of which the owner has actual knowledge but has not been found by the District.
- H. The owner shall install only backflow prevention assemblies from the current list of Washington State approved assemblies (WSDOH Publication # 331-137) as it exists now or as hereinafter changed, modified, amended, reenacted or recodified.

V. CROSS-CONNECTION CONTROL - Continued

- I. Any owner having a private well or other private water source desiring to connect to the Districts' water supply shall de-commission the well per WAC 173-160-381 as it exists now or as hereinafter changed, modified, amended, reenacted or recodified.
- J. The owner shall provide District personnel access to premises for cross connection inspection at the District's request. Failure to provide access to inspect facilities shall be grounds for termination of water service and/or installation of appropriate backflow assembly behind the meter by District crews at the owners' expense.

7. INSTALLATION AND TESTING - MINIMUM REQUIREMENTS:

- A. Minimum requirements for the testing of all backflow assemblies shall be in accordance with the Backflow Prevention Assemblies Field Test Procedure Approved for Use in Washington State, published July 1998 including subsequent revisions, adopted by reference herein. A copy is available for viewing at the District Headquarters.
- B. Backflow assemblies shall be installed in meter boxes, vaults, or "hot boxes" if greater than 2-inch diameter unless otherwise approved by the District. Vaults shall have adequate clearances and depths to allow for inspection and testing. Assemblies that cannot be easily and readily inspected shall be relocated and replumbed as directed by the District. The owner shall contact the District for applicable installation requirements and standards.
- C. All bypass lines parallel to a line on which an approved backflow assembly is installed shall have an approved backflow assembly installed that offers the same level of protection as the assembly required by the District on the main line.

8. BACKFLOW ASSEMBLIES:

- A. Classifications of backflow assemblies include but are not limited to: RPBA, RPDA, DCVA, SVBA, or PVBA of make, model, and size included on the current approved backflow assemblies list approved by WSDOH (Publication # 331-137) as it exists now or as hereinafter changed, modified, amended, reenacted or recodified. Washington State has adopted the USC/FCCCHR list of approved backflow assemblies. CD copies of the approved assemblies are available at the discretion of WSDOH. Call or check WSDOH website for availability. At this writing, this list is only available to members and affiliates of USC/FCCCHR. All major backflow assembly manufacturers display their USC approvals on

V. CROSS-CONNECTION CONTROL - Continued

their respective websites and product literature. Consult manufacturer's data before purchasing any backflow assemblies.

- B. Any existing backflow assembly in use, but not currently listed by the WSDOH can continue to be used providing all the following conditions are met:
 - 1. The assemblies were included on the WSDOH list of approved backflow assemblies at the time of installation;
 - 2. The assemblies have been properly maintained;
 - 3. The assemblies are functioning properly based on inspection by the District and testing by a certified BAT;
 - 4. The degree of protection of the District's water system is commensurate with the degree of hazard as determined by the District CCS and the provisions of this Section.
- C. When an unlisted assembly does not meet the above conditions, is moved, or cannot be repaired using spare parts from the original manufacturer, the assembly shall be replaced by an assembly currently listed as approved by the WSDOH.

9. APPLICABILITY:

- A. The provisions of this Section are applicable to all connections to the District water supply.

10. ADMINISTRATIVE PROCEDURES:

- A. In order to carry out the provisions of the District Cross-Connection Control policies, rules and procedures set forth in this Section, the District has an ongoing compliance program based upon but not limited to the following criteria: proper management of system connections; effective customer education; accurate recordkeeping and notification; Development plan review and inspections of new connections; and periodic inspection of existing connections.
- B. Minimum Requirements
 - 1. These District requirements are provided for clarification and any disagreement between the requirements listed below and requirements listed elsewhere in this Section, the more restrictive shall govern.

V. CROSS-CONNECTION CONTROL - Continued

2. All non-residential domestic water services shall be isolated from the public water system by an approved RPBA at the domestic service connection or at an alternate location acceptable to the District.
3. Fire services shall be isolated from the Public water system by an approved RPBA or RPDA at the service connection or at an alternate location acceptable to the District.
4. Premises having an auxiliary water supply (such as an active well(s)) shall be decommissioned per WAC 173-160-381 prior to connecting to the District water system.
5. All multi-family services (other than duplexes) shall have a DCVA installed at the service connection.
6. Non-residential irrigation services shall be separately metered and shall have an approved DCVA installed at the service connection. Irrigation systems that use chemical injection shall be isolated from the District's water system by an approved RPBA at the service connection.
7. Residential irrigation systems where compressed air is introduced shall have a minimum of an approved DCVA installed at the connection to the irrigation system (AVB systems are not adequate for protection of the public system where compressed air is introduced into the water system).
8. Residential Irrigation systems, which do not fall into the prior category, may have an approved PVBA installed on the system, or properly installed AVB for each zone. AVB installations are subject to periodic inspection by the District CCS.
9. Premises with water features (ponds) directly or indirectly connected to the District's system shall install a District approved AG at the fill point to the water feature, regardless of any upstream backflow protection. AG's will be annually inspected by the District CCS.

C. Compliance Inspection of Existing Buildings, Structures, and Grounds

1. An ongoing inspection program has been established by the District to locate and address cross connection potential to the District's system with priority given on the basis of risk to public health and is conducted as outlined below. The District CCS may perform additional inspections as needed.

V. CROSS-CONNECTION CONTROL - Continued

2. The District CCS periodically surveys residential meter routes, looking for irrigation systems, or signs thereof, responds to tips from customers, monitors locate requests, and uses other means with the goal that all connections to the District's water system be in compliance with State and District regulations. The District relies on plan review and premise isolation procedures established in this Section to properly protect the Public potable water system from other hazards posed by commercial, fire, and multi-family connections. Systems without required cross-connection protection when identified, shall be brought into compliance by the owner.
3. The District relies on annual test reports to ensure existing irrigation installations are in compliance. The District will endeavor to send notices of the deadline of required annual backflow assembly tests. It is the responsibility of the property owner to submit the annual Backflow Assembly Test Report in a timely manner (within 30 days) with or without notice from the District. Property owners who fail to provide annual test results certifying backflow assembly is in compliance with State and District regulations are identified and tracked until satisfactory compliance is achieved or water service is terminated.
4. The District shall respond to customer taste and odor complaints in a prompt and professional manner, understanding that these complaints may be indicative of possible contamination due to a temporary or continuing cross connection event with the Public water system. Should a cross connection be identified, it will be tracked until satisfactory compliance is achieved or water service is terminated.

D. Residential Education and Awareness

1. The District periodically sends educational pamphlets and/or bill stuffers to all of the water system customers. These include, but are not limited to, the following subjects:
 - a) Home Irrigation Safety;
 - b) Residential Fire Sprinkler Systems;
 - c) Health hazards associated with hose connections (chemical sprayers, radiator flush kits, etc.), utility sinks and other household dangers.

V. CROSS-CONNECTION CONTROL - Continued

2. The District also endeavors to provide informational handouts and presentations on cross connections at community events, school programs and with information at District Headquarters.

E. Registering of Certified Backflow Assembly Testers

1. The District maintains a list of Washington certified BATs to provide to customers. Persons or organizations wishing to be added to this list are required to provide the District with copies of the following:
 - a) Proof of current certification by the State of Washington as a BAT for each person authorized to perform tests.
 - b) Proof of current annual calibration for all testing equipment.
 - c) Proof of current liability insurance in an amount not less than one million dollars.
 - d) Any person providing backflow assembly testing service in the District service area must possess a current BAT certification, current test instrument calibration and all other licenses, permits or certifications required by law.

F. Record keeping and tracking of assemblies

1. The District meets the record keeping requirements of the State to allow effective monitoring and tracking of customer compliance with the annual backflow assembly testing requirements. The general content of the District's records include the following information on each backflow assembly includes, but is not limited to:
 - Service address
 - Business name (if applicable)
 - Specific location of each assembly
 - Initial inspection information for each location
 - Initial installation date
 - Water line size
 - Water pressure
 - Test results for all check valves
 - Assembly information (type of assembly, manufacturer, size, serial #, model, and date of test)

V. CROSS-CONNECTION CONTROL - Continued

- Complete testing history (initial and final test results for each year with: pass/fail, test type, date, tester's name and certification #)
- Hazard protected (downstream process)
- Repair history
- Test kit information
- Testers contact and certification information

SECTION VI

STANDARD DETAILS

(These details are available electronically for Developer use by contacting the District)

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VI-W17	1" OR 2" DOMESTIC FIRE SERVICE CONNECTION
VI-W18	DOUBLE CHECK VALVE ASSEMBLY, 2" AND SMALLER
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SANITARY SEWER SYSTEMS

VI-S1	SANITARY SEWER TRENCH SECTION (PVC/GRAVITY)
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VI-S17	BACKFLOW VALVE
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PAGE NO.

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SEWAGE LIFT STATIONS

VI-LS1LIFT STATION ELECTRICAL SCHEMATIC
VI-LS2BYPASS PUMP CONNECTION
VI-LS3A ROOF STRUCTURE FOR ELECTRICAL ENCLOSURE
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VI-LS4 UNDERGROUND CONDUIT DETAIL
VI-LS53/4" RPBA BACKFLOW ASSEMBLY
VI-LS6 VENT DETAIL
VI-LS7 FLUSH MOUNT SLEEVE

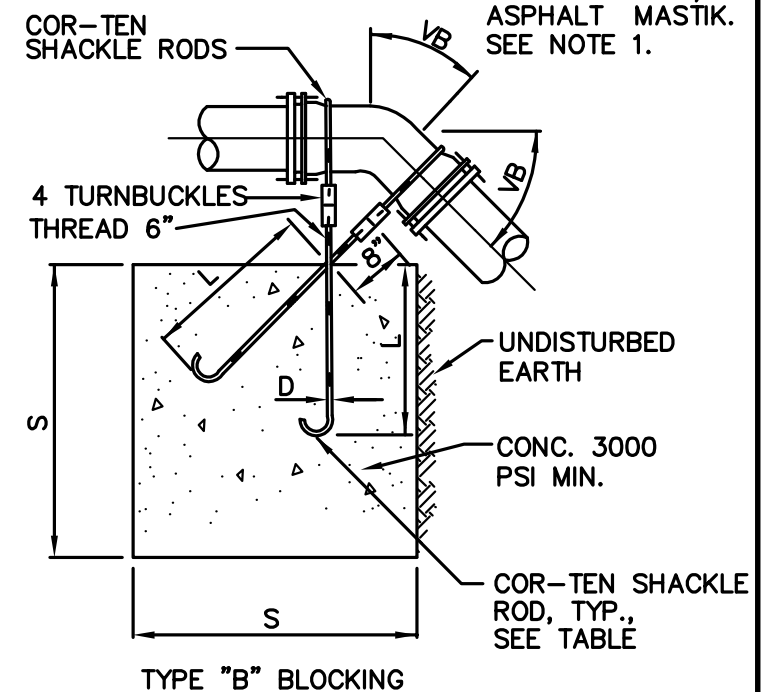
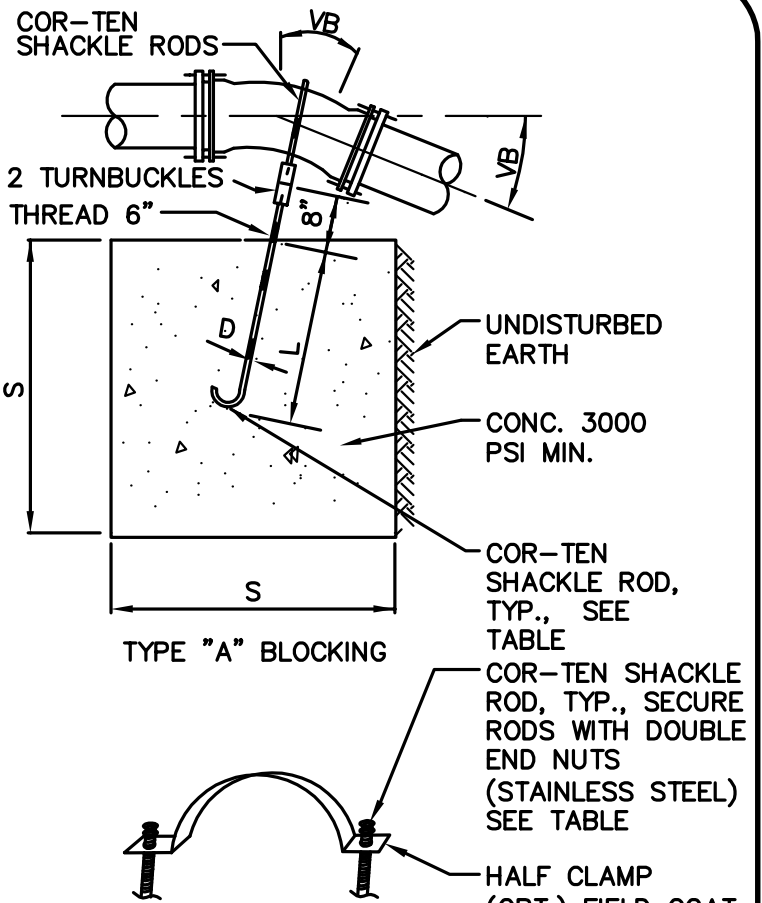
CROSS-CONNECTION CONTROL

CC-W1 AUTOMATIC ANTI-SIPHON CONTROL VALVE
CC-W2ATMOSPHERE VACUUM BREAKER
CC-W3 PRESSURE VACUUM BREAKER

GENERAL

TYPE "A" BLOCKING								
FOR 11 1/4°-22 1/2°-30° VERTICAL BENDS								
PIPE SIZE NOMINAL DIAMETER— INCHES	TEST PRESSURE PSI	VB	S	D	L			
		VERTICAL BEND DEGREES	No. OF CU. FT. OF CONC. BLOCKING	SIDE OF CUBE LIN. FT.	DIAM. OF SHACKLE RODS (2) INCHES	DEPTH OF RODS IN CONCRETE LIN. FT.		
4"	300	11 1/4	8	2	5/8"	1.5		
		22 1/2	11	2.2		2.0		
		30	17	2.6				
6"	300	11 1/4	11	2.2	5/8"	2.0		
		22 1/2	25	2.9				
		30	41	3.5				
8"	300	11 1/4	16	2.5	5/8"	2.0		
		22 1/2	47	3.6				
		30	70	4.1			3/4"	2.5
12"	250	11 1/4	32	3.2	5/8"	2.0		
		22 1/2	88	4.5			7/8"	3.0
		30	132	5.1				

TYPE "B" BLOCKING						
FOR - 45° VERTICAL BENDS						
		VB	S	D	L	
4"	300	45	30	3.1	5/8"	2.0
6"			68	4.1		
8"			123	5.0		
12"	250		232	6.1	3/4"	2.5

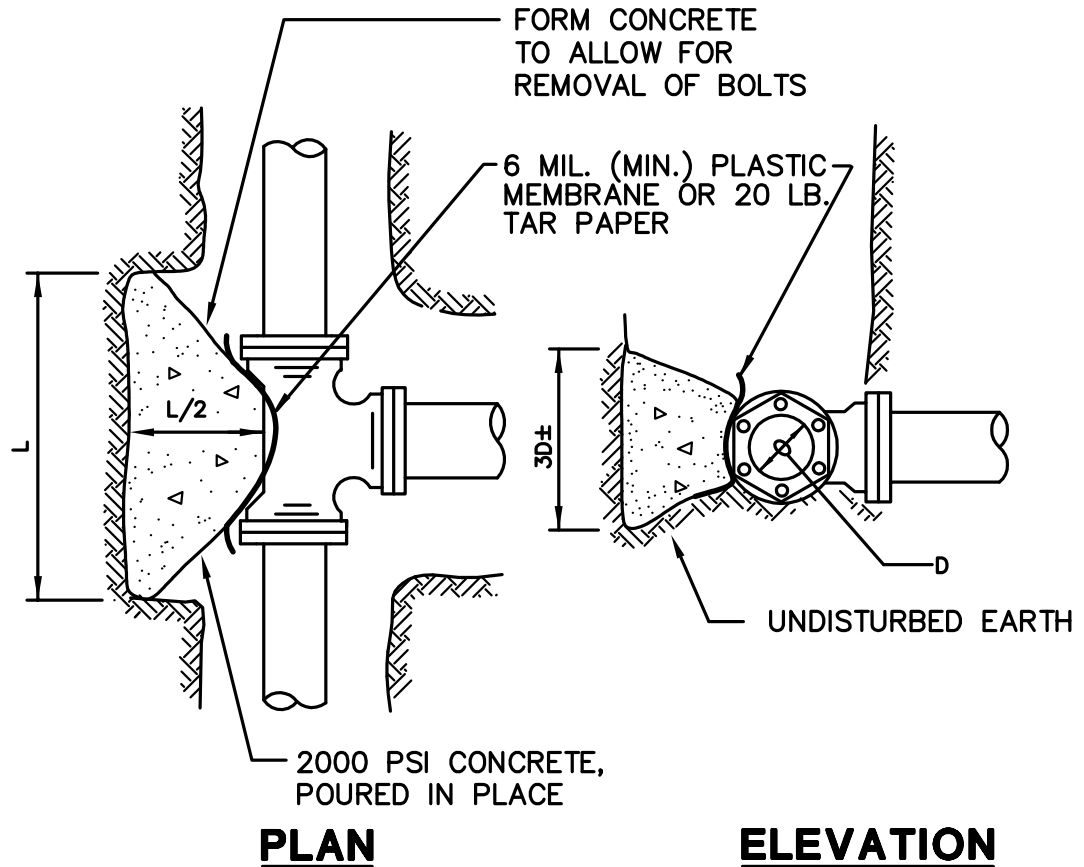


NOTES:
 1. HALF CLAMP, WASHERS AND NUTS MAY BE SUBSTITUTED FOR TURNBUCKLE ASSEMBLY. ALL OTHER SPECIFICATIONS THE SAME.

VERTICAL ANCHOR BLOCK

Whatcom County Water District 13
 STANDARD DETAILS

MINIMUM BEARING AREA TABLE					
FITTING D	TEE	90°	45°	22 1/2°	11 1/4°
6"	4 SQ.FT.	6 SQ.FT.	3 SQ.FT.	2 SQ.FT.	2 SQ.FT.
8"	7 SQ.FT.	10 SQ.FT.	6 SQ.FT.	3 SQ.FT.	2 SQ.FT.
10"	10 SQ.FT.	15 SQ.FT.	9 SQ.FT.	5 SQ.FT.	3 SQ.FT.
12"	14 SQ.FT.	22 SQ.FT.	12 SQ.FT.	6 SQ.FT.	4 SQ.FT.

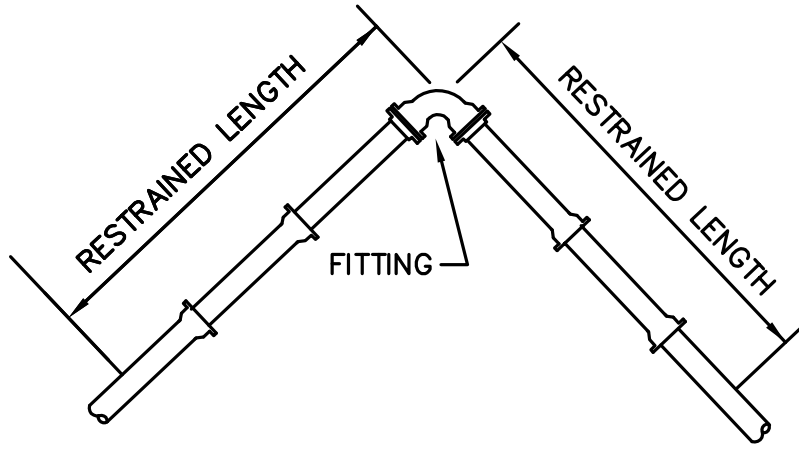


NOTES:

1. BEARING AREA TABLE BASED ON 250 PSI PRESSURE AND 2000 PSF SOIL BEARING. IF PRESSURE IS GREATER OR SOIL BEARING IS LESS, THE THRUST BLOCK SIZE SHALL BE INCREASED.
2. THIS TABLE REPRESENTS THE "MINIMUM" CONSTRUCTION STANDARDS. THE DEVELOPER'S ENGINEER SHALL BE RESPONSIBLE FOR DETERMINING THE APPROPRIATE SIZE OF ALL THRUST BLOCKS BASED ON EXISTING AND LOCAL CONDITIONS.

THRUST BLOCKS

Whatcom County Water District 13
STANDARD DETAILS



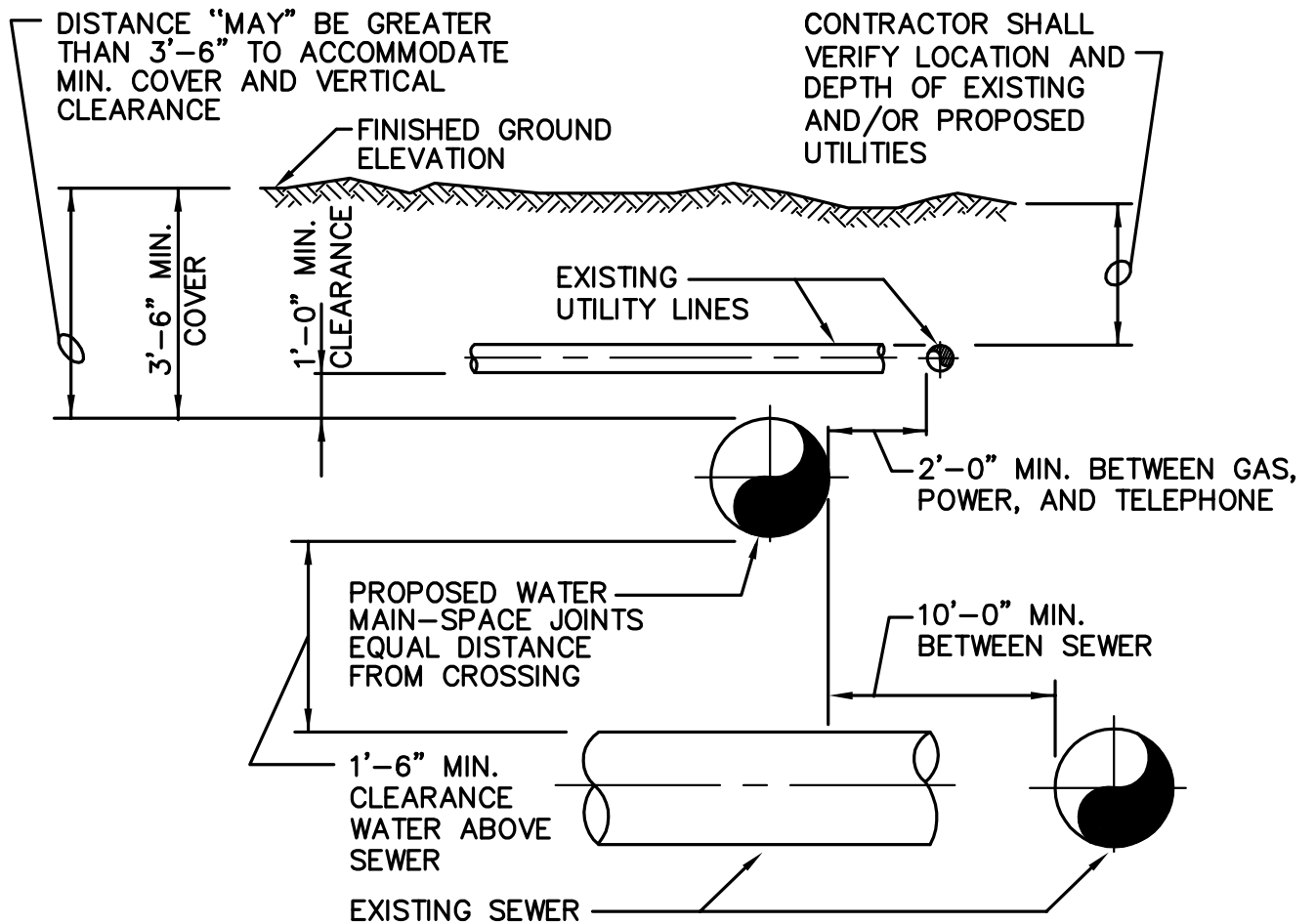
PIPE SIZE	90° BEND	45° BEND	22 1/2° BEND	11 1/4° BEND	TEE OR DEAD END CAP
	RESTRAINED LENGTH IN FEET				
4"	40	17	8	4	30
6"	55	23	11	6	39
8"	73	31	15	8	53
10"	88	37	18	9	67
12"	103	43	21	10	82

NOTES:

1. RESTRAINED LENGTHS SHOWN ARE MINIMUM AND FOR LINEAL FEET REQUIRED ON EACH SIDE OF FITTING INDICATED.
2. FOOTAGES ARE BASED ON 250 PSI PRESSURE AND 42 INCHES COVER. IF PRESSURE IS GREATER OR COVER IS LESS, THE RESTRAINED LENGTH SHALL BE INCREASED.
3. THIS TABLE REPRESENTS THE "MINIMUM" CONSTRUCTION STANDARDS. THE DEVELOPER'S ENGINEER SHALL BE RESPONSIBLE FOR DETERMINING THE APPROPRIATE RESTRAINED LENGTHS.

**THRUST RESTRAINT FOR
DUCTILE IRON PIPE**

Whatcom County Water District 13
STANDARD DETAILS

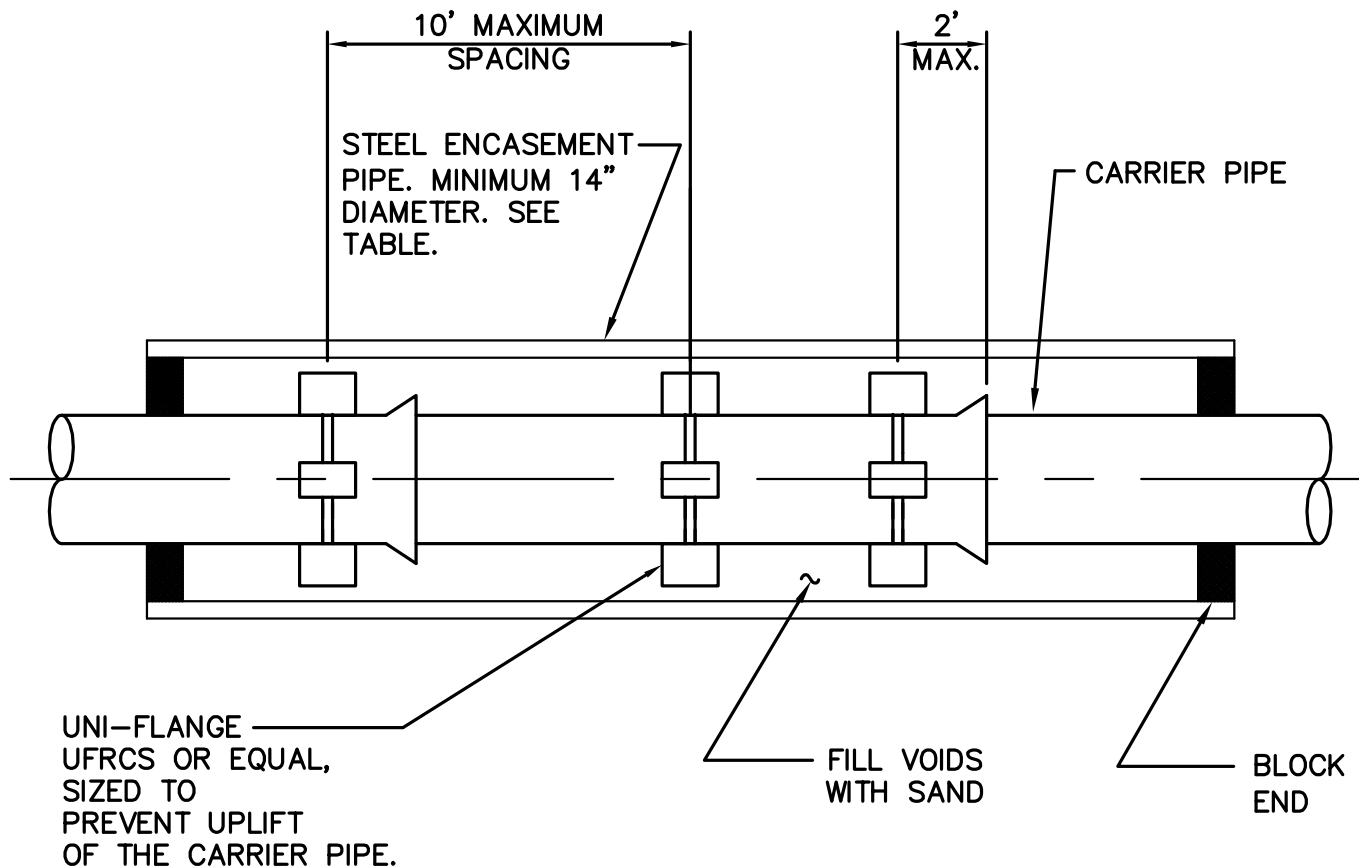


NOTES:

1. REGULATORY AGENCY REQUIREMENTS SHALL SUPERSEDE DISTRICT STANDARDS IF MORE STRINGENT.

TYPICAL UTILITY CROSSING

Whatcom County Water District 13
STANDARD DETAILS



MINIMUM ENCASEMENT DIAMETER	
CARRIER DIA.(IN.)	ENCASEMENT DIA.(IN.)
6	14
8	18
10	21.5
12	23

NOTES:

1. CONTRACTOR TO VERIFY LINE AND GRADE PRIOR TO FILLING VOIDS WITH SAND.
2. CARRIER PIPE WITHIN THE LENGTH OF THE ENCASEMENT PIPE SHALL HAVE RESTRAINED JOINTS.
3. REGULATORY AGENCY REQUIREMENTS SHALL SUPERSEDE DISTRICT STANDARDS IF MORE STRINGENT.
4. CASING PIPE SHALL BE SCHEDULE 40 STEEL PIPE, WELDED JOINT, AND MINIMUM YIELD STRENGTH (F_y) OF 35 KSI.

**ENCASEMENT/CARRIER
PIPES**

Whatcom County Water District 13
STANDARD DETAILS

WATER

FINISHED GRADE

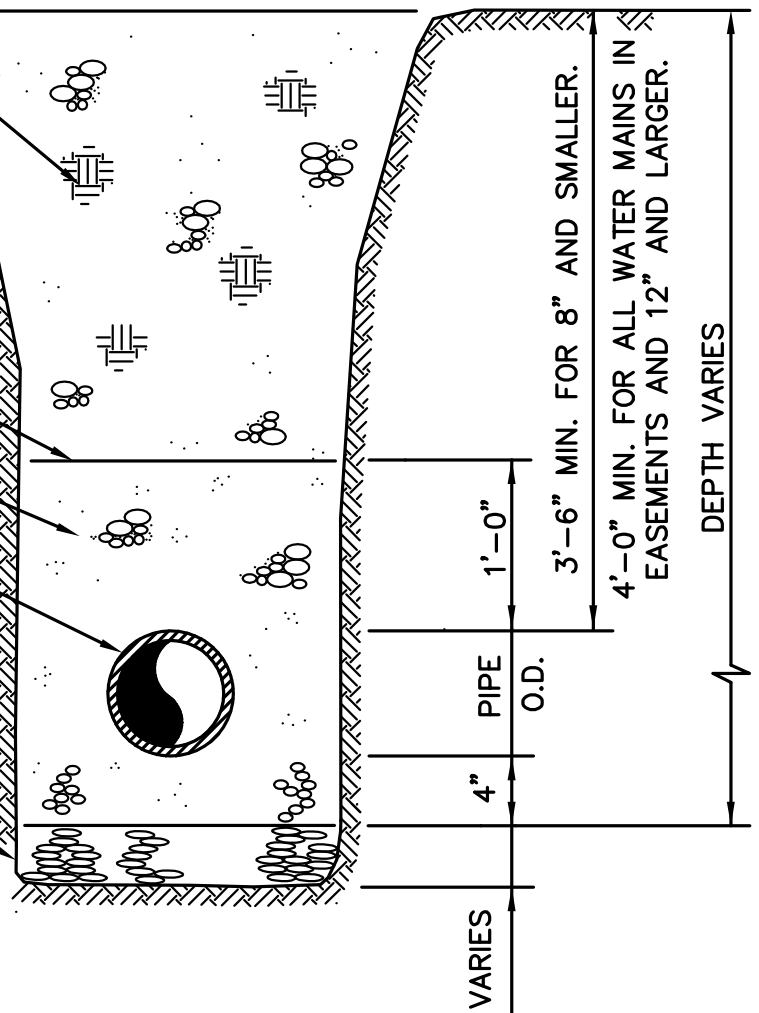
COMPACTED BACKFILL CONSISTING OF EXCAVATED MATERIAL OR GRAVEL BASE, OR CDF TO OBTAIN COMPACTION REQUIREMENTS PER MODIFIED PROCTOR ASTM D 1557 AS REQUIRED BY PERMITS

SPECIAL PRECAUTIONS TO PROTECT PIPE TO THIS LEVEL

COMPACTED SELECT BACKFILL

PVC PIPE, C900

FOUNDATION GRAVEL AS REQUIRED

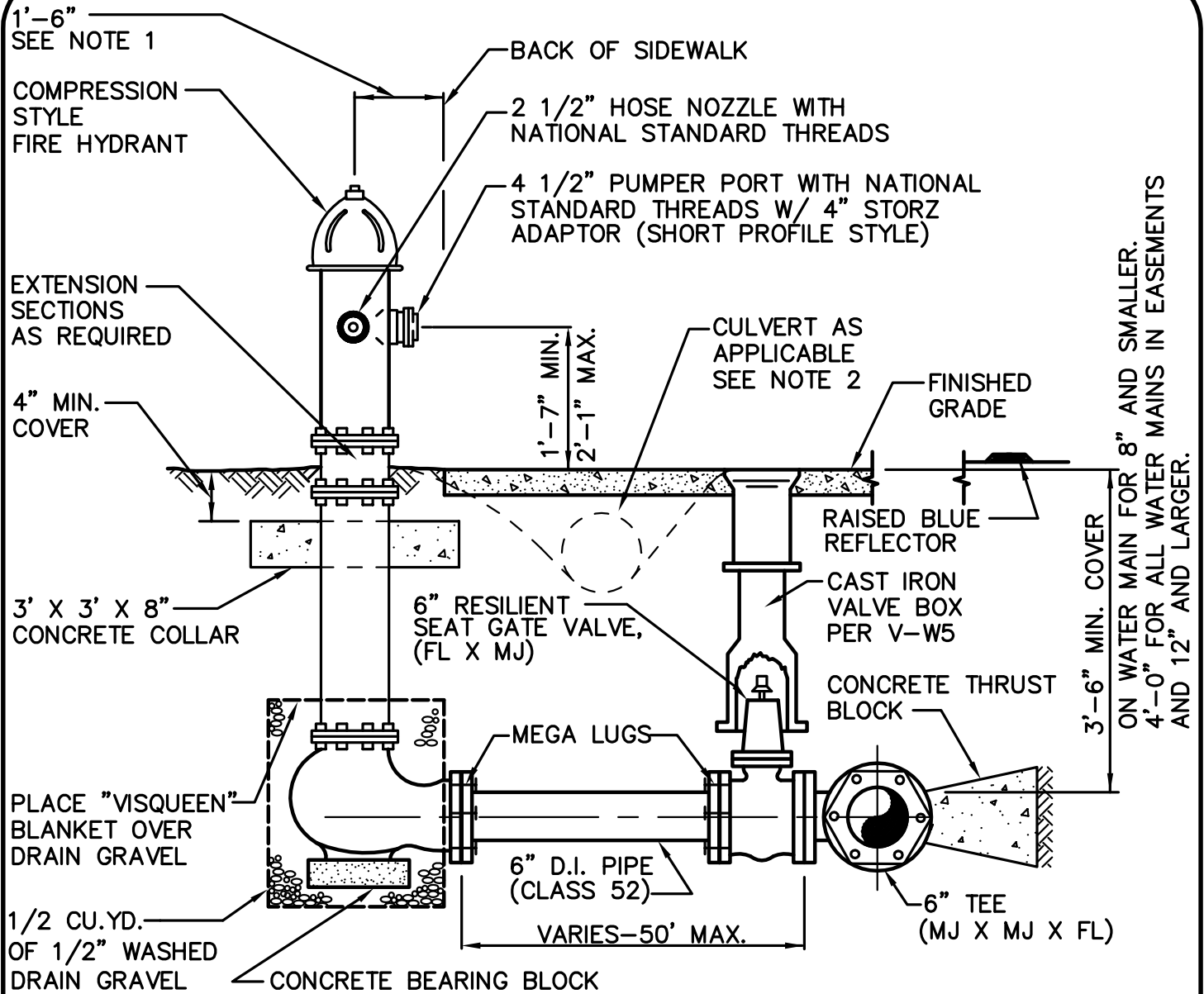


NOTE:

1. BACKFILL MATERIAL AND COMPACTION SHALL BE IN CONFORMANCE WITH DISTRICT STANDARDS AND/OR COUNTY, CITY, STATE PERMIT REQUIREMENTS.
2. DEPTH OF COVER IN EXCESS OF 7- FEET REQUIRES DISTRICT APPROVAL.
3. PIPES SHALL BE RESTRAINED IN FILL OR PREVIOUSLY DISTURBED MATERIAL.
4. CLAY OR BENTONITE DAMS SHALL BE INSTALLED ACROSS THE TRENCH AND TO THE FULL DEPTH OF THE GRANULAR MATERIAL IN ALL AREAS OF STEEP SLOPES, STREAM CROSSINGS AND WETLAND TO PREVENT MIGRATION OF WATER ALONG THE PIPELINE.

**WATER MAIN
TRENCH SECTION**

Whatcom County Water District 13
STANDARD DETAILS

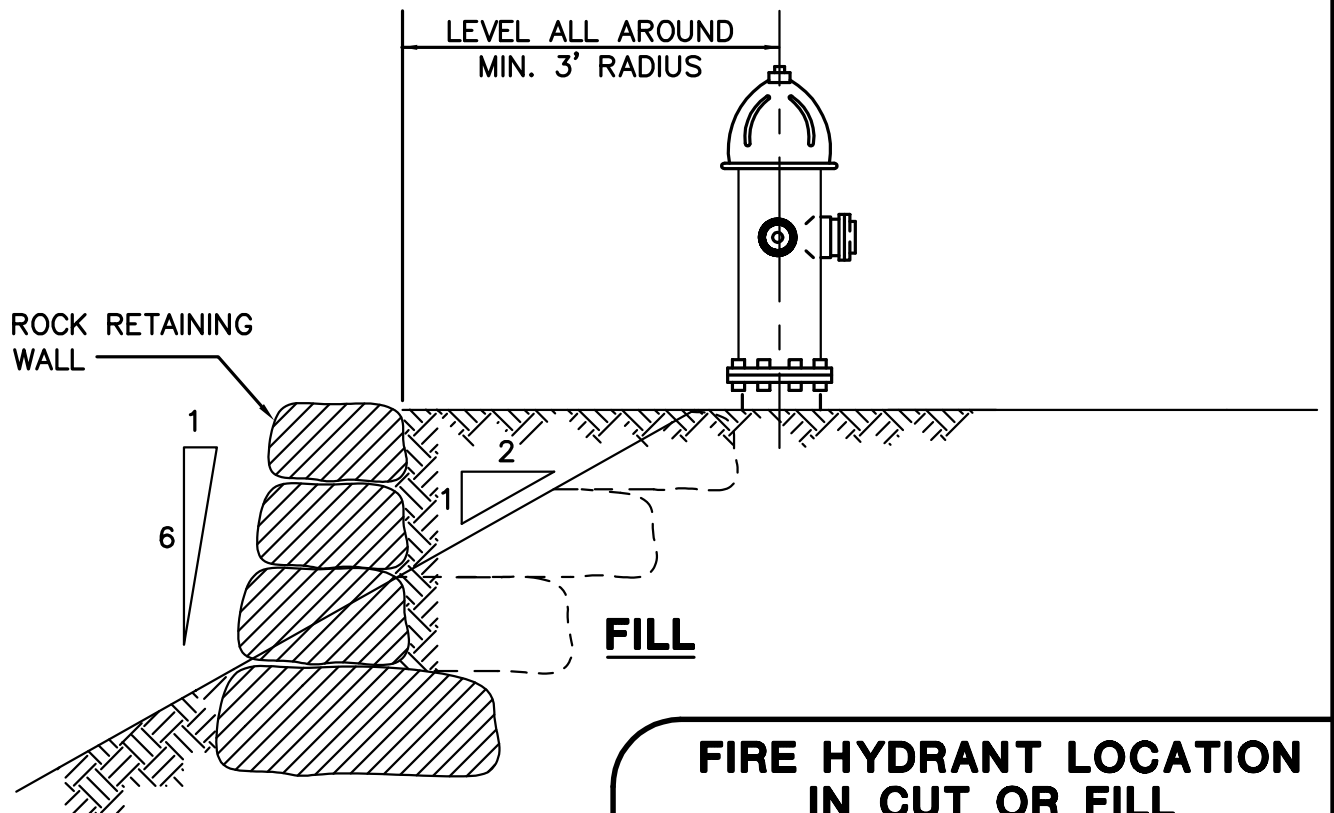
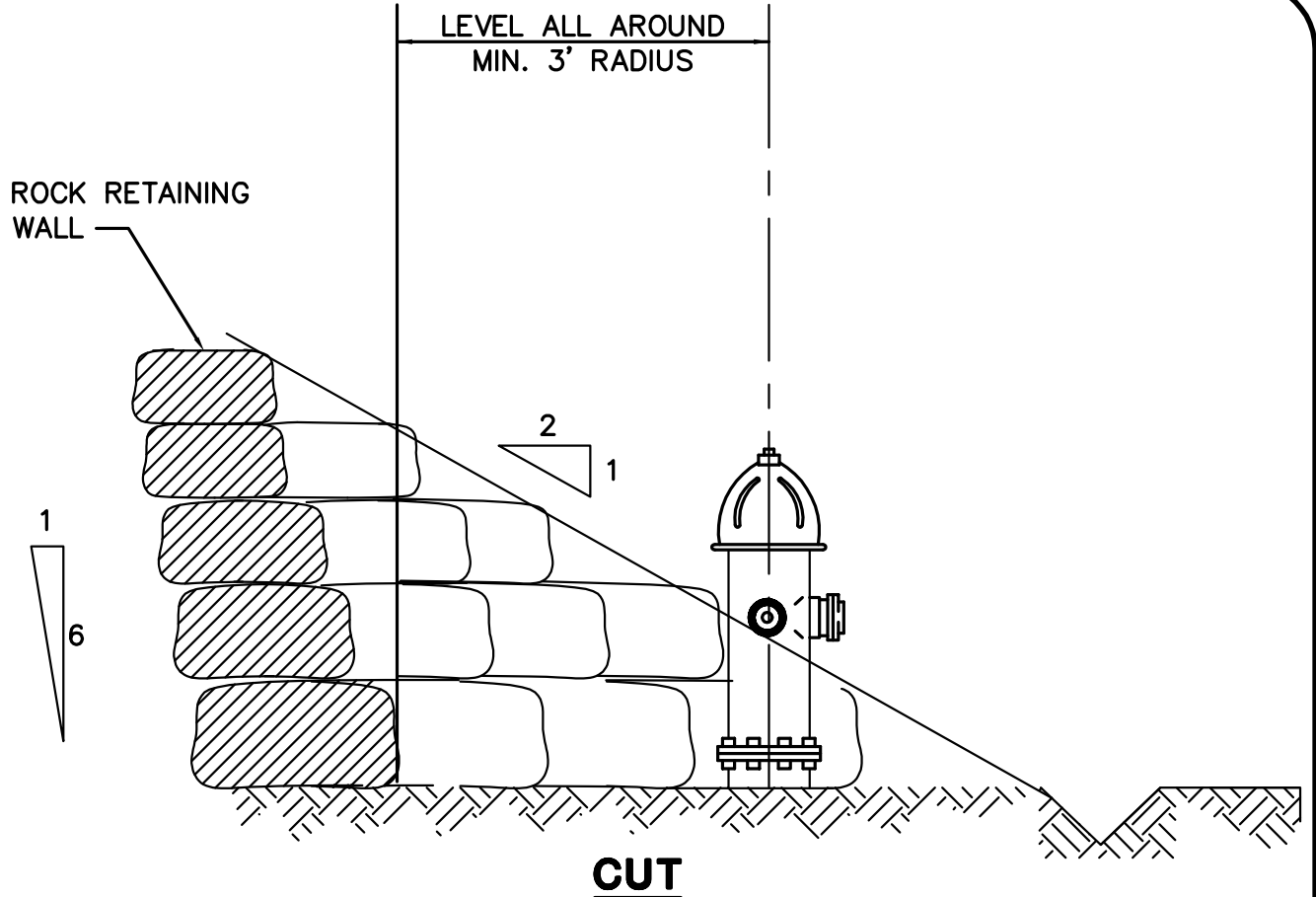


NOTES:

1. OR 3' FROM BACK OF CURB
2. PROVIDE 8' OF CULVERT AND COVER, 12" MIN. DIA. OR EQUAL IN SIZE TO ADJACENT DITCH CROSSINGS. PIPE TO COUNTY, STATE OR CITY STANDARDS AS APPLICABLE.
3. PROVIDE MIN. 3'-0" CLEARANCE AND LEVEL AREA AROUND HYDRANT
4. PAINT FIRE HYDRANT WITH TWO COATS KELLY MOORE 6100-516 YELLOW.
5. STENCIL FOOTAGE TO VALVE ON HYDRANT UNDER PORT FACING GV
6. REMOVE ALL CHAINS FOR FIRE HYDRANT CAPS
7. ACCEPTABLE HYDRANTS: CLOW MEDALLION, M&H STYLE 929, MUELLER CENTURION, WATEROUS PACER
8. INSTALL BLUE FIRE HYDRANT REFLECTOR. OFFSET 1 FOOT FROM ROAD CENTERLINE

FIRE HYDRANT ASSEMBLY

Whatcom County Water District 13
STANDARD DETAILS

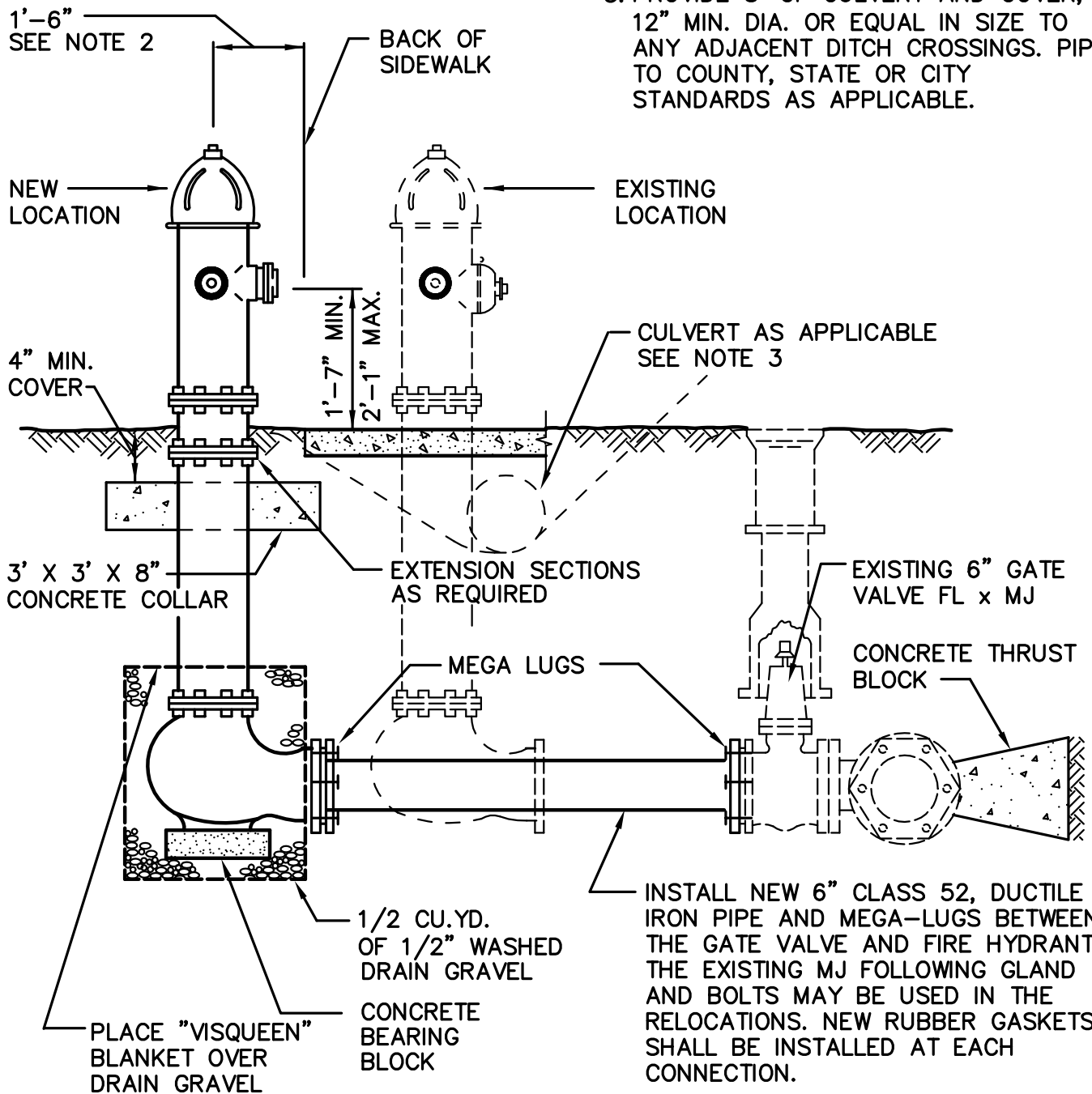


**FIRE HYDRANT LOCATION
IN CUT OR FILL**

Whatcom County Water District 13
STANDARD DETAILS

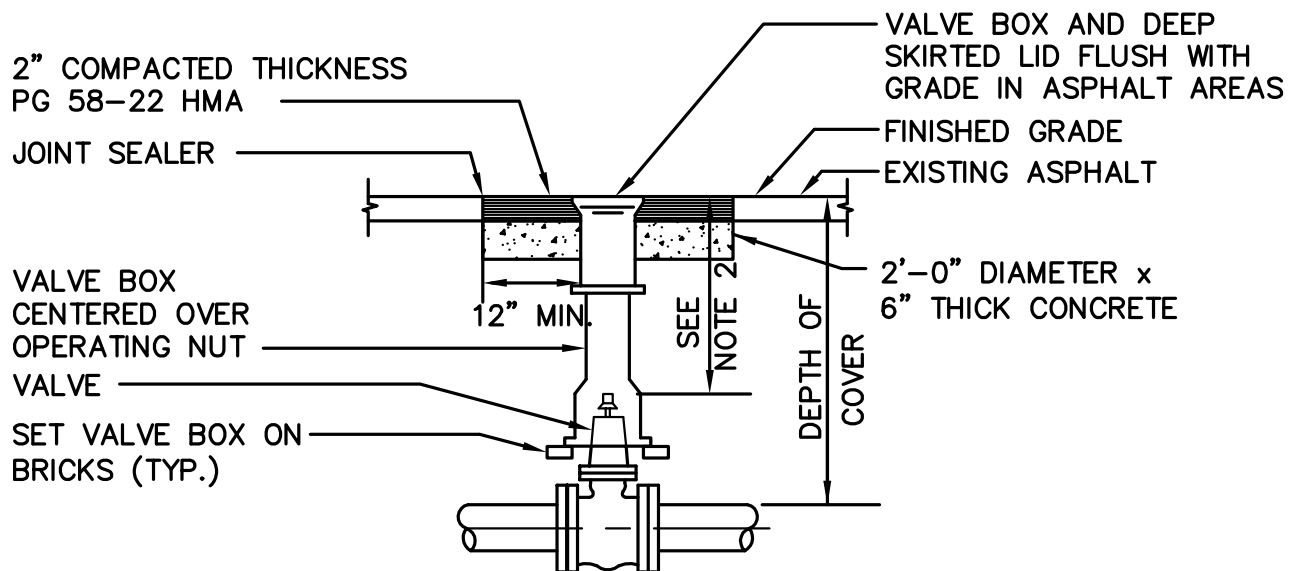
NOTES:

1. FIRE HYDRANT MUST MEET DISTRICT REQUIREMENTS. FOR NEW HYDRANTS (SEE VI-W2). REPLACE WITH NEW FIRE HYDRANT IF REQUIRED.
2. OR 3' FROM BACK OF CURB.
3. PROVIDE 8' OF CULVERT AND COVER, 12" MIN. DIA. OR EQUAL IN SIZE TO ANY ADJACENT DITCH CROSSINGS. PIPE TO COUNTY, STATE OR CITY STANDARDS AS APPLICABLE.

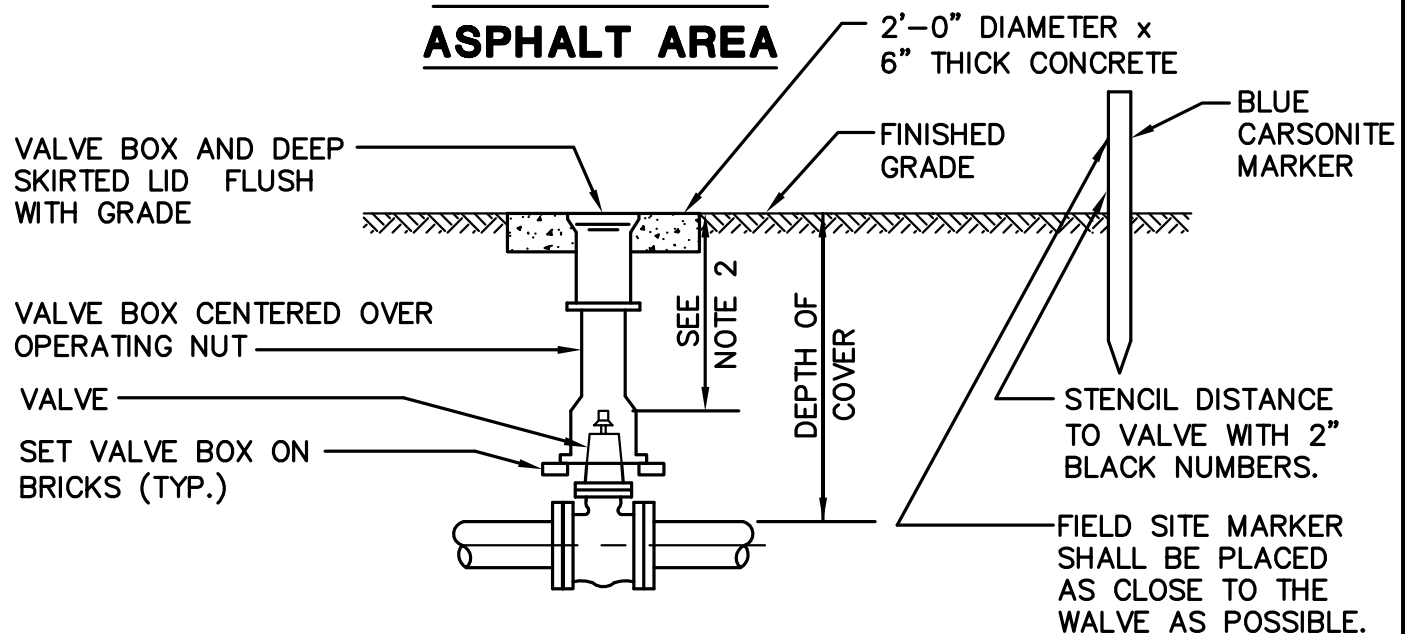


**RELOCATE
FIRE HYDRANT ASSEMBLY**

Whatcom County Water District 13
STANDARD DETAILS



VALVE BOX IN ASPHALT AREA



VALVE BOX IN UNIMPROVED AREA (VALVE MARKER REQUIRED)

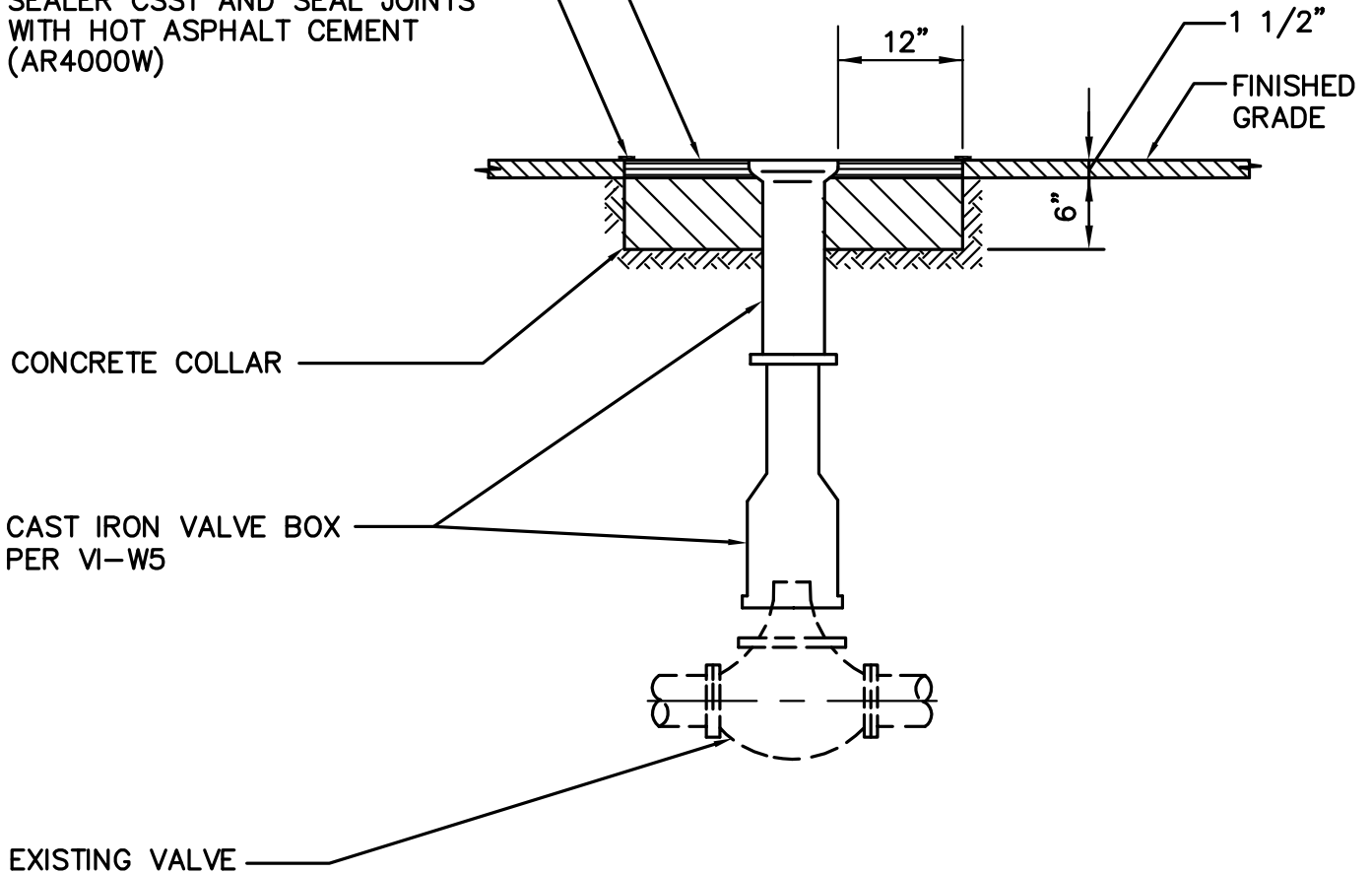
NOTES:

1. EACH VALVE SHALL BE PROVIDED WITH AN ADJUSTABLE CAST IRON VALVE BOX OF 5 INCHES (5") INSIDE DIAMETER. VALVE BOXES SHALL HAVE A TOP SECTION WITH AN EIGHTEEN INCH (18") MIN. LENGTH. THE VALVE BOX SHALL BE OLYMPIC FOUNDRY No. 940, EAST JORDON, OR EQUAL.
2. 18" MINIMUM, 24" MAXIMUM FOR OPERATOR NUT IF EXTENSION IS REQUIRED.
3. VALVE BOX EARS SHALL BE PLACED IN LINE WITH THE PIPE IT SERVES.
4. DISTRICT MAY REQUIRE LOCKING VALVE BOX IN TRAFFIC AREAS. OLYMPIC FOUNDRY NO. 045DT OR EQUAL.

VALVE BOX
Whatcom County Water District 13
STANDARD DETAILS

1 1/2" COMPACTED THICKNESS
PG 58-22 HMA.

CLEAN AND TACK EDGES WITH
SEALER CSS1 AND SEAL JOINTS
WITH HOT ASPHALT CEMENT
(AR4000W)

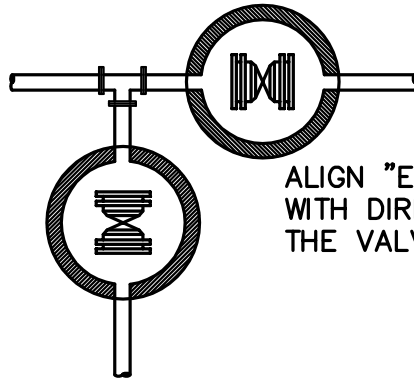


NOTES:

1. ALL EXISTING CONCRETE VALVE BOXES SHALL BE REPLACED WITH CAST IRON BOXES AND ADJUSTED WITH SOIL PIPE TO GRADE AS NEEDED.
2. ALL EXISTING CAST IRON VALVE BOXES SHALL BE ADJUSTED TO GRADE OR NEW CAST IRON BOXES INSTALLED.
3. ALIGNMENT OF THE VALVE BOX SHALL BE THE CONTRACTOR'S RESPONSIBILITY AND CARE SHALL BE TAKEN TO ENSURE THAT THE VALVE IS OPERABLE.
4. VALVE BOX EARS SHALL BE PLACED IN LINE WITH THE PIPE IT SERVES.

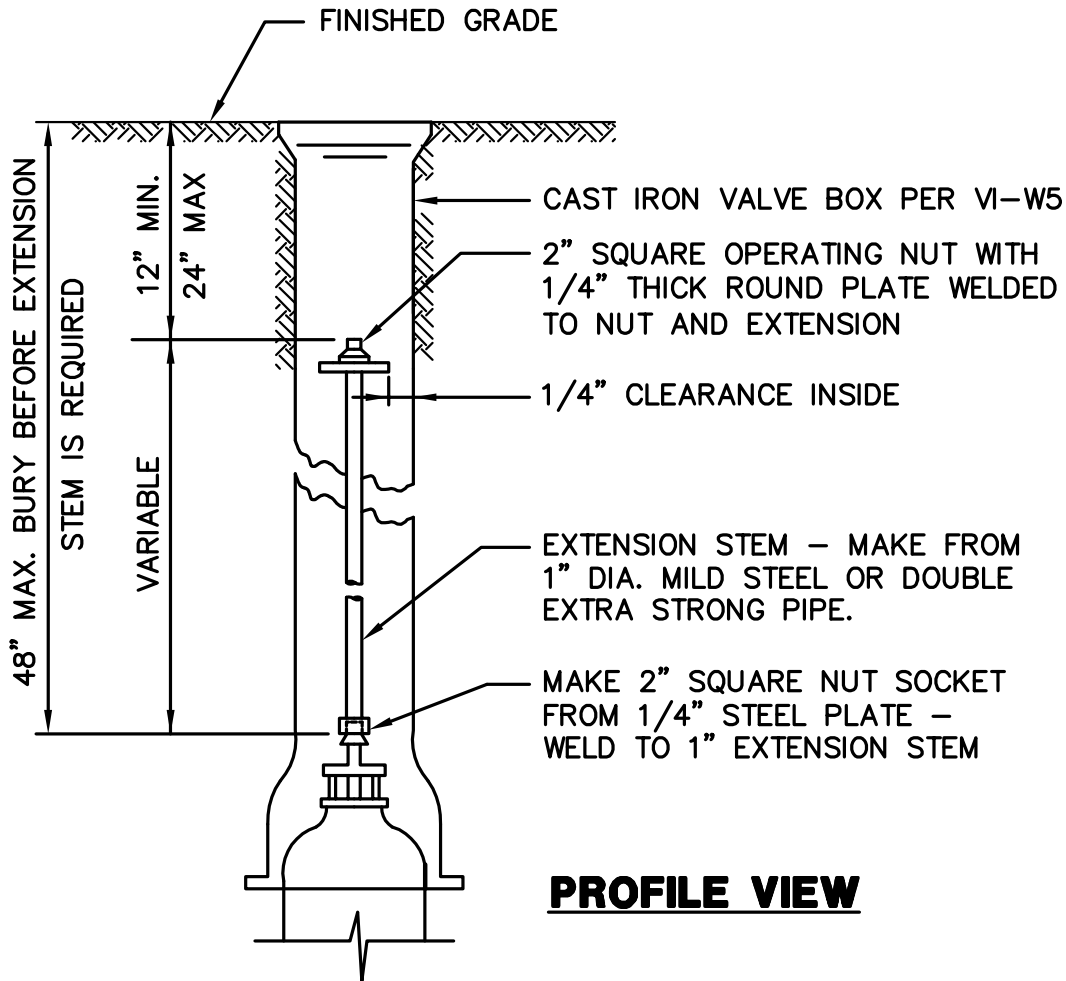
VALVE BOX ADJUSTMENT

Whatcom County Water District 13
STANDARD DETAILS



ALIGN "EARS" ON VALVE BOX TOP WITH DIRECTION OF PIPE BRANCH THE VALVE OPENS AND CLOSES.

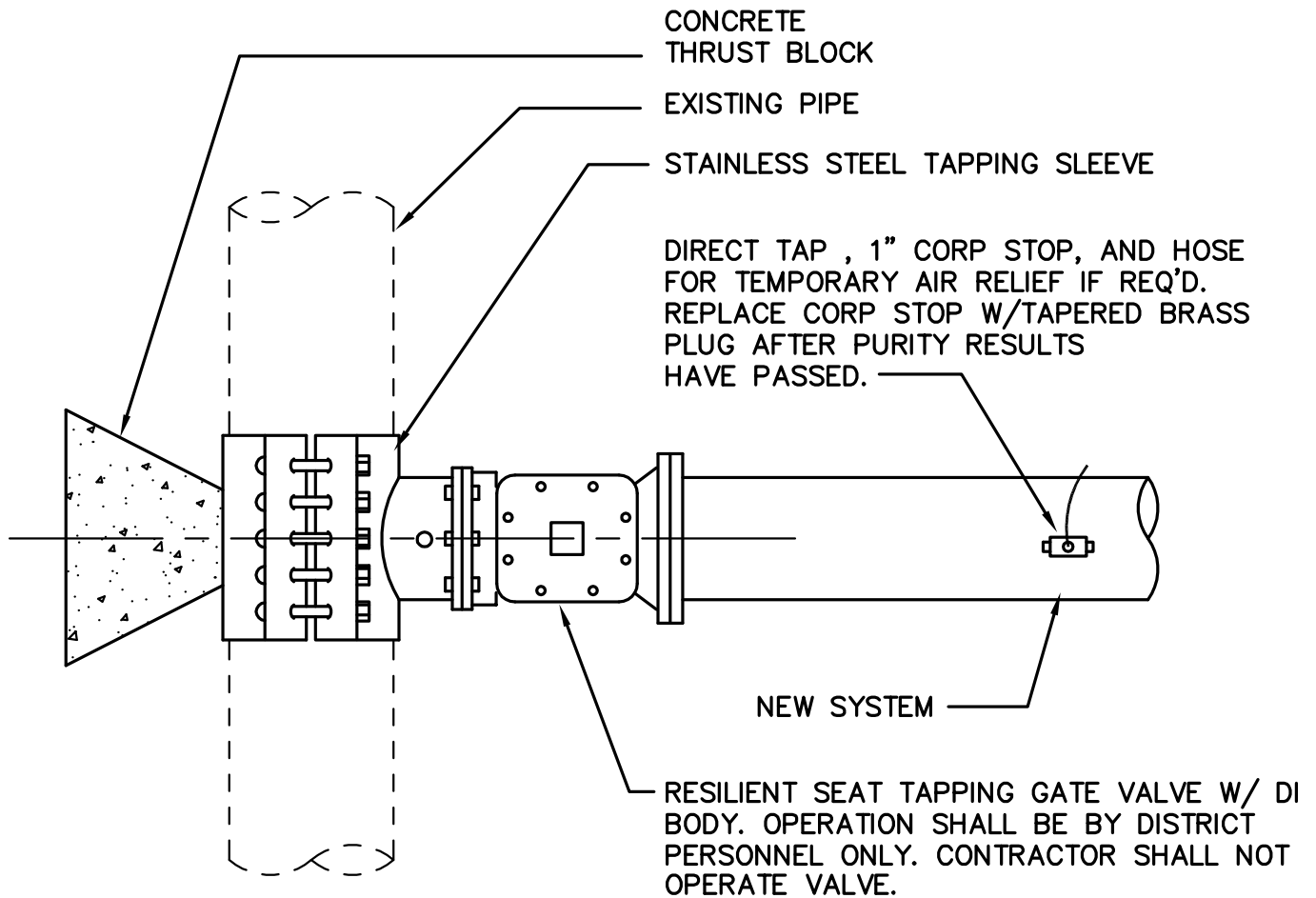
PLAN VIEW



PROFILE VIEW

VALVE EXTENSION STEM

Whatcom County Water District 13
STANDARD DETAILS

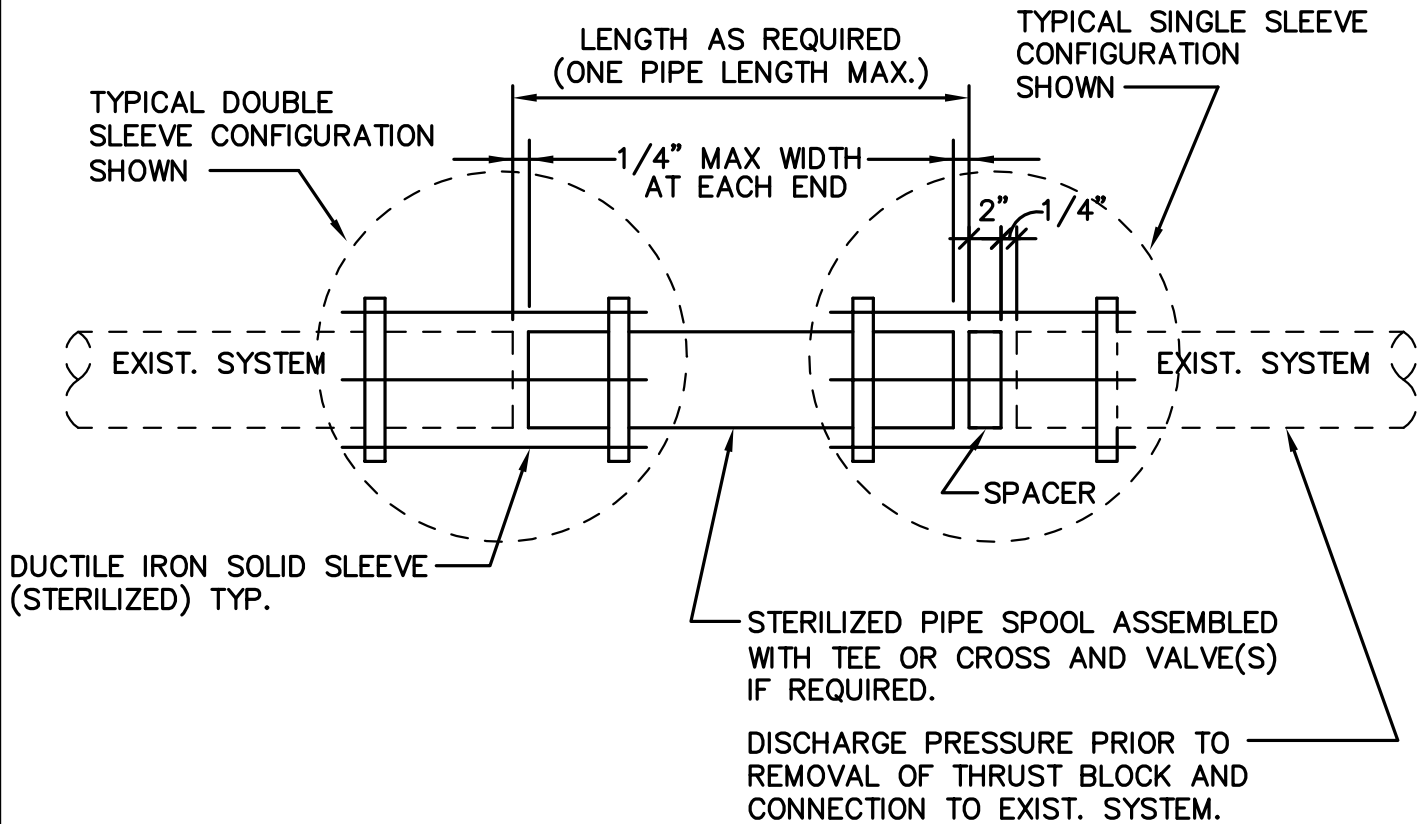


NOTES:

1. TAP TO BE INSTALLED AT DEVELOPERS EXPENSE UNDER DISTRICT OBSERVATION.
2. SIZE-ON-SIZE TAPPING TEES SHALL BE DUCTILE IRON MECHANICAL SLEEVE.
3. STEEL TAPPING TEES SHALL BE AT LEAST 2" SMALLER IN DIAMETER THAN THE EXISTING WATER MAIN AND SHALL BE EPOXY COATED.
4. TAPPING TEES SHALL BE AIR PRESSURE TESTED TO 100 PSI PRIOR TO TAPPING MAIN.
5. CONNECTIONS NOT ALLOWED ON FRIDAYS, HOLIDAYS, DAY BEFORE HOLIDAYS, OR WEEKENDS.

WET TAP CONNECTION

Whatcom County Water District 13
STANDARD DETAILS



DISCHARGE PRESSURE PRIOR TO REMOVAL OF THRUST BLOCK AND CONNECTION TO EXIST. SYSTEM.

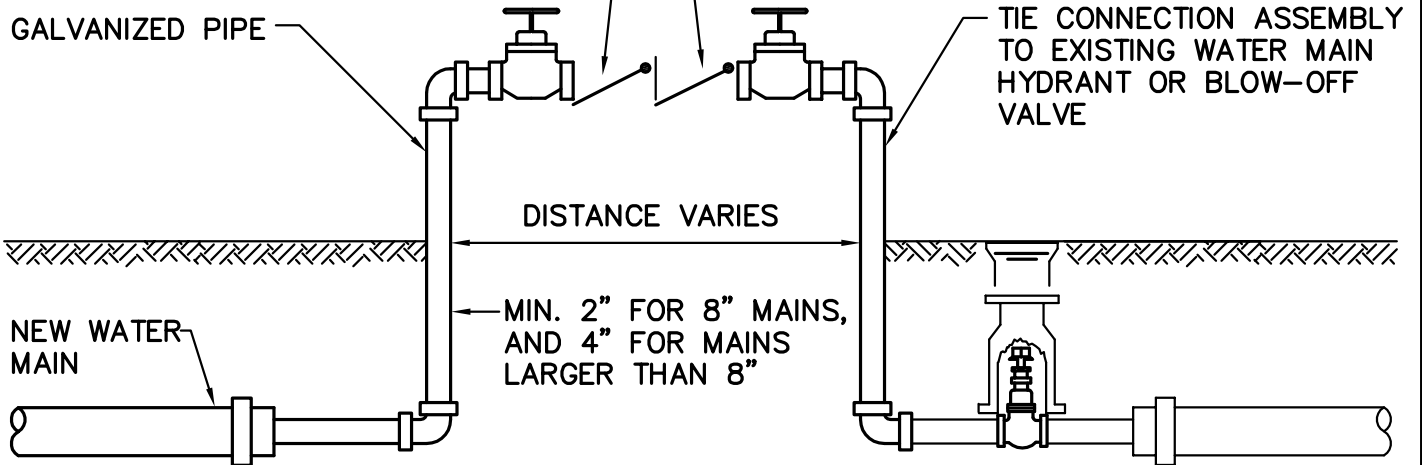
NOTES:

1. IN-LINE VALVE(S) IN EXISTING SYSTEM MAY BE REQUIRED BY THE DISTRICT AT NEW INTERTIE LOCATIONS. VALVE(S) ARE NOT SHOWN ABOVE FOR CLARITY.
2. MAXIMUM SPACES BETWEEN PIPES SHALL BE 1/4-INCH. IF A SINGLE SLEEVE IS USED, THE MAXIMUM SPACER WIDTH IS 2-INCHES.
3. CONNECTIONS NOT ALLOWED ON FRIDAYS, HOLIDAYS, DAY BEFORE HOLIDAYS, OR WEEKENDS.

CUT IN CONNECTION

Whatcom County Water District 13
STANDARD DETAILS

DOUBLE CHECK VALVES (TO MATCH PIPE DIAMETER) APPROVED IN WASHINGTON STATE, AND TESTED WITHIN 90 DAYS WHENEVER INSTALLED OR MOVED. PROVIDE CERTIFICATION TO DISTRICT.

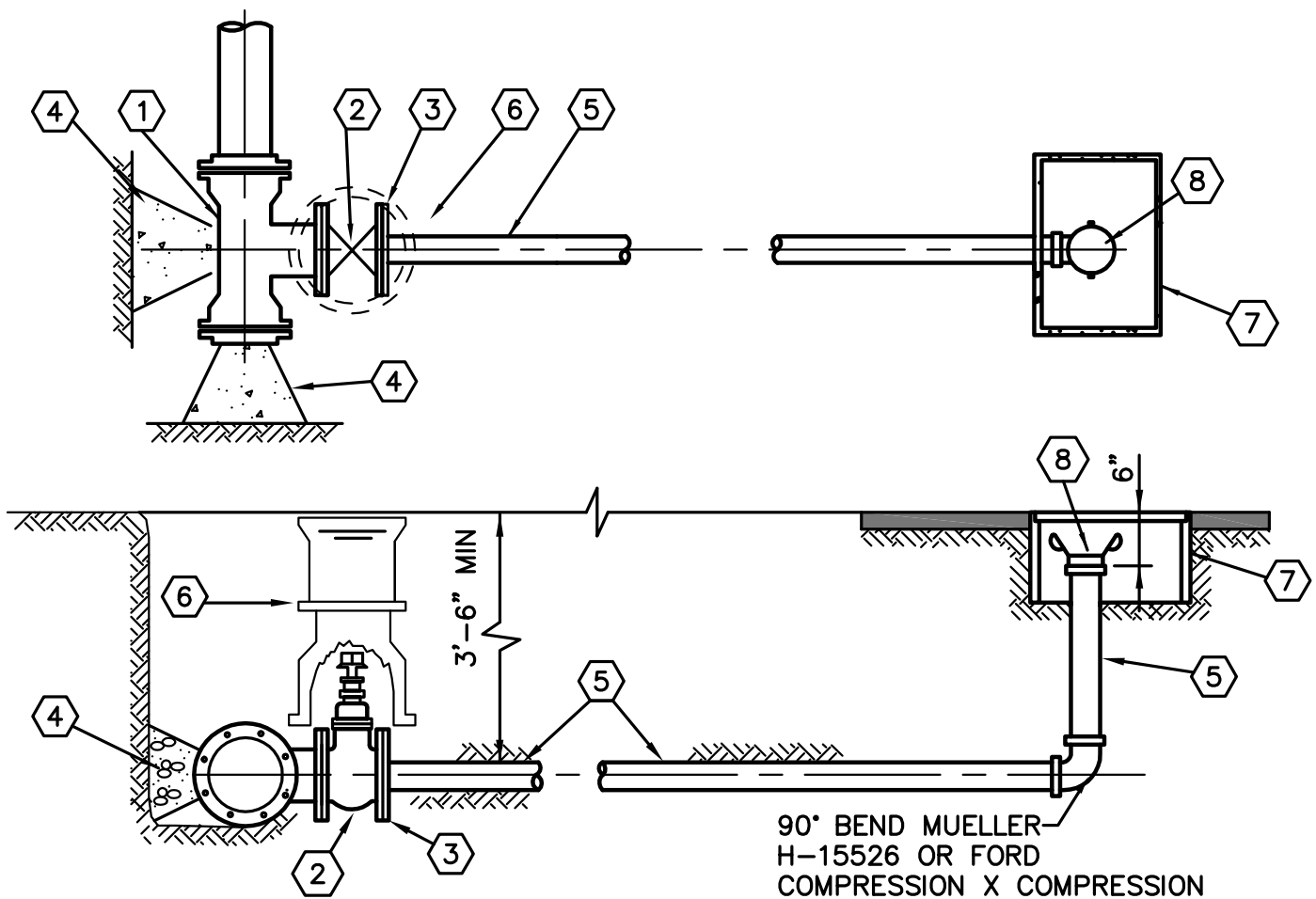


NOTES:

1. PROTECT INSTALLATION FROM DAMAGE AND FREEZING.
2. ALL WATER USED FOR FILLING AND FLUSHING SHALL BE METERED BY DISTRICT. PROVIDE SPACE FOR INSTALLATION OF METER, OR INSTALL ON POINT OF DISCHARGE.
3. ALL NEW MAINS SHALL BE KEPT SEPARATE FROM THE DISTRICT'S EXISTING SYSTEM UNTIL THE NEW MAINS ARE TESTED AND ACCEPTED. FINAL CONNECTION REQUIRES 100% INSPECTION BY THE DISTRICT.

TESTING CONNECTION DETAIL

Whatcom County Water District 13
STANDARD DETAILS



90° BEND MUELLER
H-15526 OR FORD
COMPRESSION X COMPRESSION

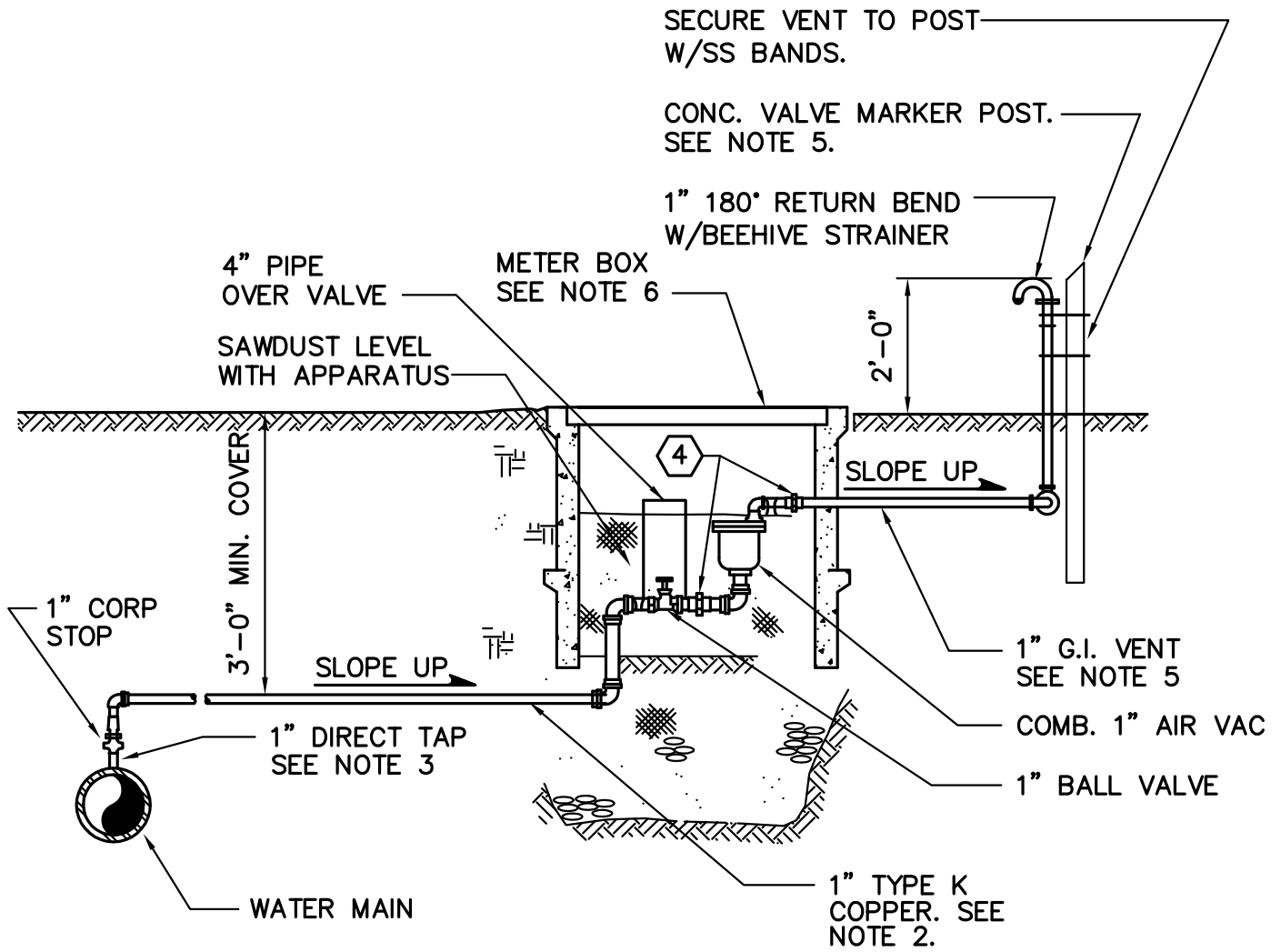
- ① MJ X MJ X 4" FL D.I. TEE.
- ② 4" AWWA RESILIENT SEAT GATE VALVE, FL X FL, WITH OPERATING NUT.
- ③ 4" BLIND FLANGE, TAPPED FOR 2" FOR 6" AND 8" MAINS. MAINS LARGER THAN 8" SHALL END IN A FIRE HYDRANT.
- ④ CONCRETE THRUST BLOCK.
- ⑤ 2" TYPE K COPPER PIPE.
- ⑥ CAST IRON VALVE BOX PER VI-W5
- ⑦ METER BOX. BERG VAULT CO. OF WASH NO. 2 CONCRETE OR MID STATES PLASTICS MSBCF 1324-12Z COMPOSITE. BOX SHALL BE H-20 LOAD RATED WHERE REQUIRED. (FIELD LOCATION TO BE IN PAVED SURFACE UNLESS DISTRICT APPROVES ALTERNATE LOCATION.)
- ⑧ ALUMINUM CAM-LOCK AND CAP. DRILL 1/8" HOLE IN CAP. (PLASTIC CAM LOCK FITTING NOT ALLOWED)

NOTES

- 1. INSTALL DIELECTRIC COMPOUNDS FOR SEPARATION AT DISSIMILAR METALS.

BLOW OFF ASSEMBLY

Whatcom County Water District 13
STANDARD DETAILS



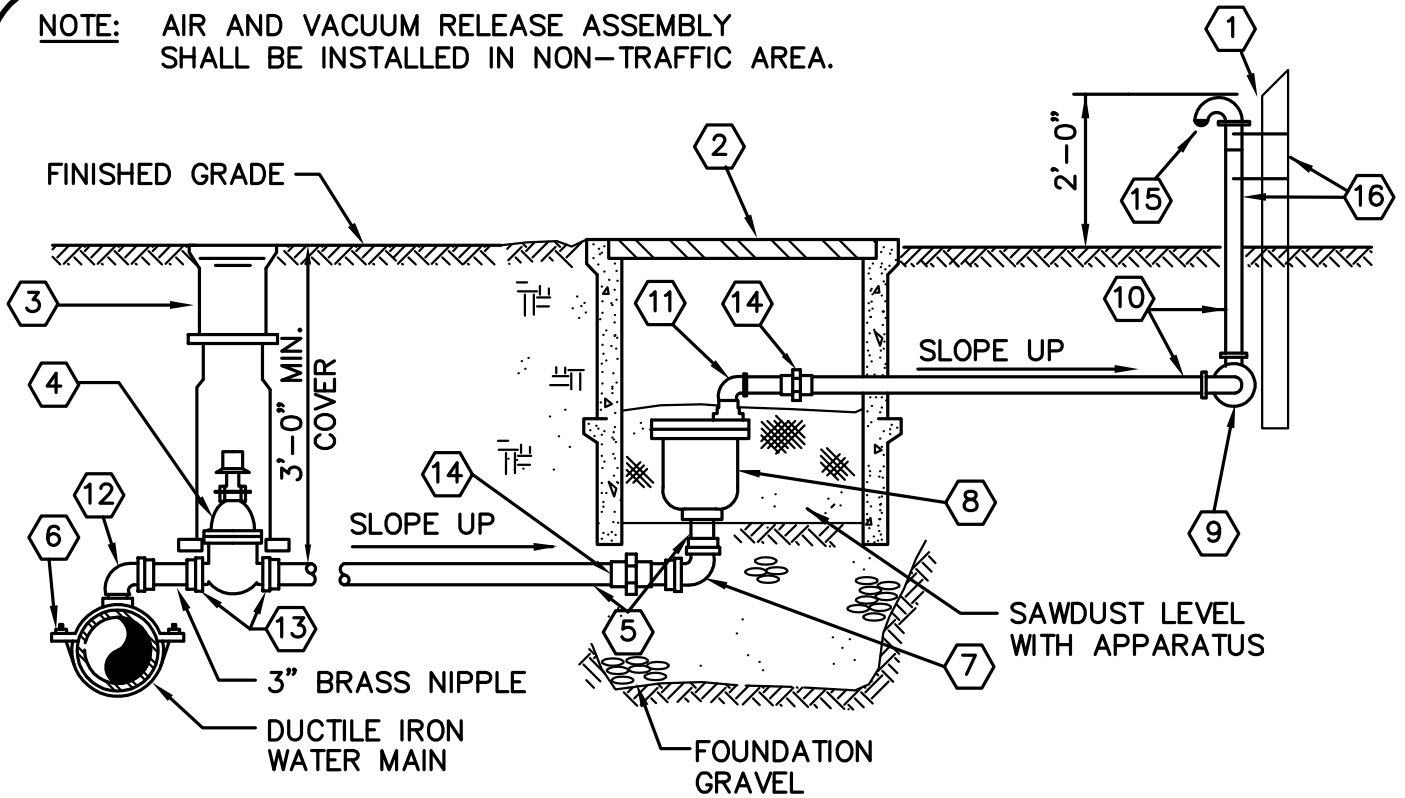
NOTES:

1. USE OF 1" AIR VAC REQUIRES DISTRICT APPROVAL, 2" AIR VAC STANDARD.
2. ALL PIPING AND FITTINGS BETWEEN CORP AND INLET SIDE OF COMBINATION AIR AND VACUUM ASSEMBLY SHALL BE COPPER OR BRASS.
3. TAP WATER MAIN AT HIGH POINT AT LOCATION DESIGNATED BY THE DISTRICT.
4. AIR VAC ASSEMBLY TO BE CONNECTED USING HORIZONTALLY PLACED UNIONS AT EACH END OF AIR VAC ASSEMBLY (MATCH PIPE MATERIAL).
5. PAINT EXPOSED PORTION OF VENT PIPE AND MARKER POST WITH 2 COATS KELLY-MOORE 6100-516 YELLOW.
6. METER BOX. BERG VAULT CO. OF WASH NO. 2 CONCRETE OR MID STATES PLASTICS MSBCF 1730-12 COMPOSITE. BOX SHALL BE H-20 LOAD RATED WHERE REQUIRED.
7. FIELD LOCATION TO BE CONFIRMED WITH DISTRICT.

**1" AIR AND VACUUM
RELEASE ASSEMBLY**

Whatcom County Water District 13
STANDARD DETAILS

NOTE: AIR AND VACUUM RELEASE ASSEMBLY SHALL BE INSTALLED IN NON-TRAFFIC AREA.



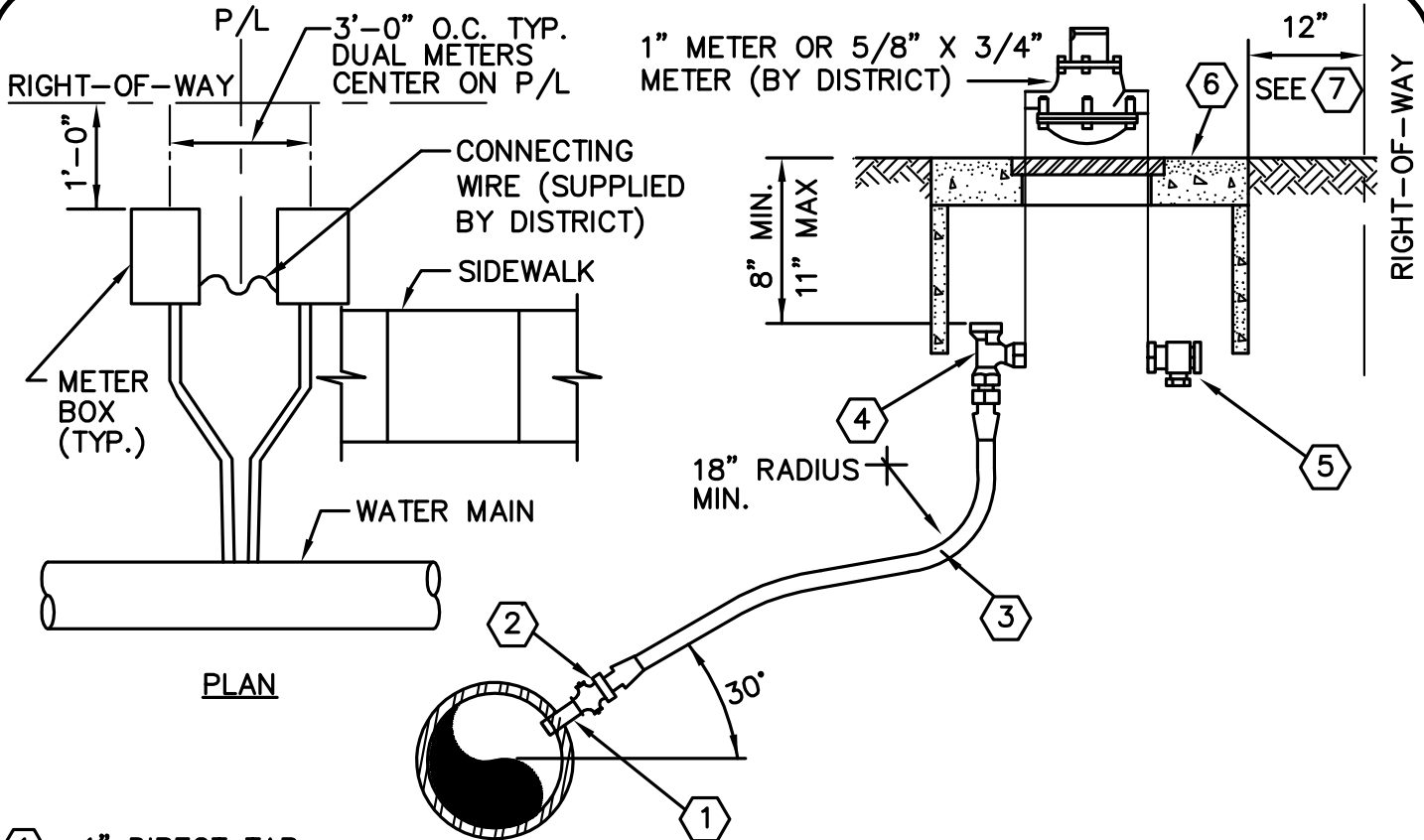
- | | |
|--|---|
| <ul style="list-style-type: none"> ① CONC. VALVE MARKER POST ② METER BOX. BERG VAULT CO. OF WASH NO.2 CONCRETE OR MID STATES PLASTICS MSBCF 1730-12 COMPOSITE. BOX SHALL BE H-20 LOAD RATED WHERE REQUIRED. ③ CAST IRON VALVE BOX PER VI-W5 ④ 2" AWWA RESILIENT SEAT GATE VALVE THD X THD, WITH OPERATING NUT ⑤ 2" TYPE "K" COPPER TUBING ⑥ DOUBLE STRAP SERVICE CLAMP ⑦ 90° BEND MUELLER No. H-15526 COMPRESSION X COMPRESSION ⑧ 2" COMBINATION AIR & VACUUM RELEASE ASSEMBLY; A. APCO MODEL 145C.
B. CRISPIN MODEL UL 20 SERIES.
C. VALMATIC | <ul style="list-style-type: none"> ⑨ 2, 2"X90° ELL, GALV. ⑩ 2" GALV. IRON PIPE (FIELD LOCATE NEXT TO EXISTING PROPERTY LINE). ⑪ 2"X90° ELL, GALV. ⑫ 90° BEND MUELLER No. H-10096 FEMALE X M.I.P. ⑬ STRAIGHT COUPLING, MUELLER No. H-15428 COMPRESSION TO M.I.P. ⑭ UNIONS ⑮ 2" OPEN PATTERN RETURN BEND WITH 2" BEEHIVE STRAINER ⑯ PAINT EXPOSED PORTION OF VENT PIPE AND MARKER POST WITH TWO COATS OF KELLY MOORE 6100-516 YELLOW. SECURE VENT TO POST WITH SS BANDS |
|--|---|

NOTES:

1. ALL PIPING AND FITTINGS BETWEEN DOUBLE STRAP SADDLE AND INLET SIDE OF COMBINATION AIR AND VACUUM ASSEMBLY SHALL BE COPPER OR BRASS.
2. TAP WATER MAIN AT HIGH POINT AT LOCATION TO BE DETERMINED BY THE DISTRICT.
3. AIR VAC ASSEMBLY TO BE CONNECTED USING HORIZONTALLY PLACED UNIONS AT EACH END OF AIR VAC ASSEMBLY (MATCH PIPE MATERIAL)

**2" AIR AND VACUUM
RELEASE ASSEMBLY**

**Whatcom County Water District 13
STANDARD DETAILS**

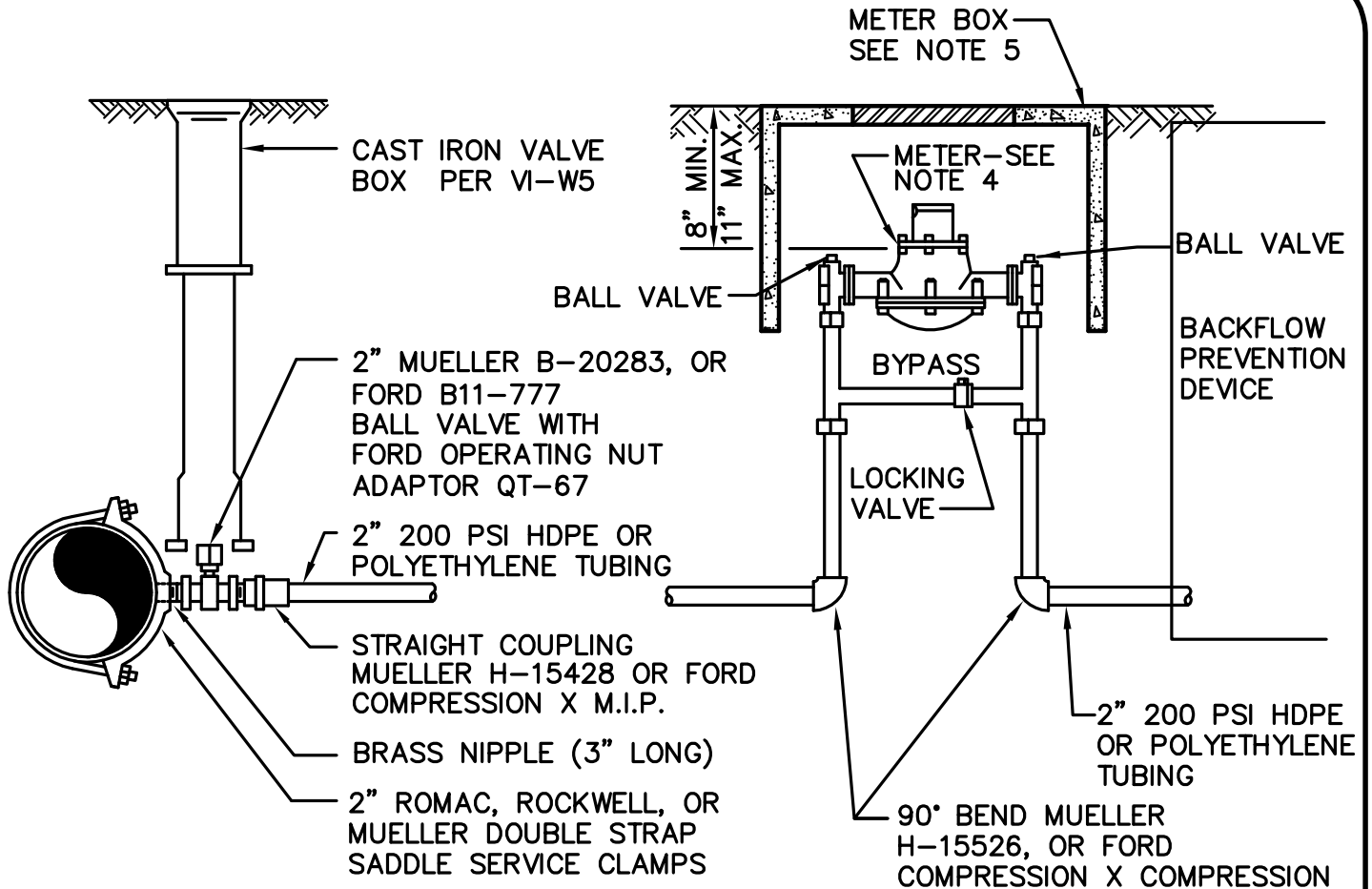


- ① 1" DIRECT TAP
- ② 1" BALL TYPE CORPORATION STOP MUELLER B-25008, FORD FB1000-Q4, A.Y. McDONALD 4701BQ
- ③ 1" 200 PSI HDPE OR POLYETHYLENE TUBING - LENGTH AS REQUIRED
- ④ 1"x3/4" FOR 5/8"x3/4" METERS, 1" ANGLE METER BALL VALVE, MUELLER B-24258, FORD BA43-342 W2, A.Y. McDONALD 4642BQ
- ⑤ 1" ANGLE DUAL CHECK VALVE, MUELLER H-14244, FORD HHA31-323, A.Y. McDONALD 12-3HE43
- ⑥ BERG VAULT CO. OF WASH NO. 1 CONCRETE METER BOX MAY BE USED FOR 5/8"x3/4" METERS ONLY, MID STATES PLASTICS MSBCF 1324-12 W/1324-RL COMPOSITE BOX MAY BE USED FOR 5/8"x3/4" OR 1"x3/4" METERS. BOX SHALL BE H-20 LOAD RATED WHERE REQUIRED BY DISTRICT.
- ⑦ OR IN PLANTER, IF BACK OF SIDEWALK IS AT RIGHT OF WAY

NOTES:

- 1. NO SPLICES IN 1" TUBING ALLOWED.
- 2. SERVICE FROM METER BOX TO HOUSE BY PROPERTY OWNER.
- 3. INDIVIDUAL SERVICE REQUIRED FOR EACH STRUCTURE OR LOT.
- 4. METER TO BE INSTALLED BY THE DISTRICT AT OWNER'S EXPENSE.
- 5. ESMT PROVIDED TO DISTRICT AROUND METERS LOCATED OUTSIDE R/W.
- 6. ALL SERVICES EXCEPT SINGLE FAMILY RESIDENTIAL TO HAVE APPROVED BACKFLOW PREVENTION DEVICE CONFIRM INSTALLATION WITH DISTRICT. INITIAL AND ANNUAL TESTING REQUIRED AND SUBMITTAL OF TEST RESULTS TO DISTRICT FOR CONFIRMATION

1" WATER SERVICE

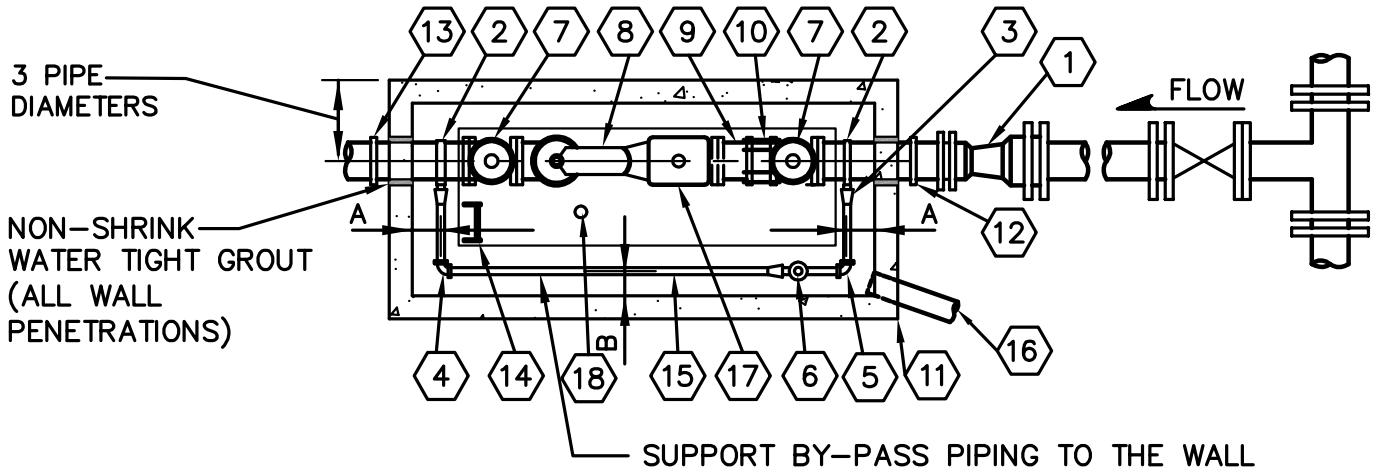


NOTES:

1. NO SPLICES IN 2" TUBING ALLOWED.
2. SERVICE FROM METER BOX TO STRUCTURE BY PROPERTY OWNER.
3. INDIVIDUAL SERVICES REQUIRED FOR EACH STRUCTURE.
4. 2-INCH METER SETTER (WITH ADAPTERS IF 1 1/2-INCH METER USED), NEPTUNE OR RADIO READ SENSUS METER WITH SENSUS AMR MXU UNIT READING 100 CUBIC FEET SHALL BE FURNISHED BY THE DEVELOPER. SETTER - A.Y. McDONALD 30B7-WWFF 775 OR MUELLER B-2427. DRILL 2" DIAMETER HOLE IN LID FOR MXU DEVICE.
5. BERG VAULT CO. OF WASH NO. 2 CONCRETE METER BOX OR MID STATES PLASTICS MSBCF 1730-12 COMPOSITE METER BOX. BOX SHALL BE H-20 LOAD RATED WHERE REQUIRED.
6. ESMT PROVIDED TO DISTRICT AROUND METERS LOCATED OUTSIDE R/W.
7. ALL SERVICES SHALL HAVE WASHINGTON STATE APPROVED RPBA FOR BACKFLOW PREVENTION LOCATED IMMEDIATELY BEHIND METER. CONFIRM LOCATION OF ASSEMBLY WITH DISTRICT. INITIAL AND ANNUAL TESTING REQUIRED AND SUBMITTAL OF TEST RESULTS TO DISTRICT FOR CONFIRMATION. MULTIFAMILY ALLOWED TO USE DCVA IN LIEU OF RPBA.

2" WATER SERVICE

Whatcom County Water District 13
STANDARD DETAILS



PLAN

- ① 4"x3" REDUCER, M.J. FOR 3" METER
- ② SINGLE STRAP SERVICE CLAMP, ROMAC 101 WITH IPS TAP, OR EQUAL (1 1/2" OR 2" BYPASS, 4-INCH BYPASS REQUIRES D.I. TEE).
- ③ FITTINGS AS REQUIRED.
- ④ BEND CPLG COPPER TO COPPER MUELLER H-15525.
- ⑤ BEND CPLG, COPPER TO OUTSIDE I.P. THREAD MUELLER H-15530, OR EQUAL.
- ⑥ BALL VALVE WITH PADLOCK WING OR LOCK CAP, FORD B21-444W OR B21-666 WITH LOCK CAP OR B21-777 WITH LOCK CAP. SIZED TO LINE.
- ⑦ RESILIENT SEAT GATE VALVE, FL X FL SIZED TO METER.
- ⑧ 3" TO 10" SENSUS METER FOR IRRIGATION SERVICES AND 3" TO 10" COMPOUND METER IF FOR DOMESTIC SERVICE. READ IN CUBIC FEET WITH MXU RADIO UNIT AS SPECIFIED BY DISTRICT SHALL BE FURNISHED AND INSTALLED BY CONTRACTOR.
- ⑨ D.I. PIPE SPOOL FL X PE LENGTH TO FIT.
- ⑩ FL CPLG. ADAPT.
- ⑪ PRECAST CONCRETE VAULT, UTILITY VAULT OR EQUAL, SEE DETAIL VI-W16B FOR SIZING AND REQUIREMENTS.
- ⑫ MEGA-LUG FOLLOWER INSTALLED ON INFLOW SIDE OF VAULT WITH CONCRETE THRUST BLOCK OR SHACKLE TO THRUST BLOCK TO PREVENT MOVEMENT IF METER IS REMOVED. (BLOCK NOT SHOWN)
- ⑬ DIELECTRIC CPLG. TO BUILDING SERVICE. SIZE AS REQUIRED.
- ⑭ GALV. STEEL OR ALUMINUM LADDER. SECURE TO VAULT LID AND FLOOR. COORDINATE LOCATION FOR ACCESS.
- ⑮ BY-PASS (SIZE BY TABLE BELOW).
- ⑯ 6" PVC TO CATCH BASIN OR DAYLIGHT. WHERE GRAVITY DRAIN IS NOT FEASIBLE, PROVIDE SUMP, ELECTRICAL SERVICE AND PUMP WITH DISCHARGE TO SURFACE DRAIN. PUMP SHALL BE 1/2 HP ZOELLER M-53, WITH CHECK VALVE ON DISCHARGE LINE.

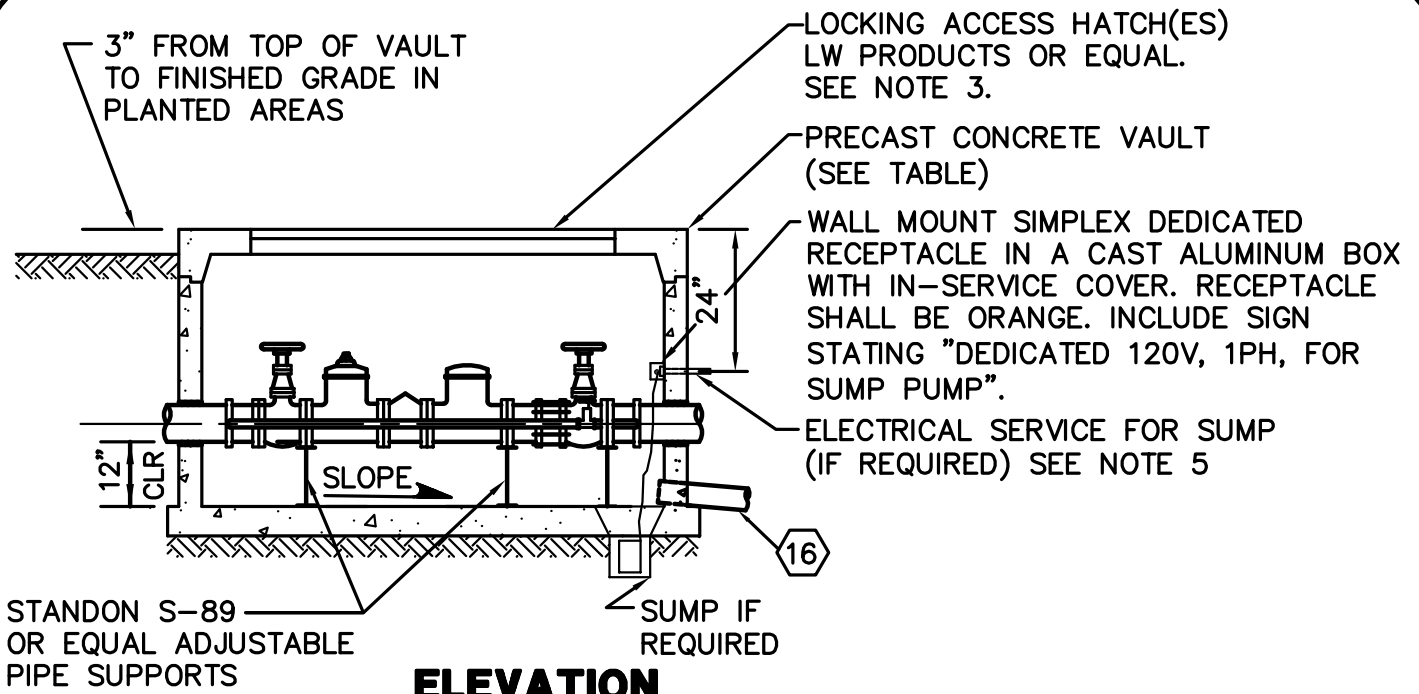
METER SIZE	MAIN-LINE	BYPASS	A	B
3"	4" DI.	1 1/2" COPPER	9"	4"
4"	4" DI.	1 1/2" COPPER	9"	4"
6"	6" DI.	2" COPPER	9"	4"
8"	8" DI.	4" DI.	14"	6"
10"	10" DI.	4" DI.	16"	6"

- ⑰ WATER METER STRAINER (FL) SENSUS OR EQUAL.
- ⑱ 2" DIAM. HOLE DRILLED IN LID, STREET SIDE FOR MXU HOLE.

METER VAULT ASSEMBLY 3" THROUGH 10"

NOTES:

1. SEE VI-W16B FOR ELEVATION AND NOTES.



ELEVATION

SEE DETAIL VI-W16A FOR CALLOUTS

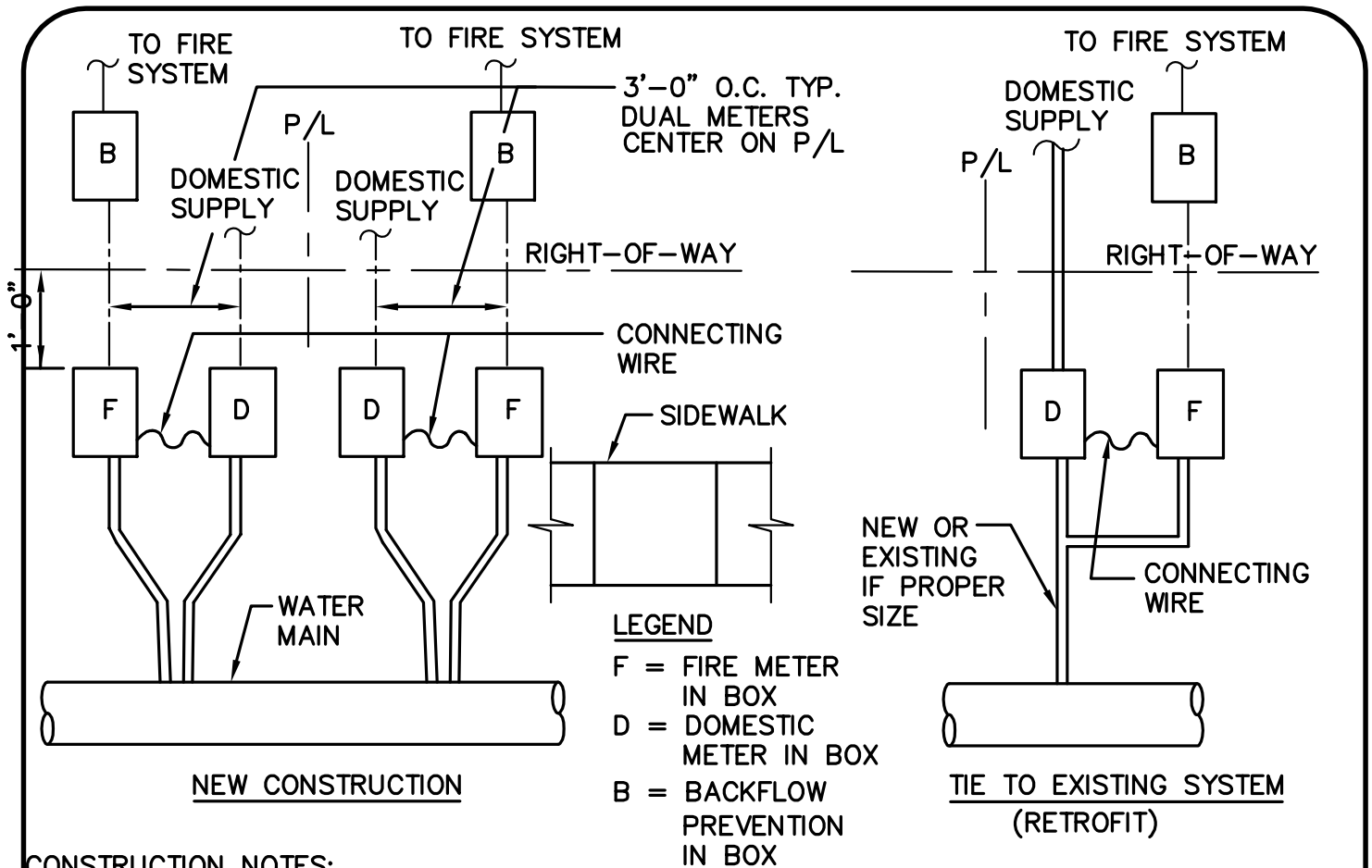
METER SIZE	MAIN-LINE	MINIMUM I/S VAULT DIM. L x W x H			UTILITY VAULT CO APPROVED MODEL	MIN. HATCH OPENING
3"	4" DI.	8'-4"	4'-4"	3'-4"	4484-LA	3' x 6'
4"	4" DI.	8'-4"	4'-4"	3'-4"	4484-LA	3' x 6'
6"	6" DI.	10'-6"	5'-0"	6'-2"	5106-LA	3' x 6'
8"	8" DI.	12'-0"	6'-0"	6'-6"	612-LA	3' x 6'
10"	10" DI.	14'-0"	8'-0"	6'-6"	814-LA	3' x 6'

NOTES:

- WASHINGTON STATE APPROVED REDUCED PRESSURE BACKFLOW PREVENTOR REQUIRED. SEE VI-W20. CONFIRM INSTALLATION WITH DISTRICT. INITIAL AND ANNUAL TEST REQUIRED.
- METER SHALL BE INSTALLED SUCH THAT IT CAN BE READ WITHOUT ENTERING VAULT WITH ACCESS HATCH OPEN.
- COORDINATE ORIENTATION OF HATCH(ES) TO PROVIDE CLEAR VERTICAL ACCESS TO METER ASSEMBLY, AND WITH LADDER LOCATION. VERIFY WITH DISTRICT.
- DRAIN DRAIN HATCH(ES) TO VAULT FLOOR WITH PVC PIPE AND FITTINGS.
- 3/4" (MINIMUM) PVC SCH-40 CONDUIT. WIRING SHALL BE COMPLETELY SEALED 120V, UNDER GROUND. CONTRACTOR TO SEAL CONDUIT PENETRATION WITH NON-SHRINK GROUT. (NOT REQUIRED IF GRAVITY VAULT DRAIN PROVIDED).
- ESMT TO BE PROVIDED TO DISTRICT AROUND METERS LOCATED OUTSIDE R/W.
- SEE VI-W16A FOR PLAN AND NOTES.

METER VAULT ASSEMBLY 3" THROUGH 10"

Whatcom County Water District 13
STANDARD DETAILS



CONSTRUCTION NOTES:

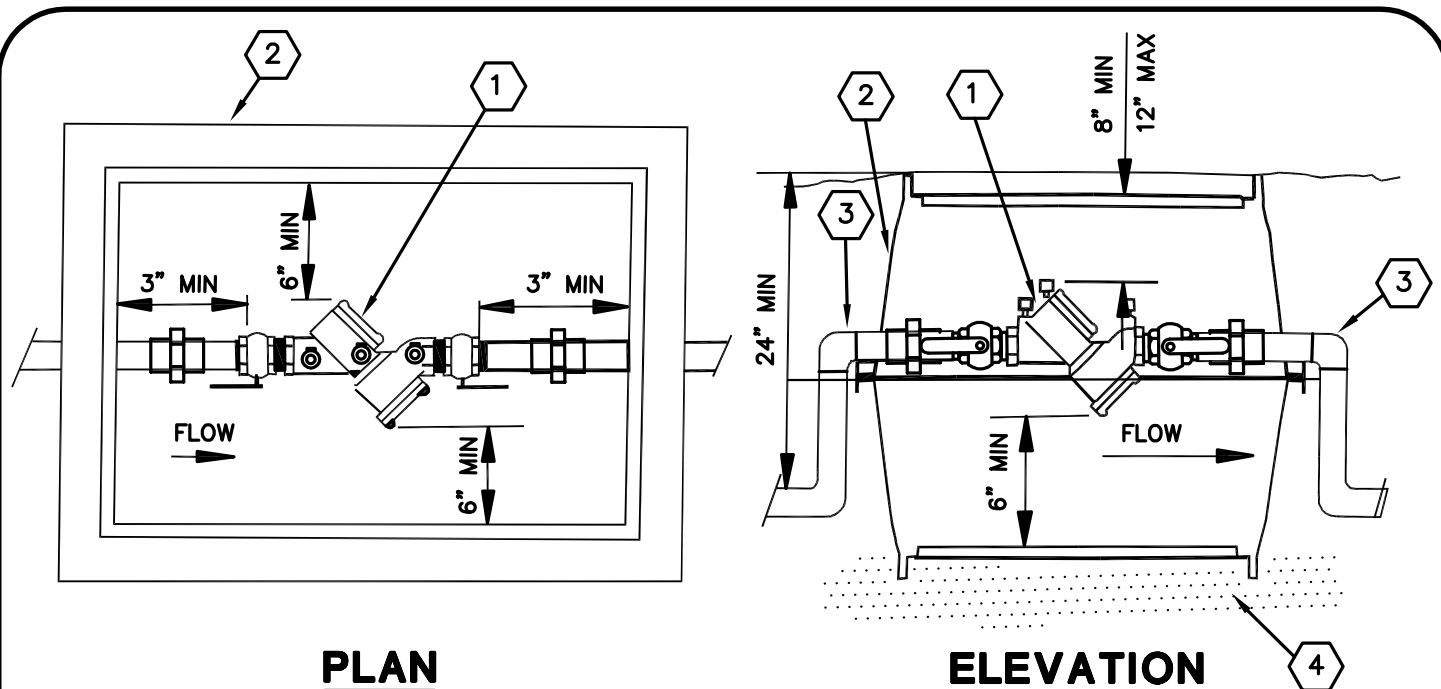
1. ALL TAPS CONFORM TO WATER SERVICE DETAIL FOR PIPE SIZE OF LATERAL.
2. BACKFLOW PREVENTION REQUIRED IMMEDIATELY FOLLOWING METER BOX OR AS PRACTICALLY CLOSE AS POSSIBLE. CONFIRM WITH DISTRICT FOR LOCATION. INITIAL AND ANNUAL CERTIFICATION TESTING REQUIRED. SUBMIT TEST RESULTS TO DISTRICT FOR CONFIRMATION.
3. WHERE METERS ARE BEING INSTALLED WITH NEW MAIN CONSTRUCTION, EACH CONNECTION SHALL BE SEPARATELY TAPPED TO MAIN LINE. IN RETROFIT CONSTRUCTION, AT THE DISTRICTS SOLE DISCRETION, BRANCH TIES OF FIRE AND DOMESTIC METERS TO A SINGLE CONNECTION LATERAL MAY BE ALLOWED.
4. ALL FIRE METERS SHALL BE INSTALLED IN A METER BOX PER 1" OR 2" WATER SERVICE STANDARD DETAIL AS APPROPRIATE. ANGLE STOP TO BE PAINTED RED IN FIELD (COMMERCIAL SAFETY RED).

PROBABLE USE CONDITIONS:

1. WHERE BUILDING CODE REQUIRES.

1" OR 2" DOMESTIC FIRE SERVICE CONNECTION

Whatcom County Water District 13
STANDARD DETAILS



PLAN

ELEVATION

- ① WASHINGTON STATE APPROVED DOUBLE CHECK VALVE ASSEMBLY (DCVA)
- ② METER BOX. BERG VAULT CO. OF WASH NO. 2 CONCRETE, OR MID STATES PLASTICS MSBCF 1730-12 COMPOSITE. BOX SHALL BE H-20 LOAD RATED WHERE REQUIRED.
- ③ BENDS MAY BE LOCATED INSIDE OR OUTSIDE OF BOX SO LONG AS SUFFICIENT ROOM IS ALLOWED AT EACH END FOR VALVE OPERATION AND DCVA REPAIR OR MAINTENANCE.
- ④ PROVIDE FREE DRAINING BACKFILL BELOW BOX. (12" WASHED GRAVEL).

NOTES:

- 1. ALL TEST COCKS SHALL POINT UPWARDS AND HAVE BRASS PLUGS.
- 2. DCVA SHALL BE CENTERED IN BOX (PLAN).
- 3. COMPLETE ALL WORK IN ACCORDANCE WITH STATE, DISTRICT AND MANUFACTURER STANDARDS.
- 4. SYSTEM SHALL NOT BE PUT INTO SERVICE UNTIL DCVA IS APPROVED BY THE DISTRICT AND TESTED/CERTIFIED BY A WASHINGTON STATE LICENSED TESTER.
- 5. DCVA IS CONSIDERED PART OF A PRIVATE SYSTEM AND SHALL BE MAINTAINED BY THE PROPERTY OWNER WITH ANNUAL CERTIFICATION REQUIRED.
- 6. INSTALL DCVA USING UNIONS ON EACH END OF ASSEMBLY. UNIONS TO BE EXPOSED INSIDE OF BOX.
- 7. BOTTOM OF BOX TO BE OPEN TO DRAIN.
- 8. NO BRANCH CONNECTIONS ALLOWED BETWEEN METER AND DCVA.

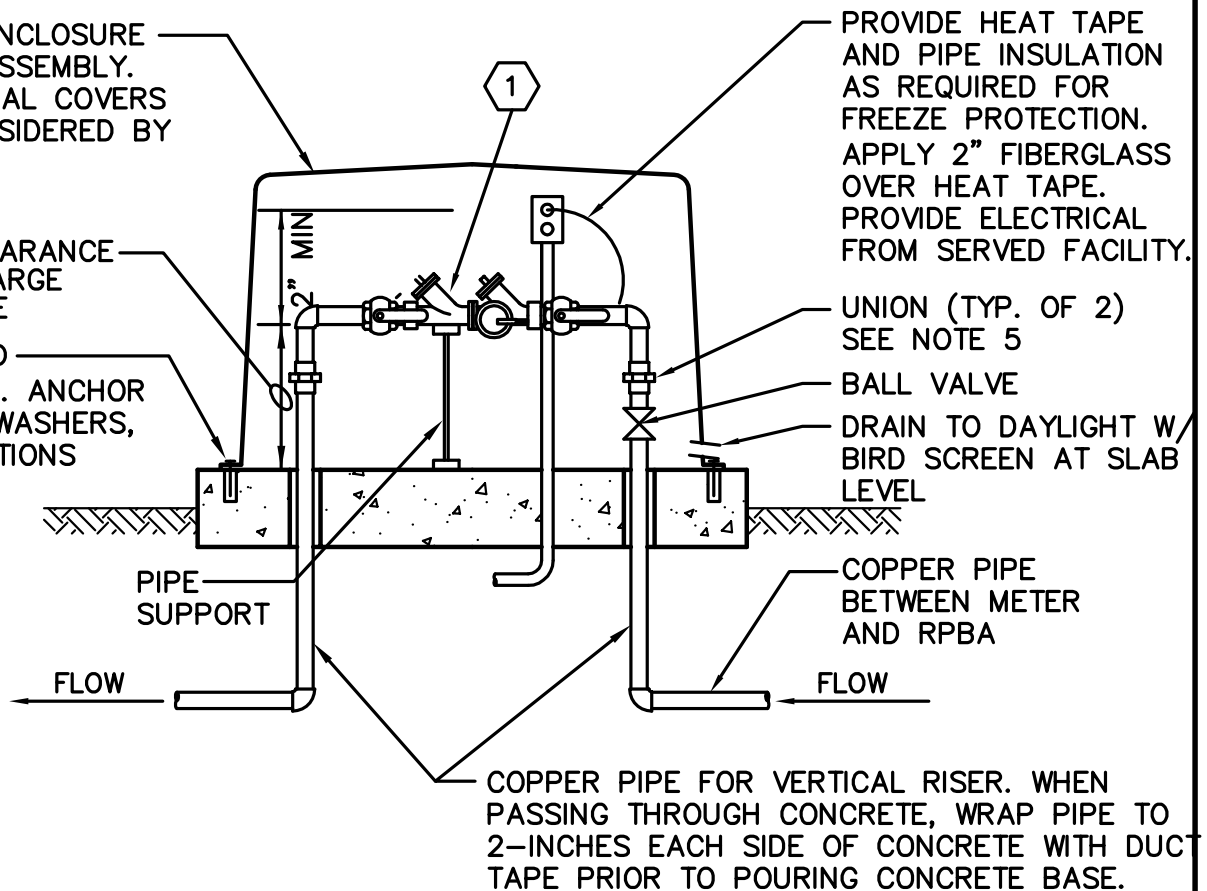
**DOUBLE CHECK VALVE
ASSEMBLY 2" & SMALLER**

Whatcom County Water District 13
STANDARD DETAILS

INSULATED ENCLOSURE
SIZED FOR ASSEMBLY.
ARCHITECTURAL COVERS
WILL BE CONSIDERED BY
DISTRICT.

12" MIN. CLEARANCE
FROM DISCHARGE
TO CONCRETE

BOLT TO PAD
W/ 3/8" S.S. ANCHOR
BOLTS AND WASHERS,
MIN. 4 LOCATIONS



PROVIDE HEAT TAPE
AND PIPE INSULATION
AS REQUIRED FOR
FREEZE PROTECTION.
APPLY 2" FIBERGLASS
OVER HEAT TAPE.
PROVIDE ELECTRICAL
FROM SERVED FACILITY.

UNION (TYP. OF 2)
SEE NOTE 5

BALL VALVE

DRAIN TO DAYLIGHT W/
BIRD SCREEN AT SLAB
LEVEL

COPPER PIPE
BETWEEN METER
AND RPBA

COPPER PIPE FOR VERTICAL RISER. WHEN
PASSING THROUGH CONCRETE, WRAP PIPE TO
2-INCHES EACH SIDE OF CONCRETE WITH DUCT
TAPE PRIOR TO POURING CONCRETE BASE.

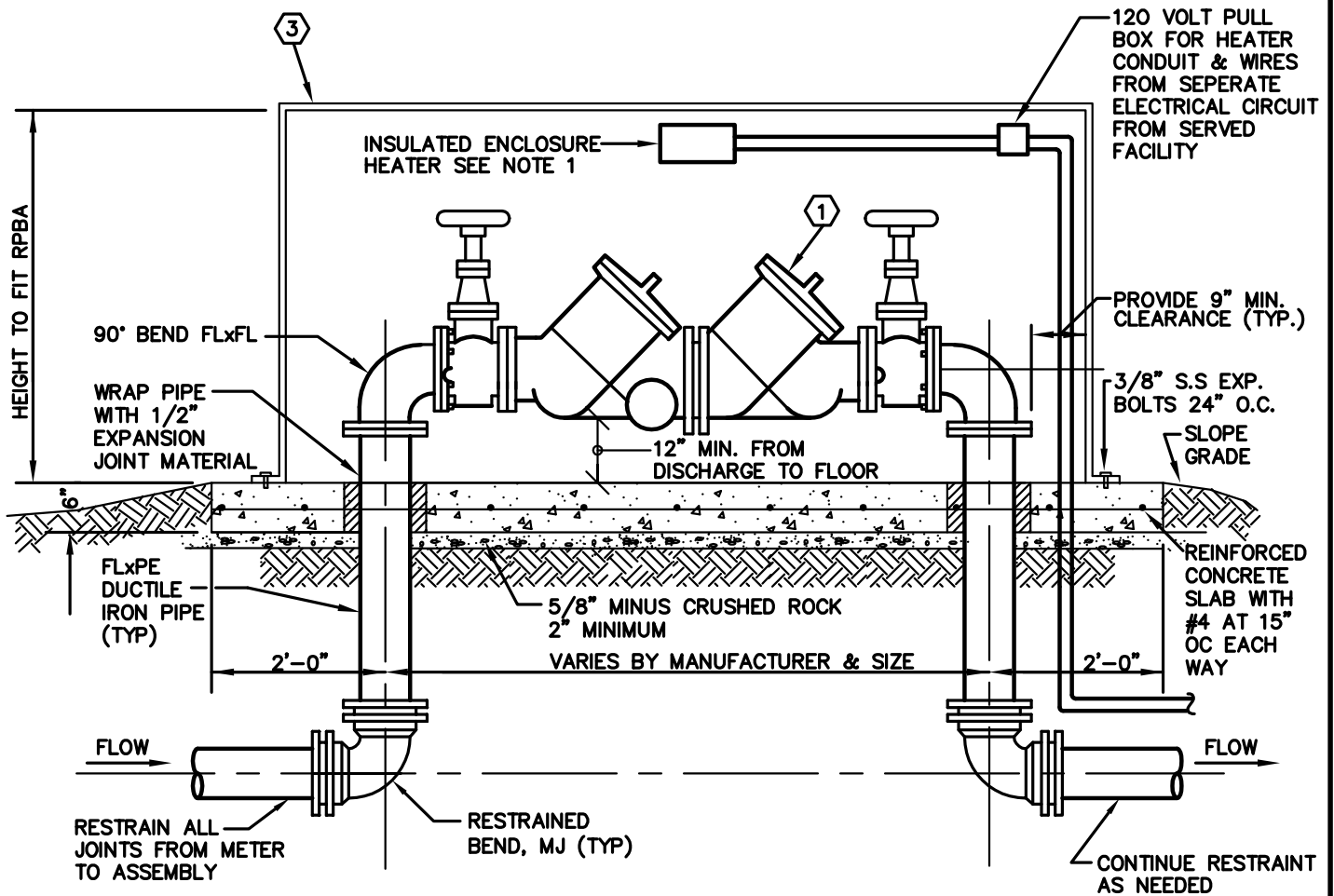
1 WASHINGTON STATE APPROVED REDUCED PRESSURE BACKFLOW ASSEMBLY (RPBA)
WITH TEST COCK PROTECTION AND BRONZE BODY BALL VALVE AT EACH END.

NOTES:

1. CONCRETE TO BE 2500 PSI (MINIMUM) MIX WITH AIR ENTRAINMENT.
2. COMPLETE ALL WORK IN ACCORDANCE WITH STATE, DISTRICT AND MANUFACTURER STANDARDS.
3. SYSTEM SHALL NOT BE PUT INTO SERVICE UNTIL RPBA IS APPROVED BY THE DISTRICT AND TESTED/CERTIFIED BY A WASHINGTON STATE LICENSED TESTER.
4. RPBA IS CONSIDERED PART OF THE PRIVATE SYSTEM AND SHALL BE MAINTAINED BY THE PROPERTY OWNER WITH ANNUAL CERTIFICATION REQUIRED.
5. DIELECTRIC UNIONS SHALL BE USED TO SEPARATE DISSIMILAR MATERIALS.
6. NO BRANCH CONNECTIONS ALLOWED BETWEEN METER AND RPBA.

**REDUCED PRESSURE BACKFLOW
ASSEMBLY-3/4" TO 2"**

Whatcom County Water District 13
STANDARD DETAILS



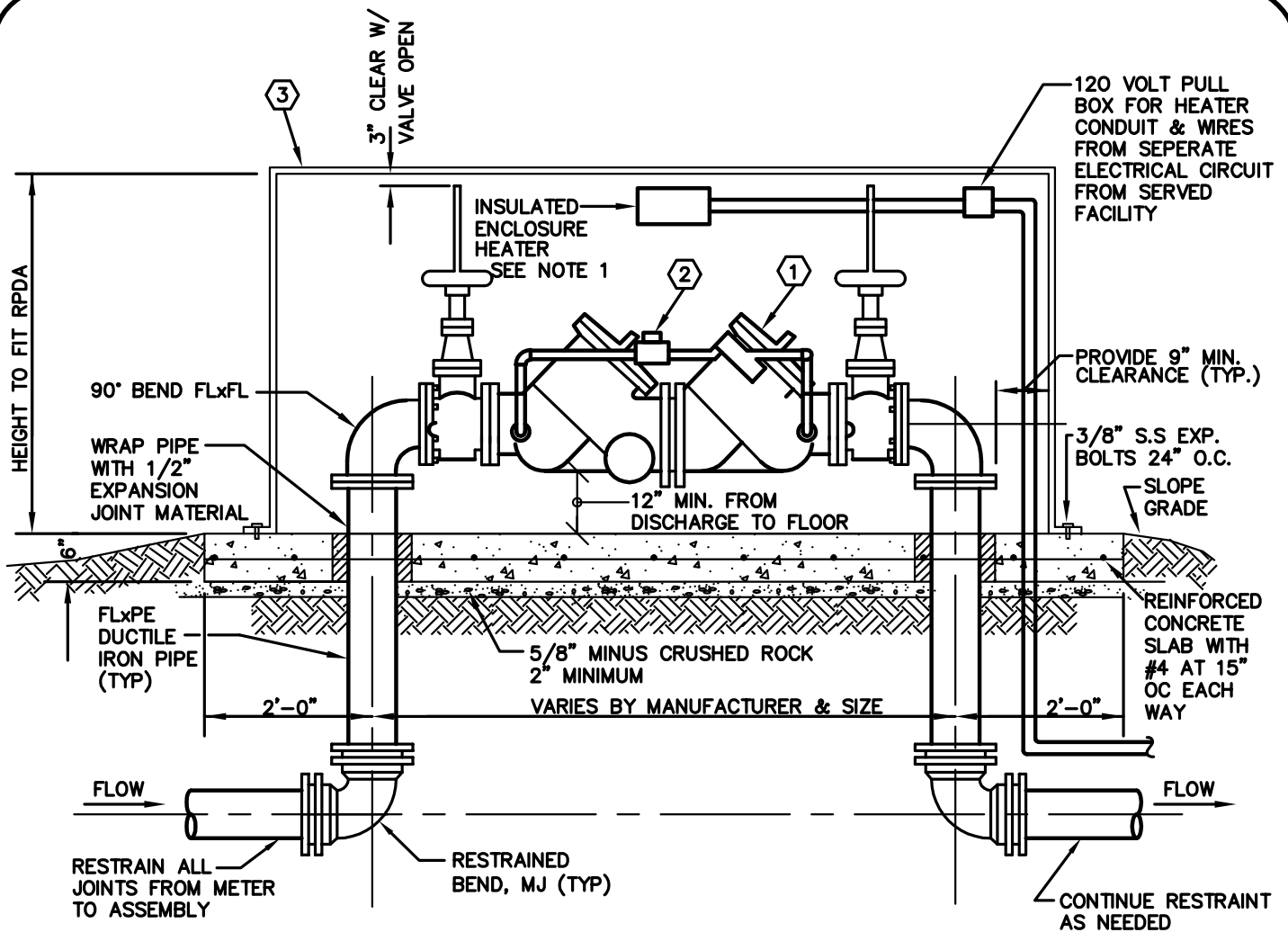
- ① WASHINGTON STATE APPROVED REDUCED PRESSURE BACKFLOW ASSEMBLY (RPBA) WITH RESILIENT SEAT GATE VALVE EACH END
- ② NOT USED
- ③ ALUMINUM INSULATED ENCLOSURE MODELS 4 THROUGH 10 FOR RESPECTIVE SIZE RPBA SHALL BE MODIFIED TO FIT ABOVE HEIGHT REQUIREMENTS. VALVE STEM SHALL NOT EXTEND OUTSIDE OF BOX.

NOTES:

1. INSULATED ENCLOSURE TO BE LOCATED OUTDOORS AND ACCESSIBLE TO DISTRICT. ALTERNATE LOCATION REQUIRES DISTRICT APPROVAL.
2. HEATERS AND WIRING SHALL BE RATED AT 2,000 WATT FOR 8" AND UNDER: 3,000 WATT FOR 10".
3. CONCRETE TO BE 2500 PSI (MINIMUM) MIX WITH AIR ENTRAINMENT.
4. COMPLETE ALL WORK IN ACCORDANCE WITH STATE, DISTRICT AND MANUFACTURER STANDARDS.
5. SYSTEM SHALL NOT BE PUT INTO SERVICE UNTIL RPBA IS APPROVED BY THE DISTRICT AND TESTED/CERTIFIED BY A WASHINGTON STATE LICENSED TESTER.
6. RPBA IS CONSIDERED PART OF THE PRIVATE SYSTEM AND SHALL BE MAINTAINED BY THE PROPERTY OWNER WITH ANNUAL CERTIFICATION REQUIRED.
7. DRAIN TO DAYLIGHT WITH BIRD SCREEN LOCATED AT SLAB LEVEL (SIZED PER MANUFACTURERS RECOMMENDATION).
8. NO BRANCH CONNECTIONS ALLOWED BETWEEN METER AND RPBA.

**REDUCED PRESSURE BACKFLOW
ASSEMBLY-3" AND LARGER**

Whatcom County Water District 13
STANDARD DETAILS



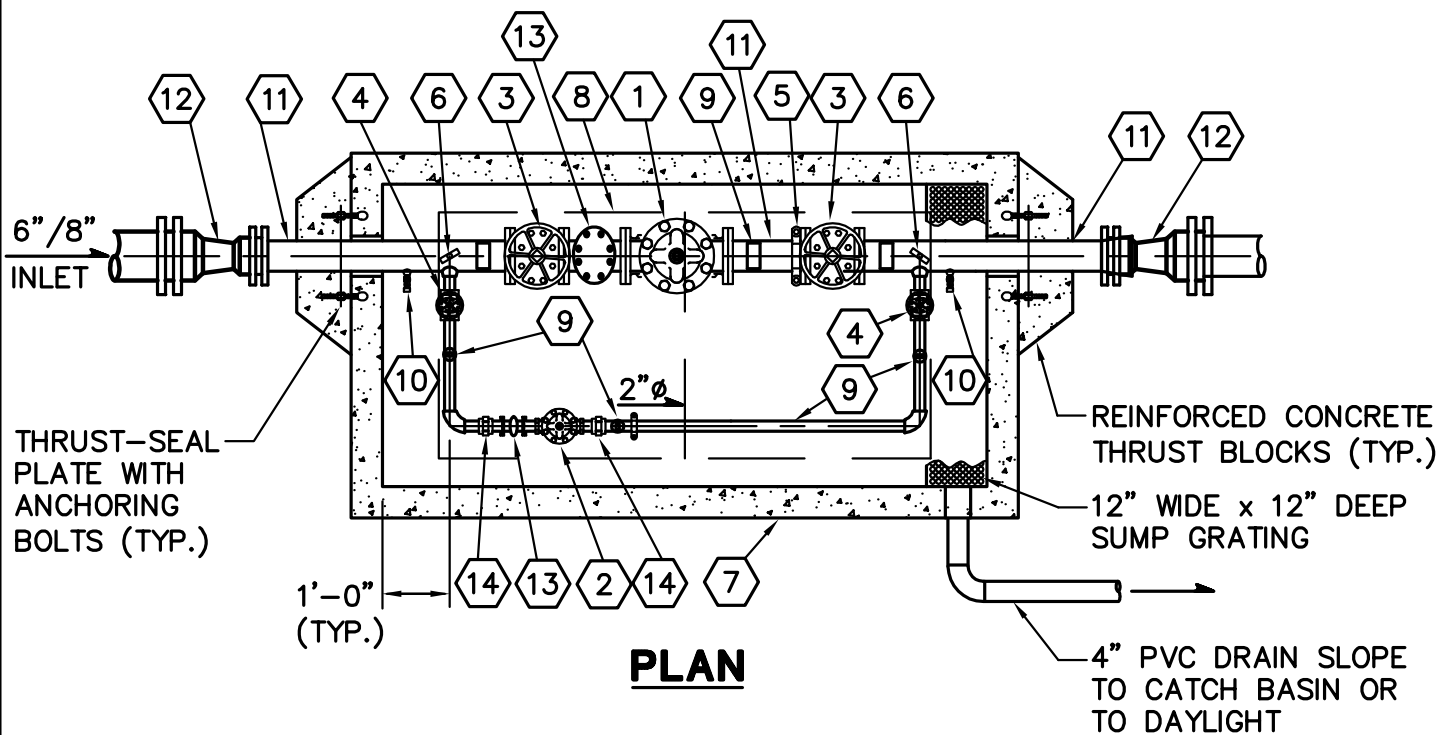
- ① WASHINGTON STATE APPROVED REDUCED PRESSURE BACKFLOW ASSEMBLY (RPBA) WITH OS&Y RESILIENT SEAT GATE VALVE EACH END AND LOW FLOW METER ASSEMBLY.
- ② LOW FLOW BYPASS METER, INCLUDING 5/8" x 3/4" NEPTUNE OR SENSUS RADIO READ WATER METER WITH SENSUS AMR AND MXU RADIO UNIT, WASHINGTON STATE APPROVED REDUCED PRESSURE BACKFLOW ASSEMBLY (RPBA) AND 2 BRONZE BODY ISOLATION BALL VALVES, BRASS OR TYPE K COPPER PIPING.
- ③ ALUMINUM INSULATED ENCLOSURE MODELS 4 THROUGH 10 FOR RESPECTIVE SIZE RPBA SHALL BE MODIFIED TO FIT ABOVE HEIGHT REQUIREMENTS. VALVE STEM SHALL NOT EXTEND OUTSIDE OF BOX.

NOTES:

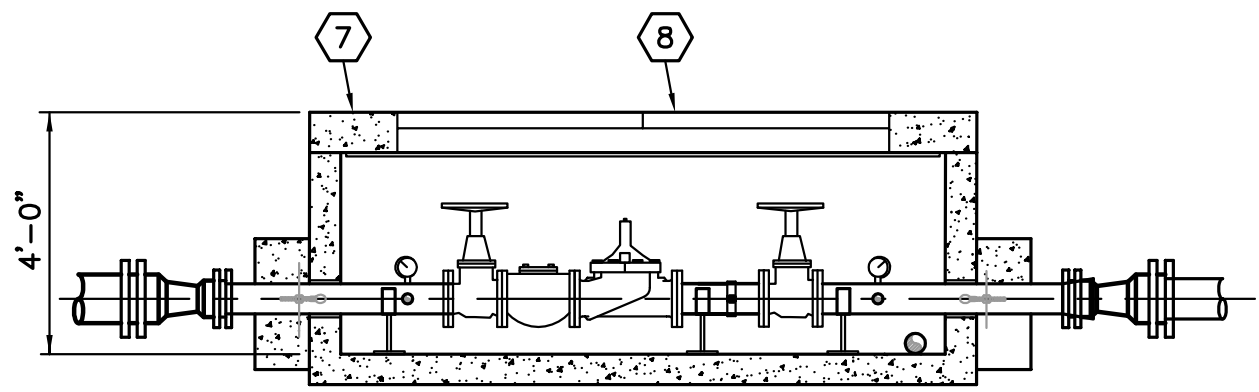
1. INSULATED ENCLOSURE TO BE LOCATED OUTDOORS AND ACCESSIBLE TO DISTRICT. ALTERNATE LOCATION REQUIRES DISTRICT APPROVAL.
2. HEATERS AND WIRING SHALL BE RATED AT 2,000 WATT FOR 8" AND UNDER: 3,000 WATT FOR 10".
3. CONCRETE TO BE 2500 PSI (MINIMUM) MIX WITH AIR ENTRAINMENT.
4. COMPLETE ALL WORK IN ACCORDANCE WITH STATE, DISTRICT AND MANUFACTURER STANDARDS.
5. SYSTEM SHALL NOT BE PUT INTO SERVICE UNTIL RPBA IS APPROVED BY THE DISTRICT AND TESTED/CERTIFIED BY A WASHINGTON STATE LICENSED TESTER.
6. RPDA IS CONSIDERED PART OF THE PRIVATE SYSTEM AND SHALL BE MAINTAINED BY THE PROPERTY OWNER WITH ANNUAL CERTIFICATION REQUIRED.
7. DRAIN TO DAYLIGHT WITH BIRD SCREEN LOCATED AT SLAB LEVEL (SIZED PER MANUFACTURERS RECOMMENDATION).
8. NO BRANCH CONNECTIONS ALLOWED BETWEEN METER AND RPBA.

REDUCED PRESSURE DETECTOR ASSEMBLY-3" AND LARGER

Whatcom County Water District 13
STANDARD DETAILS



PLAN



SECTION

NOTE:
 ALTERNATE TO FIELD ASSEMBLED PRV AND VAULT
 IS SYSTEM AS MANUFACTURED BY GC SYSTEMS.

X SEE VI-W22B FOR CALLOUTS AND NOTES

**PRESSURE REDUCING
 VALVE AND VAULT**

**Whatcom County Water District 13
 STANDARD DETAILS**

LEGEND - SEE VI-W22A FOR PLAN AND SECTION

- ① 6" CLA-VAL 92G-01BCSY PRESSURE REDUCING VALVE WITH X101 POSITION INDICATOR DI BODY, S.S. TRIM, #150 FL.
- ② 2" CLA-VAL 90G-01BC PRESSURE REDUCING VALVE WITH X101 POSITION INDICATOR DI BODY, BRONZE TRIM - THREADED.
- ③ 6" D.I. RW NRS GATE VALVE WITH HANDWHEEL, #150 FL.
- ④ 2" MUELLER A2360-6W41 W55 RW NRS GATE VALVE WITH HANDWHEEL, THD.
- ⑤ UNIFLANGE
- ⑥ 4" 0-300 PSI PRESSURE GAUGE WITH SNUBBER AND GAUGE COCK; TOP OF PIPE.
- ⑦ PRECAST CONCRETE VAULT 10'L x 5'W x 3'-7"H INSIDE, SOLID WALL WITH WHITE INTERIOR & BLACK EXTERIOR SEALANT
- ⑧ 48" X 96" DOUBLE DOOR ALUMINUM HATCH, LW PRODUCTS OR EQUAL. H-20 RATED. DRAIN HATCH TO VAULT FLOOR.
- ⑨ ADJUSTABLE PIPE SUPPORTS
- ⑩ 3/4" HOSE BIB ASSEMBLY
- ⑪ PIPE SPOOL (FLxPE) LENGTH AS REQUIRED.
- ⑫ REDUCER (AS REQUIRED), MJ WITH MEGA-LUGS
- ⑬ WATER METER STRAINER, SENSUS OR EQUAL, FL
- ⑭ UNIONS

NOTES:

- 1. 6" x 2" PRV ASSEMBLY SHOWN. SIZES TO BE DETERMINED BY THE DISTRICT BASED ON DOWNSTREAM DEMANDS.
- 2. ALL 3" AND LARGER PIPE INSIDE WETTED SURFACES TO BE SANDBLASTED, EPOXY LINED AND COATED TO AWWA C210 AND NSF-61 SPECIFICATION. EXTERIOR COATING SHALL BE BLUE ENAMEL.
- 3. ALL PIPE 2" AND SMALLER TO BE BRASS.

**PRESSURE REDUCING
VALVE AND VAULT**

Whatcom County Water District 13
STANDARD DETAILS

SEWER

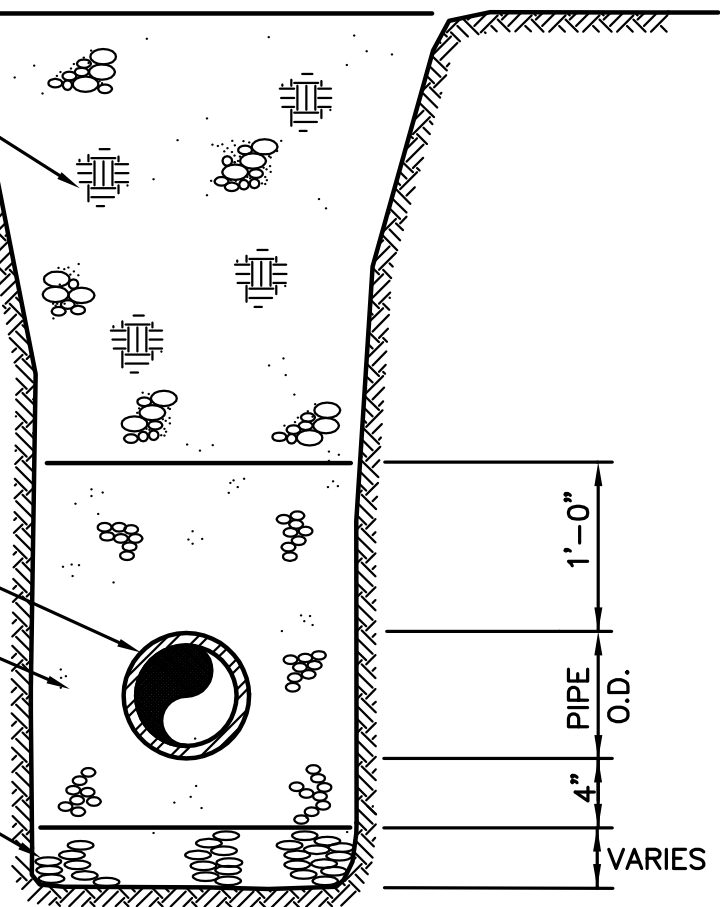
FINISHED GRADE

COMPACTED BACKFILL
CONSISTING OF EXCAVATED
MATERIAL, GRAVEL BASE,
OR CDF TO OBTAIN
COMPACTION REQUIREMENTS
PER MODIFIED PROCTOR
ASTM D 1557 AND AS
REQUIRED BY PERMITS.

PVC SEWER PIPE

PEA GRAVEL

FOUNDATION GRAVEL
AS REQUIRED



NOTE:

1. BACKFILL MATERIAL AND COMPACTION SHALL BE IN CONFORMANCE WITH DISTRICT STANDARDS AND/OR COUNTY, CITY, STATE PERMIT REQUIREMENTS.
2. PIPES SHALL BE RESTRAINED IN FILL OR PREVIOUSLY DISTURBED MATERIAL.
3. CLAY OR BENTONITE DAMS SHALL BE INSTALLED ACROSS THE TRENCH AND TO THE FULL DEPTH OF THE GRANULAR MATERIAL IN ALL AREAS OF STEEP SLOPES, STREAM CROSSINGS AND WETLAND TO PREVENT MIGRATION OF WATER ALONG THE PIPELINE.

**SANITARY SEWER TRENCH
SECTION (PVC/GRAVITY)**

Whatcom County Water District 13
STANDARD DETAILS

FINISHED GRADE

COMPACTED BACKFILL
CONSISTING OF EXCAVATED
MATERIAL, GRAVEL BASE, OR
CDF TO OBTAIN COMPACTION
REQUIREMENTS PER MODIFIED
PROCTOR ASTM D 1557 AND
AS REQUIRED BY PERMITS

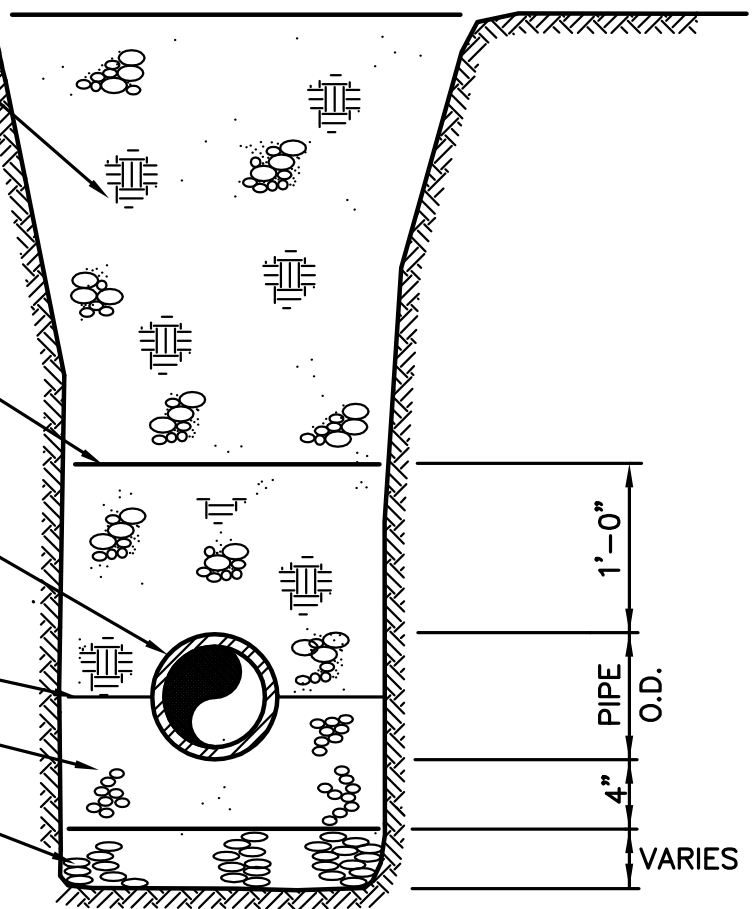
SPECIAL PRECAUTIONS
TO PROTECT PIPE
TO THIS LEVEL

DUCTILE IRON PIPE
CLASS 52, EPOXY LINED

SPRING LINE

PEA GRAVEL

FOUNDATION GRAVEL
AS REQUIRED



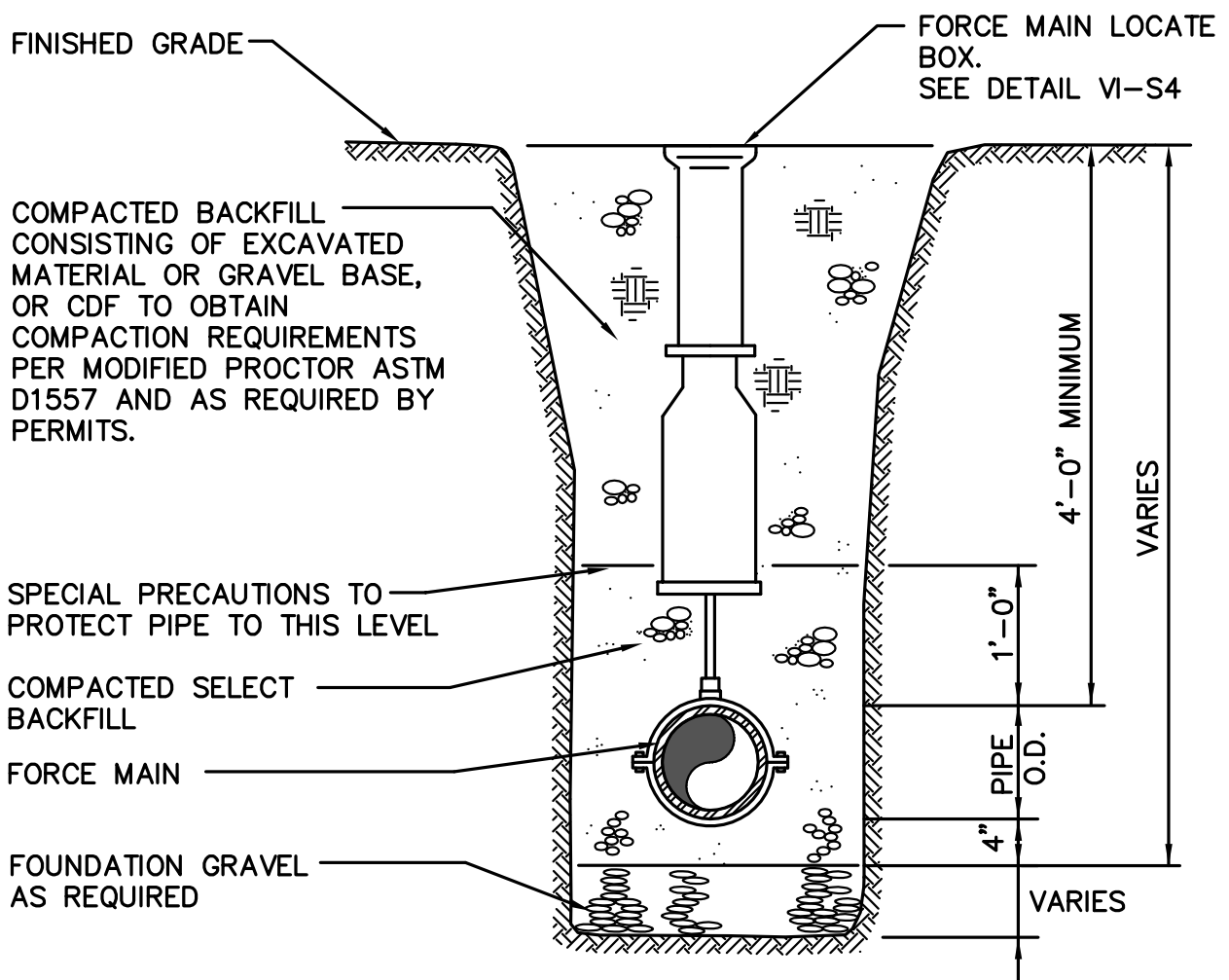
NOTE:

1. BACKFILL MATERIAL AND COMPACTION SHALL BE IN CONFORMANCE WITH DISTRICT STANDARDS AND/OR COUNTY, CITY, STATE PERMIT REQUIREMENTS.
2. PIPES SHALL BE RESTRAINED IN FILL OR PREVIOUSLY DISTURBED MATERIAL.
3. CLAY OR BENTONITE DAMS SHALL BE INSTALLED ACROSS THE TRENCH AND TO THE FULL DEPTH OF THE GRANULAR MATERIAL IN ALL AREAS OF STEEP SLOPES, STREAM CROSSINGS AND WETLAND TO PREVENT MIGRATION OF WATER ALONG THE PIPELINE.

**SANITARY SEWER TRENCH
SECTION (D.I./GRAVITY)**

Whatcom County Water District 13

STANDARD DETAILS

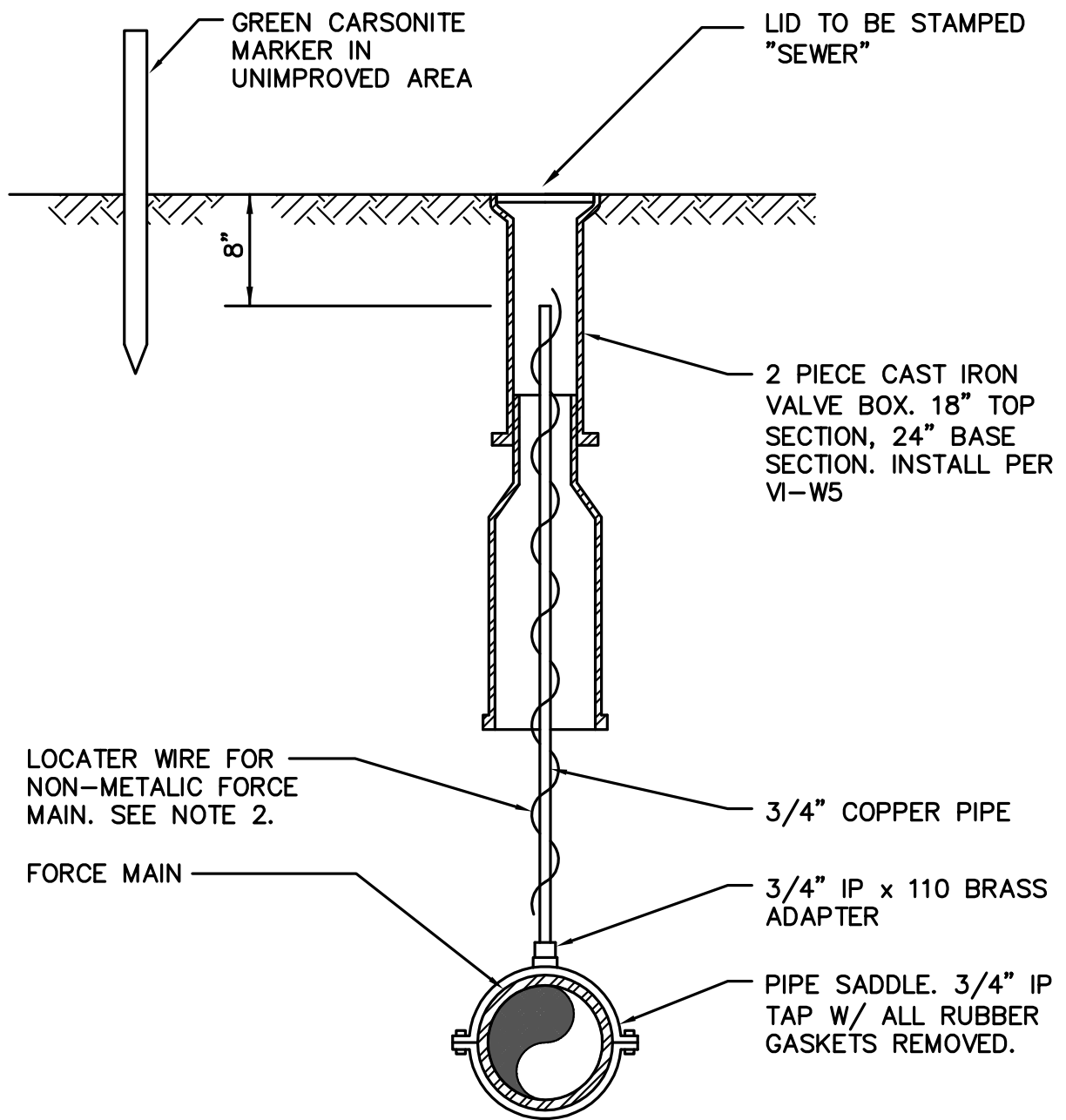


NOTE:

BACKFILL MATERIAL AND COMPACTION SHALL BE IN CONFORMANCE WITH DISTRICT STANDARDS AND/OR THE SNOHOMISH COUNTY, CITY AND STATE PERMIT REQUIREMENTS. ONLY DUCTILE IRON PIPE SHALL BE USED UNLESS APPROVED BY THE DISTRICT.

FORCE MAIN TRENCH SECTION

Whatcom County Water District 13
STANDARD DETAILS



NOTES:

1. LOCATE AT ENDS OF FORCE MAINS, ALL HORIZONTAL BENDS AND AT 300 FT. MAX SPACING, OR AS REQUIRED BY DISTRICT
2. ON NON-METALIC FORCE MAINS, PROVIDE 12 GAUGE COATED COPPER WIRE BETWEEN LOCATION BOXES. WRAP ALONG FORCE MAIN PIPE AND UP COPPER PIPE AT EACH END.

**FORCE MAIN
LOCATION BOX**

Whatcom County Water District 13
STANDARD DETAILS

MANHOLE FRAME & COVER WITH "SEWER" CAST ON COVER IN 3" RAISED LETTERS (NON-SKID PATTERN) EAST JORDAN IRON WORKS NO. 371564 OR OLYMPIC FOUNDRY NO. MH30AD/T. 3 HOLE LOCKING FRAME AND COVER. ONE (1) BOLT HOLE TO BE CENTERED OVER LADDER. SEE VI-S6 FOR OPENING LOCATION.

FIRST STEP 14" MIN. 18" MAX.

GROUT BETWEEN RINGS

POLYPROPYLENE MANHOLE STEPS AT 12" O.C.

GROUT LIFT HOLES INSIDE AND OUTSIDE

MANHOLE DIAMETER
48": STANDARD
54": DEPTH ≥ 20FT

SEE NOTE 1 FOR PIPE CONNECTION

REINFORCED CONC. COLLAR IN UNPAVED AREAS. SEE NOTE 5.

FINISHED GRADE

4" X 24" PRECAST CONC. ADJUSTMENT RINGS 2 RINGS REQUIRED 5 RINGS MAXIMUM PLASTER INSIDE AND OUTSIDE FACE WITH 1/2" THICK GROUT

OFFSET CONE

48" MIN. INSIDE DIAMETER PRECAST MANHOLE

RUBBER GASKET TO SEAL. GROUT IF NECESSARY

POLYPROPYLENE LADDER

10' MIN.

SLOPE 3/8"/FT

3/4 PIPE DIA

GROUT FILL

FLOW

FOUNDATION GRAVEL

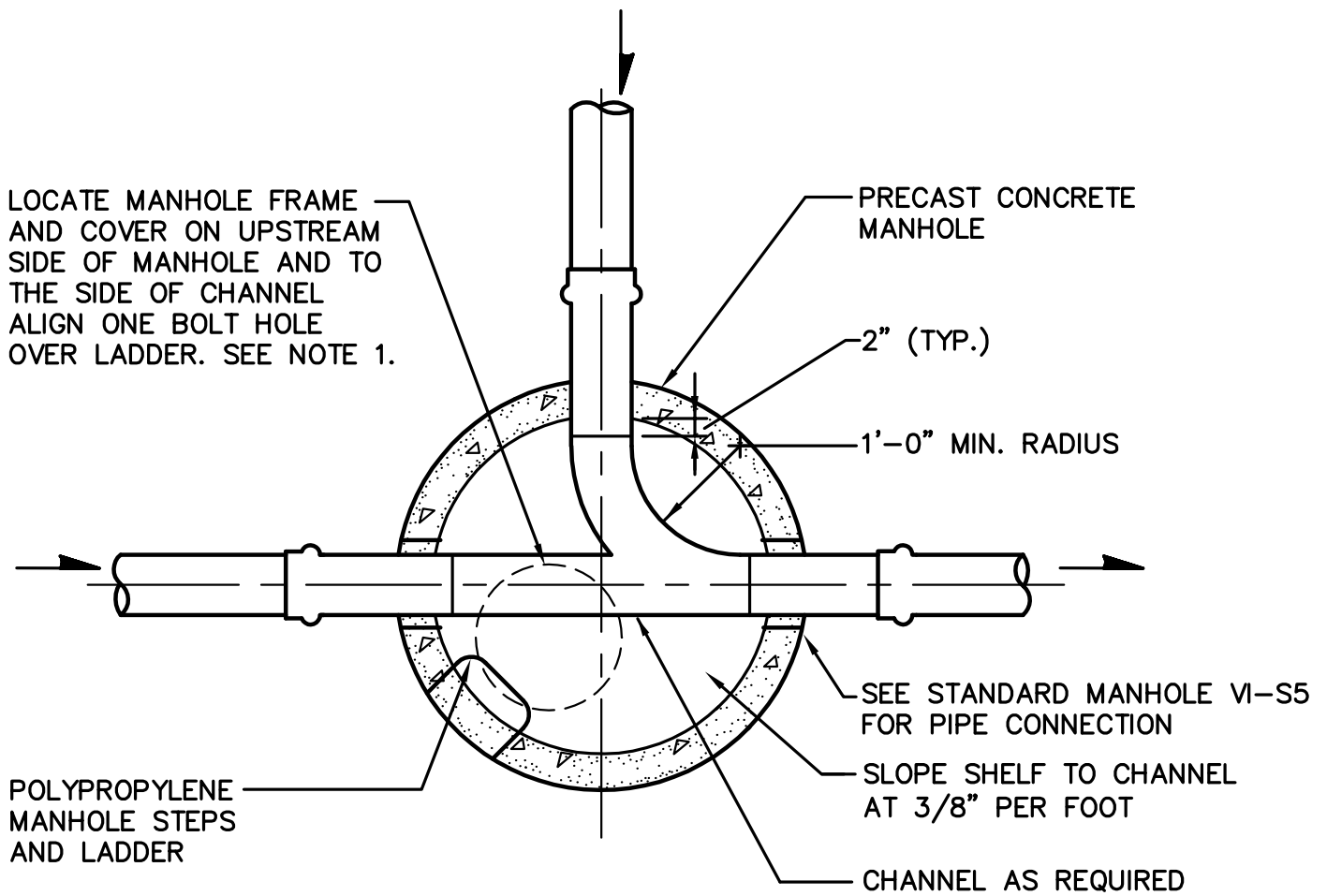
UNDISTURBED EARTH

NOTES:

1. PIPE CONNECTIONS TO MANHOLES SHALL BE AS FOLLOWS:
PVC PIPE: CAST OR GROUT A SAND COLLAR INTO WALL.
D.I. OR PVC PIPE: CORE THE MANHOLE AND CONNECT SEWER PIPE WITH A WATER TIGHT FLEXIBLE RUBBER BOOT IN MANHOLE WALL, KOR-N-SEAL BOOT OR EQUAL.
2. DROP OF GRADE THRU MANHOLE SHALL BE 0.10', UNLESS OTHERWISE NOTED.
3. MINIMUM DEPTH OF MANHOLE SHALL BE 8' UNLESS APPROVED BY THE DISTRICT.
4. INSTALL GREEN CARSONITE FIBERGLASS MANHOLE MARKERS IN EASEMENTS.
5. POUR 4'-0" DIAMETER BY 12" THICK CONCRETE COLLAR AROUND ALL MANHOLES IN UNPAVED AREAS.

SANITARY SEWER MANHOLE SECTION

Whatcom County Water District 13
STANDARD DETAILS

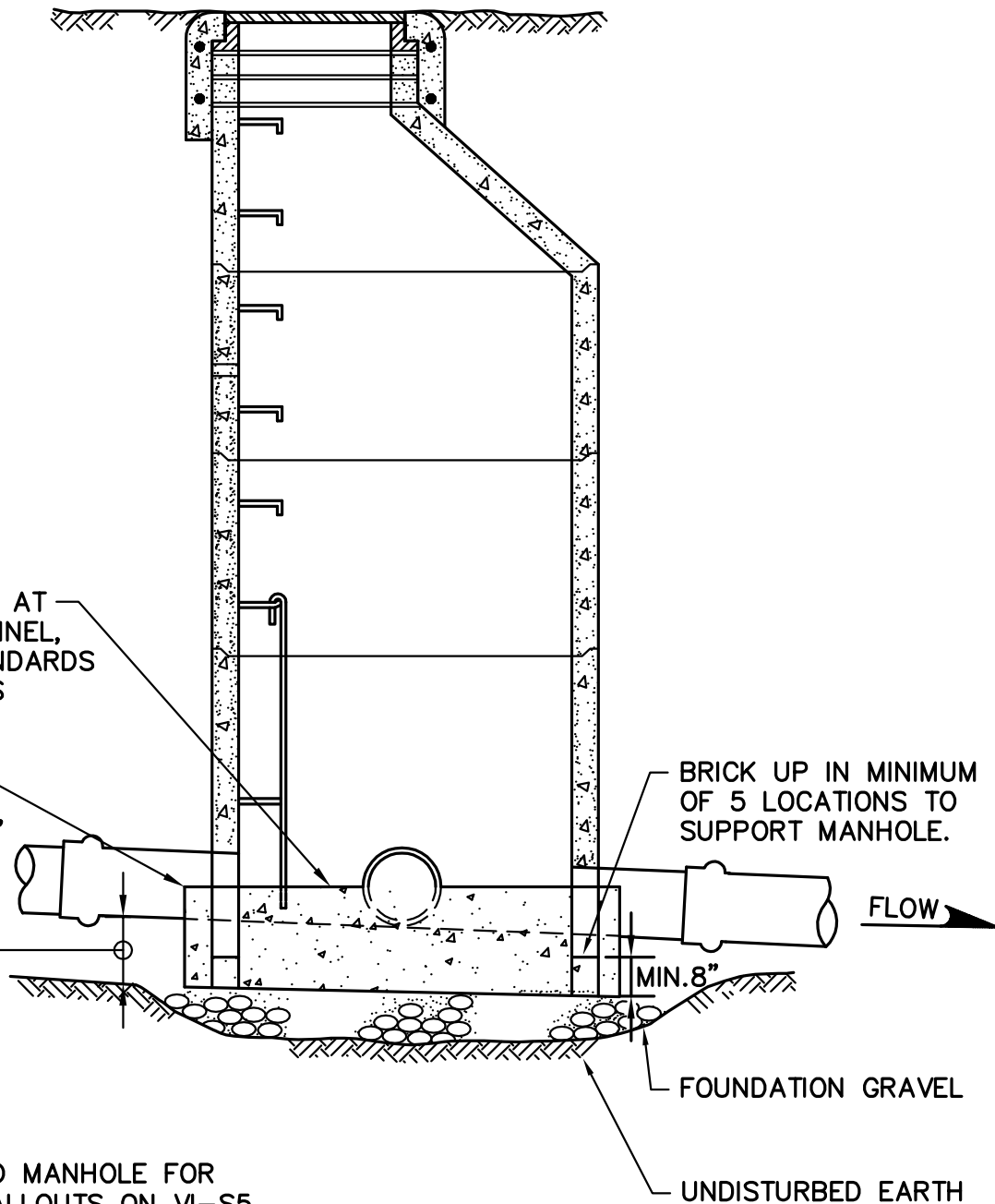


NOTES:

1. CONFIRM FRAME AND COVER LOCATION WITH DISTRICT.

SANITARY SEWER MANHOLE

Whatcom County Water District 13
STANDARD DETAILS

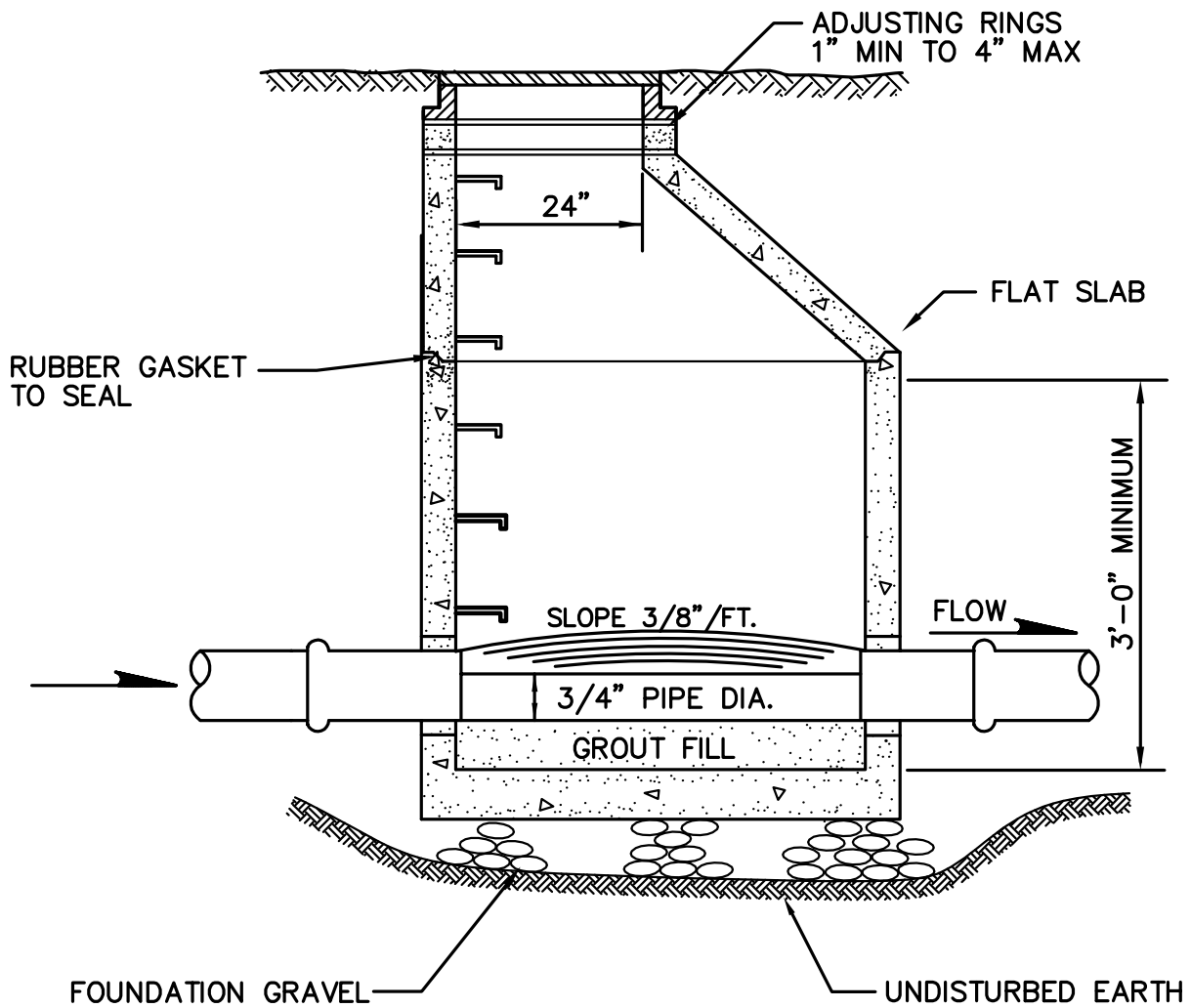


NOTES:

1. SEE STANDARD MANHOLE FOR ADDITIONAL CALLOUTS ON VI-S5

**SANITARY SEWER SADDLE
MANHOLE**

Whatcom County Water District 13
STANDARD DETAILS

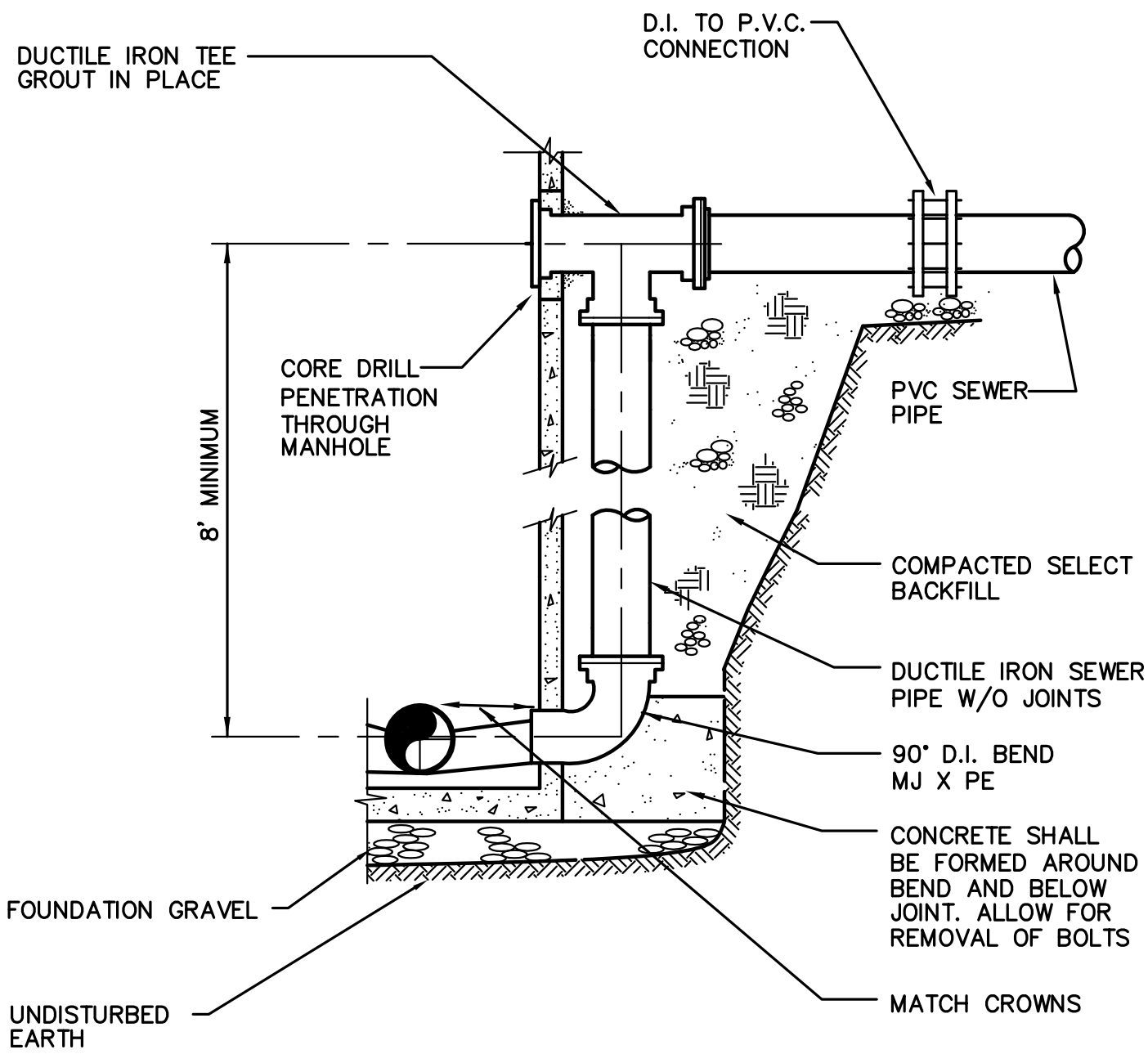


NOTES:

1. SEE STANDARD MANHOLE CALLOUTS ON VI-S5 AND VI-S6.
2. FRAME AND COVER SHALL MEET REQUIREMENTS FOR 24" MANHOLE.
3. USE OF SHALLOW MANHOLE REQUIRES DISTRICT APPROVAL.

**SANITARY SEWER SHALLOW
MANHOLE**

Whatcom County Water District 13
STANDARD DETAILS

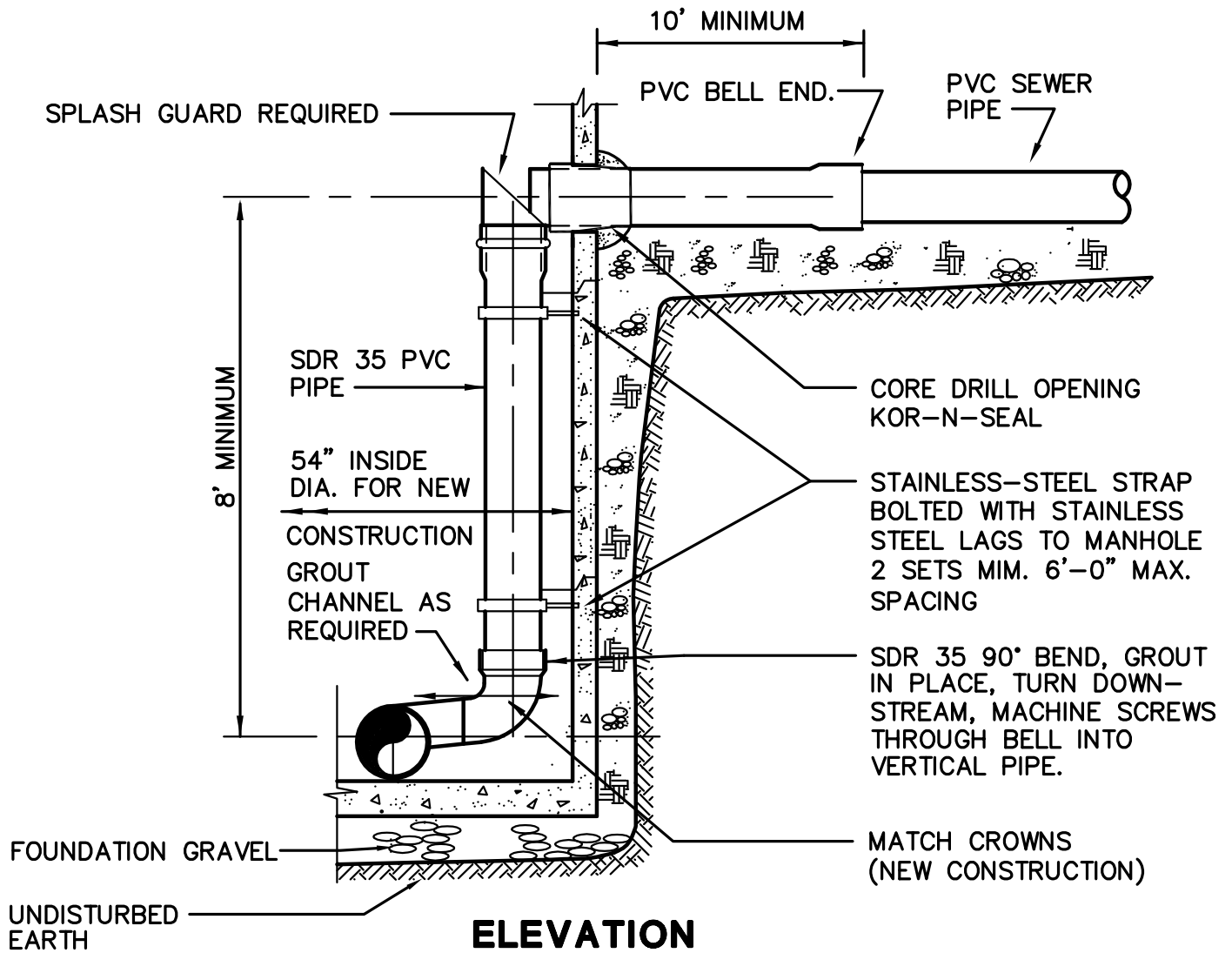


NOTES:

1. USE OF DROP MANHOLE REQUIRES DISTRICT APPROVAL.
2. DROP HEIGHT MUST BE GREATER THAN 8 FEET FOR CONSIDERATION.
3. DROP CONNECTIONS WILL ONLY BE CONSIDERED AT JUNCTIONS WITH AN EXISTING DEEP MAIN FOR LATERAL SEWERS TO BE BUILT IN THE FUTURE.

OUTSIDE DROP MANHOLE
(IF APPROVED BY DISTRICT)

Whatcom County Water District 13
STANDARD DETAILS

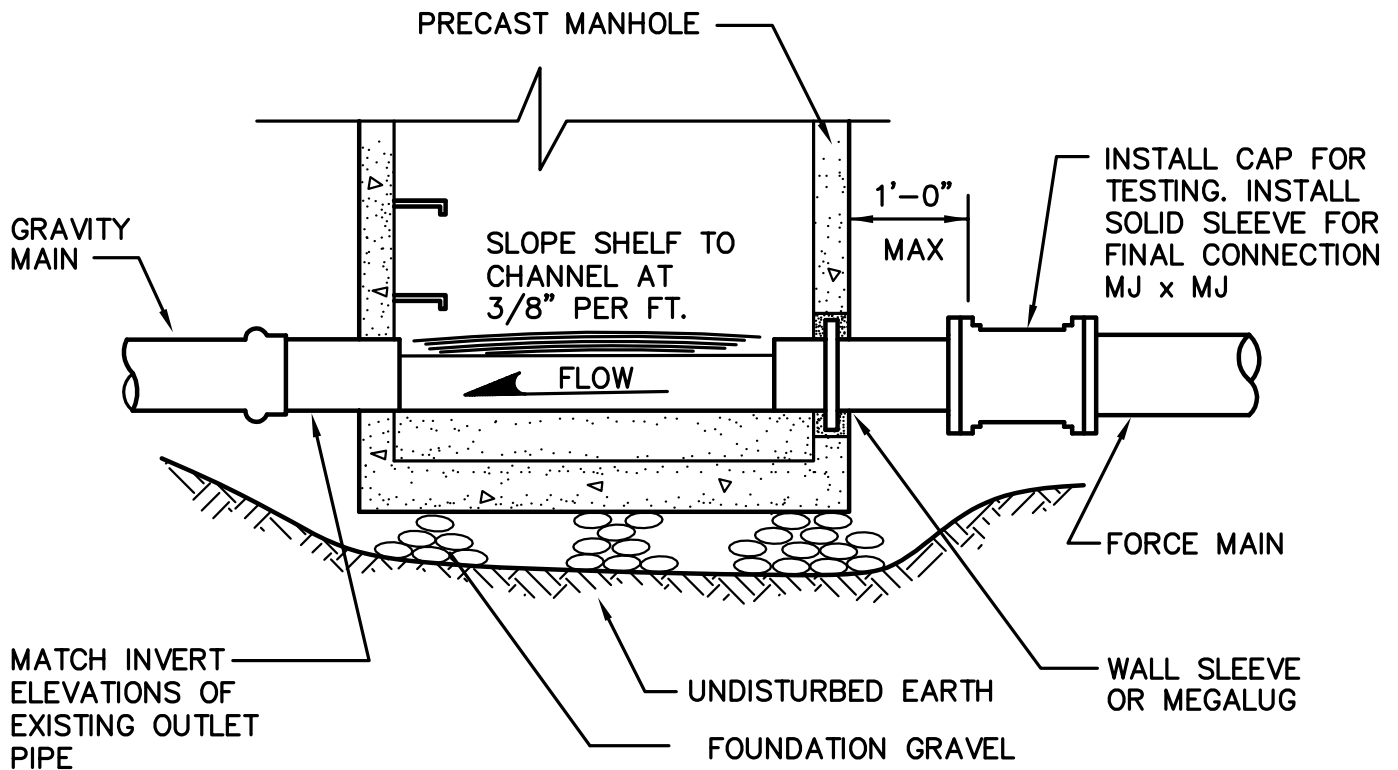


NOTES:

1. USE OF DROP MANHOLE REQUIRES DISTRICT APPROVAL.
2. DROP HEIGHT MUST BE GREATER THAN 8 FEET FOR CONSIDERATION.
3. ALL JOINTS SHALL BE GLUED.
4. BEND SHALL SWEEP INTO FLOW DIRECTION.

INSIDE DROP MANHOLE
(IF APPROVED BY DISTRICT)

Whatcom County Water District 13
STANDARD DETAILS

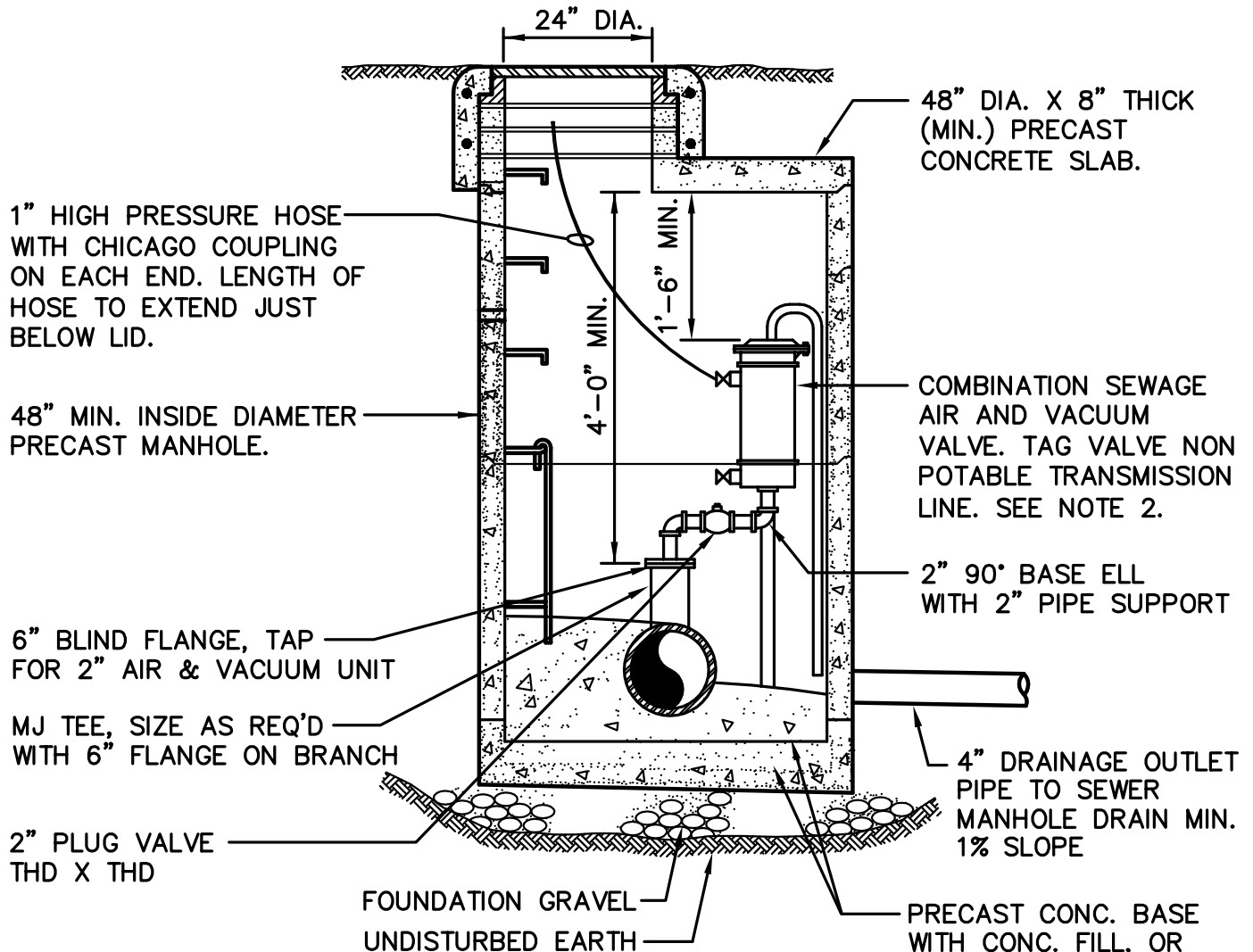
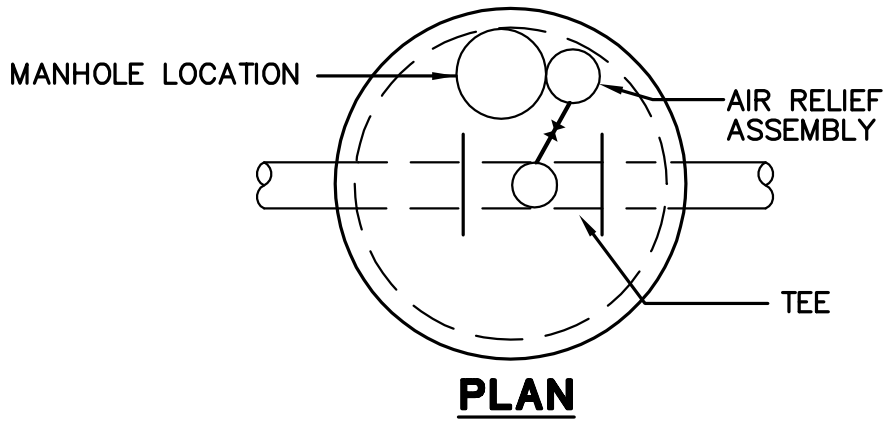


NOTES:

1. PIPE CONNECTIONS TO MANHOLES SHALL BE AS FOLLOWS: PVC PIPE: CAST OR GROUT A SAND COLLAR INTO WALL. D.I. OR PVC PIPE: CORE THE MANHOLE AND CONNECT SEWER PIPE WITH A WATER TIGHT FLEXIBLE RUBBER BOOT IN MANHOLE WALL, KOR-N-SEALBOOT OR EQUAL, EXCEPT FOR FORCE MAIN CONNECTION.
2. DROP OF GRADE THROUGH MANHOLE SHALL BE 0.10', UNLESS OTHERWISE NOTED.
3. ALIGN FORCE MAIN DISCHARGE AXIS WITH OUTLET PIPE.
4. RESTRAIN FORCE MAIN JOINTS AND FITTINGS IN ACCORDANCE WITH VI-G3.
5. SEE STANDARD MANHOLE CALLOUTS ON VI-S5 AND VI-S6.

**FORCE MAIN DISCHARGE
MANHOLE**

Whatcom County Water District 13
STANDARD DETAILS

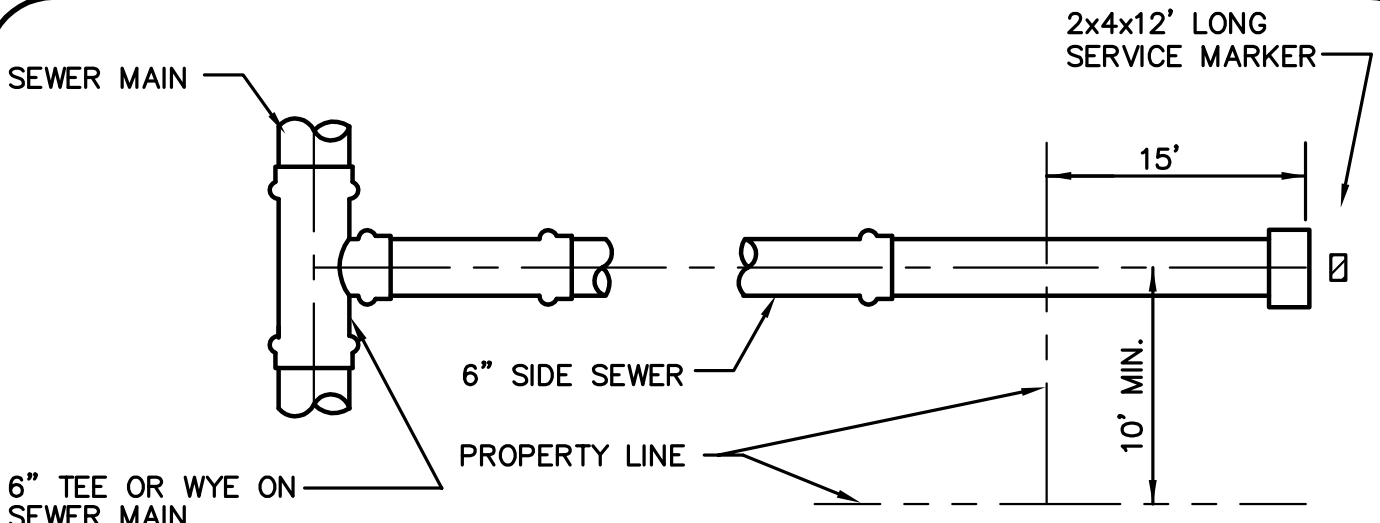


NOTES:

1. SEE STANDARD MANHOLE CALLOUTS ON VI-S5 AND VI-S6.
2. APCO, CRISPIN OR VALMATIC HEAVY-DUTY COMBINATION AIR AND VACUUM VALVE (SHORT BODY) W/STAINLESS STEEL INTERNALS, EPOXY COATING AND FLUSHING ATTACHMENTS. SEATS SHALL BE SUPPLIED FOR THE FOLLOWING WORKING PRESSURES: 20 PSI, 20-150 PSI.
3. 2" PIPING AND FITTINGS SHALL BE BRASS.

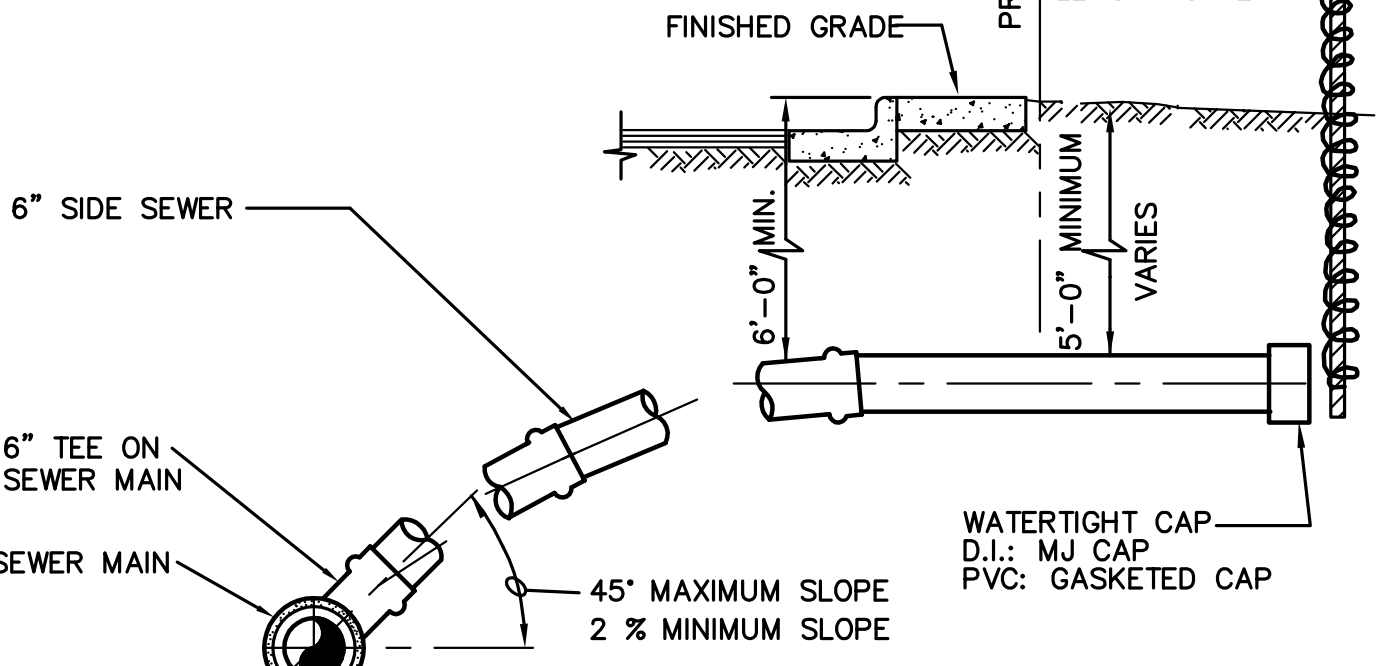
SANITARY SEWER AIR AND VACUUM RELEASE ASSEMBLY

Whatcom County Water District 13
STANDARD DETAILS



PLAN

NOTE:
 PAINT EXPOSED PORTION OF SERVICE MARKER WITH WHITE PAINT. STENCIL "SEWER" AND TOTAL LENGTH OF 2x4 USING 2" HIGH BLACK LETTERS. LOCATE SERVICE MARKER AT END OF EACH SERVICE.



ELEVATION

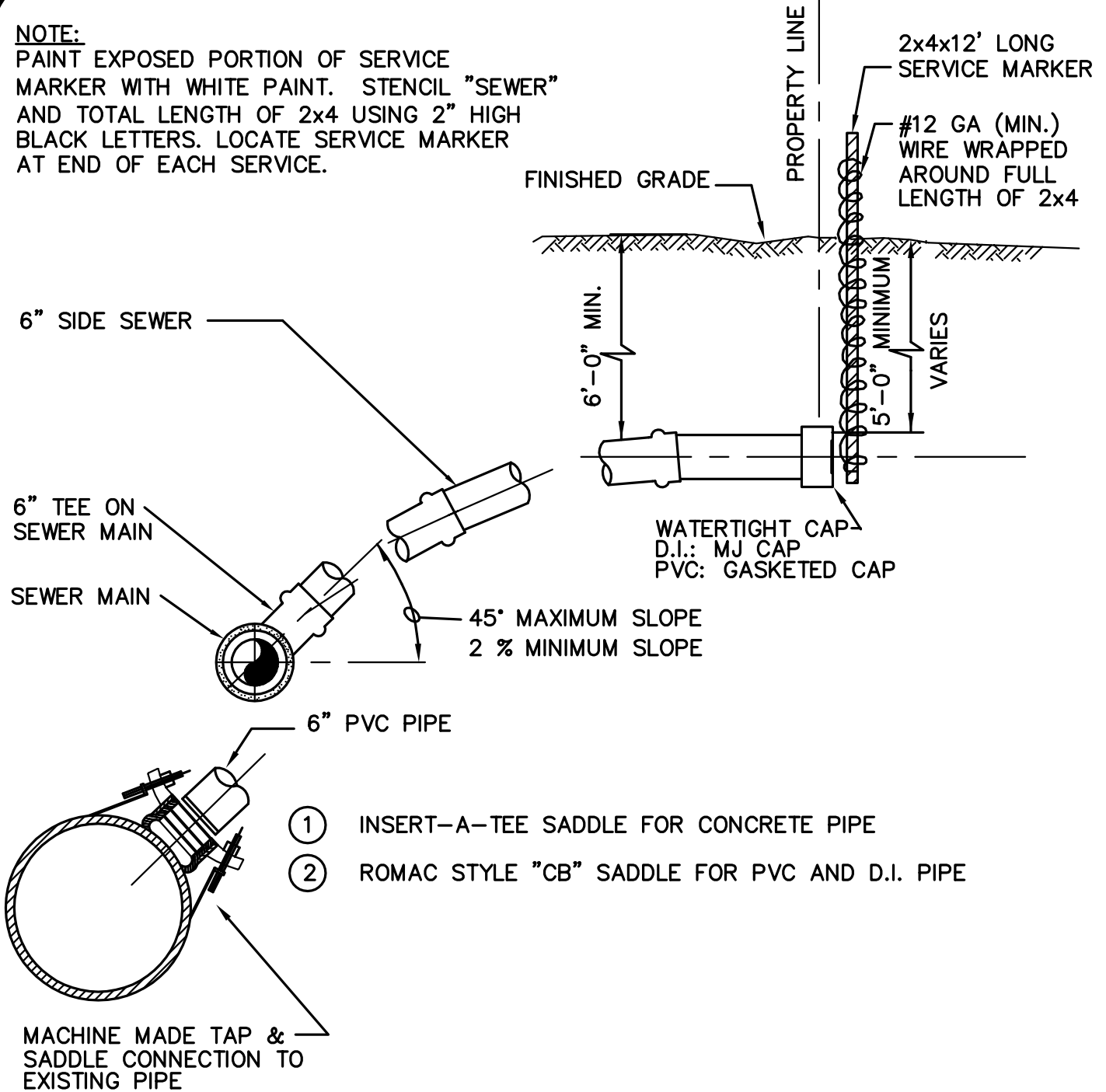
NOTES:

1. MAXIMUM DEFLECTION NOT TO EXCEED PIPE MANUFACTURER RECOMMENDATIONS.
2. SIDE SEWER LATERAL SHALL BE THE SAME MATERIAL AS THE MAIN LINE SEWER AND BEDDED THE SAME
3. SEPARATE LATERAL REQUIRED FOR EACH LOT.

STANDARD SIDE SEWER

Whatcom County Water District 13
 STANDARD DETAILS

NOTE:
 PAINT EXPOSED PORTION OF SERVICE
 MARKER WITH WHITE PAINT. STENCIL "SEWER"
 AND TOTAL LENGTH OF 2x4 USING 2" HIGH
 BLACK LETTERS. LOCATE SERVICE MARKER
 AT END OF EACH SERVICE.

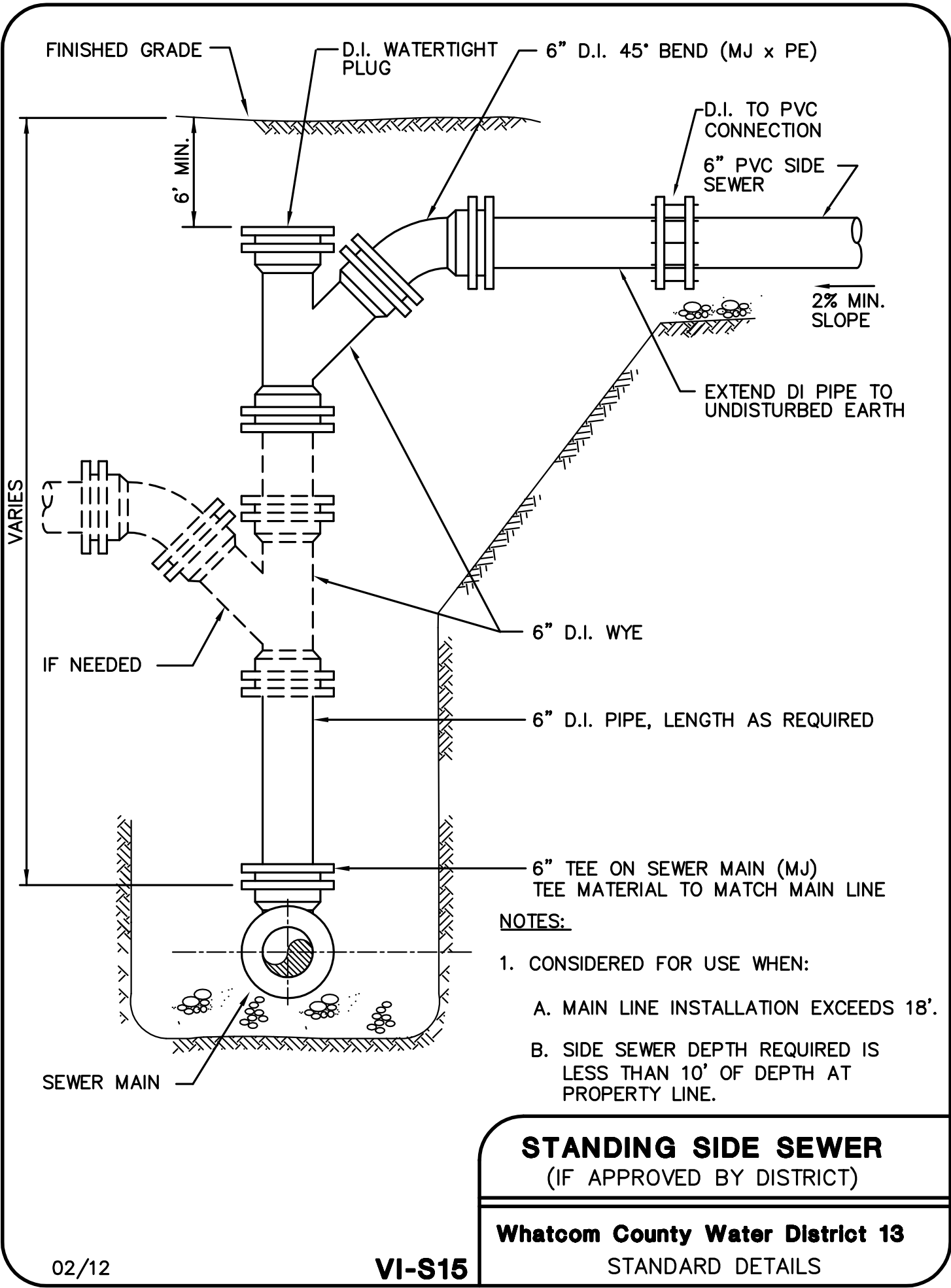


NOTES:

1. SEE STANDARD SIDE SEWER DETAIL VI-S13 FOR NEW CONSTRUCTION.
2. DEVELOPER TO PROVIDE ALL MATERIALS, TRAFFIC CONTROL, PERMITS, SHORING AND MISC. WORK AS REQUIRED TO TAP THE MAIN AND INSTALL THE SIDE SEWER.
3. CUT-IN TEES ARE PERMITTED WITH DISTRICT APPROVAL.

**SIDE SEWER DETAIL
 (CONNECTION TO EXISTING MAIN)**

Whatcom County Water District 13
 STANDARD DETAILS



FINISHED GRADE

D.I. WATERTIGHT PLUG

6" D.I. 45° BEND (MJ x PE)

D.I. TO PVC CONNECTION

6" PVC SIDE SEWER

6' MIN.

2% MIN. SLOPE

EXTEND DI PIPE TO UNDISTURBED EARTH

VARIES

IF NEEDED

6" D.I. WYE

6" D.I. PIPE, LENGTH AS REQUIRED

6" TEE ON SEWER MAIN (MJ)
TEE MATERIAL TO MATCH MAIN LINE

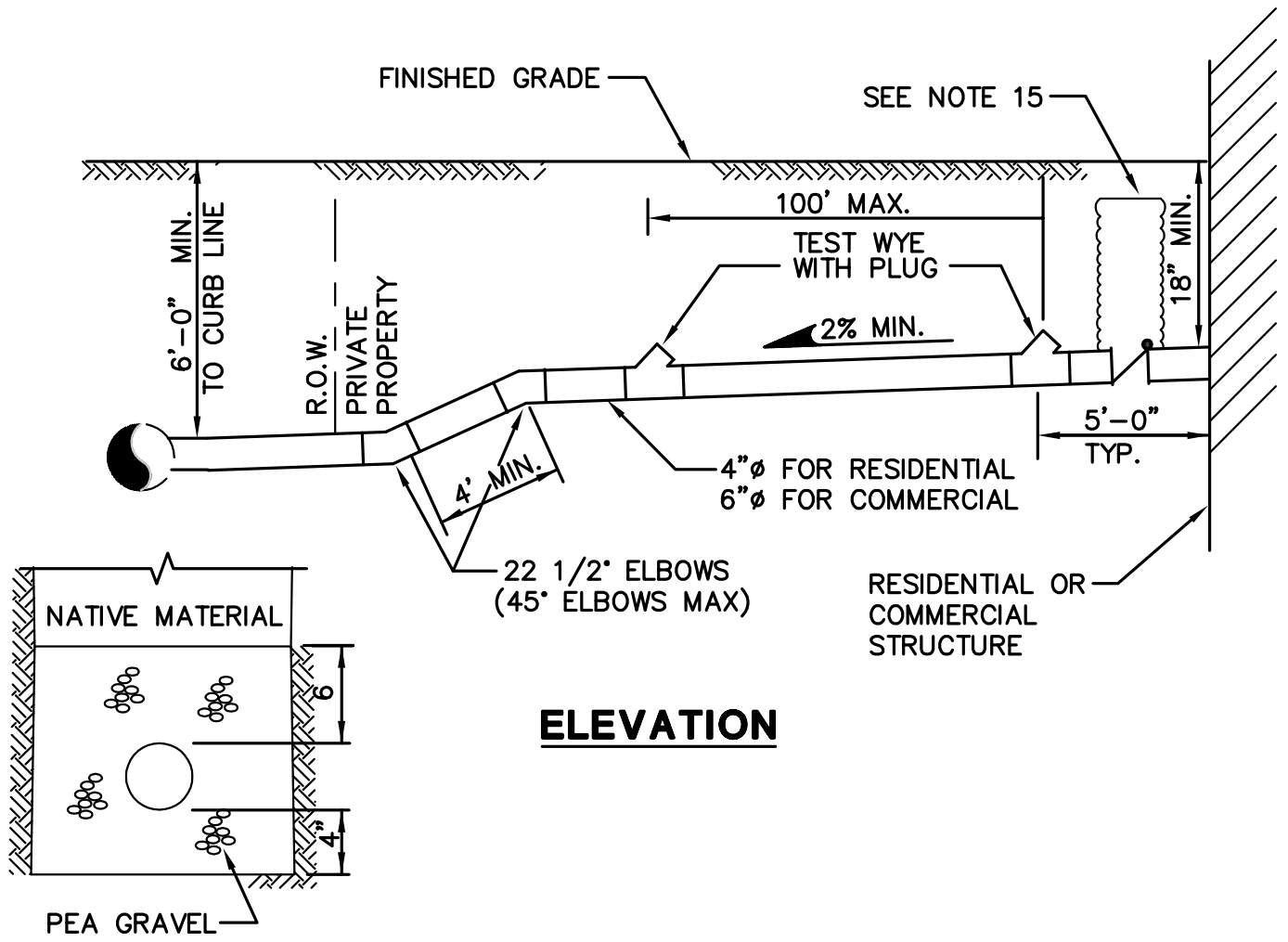
NOTES:

1. CONSIDERED FOR USE WHEN:
 - A. MAIN LINE INSTALLATION EXCEEDS 18'.
 - B. SIDE SEWER DEPTH REQUIRED IS LESS THAN 10' OF DEPTH AT PROPERTY LINE.

SEWER MAIN

STANDING SIDE SEWER
(IF APPROVED BY DISTRICT)

Whatcom County Water District 13
STANDARD DETAILS



ELEVATION

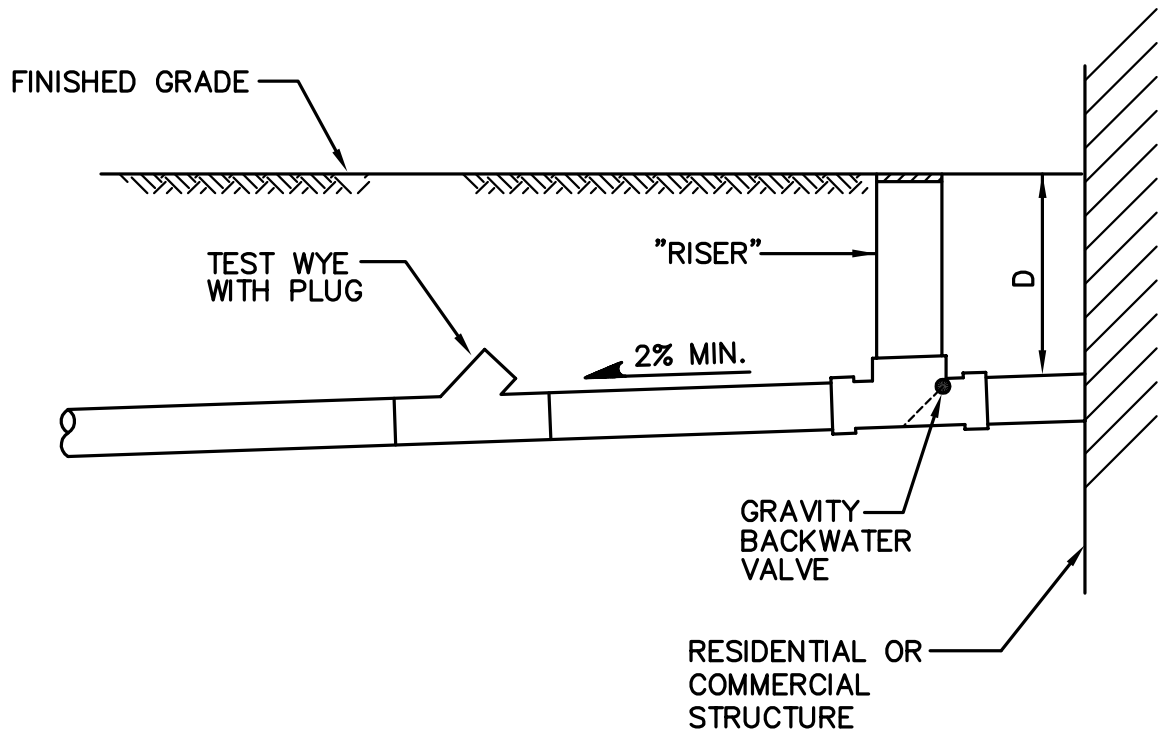
TRENCH SECTION

NOTES:

1. ELBOWS SHALL NOT BE GREATER THAN 45°. MINIMUM DISTANCE BETWEEN BENDS SHALL BE 4'.
2. CLEAN OUT IS REQUIRED FOR EACH PIPE LENGTH GREATER THAN 100' AND FOR EACH 90° ACCUMULATED ELBOW/100'
3. BACKFILL FOR PAVED AREA SHALL BE 5/8" MINUS CRUSHED SURFACING TOP COURSE, COMPACTED IN 12" LIFTS
4. ALL PLUMBING OUTLETS SHALL BE CONNECTED TO THE SEWER. NO DOWNSPOUTS OR STORM DRAINAGE MAY BE CONNECTED TO THE SEWER SYSTEM.
5. 18" MINIMUM COVERAGE OVER PRIVATE SIDE SEWER.
6. LAY PIPE IN STRAIGHT LINE BETWEEN BENDS. MAKE ALL CHANGES IN GRADE OR LINE WITH AN ELBOW OR WYE. 90° CHANGE SHALL BE ELBOW AND WYE.
7. 4" SEWER PIPE MINIMUM SIZE ON PRIVATE RESIDENTIAL PROPERTY. 6" SEWER PIPE MIN. SIZE ON COMMERCIAL PROPERTIES. 2% MINIMUM GRADE, 100% MAXIMUM (45°).
8. ALL CONSTRUCTION REQUIRES A PERMIT AND PAYMENT OF FEE, COMPLETE LEGAL DESCRIPTION OF PROPERTY AND DIMENSIONS.
9. AS-BUILT DRAWING SHOWING LOCATION OF SIDE SEWER IN RELATION TO THE HOUSE IS REQUIRED AFTER INSTALLATION.
10. SEE VI-S13 AND VI-S14 FOR SIDE SEWER LATERAL REQUIREMENTS.
11. CONSTRUCTION IN RIGHT-OF-WAY SHALL BE PERFORMED BY A REGISTERED LICENSED CONTRACTOR.
12. RIGHT-OF-WAY RESTORATION SHALL MATCH OR EXCEED THE ORIGINAL CONDITION.
13. PRE-TREATMENT SYSTEMS REQUIRE DESIGN SUBMITTAL STAMPED BY LICENSED ENGINEER.
14. PIPE TO BE BEDDED WITH PEA GRAVEL TO LIMITS SHOWN.
15. INSTALL SURFACE ACCESSIBLE BACKWATER VALVE ON ALL SIDE SEWERS WHERE POTENTIAL OCCURS FOR FLOW TO BACK INTO THE PRIVATE SERVICE. SEE VI-S17 FOR DETAILS.

PRIVATE SIDE SEWER INSTALLATION

Whatcom County Water District 13
STANDARD DETAILS



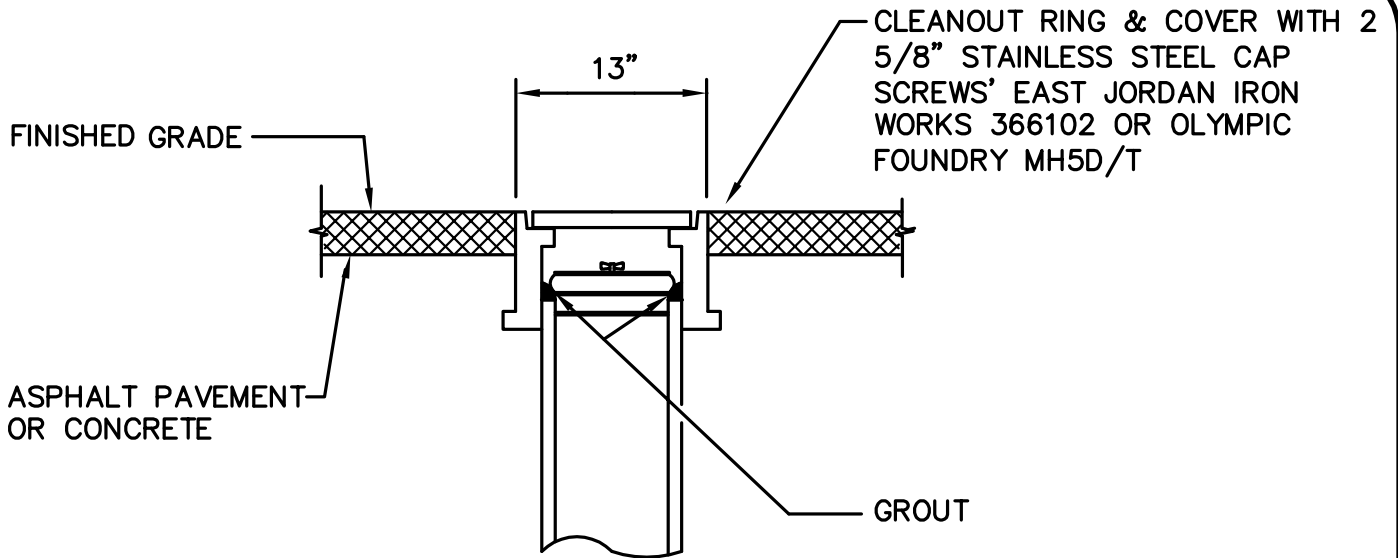
ELEVATION

NOTES:

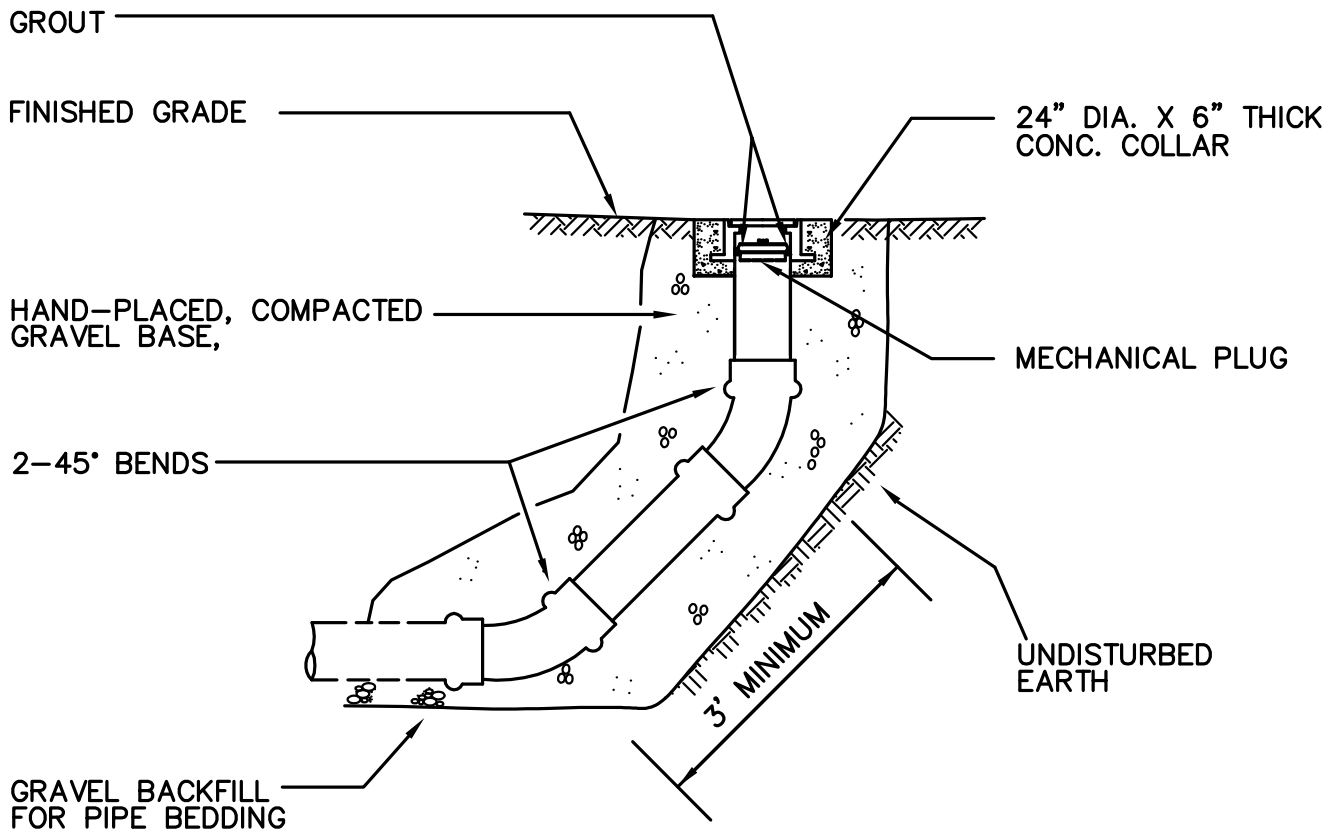
1. LOCATION TO BE APPROVED BY DISTRICT, PRIOR TO INSTALLATION.
2. NDS, OR EQUAL, GRAVITY BACKWATER VALVE. AVAILABLE IN 4" AND 6" SIZES IN ABS OR PVC MATERIAL.
3. POINT ARROWS ON TOP IN DIRECTION OF FLOW.
4. INSTALL "RISER" WITH COVER TO GROUND SURFACE FOR EASY ACCESS TO VALVE. ACCESS BY:
 - A. RISER PIPE IF DEPTH LESS THAN 18"
 - B. METER BOX TYPE 2 IF DEPTH LESS THAN 3.5 FEET
 - C. VAULT OR MANHOLE IF DEPTH GREATER THAN 3.5 FEET

PRIVATE BACKWATER VALVE

Whatcom County Water District 13
STANDARD DETAILS



PAVED



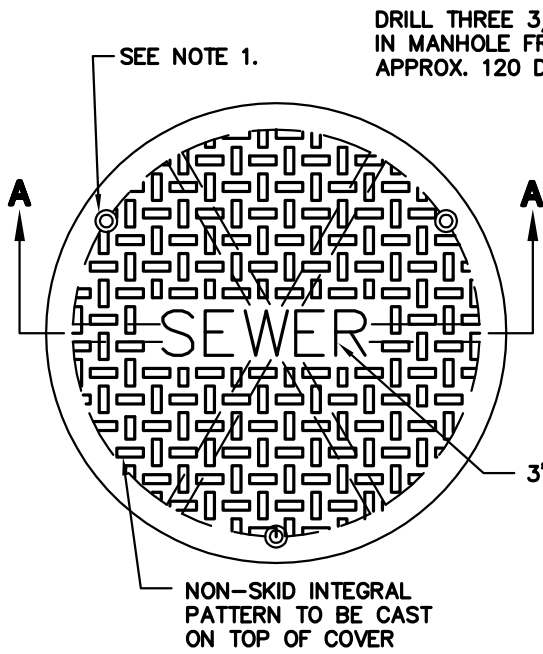
NON-PAVED

NOTE:

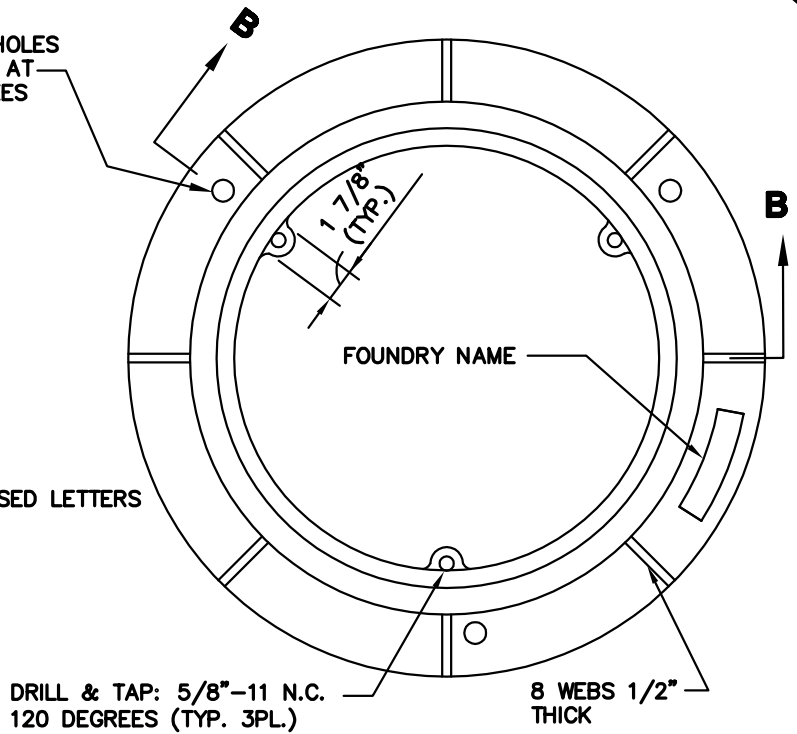
TO BE USED ON CLEANOUT ACCESS AT STRUCTURE

SIDE SEWER CLEANOUT

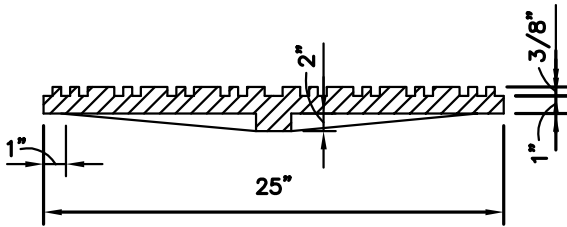
Whatcom County Water District 13
STANDARD DETAILS



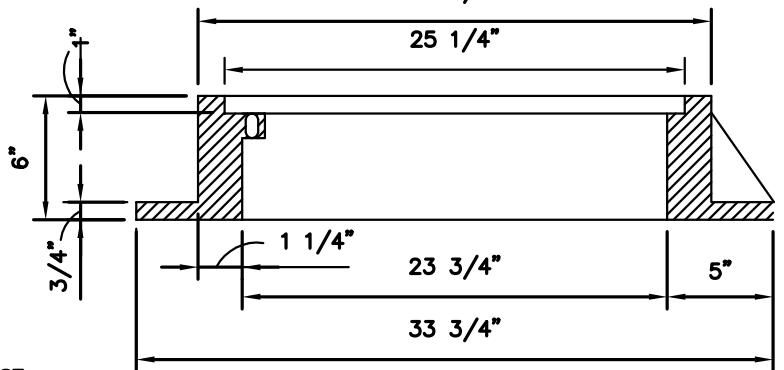
COVER PLAN



RING PLAN



SECTION A-A



SECTION B-B

GENERAL NOTES:

MANHOLE RING AND COVER SHALL BE EAST JORDAN IRON WORKS MODEL 370063, OLYMPIC FOUNDRY MODEL MH30AD/T, OR EQUAL.

COVER NOTES:

1. USE WITH THREE LOCKING BOLTS 5/8"-11 NC STAINLESS TYPE 304 STEEL SOCKET HEAD (ALLEN HEAD) BOLTS, 3" LONG. DRILL HOLES SPACED 120°, TO MATCH HOLES IN RING.
2. COVER MATERIAL IS DUCTILE IRON ASTM A536 GRADE 80-55-06.
3. SHALL CONFORM TO SEC. 9-05.15 OF THE STANDARD PECIFICATIONS, AS MODIFIED HEREIN.
4. APPROXIMATE WEIGHT OF COVER IS 150 LBS.
5. RATING - H30.

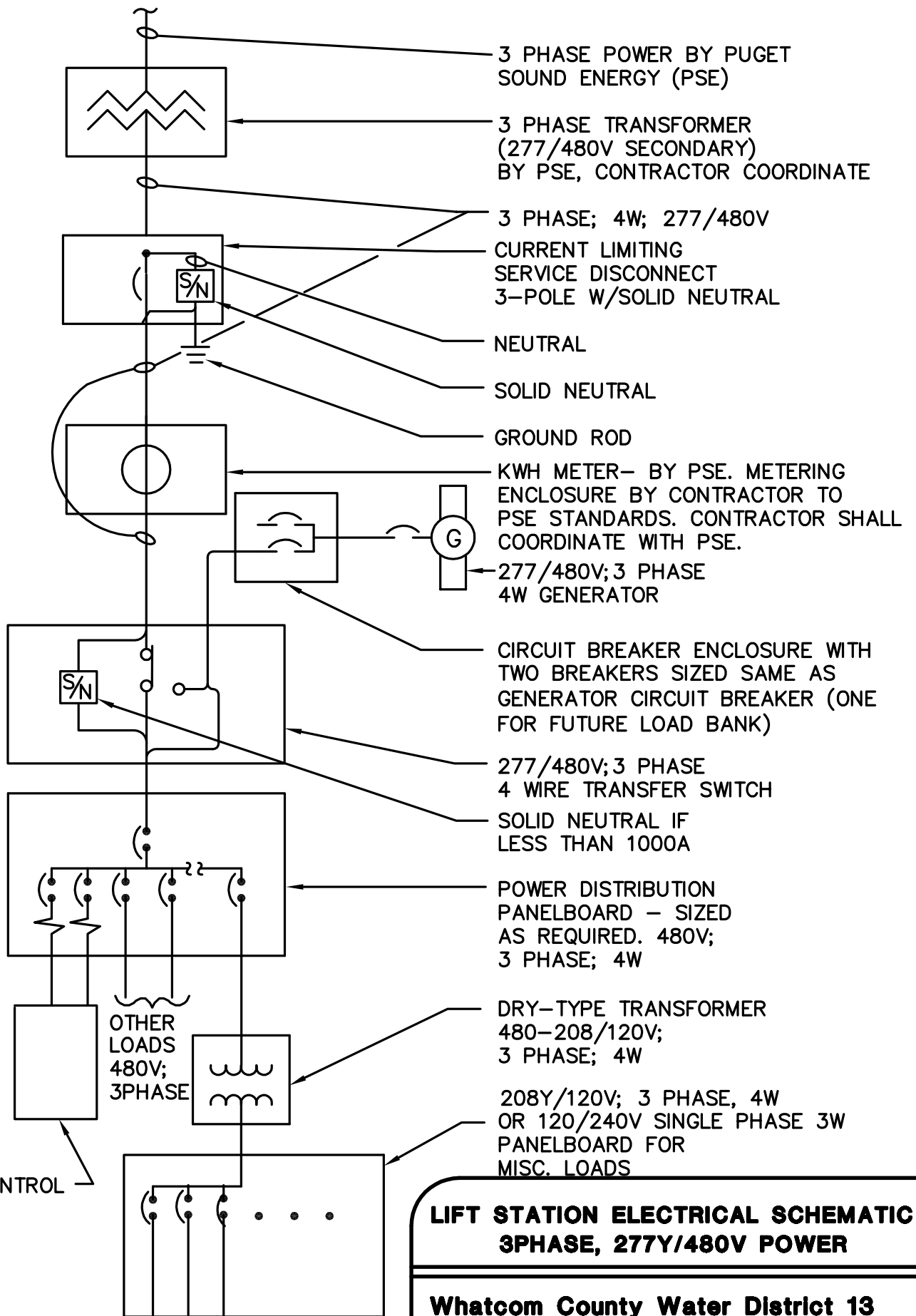
RING NOTES:

1. DRILL AND TAP THREE 5/8"-11 NC HOLES THROUGH RING AT 120°.
2. RING MATERIAL IS GREY IRON, ASTM A- 48 CLASS 30.
3. SHALL CONFORM TO SEC. 9-05.15 OF THE STANDARD SPECIFICATIONS, AS MODIFIED HEREIN.
4. APPROXIMATE WEIGHT OF RING IS 215 LBS.
5. RATING - H30.

STANDARD MANHOLE FRAME AND COVER

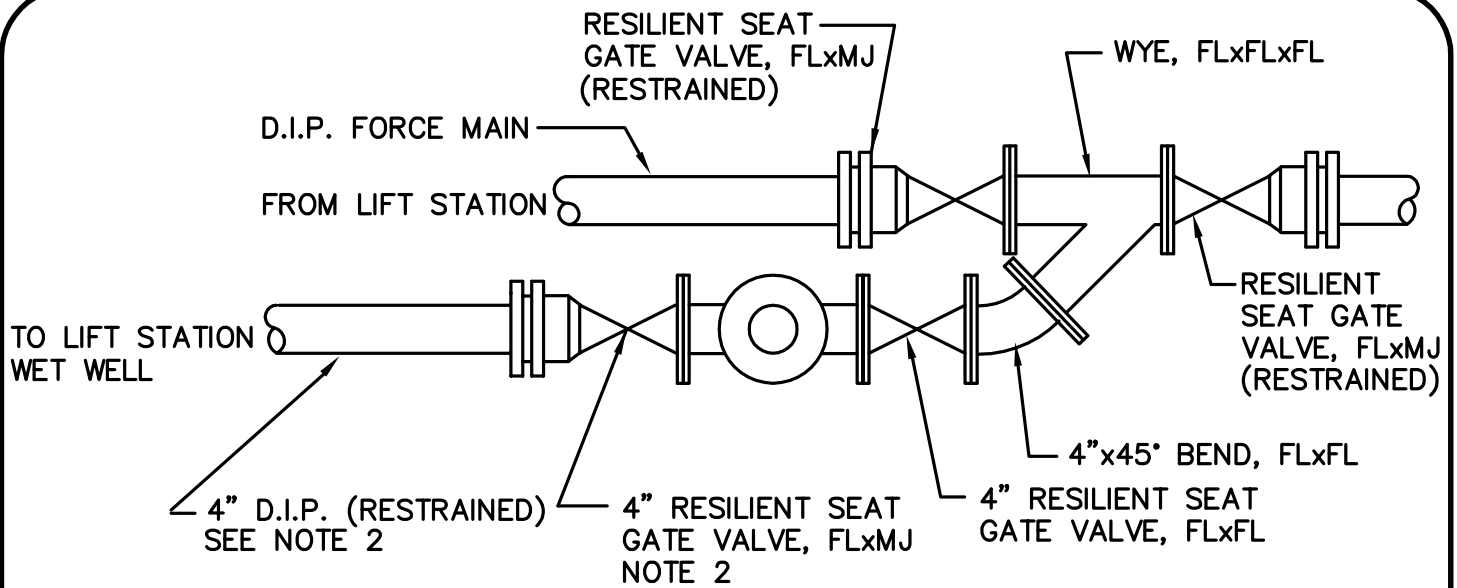
Whatcom County Water District 13
STANDARD DETAILS

LIFT STATIONS

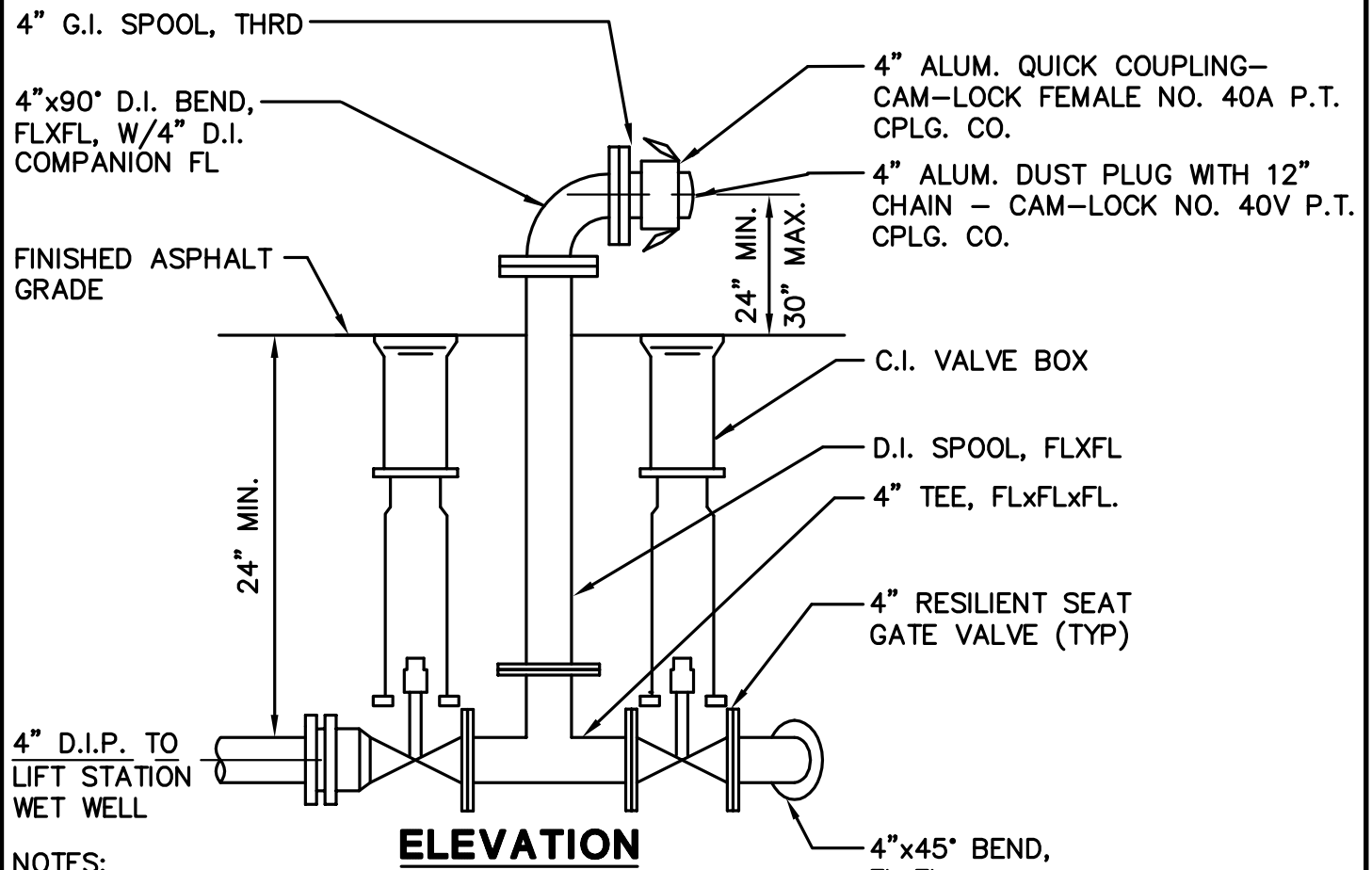


**LIFT STATION ELECTRICAL SCHEMATIC
3PHASE, 277Y/480V POWER**

Whatcom County Water District 13
STANDARD DETAILS



PLAN

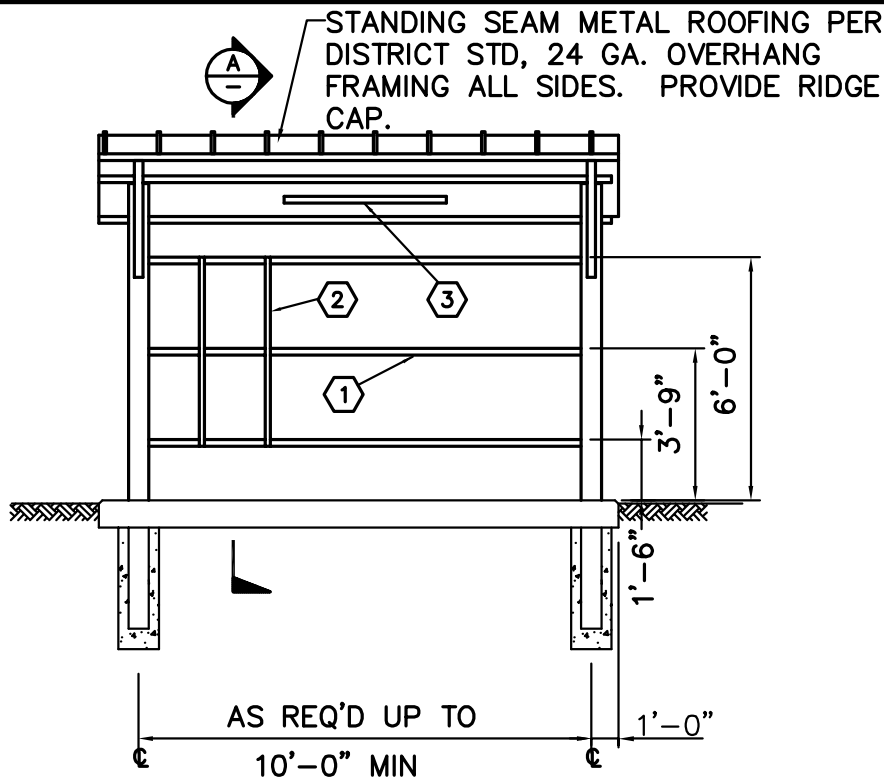


NOTES:

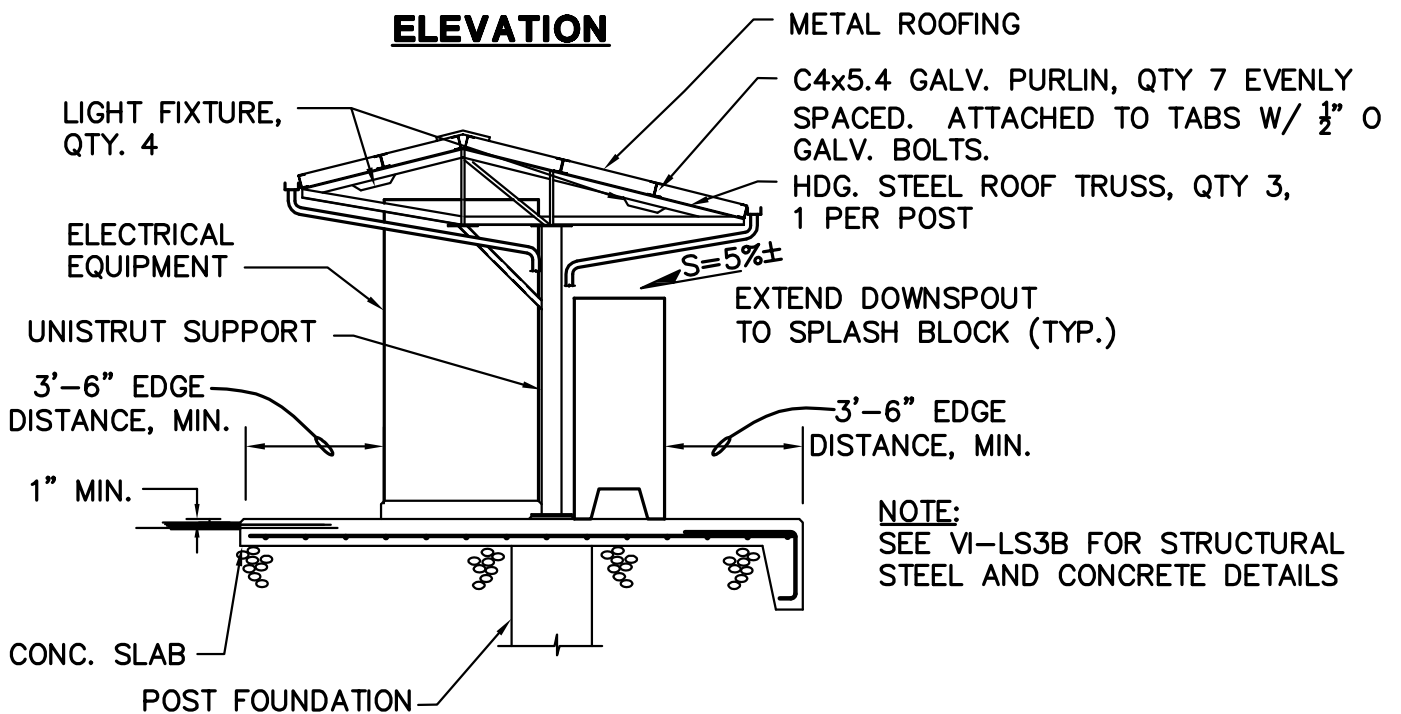
1. LOCATE AND ORIENT PUMP CONNECTION AS DIRECTED BY DISTRICT.
2. PIPE AND FITTINGS TO BE ADJUSTED BASED ON DISTANCE TO WET WELL (FLxPE, OR FLxMJ RESTRAINED)
3. 4" SIZE SHOWN, LARGER SIZE MAY BE REQUIRED TO MEET STATION CAPACITIES.

BYPASS PUMP CONNECTION

Whatcom County Water District 13
STANDARD DETAILS



ELEVATION



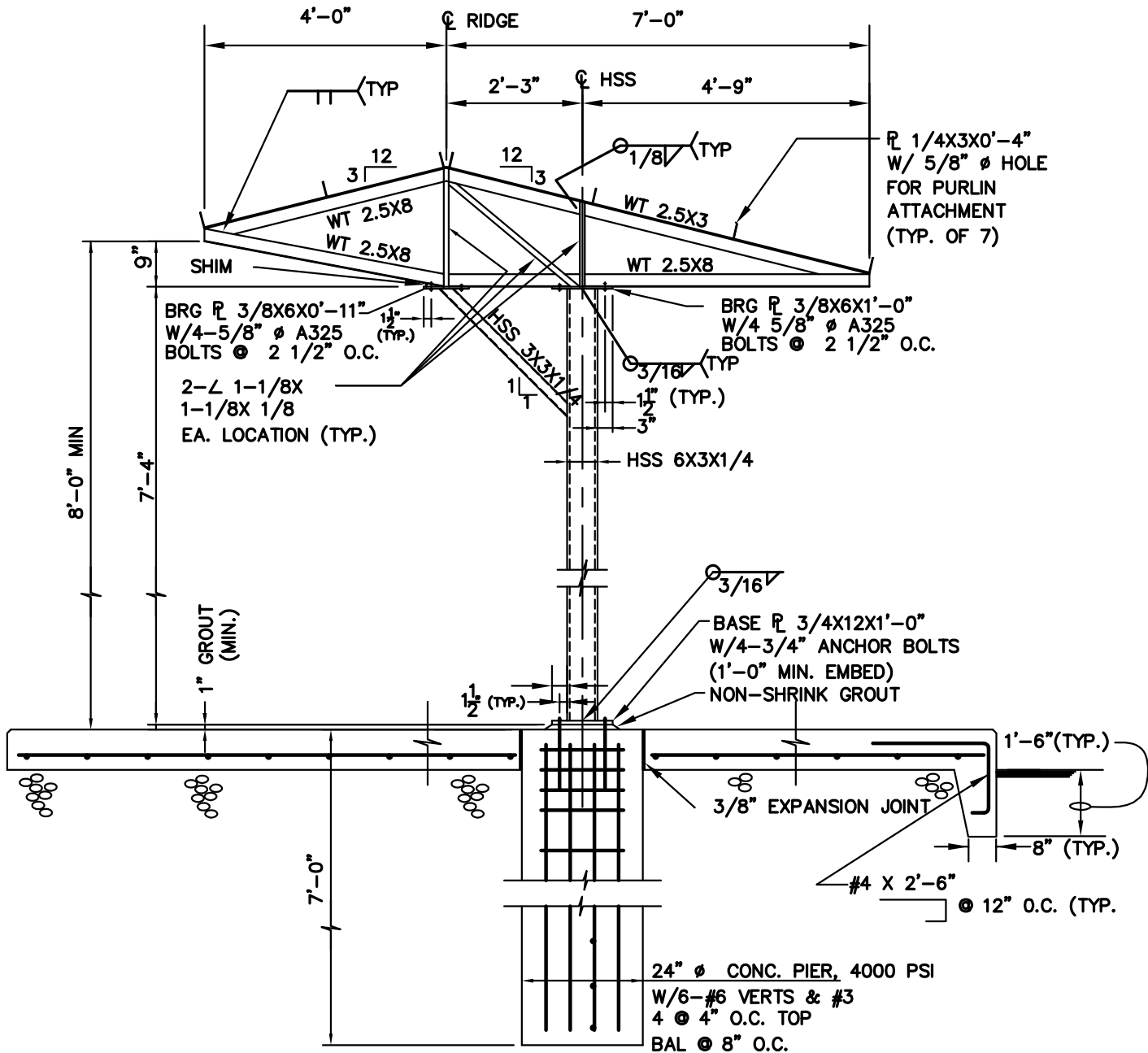
NOTE:
SEE VI-LS3B FOR STRUCTURAL STEEL AND CONCRETE DETAILS

SECTION A

- 1 C6x8.2 GALV. CHANNEL RAILS, QTY. 3 (TYP.). ATTACH TO L3x3 CLIP ANGLES W/ 1/2" Ø GALV. BOLTS.
- 2 16 GAUGE GALV. UNISTRUT SUPPORT (TYP.), AS REQUIRED.
- 3 LIGHT FIXTURE, QTY. 2 BETWEEN EA. PAIR OF COLUMNS (1 EA. FRONT & BACK)

ROOF STRUCTURE FOR ELECTRICAL ENCLOSURE

Whatcom County Water District 13
STANDARD DETAILS

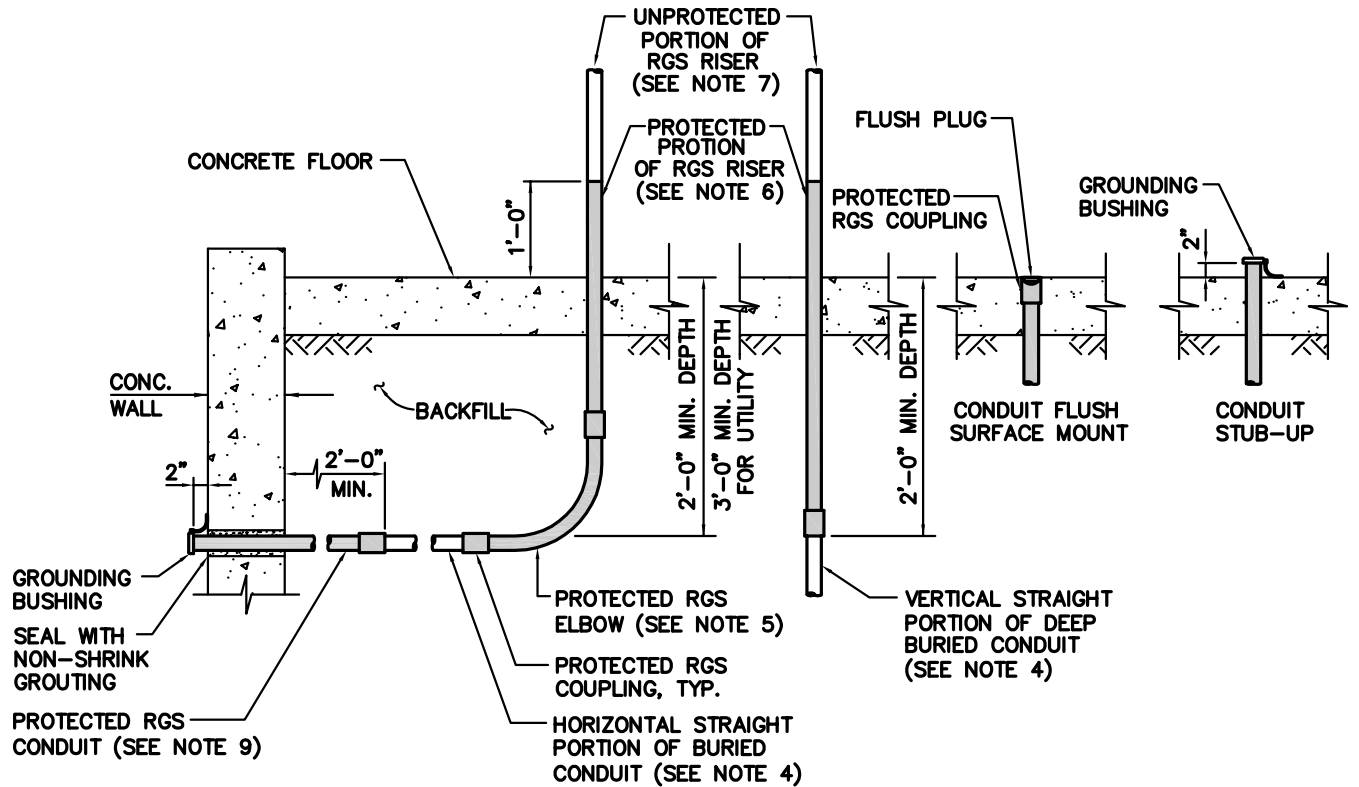


NOTE : HOT DIP GALVANIZE TRUSS AND POST ASSEMBLIES AFTER FABRICATION.

SECTION A

ROOF STRUCTURE FOR ELECTRICAL ENCLOSURE

Whatcom County Water District 13
STANDARD DETAILS

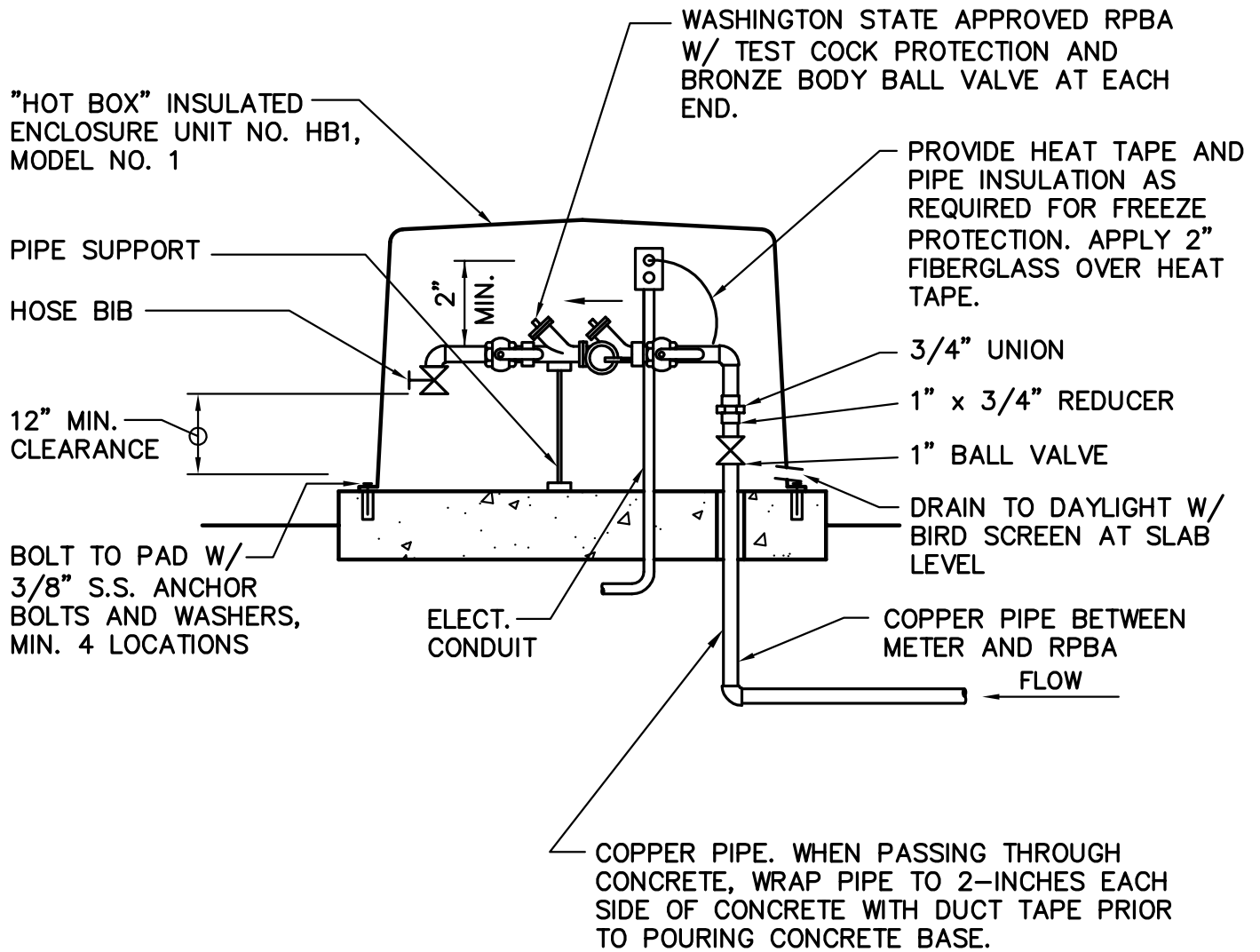


NOTES:

1. IN ALL CASES, CONDUIT INSTALLATIONS SHALL FOLLOW SPECIFICATIONS.
2. ALL SHADED COMPONENTS IN THIS DETAIL ARE PROTECTED RGS CONDUITS, FITTINGS, OR COUPLINGS.
3. ALL RGS COUPLINGS, FITTINGS, AND PORTIONS OF RGS CONDUIT UNDERGROUND, IN CONCRETE, AND WITHIN 12-INCHES OF EXISTING GRADE SHALL BE PROTECTED WITH 20 MILS (MINIMUM) OF PVC COATING.
4. BURIED STRAIGHT LENGTHS OF CONDUIT MAY BE RGS OR RNC AS DEFINED BY THE CABLE AND CONDUIT SCHEDULE.
5. ALL ELBOWS OR BENDS SHALL BE RGS, WHETHER UNDERGROUND, IN CONCRETE, OR ABOVE GROUND.
6. ALL RISERS THAT EXIT GRADE SHALL BE RGS.
7. ALL EXPOSED CONDUITS SHALL BE RGS.
8. UNDERGROUND PORTIONS OF DEEP RNC RISERS SHALL CONVERT TO PROTECTED RGS CONDUIT WITH 24-INCHES OF DEPTH TO GRADE.
9. CONDUITS PENETRATING VERTICAL WALLS OF BURIED VAULTS OR BELOW-GROUND STRUCTURES SHALL BE RGS THROUGH THE WALL AND A MINIMUM OF 24-INCHES BEHIND THE WALL UNDERGROUND. IF THE CONDUIT IS TO STUB-OUT INSIDE THE WALL, THE STUB-OUT LENGTH SHALL BE 2-INCHES.
10. ALL UNDERGROUND CONDUIT SHALL BE INSTALLED WATERTIGHT OVER THEIR ENTIRE LENGTH. WHERE THESE CONDUITS TERMINATE INSIDE THEIR ASSOCIATED JUNCTION BOXES, PLUG THE ENDS OF THE CONDUITS TO ELIMINATE THE POSSIBILITY OF WATER ENTERING THE JUNCTION BOXES FROM GROUND WATER. ALL CONDUIT PENETRATIONS SHALL BE MADE WITH NON-SHRINK GROUT.

UNDERGROUND CONDUIT DETAIL

Whatcom County Water District 13
STANDARD DETAILS

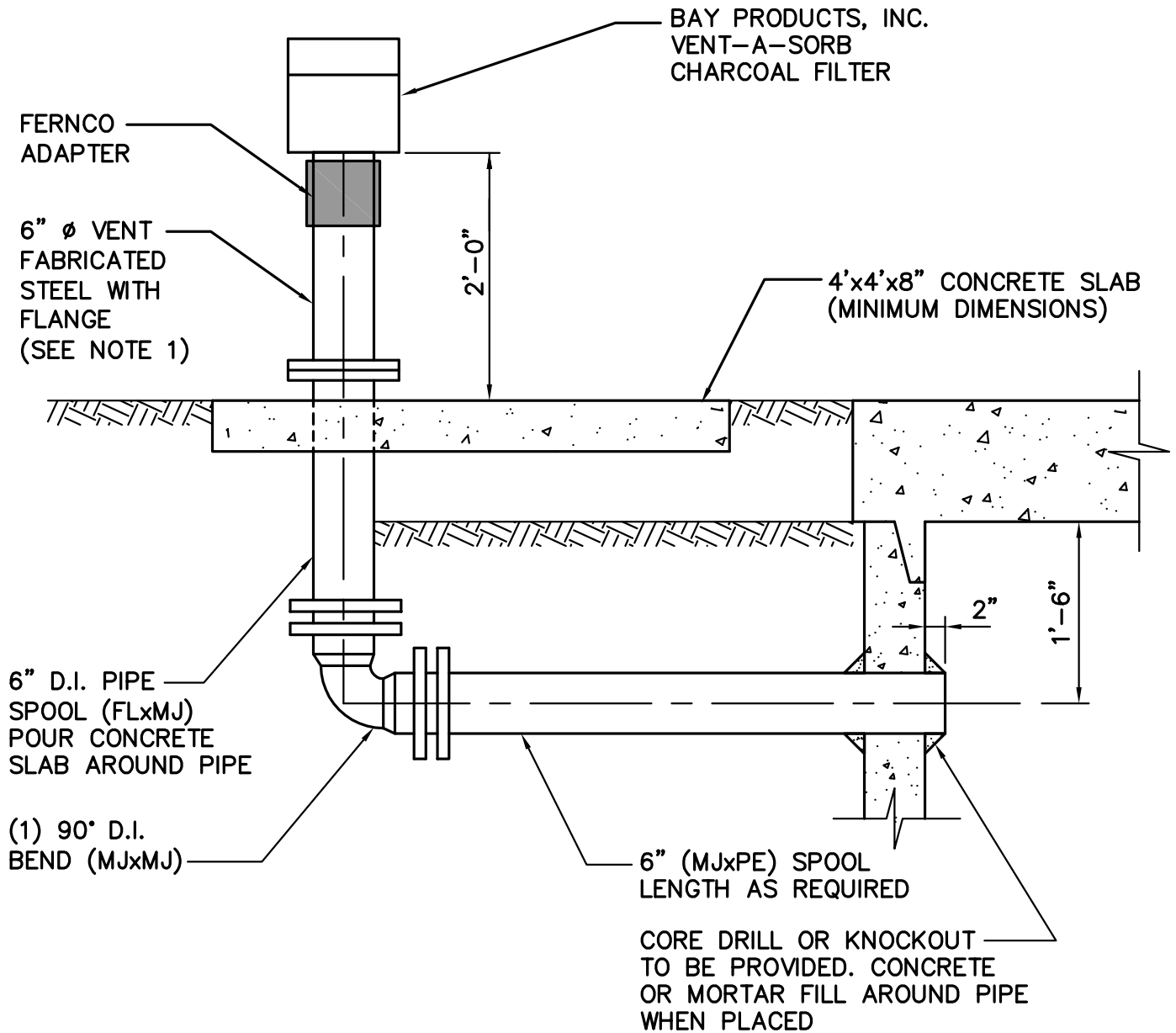


NOTES:

1. CONCRETE TO BE 2500 PSI (MINIMUM) MIX WITH AIR ENTRAINMENT.
2. COMPLETE ALL WORK IN ACCORDANCE WITH STATE, DISTRICT AND MANUFACTURER STANDARDS.
3. SYSTEM SHALL NOT BE PUT INTO SERVICE UNTIL RPBA IS APPROVED BY THE DISTRICT AND TESTED/CERTIFIED BY A WASHINGTON STATE LICENSED TESTER.
4. DIELECTRIC UNIONS SHALL BE USED TO SEPARATE DISSIMILAR MATERIALS.
5. NO BRANCH CONNECTIONS ALLOWED BETWEEN METER AND RPBA.
6. DIELECTRIC UNIONS SHALL BE USED TO SEPARATE DISSIMILAR MATERIALS.

3/4" RPBA BACKFLOW ASSEMBLY

Whatcom County Water District 13
STANDARD DETAILS

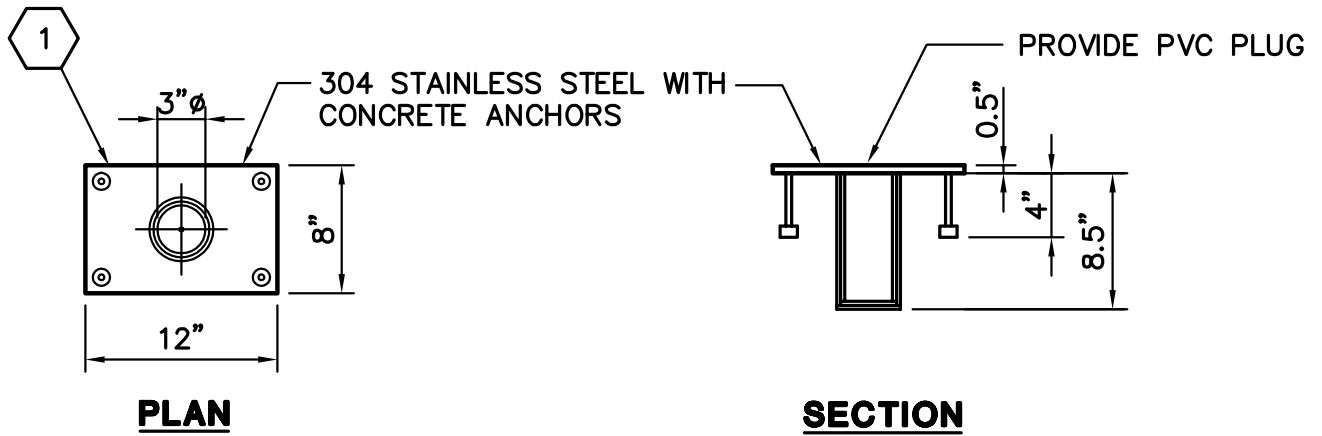
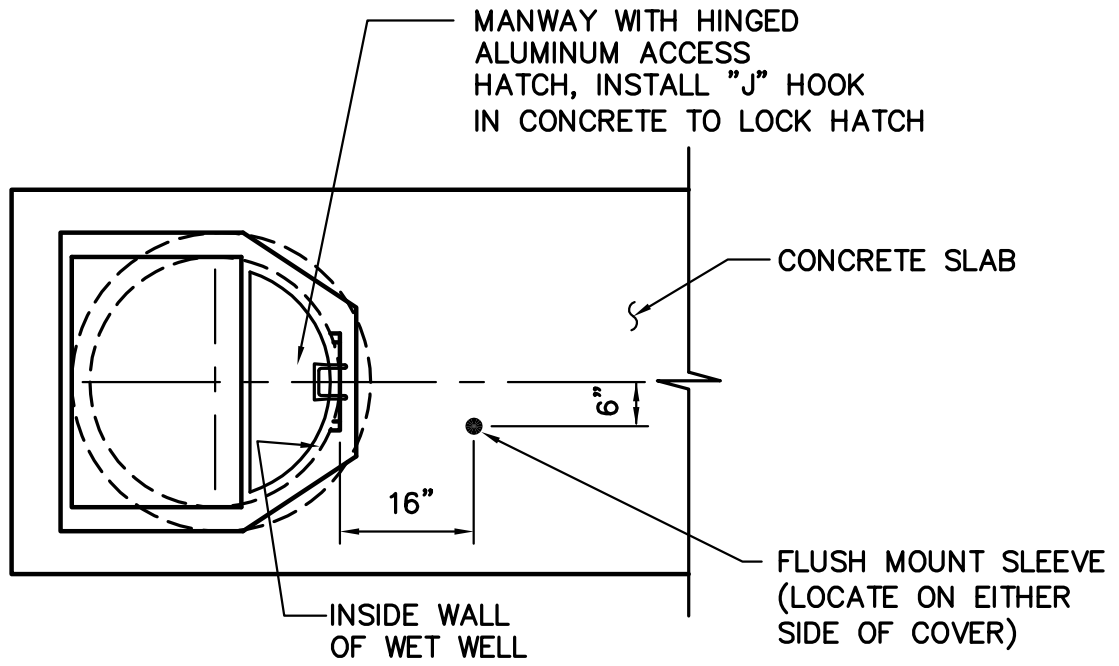


NOTES:

- HOT DIP GALVANIZE VENT "CANE" AND FLANGE AFTER FABRICATION. AFTER GALVANIZING VENT, PAINT WITH TWO COATS OF KELLY MOORE 6100-855, MACHINE GREEN, OR AS DIRECTED BY THE DISTRICT.

VENT DETAIL

Whatcom County Water District 13
STANDARD DETAILS



FLUSH MOUNT SLEEVE

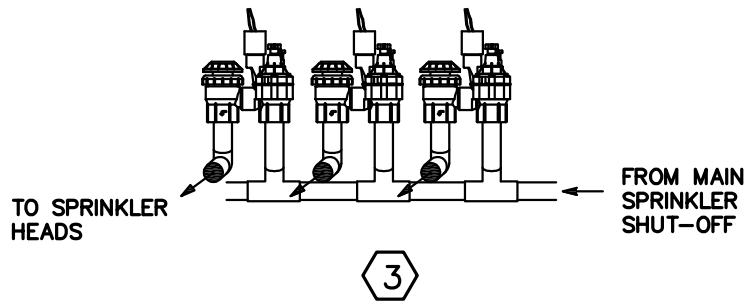
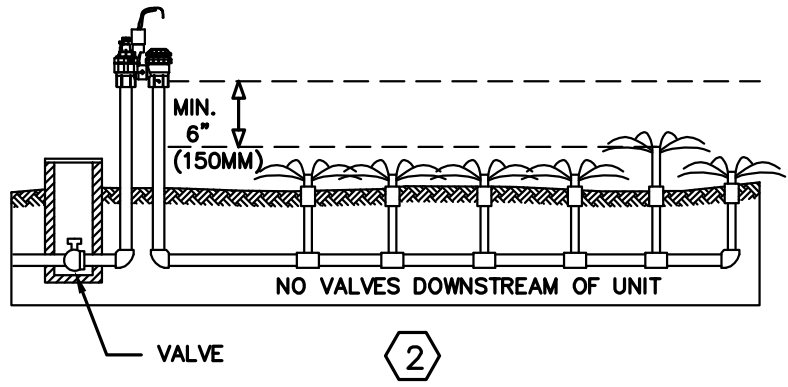
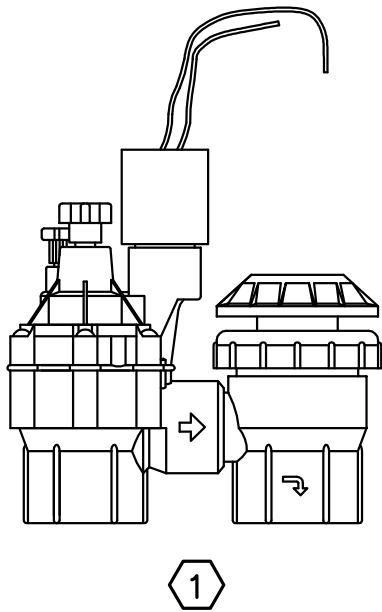
NOT TO SCALE

1 FLUSH MOUNT SLEEVE MODEL 128 BY UNIQUE CONCEPTS LTD.

FLUSH MOUNT SLEEVE

Whatcom County Water District 13
STANDARD DETAILS

CROSS-CONNECTION CONTROL



① AUTOMATIC ANTI-SIPHON CONTROL VALVE

② SHOWN IN SINGLE ZONE CONFIGURATION

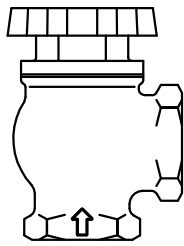
③ SHOWN IN MANIFOLD CONFIGURATION

NOTES:

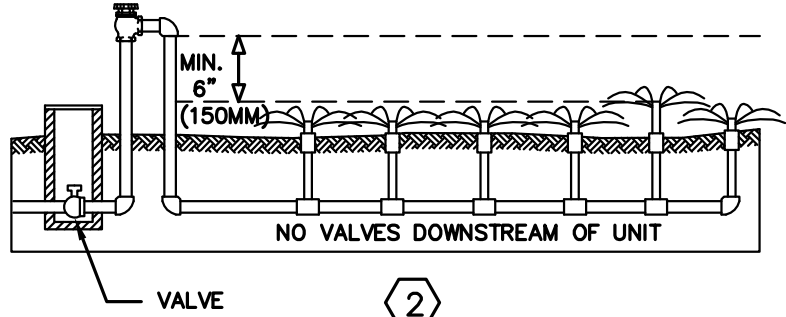
1. SHALL BE INSPECTED BY DISTRICT UPON INSTALLATION.
2. NO DOWNSTREAM VALVES ALLOWED.
3. USE 1 AUTOMATIC ANTI-SIPHON CONTROL VALVE PER ZONE.
4. INSTALL AT LEAST 6" (150MM) ABOVE HIGHEST SPRINKLER IN RESPECTIVE ZONE.
5. NEVER INSTALL BELOW GRADE.
6. MUST BE PROTECTED FROM FREEZING.
7. SHALL NOT BE MODIFIED IN ANY WAY.
8. SHALL NOT BE SUBJECT TO BACKPRESSURE.
9. MAY NOT BE INSTALLED ON SYSTEMS UTILIZING COMPRESSED AIR WINTERIZATION FITTING.
10. MAY NOT BE SUBJECT TO MORE THAN 12 HOURS OF CONTINUOUS PRESSURE.

**AUTOMATIC ANTI-SIPHON
CONTROL VALVE**

Whatcom County Water District 13
STANDARD DETAILS



①



②

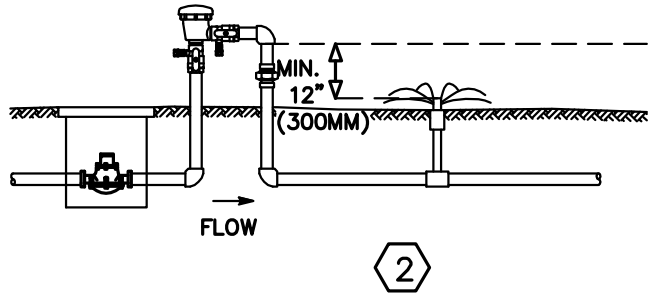
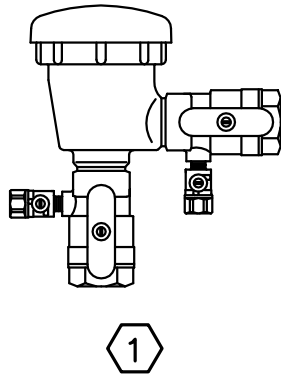
- ① ATMOSPHERIC VACUUM BREAKER
- ② SHOWN IN SINGLE ZONE CONFIGURATION
- ③ CAN BE USED IN MANIFOLD CONFIGURATION (SEE CC-W1)

NOTES:

1. SHALL BE INSPECTED BY DISTRICT UPON INSTALLATION.
2. NO DOWNSTREAM VALVES ALLOWED.
3. USE 1 ATMOSPHERIC VACUUM BREAKER PER ZONE.
4. INSTALL AT LEAST 6" (150MM) ABOVE HIGHEST SPRINKLER IN RESPECTIVE ZONE.
5. NEVER INSTALL BELOW GRADE.
6. MUST BE PROTECTED FROM FREEZING.
7. SHALL NOT BE MODIFIED IN ANY WAY.
8. SHALL NOT BE SUBJECT TO BACKPRESSURE.
9. MAY NOT BE INSTALLED ON SYSTEMS UTILIZING COMPRESSED AIR WINTERIZATION FITTING.
10. MAY NOT BE SUBJECT TO MORE THAN 12 HOURS OF CONTINUOUS PRESSURE.

**ATMOSPHERIC VACUUM
BREAKER**

Whatcom County Water District 13
STANDARD DETAILS



① PRESSURE VACUUM BREAKER

② MAY BE USED WITH DOWNSTREAM VALVES & MULTIPLE ZONES

NOTES:

1. SHALL BE INSPECTED BY DISTRICT UPON INSTALLATION.
2. SHALL BE TESTED BY A WASHINGTON STATE CERTIFIED BACKFLOW ASSEMBLY TESTER
3. INSTALL AT LEAST 12" (300MM) ABOVE HIGHEST SPRINKLER IN RESPECTIVE ZONE.
4. NEVER INSTALL BELOW GRADE.
5. MUST BE PROTECTED FROM FREEZING.
6. SHALL NOT BE MODIFIED IN ANY WAY.
7. MAY NOT BE INSTALLED ON SYSTEMS UTILIZING COMPRESSED AIR WINTERIZATION FITTING.
8. ASSEMBLY MUST BE FROM THE MOST RECENT EDITION OF "BACKFLOW PREVENTION ASSEMBLIES APPROVED FOR INSTALLATION IN WASHINGTON STATE" (D.O.H. PUB. 331-137).

PRESSURE VACUUM BREAKER

Whatcom County Water District 13
STANDARD DETAILS

APPENDIX

**SAMPLE AGREEMENT TO
PERFORM FEASIBILITY STUDY**

**WHATCOM COUNTY WATER DISTRICT NO. 13
AGREEMENT TO PERFORM A
FEASIBILITY STUDY**

_____ **WATER** _____ **SEWER**

THIS AGREEMENT is to be effective as of the ____ day of _____, 20____, by and between _____ (collectively the "Owner") and Whatcom County Water District No. 13, a municipal corporation of the State of Washington (the "District").

RECITALS

A. Sewer. The Board of Commissioners of the District operate a system of sewerage for collection and treatment of sanitary sewage in a portion of the District.

B. Water. The Board of Commissioners of the District operate a system of water for storage, treatment, and distribution of potable water for domestic use and fire protection in a portion of the District.

C. The Owner owns certain property legally described in Exhibit "A" attached hereto and by this reference made a part hereof and shown generally on Exhibit "B" attached hereto and by this reference made a part hereof (the "Property"). The Owner desires to examine the feasibility of having the Property furnished with sewage collection and treatment service or with water storage, supply, and fire flow by the District.

D. The Owner has complied or will comply with all platting and legal land use requirements of Whatcom County.

TERMS AND CONDITIONS

IN CONSIDERATION of the mutual promises and performances provided herein, the parties hereto for themselves, their assigns and successors in interest, agree as follows:

1. Preparation and Review of Study. The Owner has prepared a proposed project for serving the Property ("proposed project"). A sewer and/or water (including fire flow) feasibility study will be conducted in relation to the proposed project by either the District's Engineers or an engineering firm chosen by the Owner, the cost of either choice to be borne by the Owner. Before approval by the District of the study performed by an Engineering firm other than the District's Engineers, it shall be reviewed by District Engineers at the Owner's expense. After the study has been compiled and/or reviewed by the District's Engineers, the study, along with the Engineer's comments, shall be reviewed by the Board for approval. In the event that the Board approves the District's Engineers modifications to the study, such changes shall be made without dispute or contest. After such modifications are made, the study shall be presented to the Board for final approval. The District does not represent that the acceptance and approval of this study will constitute an approval or acceptance of any mitigation measures or bind the District in any way to a possible future developer extension agreement or to a commitment of treatment capacity or water supply.

2. Proposal Standards. The proposed project for the collection of sanitary sewage or distribution of water on the Property shall be consistent with the District's comprehensive plans, resolutions, and administrative code.

3. Mitigation. The feasibility study shall include and describe proposed improvements to the District's system, including but not limited to, installation of new facilities, upgrading of existing facilities, and installation of additional facilities. The study shall also include an estimation of the costs of such facilities and proposed methods of financing them.

4. District Authority. The approved project and proposed improvements shall be strictly in accordance with standards, rules and regulations of the District as now in effect and as the same hereafter may be amended, and standards, rules and regulations of the State Department of Ecology (sanitary sewer) and State Department of Health (water). Any proposed project rejected by the District and its Engineers shall be without dispute or contest. The determination of the District and the Engineers shall be final. Costs of such rejected proposed project shall remain the responsibility of the Owner.

5. Engineering, Legal and Administrative Costs. During the period of the study, the District shall submit monthly to the Owner a statement of charges for services of the District Engineer pursuant to this Agreement, which statement shall be equal to the statement submitted by the Engineer to the District pursuant to the applicable fee arrangement for engineering services between the District and the Engineer. The District shall also submit monthly to the Owner during such period and until this Agreement has been fully performed a statement of charges for legal services, which statement shall be equal to the statement submitted to the District by the District Attorney, pursuant to the applicable agreement between the District and the Attorney, for all work performed by the Attorney in connection with the preparation, performance or review of this Agreement, including, but not limited to, participation in any pertinent administrative or court proceeding to which the District may become a party.

The statement of charges shall include, and the Owner shall also pay, an amount equal to \$15.00 or 15%, whichever is greater, of the charges of the Engineer and the Attorney for the administrative cost to the District of handling such statement of charges, and all other out-of-pocket handling costs of the District attributable to this Agreement. The Owner shall pay any statement of charges within 10 days of receipt. Statements not paid in full within 10 days shall be deemed delinquent and shall accrue interest at the rate of 12% per annum from the date of delinquency.

The Owner has paid to the District a \$2,500 deposit, which, except in the event this Agreement is terminated for non payment, shall be refunded to the Owner without actual accrual and payment of interest after all fees and charges provided for in this Agreement have been paid by the Owner. The District reserves the right to deduct any unpaid balance from the deposit and return the balance, if any, to the Owner. If requested by the Owner, such deposit may be applied to the deposit required for a Developer Extension Agreement, if such Agreement is entered into after this Agreement is completed and upon approval from the Board.

The District shall have the right to refuse to enter into a Developer Extension Agreement and/or any other contractual relationships with the Owner in the event that charges related to this Agreement have not been paid in full and/or all the conditions stated herein have not been met. If any payment provided for in this Agreement is not timely made by the Owner, this Agreement may be terminated by the District at its option upon 10 days' written notice to the Owner.

The District shall have the right to commence, appear in or defend any action or proceeding affecting the rights of the parties hereunder, and in connection therewith shall have the right to pay necessary expenses, including but not limited to the costs of engineering and legal services. All such costs shall be subject to reimbursement by the Owner in the manner provided herein.

6. Indemnification. The Owner shall indemnify, defend and hold the District, its officers, agents and employees harmless from all suits, claims or liabilities of any nature, including attorney fees, costs and expenses, for or on account of injuries or damages sustained by persons or property resulting from the negligence (sole or concurrent) acts or omissions of the Owner, its agents or employees under this Agreement or in connection with work performed under this Agreement. If suit in respect to the above is filed, the Owner shall appear and defend the suit at its own cost and expense, and if judgment is rendered or settlement made requiring payment of damages by the District, its officers, agents or employees, the Owner shall pay the same.

7. Contractual Relationships. This Agreement does not constitute the Owner as the agent or legal representative of the District for any purpose whatsoever. The Owner is not granted any express or implied right or authority to assume or create any obligation or responsibility on behalf of or in the name of the District or to bind the District in any manner to anything whatsoever.

8. Applicable Law; Venue. This Agreement shall be construed and interpreted in accordance with the laws of the State of Washington. The venue of any action brought hereunder shall be in the Superior Court for Whatcom County.

9. Recordation. This Agreement shall be recorded in the office of the Auditor of the County of Whatcom, Washington, and shall constitute an easement and servitude upon the Property, which the Owner warrants it now owns, and shall be binding upon the parties hereto and their assigns and successors in interest. The cost of such recordation shall be paid by the owner.

All notices and payments relating to this agreement shall be made at the following addressees unless otherwise provided for in writing:

District:

Whatcom County Water District No. 13
P.O. Box 280
Maple Falls, WA 98266

Owner:

**WHATCOM COUNTY WATER DISTRICT
NO. 13**

A Washington Municipal Corporation

OWNER:

By _____
Its President

By _____

By _____
Its Secretary and Commissioner

Its _____

By _____
Its Commissioner

FOR INDIVIDUAL OWNER/DEVELOPER

STATE OF WASHINGTON)
) ss
COUNTY OF)

I certify that I know or have satisfactory evidence that _____ signed this instrument and acknowledged it to be a free and voluntary act for the uses and purposes mentioned in the instrument.

Dated: _____

NOTARY PUBLIC in and for the
State of Washington

My Commission Expires: _____

FOR CORPORATION OR PARTNERSHIP

STATE OF WASHINGTON)
) ss
COUNTY OF WHATCOM)

I certify that I know or have satisfactory evidence that _____ signed this instrument, on oath stated that _____ was authorized to execute the instrument and acknowledged it as the _____ of _____, to be the free and voluntary act of such corporation for the uses and purposes mentioned in this instrument.

Dated this ___ day of _____, 20__

NOTARY PUBLIC for the State of Washington
Printed Name: _____
Residing at: _____
My Commission Expires: _____

THE FOREGOING AGREEMENT OF _____ accepted this _____
day of _____, 20__.

WHATCOM COUNTY WATER DISTRICT NO. 13

BY _____
President, Board of Commissioners

STATE OF WASHINGTON)
) ss
COUNTY OF WHATCOM)

I certify that I know or have satisfactory evidence that _____ is the person who appeared before me, and said person acknowledged that he signed this instrument, on oath stated that he was authorized to execute said instrument and acknowledged it as the President, Board of Commissioners of WHATCOM COUNTY WATER DISTRICT NO. 13, a municipal corporation, to be the free and voluntary act of such corporation for the uses and purposes mentioned in the instrument.

Dated: _____

NOTARY PUBLIC in and for the
State of Washington

My Commission Expires: _____

SAMPLE APPLICATION

**WHATCOM COUNTY WATER DISTRICT NO. 13
APPLICATION TO CONSTRUCT
EXTENSION TO DISTRICT SYSTEM**

_____WATER _____SEWER

Project: _____

- 1) The undersigned "Developer" (also referred to as "Owner"), hereby makes application to the Commissioners of Whatcom County Water District No. 13, ("District"), for permission to construct and connect a private "Extension" to the District's existing system as herein provided. The Extension is subject to the approval of the District. The term "Extension" (also referred to as "Project") shall apply herein whether Developer is extending the District water system or the District sewer system or both.
- 2) **Attach a check for \$2,500 as a guarantee deposit.** The deposit shall be held by the District until all fees are paid to the District for the administration, feasibility study and/or fire flow analysis, review, design (where applicable), inspection, legal fees, the total of connection fees for all the units and any other services required by the District for the Project to be accepted. It is understood that the District is entitled to claim the deposit if the Project is not completed and accepted within the time limits established in the contract with the District.
- 3) The proposed Extension will be installed in roads and/or easements of the property hereinafter legally described as follows:

Common Street Address _____

Legal Description of all Properties (which owners warrant they are legal owners thereof (attach full legal if necessary).

All Property Tax Account Numbers:

- 4) **Property Description**
 - a) **Describe the type of improvement planned, if any, for the above described real property, i.e. number of single family residences, other individual residential units or commercial usage (include number of units to be served).**

b) **Attached to the application shall be three copies of each of the following:**

- i) Legal Description(s) of property if not able to fit in Item 3 (above).
- ii) Title report, current within 30 days of application and concurrent with the signatories at time that DEA is executed.
- iii) A preliminary plan setting for the proposed development, if any. The plan shall include property boundary, indication of type of development, if any, location of roads, building and/or other important features, type of building construction, including the number of units.
- iv) Final or preliminary plat map at a scale of 1 inch = 100 feet, where applicable.
- v) A contour map of the area with a five foot contour interval or less at a scale of 1 inch = 100 feet. Datum to be based on NAVD 1988 per the Whatcom County aerial survey. Location of benchmarks are to be shown. Datum used must be explicitly stated.
- vi) Existing and proposed roadway profiles.

5) Contact person and address for billing purposes:

Contact Person: _____ **Phone:** _____
Company: _____
Address: _____

6) **Set forth the proposed date for construction start and completion for the Project:**

Start of Construction: _____ Complete Construction: _____

7) **Set forth all of the current property owner's names and common street addresses. Please also attach a title report 30 days current.**

Name _____	Name _____
Address _____	Address _____
City _____ State _____ Zip _____	City _____ State _____ Zip _____

8) **Land Use Information**

a) Have you made application to Whatcom County for a building permit or for approval of a plat, short plat, rezone, or a planned unit development? If yes, set forth the name of the agency and type of action required.

Agencies	Application Date
_____	_____
_____	_____

b) **Has it ever been requested that you prepare an environmental checklist, negative declaration, or an EIS?**

Yes _____ No _____

If yes, name of agency _____

Date of Application: _____

If an EIS, negative declaration or checklist has been completed, please enclose a copy.

c) **Have you ever been required to prepare a wetland delineation map for the property?**

Yes _____ **If yes, please enclose two copies** No _____

9) **Please advise if there are any items on our Developer Extension Checklist with which you have a question or feel you cannot comply.**

10) Please provide contact information for the Project (please print):

Project Manager: _____ Phone _____

Address: _____ Fax _____

_____ Email _____

Engineer: _____ Phone _____

Address: _____ Fax _____

_____ Email _____

Geotechnical Engr: _____ Phone _____

Address: _____ Fax _____

_____ Email _____

Surveyor: _____ Phone _____

Address: _____ Fax _____

_____ Email _____

Prepared by: _____ Date: _____

Name Printed: _____

SAMPLE DEVELOPER EXTENSION AGREEMENT

**WHATCOM COUNTY WATER DISTRICT NO. 13
AGREEMENT TO CONSTRUCT
EXTENSION TO DISTRICT SYSTEM**

_____ **WATER** _____ **SEWER**

Project: _____

Developer: _____

The undersigned "Developer" (also referred to as "Owner"), has made application to the Commissioners of Whatcom County Water District No. 13, ("District"), for permission to construct and connect a private "Extension" to the District's existing system as herein provided. The term "Extension" (also referred to as "Project") shall apply herein whether Developer is extending the District water system or the District sewer system or both systems. The undersigned, in consideration of the mutual promises and covenants herein contained, agrees to the terms and conditions of this Developer Extension Agreement as follows:

1. Location of Extension.

Developer and the owners of the property acknowledge and agree that connection to District utility systems may be contingent on construction and extension of utility systems by other private parties or by District. District does not warrant infrastructure will be available to this Project in a timely manner. Developer and owner construction of onsite or off site utility facilities prior to District system being extended to allow connection is done so at their own risk.

Developer knows and understands that connection of the Extension to District water and sewer systems is likely to be subject to payment for reimbursement of fair pro rata share of costs of construction of "system area facilities" constructed by others that benefit Developer's project. Such "reimbursement payments" will be determined in the sole discretion of the District Board of Commissioners, ("Board"). Such "reimbursement payments" are due and payable to the District at the time Developer's extension is accepted by the District. On receipt of the payments, the District will make payments to others who have constructed the "system area facilities."

A. Water

The proposed water system Extension shall be installed in streets and other approved rights-of-way and/or easements and shall be for the use and benefit of the property hereinafter described, which property is owned by Developer and/or other owners for whom Developer is acting as agent. Any such owners have joined in this application and are designated on the signature page hereof.

B. Sewer

The proposed sewer system Extension shall be installed in streets and other approved rights-of-way and/or easements and shall be for the use and benefit of the property hereinafter described, which property is owned by Developer and/or other owners

for whom Developer is acting as agent. Any such owners have joined this application and are designated on the signature page hereof.

C. Owner's Property

The legal description of the owner's real property is attached hereto as Exhibit A. Sewer and water facilities contemplated under this Agreement will be constructed on the property or on easements or other property to be approved and accepted by District. Developer shall provide to District a Vicinity Map with Project location, along with the legal description.

2. Warranty of Authority.

Developer and owners of the property warrant that they are the owners of the real property described in this Agreement. Developer shall provide to District a title report establishing that the parties executing this Agreement are the owners of the real property described in this Agreement.

3. Description of Extension.

A. Water

The Extension shall consist of approximately _____ lineal feet of water pipe and appurtenances and shall be installed in accordance with this Agreement and in accordance with such Plans as Developer's Engineer may prepare in conformity with District Standards, and approved by District.

B. Sewer

The Extension shall consist of _____ and _____ lineal feet of sewer pipe and appurtenances and shall be installed in accordance with this Agreement and in accordance with such Plans as Developer's Engineer may prepare in conformity with District Standards, and approved by District.

4. Preparation of Plans.

Developer shall retain its own engineer to prepare the Plans and Specifications for the Extension according to District Standards. The following requirements apply:

(a) Prior to preparation of the Plans, Developer shall:

- (1) Obtain official preliminary plat approval (or other land use approval documents) for Developer's project using a minimum scale of one (1) inch equals fifty (50) feet;
- (2) File with the District the road and storm sewer plans and profiles for the Project;
- (3) File with the District a contour map of the Pproject with contour intervals of five (5) feet or less and using a scale of one (1) inch equals fifty (50) feet. All data to be based on NAVD88 datum;

- (4) Obtain the fire flow requirements from the Fire Marshal for multi-family and commercial projects (all projects other than single family residential);
- (5) Should a Reimbursement Agreement be requested, file with the District a plan that shows all the properties and area that can be served by the Extension and the documentation necessary for the District to determine the viability of any reimbursement agreement.

(b) Upon completion of (b) above, at the election of District, a pre-design meeting shall be held with District and with Developer and Developer's Engineer in attendance. It is expected that this meeting will occur approximately ten (10) working days after completion of (b) above. It is the obligation of Developer to arrange for the meeting and the attendance of concerned parties.

(c) At the pre-design meeting, Developer's Engineer shall submit to District a conceptual plan for the utility development of the Project.

(d) Upon preliminary review of the conceptual plan, Developer's Engineer shall prepare and submit to District a preliminary design and Plans for review and approval by District. Water and sewer plans shall be on separate sheets. Plans shall include a general vicinity map depicting the Project location. District shall have the right to require changes in the preliminary design and Plans as may be deemed necessary. All designs and plans prepared by Developer's Engineer shall be prepared in accordance with District Standards.

(e) Upon approval of the preliminary design and Plan by District, Developer's Engineer shall prepare a proposed final Plan and submit three (3) copies of the proposed final Plan, together with an electronic file of the Plans on AutoCAD Release 13 or 14, or as updated to be compatible with District's system, to District for review. Upon receipt of the proposed final Plan, District shall have the right to require such changes to the proposed final Plan as may be deemed necessary.

(f) Upon completion of all required changes to the final Plan, the Board will consider the final Plan for approval. The Board shall have the right to approve, reject, or require changes to the final Plan as may be deemed necessary.

(g) Upon approval of the final Plan by the Board, the District Manager, or designee, will indicate his approval of the Plan on the original Mylar Drawings.

(h) Upon approval of the original Mylar Plan Drawings, Developer's Engineer shall submit copies of the approved Plan so that District can procure the Whatcom County right-of-way construction permits for the Plan as may be necessary. Developer's Engineer shall notify District of any permits required. Developer shall be responsible for procuring all other necessary and applicable permits. Should changes to the Plan be required in order to receive the permits and approvals, Developer's Engineer shall make all changes as required.

5. Warranties of Developer -- Water and Sewer

(a) Before commencement of work, Developer shall agree to District approved plans and specifications and a schedule of work. Developer shall reimburse

District for all costs of plan review, inspection, and other work on the Project done by District staff or consultants.

(b) All public and private property which is disturbed by the construction of the Project improvements shall be restored to as good a condition as it was prior to the commencement of the construction.

(c) All design and all work shall be in conformance with requirements of the District, the State of Washington Department of Ecology, and regulations or controls or conditions of any other governmental agency charged with the responsibility of permitting, inspecting, accepting or approving design and construction of the Project improvements.

(d) **INSURANCE REQUIREMENTS, SUMMARY OF COVERAGE & INDEMNITY:** The Developer shall carry liability and property damage insurance covering all work during Project construction, including that done by Developer's Contractor and the Contractor's subcontractors. This insurance shall also protect District from any contingent liability prior to Project acceptance.

Developer shall obtain from an insurance company, with an A.M. Best rating of "AVII" or better approved by the Insurance Commissioner of the State of Washington pursuant to Title 48 RCW, commercial general liability and automobile liability insurance against claims to Developer, District and its elected and appointed officials, officers, employees, agents and volunteers for injury to person or property which may arise from any act or omission by anyone directly or indirectly employed by the Developer from or relating to the performance, supervision, or inspection of the work. The insurance policy(s) shall specifically name and include District and its elected and appointed officials, officers, employees, agents and volunteers as additional insured's under such policy(s) with regards to damages and defense of claims arising from: (a) activities performed by or on behalf of Developer; (b) products and completed operations of Developer, or (c) premises owned, leased or used by Developer for the work proposed under this Agreement. Proof of the existence of such insurance shall be provided to District in a form acceptable to District prior to the Pre-Construction Meeting.

Developer shall not begin work under this Agreement or under any special condition until all required insurance has been obtained and until such insurance has been reviewed and accepted by District. Developer shall file with District either a certified copy of all insurance policies or a certificate of insurance with the endorsements in the form included herein as are necessary to comply with these specifications.

The minimum limits of coverage shall be as follows:

General Aggregate	\$2,000,000.00
Products-Comp/OPS Aggregate	\$2,000,000.00
Personal Injury	\$2,000,000.00
Each Occurrence	\$2,000,000.00
Automobile	\$2,000,000.00

Policies shall be kept in force until the project is accepted by District. District shall be given at least forty-five (45) days written notice of cancellation, non-renewal, material

reduction, or modification of coverage. District may increase these limits if the scope of the proposed work warrants additional coverage.

Failure of Developer to fully comply with the requirements regarding insurance will be considered a material breach of this Agreement and shall be cause for immediate termination of this Agreement and any and all District obligations, regarding same.

The coverage provided by the insurance policies shall be primary to any insurance maintained by District, except with respect to losses attributable to the sole negligence of District. Any insurance that might cover this Agreement which is maintained by District shall be in excess of the Developer's/Contractor's insurance and shall not contribute with it.

The insurance policy shall protect each insured in the same manner as though a separate policy had been issued to each. The inclusion of more than one insured shall not affect the rights of any insured with respect to any claim, suit or judgment made or brought by or for any other insured or by or for any employee of any other insured.

The general aggregate provisions of the insurance policy shall be amended to show that the general aggregate limit of the policies apply separately to this Project.

The insurance policy shall not contain a deductible or self-insured retention in excess of \$10,000 unless approved by District.

Providing coverage in the stated amounts shall not be construed to relieve Developer from liability in excess of such limits.

Developer shall indemnify, defend and hold District and its elected and appointed officials, officers, employees, agents and volunteers harmless from and against all losses and all claims, demands, payments, suits, actions, recoveries, and judgments of every nature and description brought or recovered against District by reason of any act or omission of Developer, Developer's agents or employees, in connection with the work performed under this Agreement, or caused or occasioned in whole or in part by reason of the presence of Developer, Developer's Contractor or Sub-contractors, or their property, employees or agents, upon or proximity to any property upon which work is being performed under this Agreement.

For the purpose of applying RCW 4.24.115 to Developer's project, Developer and District agree that the term "damages" applies only to the finding in a judicial proceeding and is exclusive of third party claims for damages preliminary thereto.

Developer agrees to indemnify, defend and hold harmless District, and its elected and appointed officials, officers, employees, agents and volunteers from all claims for damages by third parties, including costs and reasonable attorney's fees in the defense of such claims for damages, arising from performance of the work under this Agreement. Developer waives any right of contribution against District.

It is agreed and mutually negotiated that in any and all claims against District or any of its agents or employees by any employee of Developer, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, the indemnification obligation hereunder constitutes Developer's and its Contractor's and

Sub-Contractor's waiver of immunity under Title 51 RCW, solely for the purposes of this indemnity.

District and Developer agree that all third party claims for damage against District for which Developer's insurance carrier does not accept defense of District may be tendered by District to the Developer who shall, if so tendered by District, accept and undertake to defend or settle with the Claimant. District retains the right to approve claims investigation and legal counsel assigned to said claim and all investigation and legal work product regarding said claim shall be performed under a fiduciary relationship to District. In the event that District agrees or a court finds that the claim arises from the sole negligence of District, this indemnification shall be void and District shall be responsible for all damages payable to the third party claimant. In the event that District and Developer agree or a court finds that the claim arises from or includes negligence of both the Developer and District, Developer shall be responsible for all damages payable by Developer to the third party claimant under the court finding, and, in addition thereto, Developer shall hereunder indemnify District for all damages paid or payable by District under the court finding an amount not to exceed the percentage of total fault attributable to Developer. For example, where Developer is 25 percent negligent, Developer shall not be required to indemnify District for any amount in excess of 25 percent of the claimant's total damages.

Nothing contained in these insurance requirements is to be construed as limiting the extent of Developer's and its contractor's responsibility for payment of damages resulting from operations under this Agreement.

(e) Upon completion of the construction, and after acceptance of the facilities by District, Developer shall convey the facilities to District by means of a bill of sale. The bill of sale to be provided by Developer to District shall contain the following warranties with District as beneficiary:

(1) Developer is the owner of the Extension, the same is free and clear of all encumbrances and Developer has good right and authority to transfer title thereto to District and shall defend the title of District against the claims of all third parties claiming to own the same or claiming any interest therein or encumbrance thereon; and

(2) That all bills and taxes relating to the construction and installation of the Extension have been paid in full and that there are no lawsuits pending involving this Project. The undersigned further warrants that in the event any lawsuit is filed as a result of, or involving, this Project Developer and Owner shall undertake to defend the lawsuit and shall accept responsibility and pay for all costs of litigation, including District's costs, and reasonable attorneys fees and shall hold District harmless on any judgment rendered against District in accordance with provisions set forth in more detail in the District Standards; and

(3) That all laws and ordinances respecting construction of this Project have been complied with, and that the Extension is in proper working condition, order and repair, and is fit for its

intended purpose and that it has been constructed in accordance with the District Standards; and

(4) For a period of two (2) years from the date of final acceptance of the Extension by District, the Extension and all parts thereof shall remain in proper working condition, order and repair; and Developer shall repair or replace, at Developer's expense, any work or material which may prove to be defective during the period of the warranty.

(f) Developer shall notify District of the date work on the construction of the facilities described in this Agreement will commence. In the event of interruption of work for any reason for more than seven (7) consecutive calendar days, Developer shall give District notice of not less than twenty-four (24) hours before resuming work.

(g) After the work is commenced or recommenced, Developer shall vigorously and consistently continue the work in a first class manner until completion.

(h) Upon completion of construction, Developer shall deliver to District all Mylar originals of as-built drawings, together with an electronic file of the Plans on AutoCAD Release 13 or 14 or as updated to be compatible with District's system, and such other engineering records and data as may be required by District.

In addition, Developer shall obtain warranties and guaranties from its subcontractors and/or suppliers where such warranties or guaranties are specifically required in this Agreement. When corrections of defects occurring within the warranty period are made, Developer shall further warrant corrected work for two (2) years after acceptance of the correct work by District.

6. Correction of Defects Occurring Within Warranty Period.

When defects in the Extension are discovered within the warranty period, Developer shall start work to remedy any such defects within seven (7) calendar days of notice by District and shall complete such work within a reasonable time. In emergencies, where damages may result from delay or where loss of service may result, corrections may be made by District upon discovery, in which case the cost thereof shall be borne by Developer. In the event Developer does not commence and/or accomplish corrections within the time specified, the work may be accomplished by District at its option, and the cost thereof shall be paid by Developer.

Developer shall be responsible for any expenses incurred by District resulting from defects in Developer's work, including actual damages, costs of materials and labor expended by District in making repairs and the cost of engineering, inspection and supervision by District or District Consultants.

7. Performance Guarantee.

Developer shall furnish to District prior to the pre-construction conference a performance guarantee of a type and in a form as determined by District, in its sole discretion, in an amount equal to the Developer's Engineer's estimated cost of the Extension or contractor bid price. The performance guarantee shall require completion of all work in accordance with this Agreement, the Plans and Specifications, District Standards and other requirements of District within a period of twenty-four (24) months

from the date of acceptance of the Plans by District. District in its sole discretion may also require a payment bond of a type and in a form as determined by District requiring the payment by Developer of all persons furnishing labor and materials in connection with the work performed under this Agreement, and shall hold District harmless from any claims there from. Any payment bond required by District shall be provided to District prior to the pre-construction conference as a condition of District granting final acceptance of the work referenced herein. No third person or party shall have any rights under any performance guarantee. District may require from Developer and such performance guarantee is provided entirely for the benefit of District and Developer and their successors in interest.

8. Maintenance Bond.

Acceptance by District shall not relieve Developer of the obligation to correct defects in labor and/or materials as herein provided and/or the obligations set forth in applicable paragraphs hereof. Prior to acceptance of the Extension by District and the transfer of title to such extension(s) as set forth herein, Developer shall furnish to District a maintenance bond (cash or bond) which shall continue in force from the date of acceptance of said Extension for a period of two (2) years. The bond shall be in a form as prescribed by District and shall require Developer and the bonding company to correct the defects in labor and materials which arise in the Extension for a period of two (2) years from the date of acceptance of the Extension and transfer of title. The maintenance bond shall be in an amount equal to fifteen (15) percent of the cost of the Extension, but not less than five thousand dollars (\$5,000.00). The District shall review the submitted construction costs and determine the amount of the maintenance bond.

9. Limitation of Period of Acceptance.

The Extension shall be completed and accepted within twenty-four (24) months of the date of acceptance of the Plans by District.

If the Extension is not completed and accepted within the twenty-four (24) month period, then this Agreement and all of Developer's rights herein shall terminate and cease. Extension of the time for completion of this Agreement shall be allowed only at the election of the Board. In the event this Agreement terminates, Developer shall be required to make a new pre-application and new application for extension agreement to District. Any such new agreement entered into between District and Developer pursuant to a new application shall be subject to any new or amended Resolutions, construction policies, standards and specifications which have taken effect since the execution of the terminated agreement. Nothing herein shall be construed to convey any rights or privileges to Developer except as explicitly set forth in this agreement.

If Developer abandons the Extension during twenty-four (24) months or shall fail to complete the Extension within that period, Developer may be deemed, at District's sole option and election, to have transferred and conveyed to District any portion of the Extension which has been completed.

10. Final Acceptance - Conditions Precedent.

Compliance with all terms and conditions of this Agreement, the Plans and Specifications prepared hereunder, District Standards, and other District requirements shall be a condition precedent to District's obligation to allow connection to District's system, to accept the Bill of Sale to the Extension, and to District's agreement to

maintain and operate the Extension and to provide service to the real property that is described in this Agreement.

District will not be required to allow any connection to District's system any portion of the real property described in this Agreement if there are any fees or costs unpaid to District under this Agreement or there are other fees arising under other District requirements which are unpaid.

District will not be obligated to provide service to the property described in this Agreement if construction by third parties of facilities to be deeded to District has not been completed and title accepted by District if such third-party facilities are necessary to provide service to the property described in this Agreement.

District will not be obligated to allow service connections to its system until all General Facilities (water) and Connection (sewer) charges in effect on the date of application for service have been paid. Developer understands and specifically agrees that General Facilities and Connection charges required by District to connect to District's system will be determined by District at time of connection. Developer understands and agrees that any and all fees and charges of the District may be adjusted by District prior to the time of connection to District system and Developer waives actual notice of any hearing by the Board of Commissioners to consider adjustment of any such fees and charges.

District will accept title to the Extension at such time as all work which may, in any way, affect the lines constituting the Extension has been completed, and any damage to the Extension which may exist has been repaired, and District has made final inspection and given its approval to the Extension as having been completed in accordance with this Agreement, the Plans and Specifications, District Standards, and other requirements of District.

11. Procedure for Acceptance.

Acceptance of title to the Extension will be made by District. Prior to such acceptance, an executed bill of sale in a form approved by District and containing the warranties required by this Agreement shall be executed by Developer and any additional owners and delivered to District. There will be no conditional acceptance or acceptance for use and operation.

12. Effect of Acceptance.

Acceptance by District shall cause the Extension to be a public system subject to the control, use and operation of District and all regulations, conditions of service, and service charges as District determines to be reasonable and proper, and subject to the laws of the State of Washington.

13. Rates and Charges.

The property described in this Agreement shall be subject to all rates and charges established by District, as now exist or hereinafter amended or adjusted.

14. Subcontracting.

Developer shall be fully responsible for the acts and omissions of subcontractors and persons employed, directly or indirectly, by subcontractors, as well as the acts and commissions of persons directly employed by Developer.

15. No Assignment without District Approval.

Developer's rights and responsibilities arising out of this Agreement shall not be assignable unless District's prior consent is obtained. Written documents as required by District of any District approved assignment shall be filed with District by Developer herein at the time of any assignment.

16. District Standards.

The District Standards, as currently adopted or hereafter amended, are incorporated herein by this reference.

17. Remedies Available to District.

In the event Developer fails to pay any of the extension fees and charges and fines referenced herein when due as determined by District, the charge or fine shall then be delinquent and shall accrue interest at the highest legal rate per annum until paid. In addition to any other remedies available to District, District shall be entitled to file a lien against the Real Property described in this Agreement in the event of nonpayment and to foreclose such lien pursuant to RCW 57.08.080-090, as revised or amended.

18. Reimbursement Agreement

Developer may request, as provided for in this section, reimbursement for costs of constructing sewer or water system offsite of the proposed development by adjacent properties that subsequently connect to or use the Extension and that did not contribute to the original cost of the Extension.

If requested by Developer, District and Developer shall enter into a Developer Reimbursement Agreement consistent with the terms and conditions of Chapter 57.22 RCW.

District will not accept the Bill of Sale for the Extension or accept the development as complete until all property owners within the benefited area have been notified of the latecomer's charges as described in the Reimbursement Agreement. The District takes no responsibility to defend legal challenge to a Reimbursement Agreement with Developer. Any challenge to District's authority or process for a Reimbursement Agreement will not be defended by District. District may tender defense of the reimbursement agreement to Developer.

The Developer shall make his request for such agreement at the time of submitting the application for the Developer Extension Agreement by signing the following declaration:

Yes, I request a Reimbursement Agreement _____

No, I do not request a Reimbursement Agreement _____

Developer agrees that Developer's costs for the sewer/water improvements to be constructed by Developer hereunder have been factored into the feasibility of the Project and that Developer's decision to proceed with the Project is not contingent or in any way dependent on receipt of latecomer payments or payments from other property owners or developers that may connect to or use sewer/water facilities constructed by Developer under this Agreement. Developer agrees and acknowledges that District reserves the right to direct water/sewer flows and to contract for the construction of other sewer/water facilities, regardless of whether future flows and future facilities constructed under other contracts affect anticipated receipt of latecomer payments hereunder.

19. Notice.

Any notice required by this Agreement to be given by District to Developer shall be given as follows:

Name: _____ Phone: _____

Address: _____

20. Complete Agreement.

This Agreement, and the plans approved by District, constitutes the entire agreement between Developer and District with respect to the rights and responsibilities of both parties in regard to project referred to herein. For purpose of identification, this Agreement shall be assigned a number by District, which number shall be endorsed on the first page of this Agreement. This Agreement may be changed in writing only upon mutual agreement of the Commissioners of District and Developer.

ACCEPTANCE OF THIS AGREEMENT BY DISTRICT CONSTITUTES A CONTRACT WITH DEVELOPER, THE TERMS OF WHICH ARE EACH PARAGRAPH OF THIS AGREEMENT, THE DISTRICT STANDARDS, AND THE EXTENSION DESIGN PLANS APPROVED BY DISTRICT.

DATED this _____ day of _____, 20____.

BY _____
Developer

Its _____

FOR INDIVIDUAL OWNER/DEVELOPER

STATE OF WASHINGTON)
) ss
COUNTY OF)

I certify that I know or have satisfactory evidence that _____ signed this instrument and acknowledged it to be a free and voluntary act for the uses and purposes mentioned in the instrument.

Dated: _____

NOTARY PUBLIC in and for the
State of Washington

My Commission Expires: _____

FOR CORPORATION OR PARTNERSHIP

STATE OF WASHINGTON)
) ss
COUNTY OF)

I certify that I know or have satisfactory evidence that _____ signed this instrument, on oath stated that _____ was authorized to execute the instrument and acknowledged it as the _____ of _____, to be the free and voluntary act of such corporation for the uses and purposes mentioned in this instrument.

Dated this ____ day of _____, 20____

NOTARY PUBLIC for the State of Washington
Printed Name: _____
Residing at: _____
My Commission Expires: _____

THE FOREGOING AGREEMENT OF _____ accepted this
____ day of _____, 20_____.

NOTE:

The following insurance forms completed by Developer's Insurance provider are to be presented to District prior to scheduling a pre-construction meeting.

FORMS:

- 1) Accord 25 (2001/08) Example**
- 2) Accord 25 (2001/08) Blank**
- 3) CG 20-10-11-85 Additional Insured (2-Pages)**
- 4) CG 20-10-10-01**
- 5) CG 20-37-10-01**

ACORD™ CERTIFICATE OF LIABILITY INSURANCE DATE (MM/DD/YYYY)
08/26/03

PRODUCER Contractors Insurance Services P.O. Box 1000 Anytown, WA License No. 123456	THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW.												
INSURED ABC Construction Co. 123 Main Street Hometown, WA	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 70%;">INSURERS AFFORDING COVERAGE</th> <th style="width: 30%;">NAIC #</th> </tr> <tr> <td>INSURER A: Travelers Insurance Co.</td> <td></td> </tr> <tr> <td>INSURER B: Hartford</td> <td></td> </tr> <tr> <td>INSURER C: Fireman's Fund</td> <td></td> </tr> <tr> <td>INSURER D: DPIC</td> <td></td> </tr> <tr> <td>INSURER E:</td> <td></td> </tr> </table>	INSURERS AFFORDING COVERAGE	NAIC #	INSURER A: Travelers Insurance Co.		INSURER B: Hartford		INSURER C: Fireman's Fund		INSURER D: DPIC		INSURER E:	
INSURERS AFFORDING COVERAGE	NAIC #												
INSURER A: Travelers Insurance Co.													
INSURER B: Hartford													
INSURER C: Fireman's Fund													
INSURER D: DPIC													
INSURER E:													

COVERAGES

THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. AGGREGATE LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	ADD'L INSRD	TYPE OF INSURANCE	POLICY NUMBER	POLICY EFFECTIVE DATE (MM/DD/YY)	POLICY EXPIRATION DATE (MM/DD/YY)	LIMITS	
A		GENERAL LIABILITY <input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY <input type="checkbox"/> CLAIMS MADE <input checked="" type="checkbox"/> OCCUR <input checked="" type="checkbox"/> Stop Gap \$1,000,000 <input type="checkbox"/> _____ GEN'L AGGREGATE LIMIT APPLIES PER: <input checked="" type="checkbox"/> POLICY <input type="checkbox"/> PROJECT <input type="checkbox"/> LOC	GL1234	10/01/02	10/01/03	EACH OCCURRENCE	\$ 1,000,000
						DAMAGE TO RENTED PREMISES (Ea occurrence)	\$ 50,000
						MED EXP (Any one person)	\$ 10,000
						PERSONAL & ADV INJURY	\$ 1,000,000
						GENERAL AGGREGATE	\$ 2,000,000
						PRODUCTS - COM/POP AGG	\$ 1,000,000
B		AUTOMOBILE LIABILITY <input checked="" type="checkbox"/> ANY AUTO <input type="checkbox"/> ALL OWNED AUTOS <input type="checkbox"/> SCHEDULED AUTOS <input type="checkbox"/> HIRED AUTOS <input type="checkbox"/> NON-OWNED AUTOS <input type="checkbox"/> _____ <input type="checkbox"/> _____	AL1234	10/01/02	10/01/03	COMBINED SINGLE LIMIT (Ea accident)	\$ 1,000,000
						BODILY INJURY (Per person)	\$
						BODILY INJURY (Per accident)	\$
						PROPERTY DAMAGE (Per accident)	\$
		GARAGE LIABILITY <input type="checkbox"/> ANY AUTO <input type="checkbox"/> _____				AUTO ONLY - EA ACCIDENT	\$
						OTHER THAN EA ACC	\$
						AUTO ONLY: AGG	\$
C		EXCESS/UMBRELLA LIABILITY <input checked="" type="checkbox"/> OCCUR <input type="checkbox"/> CLAIMS MADE <input type="checkbox"/> DEDUCTIBLE <input type="checkbox"/> RETENTION \$	XS2345	10/01/02	10/01/03	EACH OCCURRENCE	\$ 2,000,000
						AGGREGATE	\$
							\$
							\$
							\$
		WORKERS COMPENSATION AND EMPLOYERS' LIABILITY Washington Labor & Industries # _____				<input type="checkbox"/> WC STATUTORY LIMITS <input type="checkbox"/> OTHER	
						E.L. EACH ACCIDENT	\$
						E.L. DISEASE - EA EMPLOYEE	\$
						E.L. DISEASE - POLICY LIMIT	\$
D		OTHER Professional Liability	PL3456	10/01/02	10/01/03	1,000,000 per Claim 1,000,000 Aggregate	

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES / EXCLUSIONS ADDED BY ENDORSEMENT / SPECIAL PROVISIONS

(Member) District is an Additional Insured on General and Auto Liability Policies with respect to Pumphouse Construction Project for (Member) District at 456 Main Street Site.

CERTIFICATE HOLDER

(Member) District
 456 Main Street
 Hometown, WA

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, THE ISSUING INSURER WILL ENDEAVOR TO MAIL 45 DAYS WRITTEN NOTICE TO THE CERTIFICATE HOLDER NAMED TO THE LEFT, BUT FAILURE TO DO SO SHALL IMPOSE NO OBLIGATION OR LIABILITY OF ANY KIND UPON THE INSURER, ITS AGENTS OR REPRESENTATIVES. AUTHORIZED REPRESENTATIVE

AUTHORIZED REPRESENTATIVE
 Contractor's Agent/Broker

ACORD™ CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)

PRODUCER	THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW.	
	INSURERS AFFORDING COVERAGE	NAIC #
INSURED	INSURER A:	
	INSURER B:	
	INSURER C:	
	INSURER D:	
	INSURER E:	

COVERAGES

THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. AGGREGATE LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR ADD'L LTR INSRD	TYPE OF INSURANCE	POLICY NUMBER	POLICY EFFECTIVE DATE (MM/DD/YY)	POLICY EXPIRATION DATE (MM/DD/YY)	LIMITS								
	GENERAL LIABILITY <input type="checkbox"/> COMMERCIAL GENERAL LIABILITY <input type="checkbox"/> CLAIMS MADE <input type="checkbox"/> OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: <input type="checkbox"/> POLICY <input type="checkbox"/> PRO-JECT <input type="checkbox"/> LOC				EACH OCCURRENCE \$ DAMAGE TO RENTED PREMISES (Ea occurrence) \$ MED EXP (Any one person) \$ PERSONAL & ADV INJURY \$ GENERAL AGGREGATE \$ PRODUCTS - COMP/OP AGG \$								
	AUTOMOBILE LIABILITY <input type="checkbox"/> ANY AUTO <input type="checkbox"/> ALL OWNED AUTOS <input type="checkbox"/> SCHEDULED AUTOS <input type="checkbox"/> HIRED AUTOS <input type="checkbox"/> NON-OWNED AUTOS				COMBINED SINGLE LIMIT (Ea accident) \$ BODILY INJURY (Per person) \$ BODILY INJURY (Per accident) \$ PROPERTY DAMAGE (Per accident) \$								
	GARAGE LIABILITY <input type="checkbox"/> ANY AUTO				AUTO ONLY - EA ACCIDENT \$ OTHER THAN EA ACC \$ AUTO ONLY: AGG \$								
	EXCESS/UMBRELLA LIABILITY <input type="checkbox"/> OCCUR <input type="checkbox"/> CLAIMS MADE <input type="checkbox"/> DEDUCTIBLE <input type="checkbox"/> RETENTION \$				EACH OCCURRENCE \$ AGGREGATE \$ \$ \$ \$								
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? If yes, describe under SPECIAL PROVISIONS below				<table border="1"> <tr> <td>WC STATU-TORY LIMITS</td> <td>OTH-ER</td> </tr> <tr> <td>E.L. EACH ACCIDENT</td> <td>\$</td> </tr> <tr> <td>E.L. DISEASE - EA EMPLOYEE</td> <td>\$</td> </tr> <tr> <td>E.L. DISEASE - POLICY LIMIT</td> <td>\$</td> </tr> </table>	WC STATU-TORY LIMITS	OTH-ER	E.L. EACH ACCIDENT	\$	E.L. DISEASE - EA EMPLOYEE	\$	E.L. DISEASE - POLICY LIMIT	\$
WC STATU-TORY LIMITS	OTH-ER												
E.L. EACH ACCIDENT	\$												
E.L. DISEASE - EA EMPLOYEE	\$												
E.L. DISEASE - POLICY LIMIT	\$												
	OTHER												

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES / EXCLUSIONS ADDED BY ENDORSEMENT / SPECIAL PROVISIONS

CERTIFICATE HOLDER

CANCELLATION

	SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, THE ISSUING INSURER WILL ENDEAVOR TO MAIL _____ DAYS WRITTEN NOTICE TO THE CERTIFICATE HOLDER NAMED TO THE LEFT, BUT FAILURE TO DO SO SHALL IMPOSE NO OBLIGATION OR LIABILITY OF ANY KIND UPON THE INSURER, ITS AGENTS OR REPRESENTATIVES.
	AUTHORIZED REPRESENTATIVE

IMPORTANT

If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

DISCLAIMER

The Certificate of Insurance on the reverse side of this form does not constitute a contract between the issuing insurer(s), authorized representative or producer, and the certificate holder, nor does it affirmatively or negatively amend, extend or alter the coverage afforded by the policies listed thereon.

ISO | Commercial General Liability Forms | 11/01/85

POLICY NUMBER: COMMERCIAL GENERAL LIABILITY

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

ADDITIONAL INSURED -- OWNERS, LESSEES OR
CONTRACTORS (FORM B)

This endorsement modifies insurance provided under the following:

COMMERCIAL GENERAL LIABILITY COVERAGE PART.

SCHEDULE

Name of Person or Organization:

(If no entry appears above, information required to complete this endorsement will be shown in the Declarations as applicable to this endorsement.)

WHO IS AN INSURED (Section II) is amended to include as an insured the person or organization shown in the Schedule, but only with respect to liability arising out of "your work" for that insured by or for you.

CG 20 10 11 85 Copyright, Insurance Services Office, Inc., 1984

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©2004 Insurance Reference Systems, Inc. All Rights Reserved.

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

**ADDITIONAL INSURED – OWNERS, LESSEES OR
CONTRACTORS – SCHEDULED PERSON OR
ORGANIZATION**

This endorsement modifies insurance provided under the following:

COMMERCIAL GENERAL LIABILITY COVERAGE PART

SCHEDULE

<p>Name of Person or Organization:</p>

(If no entry appears above, information required to complete this endorsement will be shown in the Declarations as applicable to this endorsement.)

A. Section II – Who Is An Insured is amended to include as an insured the person or organization shown in the Schedule, but only with respect to liability arising out of your ongoing operations performed for that insured.

B. With respect to the insurance afforded to these additional insureds, the following exclusion is added:

2. Exclusions

This insurance does not apply to "bodily injury" or "property damage" occurring after:

- (1) All work, including materials, parts or equipment furnished in connection with such work, on the project (other than service, maintenance or repairs) to be performed by or on behalf of the additional insured(s) at the site of the covered operations has been completed; or
- (2) That portion of "your work" out of which the injury or damage arises has been put to its intended use by any person or organization other than another contractor or subcontractor engaged in performing operations for a principal as a part of the same project.

POLICY NUMBER:

COMMERCIAL GENERAL LIABILITY
CG 20 37 10 01

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

**ADDITIONAL INSURED – OWNERS, LESSEES OR
CONTRACTORS – COMPLETED OPERATIONS**

This endorsement modifies insurance provided under the following:

COMMERCIAL GENERAL LIABILITY COVERAGE PART

SCHEDULE

Name of Person or Organization:
Location And Description of Completed Operations:
Additional Premium:

(If no entry appears above, information required to complete this endorsement will be shown in the Declarations as applicable to this endorsement.)

Section II – Who Is An Insured is amended to include as an insured the person or organization shown in the Schedule, but only with respect to liability arising out of "your work" at the location designated and described in the schedule of this endorsement performed for that insured and included in the "products-completed operations hazard".

SAMPLE BILL OF SALE

WHATCOM COUNTY WATER DISTRICT NO. 13

BILL OF SALE - WATER

Project: _____

Developer: _____

THE UNDERSIGNED hereby conveys and transfers to the WHATCOM COUNTY WATER DISTRICT NO. 13 (the "District") the following described personal property:

This conveyance is made in consideration of the District's agreement to provide routine maintenance of said property and to provide water services pursuant to the District's resolutions and regulations, which may be amended from time to time.

The undersigned, and its successors and assigns, covenants and agrees to and with the District, its successors and assigns, that the undersigned is the owner of said property and has the right and authority to sell the same, that the property is free of all liens or encumbrances, and that the undersigned will, and does, hereby warrant and agree to defend the title of the District, its successors and assigns, against the claims of all third parties claiming to own the same or claiming any interest therein or encumbrance thereon.

The undersigned warrants that all bills and taxes relating to the construction and installation of the water main and appurtenances have been paid in full and that there are no lawsuits pending involving this project. The undersigned further warrants that in the event any lawsuit is filed as a result of, or involving, this project the undersigned will undertake to defend the lawsuit and will accept responsibility for all costs of litigation, including costs on appeal, and will hold the District harmless on any judgment rendered against the District.

The undersigned further warrants that all laws and ordinances respecting construction of this project have been complied with, and that the property is in proper working condition, order and repair and fit for purposes intended; i.e., for use as a water distribution system including distribution and supply lines adequate for the service intended and has been constructed in accordance with the conditions and standards of the District.

The undersigned covenants and agrees with the District to replace, repair and correct any defect in work or materials in respect to the personal property subject to this Bill of Sale arising during a period of two (2) years from date hereof, without cost to the District. The undersigned shall further warrant the corrected work for two years after acceptance of the corrected work by the District.

DEVELOPER: _____

By: _____

Its: _____

INDIVIDUAL

STATE OF WASHINGTON)
)
County of _____)

ss.

On this _____ day of _____, 20____, before me, the undersigned Notary Public, duly commissioned and sworn, personally appeared _____ to me known to be the individual(s) named herein, and who executed the within and foregoing in instrument, and acknowledged execution of the said instrument to be the free and voluntary act and deed of said individual(s), for the uses and purposes therein mentioned.

WITNESS my hand and official seal hereto affixed the day and year first above written.

NOTARY PUBLIC in and for
Washington State, residing at _____

My Commission Expires: _____

CORPORATE

STATE OF WASHINGTON)
)
County of _____)

ss.

On this _____ day of _____, 20____, before me, the undersigned Notary Public in and for the State of Washington, duly commissioned and sworn, personally appeared _____

_____ to me known to be the _____ of _____ the corporation named herein, and acknowledged execution of the said instrument to be the free and voluntary act and deed of said corporation, for the uses and purposes therein mentioned; and on oath stated that he is authorized to execute said instrument and that the seal affixed (if any) is the corporate seal of said corporation.

WITNESS my hand and official seal hereto affixed the day and year first above written.

NOTARY PUBLIC in and for
Washington State, residing at _____

My Commission Expires: _____

WHATCOM COUNTY WATER DISTRICT NO. 13
ITEMIZED COST OF
WATER SYSTEM

Project: _____

Developer: _____

Date _____

DESCRIPTION	QUANTITY	UNIT COST	ITEM TOTAL
6-In. Diam. Ductile Iron Pipe			
8-In. Diam. Ductile Iron Pipe			
12-In. Diam. Ductile Iron Pipe			
Fire Hydrant Assemblies			
3/4-In. Water Services			
1-In. Water Services			
1-1/2-In. Water Services			
2-In. Water Services			
Meter Vault and Larger Services			
Air-Vac Assemblies			
Blow Off Assemblies			
Detector Check Assembly			

SUBTOTAL _____

SALES TAX _____

TOTAL COST _____

Note:

1. Include in each pipe price (Total Cost & Unit Cost) the cost of gate valves, fittings, pavement repairs, and any other items not otherwise listed above.
2. Include in each fire hydrant price the main line tee, hydrant valve, valve boxes, shackle rods, thrust blocks, hydrant posts and other related items for a complete hydrant installation.
3. Blank spaces reserved for major cost items such as pressure reducing vaults, pressure relief vaults, pump stations, etc. Contact District regarding listing of such items.

WHATCOM COUNTY WATER DISTRICT NO. 13

BILL OF SALE - SEWER

Project: _____

Developer: _____

THE UNDERSIGNED hereby conveys and transfers to the WHATCOM COUNTY WATER DISTRICT NO. 13 (the "District") the following described personal property:

This conveyance is made in consideration of the District's agreement to provide routine maintenance of said property and to provide sewer services pursuant to the District's resolutions and regulations, which may be amended from time to time.

The undersigned, and its successors and assigns, covenants and agrees to and with the District, its successors and assigns, that the undersigned is the owner of said property and has the right and authority to sell the same, that the property is free of all liens or encumbrances, and that the undersigned will, and does, hereby warrant and agree to defend the title of the District, its successors and assigns, against the claims of all third parties claiming to own the same or claiming any interest therein or encumbrance thereon.

The undersigned warrants that all bills and taxes relating to the construction and installation of the sewer main and appurtenances have been paid in full and that there are no lawsuits pending involving this project. The undersigned further warrants that in the event any lawsuit is filed as a result of, or involving, this project the undersigned will undertake to defend the lawsuit and will accept responsibility for all costs of litigation, including costs on appeal, and will hold the District harmless on any judgment rendered against the District.

The undersigned further warrants that all laws and ordinances respecting construction of this project have been complied with, and that the property is in proper working condition, order and repair and fit for purposes intended; i.e., for use as a sewer collection system adequate for the service intended and has been constructed in accordance with the conditions and standards of the District.

The undersigned covenants and agrees with the District to replace, repair and correct any defect in work or materials in respect to the personal property subject to this Bill of Sale arising during a period of two (2) years from date hereof, without cost to the District. The undersigned shall further warrant the corrected work for two years after acceptance of the corrected work by the District.

DEVELOPER: _____

By: _____

Its: _____

INDIVIDUAL

STATE OF WASHINGTON)
)
 County of _____) ss.

On this _____ day of _____, before me, the undersigned Notary Public, duly commissioned and sworn, personally appeared _____ to me known to be the individual(s) named herein, and who executed the within and foregoing instrument, and acknowledged execution of the said instrument to be the free and voluntary act and deed of said individual(s), for the uses and purposes therein mentioned.

WITNESS my hand and official seal hereto affixed the day and year first above written.

 NOTARY PUBLIC in and for
 Washington State, residing at _____
 My Commission Expires: _____

CORPORATE

STATE OF WASHINGTON)
)
 County of _____) ss.

On this _____ day of _____, 20____, before me, the undersigned Notary Public in and for the State of Washington, duly commissioned and sworn, personally appeared _____

to me known to be the _____
 of _____
 the corporation named herein, and acknowledged execution of the said instrument to be the free and voluntary act and deed of said corporation, for the uses and purposes therein mentioned; and on oath stated that he is authorized to execute said instrument and that the seal affixed (if any) is the corporate seal of said corporation.

WITNESS my hand and official seal hereto affixed the day and year first above written.

 NOTARY PUBLIC in and for
 Washington State, residing at _____
 My Commission Expires: _____

WHATCOM COUNTY WATER DISTRICT NO. 13
ITEMIZED COST OF
SANITARY SEWER SYSTEM

Project: _____

Developer: _____

Date _____

DESCRIPTION	QUANTITY	UNIT COST	ITEM TOTAL
8-In. Diam. PVC Pipe			
8-In. Diam. Ductile Iron Pipe			
6-In. Diam. PVC Side Sewer			
6-In. Diam. Ductile Iron Side Sewer			
Manholes			

SUBTOTAL _____

SALES TAX _____

TOTAL COST _____

Note:

1. Include in each pipe price (Total Cost & Unit Cost) the cost of fittings, pavement repairs, and any other items not otherwise listed above.
2. Blank spaces reserved for major cost items such as force mains, vaults, sewage lift stations, etc. Contact District regarding listing of such items.

23-MONTH INSPECTION

23 - MONTH INSPECTION - WATER

Final inspection report for:

1. Name of Development _____
2. Contractor _____
3. Developer _____
4. Date of Inspection _____
5. Inspector _____

INSPECTION CHECKLIST:

- a. Condition of Roadway: _____

- b. Condition of Water Main: _____

- c. Condition of Valves and Fire Hydrants: _____

- d. Any other utilities problems visible: water boxes, valve box, light poles, storm drains, etc.

- e. What conditions need to be corrected in order to approve project. Use additional page(s), if necessary:

23 - MONTH INSPECTION - SEWER

Final inspection report for:

1. Name of Development _____
2. Contractor _____
3. Developer _____
4. Date of Inspection _____
5. Inspector _____

INSPECTION CHECKLIST:

d. Condition of Roadway: _____

e. Condition of Sewer Main: _____

f. Condition of Manholes: _____

d. Any other utilities problems visible: water boxes, valve box, light poles, storm drains, etc.

e. What conditions need to be corrected in order to approve project. Use additional page(s), if necessary:

RELEASE OF ENCUMBRANCE

RELEASE OF ENCUMBRANCE

WITNESSETH:

WHATCOM COUNTY WATER DISTRICT NO. 13, a Washington Municipal Corporation ("the District") and _____ ("the Developer") entered into an Agreement on the _____ day of, _____, 20__ for construction of a water/sewer system on property located adjacent to or in the District and in Whatcom County, legally described as:

SEE ATTACHED EXHIBIT "A"

and,

The Agreement was an Agreement of Restriction encumbering lithe Property" (legally described above) and the Developer, and

Developer has now satisfactorily performed all of the terms and conditions of the Agreement, including payment of the connection charge, NOW, THEREFORE,

The District quit claims and releases unto the Developer any encumbrance held by the District against the Developer and the Property as legally described above, held by virtue of the Agreement recorded in the files of the Whatcom County Auditor, Recording No. _____
_____.

WHATCOM COUNTY WATER DISTRICT NO. 13
Whatcom County, Washington

President and Board Member

Secretary and Board Member

SAMPLE LATECOMERS AGREEMENT

Latecomers Agreement

This agreement entered into this _____ day of _____ 20__ by and between Whatcom County Water District No. 13 (“District”), a Municipal Corporation of the State of Washington and _____ (Developer).

Recitals

WHEREAS; Developer has completed construction of _____ in the Whatcom County Water District No. 13 (hereinafter “Development”) and

WHEREAS; Developer has constructed a _____ for the purpose of serving its Development, (the type and location of said facilities are described in Exhibit A, attached hereto), and

WHEREAS; Developer and the District entered into an Extension Agreement for the aforementioned facilities, and

WHEREAS; the installation of the aforementioned facilities benefits the property as described and set forth in Exhibit B, and

WHEREAS; Developer is entitled to reimbursement from the property owners of the aforementioned properties seeking connection to such facilities, for the cost of such facilities, in excess of Developer’s fair pro rata share thereof, and

WHEREAS; the District acknowledges that the installation of such facilities will be beneficial to the aforementioned properties and improve the District’s (Describe water and/or sewer services to that general area, and

WHEREAS; the District is willing to collect Latecomers charges from the owners of the aforementioned properties for the specific purpose of reimbursing Developer the cost of the installation of the aforementioned facilities in excess of Developer’s fair pro rata share; and

WHEREAS; Developer has indicated certain owners of properties benefited by installation of said facilities have participated in and contributed to construction of said facilities and Developer will waive latecomers’ amount for these properties.

NOW THEREFORE, the parties agree as follows:

I. AUTHORITY

1.1 This agreement is executed pursuant to the provisions of Chapter 57.22 RCW, Contracts for Water System Extension.

- 1.2 The improvements and betterments constructed by Developer are consistent with the comprehensive plan(s) of the Whatcom County Water District No. 13 and were a prerequisite of further development in the area.

II. PURPOSE OF THIS AGREEMENT

- 2.1 The purpose of this agreement is to provide a means whereby Developer will be reimbursed for a portion of the costs it incurred for the installation of the facilities described on Exhibit "A" (_____ extension). Such reimbursement shall be by means of a Latecomers reimbursement assessment against the property benefiting by the installation of said facilities, as set forth in Exhibit C.
- 2.2 The parties agree the construction of these facilities provide adequate _____ to properties listed in Exhibit C so as to meet requirements of state and local government.

III. DESCRIPTION OF WORK

- 3.1 The improvements and facilities as generally described in Exhibit A have been constructed by Developer pursuant to approved plans and consistent with the then existing standards and existing Comprehensive Plan(s) of the District

IV. DUTIES OF DEVELOPER

- 4.1 Developer shall comply with each and every provision of District Resolution 538.

V. DUTIES OF THE DISTRICT

- 5.1 The District shall process this application in accordance with Resolution 538.
- 5.2 The District will use its best effort to collect and distribute the funds pursuant to the process set forth in this agreement. However, the District, its officials, employees, or agents shall not be held liable or responsible for failure to implement any of the collection provisions of this agreement, unless such failure is willful or intentional. The District is acting in the capacity of a collection agent and is not obligated by this agreement to make any payment except those amounts actually collected pursuant to this agreement. This agreement does not constitute a guarantee on the part of the District that any reimbursement will be collected or paid during the term of this agreement. The District takes no responsibility to defend legal challenge to a reimbursement agreement with Developer. Any challenge to District's authority or process for a reimbursement agreement will not be defended by District. District may tender defense of the reimbursement agreement to Developer.

VI. LATECOMERS/REIMBURSEMENT

- 6.1 In order to assure conformance with the terms and conditions of this Agreement, the District agrees that for a period of ten (10) years commencing from the date of adoption of a Reimbursement Resolution, the District will make effort to collect on behalf of Developer a Latecomer's fee in an amount as set forth in Exhibit C from any property benefited, at the time of the adoption of the reimbursement resolution, by the aforementioned facilities at such time the property connects to the District system. The District shall forward said Latecomer's fee to Developer at Developer's address provided herein, or to Developer's agent, as authorized by Developer. As a condition of receiving such reimbursement funds, Developer or Developer's agent shall execute a receipt to the District for such reimbursement amount so paid, upon a receipt form provided by District. Such form shall include the legal description and name of the owner of the connecting property making payment of such amount.
- 6.2 District and Developer understand and acknowledge that the properties within the Latecomers – Reimbursement area set forth on Exhibits "B" and "C" have a right to notice of such reimbursement charge and the amount thereof. Such property owners have a right to request a hearing on such reimbursement charge before the Commissioners of the Silver Lake Water District. If requested the Commissioners shall conduct such hearing. The parties understand and acknowledge that such hearing may result in denial of latecomers' reimbursement charges, changes to the reimbursement area and the reimbursement charges placed on benefiting properties that have not contributed to the original cost of the additional facilities. Should such hearing occur, Exhibits "B" and "C" may be adjusted to reflect the determination of the Commissioners after deliberation of evidence provided at such hearing. Such adjustment shall be set forth on Exhibits "B" and "C" and the parties agree the adjusted Exhibits "B" and "C" shall control operation of this agreement. Should Developer not be present at such hearing, the latecomer's reimbursement request will be denied.
- 6.3 District shall receive an administrative fee in an amount equal to Ten percent (10%) of the reimbursement connection charge. Said fee shall be deducted from the Latecomers fee upon collection and prior to forwarding said fee to Developer.

VII. RECORDATION

- 7.1 This contract and the Reimbursement Resolution shall be recorded in the office of the Whatcom County Auditor, Whatcom County, Washington, immediately upon execution by the District and Developer. Such contract shall constitute a lien and servitude upon the properties described in Exhibits "B" and "C", having not contributed to the original cost of the aforementioned facilities installed by Developer under the provisions hereof, and shall be binding upon the parties and

all successors in interest to those respective parties in accordance with Chapter 57.22 RCW.

Developer shall be responsible for recording this contract and the Reimbursement Resolution. The District's obligation to collect pursuant to the contract shall not arise until the District has been served with proof of recording.

VIII. ENFORCEMENT

- 8.1 This agreement shall be enforceable only by the parties. The agreement is for the benefit of the parties, or their assigns, and not for the benefit of any third party.
- 8.2 Should any legal action be brought by either party for breach of this agreement or to enforce any provision herein, the prevailing party of such action shall be entitled to reasonable attorney's fees, court costs and such other costs as may be fixed by court.

IX. MISCELLANEOUS PROVISIONS

- 9.1 Developer shall not assign this contract without written consent of the District. Such consent shall not be unreasonably withheld.
- 9.2 It is understood that the contractual relationship between the District and Developer is such that Developer is an independent contractor and not an agent of the District.
- 9.3 This Agreement shall inure to the benefit of and be binding upon the parties, their heirs, successors and assigns.
- 9.4 If any part or provision of this agreement is held to be invalid, unenforceable, or unconstitutional, the remainder of the agreement is not affected.
- 9.5 Nothing herein releases Developer, or its successors, from the payment of water meter or side sewer installation charges and any and all other connection charges, rates and assessments against the property in existence at the time of connection of such property to the system.
- 9.6 All notices required or provided under this agreement shall be in writing and delivered in person or sent by certified mail, postage prepaid. Notices required to the District shall be addressed as follows:

Whatcom County Water District No. 13
Attention: General Manager
532 Sprague Valley Drive
Maple Falls, WA 98266

Notices to be given to Developer shall be addressed as follows:

9.7 This writing constitutes the full and only agreement between the parties, as to these matters, there being no promises, agreements or understandings, written or oral, except as herein set forth.

9.8 The effective date of this agreement shall be _____, 20_____.

Developer

by: _____

Whatcom County Water District No. 13

by: President

STATE OF WASHINGTON)

County of _____)
SS

I certify that I know or have satisfactory evidence that _____ signed this instrument, on oath stated that _____ was authorized to execute the instrument and acknowledged to as the _____ of _____, to be the free and voluntary act of such corporation for the uses and purposes mentioned in this instrument.

Dated this _____ day of _____, 20_____.

NOTARY PUBLIC for the State of Washington
Printed Name: _____
Residing at: _____
My Commission Expires: _____

(STATE OF WASHINGTON)

:ss

(County of _____)

I certify that I know or have satisfactory evidence that _____ signed this instrument, and acknowledged it to be free and voluntary act and deed for the uses and purposes therein mentioned.

Dated this _____ day of _____, of 20_____.

NOTARY PUBLIC for the State of Washington

Printed Name: _____

Residing at: _____

My Commission Expires: _____

SAMPLE

GENERAL DRAFTING REQUIREMENTS AND NOTES

GENERAL DRAFTING REQUIREMENTS

Plans for all water and sewer system improvements shall be accurate, legible and properly detailed, and afford the maximum degree of understandability.

CONSTRUCTION PLANS

Construction Plans for the water and sewer system improvements shall meet the following minimum requirements:

- (1) The Plans shall be separate from those plans for plat improvements, storm drainage improvements, road and street improvements and drawings and plans for any other utility. Plans for water system improvements shall be separate from those for sanitary sewer system improvements. Line weights and screening are to be selected to show new work clearly with existing utilities in background.
- (2) The Plans shall be prepared in AutoCAD DWG format (Release 2010, Civil 3D, or earlier version) with entities placed on unique layers as listed in "As-Built Drawings and Electronic Files" for incorporation into the District's GIS unless otherwise pre-approved by the District.
- (3) **The size of each Plan sheet shall be 22" x 34".**
- (4) The sheet material for the construction plans shall be Mylar, Vellum or equivalent durable material. Paper diazo reproductions, or photographic reproductions are not acceptable.
- (5) The Plans shall include a suitable title block/plate, which states the names and addresses of the property owner/Developer, Engineer, general notes, the scale, the date and the stamp and signature of the Design Engineer. This information should be located on the right side or lower right hand corner of the Plan.
- (6) The Plans shall provide a legend of symbols used, to ensure clarity.
- (7) The Plans shall have a legal description of the developing property and a location/vicinity or index map that clearly shows the project and its boundaries in relationship to the nearest street intersections.
- (8) To the maximum extent possible, the north arrow shall be oriented to the top or to the left of each Plan.
- (9) The horizontal scale of the Plans shall be 1-inch = 50 feet. In circumstances where the clarity of the Plans would otherwise be unacceptable due to the complexity of the work, or the number of other simultaneous construction elements within the same Project (such as for a major street/road improvement) are extensive, the District will consider a horizontal scale of 1-inch = 20 feet upon written request with justification provided. **The vertical datum plane for the Plans shall be NAVD 88.** An elevation benchmark shall be clearly identified. Note: Some District elevation records for existing structures are NGVD 29. When this occurs, elevations should be converted to NAVD 88 wherever shown on the Plans with a parenthetical note stating "(Existing elevation converted from NGVD 29 to NAVD 88)."
- (10) Profile views are required for all sewer system construction Plans. **Profile view shall be oriented directly above or below the respective Plan view.**

- (11) The Plans shall be prepared and stamped by a civil engineer with current registration in the State of Washington.
- (12) The Plans shall indicate and identify all property and lot lines, street rights-of-way that have been vacated shall be shown as such on the Plans. The area included in the Plan shall be enough to locate the property from an existing street intersection unless waived by the District. The Plans shall indicate and identify all existing buildings; structures; underground power, electrical, telephone, natural gas, cable television, storm drainage, and appurtenances; street, alley and driveway pavement; stream crossings; trees to be saved, new trees, landscaping, green belt; and other known physical features within the project area which will affect the execution of the system improvement construction. This information should not obscure any water or sewer improvement information.
- (13) Where proposed easements are incorporated in the Plans, and they are defined as a constant width on each side of the pipeline/structure, a segment of said easement shall be shown and labeled as "Typical" and shown as Whatcom County Water District No. 13 sewer and/or water easement.
- (14) Provide the following additional information when required for clarity:
 - a. Site grading plan
 - b. Plan for other utilities
 - c. Plan of future phases of same project
 - d. Contour maps or street profiles
- (15) Upon approval of the construction concept, the original Plans shall be submitted to the District for signature as "approved for construction." The originals will be returned to the Design Engineer and a minimum of four prints of the signed "approved" Plans shall be provided to the District prior to scheduling a pre-construction conference with the District. Additional copies will be required if right-of-way utility use permit application is necessary for construction of the water or sewer facilities.
- (16) The Plans shall have a revision block located in the border frame that will be blank on the initial "approved for construction drawings" when signed by the District and will be used to document significant modifications made and approved by the District during the course of construction.

AS BUILT DRAWINGS AND ELECTRONIC FILES

- (1) Upon completion of construction and prior to acceptance, Mylar drawings corrected to reflect "As-Built" conditions shall be returned to the District. All constructed facilities and easements shall be placed to scale on these drawings. Each drawing shall include a project number provided by the District.
- (2) Prior to project acceptance, the Developer shall be responsible for an "As-Built Survey." This survey may be performed by a licensed surveyor of the Developer's choosing. If the Developer is unable to perform the survey, the District shall perform the survey at cost to the Developer. The "As-Built Survey" shall be limited to surface water and sewer features, shall be performed in the appropriate datum, shall be incorporated into the record drawings, and shall be submitted to the District electronically prior to project acceptance.

- (3) All dimensions shall be corrected to concur with field location. No scratch out of dimensions and notes will be accepted. Remove erroneous and “not applicable” notes and correctly include the new location information and dimensions.
- (4) If reprinted, the Mylars shall include a reference block to the prior approved construction drawings that provides the name and date of signature of the design engineer, the name of the District approving personnel and date of approval.
- (5) Prior to receiving District acceptance, Developers/Owners of commercial properties, industrial properties and residential/multi-family properties shall submit to the District, drawing files in AutoCAD DWG format (Release 2010, Civil 3D, or earlier version), on CDROM, accompanied by the original mylar record drawings which indicate the water and sewer services. Additionally, electronically scanned copies of the final record drawings in TIF or PDF format (at 200 DPI or best resolution for legibility) are required. The AutoCAD files submitted shall include electronic copies of the project base map containing the water and sewer system as submitted on the mylar record drawings. These files shall include electronic files for the “As-Built Survey.” All AutoCAD files shall be submitted with the mylar record drawings. The Developer shall be responsible for any required changes to the mylar record drawings or electronic AutoCAD files, which are not representative of as-built conditions.

Final record drawings shall incorporate all changes from the original approved plans and shall reflect as-built conditions. If the property has existing water and sewer infrastructure which are not on the District’s G.I.S., the Developer/Owner shall also include the existing facilities. The AutoCAD drawing files shall be supplied in the format listed below:

The entities shall be placed on a unique layer as listed. Any other unique features not listed shall be given a descriptive layer name. A layer list shall be provided with the drawing files to indicate what additional layer names represent. All pertinent text information provided on the drawings shall be placed in a layer called REFTEXT. Associated leaders, dimension lines and arrows can also be placed in this layer.

Lines which are intended to remain separate shall be represented by separate polylines. The AutoCAD drawing file shall be drawn with one drawing unit = 1 foot and shall be supplied showing the complete plat on one drawing file. Drawing files shall be tied to the Washington State Plane (North Zone) coordinate system, NAD 83 datum, in U.S. feet.

The following drawing entities shall be developed as single points representing the location of the center of the item they represent. The proper symbols will be allocated to these points by the District once the drawing is translated into the Whatcom County Water District No. 13’s GIS. The points shall be placed on the proper layers as listed below:

<u>Entity</u>	<u>Layer</u>
1. Set monument in Case	MON
2. Existing Property Corner	PROPCOR
3. Fire hydrant	WHYD
4. Sanitary sewer manhole	SSMAN
5. Sanitary sewer cleanout	SSCO
6. Sanitary sewer force main air-vac assembly	SS FM-AV
7. Water valve	WVALV(size)
8. Double check valve assembly	DCV
9. Water meter	WM(size)
10. Blow off assembly	WBLOWOFF
11. Utility vault – water and sewer only	VAULT
12. Air vacuum and release assembly	WAIRVAC
13. Backflow preventer assembly	WBFP
14. Fire department connection	WFDC
15. Sewer lift station	SLS
16. Master meter	WMM
17. Pressure reducing valve vault	WPRVA
18. Booster station	WBS

The following drawing entities shall be developed as polylines. Each entity shall be placed on the proper layer as listed.

<u>Entity</u>	<u>Layer</u>
1. Water Polylines shall run between valves and/or pipe intersection to intersection (8-inch water lines) would be located on Layer WL8, and 12 inch on WL12, etc.)	WL(size)

- | | | |
|----|---|-------------|
| 2. | Sanitary sewer lines shall run between manholes as a single polyline. (e.g., 8-inch sewer lines shall be located on layer SS8). | SSL(size) |
| 3. | Sanitary side sewer stub shall run between main line and end of stub. | SSTUB(size) |
| 4. | Record drawing information for sanitary side sewer stubs shall be placed on its own layer. | SSTUB-TXT |
| 5. | Water service lines shall run from main line to meter box (e.g., 1-inch water lines shall be located on layer WS1) | WLS(size) |
| 6. | Centerline polylines shall run from intersection to intersection (one per road). | CL |
| 7. | Sewer force mains shall start at lift stations and terminate at discharge point. | SSFM(size) |

The AutoCAD files shall be structured so that the following drawing entities are developed using closed polygons.

<u>Entity</u>	<u>Layer</u>
1. Parcels (property lines)	PROP
2. Water Easements	WEASE
3. Sewer Easements	SSEASE
4. Right-of-Way	ROW
9. Reservoirs	RESERVOIR

GENERAL NOTES

1. LOCATIONS SHOWN OF EXISTING UTILITIES AND IMPROVEMENTS ARE APPROXIMATE ONLY, AND IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE EXACT LOCATIONS OF ALL UTILITIES AND IMPROVEMENTS TO AVOID DAMAGE OR DISTURBANCE.
2. ALL WORK AND MATERIALS MUST BE IN ACCORDANCE WITH THE LATEST REVISION, INCLUDING ADDENDA AND UPDATES, OF THE WHATCOM COUNTY WATER DISTRICT NO. 13 STANDARDS. CONTRACTOR TO HAVE THESE STANDARDS ON JOBSITE.
3. ROAD RESTORATION SHALL BE PER APPLICABLE WHATCOM COUNTY/WSDOT STANDARDS.
4. CONTRACTOR SHALL CALL "DIAL DIG" (1-800-424-5555), 2 FULL WORKING DAYS PRIOR TO CONSTRUCTION, FOR AID IN LOCATING ANY EXISTING UNDERGROUND UTILITIES.
5. THE CONTRACTOR SHALL KEEP TWO SETS OF PLANS ONSITE AT ALL TIMES FOR RECORDING "AS BUILT" INFORMATION. ONE SET SHALL BE SUBMITTED TO WHATCOM COUNTY WATER DISTRICT NO. 13 AT COMPLETION OF CONSTRUCTION.
6. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL CONTACT THE WHATCOM COUNTY WATER DISTRICT NO. 13 FOR A PRECONSTRUCTION MEETING.
7. THE CONTRACTOR SHALL COORDINATE WITH THE DISTRICT FOR A FIELD MEETING PRIOR TO INSTALLATION OF ANY REDUCED PRESSURE BACKFLOW ASSEMBLY OR REDUCED PRESSURE DETECTOR ASSEMBLY.
8. EACH WATER AND SEWER CONSTRUCTION DRAWING SHEET SHALL HAVE THE FOLLOWING DISTRICT SIGNATURE BLOCK.

WHATCOM COUNTY WATER DISTRICT NO. 13
APPROVED FOR CONSTRUCTION

BY: _____ DATE: _____
DISTRICT OFFICIAL

DISTRICT PROJECT NUMBER: _____

"THESE PLANS ARE APPROVED FOR CONSTRUCTION FOR THE PERIOD NOTED ON THE DEVELOPER EXTENSION AGREEMENT. THE DISTRICTS RESERVES THE RIGHT TO

MAKE REVISIONS, MODIFICATIONS, AND CHANGES SHOULD
CONSTRUCTION BE DELAYED BEYOND THIS TIME LIMIT.”

(This page is available electronically for Developer use by contacting the District)

STANDARD WATER GENERAL NOTES

1. ALL WORK SHALL CONFORM TO THE STANDARDS OF WHATCOM COUNTY WATER DISTRICT NO. 13, WHICH ARE CONTAINED IN A BOUND VOLUME ENTITLED "DISTRICT STANDARDS".
2. THE DISTRICT SHALL BE NOTIFIED PRIOR TO COMMENCEMENT OF CONSTRUCTION. ALL TESTING AND CONSTRUCTION SHALL BE INSPECTED BY WHATCOM COUNTY WATER DISTRICT NO. 13.
3. TYPICAL WATER SERVICE TO BE 200 PSI P.E. ASTM D2239 (3/4" SINGLE AND 1" DOUBLE SERVICE).
4. WATER MAINS ARE TO BE CLASS 50 CEMENT LINED DUCTILE IRON, OR C900 PVC SIZE NOTED ON PLANS.
5. SIDE SERVICES SHALL BE LOCATED TO PROVIDE WATER SERVICE ON OPPOSITE SIDE OF LOT FROM SEWER STUB LOCATION.
6. ALL VALVES ADJACENT TO TEE OR CROSS SHALL BE FLANGE CONNECTED.
7. ALL VALVES SHALL BE FURNISHED WITH A CONCRETE VALVE MARKER.
8. LOCATIONS SHOWN ON EXISTING UTILITIES ARE APPROXIMATE. IDENTIFICATION, LOCATION, MARKING AND RESPONSIBILITY FOR UNDERGROUND FACILITIES OR UTILITIES IS GOVERNED BY THE PROVISIONS OF CHAPTER 19.122, REVISED CODE OF WASHINGTON.
9. PLAN AND PROFILE INFORMATION AS FURNISHED BY THE DEVELOPER OR DEVELOPER'S ENGINEER.
10. MINIMUM SEPARATION OF POTABLE WATER MAINS AND SANITARY SEWER LINES SHALL BE TEN (10) FEET HORIZONTALLY FOR PARALLEL PIPE, AND THREE (3) FEET VERTICALLY FOR PERPENDICULAR OR OBLIQUE CROSSINGS, MEASURED FROM OUTSIDE EDGE TO OUTSIDE EDGE. SITUATIONS OCCURRING WITH LESS THAN MINIMUM SEPARATION WILL REQUIRE CONSTRUCTION IN ACCORDANCE WITH THE "CRITERIA FOR SEWAGE WORKS DESIGN" PUBLISHED BY THE WASHINGTON STATE DEPARTMENT OF ECOLOGY AS REVISED.
11. WHILE CUTTING OR WORKING WITH ASBESTOS CEMENT PIPE, ALL FEDERAL, STATE AND LOCAL REGULATIONS MUST BE OBSERVED.

NOTICE:

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

STANDARD SEWER GENERAL NOTES

1. ALL WORK SHALL CONFORM TO THE STANDARDS OF WHATCOM COUNTY WATER DISTRICT NO. 13, WHICH ARE CONTAINED IN A BOUND VOLUME ENTITLED "DISTRICT STANDARDS".
2. THE DISTRICT SHALL BE NOTIFIED PRIOR TO COMMENCEMENT OF CONSTRUCTION. ALL TESTING AND CONSTRUCTION SHALL BE INSPECTED BY WHATCOM COUNTY WATER DISTRICT NO. 13.
3. TYPICAL SEWERS TO BE 6-INCH MINIMUM SIZE PIPE TO PROPERTY LINE. MINIMUM SLOPE = 2%.
4. SIDE SEWERS SHALL BE LOCATED ON OPPOSITE SIDE OF LOT FROM WATER SERVICES.
5. A 1-1/4 INCH WHITE PVC PIPE, ASTM 2241, SDR 21, 200 PSI SHALL BE PLACED VERTICALLY AT THE END OF EACH STUB AND SHALL RISE 2 FEET ABOVE FINISH GRADE LEVEL. BOTH ENDS OF THE PVC PIPE SHALL HAVE CAPS GLUED ON AND THE PIPE INTERIOR KEPT CLEAN FOR THE PURPOSE OF FUTURE DEPTH MEASUREMENT.
6. LOCATIONS SHOWN ON EXISTING UTILITIES ARE APPROXIMATE. IDENTIFICATION, LOCATION, MARKING AND RESPONSIBILITY FOR UNDERGROUND FACILITIES OR UTILITIES IS GOVERNED BY THE PROVISIONS OF CHAPTER 19.122, REVISED CODE OF WASHINGTON.
7. PLAN AND PROFILE INFORMATION AS FURNISHED BY THE DEVELOPER OR DEVELOPER'S ENGINEER.
10. MINIMUM SEPARATION OF POTABLE WATER MAINS AND SANITARY SEWER LINES SHALL BE TEN (10) FEET HORIZONTALLY FOR PARALLEL PIPE, AND THREE (3) FEET VERTICALLY FOR PERPENDICULAR OR OBLIQUE CROSSINGS, MEASURED FROM OUTSIDE EDGE TO OUTSIDE EDGE. SITUATIONS OCCURRING WITH LESS THAN MINIMUM SEPARATION WILL REQUIRE CONSTRUCTION IN ACCORDANCE WITH THE "CRITERIA FOR SEWAGE WORKS DESIGN" PUBLISHED BY THE WASHINGTON STATE DEPARTMENT OF ECOLOGY AS REVISED.
11. A PLUG SHALL BE PLACED IN THE OUTLET PIPE OF THE EXISTING MANHOLE WHICH IS TO BE CONNECTED TO OR THE OUTLET PIPE OF THE FIRST NEW MANHOLE CONSTRUCTED. THIS PLUG SHALL REMAIN IN PLACE AND MAY NOT BE REMOVED WITHOUT PERMISSION OF THE DISTRICT. **REMOVAL WILL RESULT IN FORFEITURE OF SYSTEM ISOLATION DEPOSIT.**

NOTICE:

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

PLANS AND CONSTRUCTION CHECKLIST

**PLANS AND CONSTRUCTION CHECK LIST
WHATCOM COUNTY WATER DISTRICT NO. 13**

<i>YES</i>	<i>NO</i>	
_____	_____	District Assigned Project No.
_____	_____	Current version of District Standards used in design:_____ .
_____	_____	Construction Plans signed and dated by a Washington State licensed engineer.
_____	_____	Construction plans expire 1 year from date of District approval.
_____	_____	Cover sheet showing entire property and location of improvements has been included.
_____	_____	Plans showing Erosion Control, Grading, Street Improvements, Storm Drainage, and Landscaping have been included.
_____	_____	Engineering scale and north arrow are shown for each plan view.
_____	_____	Plans sheets are 22" x 34".
_____	_____	Horizontal scale: 1-inch = 50 feet, Vertical Scale: 1 inch = 5 feet (or as otherwise approved by the District).
_____	_____	Vertical datum is NAVD 88 with conversion factor noted to NGVD 29.
_____	_____	District General Notes are included on first water plan sheet and sewer plan sheet.
_____	_____	District Approval Block is included on each water and sewer plan sheet.
_____	_____	Location of streets, right-of-ways, easements, existing utilities and water system facilities have been located and/or called out.
_____	_____	All flood plains, wetlands, steep slope, and/or sensitive areas are clearly identified.
_____	_____	Existing and proposed grades have been shown and labeled.
_____	_____	Stationing has been provided for the site area and on all structures to be constructed.
_____	_____	Match lines and title blocks are shown correctly.
_____	_____	All existing/proposed utilities are shown on Plans.
_____	_____	District system standard details have been referenced.
_____	_____	Road restoration has been performed per County, City, and/or State standards.

_____ _____ All public rights-of-way, front lot corners and a property line stakes are clearly identified.

_____ _____ Fenced easement areas provided with access gates of matching construction.

WATER

_____ _____ Property lines, water meters, water valves, hydrants, and paving locations are shown.

_____ _____ Mains are located 10 feet northerly or easterly of street centerline (or District approved location).

_____ _____ Water main easements are minimum of 15-feet wide.

_____ _____ A minimum of 3'-6" cover over all 8-inch or less sized water mains except 4'-0" cover in easements. A minimum 4'-0" cover on all water mains 12-inches and larger.

_____ _____ Fire hydrant spacing does not exceed 600 feet and/or located no more than 350 feet from the back of any proposed lot.

_____ _____ Each hydrant shall be marked 1 foot offset from the center line of the street with a Type III blue reflector.

_____ _____ Pipes connecting hydrants to mains are at least 6 inches in diameter and not longer than 50 feet.

_____ _____ Only one fire hydrant is installed on any dead-end 8-inch run.

_____ _____ Valve spacing has not been exceeded (1,000 feet maximum spacing).

_____ _____ Valves are installed on each leg of all tees and crosses, except fire hydrant tees unless required by the District.

_____ _____ Valves are installed at each end of easements.

_____ _____ All valves 14 inches and larger are ductile iron butterfly valves.

_____ _____ All valves 12 inches and smaller are ductile iron resilient seated gate valves.

_____ _____ Approved backflow assemblies are provided for all connections other than single family residential.

_____ _____ All backflow assemblies are located immediately behind and on the property side of the water service box unless internal location in a building receives prior District approval.

_____ _____ District approved air and vacuum assemblies are located at all isolated high point(s) in system.

- _____ _____ Blow off assemblies are located at all isolated low point(s) and dead ends in system. Fire hydrants may be required in lieu of blow off assemblies at the discretion of the District.
- _____ _____ All dead end mains are closed with dead end MJ caps, plugs, thrust blocks, and blow off assemblies or hydrants.
- _____ _____ All pipeline deflections are designed and constructed in accordance with pipe manufacturer's recommendations.
- _____ _____ Thrust blocks, anchor blocks or restrained joint pipe have been provided for all fittings and bends.
- _____ _____ Minimum size service lines between water main and a single water meter is 1-inch for single-family and 2-inch for commercial and multi-family. Pipes and fittings have been inspected for defects before installation, and are clearly labeled and identified by manufacturer in regards to Class.
- _____ _____ Valves have been set with vertical stems.
- _____ _____ Operating nut of all valves is within 3'-6" of finished grade, 2-inch standard nut, and 5-inch soil pipe will be used in assembly. Stem extension required if greater in depth than 3'-6".
- _____ _____ Valves located in easements or outside of paved areas are set to grade and have concrete collars.
- _____ _____ Valve markers have been placed at edge of right-of-way opposite the valve and painted and stenciled appropriately.
- _____ _____ Guard posts have been installed and painted for each hydrant, if required by District.
- _____ _____ All water services are located within public road rights-of-way or District approved easements.
- _____ _____ Meter service, MXU radio unit, and meter boxes have been set to final finished grade elevations and adjusted prior to final pressure test (unless otherwise approved by the District).
- _____ _____ Water meters larger than 1-inch have been furnished and installed by the Contractor.
- _____ _____ All pipes have been tested and disinfected to District and AWWA standards prior to acceptance.
- _____ _____ Service gaskets and dual check valves have been provided to the District.
- _____ _____ Backflow assemblies have been tested and installed on all services other than single family residential connections, certified and written test results have been provided to the District.

SEWER

YES NO

- | | | |
|-------|-------|--|
| _____ | _____ | Property lines, sewer main, manholes, side sewer, and paving locations are shown. |
| _____ | _____ | Mains are located 5 feet south or west of centerline (or District approved location). Sewer main easements are minimum of 15 feet wide. |
| _____ | _____ | All-weather access is provided to manholes in easements suitable for vactor trucks. |
| _____ | _____ | All pipelines shall have a minimum cover of 3 feet. (Side sewer laterals in public rights-of-way shall have a minimum of 5-feet cover at right-of-way line). |
| _____ | _____ | All sewer main crossings and parallel sewer mains have 10-foot horizontal spacing and 18 inches of vertical separation from the nearest water main. |
| _____ | _____ | Pipes between manholes are straight in alignment. |
| _____ | _____ | Pipes are designed for no less than the following minimum grade:
8 inch gravity main - 0.5%
6 inch side sewer - 2.0%
8 inch gravity dead end - 1.0%. |
| _____ | _____ | Steeper slopes may be required depending on topography and tributary flows (at the discretion of the District). Other diameter pipe lines must conform to Ecology design standards. |
| _____ | _____ | Side sewer laterals are located at downstream sewer locations (10 feet from the side lot line and 15 feet (typical) past the street right-of-way line). |
| _____ | _____ | Backwater valves provided for all side sewers where potential exists for sewer main to back up into the served facility. |
| _____ | _____ | Sewers on 18% slope or greater are anchored securely with concrete anchors or equal:
18 to 35% - 36 feet center to center
35 to 50% - 24 feet center to center
50% and over - 16 feet center to center. |
| _____ | _____ | Manhole spacing has not exceeded 400 feet (unless approved by District). |
| _____ | _____ | Manholes are a minimum of 8 feet from rim to invert (unless approved by District). |

- _____ _____ Manholes are located at all changes in grade, pipe alignment, pipe intersections, and termination points. Clean-outs are not acceptable as a substitute except as approved by the District.
- _____ _____ Manholes are not located in low points of vertical curves or curb flow lines (gutter sections).
- _____ _____ Manholes are located at the terminus of all sewer mains (unless approved by the District).
- _____ _____ Drop connections must be approved by District.
- _____ _____ Manholes and cleanouts have locking lids.
- _____ _____ Manholes and cleanouts located in easement areas or outside of paved areas have concrete collars and green carsonite markers.
- _____ _____ Manholes have a 0.10 foot drop across the channel.
- _____ _____ Match crowns of the pipes where a smaller sewer joins a larger one.
- _____ _____ Invert and rim elevations are shown on plan and profile for all manholes.
- _____ _____ Correct invert elevation at point of connection (field verified) is shown on the plans.
- _____ _____ Manhole steps and ladders are polypropylene.
- _____ _____ Individual tee connections have been used for side sewer lines (or District approved alternative).
- _____ _____ All pipe bedding has been field inspected prior to backfill.
- _____ _____ Side sewer stubs have been provided for each lot that requires service (no double side sewer connections).
- _____ _____ Inspection of side sewer has been completed prior to backfill of line.
- _____ _____ Markers have been provided at the termination of all side sewer stubs and stenciled appropriately.
- _____ _____ Side sewer cleanouts have been placed at no more than 100-foot spacing.
- _____ _____ Commercial, Industrial, and School food establishments have grease interceptor(s) installed outside of the building (interceptor installed as close as possible to source of grease/fat).
- _____ _____ All pipes have been tested prior to acceptance.

ADDITIONAL REQUIREMENTS MAY BE MANDATED BY THE DISTRICT, ON A CASE BY CASE BASIS, DUE TO SITE SPECIFIC CONDITIONS.

PRECONSTRUCTION CHECKLIST

**WHATCOM COUNTY WATER DISTRICT NO. 13
PRECONSTRUCTION MEETING CHECK LIST**

CONSTRUCTION UNDER 2011 WCWD13 DEVELOPER STANDARDS

Date: _____

PROJECT NAME: _____ G&O NO.: _____

Developer: _____ Phone: _____

Contractor: _____ Phone: _____

Superintendent/Foreman: _____ Phone: _____

Designer: _____ Staking By: _____

Suppliers/Materials: _____

GENERAL

Start Date: _____

- _____ Performance Bond required. _____ Yes _____ No
- _____ Certificate of Insurance.
- _____ Submit material list for approval of all items prior to ordering and start of construction (Sewer and Water).
- _____ Use construction plans approved and signed by the District.
- _____ Contractor to maintain a separate set of as-built drawings on site.
- _____ Control layout staked including lot corners (Sewer & Water).
- _____ Schedule other agency Inspectors as necessary.
- _____ Trench safety.
- _____ Trenches to be compacted per County/City/State Specs.
- _____ Soils Lab: _____.
- _____ Provide compaction reports (modified Proctor).
- _____ Schedule inspections.
- _____ All field communication to go through the Inspector.
- _____ Overtime inspection to be requested (4 hours min.) in writing by the previous Wednesday & will be based on availability of Inspectors.
- _____ All D.I. pipe liner to be checked before installed.
- _____ **Contractor to meet “Offsite County Use Permit Conditions and Requirements of Endangered Species Act” and the “County’s Best Management Practice” (BMP) requirements or work will be halted by County.**

SEWER

- _____ Lots to be graded to final grades prior to side sewer installation.
- _____ Inspection required on pipe, bedding, MHs, and existing utilities.

- _____ Provide cut sheets prior to start of pipe laying.
- _____ Air testing and televised record (narrated DVD) required after utilities installed. Re-TV'ing may be required if discrepancies discovered (to confirm correction).
- _____ Deep construction required _____ D.I. (401 Protecto Lined) pipe _____ or C900 PVC _____.
- _____ First MH to be plugged on downstream side.
- _____ 12-foot 2x4s (wired) to be used for side sewers at 6 feet and 8 feet deep unless lot grade dictates otherwise.
- _____ Extend side sewers 15 feet (typical) into each lot.
- _____ Verify if standing side sewers are needed in easements.

WATER

- _____ Pipe shall be delivered to the site with ends wrapped or with pipe plugs and shall remain in place until the pipe is installed in the trench.
- _____ Inspection required on all bends, valves, F.H.s, B.O.s, thrust blocks and existing utilities.
- _____ Subgrade to be complete prior to laying water main or provide cut stakes.
- _____ Provide minimum 3'-6" cover over 8-inch mains (4 feet in easements) and 4'-0" cover over 12-inch mains.
- _____ Use restrained joint pipe and fittings in fills or if trenches are behind bends. Use thrust block or restrained joint table.
- _____ Group water meter boxes. Meter boxes to have coated wire placed between boxes with minimum 1 foot of coiled wire in each box (District will provide the wire). Use Berg or Mid States Plastics meter boxes. H-20 load rated where required.
- _____ All valves and fittings to be ductile iron.
- _____ F.H.s required to have short bodied 4-inch Storz adapters.
- _____ May need a temporary air vent where water feed is higher than the new mains.
- _____ Flush water to be metered. Meters shall be rented from the District. Flush to on-site erosion control ponds where possible. Dechlorination methods must be approved by the District.
- _____ Meters 1-1/2 inches or larger to be provided by developer and to be Sensus or Neptune Meter with Sensus MXU, in Cu.Ft. (Give MXU box to District).
- _____ Backflow assemblies are required for all services other than single family residential meters.
- _____ Backflow assembly has been approved by the District.
- _____ Only WCWD13 or their representative to operate valves connected to existing mains.
- _____ New system will be isolated from existing using protected connection until final connection is allowed by District.
- _____ Provide fire hydrant depths.

SAMPLE EASEMENTS

RECORDED AT THE REQUEST OF:
WHATCOM COUNTY WATER DISTRICT NO. 13
532 SPRAGUE VALLEY DRIVE
MAPLE FALLS, WA 98266

PERMANENT WATER EASEMENT

THE UNDERSIGNED GRANTOR _____
for and in consideration of good and valuable consideration in hand paid, the receipt of which is hereby acknowledged, does hereby grant, convey and transfer unto the WHATCOM WATER DISTRICT NO. 13, a Municipal Corporation, its heirs or assigns, a permanent easement, including the perpetual right to enter upon the real estate hereinafter described, at any time that it may deem reasonably necessary to construct, maintain, repair and operate a water line over, across, through and under the lands hereinafter described, together with the right to excavate and refill ditches and trenches for the location of pipelines and mains, and the further right to remove trees, bushes, undergrowth and other obstructions interfering with the location, construction and maintenance of said pipelines and mains.

The easement and right-of-way hereby granted is located in the County of Whatcom, State of Washington, and is more particularly described as follows:

The District agrees to restore to substantially the original condition such improvements as are disturbed during the construction, maintenance or repair of District water system improvements within said right of way; provided, the Grantor, its heirs or assigns shall not construct any permanent structure over, upon or within the permanent easement.

IN WITNESS WHEREOF, these presents are hereby signed this _____ day of _____, 20____.

GRANTOR

WHATCOM COUNTY WATER DISTRICT NO. 13

BY: _____
ITS:

General Manager

STATE OF WASHINGTON)

: ss

County of _____)

I certify that I know or have satisfactory evidence that _____ signed this instrument, on oath stated that _____ was authorized to execute the instrument and acknowledged to as the _____ of _____, to be the free and voluntary act of such corporation for the uses and purposes mentioned in this instrument.

Dated this _____ day of _____, 20_____.

NOTARY PUBLIC for the State of Washington

Printed Name: _____

Residing at: _____

My Commission Expires: _____

STATE OF WASHINGTON)

: ss

County of _____)

I certify that I know or have satisfactory evidence that _____ signed this instrument, and acknowledged it to be free and voluntary act and deed for the uses and purposes therein mentioned.

Dated this _____ day of _____, of 20_____.

NOTARY PUBLIC for the State of Washington

Printed Name: _____

Residing at: _____

My Commission Expires: _____

RECORDED AT THE REQUEST OF:
WHATCOM COUNTY WATER DISTRICT NO. 13
532 SPRAGUE VALLEY DRIVE
MAPLE FALLS, WA 98266

PERMANENT SEWER EASEMENT

THE UNDERSIGNED GRANTOR _____

for and in consideration of good and valuable consideration in hand paid, the receipt of which is hereby acknowledged, does hereby grant, convey and transfer unto the WHATCOM COUNTY WATER DISTRICT NO. 13, a Municipal Corporation, its heirs or assigns, a permanent easement, including the perpetual right to enter upon the real estate hereinafter described, at any time that it may deem reasonably necessary to construct, maintain, repair and operate a sanitary sewer line over, across, through and under the lands hereinafter described, together with the right to excavate and refill ditches and trenches for the location of pipelines and mains, and the further right to remove trees, bushes, undergrowth and other obstructions interfering with the location, construction and maintenance of said pipelines and mains.

The easement and right-of-way hereby granted is located in the County of Whatcom, State of Washington, and is more particularly described as follows.

The District agrees to restore to substantially the original condition such improvements as are disturbed during the construction, maintenance or repair of District sewer system improvements within said right of way; provided, the Grantor, its heirs or assigns shall not construct any permanent structure over, upon or within the permanent easement.

IN WITNESS WHEREOF, these presents are hereby signed this _____ day of _____, 20____.

GRANTOR

WHATCOM COUNTY WATER DISTRICT NO. 13

BY: _____
ITS: _____

BY: _____
ITS: General Manager

STATE OF WASHINGTON)

County of _____ : ss
_____)

I certify that I know or have satisfactory evidence that _____ signed this instrument, on oath stated that _____ was authorized to execute the instrument and acknowledged to as the _____ of _____, to be the free and voluntary act of such corporation for the uses and purposes mentioned in this instrument.

Dated this _____ day of _____, 20____.

NOTARY PUBLIC for the State of Washington
Printed Name: _____
Residing at: _____
My Commission Expires: _____

STATE OF WASHINGTON)

County of _____ : ss
_____)

I certify that I know or have satisfactory evidence that _____ signed this instrument, and acknowledged it to be free and voluntary act and deed for the uses and purposes therein mentioned.

Dated this _____ day of _____, of 20____.

NOTARY PUBLIC for the State of Washington
Printed Name: _____
Residing at: _____
My Commission Expires: _____

**SAMPLE PERFORMANCE, PAYMENT,
AND GUARANTY BOND**

PERFORMANCE, PAYMENT AND GUARANTY BOND

Project: _____

Developer: _____

STATE OF WASHINGTON)
) : ss
COUNTY OF WHATCOM)

Bond No. _____

_____, as Principal, and _____, as surety, a corporation duly licensed and authorized to do business in the State of Washington, are held and firmly bound unto the **Whatcom County Water District No. 13**, hereinafter called "District", in the sum of _____ Dollars (\$ _____), for payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, Principal agreed with District to perform the work as specified or indicated by _____ caused by the contractors operation, and restore such areas to conditions existing prior to construction. Such measures shall include, but not be limited to grading and seeding.

NOW, THEREFORE, if Principal shall perform all of this work; and

If Principal shall pay for all materials, equipment, or other supplies, or for rental of same used in connection with the performance of work to be done, and for all amounts due under applicable State law for any work or labor thereon; and

If Principal shall pay the sales, use and any other applicable taxes of the State of Washington or any political subdivision of said State relating to the work performed, and pay amounts due the State pursuant to Titles 50 and 51 of the Revised Code of Washington; and

If Principal shall indemnify and hold the District harmless from any defects in the workmanship of materials incorporated into the work for a period of two years after the final acceptance of the work;

Then, the obligation of Principal and Surety under this Bond shall be void, but otherwise it shall remain in full force and effect.

This Bond shall inure to the benefit of any person, companies or corporations entitled to file claims under applicable State law.

PERFORMANCE, PAYMENT AND GUARANTY BOND - Continued

If suit (including any dispute resolution process) is brought upon this bond, a reasonable attorney's fee and litigation costs shall be awarded to the prevailing party.

Any alterations in the work to be done or the materials to be furnished, or changes in the time of completion, shall not in any way release Principal or Surety thereunder, nor shall any extensions of time granted release either Principal or Surety, and notice of such alterations or extension is hereby waived by Surety.

IT IS FURTHER AGREED that nothing of any kind or nature that will not discharge the Principal shall operate as a discharge or release of the Surety, regardless of law, rule of equity or usage relating to the liability of sureties to the contrary notwithstanding.

SIGNED AND SEALED, this _____, day of _____, 20____.

(Seal)

(Seal)

Principal

Surety

Address

Address

City, State & Zip

City, State & Zip

Phone No.

Phone No.

Fax No.

Fax No.

Signature of Principal

Signature of Surety Official

Print Name and Title

Print Name and Title

Accepted by the Whatcom County Water District No. 13 this _____ day of _____, 20____.

General Manager Whatcom County Water District No. 13

SAMPLE MAINTENANCE BOND

MAINTENANCE BOND

Project: _____

Developer: _____

STATE OF WASHINGTON)

: ss

COUNTY OF WHATCOM)

Bond No. _____

We, _____, as principal, and _____, a corporation organized under the laws of the State of _____, and duly authorized to transact business in the State of Washington, as surety, are held and firmly bound unto the Whatcom County Water District No. 13, Whatcom County, Washington, in the amount of \$ _____, for the payment of which sum we bind ourselves, and each of our executors, administrators, successors, and assigns, jointly and severally.

Now, therefore, the conditions of these obligations are such that if the principal shall replace or correct any part or parts of principal's Extension to the District system(s) built by principal or principal's Contractor as required by Developer Extension agreement signed by principal dated the _____ day of _____, 20____ discovered by the Whatcom County Water District No. 13 to be defective in material or inefficient or otherwise unsatisfactory in operations, through faulty construction, materials or workmanship, or through any fault of design or detail arising with Contractor or manufacturer within two years of the acceptance of the work and transfer of title, then the obligation of Principal and Surety under this Bond shall be void, but otherwise it shall remain in full force and effect.

Such parts shall be replaced with parts constructed in accordance with designs and of material satisfactory to the District.

Upon the failure of the principal to perform the terms of this Bond, the Surety shall either perform the terms of the Bond itself or shall, upon demand by the Manager of the District, release up to the full bonded amount to the Whatcom County Water District No. 13. The amount demanded by the Manager or designer will be a good faith estimate of the actual cost of repairs.

We further agree that up to the full bonded amount shall be released to Whatcom County Water District No. 13 upon written demand by the Manager of the District. The amount demanded by the Manager or designee will be a good faith estimate of the actual cost of the repairs.

We further agree that if it is necessary for the Whatcom County Water District No. 13 to take any legal action against any signatory to this agreement to assure compliance with its terms, the District shall be entitled to its reasonable costs and attorney's fees.

We further agree that nothing of any kind or nature that will not discharge the principal shall operate as a discharge or release of the Surety, regardless of law, rule of equity or usage relating to the liability of sureties to the contrary notwithstanding.

It shall be the responsibility of both the principal and the surety to inform the Whatcom County Water District No. 13, in writing, of any change of mailing address. The District will mail only to the last known address of principal and surety.

SIGNED this _____ day of _____, 20____.

Principal

Surety

Address

Address

City, State & Zip

City, State & Zip

Phone No.

Phone No.

Fax No.

Fax No.

Signature of Principal

Signature of Surety Official

Print Name and Title

Print Name and Title

Accepted by the Whatcom County Water District No. 13 this _____ day of _____, 20____.

General Manager Whatcom County Water District No. 13

**SAMPLE ASSIGNMENT OF FUNDS IN LIEU OF
MAINTENANCE BOND**

**WHATCOM COUNTY WATER DISTRICT NO. 13
ASSIGNMENT OF FUNDS
IN LIEU OF MAINTENANCE BOND**

Project: _____

Developer: _____

STATE OF WASHINGTON)
 : ss.
COUNTY OF WHATCOM)

We hereby agree that the sum of \$_____ will be held in savings account number _____ in _____ in the name of _____ to assure maintenance requirements hereunder.

Now, therefore, the conditions of these obligations are such, that the principal shall replace or correct any part or parts of the _____ Extension to the system(s) discovered by the Whatcom County Water District No. 13 to be defective in material or inefficient or otherwise unsatisfactory in operations, through faulty construction, materials or workmanship, or through any fault of design or detail arising with Contractor or manufacturer within two years of the acceptance of the work and transfer of title. Such parts shall be replaced with parts constructed in accordance with designs and of material satisfactory to the District.

We further agree that up to the full amount of the funds in the above referenced account shall be released to the Whatcom County Water District No. 13 upon written demand by the Manager of the District. The amount demanded by the Manager or designee will be a good faith estimate of the actual cost of the repairs.

We further agree that if it is necessary for the Whatcom County Water District No. 13 to take any legal action against any signatory to this agreement to assure compliance with its terms, the District shall be entitled to its reasonable costs and attorney's fees.

It shall be the responsibility of both the principal and the financial institution to inform the Whatcom County Water District No. 13, in writing, of any change of mailing address. The District will mail only to the last known address of principal and financial institution.

Signed this _____ day of _____, 20__.

Principal

Name of Financial Institution

Address

Address

City, State, Zip

City, State, Zip

Phone No.

Phone No.

Fax No. _____

Fax No. _____

Signature of Principal

Signature of Bank Official

Print Name and Title

Print Name and Title

Accepted by the Whatcom County Water District No. 13 this _____ day of _____, 20__.

General Manager Whatcom County Water
District No. 13

SAMPLE

SAMPLE EASEMENT RESTORATION RELEASE

WHATCOM COUNTY WATER DISTRICT NO. 13

Easement Restoration Release

Easement No. _____

Date _____

Project No. _____

Project _____

Contract No. _____

Owner _____

Contractor _____

Property Owner(s) _____

Property Address/Description _____

Property Owner's Approval

The undersigned owner(s) of the above property do hereby accept the restoration work completed by the Contractor on (our) property. I (We) release the Whatcom County Water District No. 13 and the Contractor from further restoration work, except as follows:

Signature

Date

Phone No.

Signature

Date

Phone No.

APPENDIX F

**WHATCOM COUNTY WATER DISTRICT NO. 13
SMALL WATER SYSTEM MANAGEMENT PLAN**

**ENGINEERING REPORT AND CALCULATIONS
July 23, 2020**

Prepared by:

Roger W. Kuykendall, PE
Gray & Osborne, Inc.
3710 168th Street NE, Suite 210
Arlington, WA 98223

Water Demand Calculations, Based upon Historical Records

Water District 13 began metering its residential customers in March 2007. Prior to this date, only the commercial customers were metered, including the now-closed golf course (1.0 water ERU), and the Peaceful Valley Community Club (PVCC – 1.0 water ERUs). Other commercial properties now include a realtor office (1.0 water ERU) and the East Whatcom Regional Resource Center (EWRRC – 4.5 water ERUs), opened in 2011. An addition to the resource center is due to open in late 2019. The District has also read the source meters and kept good records of water production on a monthly basis since 1998. Analysis of the District's water system is based upon water production and use records for 2016, 2017, and 2018. All service meters in the system were replaced with new meters in 2018.

Growth within the District over the last several years has been slow, however; two large parcels of land have recently begun developing portions of their property:

- Tin Rock Development extended roadway (Balfour Valley Lane), drainage, water, and sewer improvements and constructed 5 new homes off the west end of Peaceful Valley Drive in 2014.
- Trek Properties developed Phase 1A their approved preliminary plat in 2018, extending roadway, drainage, water, and sewer improvements to serve 25 new lots, located north of Green Valley Drive. Several homes are under construction.
- Trek also has preliminary approval for Phase 1B, which includes an additional 57 lots located north of Phase 1A.
- Cowden, Inc., has received preliminary plat approval for 29 additional lots in and around Balfour Valley Lane, with 8 new lots expected to be ready for home construction in early 2020.

The majority of land within the District is zoned for Urban Residential at four dwelling units per acre, but approximately 41 acres has been designated as General Commercial. Growth in the District was estimated and specified in Table 3.3 of the District's 2012 Comprehensive Sewer Plan. At that time, it was estimated (based on a growth rate of 1.78 percent) that there would be 452 ERUs by the end of 2018, however; currently, there

are only 377 water ERUs served by the District. The 2016 Whatcom County Comprehensive Plan, updated in May 2018, now estimates a growth rate in the Columbia Valley Urban Growth Area (UGA) of 1.58 percent, with most of the growth occurring within the District because of available vacant land and sewer service. However, because of recent development activity, a slightly higher growth rate (1.78 percent) has been selected for this plan, as shown in Table 1. The selected growth rate would add 73 new ERUs over the next ten years.

**TABLE 1
Projected ERU Growth**

Year	Selected ERUs Growth Rate
2019	377
2020	380
2021	383
2022	390
2023	398
2024	405
2025	413
2026	420
2027	428
2028	435
2029	443
2030	450

Historical Water Use

A summary of annual water production, use, and leakage is provided in Table 2. The total produced is the total amount pumped from the two source wells. The total consumed is based on all the service meter readings, plus hydrant flushing, and fire department use. Based upon the last three years of water data, there appears to be an overall reduction in water use in the District, as the peak summer production and consumption of water has decreased.

Distribution System Loss (DSL) represents the difference between the produced water and the consumed water, and indicates leakage in the system. The 3-year average for DSL is 20.2 percent. This is similar to DSL calculated in 2011. Historically, DSL in the District has varied widely, as leaks are difficult to find due to the very porous soils in the area. The operator reports DSL at every monthly Board meeting. DSL varies each month from 4 percent to over 30 percent. Typically, when DSL increases to greater than 10 percent, the District will begin searching for distribution system leaks. This has resulted in a major leak being discovered and repaired every 1-2 years.

TABLE 2
Water Use (gallons)

Year	2016	2017	2018
Total Produced	29,881,294	29,317,925	24,980,198
Total Consumed	24,996,290	22,570,212	19,669,915
DSL (gal)	4,885,004	6,747,713	5,310,283
DSL (%)	16.3%	23.0%	21.3%

It should be noted that the production meter for Well No. 2 began malfunctioning in late October, 2017 and was finally repaired in February 2018. Also, the District replaced all of its customer meters in 2018. Small, residential meters tend to under-read water use as they age, so it is anticipated that more accurate (and higher) water sales will result from this project.

Not related to DSL, but in an effort to increase water use efficiency, the District tracks water use of individual services, and therefore can detect a significant service leak when the meters are read, and notify the property owner of needed repairs. A commodity charge was implemented in mid-2018, in order to curtail excessive water use, and provide a financial incentive to quickly repair leaking service lines.

Average Daily Demand (ADD)

Water loss is conservatively assumed to be 20 percent for estimating future demand. Average Daily Demand (ADD) is calculated from residential actual water use. Since several properties in the District are vacant, only water use from active customers was calculated. An active customer is defined as having at least 6 months of water use. Table 3 identifies the residential water consumed and the number of active residential ERUs to generate an average daily ERU use.

TABLE 3
Average Daily Demand (ADD)
Based on Consumption

Year	2016	2017	2018
Total Consumed ⁽¹⁾	24,833,518	22,283,181	19,127,100
Active ERUs	346	344	347
ADD (gpd/ERU)	195 ⁽²⁾	182 ⁽³⁾	151 ⁽⁴⁾

(1) Metered use minus commercial, hydrant flushing, and fire department use

(2) 369 days of record

(3) 356 days of record

(4) 367 days of record

The average consumed residential water use over the 3-year period for which the District has metered service connections is 176 gallons per day per ERU. This is significantly lower than the 215 gpd calculated in 2011. With a 20 percent DSL assumption, the average daily demand is calculated at 211 gpd/ERU.

Maximum Day Demand (MDD)

Maximum Day Demand (MDD) is estimated at approximately 2.0 times the Average Daily Demand, yielding a MDD of 422 gpd/ERU. Comparing the last three years' maximum month's average demand day (MMAD), including a DSL of 20 percent, to ADD yields peaking factors of 1.96, 1.84, and 1.64 for 2016, 2017, and 2018, respectively, so a peaking factor of 2.0 times ADD is conservative.

Peak Hour Demand (PHD)

Peak Hour Demand (PHD) can be determined by using the formula Equation 5-1, Water System Design Manual, 2009:

$$PHD = (MDD/1440)[(C)(N) + F] + 18$$

Where C=1.8 & F=125 for N<500; and C=1.6 & F=225 for N>500, where N is the number of ERUs. Table 4 shows the PHD for the existing, 10-year, and 20-year planning dates.

TABLE 4
Peak Hourly Demand (PHD)

Year	ERUs (N) ⁽¹⁾	PHD, gpm
2019	377	254
2030	450	292
2040	537	336

(1) Growth per Table 1 – 1.78%

Water Source Calculations

The District has two wells with identical pumps, designed to pump at 450 gpm each. The pumps are controlled by an alternator which currently allows operation of only one pump at a time. The controls can be modified if necessary, to run both pumps simultaneously.

System Capacity from Annual Volume

The District's water rights currently allow for an annual volume of 484 acre-feet of water to be withdrawn. This equates to 157,700,000 gallons per year, or 432,000 gallons per day. Based on a future ADD of 211 gpd/ERU the annual water rights can support **2,048 ERUs**.

System Capacity from Instantaneous Water Right

Well SO-1 water right G1-22158 allows a maximum withdrawal of 450 gpm. Well SO-2 water right G1-22178 allows a maximum withdrawal of 700 gpm. Total water right

withdrawal amount is 1,150 gpm. Based on a future MDD of 422 gpd/ERU, the water rights can support **3,924 ERUs**.

System Capacity from Instantaneous Well Pump Rate

The existing pumps, each rated for 450 gpm, can supply a total of 900 gpm. Based on a MDD of 422 gpd/ERU, the maximum pump capacity will support **3,071 ERUs**.

Storage Calculations

The District owns and operates one dual-tank reservoir. Both tanks combined store 7,760 gallons per foot for a total of 300,000 gallons. Water storage must be sufficient to meet expected system demands by providing operational, equalizing, standby, and fire suppression storage volumes. Standby storage and fire suppression storage may be “nested” together – that is, the larger of the two volumes may be used as the total design requirement for both. Calculations are in accordance with the State Department of Health Design Manual (2009). The tanks are configured as follows:

Type:	Two equally sized concrete tanks
Inside Diameter =	25.7 feet
Inside Height =	40.0 feet
Bottom Elevation =	594.5 feet (1929 NAV)
Full Elevation =	633.0± feet (1929 NAV)
Capacity =	3,880 gallons per foot per tank = 149,380 gallons per tank

Operational Storage (OS)

Operational Storage (OS) is the volume of water devoted to supplying the water system while, under normal operating conditions, the sources of supply are in “off” status (WAC 246-290-010). Operational storage is in addition to other storage components, thus providing a factor of safety for equalizing, standby, and fire suppression storage. As currently set by the District, one source pump turns on when the water level in the tanks drops below 631.00, and turns off when the water level reaches 633.00. This allows an operating range of 2.0 feet, or 15,522 gallons. At 450 gpm pumping rate, with a conservative assumed outflow of 225 gpm, the shortest pump cycle time is approximately one hour.

Equalizing Storage (ES)

Equalizing storage (ES) must be provided as part of the total storage for the system to provide water during periods of peak demand that cannot be met by the source production capacity. ES volume is based on PHD demand requirements, assuming peak demand for 2½ hours. If the source pumps will, by themselves, meet PHD, then no equalizing storage is needed. The following equation is used to calculate equalizing storage volume:

$$ES = (PHD - Q_s) * 150 \text{ min.} \quad \text{where } Q_s \text{ is the total source pumping capacity}$$

Since the District currently alternates pump operation, equalizing storage is calculated based upon only one pump operating at 450 gpm. Within the 20-year planning horizon, one pump is adequate to meet the peak demands of the District (336 gpm in 2040).

Standby Storage (SB)

Standby storage (SB) provides a measure of reliability in case sources fail or unusual conditions impose higher demand than anticipated. SB volume is based on customer expectations. Generally, this emergency volume is two days worth of ADD, as represented by the equation for systems with multiple sources:

$$SB = (2 \text{ days})[(ADD)(N) - 1440(Q_S - Q_L)]$$

where Q_L is the largest source and Q_S is the total of all sources

For the District, with one source failed, the other source can provide the ADD, so additional standby storage is not required by the above calculation. However, the Department of Health recommends that standby storage be 200 gpd/ERU, as a minimum. A standby storage of 200 gpd/ERU is calculated.

Fire Suppression Storage (FSS)

Water systems must be capable of delivering fire flows in accordance with adopted fire flow requirements, while maintaining minimum pressure requirements (20 psi) throughout the District. Fire suppression requirements are set by the local Fire Marshall and are generally stated as a flow rate (FF) for a specific duration (t_M). Historically, the District has been developed as only residential, and the Whatcom County Fire Marshall required 500 gpm fire flow for one hour. According to the 2016 Whatcom County Coordinated Water System Plan (CWSP), the minimum required fire flow for new development is 500 gpm for 1 hour for residential and 1,000 gpm for 2 hours for commercial. The hydraulic model for the system has been run to verify it can meet these requirements. Therefore, FSS can be calculated by the equation:

$$FSS = (FF)(t_M)$$

Dead Storage (DS)

Dead Storage (DS) is the volume of stored water not available to all customers at the minimum design pressure. This storage might be typically used to shift water between reservoirs, or to provide minimum pressure to a residence located at a higher elevation. Because the District has a single storage facility, with the bottom of the tanks at elevation 594.5, and no service connection higher than about elevation 490, no dead storage is required.

Tables 5 and 6 provide a summary of the storage calculations, in terms of gallons (Table 5) and also with respect to feet of reservoir storage (Table 6). Nesting of Standby and Fire Suppression Storages is utilized in this analysis. Based on the analysis, the District’s facilities do not show any source or storage deficiencies for the 20-year planning period.

**TABLE 5
Storage Requirements (gallons)**

Design Parameter	Year		
	2019	2030	2040
ERUs	377	450	537
Operational Storage	15,522	15,522	15,522
Equalizing Storage ⁽¹⁾	N/A	N/A	N/A
Standby Storage ⁽²⁾	75,400	90,000	107,400
Fire Storage ⁽³⁾	120,000	120,000	120,000
Total Storage Required ⁽⁴⁾	135,522	135,522	135,522
Storage Provided	298,760	298,760	298,760
Deficiency?	No	No	No

- (1) Equalizing storage not required, since each pump, operating alone, can supply PHD.
- (2) Standby storage based on 200 gpd/ERU, as recommended.
- (3) Based on 1,000 gpm for 2 hours.
- (4) Equal to OS + ES + greater of SB or FSS (FSS nested with SB)

**TABLE 6
Storage Requirements (feet)**

Design Parameter	Year		
	2019	2030	2040
ERUs	377	450	537
Operational Storage	2.0	2.0	2.0
Equalizing Storage ⁽¹⁾	N/A	N/A	N/A
Standby Storage ⁽²⁾	9.7	11.6	13.9
Fire Storage ⁽³⁾	15.5	15.5	15.5
Total Storage Required ⁽⁴⁾	17.5	17.5	17.5
Storage Provided	38.5	38.5	38.5
Deficiency?	No	No	No
Tank Elevation at Bottom of Fire Suppression ⁽⁵⁾	615.5	615.5	615.5

- (1) Equalizing storage not required, since each pump, operating alone, can supply PHD.
- (2) Standby storage based on 200 gpd/ERU as recommended.
- (3) Based on 1,000 gpm for 2 hours.
- (4) Equals OS + ES + greater of SB or FSS (FSS nested with SB).
- (5) Used for hydraulic modeling during fire suppression. Equals 633.00-OS-ES-FSS.

For the purposes of hydraulic modeling during fire flow for minimum pressure requirements, the water elevation in the tanks is assumed to be at the bottom of operating

storage, equalizing storage, and standby storage, with credit taken for nesting fire suppression storage with standby storage, or:

Tank water elevation at bottom of fire suppression = 633.00-OS-ES-greater of SB or FSS.

Treatment Storage is needed when the source water requires adequate contact time for routine disinfection or to meet surface water treatment requirements. The District currently does not provide treatment or disinfection; therefore, treatment storage is not required.

Analysis to determine the maximum ERUs, based only on meeting the storage requirements (633.00-OS-ES-greater of SB or FSS), results in a maximum ERU count of **1,416**. At this level of development, the required standby storage (1,416 ERU x 200 gpd/ERU= 283,200 gallons) plus operational storage (15,522 gal) is almost 298,760 gallons. With two pumps operating, equalization storage is still not required.

Table 7 summarizes how each system component controls the maximum ERUs that can be supported by the existing water system. Storage is the limiting component for the water system.

**TABLE 7
Summary of Source and Supply ERUs**

System Component	Maximum ERUs
Water Rights, Annual Volume	2,048
Water Rights, Rate	3,924
Existing Wells/Pumps	3,071
Storage	1,416

Hydraulic Model

The District’s water system is analyzed using Innowyze InfoWater hydraulic modeling software, which operates in ArcGIS environment. The model has not been calibrated by an actual flow test. In addition to modeling the existing system configuration, several future projects were added to the model and evaluated. These projects were included in the Table 5.8 of the 2012 Small Water System Plan:

Project A: Install 8-inch line from existing 8-inch source line (from Well 1) to 6-inch line on Fall Valley Road. This project would provide for a second crossing of the state highway to serve the east side of the District, providing redundancy to the east side of the District.

Project B: Install 8-inch line from 6-inch line on Clear Valley Drive to 6-inch line on Boulder Valley Lane. This project would provide for a second connection to

the King Valley Drive/Deep Valley Drive loop, providing additional water to the yet-to-be-developed northeast portions of the District.

Project C: Install 8-inch loop from Peaceful Valley Drive to Sprague Valley Drive across undeveloped land. This project, constructed by private development, would provide a looped system on the west side of the state highway to serve growth. For modeling purposes, this project is not expected to be complete until year 2040.

The following modeling scenarios were run for the District’s water system:

**TABLE 8
Summary of Modeling Scenarios**

Model Scenario	2019	2030	2040
Existing System	X	X	X
Project A	X	X	X
Projects A & B	X	X	X
Project C			X
Projects A & C			X
Projects A, B, & C			X

Peak Hour Demand Check

Minimum distribution pressure must be maintained in order to provide a reliable and safe water system, including adequate fire suppression. The water system must be able to provide Peak Hour Demand (PHD) at no less than 30 psi at all service connections throughout the distribution system when all equalizing storage is depleted (WAC 246-290-230(5)). Table 9 provides information regarding the system’s ability to meet this requirement. Minimum distribution system pressure is easily maintained throughout the District, for all modeled scenarios. As expected, the lowest pressure calculated exists at, or near, the intersection of Fall Valley Lane and Clear Valley Drive, the highest elevation served by the District.

Table 9
Peak Hour Demand (PHD) System Hydraulic Check ⁽¹⁾
Minimum Pressure

Scenario	2019 PHD=254 gpm	2030 PHD=292 gpm	2040 PHD=336 gpm
Existing System	68.0 psi @ Node J78	66.5 psi @ Node J78	65.0 psi @ Node J78
Project A	71.3 psi @ Node J78	70.1 psi @ Node J78	68.5 psi @ Node J81
Projects A & B	70.6 psi @ Node J78	69.3 psi @ Node J78	67.9 psi @ Node J78
Project C	N/A	N/A	62.1 psi @ Node J78
Projects A & C	N/A	N/A	65.0 psi @ Node J81
Projects A, B, & C	N/A	N/A	73.7 psi @ Node J78

- (1) Tank level set at bottom of equalizing storage = 631.0 feet. One well pump operating.
- (2) Node J78 is located at the intersection of Fall Valley Lane and Clear Valley Drive.
- (3) Node J81 is located at the northern terminus of Clear Valley Drive.

Fire Suppression Check

During fire suppression events, the water system must be able to provide 20 psi minimum pressure at ground level at all points throughout the distribution system. The water system must be able to provide this minimum pressure under fire-flow conditions plus the MDD rate when all equalizing and fire flow storage is depleted (WAC 246-290-230(6)). For residential areas, the required minimum fire flow is 500 gpm for 1 hour and for commercial areas, 1,000 gpm for 2 hours. At the current time, all nodes are capable of meeting the assigned fire flow rates under the modelled system conditions. Hydrants providing the lowest flow rate under each scenario are shown in Table 10.

Table 10
Fire Suppression System Hydraulic Check ⁽¹⁾
Lowest Flow

Scenario	2019	2030	2040
Existing System	598 gpm @ Node J79	593 gpm @ Node J79	587 gpm @ Node J79
Project A	876 gpm @ Node J76	830 gpm @ Node J141	825 gpm @ Node J141
Projects A & B	876 gpm @ Node J76	862 gpm @ Node J141	857 gpm @ Node J141
Project C	N/A	N/A	606 gpm @ Node J79
Projects A & C	N/A	N/A	875 gpm @ Node J141
Projects A, B, & C	N/A	N/A	876 gpm @ Node J76

- (1) Tank level set at bottom of fire flow storage = 615.5 feet. One well pump operating.
- (2) Node J79 is located on Fall Valley Lane.
- (3) Node J76 is located on Blackbird Valley Lane.
- (4) Node J141 is located at the northern terminus of Gold Run Drive.

Under all scenarios, the completion of Project A results in a significant increase (greater than 20%) in flow to Clear Valley Drive, Blackbird Valley Lane, and Fall Valley Lane, with smaller increases throughout the east side. The completion of Projects A and B, results in a significant increase in flow to Boulder Valley Lane and Deep Valley Drive, with moderate increases throughout the east side. The completion of Project C alone, results in significant increases in flow to Flair Valley Drive, Balfour Valley Lane, Boulder Valley Lane, Balfour Valley Road, and the commercial area. Completion of Projects A and C, or A, B, and C results in significant increases in flow throughout the District, except at dead-end lines, as expected.

Since a portion of the District is zoned for General Commercial, a fire flow of 1,000 gpm for two hours duration is required in those areas west of Sumas-Kendall Road and north/northwest of Balfour Valley Road. Modeling was performed for the commercial area, with the lowest fire flow of 1,291gpm in year 2040 with no system improvements.

The existing infrastructure within the District meets the minimum peak demand pressure requirements (30 psi) and also fire flow requirements (20 psi minimum), assuming that growth is constructed on the valley floor, wherein ground elevations vary from about 450 to 500 feet. Portions of the undeveloped urban growth areas within the District are of a significantly higher elevation, including areas to the west of the County Resource Center, and the area south of Sprague Lake. When and where these areas are developed remains to be seen. Currently, there are no development proposals for these areas. At such time a proposal is brought forth for these areas, feasibility studies will be required. Depending on the amount and elevation of the proposal, it is likely that infrastructure improvements (booster station, additional storage at higher elevation, etc.,) may be required of the development in order to adequately service these areas.

System Improvements (Capital Improvements)

District Financed Improvements:

The recommended improvements listed are general facilities to be constructed by the District:

1. Emergency backup generator(s) at the well site(s). The District is currently looking to purchase a surplus portable generator when available, to be used for multiple sites.
2. Storage tank piping modifications should be made to provide equalization of water in the tanks and better circulation of water within the tanks.
3. Replace and add valves at system junctions.
4. Install 8-inch loop connection from 8-inch source line (Well 1) to 6-inch line in Fall Valley Lane, herein identified as Project A.
5. Install 8-inch loop connection from 6-inch line in Clear Valley Drive to 6-inch line in Boulder Valley Lane, herein identified as Project B. By itself, Project B provides very little benefit and therefore is not recommended until Project A is complete.
6. Evaluate the District's base rates, commodity charges, and connection charges periodically.

Developer Financed Improvements:

The improvements listed below assume that as future development within the service area occurs, water mains will be installed to create loops in the distribution system. These improvements are to be constructed by developers. It is the District's responsibility to see that the minimum improvements are completed by developers. Not all potential loops are identified herein, however the following obvious loops are as follows:

1. Install new 8-inch water line to create a loop from Balfour Valley Road to Sprague Valley Drive, near the wastewater treatment plant, herein identified as Project C.
2. Install new 8-inch water line from the bottom of the existing 8-inch tank supply line to the new 8-inch line at the western property line of the County Resource Center, also with extension/connection to the 8-inch line at Peaceful Valley Drive.

3. Install new 8-inch water line to create a loop from Gold Run Drive to the intersection of Peaceful Valley Drive and Deep Valley Drive, also with extension/connection to the 8-inch line at Deep Valley Drive and King Valley Drive.

WELL SITE EASEMENT

01201

THE GRANTORS, Peaceful Valley, a Washington Limited Partnership, for a valuable consideration, receipt of which is hereby acknowledged, conveys to Whatcom County Water District No. 13, a municipal corporation, an easement for the existing well and protective zone on, across, and under the following described real property:

Beginning at the Northwest corner of the plat of Peaceful Valley, Division 1, located in Section 22, Township 40 North, Range 5E, W.M., thence commencing North 87° 25' 57" West, which is the same bearing along the North side of said plat at this point, to its intersection with the centerline of County Road No. 361, more commonly known as the Sumas-Kendall Road, thence south 68° 44' 17" East a distance of 579 feet to the well casing and source of Water District No. 13 water supply. The well tract easement area and protective zone is a circle with a 200 foot radius whose radius point is the well casing.

THE GRANTORS further acknowledge and agree that said Water District No. 13 shall have such additional access as may be necessary or convenient for the maintenance and repair of said well and water lines appurtenant thereto on condition that upon completion of said maintenance and repair that the property be restored as near as practicable to its existing condition prior to the maintenance and repairs consistent with good engineering practices.

DATED this 12th day of January, 1982.

PEACEFUL VALLEY, a Washington Limited Partnership.

By H. E. Isenhart
H. E. ISENHART, General Partner

STATE OF WASHINGTON) ss
COUNTY OF WHATCOM)

ON THIS DAY PERSONALLY APPEARED BEFORE ME H. E. Isenhart known to me to be a General Partner of Peaceful Valley, a Washington Limited Partnership, who executed the within and foregoing instrument on behalf of the partnership and acknowledged that he signed the same as his free and voluntary act and deed of the Limited Partnership for the uses therein mentioned.

GIVEN UNDER MY HAND and official seal this 12th day of January, 1982.

Joan Ogden
NOTARY PUBLIC, in and for the State of Washington, residing at Bellingham.

Return to:
Whatcom County Water District # 13
8193 Kendall Rd.
Maple Falls, Wa. 96266

1410319

W.C. DIST #13
JAN 25 10 51 AM '82
REGISTRY
JOAN OGDEN, Notary Public
WHATCOM COUNTY, WASH. DEPUTY

WATER FACILITIES INVENTORY (WFI) FORM - Continued

1. SYSTEM ID NO.	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE
95914 3	WHATCOM COUNTY WATER DIST 13	WHATCOM	A	Comm

	ACTIVE SERVICE CONNECTIONS	DOH USE ONLY! CALCULATED ACTIVE CONNECTIONS	DOH USE ONLY! APPROVED CONNECTIONS
25. SINGLE FAMILY RESIDENCES (How many of the following do you have?)		384	1334
A. Full Time Single Family Residences (Occupied 180 days or more per year)	384		
B. Part Time Single Family Residences (Occupied less than 180 days per year)	0		
26. MULTI-FAMILY RESIDENTIAL BUILDINGS (How many of the following do you have?)			
A. Apartment Buildings, condos, duplexes, barracks, dorms	0		
B. Full Time Residential Units in the Apartments, Condos, Duplexes, Dorms that are occupied more than 180 days/year	0		
C. Part Time Residential Units in the Apartments, Condos, Duplexes, Dorms that are occupied less than 180 days/year	0		
27. NON-RESIDENTIAL CONNECTIONS (How many of the following do you have?)			
A. Recreational Services and/or Transient Accommodations (Campsites, RV sites, hotel/motel/overnight units)	0	0	0
B. Institutional, Commercial/Business, School, Day Care, Industrial Services, etc.	4	4	4
28. TOTAL SERVICE CONNECTIONS		388	1338

29. FULL-TIME RESIDENTIAL POPULATION
A. How many residents are served by this system 180 or more days per year? 795

30. PART-TIME RESIDENTIAL POPULATION	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. How many part-time residents are present each month?												
B. How many days per month are they present?												

31. TEMPORARY & TRANSIENT USERS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. How many total visitors, attendees, travelers, campers, patients or customers have access to the water system each month?												
B. How many days per month is water accessible to the public?												

32. REGULAR NON-RESIDENTIAL USERS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. If you have schools, daycares, or businesses connected to your water system, how many students daycare children and/or employees are present each month?												
B. How many days per month are they present?												

33. ROUTINE COLIFORM SCHEDULE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	1	1	1	1	1	1	1	1	1	1	1	1

34. NITRATE SCHEDULE	QUARTERLY	ANNUALLY	ONCE EVERY 3 YEARS
(One Sample per source by time period)			

35. Reason for Submitting WFI:

Update - Change
 Update - No Change
 Inactivate
 Re-Activate
 Name Change
 New System
 Other _____

36. I certify that the information stated on this WFI form is correct to the best of my knowledge.

SIGNATURE: _____ DATE: _____

PRINT NAME: _____ TITLE: _____

Total WFI Printed: 1



Water Facilities Inventory (WFI)

Report Create Date: 9/15/2020
Water System Id(s): 95914
Print Data on Distribution Page: ALL
Print Copies For: DOH Copy
Water System Name: ALL
County: -- Any --
Region: ALL
Group: ALL
Type: ALL
Permit Renewal Quarter: ALL
Water System Is New: ALL
Water System Status: ALL
Water Status Date From: ALL **To** ALL
Water System Update Date ALL **To** ALL
Owner Number: ALL
SMA Number: ALL
SMA Name: ALL
Active Connection Count From: ALL **To:** ALL
Approved Connection Count ALL **To:** ALL
Full-Time Population From: ALL **To:** ALL
Water System Expanding ALL
Source Type: ALL
Source Use: ALL
WFI Printed For: On-Demand



Water Quality Monitoring Schedule

System: WHATCOM COUNTY WATER DIST 13
Contact: Kelly T Wynn
SMA ID: 148

PWS ID: 95914 3
Group: A - Comm
SMA Name: Water & Wastewater Services SMA 148

Region: NORTHWEST
County: WHATCOM

NOTE: To receive credit for compliance samples, you must fill out laboratory and sample paperwork completely, send your samples to a laboratory accredited by Washington State to conduct the analyses, AND ensure the results are submitted to DOH Office of Drinking Water. There is often a lag time between when you collect your sample, when we credit your system with meeting the monitoring requirement, and when we generate the new monitoring requirement.

Coliform Monitoring Requirements

	Sep 2020	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	Mar 2021	Apr 2021	May 2021	Jun 2021	Jul 2021	Aug 2021
Coliform Monitoring Population	795	795	795	795	795	795	795	795	795	795	795	795
Number of Routine Samples Required	1	1	1	1	1	1	1	1	1	1	1	1

- Collect samples from representative points throughout the distribution system.
- Collect required repeat samples following an unsatisfactory sample. In addition, collect a sample from each operating groundwater source.
- For systems that chlorinate, record chlorine residual (measured when the coliform sample is collected) on the coliform lab slip.

Chemical Monitoring Requirements

Distribution Monitoring

<u>Test Panel/Analyte</u>	<u># Samples Required</u>	<u>Compliance Period</u>	<u>Frequency</u>	<u>Last Sample Date</u>	<u>Next Sample Due</u>
Lead and Copper	10	Jan 2020 - Dec 2022	standard - 3 year	11/06/2019	Jul 2022
Asbestos	0	Jan 2020 - Dec 2028	waiver - 9 year		

Notes on Distribution System Chemical Monitoring

- For Lead and Copper:**
- Collect samples from the COLD WATER side of a KITCHEN or BATHROOM faucet that is used daily.
 - Before sampling, make sure the water has sat unused in the pipes for at least 6 hours, but no more than 12 hours (e.g. overnight).
 - If you are sampling from a faucet that has hot water, make sure cold water is the last water to run through the faucet before it sits overnight.
 - If your sampling frequency is annual or every 3 years, collect samples between June 1 and September 30.

For Asbestos: Collect the sample from one of your routine coliform sampling sites in an area of your distribution system that has asbestos concrete pipe.



Water Quality Monitoring Schedule

Source Monitoring

- Collect 'source' chemical monitoring samples from a tap after all treatment (if any), but before entering the distribution system.
- Washington State grants monitoring waivers for various test panels /analytes. Please note that we may require some monitoring as a condition of some waivers. We have granted complete waivers for dioxin, endothal, glyphosate, diquat, and insecticides.
- Nitrate, arsenic, iron, and other individual inorganics are included as part of a Complete Inorganic (IOC) analysis when it is collected.

Source S01	WELL #1	Well	Use - Permanent	Susceptibility - Moderate		
<u>Test Panel/Analyte</u>	<u># Samples Required</u>	<u>Compliance Period</u>	<u>Frequency</u>	<u>Last Sample Date</u>	<u>Next Sample Due</u>	
Nitrate	1	Jan 2020 - Dec 2020	standard - 1 year	04/02/2020		
Complete Inorganic (IOC)	1	Jan 2020 - Dec 2028	waiver - 9 year	05/02/2017	May 2026	
Volatile Organics (VOC)	1	Jan 2020 - Dec 2025	waiver - 6 year	12/29/2016	Oct 2022	
Herbicides	1	Jan 2014 - Dec 2022	waiver - 9 year	09/27/2018		
Pesticides	1	Jan 2014 - Dec 2022	waiver - 9 year	09/27/2018		
Soil Fumigants	0	Jan 2020 - Dec 2022	waiver - 3 year	08/12/2004		
Gross Alpha	1	Jan 2020 - Dec 2025	standard - 6 year	12/29/2015	Dec 2021	
Radium 228	1	Jan 2020 - Dec 2025	standard - 6 year	12/29/2015	Dec 2021	

Source S02	WELL #2	Well	Use - Permanent	Susceptibility - Moderate		
<u>Test Panel/Analyte</u>	<u># Samples Required</u>	<u>Compliance Period</u>	<u>Frequency</u>	<u>Last Sample Date</u>	<u>Next Sample Due</u>	
Nitrate	1	Jan 2020 - Dec 2020	standard - 1 year	04/02/2020		
Complete Inorganic (IOC)	1	Jan 2020 - Dec 2028	waiver - 9 year	05/02/2017	May 2026	
Volatile Organics (VOC)	1	Jan 2020 - Dec 2025	waiver - 6 year	12/29/2016	Oct 2022	
Herbicides	1	Jan 2017 - Dec 2025	waiver - 9 year	09/27/2018		
Pesticides	1	Jan 2014 - Dec 2022	waiver - 9 year	09/27/2018		
Soil Fumigants	0	Jan 2020 - Dec 2022	waiver - 3 year	08/12/2004		
Gross Alpha	1	Jan 2020 - Dec 2025	standard - 6 year	12/29/2015	Dec 2021	
Radium 228	1	Jan 2020 - Dec 2025	standard - 6 year	12/29/2015	Dec 2021	



Water Quality Monitoring Schedule

Other Information

Other Reporting Schedules	Due Date
Submit Consumer Confidence Report (CCR) to customers and ODW (Community systems only):	07/01/2020
Submit CCR certification form to ODW (Community systems only):	10/01/2020
Submit Water Use Efficiency report online to ODW and to customers (Community and other municipal water systems only):	07/01/2020
Send notices of lead and copper sample results to the customers sampled:	30 days after you receive the laboratory results
Submit Certification of customer notification of lead and copper results to ODW:	90 days after you notify customers

Special Notes

None

Northwest Regional Water Quality Monitoring Contacts

For questions regarding chemical monitoring: Steve Hulsman: (253) 395-6777 or Steve.Hulsman@doh.wa.gov
 For questions regarding DBPs: Steve Hulsman: (253) 395-6777 or Steve.Hulsman@doh.wa.gov
 For questions regarding coliform bacteria and microbial issues: Ingrid Salmon: (253) 395-6775 or ingrid.salmon@doh.wa.gov

Additional Notes

The information on this monitoring schedule is valid as of the date in the upper left corner on the first page. However, the information may change with subsequent updates in our water quality monitoring database as we receive new data or revise monitoring schedules. There is often a lag time between when you collect your sample and when we credit your system with meeting the monitoring requirement.

We have not designed this monitoring schedule to display all compliance requirements. The purpose of this schedule is to assist water systems with planning for most water quality monitoring, and to allow systems to compare their records with DOH ODW records. Please be aware that this monitoring schedule does not include constituents that require a special monitoring frequency, such as monitoring affiliated with treatment.

Any inaccuracies on this schedule will not relieve the water system owner and operator of the requirement to comply with applicable regulations.

If you have any questions about your monitoring requirements, please contact the regional office staff listed above.



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View Sample Detail - WSID 959143 - WHATCOM COUNTY WATER DIST 13

Collect Date 8/13/2020
 Lab Number 164
 Lab Name Edge Analytical Inc - Bellingham
 Sample Number 52944
 Source Dist
 Analyte Group MICRO-MICROBIOLOGICAL
 Test Panel COLI_AP-ABSENCE / PRESENCE
 Sample Location Sample Station at 2341 Clear Valley
 Sample Type Post-Treatment / Finished

Result Range, A/P, Units: Mouse over for full description

Analyte DOH Num	Analyte Name	Result Range	A/P	Units	Maximum Contaminant Level	State Reporting Limit
0001	TOTAL COLIFORM	EQ	A	/100ml		
0003	E. COLI	EQ	A	/100ml		

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Collect Date 7/7/2020
 Lab Number 164
 Lab Name Edge Analytical Inc - Bellingham
 Sample Number 42627
 Source Dist
 Analyte Group MICRO-MICROBIOLOGICAL
 Test Panel COLI_AP-ABSENCE / PRESENCE
 Sample Location Sample Station at 1121
 Sample Type Post-Treatment / Finished

Result Range, A/P, Units: Mouse over for full description

Analyte DOH Num	Analyte Name	Result Range	A/P	Units	Maximum Contaminant Level	State Reporting Limit
0001	TOTAL COLIFORM	EQ	A	/100ml		
0003	E. COLI	EQ	A	/100ml		

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Collect Date 6/2/2020
 Lab Number 164
 Lab Name Edge Analytical Inc - Bellingham
 Sample Number 33503
 Source Dist
 Analyte Group MICRO-MICROBIOLOGICAL
 Test Panel COLI_AP-ABSENCE / PRESENCE
 Sample Location Sample Station at 2341 Clear Valley
 Sample Type Post-Treatment / Finished

Result Range, A/P, Units: Mouse over for full description

Analyte DOH Num	Analyte Name	Result Range	A/P	Units	Maximum Contaminant Level	State Reporting Limit
0001	TOTAL COLIFORM	EQ	A	/100ml		
0003	E. COLI	EQ	A	/100ml		

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Collect Date 5/7/2020
 Lab Number 164
 Lab Name Edge Analytical Inc - Bellingham
 Sample Number 28391
 Source Dist
 Analyte Group MICRO-MICROBIOLOGICAL
 Test Panel COLI_AP-ABSENCE / PRESENCE
 Sample Location Well #1 Sample Tap
 Sample Type Post-Treatment / Finished

Result Range, A/P, Units: Mouse over for full description

Analyte DOH Num	Analyte Name	Result Range	A/P	Units	Maximum Contaminant Level	State Reporting Limit
0001	TOTAL COLIFORM	EQ	A	/100ml		
0003	E. COLI	EQ	A	/100ml		

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Collect Date 5/7/2020
 Lab Number 164
 Lab Name Edge Analytical Inc - Bellingham
 Sample Number 28392
 Source Dist
 Analyte Group MICRO-MICROBIOLOGICAL
 Test Panel COLI_AP-ABSENCE / PRESENCE
 Sample Location Well #2 Sample Tap
 Sample Type Post-Treatment / Finished

Result Range, A/P, Units: Mouse over for full description

Analyte DOH Num	Analyte Name	Result Range	A/P	Units	Maximum Contaminant Level	State Reporting Limit
0001	TOTAL COLIFORM	EQ	A	/100ml		
0003	E. COLI	EQ	A	/100ml		

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Collect Date 5/7/2020
 Lab Number 164
 Lab Name Edge Analytical Inc - Bellingham
 Sample Number 28393
 Source Dist
 Analyte Group MICRO-MICROBIOLOGICAL
 Test Panel COLI_AP-ABSENCE / PRESENCE
 Sample Location 482 Sprague Valley Dr
 Sample Type Post-Treatment / Finished

Result Range, A/P, Units: Mouse over for full description

Analyte DOH Num	Analyte Name	Result Range	A/P	Units	Maximum Contaminant Level	State Reporting Limit
0001	TOTAL COLIFORM	EQ	A	/100ml		
0003	E. COLI	EQ	A	/100ml		

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Collect Date 5/7/2020
 Lab Number 164
 Lab Name Edge Analytical Inc - Bellingham
 Sample Number 28394
 Source Dist
 Analyte Group MICRO-MICROBIOLOGICAL
 Test Panel COLI_AP-ABSENCE / PRESENCE
 Sample Location 612 Sprague Valley Dr
 Sample Type Post-Treatment / Finished

Result Range, A/P, Units: Mouse over for full description

Analyte DOH Num	Analyte Name	Result Range	A/P	Units	Maximum Contaminant Level	State Reporting Limit
0001	TOTAL COLIFORM	EQ	A	/100ml		
0003	E. COLI	EQ	A	/100ml		

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Collect Date 5/7/2020
 Lab Number 164
 Lab Name Edge Analytical Inc - Bellingham
 Sample Number 28395
 Source Dist
 Analyte Group MICRO-MICROBIOLOGICAL
 Test Panel COLI_AP-ABSENCE / PRESENCE
 Sample Location 572 Sprague Valley Sample Tap
 Sample Type Post-Treatment / Finished

Result Range, A/P, Units: Mouse over for full description

Analyte DOH Num	Analyte Name	Result Range	A/P	Units	Maximum Contaminant Level	State Reporting Limit
0001	TOTAL COLIFORM	EQ	A	/100ml		
0003	E. COLI	EQ	A	/100ml		

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Collect Date 5/5/2020
 Lab Number 164
 Lab Name Edge Analytical Inc - Bellingham
 Sample Number 27878
 Source Dist
 Analyte Group MICRO-MICROBIOLOGICAL
 Test Panel COLI_AP-ABSENCE / PRESENCE
 Sample Location 572 Sprague Valley Dr
 Sample Type Post-Treatment / Finished

Result Range, A/P, Units: Mouse over for full description

Analyte DOH Num	Analyte Name	Result Range	A/P	Units	Maximum Contaminant Level	State Reporting Limit
0001	TOTAL COLIFORM	EQ	P	/100ml		
0003	E. COLI	EQ	A	/100ml		

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View Sample Detail - WSID 959143 - WHATCOM COUNTY WATER DIST 13

Collect Date 4/2/2020
 Lab Number 046
 Lab Name Edge Analytical - Burlington
 Sample Number 21655
 Source 01
 Analyte Group IOC-INORGANIC CONTAMINANTS
 Test Panel NIT-NITRATE SUITE
 Sample Location s01 s/t
 Sample Type Unknown

Result Range, A/P, Units: Mouse over for full description

Analyte DOH Num	Analyte Name	Result Range	Result Quantity	Maximum Contaminant Level	State Reporting Limit	Units
0020	NITRATE-N	EQ	0.8400	10.0000	0.5000	mg/L

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View Sample Detail - WSID 959143 - WHATCOM COUNTY WATER DIST 13

Collect Date 4/2/2020
 Lab Number 046
 Lab Name Edge Analytical - Burlington
 Sample Number 21656
 Source 02
 Analyte Group IOC-INORGANIC CONTAMINANTS
 Test Panel NIT-NITRATE SUITE
 Sample Location s02 s/t
 Sample Type Unknown

Result Range, A/P, Units: Mouse over for full description

Analyte DOH Num	Analyte Name	Result Range	Result Quantity	Maximum Contaminant Level	State Reporting Limit	Units
0020	NITRATE-N	EQ	1.1600	10.0000	0.5000	mg/L

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Collect Date 4/2/2020
 Lab Number 164
 Lab Name Edge Analytical Inc - Bellingham
 Sample Number 21866
 Source Dist
 Analyte Group MICRO-MICROBIOLOGICAL
 Test Panel COLI_AP-ABSENCE / PRESENCE
 Sample Location Sample Tap at 1121
 Sample Type Post-Treatment / Finished

Result Range, A/P, Units: Mouse over for full description

Analyte DOH Num	Analyte Name	Result Range	A/P	Units	Maximum Contaminant Level	State Reporting Limit
0001	TOTAL COLIFORM	EQ	A	/100ml		
0003	E. COLI	EQ	A	/100ml		

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Collect Date 3/19/2020
 Lab Number 164
 Lab Name Edge Analytical Inc - Bellingham
 Sample Number 19340
 Source Dist
 Analyte Group MICRO-MICROBIOLOGICAL
 Test Panel COLI_AP-ABSENCE / PRESENCE
 Sample Location 2341 Clear Valley Dr.
 Sample Type Post-Treatment / Finished

Result Range, A/P, Units: Mouse over for full description

Analyte DOH Num	Analyte Name	Result Range	A/P	Units	Maximum Contaminant Level	State Reporting Limit
0001	TOTAL COLIFORM	EQ	A	/100ml		
0003	E. COLI	EQ	A	/100ml		

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Collect Date 2/13/2020
 Lab Number 164
 Lab Name Edge Analytical Inc - Bellingham
 Sample Number 11193
 Source Dist
 Analyte Group MICRO-MICROBIOLOGICAL
 Test Panel COLI_AP-ABSENCE / PRESENCE
 Sample Location 1121 Deep Valley Dr.
 Sample Type Post-Treatment / Finished

Result Range, A/P, Units: Mouse over for full description

Analyte DOH Num	Analyte Name	Result Range	A/P	Units	Maximum Contaminant Level	State Reporting Limit
0001	TOTAL COLIFORM	EQ	P	/100ml		
0003	E. COLI	EQ	A	/100ml		

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Collect Date 2/13/2020
 Lab Number 164
 Lab Name Edge Analytical Inc - Bellingham
 Sample Number 11194
 Source Dist
 Analyte Group MICRO-MICROBIOLOGICAL
 Test Panel COLI_AP-ABSENCE / PRESENCE
 Sample Location 941 Deep Valley Dr.
 Sample Type Post-Treatment / Finished

Result Range, A/P, Units: Mouse over for full description

Analyte DOH Num	Analyte Name	Result Range	A/P	Units	Maximum Contaminant Level	State Reporting Limit
0001	TOTAL COLIFORM	EQ	A	/100ml		
0003	E. COLI	EQ	A	/100ml		

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Collect Date 2/13/2020
 Lab Number 164
 Lab Name Edge Analytical Inc - Bellingham
 Sample Number 11195
 Source Dist
 Analyte Group MICRO-MICROBIOLOGICAL
 Test Panel COLI_AP-ABSENCE / PRESENCE
 Sample Location 841 King Valley Dr.
 Sample Type Post-Treatment / Finished

Result Range, A/P, Units: Mouse over for full description

Analyte DOH Num	Analyte Name	Result Range	A/P	Units	Maximum Contaminant Level	State Reporting Limit
0001	TOTAL COLIFORM	EQ	P	/100ml		
0003	E. COLI	EQ	A	/100ml		

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Collect Date 2/13/2020
 Lab Number 164
 Lab Name Edge Analytical Inc - Bellingham
 Sample Number 11196
 Source Dist
 Analyte Group MICRO-MICROBIOLOGICAL
 Test Panel COLI_AP-ABSENCE / PRESENCE
 Sample Location Well #1 Sample Tap
 Sample Type Post-Treatment / Finished

Result Range, A/P, Units: Mouse over for full description

Analyte DOH Num	Analyte Name	Result Range	A/P	Units	Maximum Contaminant Level	State Reporting Limit
0001	TOTAL COLIFORM	EQ	A	/100ml		
0003	E. COLI	EQ	A	/100ml		

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Collect Date 2/13/2020
 Lab Number 164
 Lab Name Edge Analytical Inc - Bellingham
 Sample Number 11197
 Source Dist
 Analyte Group MICRO-MICROBIOLOGICAL
 Test Panel COLI_AP-ABSENCE / PRESENCE
 Sample Location Well #2 Sample Tap
 Sample Type Post-Treatment / Finished

Result Range, A/P, Units: Mouse over for full description

Analyte DOH Num	Analyte Name	Result Range	A/P	Units	Maximum Contaminant Level	State Reporting Limit
0001	TOTAL COLIFORM	EQ	A	/100ml		
0003	E. COLI	EQ	A	/100ml		

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View Sample Detail - WSID 959143 - WHATCOM COUNTY WATER DIST 13

Collect Date 2/11/2020
 Lab Number 164
 Lab Name Edge Analytical Inc - Bellingham
 Sample Number 10606
 Source Dist
 Analyte Group MICRO-MICROBIOLOGICAL
 Test Panel COLI_AP-ABSENCE / PRESENCE
 Sample Location 941 Deep Valley
 Sample Type Post-Treatment / Finished

Result Range, A/P, Units: Mouse over for full description

Analyte DOH Num	Analyte Name	Result Range	A/P	Units	Maximum Contaminant Level	State Reporting Limit
0001	TOTAL COLIFORM	EQ	P	/100ml		
0003	E. COLI	EQ	A	/100ml		

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Collect Date 1/21/2020
 Lab Number 164
 Lab Name Edge Analytical Inc - Bellingham
 Sample Number 04389
 Source Dist
 Analyte Group MICRO-MICROBIOLOGICAL
 Test Panel COLI_AP-ABSENCE / PRESENCE
 Sample Location 612 Sprague Valley Dr
 Sample Type Post-Treatment / Finished

Result Range, A/P, Units: Mouse over for full description

Analyte DOH Num	Analyte Name	Result Range	A/P	Units	Maximum Contaminant Level	State Reporting Limit
0001	TOTAL COLIFORM	EQ	A	/100ml		
0003	E. COLI	EQ	A	/100ml		

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Collect Date 12/9/2019
 Lab Number 164
 Lab Name Edge Analytical Inc - Bellingham
 Sample Number 91076
 Source Dist
 Analyte Group MICRO-MICROBIOLOGICAL
 Test Panel COLI_AP-ABSENCE / PRESENCE
 Sample Location 531 Flair Valley Dr.
 Sample Type Post-Treatment / Finished

Result Range, A/P, Units: Mouse over for full description

Analyte DOH Num	Analyte Name	Result Range	A/P	Units	Maximum Contaminant Level	State Reporting Limit
0001	TOTAL COLIFORM	EQ	A	/100ml		
0003	E. COLI	EQ	A	/100ml		

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Collect Date 11/7/2019
 Lab Number 164
 Lab Name Edge Analytical Inc - Bellingham
 Sample Number 83047
 Source Dist
 Analyte Group MICRO-MICROBIOLOGICAL
 Test Panel COLI_AP-ABSENCE / PRESENCE
 Sample Location 2901 Green Valley Dr
 Sample Type Post-Treatment / Finished

Result Range, A/P, Units: Mouse over for full description

Analyte DOH Num	Analyte Name	Result Range	A/P	Units	Maximum Contaminant Level	State Reporting Limit
0001	TOTAL COLIFORM	EQ	P	/100ml		
0003	E. COLI	EQ	A	/100ml		

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Collect Date 11/7/2019
 Lab Number 164
 Lab Name Edge Analytical Inc - Bellingham
 Sample Number 83048
 Source Dist
 Analyte Group MICRO-MICROBIOLOGICAL
 Test Panel COLI_AP-ABSENCE / PRESENCE
 Sample Location 2921 Green Valley Dr
 Sample Type Post-Treatment / Finished

Result Range, A/P, Units: Mouse over for full description

Analyte DOH Num	Analyte Name	Result Range	A/P	Units	Maximum Contaminant Level	State Reporting Limit
0001	TOTAL COLIFORM	EQ	P	/100ml		
0003	E. COLI	EQ	A	/100ml		

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Collect Date 11/7/2019
 Lab Number 164
 Lab Name Edge Analytical Inc - Bellingham
 Sample Number 83049
 Source Dist
 Analyte Group MICRO-MICROBIOLOGICAL
 Test Panel COLI_AP-ABSENCE / PRESENCE
 Sample Location 2851 Green Valley Dr
 Sample Type Post-Treatment / Finished

Result Range, A/P, Units: Mouse over for full description

Analyte DOH Num	Analyte Name	Result Range	A/P	Units	Maximum Contaminant Level	State Reporting Limit
0001	TOTAL COLIFORM	EQ	A	/100ml		
0003	E. COLI	EQ	A	/100ml		

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Collect Date 11/7/2019
 Lab Number 164
 Lab Name Edge Analytical Inc - Bellingham
 Sample Number 83045
 Source 01
 Analyte Group MICRO-MICROBIOLOGICAL
 Test Panel COLI_AP-ABSENCE / PRESENCE
 Sample Location Well #1 Sample Tap
 Sample Type Pre-Treatment / Raw

Result Range, A/P, Units: Mouse over for full description

Analyte DOH Num	Analyte Name	Result Range	A/P	Units	Maximum Contaminant Level	State Reporting Limit
0001	TOTAL COLIFORM	EQ	A	/100ml		
0003	E. COLI	EQ	A	/100ml		

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Collect Date 11/7/2019
 Lab Number 164
 Lab Name Edge Analytical Inc - Bellingham
 Sample Number 83046
 Source 02
 Analyte Group MICRO-MICROBIOLOGICAL
 Test Panel COLI_AP-ABSENCE / PRESENCE
 Sample Location Well #2 Sample Tap
 Sample Type Pre-Treatment / Raw

Result Range, A/P, Units: Mouse over for full description

Analyte DOH Num	Analyte Name	Result Range	A/P	Units	Maximum Contaminant Level	State Reporting Limit
0001	TOTAL COLIFORM	EQ	A	/100ml		
0003	E. COLI	EQ	A	/100ml		

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Collect Date 11/6/2019
 Lab Number 046
 Lab Name Edge Analytical - Burlington
 Sample Number 83071
 Source Dist
 Analyte Group IOC-INORGANIC CONTAMINANTS
 Test Panel LCR-LEAD COPPER
 Sample Location 14xxxxxxxxr
 Sample Type Post-Treatment / Finished

Result Range, A/P, Units: Mouse over for full description

Analyte DOH Num	Analyte Name	Result Range	Result Quantity	Maximum Contaminant Level	State Reporting Limit	Units
0023	COPPER	EQ	0.0129		0.0200	mg/L
0009	LEAD	LT	0.0010		0.0010	mg/L

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Collect Date 11/6/2019
 Lab Number 046
 Lab Name Edge Analytical - Burlington
 Sample Number 83072
 Source Dist
 Analyte Group IOC-INORGANIC CONTAMINANTS
 Test Panel LCR-LEAD COPPER
 Sample Location 24xxxxxxxxxn
 Sample Type Post-Treatment / Finished

Result Range, A/P, Units: Mouse over for full description

Analyte DOH Num	Analyte Name	Result Range	Result Quantity	Maximum Contaminant Level	State Reporting Limit	Units
0009	LEAD	LT	0.0010		0.0010	mg/L
0023	COPPER	LT	0.0200		0.0200	mg/L

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Collect Date 11/6/2019
 Lab Number 046
 Lab Name Edge Analytical - Burlington
 Sample Number 83074
 Source Dist
 Analyte Group IOC-INORGANIC CONTAMINANTS
 Test Panel LCR-LEAD COPPER
 Sample Location 29xxxxxxxxdr
 Sample Type Post-Treatment / Finished

Result Range, A/P, Units: Mouse over for full description

Analyte DOH Num	Analyte Name	Result Range	Result Quantity	Maximum Contaminant Level	State Reporting Limit	Units
0023	COPPER	EQ	0.0111		0.0200	mg/L
0009	LEAD	LT	0.0010		0.0010	mg/L

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Collect Date 11/6/2019
 Lab Number 046
 Lab Name Edge Analytical - Burlington
 Sample Number 83075
 Source Dist
 Analyte Group IOC-INORGANIC CONTAMINANTS
 Test Panel LCR-LEAD COPPER
 Sample Location 26xxxxxxxxxn
 Sample Type Post-Treatment / Finished

Result Range, A/P, Units: Mouse over for full description

Analyte DOH Num	Analyte Name	Result Range	Result Quantity	Maximum Contaminant Level	State Reporting Limit	Units
0009	LEAD	EQ	0.0012		0.0010	mg/L
0023	COPPER	EQ	0.0364		0.0200	mg/L

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Collect Date 11/6/2019
 Lab Number 046
 Lab Name Edge Analytical - Burlington
 Sample Number 83076
 Source Dist
 Analyte Group IOC-INORGANIC CONTAMINANTS
 Test Panel LCR-LEAD COPPER
 Sample Location 30xxxxxxxxdr
 Sample Type Post-Treatment / Finished

Result Range, A/P, Units: Mouse over for full description

Analyte DOH Num	Analyte Name	Result Range	Result Quantity	Maximum Contaminant Level	State Reporting Limit	Units
0023	COPPER	EQ	0.0236		0.0200	mg/L
0009	LEAD	LT	0.0010		0.0010	mg/L

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Collect Date 11/6/2019
 Lab Number 046
 Lab Name Edge Analytical - Burlington
 Sample Number 83077
 Source Dist
 Analyte Group IOC-INORGANIC CONTAMINANTS
 Test Panel LCR-LEAD COPPER
 Sample Location 24xxxxxxxxxn
 Sample Type Post-Treatment / Finished

Result Range, A/P, Units: Mouse over for full description

Analyte DOH Num	Analyte Name	Result Range	Result Quantity	Maximum Contaminant Level	State Reporting Limit	Units
0023	COPPER	EQ	0.0050		0.0200	mg/L
0009	LEAD	LT	0.0010		0.0010	mg/L

[Milligrams per Liter](#)

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Collect Date 11/6/2019
 Lab Number 046
 Lab Name Edge Analytical - Burlington
 Sample Number 83078
 Source Dist
 Analyte Group IOC-INORGANIC CONTAMINANTS
 Test Panel LCR-LEAD COPPER
 Sample Location 57xxxxxxxxdr
 Sample Type Post-Treatment / Finished

Result Range, A/P, Units: Mouse over for full description

Analyte DOH Num	Analyte Name	Result Range	Result Quantity	Maximum Contaminant Level	State Reporting Limit	Units
0009	LEAD	LT	0.0010		0.0010	mg/L
0023	COPPER	LT	0.0200		0.0200	mg/L

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Collect Date 11/6/2019
 Lab Number 046
 Lab Name Edge Analytical - Burlington
 Sample Number 83080
 Source Dist
 Analyte Group IOC-INORGANIC CONTAMINANTS
 Test Panel LCR-LEAD COPPER
 Sample Location 22xxxxxxxxxn
 Sample Type Post-Treatment / Finished

Result Range, A/P, Units: Mouse over for full description

Analyte DOH Num	Analyte Name	Result Range	Result Quantity	Maximum Contaminant Level	State Reporting Limit	Units
0023	COPPER	EQ	0.0172		0.0200	mg/L
0009	LEAD	LT	0.0010		0.0010	mg/L

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Collect Date 11/5/2019
 Lab Number 046
 Lab Name Edge Analytical - Burlington
 Sample Number 83079
 Source Dist
 Analyte Group IOC-INORGANIC CONTAMINANTS
 Test Panel LCR-LEAD COPPER
 Sample Location 20xxxxxxxxdr
 Sample Type Post-Treatment / Finished

Result Range, A/P, Units: Mouse over for full description

Analyte DOH Num	Analyte Name	Result Range	Result Quantity	Maximum Contaminant Level	State Reporting Limit	Units
0009	LEAD	EQ	0.0059		0.0010	mg/L
0023	COPPER	EQ	0.1560		0.0200	mg/L

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View Sample Detail - WSID 959143 - WHATCOM COUNTY WATER DIST 13

Collect Date 11/5/2019
 Lab Number 164
 Lab Name Edge Analytical Inc - Bellingham
 Sample Number 82380
 Source Dist
 Analyte Group MICRO-MICROBIOLOGICAL
 Test Panel COLI_AP-ABSENCE / PRESENCE
 Sample Location 2901 Green Valley Dr
 Sample Type Post-Treatment / Finished

Result Range, A/P, Units: Mouse over for full description

Analyte DOH Num	Analyte Name	Result Range	A/P	Units	Maximum Contaminant Level	State Reporting Limit
0001	TOTAL COLIFORM	EQ	P	/100ml		
0003	E. COLI	EQ	A	/100ml		

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Collect Date 11/4/2019
 Lab Number 046
 Lab Name Edge Analytical - Burlington
 Sample Number 83073
 Source Dist
 Analyte Group IOC-INORGANIC CONTAMINANTS
 Test Panel LCR-LEAD COPPER
 Sample Location 82xxxxxxxxxd
 Sample Type Post-Treatment / Finished

Result Range, A/P, Units: Mouse over for full description

Analyte DOH Num	Analyte Name	Result Range	Result Quantity	Maximum Contaminant Level	State Reporting Limit	Units
0009	LEAD	EQ	0.0012		0.0010	mg/L
0023	COPPER	EQ	0.3720		0.0200	mg/L

[Milligrams per Liter](#)

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Collect Date 10/1/2019
 Lab Number 046
 Lab Name Edge Analytical - Burlington
 Sample Number 73012
 Source 02
 Analyte Group IOC-INORGANIC CONTAMINANTS
 Test Panel NIT-NITRATE SUITE
 Sample Location s02 s/t
 Sample Type Unknown

Result Range, A/P, Units: Mouse over for full description

Analyte DOH Num	Analyte Name	Result Range	Result Quantity	Maximum Contaminant Level	State Reporting Limit	Units
0020	NITRATE-N	EQ	0.6500	10.0000	0.5000	mg/L

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Collect Date 10/1/2019
 Lab Number 046
 Lab Name Edge Analytical - Burlington
 Sample Number 73011
 Source 01
 Analyte Group IOC-INORGANIC CONTAMINANTS
 Test Panel NIT-NITRATE SUITE
 Sample Location s01
 Sample Type Unknown

Result Range, A/P, Units: Mouse over for full description

Analyte DOH Num	Analyte Name	Result Range	Result Quantity	Maximum Contaminant Level	State Reporting Limit	Units
0020	NITRATE-N	EQ	0.6600	10.0000	0.5000	mg/L

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Collect Date 10/1/2019
 Lab Number 164
 Lab Name Edge Analytical Inc - Bellingham
 Sample Number 73087
 Source Dist
 Analyte Group MICRO-MICROBIOLOGICAL
 Test Panel COLI_AP-ABSENCE / PRESENCE
 Sample Location 281 Flair
 Sample Type Post-Treatment / Finished

Result Range, A/P, Units: Mouse over for full description

Analyte DOH Num	Analyte Name	Result Range	A/P	Units	Maximum Contaminant Level	State Reporting Limit
0001	TOTAL COLIFORM	EQ	A	/100ml		
0003	E. COLI	EQ	A	/100ml		

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Collect Date 9/27/2019
 Lab Number 164
 Lab Name Edge Analytical Inc - Bellingham
 Sample Number 72515
 Source Dist
 Analyte Group MICRO-MICROBIOLOGICAL
 Test Panel COLI_AP-ABSENCE / PRESENCE
 Sample Location 2361 Clear Valley
 Sample Type Post-Treatment / Finished

Result Range, A/P, Units: Mouse over for full description

Analyte DOH Num	Analyte Name	Result Range	A/P	Units	Maximum Contaminant Level	State Reporting Limit
0001	TOTAL COLIFORM	EQ	A	/100ml		
0003	E. COLI	EQ	A	/100ml		

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Collect Date 8/20/2019
 Lab Number 164
 Lab Name Edge Analytical Inc - Bellingham
 Sample Number 61136
 Source Dist
 Analyte Group MICRO-MICROBIOLOGICAL
 Test Panel COLI_AP-ABSENCE / PRESENCE
 Sample Location 482 Sprague Valley
 Sample Type Post-Treatment / Finished

Result Range, A/P, Units: Mouse over for full description

Analyte DOH Num	Analyte Name	Result Range	A/P	Units	Maximum Contaminant Level	State Reporting Limit
0001	TOTAL COLIFORM	EQ	A	/100ml		
0003	E. COLI	EQ	A	/100ml		

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Collect Date 7/1/2019
 Lab Number 164
 Lab Name Edge Analytical Inc - Bellingham
 Sample Number 47015
 Source Dist
 Analyte Group MICRO-MICROBIOLOGICAL
 Test Panel COLI_AP-ABSENCE / PRESENCE
 Sample Location 281 Flair Way
 Sample Type Post-Treatment / Finished

Result Range, A/P, Units: Mouse over for full description

Analyte DOH Num	Analyte Name	Result Range	A/P	Units	Maximum Contaminant Level	State Reporting Limit
0001	TOTAL COLIFORM	EQ	A	/100ml		
0003	E. COLI	EQ	A	/100ml		

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**View Sample Detail - WSID 959143 - WHATCOM
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Collect Date 9/27/2018
 Lab Number 046
 Lab Name Edge Analytical - Burlington
 Sample Number 75738
 Source 02
 Analyte Group SOC-SYNTHETIC ORGANIC
CONTAMINANTS
 Test Panel HERB1-CHLOROPHENOXY HERBICIDES
 Sample Location s02
 Sample Type Unknown

Result Range, A/P, Units: Mouse over for full description

Analyte DOH Num	Analyte Name	Result Range	Result Quantity	Maximum Contaminant Level	State Reporting Limit	Units
0037	2,4 - D	LT	0.1000	70.0000	0.1000	ug/L
0038	2,4,5 TP (SILVEX)	LT	0.2000	50.0000	0.2000	ug/L
0134	PENTACHLOROPHENOL	LT	0.0400	1.0000	0.0400	ug/L
0135	2,4 DB	LT	1.0000		1.0000	ug/L
0137	DALAPON	LT	1.0000	200.0000	1.0000	ug/L
0138	DICAMBA	LT	0.2000		0.2000	ug/L
0139	DINOSEB	LT	0.2000	7.0000	0.2000	ug/L
0140	PICLORAM	LT	0.1000	500.0000	0.1000	ug/L
0223	ACIFLUORFEN	LT	2.0000		2.0000	ug/L
0225	DCPA ACID METABOLITES	LT	0.1000		0.1000	ug/L
0226	3,5 DICHLORBENZOIC ACID	LT	0.5000		0.5000	ug/L

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**View Sample Detail - WSID 959143 - WHATCOM
COUNTY WATER DIST 13**

Collect Date 9/27/2018
 Lab Number 046
 Lab Name Edge Analytical - Burlington
 Sample Number 75737
 Source 01
 Analyte Group SOC-SYNTHETIC ORGANIC
 CONTAMINANTS
 Test Panel HERB1-CHLOROPHENOXY HERBICIDES
 Sample Location s01
 Sample Type Unknown

Result Range, A/P, Units: Mouse over for full description

Analyte DOH Num	Analyte Name	Result Range	Result Quantity	Maximum Contaminant Level	State Reporting Limit	Units
0037	2,4 - D	LT	0.1000	70.0000	0.1000	ug/L
0038	2,4,5 TP (SILVEX)	LT	0.2000	50.0000	0.2000	ug/L
0134	PENTACHLOROPHENOL	LT	0.0400	1.0000	0.0400	Micrograms per Liter
0135	2,4 DB	LT	1.0000		1.0000	ug/L
0137	DALAPON	LT	1.0000	200.0000	1.0000	ug/L
0138	DICAMBA	LT	0.2000		0.2000	ug/L
0139	DINOSEB	LT	0.2000	7.0000	0.2000	ug/L
0140	PICLORAM	LT	0.1000	500.0000	0.1000	ug/L
0223	ACIFLUORFEN	LT	2.0000		2.0000	ug/L
0225	DCPA ACID METABOLITES	LT	0.1000		0.1000	ug/L
0226	3,5 DICHLORBENZOIC ACID	LT	0.5000		0.5000	ug/L

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Collect Date 9/27/2018
 Lab Number 046
 Lab Name Edge Analytical - Burlington
 Sample Number 75738
 Source 02
 Analyte Group SOC-SYNTHETIC ORGANIC
 CONTAMINANTS
 Test Panel PEST1-GENERAL PESTICIDE SUITE
 Sample Location s02
 Sample Type Unknown

Result Range, A/P, Units: Mouse over for full description

Analyte DOH Num	Analyte Name	Result Range	Result Quantity	Maximum Contaminant Level	State Reporting Limit	Units
0033	ENDRIN	LT	0.0100	2.0000	0.0100	ug/L
0034	LINDANE (BHC - GAMMA)	LT	0.0200	0.2000	0.0200	ug/L
0035	METHOXYCHLOR	LT	0.1000	40.0000	0.1000	ug/L
0036	TOXAPHENE	LT	1.0000	3.0000	1.0000	ug/L
0117	Alachlor	LT	0.2000	2.0000	0.2000	ug/L
0118	ALDRIN	LT	0.1000		0.1000	ug/L
0119	ATRAZINE	LT	0.1000	3.0000	0.1000	ug/L
0120	BENZO (A) PYRENE	LT	0.0200	0.2000	0.0200	ug/L
0121	BUTACHLOR	LT	0.1000		0.1000	ug/L
0122	CHLORDANE (TOTAL)	LT	0.2000	2.0000	0.2000	ug/L
0123	DIELDRIN	LT	0.1000		0.1000	ug/L
0124	DI (ETHYLHEXYL) ADIPATE	LT	0.6000	400.0000	0.6000	ug/L
0125	DI (ETHYLHEXYL) PHTHALATE	LT	0.6000	6.0000	0.6000	ug/L
0126	HEPTACHLOR	LT	0.0400	0.4000	0.0400	ug/L
0127	HEPTACHLOR EPOXIDE	LT	0.0200	0.2000	0.0200	ug/L
0128	HEXACHLOROBENZENE	LT	0.1000	1.0000	0.1000	ug/L
0129	HEXACHLOROCYCLO PENTADIENE	LT	0.1000	50.0000	0.1000	ug/L
0130	METOLACHLOR	LT	0.1000		0.1000	ug/L
0131	METRIBUZIN	LT	0.1000		0.1000	ug/L
0132	PROPACHLOR	LT	0.1000		0.1000	ug/L
0133	SIMAZINE	LT	0.0700	4.0000	0.0700	ug/L
0173	AROCHLOR 1221	LT	20.0000		20.0000	ug/L
0174	AROCHLOR 1232	LT	0.5000		0.5000	ug/L
0175	AROCHLOR 1242	LT	0.3000		0.3000	ug/L
0176	AROCHLOR 1248	LT	0.1000		0.1000	ug/L

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Collect Date 9/27/2018
 Lab Number 046
 Lab Name Edge Analytical - Burlington
 Sample Number 75737
 Source 01
 Analyte Group SOC-SYNTHETIC ORGANIC
 CONTAMINANTS
 Test Panel PEST1-GENERAL PESTICIDE SUITE
 Sample Location s01
 Sample Type Unknown

Result Range, A/P, Units: Mouse over for full description

Analyte DOH Num	Analyte Name	Result Range	Result Quantity	Maximum Contaminant Level	State Reporting Limit	Units
0033	ENDRIN	LT	0.0100	2.0000	0.0100	ug/L
0034	LINDANE (BHC - GAMMA)	LT	0.0200	0.2000	0.0200	ug/L
0035	METHOXYCHLOR	LT	0.1000	40.0000	0.1000	ug/L
0036	TOXAPHENE	LT	1.0000	3.0000	1.0000	ug/L
0117	Alachlor	LT	0.2000	2.0000	0.2000	ug/L
0118	ALDRIN	LT	0.1000		0.1000	ug/L
0119	ATRAZINE	LT	0.1000	3.0000	0.1000	ug/L
0120	BENZO (A) PYRENE	LT	0.0200	0.2000	0.0200	ug/L
0121	BUTACHLOR	LT	0.1000		0.1000	ug/L
0122	CHLORDANE (TOTAL)	LT	0.2000	2.0000	0.2000	ug/L
0123	DIELDRIN	LT	0.1000		0.1000	ug/L
0124	DI (ETHYLHEXYL) ADIPATE	LT	0.6000	400.0000	0.6000	ug/L
0125	DI (ETHYLHEXYL) PHTHALATE	LT	0.6000	6.0000	0.6000	ug/L
0126	HEPTACHLOR	LT	0.0400	0.4000	0.0400	ug/L
0127	HEPTACHLOR EPOXIDE	LT	0.0200	0.2000	0.0200	ug/L
0128	HEXACHLOROBENZENE	LT	0.1000	1.0000	0.1000	ug/L
0129	HEXACHLOROCYCLO PENTADIENE	LT	0.1000	50.0000	0.1000	ug/L
0130	METOLACHLOR	LT	0.1000		0.1000	ug/L
0131	METRIBUZIN	LT	0.1000		0.1000	ug/L
0132	PROPACHLOR	LT	0.1000		0.1000	ug/L
0133	SIMAZINE	LT	0.0700	4.0000	0.0700	ug/L
0173	AROCHLOR 1221	LT	20.0000		20.0000	ug/L
0174	AROCHLOR 1232	LT	0.5000		0.5000	ug/L
0175	AROCHLOR 1242	LT	0.3000		0.3000	ug/L
0176	AROCHLOR 1248	LT	0.1000		0.1000	ug/L

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Collect Date 8/17/2018
 Lab Number 046
 Lab Name Edge Analytical - Burlington
 Sample Number 62196
 Source 02
 Analyte Group IOC-INORGANIC CONTAMINANTS
 Test Panel NIT-NITRATE SUITE
 Sample Location s02
 Sample Type Unknown

Result Range, A/P, Units: Mouse over for full description

Analyte DOH Num	Analyte Name	Result Range	Result Quantity	Maximum Contaminant Level	State Reporting Limit	Units
0020	NITRATE-N	EQ	0.7500	10.0000	0.5000	mg/L

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Collect Date 8/17/2018
 Lab Number 046
 Lab Name Edge Analytical - Burlington
 Sample Number 62194
 Source 01
 Analyte Group IOC-INORGANIC CONTAMINANTS
 Test Panel NIT-NITRATE SUITE
 Sample Location s01
 Sample Type Unknown

Result Range, A/P, Units: Mouse over for full description

Analyte DOH Num	Analyte Name	Result Range	Result Quantity	Maximum Contaminant Level	State Reporting Limit	Units
0020	NITRATE-N	EQ	0.7300	10.0000	0.5000	mg/L

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Collect Date 5/2/2017
 Lab Number 046
 Lab Name Edge Analytical - Burlington
 Sample Number 22939
 Source 01
 Analyte Group IOC-INORGANIC CONTAMINANTS
 Test Panel IOC-COMPLETE INORGANIC ANALYSIS
 Sample Location 2671 blue jay
 Sample Type Unknown

Result Range, A/P, Units: Mouse over for full description

Analyte DOH Num	Analyte Name	Result Range	Result Quantity	Maximum Contaminant Level	State Reporting Limit	Units
0005	BARIUM	EQ	0.0060	2.0000	0.1000	mg/L
0012	SELENIUM	EQ	0.0030	0.0500	0.0020	mg/L
0014	SODIUM	EQ	2.9600		5.0000	mg/L
0015	HARDNESS	EQ	103.0000		10.0000	mg/L
0016	CONDUCTIVITY	EQ	241.0000	700.0000	70.0000	Umhos/cm
0017	TURBIDITY	EQ	0.3000		0.1000	NTU
0020	NITRATE-N	EQ	0.8800	10.0000	0.5000	mg/L
0021	CHLORIDE	EQ	2.2000	250.0000	20.0000	mg/L
0022	SULFATE	EQ	18.1000	250.0000	50.0000	mg/L
0024	ZINC	EQ	0.0050	5.0000	0.2000	mg/L
0161	TOTAL NITRATE/NITRITE	EQ	0.8800		0.5000	mg/L
0004	ARSENIC	LT	0.0010	0.0104	0.0010	mg/L
0006	CADMIUM	LT	0.0020	0.0050	0.0010	mg/L
0007	CHROMIUM	LT	0.0200	0.1000	0.0070	mg/L
0008	IRON	LT	0.1000	0.3000	0.1000	mg/L
0009	LEAD	LT	0.0010		0.0010	mg/L
0010	MANGANESE	LT	0.0100	0.0500	0.0100	mg/L
0011	MERCURY	LT	0.0004	0.0020	0.0002	mg/L
0013	SILVER	LT	0.1000	0.1000	0.1000	mg/L
0018	COLOR	LT	15.0000	15.0000	15.0000	CU
0019	FLUORIDE	LT	0.2000	4.0000	0.2000	mg/L
0023	COPPER	LT	0.0200		0.0200	mg/L
0110	BERYLLIUM	LT	0.0008	0.0040	0.0003	mg/L
0111	NICKEL	LT	0.1000	0.1000	0.0050	mg/L
0112	ANTIMONY	LT	0.0060	0.0060	0.0030	mg/L

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**View Sample Detail - WSID 959143 - WHATCOM
COUNTY WATER DIST 13**

Collect Date 5/2/2017
 Lab Number 046
 Lab Name Edge Analytical - Burlington
 Sample Number 22939
 Source 02
 Analyte Group IOC-INORGANIC CONTAMINANTS
 Test Panel IOC-COMPLETE INORGANIC ANALYSIS
 Sample Location 2671 blue jay
 Sample Type Unknown

Result Range, A/P, Units: Mouse over for full description

Analyte DOH Num	Analyte Name	Result Range	Result Quantity	Maximum Contaminant Level	State Reporting Limit	Units
0005	BARIUM	EQ	0.0060	2.0000	0.1000	mg/L
0012	SELENIUM	EQ	0.0030	0.0500	0.0020	mg/L
0014	SODIUM	EQ	2.9600		5.0000	Milligrams per Liter
0015	HARDNESS	EQ	103.0000		10.0000	mg/L
0016	CONDUCTIVITY	EQ	241.0000	700.0000	70.0000	Umhos/cm
0017	TURBIDITY	EQ	0.3000		0.1000	NTU
0020	NITRATE-N	EQ	0.8800	10.0000	0.5000	mg/L
0021	CHLORIDE	EQ	2.2000	250.0000	20.0000	mg/L
0022	SULFATE	EQ	18.1000	250.0000	50.0000	mg/L
0024	ZINC	EQ	0.0050	5.0000	0.2000	mg/L
0161	TOTAL NITRATE/NITRITE	EQ	0.8800		0.5000	mg/L
0004	ARSENIC	LT	0.0010	0.0104	0.0010	mg/L
0006	CADMIUM	LT	0.0020	0.0050	0.0010	mg/L
0007	CHROMIUM	LT	0.0200	0.1000	0.0070	mg/L
0008	IRON	LT	0.1000	0.3000	0.1000	mg/L
0009	LEAD	LT	0.0010		0.0010	mg/L
0010	MANGANESE	LT	0.0100	0.0500	0.0100	mg/L
0011	MERCURY	LT	0.0004	0.0020	0.0002	mg/L
0013	SILVER	LT	0.1000	0.1000	0.1000	mg/L
0018	COLOR	LT	15.0000	15.0000	15.0000	CU
0019	FLUORIDE	LT	0.2000	4.0000	0.2000	mg/L
0023	COPPER	LT	0.0200		0.0200	mg/L
0110	BERYLLIUM	LT	0.0008	0.0040	0.0003	mg/L
0111	NICKEL	LT	0.1000	0.1000	0.0050	mg/L
0112	ANTIMONY	LT	0.0060	0.0060	0.0030	mg/L

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Collect Date 5/2/2017
 Lab Number 046
 Lab Name Edge Analytical - Burlington
 Sample Number 22962
 Source 01
 Analyte Group IOC-INORGANIC CONTAMINANTS
 Test Panel IOC-COMPLETE INORGANIC ANALYSIS
 Sample Location 2661 blue jay
 Sample Type Unknown

Result Range, A/P, Units: Mouse over for full description

Analyte DOH Num	Analyte Name	Result Range	Result Quantity	Maximum Contaminant Level	State Reporting Limit	Units
0005	BARIUM	EQ	0.0060	2.0000	0.1000	mg/L
0012	SELENIUM	EQ	0.0040	0.0500	0.0020	mg/L
0014	SODIUM	EQ	3.0100		5.0000	Milligrams per Liter
0015	HARDNESS	EQ	108.3000		10.0000	mg/L
0016	CONDUCTIVITY	EQ	249.0000	700.0000	70.0000	Umhos/cm
0017	TURBIDITY	EQ	0.1700		0.1000	NTU
0020	NITRATE-N	EQ	0.9200	10.0000	0.5000	mg/L
0021	CHLORIDE	EQ	2.3000	250.0000	20.0000	mg/L
0022	SULFATE	EQ	18.9000	250.0000	50.0000	mg/L
0023	COPPER	EQ	0.0100		0.0200	mg/L
0024	ZINC	EQ	0.0150	5.0000	0.2000	mg/L
0161	TOTAL NITRATE/NITRITE	EQ	0.9200		0.5000	mg/L
0004	ARSENIC	LT	0.0010	0.0104	0.0010	mg/L
0006	CADMIUM	LT	0.0020	0.0050	0.0010	mg/L
0007	CHROMIUM	LT	0.0200	0.1000	0.0070	mg/L
0008	IRON	LT	0.1000	0.3000	0.1000	mg/L
0009	LEAD	LT	0.0010		0.0010	mg/L
0010	MANGANESE	LT	0.0100	0.0500	0.0100	mg/L
0011	MERCURY	LT	0.0004	0.0020	0.0002	mg/L
0013	SILVER	LT	0.1000	0.1000	0.1000	mg/L
0018	COLOR	LT	15.0000	15.0000	15.0000	CU
0019	FLUORIDE	LT	0.2000	4.0000	0.2000	mg/L
0110	BERYLLIUM	LT	0.0008	0.0040	0.0003	mg/L
0111	NICKEL	LT	0.1000	0.1000	0.0050	mg/L
0112	ANTIMONY	LT	0.0060	0.0060	0.0030	mg/L

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COUNTY WATER DIST 13**

Collect Date 5/2/2017
 Lab Number 046
 Lab Name Edge Analytical - Burlington
 Sample Number 22962
 Source 02
 Analyte Group IOC-INORGANIC CONTAMINANTS
 Test Panel IOC-COMPLETE INORGANIC ANALYSIS
 Sample Location 2661 blue jay
 Sample Type Unknown

Result Range, A/P, Units: Mouse over for full description

Analyte DOH Num	Analyte Name	Result Range	Result Quantity	Maximum Contaminant Level	State Reporting Limit	Units
0005	BARIUM	EQ	0.0060	2.0000	0.1000	mg/L
0012	SELENIUM	EQ	0.0040	0.0500	0.0020	mg/L
0014	SODIUM	EQ	3.0100		5.0000	Milligrams per Liter
0015	HARDNESS	EQ	108.3000		10.0000	mg/L
0016	CONDUCTIVITY	EQ	249.0000	700.0000	70.0000	Umhos/cm
0017	TURBIDITY	EQ	0.1700		0.1000	NTU
0020	NITRATE-N	EQ	0.9200	10.0000	0.5000	mg/L
0021	CHLORIDE	EQ	2.3000	250.0000	20.0000	mg/L
0022	SULFATE	EQ	18.9000	250.0000	50.0000	mg/L
0023	COPPER	EQ	0.0100		0.0200	mg/L
0024	ZINC	EQ	0.0150	5.0000	0.2000	mg/L
0161	TOTAL NITRATE/NITRITE	EQ	0.9200		0.5000	mg/L
0004	ARSENIC	LT	0.0010	0.0104	0.0010	mg/L
0006	CADMIUM	LT	0.0020	0.0050	0.0010	mg/L
0007	CHROMIUM	LT	0.0200	0.1000	0.0070	mg/L
0008	IRON	LT	0.1000	0.3000	0.1000	mg/L
0009	LEAD	LT	0.0010		0.0010	mg/L
0010	MANGANESE	LT	0.0100	0.0500	0.0100	mg/L
0011	MERCURY	LT	0.0004	0.0020	0.0002	mg/L
0013	SILVER	LT	0.1000	0.1000	0.1000	mg/L
0018	COLOR	LT	15.0000	15.0000	15.0000	CU
0019	FLUORIDE	LT	0.2000	4.0000	0.2000	mg/L
0110	BERYLLIUM	LT	0.0008	0.0040	0.0003	mg/L
0111	NICKEL	LT	0.1000	0.1000	0.0050	mg/L
0112	ANTIMONY	LT	0.0060	0.0060	0.0030	mg/L

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Collect Date 12/29/2016
 Lab Number 046
 Lab Name Edge Analytical - Burlington
 Sample Number 76739
 Source 02
 Analyte Group VOC-VOLATILE ORGANIC
 CONTAMINANTS
 Test Panel VOC1-VOLATILE ORGANIC
 Sample Location s02
 Sample Type Unknown

Result Range, A/P, Units: Mouse over for full description

Analyte DOH Num	Analyte Name	Result Range	Result Quantity	Maximum Contaminant Level	State Reporting Limit	Units
0027	CHLOROFORM	LT	0.5000		0.5000	ug/L
0028	BROMODICHLOROMETHANE	LT	0.5000		0.5000	ug/L
0029	DIBROMOCHLOROMETHANE	LT	0.5000		0.5000	ug/L
0030	BROMOFORM	LT	0.5000		0.5000	ug/L
0045	VINYL CHLORIDE	LT	0.5000	2.0000	0.5000	ug/L
0046	1,1 DICHLOROETHYLENE	LT	0.5000	7.0000	0.5000	ug/L
0047	1,1,1 TRICHLOROETHANE	LT	0.5000	200.0000	0.5000	ug/L
0048	CARBON TETRACHLORIDE	LT	0.5000	5.0000	0.5000	ug/L
0049	BENZENE	LT	0.5000	5.0000	0.5000	ug/L
0050	1,2 DICHLOROETHANE	LT	0.5000	5.0000	0.5000	ug/L
0051	TRICHLOROETHYLENE	LT	0.5000	5.0000	0.5000	ug/L
0052	1,4 DICHLOROBENZENE	LT	0.5000	75.0000	0.5000	ug/L
0053	CHLOROMETHANE	LT	0.5000		0.5000	ug/L
0054	BROMOMETHANE	LT	0.5000		0.5000	ug/L
0055	CHLOROETHANE	LT	0.5000		0.5000	ug/L
0056	METHYLENE CHLORIDE(DICHLOROMETHANE)	LT	0.5000	5.0000	0.5000	ug/L
0057	TRANS- 1,2 DICHLOROETHYLENE	LT	0.5000	100.0000	0.5000	ug/L
0058	1,1 DICHLOROETHANE	LT	0.5000		0.5000	ug/L
0059	2,2 DICHLOROPROPANE	LT	0.5000		0.5000	ug/L
0060	CIS- 1,2 DICHLOROETHYLENE	LT	0.5000	70.0000	0.5000	ug/L
0062	1,1 DICHLOROPROPENE	LT	0.5000		0.5000	ug/L
0063	1,2 DICHLOROPROPANE	LT	0.5000	5.0000	0.5000	ug/L
0064	DIBROMOMETHANE	LT	0.5000		0.5000	ug/L
0065	CIS- 1,3 DICHLOROPROPENE	LT	0.5000		0.5000	ug/L
0066	TOLUENE	LT	0.5000	1000.0000	0.5000	ug/L

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COUNTY WATER DIST 13**

Collect Date 12/29/2016
 Lab Number 046
 Lab Name Edge Analytical - Burlington
 Sample Number 76691
 Source 01
 Analyte Group VOC-VOLATILE ORGANIC
 CONTAMINANTS
 Test Panel VOC1-VOLATILE ORGANIC
 Sample Location s01
 Sample Type Unknown

Result Range, A/P, Units: Mouse over for full description

Analyte DOH	Analyte Name	Result Range	Result Quantity	Maximum Contaminant Level	State Reporting Limit	Units
0027	CHLOROFORM	LT	0.5000		0.5000	ug/L
0028	BROMODICHLOROMETHANE	LT	0.5000		0.5000	ug/L
0029	DIBROMOCHLOROMETHANE	LT	0.5000		0.5000	Micrograms per Liter
0030	BROMOFORM	LT	0.5000		0.5000	ug/L
0045	VINYL CHLORIDE	LT	0.5000	2.0000	0.5000	ug/L
0046	1,1 DICHLOROETHYLENE	LT	0.5000	7.0000	0.5000	ug/L
0047	1,1,1 TRICHLOROETHANE	LT	0.5000	200.0000	0.5000	ug/L
0048	CARBON TETRACHLORIDE	LT	0.5000	5.0000	0.5000	ug/L
0049	BENZENE	LT	0.5000	5.0000	0.5000	ug/L
0050	1,2 DICHLOROETHANE	LT	0.5000	5.0000	0.5000	ug/L
0051	TRICHLOROETHYLENE	LT	0.5000	5.0000	0.5000	ug/L
0052	1,4 DICHLOROBENZENE	LT	0.5000	75.0000	0.5000	ug/L
0053	CHLOROMETHANE	LT	0.5000		0.5000	ug/L
0054	BROMOMETHANE	LT	0.5000		0.5000	ug/L
0055	CHLOROETHANE	LT	0.5000		0.5000	ug/L
0056	METHYLENE CHLORIDE(DICHLOROMETHANE)	LT	0.5000	5.0000	0.5000	ug/L
0057	TRANS- 1,2 DICHLOROETHYLENE	LT	0.5000	100.0000	0.5000	ug/L
0058	1,1 DICHLOROETHANE	LT	0.5000		0.5000	ug/L
0059	2,2 DICHLOROPROPANE	LT	0.5000		0.5000	ug/L
0060	CIS- 1,2 DICHLOROETHYLENE	LT	0.5000	70.0000	0.5000	ug/L
0062	1,1 DICHLOROPROPENE	LT	0.5000		0.5000	ug/L
0063	1,2 DICHLOROPROPANE	LT	0.5000	5.0000	0.5000	ug/L
0064	DIBROMOMETHANE	LT	0.5000		0.5000	ug/L
0065	CIS- 1,3 DICHLOROPROPENE	LT	0.5000		0.5000	ug/L
0066	TOLUENE	LT	0.5000	1000.0000	0.5000	ug/L

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COUNTY WATER DIST 13**

Collect Date 12/29/2015
 Lab Number 156
 Lab Name Pace Analytical Srvs,LLC-Pittsburgh
 Sample Number 62369
 Source 01
 Analyte Group RAD-RADIONUCLIDES
 Test Panel RAD-RADIONUCLIDES
 Sample Location s01
 Sample Type Unknown

Result Range, A/P, Units: Mouse over for full description

Analyte DOH Num	Analyte Name	Result Range	Result Quantity	Maximum Contaminant Level	State Reporting Limit	Units
0042	GROSS BETA	LT	4.0000	50.0000	4.0000	pCi/L
0165	GROSS ALPHA	LT	3.0000		3.0000	pCi/L
0166	RADIUM 228	LT	1.0000	5.0000	1.0000	pCi/L

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Tumwater, WA 98501

Mail:

PO BOX 47822
Olympia, WA 98504-7822

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View Sample Detail - WSID 959143 - WHATCOM COUNTY WATER DIST 13

Collect Date 12/29/2015
 Lab Number 156
 Lab Name Pace Analytical Srvs,LLC-Pittsburgh
 Sample Number 62370
 Source 02
 Analyte Group RAD-RADIONUCLIDES
 Test Panel RAD-RADIONUCLIDES
 Sample Location s02
 Sample Type Unknown

Result Range, A/P, Units: Mouse over for full description

Analyte DOH Num	Analyte Name	Result Range	Result Quantity	Maximum Contaminant Level	State Reporting Limit	Units
0042	GROSS BETA	LT	4.0000	50.0000	4.0000	pCi/L
0165	GROSS ALPHA	LT	3.0000		3.0000	pCi/L
0166	RADIUM 228	LT	1.0000	5.0000	1.0000	pCi/L

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Collect Date 12/29/2015
 Lab Number 046
 Lab Name Edge Analytical - Burlington
 Sample Number 62369
 Source 01
 Analyte Group IOC-INORGANIC CONTAMINANTS
 Test Panel NIT-NITRATE SUITE
 Sample Location s01
 Sample Type Unknown

Result Range, A/P, Units: Mouse over for full description

Analyte DOH Num	Analyte Name	Result Range	Result Quantity	Maximum Contaminant Level	State Reporting Limit	Units
0020	NITRATE-N	EQ	0.8100	10.0000	0.5000	mg/L

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Collect Date 12/29/2015
 Lab Number 046
 Lab Name Edge Analytical - Burlington
 Sample Number 62370
 Source 02
 Analyte Group IOC-INORGANIC CONTAMINANTS
 Test Panel NIT-NITRATE SUITE
 Sample Location s02
 Sample Type Unknown

Result Range, A/P, Units: Mouse over for full description

Analyte DOH Num	Analyte Name	Result Range	Result Quantity	Maximum Contaminant Level	State Reporting Limit	Units
0020	NITRATE-N	EQ	0.7800	10.0000	0.5000	mg/L

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STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

SUPERSEDING PERMIT
TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

- Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917 and amendments thereto, and the rules and regulations of the Department of Ecology.)
- Ground Water (Issued in accordance with the provisions of Chapter 253, Laws of Washington for 1945 and amendments thereto, and the rules and regulations of the Department of Ecology.)

PRIORITY DATE: November 13, 1974	APPLICATION NUMBER: G1-22178A	PERMIT NUMBER: G1-22178P	CERTIFICATE NUMBER:
-------------------------------------	----------------------------------	-----------------------------	---------------------

NAME: Whatcom County Water District No. 13			
ADDRESS (STREET): P.O. Box 280	CITY: Maple Falls	STATE: WA	ZIP CODE: 98266

The applicant is hereby granted a permit to appropriate the following public waters of the State of Washington, subject to existing rights and to the limitations and provisions set herein.

PUBLIC WATERS TO BE APPROPRIATED

SOURCE: Wells 1 & 2		
TERTIARY OF (SURFACE WATERS):		
MAXIMUM CUBIC FEET PER SECOND:	MAXIMUM GALLONS PER MINUTE: 450*	MAXIMUM ACRE FEET PER YEAR: **
QUANTITY, TYPE OF USE, PERIOD OF USE:		

Municipal Water Supply Purposes – continuously

* The maximum instantaneous rate authorized by this right and G1-22158C shall not exceed 450 gallons per minute from well 1. The maximum instantaneous rate authorized by this right shall not exceed 450 gallons per minute from well 2.

** The annual quantity from this right and G1-22158C shall not exceed 454 acre-feet per year. Water Right Certificate G1-22158C authorizes the withdrawal of up to 275 acre-feet per year.

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION/WITHDRAWAL:
Well 1 – 200 feet south and 570 feet east of the W¼ corner of Section 22
Well 2 – 1130 feet north and 1075 feet west of the S¼ corner of Section 22

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION): Well 1 – NW¼ SW¼, Well 2 - SE¼ SW¼	SECTION: 22	TOWNSHIP N: 40N	RANGE, E. OR W. & W.M: 5E	W.R.T.A: 1	COUNTY: Whatcom
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RECORDED PLATTED PROPERTY

LOT:	BLOCK:	OR (GIVE NAME OF PLAT OR ADDITION):
------	--------	-------------------------------------

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

The place of use of this water right is the service area described in the 2004 Water System Plan approved by the Washington State Department of Health. RCW 90.03.386 may have the effect of revising the place of use of this water right if the criteria in section RCW 90.03.386(2) are met.

DESCRIPTION OF PROPOSED WORKS

Two wells, two 150,000 gallon concrete storage tanks. Mainlines consist of 8-inch, 6-inch, and 4-inch PVC pipe.

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE	COMPLETE PROJECT BY THIS DATE	WAIT/PUT TO FULL USE BY THIS DATE
Started	Complete	October 31, 2009

PROVISIONS

- This authorization to make use of public waters of the state is subject to existing rights, including any existing rights held by the United States for the benefit of Tribes under treaty or settlement.
- The applicant is advised that a certificate will issue for only that quantity of water that has been withdrawn and applied to actual beneficial use. Such quantity applied to actual beneficial use under this authorization shall not exceed the quantity specified in this report of exam and will be calculated on the basis of the best information available to Ecology, including metering data and/or water duty analysis.
- An approved measuring device shall be installed and maintained for each diversion/withdrawal of the sources identified by this water right in accordance with the rule "Requirements for Measuring and Reporting Water Use", chapter 173-173 WAC.

Water use data shall be recorded weekly. The maximum monthly instantaneous rate of diversion/withdrawal and the monthly total volume shall be submitted to Ecology by January 31st of the following year. Ecology is requiring submittal of monthly meter readings to collect seasonal information for water resource planning, management and compliance.

The following information shall be included with each submittal of water use data: owner, contact name if different, mailing address, daytime phone number, Permit/Certificate/Claim No., source name, volume including units, Department of Health WFI water system number and source number(s) (for public drinking water systems), and well tag number (for ground water withdrawals). In the future, Ecology may require additional parameters to be reported or more frequent reporting. Ecology prefers web based data entry, but does accept hard copies. Ecology will provide forms and electronic data entry information.

Chapter 173-173 WAC describes the requirements for data accuracy, device installation and operation, and information reporting. It also allows a water user to petition Ecology for modifications to some of the requirements. Installation, operation and maintenance requirements are contained in the document entitled "Water Measurement Device Installation and Operation Requirements".

Department of Ecology personnel, upon presentation of proper credentials, shall have access at reasonable times, to the records of water use that are kept to meet the above conditions, and to inspect at reasonable times any measuring device used to meet the above conditions.

Installation and maintenance of an access port as described in chapter 173-160 is required. An airline and gauge may be installed in addition to the access port.

- In order to protect the resource, static water levels (SWL) shall be measured in each well at least once each month. Ecology's Water Resources section (NWRO) shall be notified if a below normal seasonal drop is measured in SWL; otherwise this data shall be maintained and be made available to Ecology upon request.
- The maximum instantaneous rate from well 1 shall not exceed 450 gallons per minute. The maximum instantaneous rate from well 2 shall not exceed 450 gallons per minute. If both wells are pumped simultaneously, then well 1 will be operating under the authority of G1-22158 and well 2 will be operating under the authority of G1-22178.
- If it can be shown that pumping well 1 (as authorized by this change) or well 2 has a detrimental effect on existing rights, it shall be the responsibility of Water District No. 13 to mitigate for this impact and/or alter or cease pumping.
- Issuance of this water right may be subject to implementation of the minimum requirements established in the Conservation Planning Requirements, Guidelines and Requirements for Public Water Systems Regarding Water Use Reporting, Demand Forecasting Methodology, and Conservation Programs, July 1994, and as revised.
- A certificate of water right will not be issued until a final investigation is made.

This permit shall be subject to cancellation should the permittee fail to comply with the above development schedule and/or fail to give notice to the Department of Ecology on forms provided by that Department documenting such compliance.

Given under my hand and the seal of this office at Bellevue, Washington, this 3RD day of JUNE, 2005.



Department of Ecology

By Daniel Swenson
Daniel L. Swenson, Section Supervisor, Water Resources



STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

Northwest Regional Office, 3190 - 160th Ave S.E. • Bellevue, Washington 98008-5452 • (206) 649-7000

October 25, 1995

Whatcom County Water District No. 13
Attn. Mr. Glenn Henderson
P.O. Box 280
Maple Falls WA 98266

Dear Mr. Henderson:

Re: Water Right Permit G1-22178P

At your meeting with Mr. Stephen Hirschey on September 6, 1995, I believe you asked for two things:

- The Department of Ecology's understanding of Water Right Permit G1-22178P, and
- What might be done by Ecology to facilitate resolution of Whatcom County Water District No. 13's (District) bankruptcy issues.

You indicated the District can more easily resolve the bankruptcy issues, if certain property held by the District can be sold. However, nobody wants to buy the property without a commitment by the District to supply water. And finally, the District needs the water right permit in question to serve the property water.

As you know, on January 2, 1992, Ecology issued an Order of Rescission for Water Right Certificate No. G1-22178C and reinstated the permit. The Order of Rescission was issued because the well authorized by the permit was never drilled. On August 4, 1993, Ecology then issued a Show Cause Order for cancelling the permit.

The Show Cause Order was issued because it did not appear to Ecology that reasonable progress and due diligence had been demonstrated by the permittee in putting the water authorized by the permit to use. That action got tangled up in the bankruptcy. Essentially, your position is that the bankruptcy action prohibits Ecology from canceling the permit. Ecology's position is that an exercise of police powers is an activity that can occur when a party is in bankruptcy.

Water Right Permit G1-22178P authorized the construction of a well 400 feet South and 900 feet West of the E $\frac{1}{4}$ corner of Section 22, Township 40 North, Range 5

Mr. Glenn Henderson
October 23, 1995
Page 2

E.W.M. in October of 1975. The instantaneous quantity authorized was 700 gallons per minute, with the annual quantity supplemental to the cumulative annual quantity of 560 acre-feet per year authorized in Water Right Certificates G1-20984 and G1-22158.

In August of 1977, a Completion of Construction form was filed by the Commissioner for the District (Mr. S. Isenhart) indicating actual construction of the infrastructure to use water under the permit. The Proof of Appropriation affidavit was filed in November of 1977 (signed by Mr. Thomas E. Isenhart) and stated water was completely put to use in February of 1977. The Proof of Appropriation also contradicts itself, in that "none" was written down as actual amount of water diverted from permanent system. During 1992, it was discovered by Ecology staff, that the well authorized was never drilled.

Water right certificate G1-20984 is held by Paradise Lakes County Club and was the subject of a dispute between Ecology and Paradise Lakes County Club in 1992. Their situation is similar to yours. The certificate issued for a well that was never drilled.

Currently, G1-20984 authorizes the withdrawal of 105 gallons per minute, 106 acre-feet per year of water for domestic use in the NW $\frac{1}{4}$ of Section 22, the SW $\frac{1}{4}$ of Section 15; the SE $\frac{1}{4}$ SE $\frac{1}{4}$ of Section 16; and the E $\frac{1}{2}$ NE $\frac{1}{4}$ of Section 21 all within Township 40 north, Range 5 E.W.M. The annual quantity authorized is supplemental to G1-00034C and G1-20349C. Water rights G1-00034C and G1-20349C are held by Paradise Lakes County Club for that development. The annual quantity on G1-20984 was made supplemental to G1-00034C and G1-20349C as part of the stipulated settlement to resolve the litigation with Paradise Lakes County Club.

It appears that water right permit G1-22178P is associated with a water right held by another party, which is in turn supplemental to other rights held by them.

In addition, G1-22158C is also associated with to G1-20984P. As you know, G1-22158C is what Whatcom County Water District No. 13 (WCWD No. 13) relies upon for authorization of withdrawals from the well in the NW $\frac{1}{4}$ NW $\frac{1}{4}$ SW $\frac{1}{4}$ of Section 22.

It appears that water rights G1-20984, G1-22158, and G1-22178 were all related and that impacts to G1-22158, and G1-22178 were not considered in the settlement related to G1-20984. Therefore, Ecology is willing to consider 484 acre-feet of water the annual quantity of water associated with Water Right Certificates G1-22158 and Water Right Permit G1-22178.

The 484 acre-feet can be for community domestic supply within the service area of


Mr. Glenn Henderson
October 25, 1995
Page 3

WCWD No. 13 as that area is defined in G1-22158, and G1-22178. It appears that a golf course is being irrigated with WCWD No. 13 water; I note that irrigation of a golf course is not authorized under either your permit or certificate. You may want to address that issue in the future.

What remains is for Ecology to find that reasonable progress and due diligence has been shown by the permittee for permit number G1-22178 and that it should not be canceled. Ecology assumes that you want your letter of October 11, 1993, to be used as your response to the show cause order. If not, please inform Ecology. If a satisfactory showing of due diligence is made, G1-22178P will remain a permit until perfected.

If you have any questions or concerns on this letter, please contact Mr. Stephen Hirshey (206) 649-7066 or myself at (206) 649-7069.

362-467-6450
Sincerely,


Raymond Hellwig
Regional Supervisor
Shorelands & Water Resources Program

RH:SJH:sa

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

WELL #1

CERTIFICATE OF WATER RIGHT

- Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)
- Ground Water (Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

PRIORITY DATE October 29, 1974	APPLICATION NUMBER G1-22158	PERMIT NUMBER G1-22158P	CERTIFICATE NUMBER G1-22158C
-----------------------------------	--------------------------------	----------------------------	---------------------------------

NAME
WHATCOM COUNTY WATER DISTRICT NO. 13

ADDRESS (STREET) 8193 Kendall Road (CITY) Maple Falls (STATE) Washington (ZIP CODE) 98266

This is to certify that the herein named applicant has made proof to the satisfaction of the Department of Ecology of a right to the use of the public waters of the State of Washington as herein defined, and under and specifically subject to the provisions contained in the Permit issued by the Department of Ecology, and that said right to the use of said waters has been perfected in accordance with the laws of the State of Washington, and is hereby confirmed by the Department of Ecology and entered of record as shown.

SOURCE: PUBLIC WATER TO BE APPROPRIATED
Well - 12"x80'

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE 450.0	MAXIMUM ACRE-Feet PER YEAR 275.0
-------------------------------	-------------------------------------	-------------------------------------

QUANTITY, TYPE OF USE, PERIOD OF USE
Community domestic supply - continuously

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION-WITHDRAWAL
570 feet east and 200 feet south of the NW corner of Sec. 22

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION) NW 1/4 NW 1/4 SW 1/4	SECTION 22	TOWNSHIP N. 40	RANGE, (E. OR W.) W.M. 5 E.	W.R.I.A. 1	COUNTY Whatcom
---	---------------	-------------------	--------------------------------	---------------	-------------------

RECORDED PLATTED PROPERTY
LOT # BLOCK OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

Area served by Whatcom County Water District No. 13 within Sections 21, 22, 27 and 28, T. 40 N., R. 5 E.W.M.

Installation and maintenance of an access port as described in Ground Water Bulletin No. 1 is required. An air line and gauge may be installed in addition to 1" access port.

The right to the use of the water aforesaid hereby confirmed is restricted to the lands or place of use herein described, except as provided in RCW 90.03.380, 90.03.390, and 90.44.020.

This certificate of water right is specifically subject to relinquishment for nonuse of water as provided in RCW 90.14.180.

Given under my hand and the seal of this office at Redmond Washington, this 30th day of May 19 80

Department of Ecology

ENGINEERING DATA

OK *[Signature]*

by *[Signature]*
ROBERT K. McCORMICK, Regional Manager

FOR COUNTY USE ONLY

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

PERMIT
TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

SURFACE WATER

GROUND WATER

PERMIT NUMBER G1-22178P	APPLICATION NUMBER G1-22178	PRIORITY DATE November 13, 1974
-----------------------------------	---------------------------------------	---

NAME: **WHATCOM COUNTY WATER DISTRICT NO. 13**

ADDRESS (STREET): **8295 Kendall Road**

(CITY): **Sumas** (STATE): **Washington** (ZIP CODE): **98295**

The applicant is, pursuant to the Report of Examination which has been accepted by the applicant, hereby granted a permit to appropriate the following described public waters of the State of Washington, subject to existing rights and to the limitations and provisions set out herein.

SOURCE: **Well** PUBLIC WATER TO BE APPROPRIATED

TRIBUTARY OF (IF SURFACE WATERS):

MAXIMUM CUBIC FEET PER SECOND

TYPE OF USE, (PERIOD OF USE): **Community Domestic Supply - continuously**

MAXIMUM GALLONS PER MINUTE: **700.0**

MAXIMUM ACRE-Feet PER YEAR: *** See Page 2**

APPROXIMATE LOCATION OF DIVERSION/WITHDRAWAL: **400 feet South and 900 feet West of the E $\frac{1}{2}$ corner of Sec. 22**

LOCATION OF DIVERSION/WITHDRAWAL

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION): **NE $\frac{1}{4}$ SE $\frac{1}{4}$**

SECTION 22	TOWNSHIP N. 40	RANGE, (E. OR W.) W.M. 5 E.	W.R.I.A. 1	COUNTY Whatcom
----------------------	--------------------------	---------------------------------------	----------------------	--------------------------

RECORDED PLATTED PROPERTY

LEGAL DESCRIPTION OF PROPERTY WATER TO BE USED ON

Area served by Whatcom County Water District No. 13.

Trusts but not schedule



DEVELOPMENT SCHEDULE

BEGINNING DATE

October 31, 1976

COMPLETION DATE

October 31, 1977

DATE COMPLETE APPLICATION OF WATER TO BE MADE

October 31, 1978

PROVISIONS

Nothing in this permit shall be construed as excusing the permittee from compliance with any applicable federal, state, or local statutes, ordinances, or regulations including those administered by local agencies under the Shoreline Management Act of 1971.

* The permits should issued as follows:

- * G1-20984 500.0 gallons per minute 106 AC-FT *NEVER DRILLED NOT DISTRICT WELL
- G1-22158 700.0 gallons per minute 275 AC-FT
- G1-22178 700.0 gallons per minute

Total annual quantity from all three (3) applications shall not exceed 560.0 acre-feet per year. These quantities were used for various change in storage calculations to determine safe sustained yield.

The installation of an access port as described in attached Ground Water Bulletin No. 1 shall be required prior to issuance of final certificate of water right. The applicant may, for his own convenience, wish to install an airline and gage in addition to the access port.

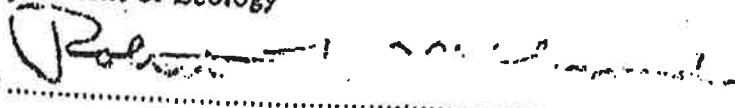
Owing to the proximity of neighboring wells, the applicant is reminded of his responsibility toward same and advised that he may be required to regulate his withdrawal and pumping rate if existing rights are injuriously affected.

This permit shall be subject to cancellation should the permittee fail to comply with the above development schedule and/or fail to give notice to the Department of Ecology on forms provided by that Department documenting such compliance.

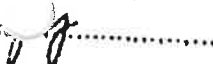
Given under my hand and the seal of this office at Olympia, Washington, this 31st day

October 19 75

JOHN A. BIGGS, Director
Department of Ecology

by 
ROBERT K. McCORMICK, Regional Manager

ING DATA



WELL #1

WELL SITE EASEMENT

01201

1410319

THE GRANTORS, Peaceful Valley, a Washington Limited Partnership, for a valuable consideration, receipt of which is hereby acknowledged, conveys to Whatcom County Water District No. 13, a municipal corporation, an easement for the existing well and protective zone on, across, and under the following described real property:

Beginning at the Northwest corner of the plat of Peaceful Valley, Division 1, located in Section 22, Township 40 North, Range 5E, W.M., thence commencing North 87° 25' 57" West, which is the same bearing along the North side of said plat at this point, to its intersection with the centerline of County Road No. 361, more commonly known as the Sumas-Kendall Road, thence south 68° 44' 17" East a distance of 579 feet to the well casing and source of Water District No. 13 water supply. The well tract easement area and protective zone is a circle with a 200 foot radius whose radius point is the well casing.

THE GRANTORS further acknowledge and agree that said Water District No. 13 shall have such additional access as may be necessary or convenient for the maintenance and repair of said well and water lines appurtenant thereto on condition that upon completion of said maintenance and repair that the property be restored as near as practicable to its existing condition prior to the maintenance and repairs consistent with good engineering practices.

DATED this 12th day of January, 1982.

PEACEFUL VALLEY, a Washington Limited Partnership.

By H. E. Isenhart
H. E. ISENHART, General Partner

REC'D
W.C. DIST #13
JAN 25 10 54 AM '82
FILE
NOTARY PUBLIC
JOAN O'NEIL, RUC FOR
WHATCOM COUNTY, WASH

STATE OF WASHINGTON) ss
COUNTY OF WHATCOM)

ON THIS DAY PERSONALLY APPEARED BEFORE ME H. E. Isenhart known to me to be a General Partner of Peaceful Valley, a Washington Limited Partnership, who executed the within and foregoing instrument on behalf of the partnership and acknowledged that he signed the same as his free and voluntary act and deed of the Limited Partnership for the uses therein mentioned.

GIVEN UNDER MY HAND and official seal this 12th day of January, 1982.

Joan O'Neil
NOTARY PUBLIC, in and for the State of Washington, residing at Bellingham.

Return to:
Whatcom County Water District # 13
8193 Kendall Rd.
Maple Falls, Wa. 98266

WELL #2

WATER WELL REPORT

Start Card No. W 075862
 Unique Well I.D. #
 Water Right Permit No. 01-221709

STATE OF WASHINGTON

(1) OWNER: Name **WHATCOM CTY WATER DIST 13** Address **PO BOX 388 MAPLE FALLS, WA 98265**
 (2) LOCATION OF WELL: County **WHATCOM** - **SW 1/4 NW 1/4 Sec 23 T 40 N., R 2E W1**
 (2a) STREET ADDRESS OF WELL (or nearest address) **PEACEFUL VALLEY & BALFOUR, KENDALL**

(3) PROPOSED USER: **MUNICIPAL**

(1a) WELL LOG
 Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change in formation.

(4) TYPE OF WORK: Owner's Number of well (if more than one) **2**
 Method: **ROTARY**
 NEW WELL

(5) DIMENSIONS: Diameter of well **10** inches
 Drilled **121** ft. Depth of completed well **121** ft.

MATERIAL	FROM	TO
GRAVEL & SAND & LITTLE CLAY (brown)	0	60
GRAVEL SAND & WATER	60	85
GRAVEL & SAND BROWN CLAY & WATER	85	102
WATER GRAVEL & SAND	102	

(6) CONSTRUCTION DETAILS:
 Casing installed: **10** " Dia. from **0** ft. to **103** ft.
 WELDED " Dia. from " ft. to " ft.
 " Dia. from " ft. to " ft.

Ecology Well ID # 71695

Perforations: **NO**
 Type of perforator used
 SIZE of perforations in. by in.
 perforations from ft. to ft.
 perforations from ft. to ft.
 perforations from ft. to ft.

Screens: **YES** **5' riser; 2' extension**
 Manufacturer's Name **JOHNSON**
 Type **STAINLESS STEEL** Model No.
 Diam. **10** slot size **40** from **104** ft. to **109** ft.
 Diam. **10** slot size **30** from **109** ft. to **119** ft.

Level packed: **NO**
 Gravel placed from " ft. to " ft. Size of gravel " ft.

Surface seal: **YES** To what depth? **10** ft.
 Material used in seal **BENTONITE**
 Did any strata contain unusable water? **NO**
 Type of water? Depth of strata " ft.
 Method of sealing strata off

(7) PUMP: Manufacturer's Name
 Type H.P.

(8) WATER LEVELS: Land-surface elevation
 Static level **29** ft. above mean sea level ... ft. Date **02/20/97**
 Artesian Pressure lbs. per square inch Date
 Artesian water controlled by

Work started **02/12/97** Completed **02/20/97**

(9) WELL TESTS: Drawdown is amount water level is lowered below static level.
 Was a pump test made? **YES** If yes, by whom? **BRUCE FOWLER**
 Yield: **475** gal./min with **.04** ft. drawdown after **4** hrs.

WELL CONSTRUCTOR CERTIFICATION:
 I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

Recovery data
 Time Water Level Time Water Level Time Water Level

NAME **DANLEIGH PUMP & WELL DRILL**
 (Person, firm, or corporation) (Type or print)

Full recovery in **3 minutes**

ADDRESS **PO BOX 422**
 [SIGNED] *Ralph W. Biggs* License No. **2043**

Date of test **03/03/97**
 Boiler test gal./min. **50** ft. drawdown after hrs.
 Air test **500+** gal./min. w/ ulem set at ft. for **4** hrs.
 Artesian flow g.p.w. Date
 Temperature of water Was a chemical analysis made? **YES**

Contractor's
 Registration No. **DANLEDPW123LC** Date **03/04/97**

DAHLMAN Pump & Well Drilling, Inc.

SALES • PUMPS • SERVICE • WELL DRILLING



DAHLMPW123LC

H. Ken Fowler
President

Scott J. Fowler
Vice President

Bruce M. Fowler
Vice President

31 Cook Road, Bow
P.O. Box 422
Burlington, WA 98233

(360) 757-6666
Fax (360) 757-7353
1-800-277-4898

Project No. _____ Date March 3, 1997 Page 1 of 2

Owner Whatcom County Water District #13 Location Kendall

Pump Company Dahlman Pump & Well Drilling Operator Bruce Fowler

Observers _____ Well No. #2

Measuring point is top of casing which is 2 feet above/below surface.

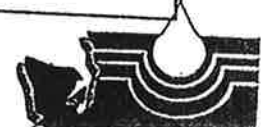
Static water level 29'10" feet below land surface at 11:08 am/~~pm~~

Depth to intake 89' feet. Well depth 121 feet.

Discharge rate of pumped well 475 gpm (gallons per minute).

TIME	ELAPSED TIME	DEPTH TO WATER	DRAWDOWN OR RECOVERY	PUMPING RATE	REMARKS
11:08 am		29'10"		390	
11:10 am		30'7"		390	
11:12 am		30'7½"		390	
11:13 am		30'7½"		390	
11:14 am		30'7½"		390	
11:15 am		30'7½"		475	
11:16 am		30'7½"		475	
11:17 am		30'7½"		475	
11:18 am		30'8"		475	
11:19 am		30'8"		475	
11:20 am		30'8"		475	
11:25 am		30'8"		475	
11:30 am		30'8"		475	
11:35 am		30'8"		475	

WELL 502



SAND ANALYSIS

UNITED PIPE & SUPPLY of Washington



TACOMA
800-247-4707
FAX 206-838-9592

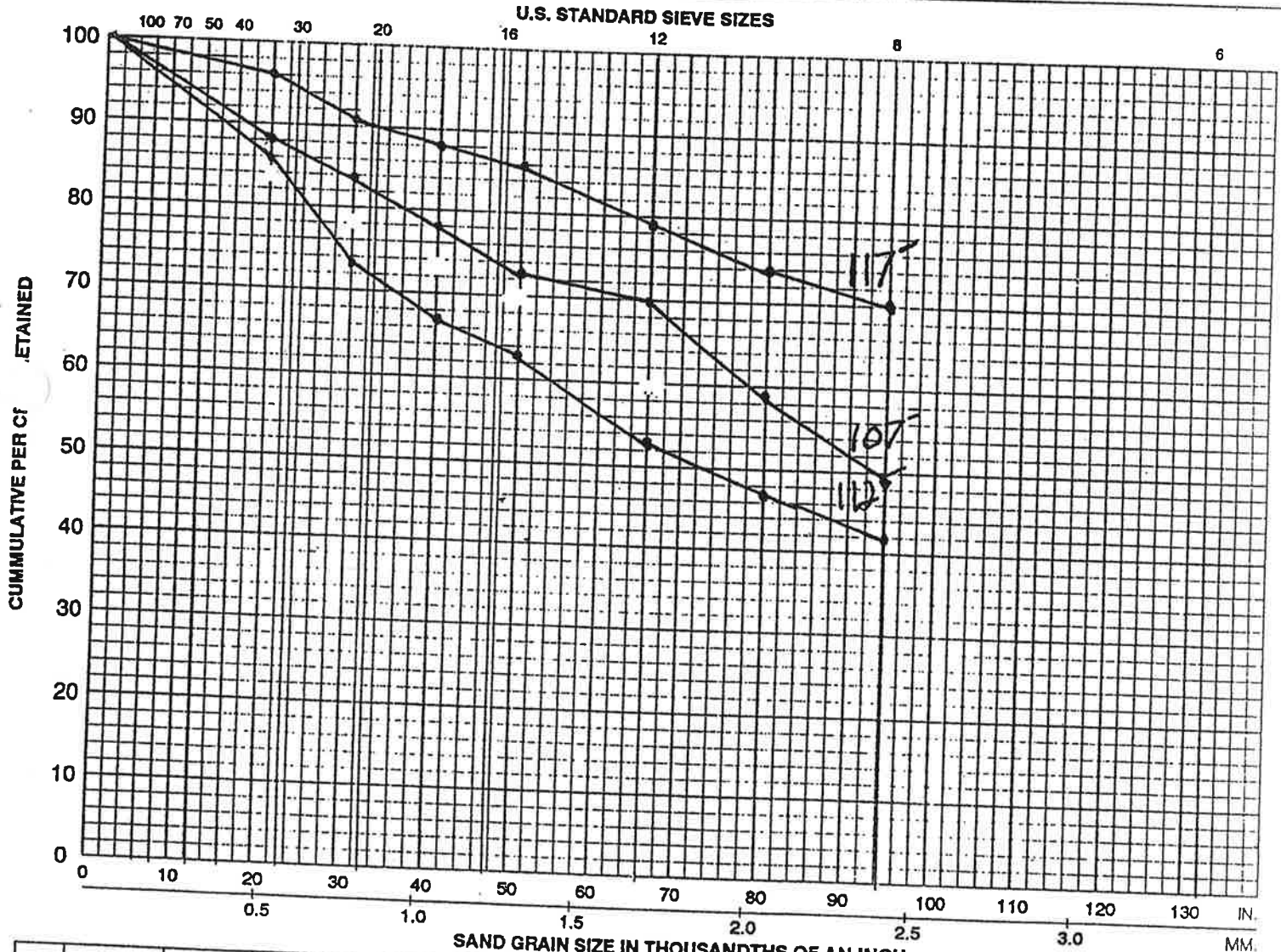
TUKWILA
800-525-3104
FAX 206-251-3999

LYNNWOOD
206-745-5700
FAX 206-353-6295

WENATCHEE
800-772-7855
FAX 509-663-0172

SPOKANE
800-622-3037
FAX 509-483-9128

WELL DRILLER: NAME AND ADDRESS	ENGINEER: NAME AND ADDRESS	OWNER: NAME AND ADDRESS
PHONE:	PHONE:	PHONE:



U.S. SIEVE NO.	SLOT OPENING		SAMPLE DEPTHS			
	IN	MM	117		107	
			WT.	%	WT.	%
6	.132	3.36	12.9	70	7.4	42
8	.094	2.38	13.7	74	8.4	47
	.068	1.68	14.5	79	9.4	53
	.050	1.27	15.8	86	11.3	63
20	.075	1.90	15.8	86	11.3	63
30	.050	1.27	16.2	88	12.0	67
40	.037	.94	16.8	91	13.0	73
50	.028	.71	17.6	96	15.3	86
60	.025	.64	18.4	100	17.8	100
70	.020	.51				
100	.008	.21				
PAN	0	0				

STATIC WATER LEVEL _____

WELL DIAMETER _____

AQUIFER FROM _____ TO _____

DESIRED YIELD _____

COMMENTS _____

SCREEN RECOMMENDATIONS:

DIAMETER _____

LENGTH _____

FITTINGS _____

SETTING _____

FILTER PACK _____

BY _____

SO?



UNITY HEALTH CENTER

19 Grand Street
Bellingham, Washington
X (360) 676-7646

WHATCOM HEALTH CENTER

1500 North State Street
Bellingham, Washington
FAX (360) 676-6779

WHATCOM COUNTY HEALTH DEPARTMENT

P.O. Box 935
Bellingham, WA 98227-0935
(360) 676-6720 (360) 384-1528

FRANK L. JAMES, M.D.
Health Officer

April 5, 1996

Carl Reichhardt
Reichhardt and Ebe Engineering, Inc.
PO Box 978
Lynden, WA 98264

WELL #2

Re: proposed well sites A & B for WD #13

Dear Mr. Reichhardt,

On 3/22/96 well site inspection was performed on the above noted property, as required by State Drinking Water Regulations WAC 246-290. The site plan as indicated in a drawing submitted by you on 3/15/96 and the sites themselves appear to be satisfactory providing that you:

1. Verify that site B is 100' from any existing road easement. I measured approximately 96' from the stake to the edge of the existing clubhouse access road pavement.
2. Submit a declaration of covenant and/or restrictive covenants securing the required 100' radius sanitary control zone around the well. A copy of these documents must be submitted to the State Department of Health after they have been recorded with the County Auditor.

This was a well site inspection for a Group A Public Water System. A licensed engineer must submit a project report for the proposed well to the State Department of Health. Further information regarding source approval, plan approval, and design of the distribution system should be obtained from the State Department of Health's Regional Office in Seattle at (206) 464-7071.

If you have any questions, please contact this office at 676-6724 or 384-1565.

Sincerely,

Anne E. Atkeson
Anne Atkeson
Environmental Health Specialist

COPY

cc: John Thielemann, DOH
Glen Henderson, WD#13

mental Health	STD/AIDS Travel Clinic	Communicable Disease Immunizations	Maternal/Infant	Child Health Clinic	WIC Clinic	Communicable Disease Reporting Unit
76 6724 20-1565	676 4583 384 5648	738-2508 384-1376	607-7323 384 3017	738-2522 384 0574	738-2505 384 1671	738-2503 384-1633

JAF:ON,VISSER

TEL: 1-360-647-1501

Apr 24 96

4:10 No.011 P.02

WELL #2

RESTRICTIVE COVENANT

The grantor herein is the owner of the following described real estate situated in Whatcom County, State of Washington, to wit:

Tract A of the Plat of Peaceful Valley Division 2a, as recorded in Volume 15 of Plats, pages 44-48, record of Whatcom County Auditor.

The grantee herein, Whatcom County Water District No. 13, owns and operates a well and waterworks supplying water for public use, located within an easement upon the above described real estate, to wit:

Commencing at the Southeast Corner of Tract A of the Plat of Peaceful Valley Division 2a, as recorded in Volume 15 of Plats, pages 44-48, record of Whatcom County Auditor; thence N. 2 00' 00" W., 185.00 feet along the Westerly line of said Tract A; thence N. 88 00' 00" E., 220.00 feet to the center point of the easement. Said easement being a circle with a radius of 100.00 feet.

Which well and waterworks is located upon the land of the grantor and said grantee is required to keep the water supplied from said well free from impurities which might be injurious to the public health.

It is the purpose of these grants and covenants to prevent certain practices hereinafter enumerated in the use of the said grantor's land which might contaminate said water supply.

NOW, THEREFORE, in consideration of One Dollar (\$1.00) in hand paid and other good and valuable consideration received by said grantor, the grantor agrees and covenants with the grantee, its successors and assigns, said covenants to run with the land for the benefit of the grantee, that said grantor, its heirs, successors and assigns will not construct, maintain or suffer to be constructed or maintained upon the said land of the grantor and within 100 feet of the well of the grantor, so long as the same is operated to furnish water for public consumption, and potential source of contamination, such as cesspools, sewers, privies, septic tanks, drain fields, manure piles, garbage of any kind or description, barns, chicken houses, rabbit hutches, pigpens, or other enclosures or structures for the keeping or maintenance of cows or animals, or storage of liquid or dry chemicals, herbicides, or insecticides.

WITNESS our hands this 22nd day of April, 1996. Peaceful Valley Country Club
by Eileen Foster PRES.
by Judith Lapp TROR

State of Washington)
County of Whatcom)

WHATCOM COUNTY
BELLINGHAM, WA
04/24/96 11:39 AM
REQUEST OF: C G HENDE
Shirley Forslos, AUDITOR

I, the undersigned, a Notary Public in and for the above named County and State, do hereby certify that 22nd day of April, 1996, personally appeared before me

Judith Lapp and Eileen Foster

to me known to be the individuals described in and who executed the within instrument, and acknowledge that they signed and sealed the same as their free and voluntary act and deed, for the uses and purposes therein mentioned.

Given under my hand and official seal the day and year last above written

Joe Coll

Notary Public in and for the State of Washington residing at Everett
my commission expires June 1999



File No: 5-534-119
Page: 1

APPENDIX G

Whatcom County Water District #13

WELLHEAD PROTECTION COMMITTEE

Commissioners:

Phil Cloward
522 Sprague Valley Drive
Maple Falls, WA 98266
(360) 599-1738

Jackque Fowler
2491 Blackbird Valley Lane
Maple Falls, WA 98266
(360) 599-3334

Rebecca Cayen
2261 Fall Valley Lane
Maple Falls, WA 98266
(360) 510-3137

Richard Whitson
2461 Blackbird Valley Lane
Maple Falls, WA 98266
(360) 599-1150

Robert Vandenhaak
2681 Bluejay Valley Lane
Maple Falls, WA 98266
(360) 599-1147

District Manager:

Kelly Wynn
Water & Wastewater Services, LLC
14263 Calhoun Road
Mount Vernon, WA 98273
(360) 466-4443 Ext. 201
(360) 661-0930 Cell

WELLHEAD PROTECTION PLAN

Part I

This plan was prepared for the **Whatcom County Water District # 13**, hereafter referred to as the Purveyor.

The plan is divided into two parts. Part I is general information applicable to all water systems. Part II includes the information applicable to this specific system.

A. REQUIREMENT FOR PROGRAM

Section 1428 of the 1986 Amendments to the Federal Safe Drinking water Act mandates that every state develop a wellhead protection program. The Washington Department of Health is designated lead agency for wellhead protection program development and administration. The Safe Drinking Water Act requires that all federally defined public water systems (Group A systems) using ground water as their source implement a wellhead protection program. The minimum elements of a program required by the Washington Department of Health are:

- A delineated wellhead protection area for each well, well field, or spring.
- An inventory within the wellhead protection area of all potential sources of ground water contamination.
- A management plan to reduce the likelihood that potential contaminant sources will pollute the drinking water supply.
- Contingency plans for providing alternate sources of drinking water in the event that contamination does occur.
- Inclusion of public participation while the program is developing.

B. DESCRIPTION OF GROUNDWATER SOURCES

See Part II, Table I - List of Sources of Supply

C. PROGRAM OBJECTIVE

The objectives of the wellhead protection program are:

- 1) To reasonably reduce the risk of contamination of the ground water supplying the Purveyor's well sources, and
- 2) With other utilities, cooperated and support the County aquifer protection program.

D. RELATED PROGRAMS

The disposal of hazardous chemicals in general, is regulated by County, Code through the exercise of the Board of Health function established through Chapter 70.05 of the Revised Code of Washington. The regulations include collection and storage

household hazardous waste and moderate-risk waste.

Groundwater resource (aquifer) protection regulations are enforced by County Code.

On-site sewerage disposal systems are regulated by County Code.

Transportation of hazardous waste is overseen by the local fire department.

E. PROGRAM OPERATION

The responsibility for program administration is delegated by the Purveyor to the system manager.

The system manager will undertake, or will employ qualified persons to undertake the elements of the program described hereafter.

F. ELEMENTS OF PROGRAM

The standard elements of a wellhead protection program are incorporated as follows:

1. Wellhead Protection Area

The wellhead protection areas are delineated using the "Calculated Fixed Radius" method set forth in the DOH "Ground Water Contamination Susceptibility Assessment Survey Forms", and attached herewith.

Because of the limited size of the delineation wellhead protection area initially calculated by the fixed radius method, and the predominant single family residential land use within and surrounding the area, a more detailed delineation (e.g., using the EPA analytical model GPTRAC to define the capture zone) was not scheduled for the foreseeable future. A more detailed delineation is planned only when the surrounding land use changes in a manner that would increase the potential risk of contamination.

2. Potential Sources of Contamination

The initial inventory of potential sources of ground water contamination in and around the delineated wellhead protection areas was made using the WA DOH "Ground Water Contamination Susceptibility Assessment Survey Forms", copy attached.

The WA Department of Health susceptibility rating for the wells are shown in Part II. Information on VOCs and SOCs for the source(s) of supply is provided in Part II.

3. Management Plan

The Purveyor does not have regulatory authority over land use. Such regulatory authority rests with the County aquifer protection program.

The inventory of potential sources of contamination in the Purveyor's system indicates a relatively low risk for potential groundwater contamination. Therefore, the management plan shall consist of:

- a) Notification of the County Health Department and/or Solid Waste Department of any potential sources of contamination in the "high risk" category, identified Washington State publication "Wellhead Protection program", December 1993, Tables 2, except those activities related to residential land use.
- b) Public education, as described hereafter.
- c) Monitoring of water quality, to give a warning of ground water contamination.
- d) Survey of properties where restrictive covenants govern the sanitary control radius for the utility's wells, and enforcement of the covenants when necessary.
- e) Encourage voluntary water conservation, to reduce the radius of influence of the drawdown curve, and thus, to reduce the potential for drawing in contaminated ground water.

4. **Contingency Plan**

If the operating source becomes contaminated, the Purveyor will:

- a) If necessary, implement the Purveyor's Water Shortage Response Plan to reduce water demand.
- b) Assess the impact of the contaminant on water quality; determine if water treatment will allow the continued use of the contaminated well.
- c) And if necessary, proceed with the acquisition of a replacement well site.

5. **Public Participation and Education**

The opportunity for direct public involvement is provided in the requisite public meetings for the adoption of the *Water System Plan* or *Small Water System Management Program*, water use efficiency goals, and other programs where prescribed by the agencies having jurisdiction.

Public education will be divided into the following three tasks:

- a) Whatcom County Cooperative Extension/Washington State University Beach Watchers Program or similar County program.

The Purveyor will utilize the existing public education program developed by the WSU Beach Watchers. This program combines the topics of prevention of contamination of storm water and groundwater.

The program completed to date, and to be continued by the WSU Beach Watchers, includes the following:

- The development of an educational display that features photographs depicting different forms of pollutants. It gives solutions and alternatives to use of common household "hazardous" chemicals. The display was first used at the Penn Cove Water Festival in May, 1995. It will continue to be used at other public events. Because the display is too big for some places, a smaller table-top display was also developed. The smaller display has been set up at libraries, local banks, etc.
- A series of evening lectures by the WSU Beach Watcher's "Home-Asyst" program included presentations on watershed and wellhead protection, and hazardous waste disposal.
- Several brochures have been developed or were obtained for distribution at the above displays. These include:
 - Construction Best Management Practices
 - Storm Water Runoff Information
 - Informational Quiz (for schools)
 - Business & Household Hazardous Waste (County's Solid Waste Program)

b) Distribution of General Information Brochures

Brochures pertaining to the prevention of groundwater contamination will be periodically included with utility bills (See Attachment 'A')

c) Distribution of Notification Letters

All property owners in the wellhead protection area boundaries and all property owners in the subdivision will receive a letter notifying them of the presence of the wells and the need to prevent groundwater contamination (See sample letter, Attachment 'B' in Part II). The County Health Department, and the local fire department will be notified at the same time.

d) Consumers Confidence Report

Include information in the annual consumer confidence report about wellhead protection and disposal of hazardous waste products.

6. Spill Response Plan

The Purveyor relies upon the local fire department, and the County Solid Waste

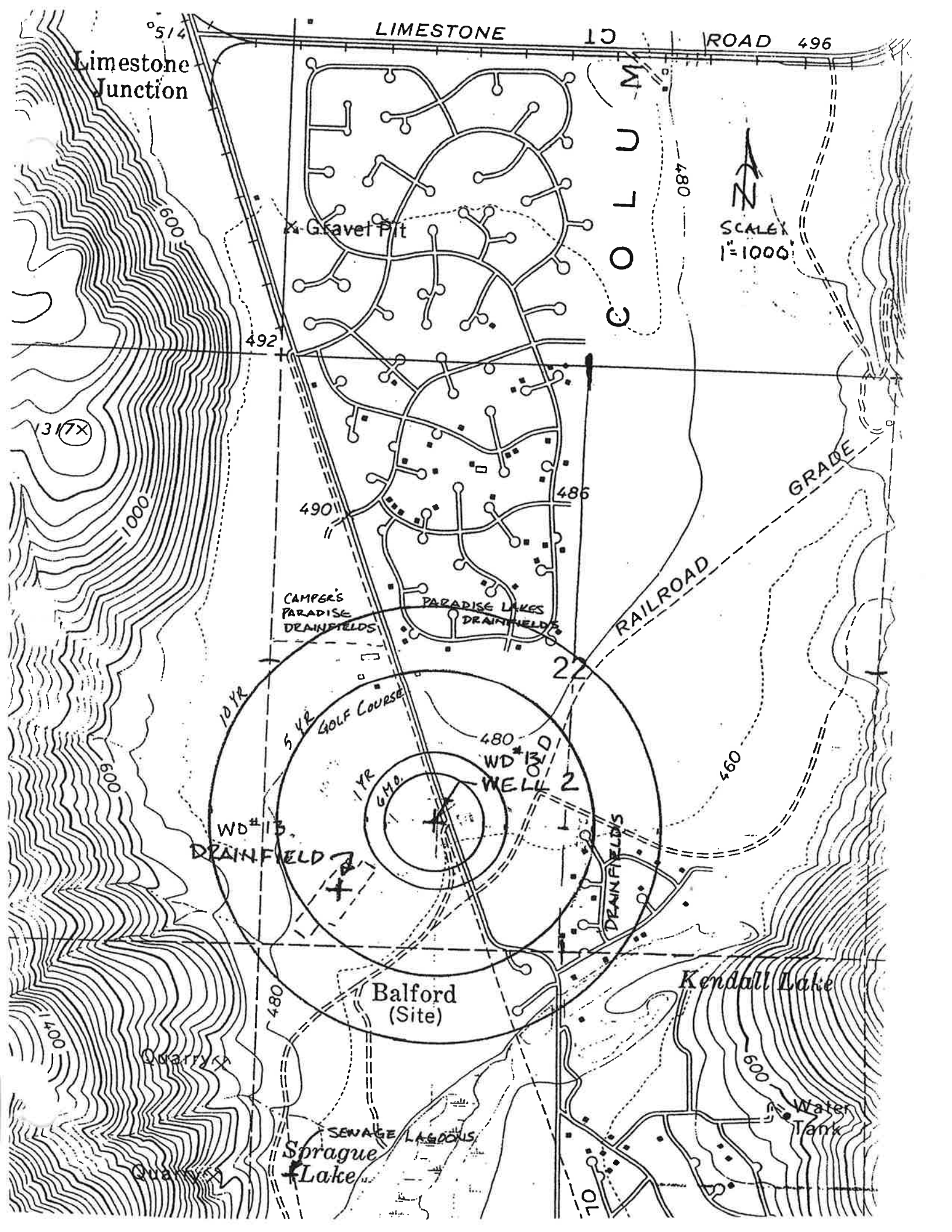
Department (hazardous material coordinator) to be the lead agencies in spill response. It is assumed that the qualifications of these agencies incident and spill response plans will be suitable for the protection of the wells.

E. REFERENCE MATERIAL

The following publications should be retained by the utility as references for its wellhead protection program:

"Wellhead Protection Program", December 1993, Washington Department of Health

"Protecting Local Ground-Water Supplies Through Wellhead Protection", May 1991, US Environmental Protection Agency (publication EPA 570/9-91-007).



LIMESTONE

13

ROAD 496

Limestone Junction

C O L U M B I

SCALE
1" = 1000'

Gravel Pit

492

490

486

CAMPERS PARADISE DRAINFIELDS

PARADISE LAKES DRAINFIELDS

RAILROAD

GRADE

10 YR

5 YR

GOLF COURSE

480

WD #13 DRAINFIELD

WELL 2

1 YR

6 MO.

WD #13 DRAINFIELD

DRAINFIELDS

460

Balford (Site)

Kendall Lake

Quarry

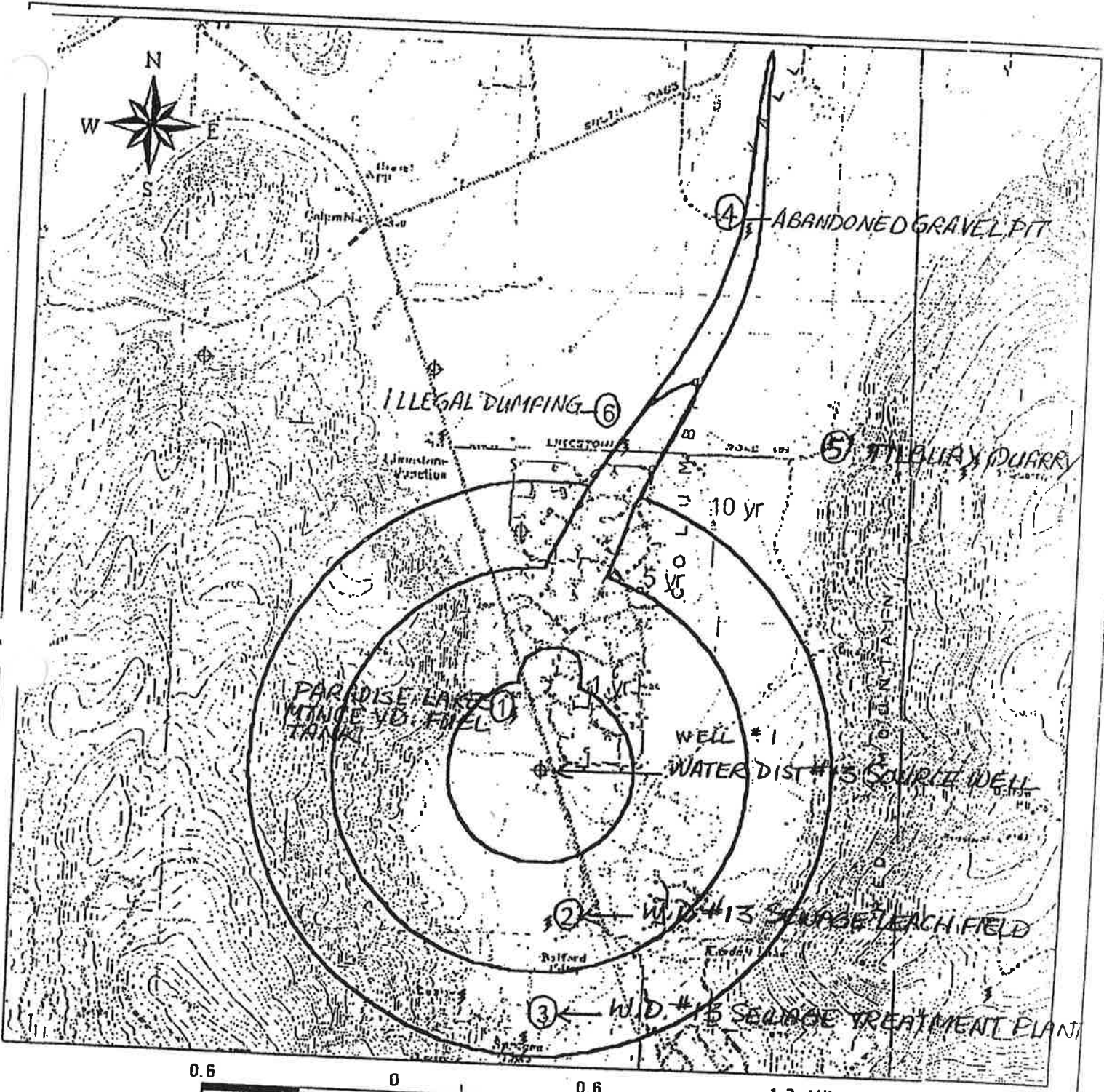
Quarry

SEWAGE LAGOONS
Sprague Lake

Water Tank

10

600



Whatcom County Water Distict 13 Wellhead Protection Areas

WELL NO 1

Legend

- Wellhead Protection Zone
- Potential Contaminant Source

Wellhead protection zones were determined by combining results of the calculated fixed radius method and the EPA WhAEM



**Ground Water Contamination
Susceptibility Assessment Survey Form
Version 2.2**

IMPORTANT! Please complete one form for each ground water source (well, wellfield, spring) used in your water system. Photocopy as necessary.

PART I: System Information

Well owner/manager : WHATCOM CO. WATER DIST. 13, JANA CRITTENDEN, MGR.

Water system name : WATER DISTRICT 13

County: WHATCOM

Water system number: 959143 Source number: 02

Well depth: 121 (ft.) (From WFI form)

Source name: WELL No 2

WA well identification tag number: _____

_____ well not tagged

Number of connections: 385

Population served: 838

Township: 40N

Range: 5E

Section: 22

1/4 1/4 Section: SE 1/4 of SW 1/4

Latitude/longitude (if available): 48° 56' 21" , 122° 08' 48"

How was lat./long. determined?

_____ global positioning device _____ survey topographic map
_____ other: _____

* Please refer to Assistance Packet for details and explanations of all questions in Parts II through V.

PART II: Well Construction and Source Information

1) Date well originally constructed: 03/04/97 month/day/year

last reconstruction: / / month/day/year

_____ information unavailable

PART III: Hydrogeologic Information

1) Depth to top of open interval: [check one]

- (less than) 20 ft 20-50 ft 50-100 ft 100-200 ft (greater than) 200 ft
 information unavailable

2) Depth to ground water (static water level):

- (less than) 20 ft 20-50 ft 50-100 ft (greater than) 100 ft
 flowing well/spring (artesian)

How was water level determined?

- well log other: _____
 depth to ground water unknown

3) If source is a flowing well or spring, what is the confining pressure:

- _____ psi (pounds per square inch)
or
_____ feet above wellhead

If source is a flowing well or spring, is there a surface impoundment, reservoir, or catchment associated with this source: YES NO

5) Wellhead elevation (height above mean sea level): 475 (ft)

How was elevation determined? topographic map Drilling/Well Log altimeter

other: SEWER DATUM

information unavailable

6) Confining layers: (This can be completed only for those sources with a drilling log, well log or geologic report describing subsurface conditions. Please refer to assistance package for example.)

- evidence of a confining layer in well log
 no evidence of a confining layer in well log

If there is evidence of a confining layer, is the depth to ground water more than 20 feet above the bottom of the lowest confining layer? YES NO

information unavailable

PART IV: Mapping Your Ground Water Resource

Annual volume of water pumped: 20,000,000 (gallons)

How was this determined?

meter

estimated: pumping rate (_____)

pump capacity (_____)

other: 1/2 TOTAL DISTRICT AVERAGE ANNUAL USE

2) "Calculated Fixed Radius" estimate of ground water movement:
(see Instruction Packet)

6 month ground water travel time : 440' (ft)

1 year ground water travel time : 620' (ft)

5 year ground water travel time: 1390' (ft)

10 year ground water travel time: 1970' (ft)

Information available on length of screened/open interval?

YES NO

Length of screened/open interval: 15' (ft)

3) Is there a river, lake, pond, stream, or other obvious surface water body within the 6 month time of travel boundary? YES NO (mark and identify on map).

4) Is there a stormwater and/or wastewater facility, treatment lagoon, or holding pond located within the 6 month time of travel boundary? YES NO (mark and identify on map).

Comments: _____

2) Source specific water quality records:

Please indicate the occurrence of any test results since 1986 that meet the following conditions:
(Unless listed on assessment, MCLs are listed in assistance package.)

A. Nitrate: (Nitrate MCL = 10 mg/l)

- Results greater than MCL
- (less than) 2 mg/liter nitrate
- 2-5 mg/liter nitrate
- (greater than) 5 mg/liter nitrate
- Nitrate sampling records unavailable

YES

B. VOCs: (VOC detection level 0.5 ug/l or 0.0005 mg/l.)

- Results greater than MCL or SAL
- VOCs detected at least once
- VOC test performed but never detected
- VOC sampling records unavailable

YES

X

C. EDB/DBCP:

(EDB MCL = 0.05 ug/l or 0.00005 mg/l. DBCP MCL = 0.2 ug/l or 0.0002 mg/l.)

- EDB/DBCP detected below MCL at least once
- EDB/DBCP detected above MCL at least once
- EDB/DBCP never detected
- EDB/DBCP tests required but not yet completed
- EDB/DBCP tests not required

YES

X

D. Other SOCs (pesticides and other synthetic organic chemicals):

- Other SOC s detected
- Other SOC tests performed but none detected *
- Other SOC tests not performed

YES

X

*If any SOC s in addition to EDB/DBCP were detected, please identify and date. If other SOC tests were performed, but no SOC s detected, list test methods here:

3) Is the source located in an aquifer with a high horizontal flow rate? (These can include sources located on flood plains of large rivers, artesian wells with high water pressure, and/or shallow flowing wells and springs.)

YES NO

4) Are there other high capacity wells (agricultural, municipal and/or industrial) located within the CFRs?

a) Presence of ground water extraction wells removing more than approximately 500 gal/min within...

	YES	NO	unknown
6 month travel time	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
6 month-1 year travel time	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
1-5 year travel time	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
5-10 year travel time	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

b) Presence of ground water recharge wells (dry wells) or heavy irrigation within...

	YES	NO	unknown
1 year travel time	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
1-5 year travel time	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
5-10 year travel time	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Please identify or describe additional hydrologic or geographic conditions that you believe may affect the type of the zone of contribution for this source. Where possible, reference them to locations on the map produced in Part IV.

HYDRAULIC GRADIENT NORTH TO SOUTH, S = 0.0027 FT/FT

SEE ATTACHED CAPTURE ZONE CALCULATIONS FROM GEOENGINEERS

WELL #1

WELL SITE EASEMENT

01201

1410319

THE GRANTORS, Peaceful Valley, a Washington Limited Partnership, for a valuable consideration, receipt of which is hereby acknowledged, conveys to Whatcom County Water District No. 13, a municipal corporation, an easement for the existing well and protective zone on, across, and under the following described real property:

Beginning at the Northwest corner of the plat of Peaceful Valley, Division 1, located in Section 22, Township 40 North, Range 5E, W.M., thence commencing North 87° 25' 57" West, which is the same bearing along the North side of said plat at this point, to its intersection with the centerline of County Road No. 361, more commonly known as the Sumas-Kendall Road, thence south 68° 44' 17" East a distance of 579 feet to the well casing and source of Water District No. 13 water supply. The well tract easement area and protective zone is a circle with a 200 foot radius whose radius point is the well casing.

THE GRANTORS further acknowledge and agree that said Water District No. 13 shall have such additional access as may be necessary or convenient for the maintenance and repair of said well and water lines appurtenant thereto on condition that upon completion of said maintenance and repair that the property be restored as near as practicable to its existing condition prior to the maintenance and repairs consistent with good engineering practices.

DATED this 12th day of January, 1982.

PEACEFUL VALLEY, a Washington Limited Partnership.

By H. E. Isenhart
H. E. ISENHART, General Partner

W.C. DIST #13
JAN 25 10 54 AM '82
REGISTRY
JOAC OJEN, CLERK
WHATCOM COUNTY, WASH.

(STATE OF WASHINGTON) ss
COUNTY OF WHATCOM)

ON THIS DAY PERSONALLY APPEARED BEFORE ME H. E. Isenhart known to me to be a General Partner of Peaceful Valley, a Washington Limited Partnership, who executed the within and foregoing instrument on behalf of the partnership and acknowledged that he signed the same as his free and voluntary act and deed of the Limited Partnership for the uses therein mentioned.

GIVEN UNDER MY HAND and official seal this 12th day of January, 1982.

Joseph Rogers
NOTARY PUBLIC, in and for the State of Washington, residing at Bellingham.

Return to:
Whatcom County Water District # 13
8193 Kendall Rd.
Maple Falls, Wa. 96266

WELL #2

WATER WELL REPORT

Start Card No. W 075802
 Unique Well I.D. #
 Water Right Permit No. 01-221709

STATE OF WASHINGTON

(1) OWNER: Name WHATCOM CTY WATER DIST 13 Address P O BOX 200 MAPLE FALLS, WA 98266

(2) LOCATION OF WELL: County WHATCOM - SW 1/4 NW 1/4 Sec 22 T 40 N., R 5E W1

(2a) STREET ADDRESS OF WELL (or nearest address) PEACEFUL VALLEY & BALFOUR, KENDALL

(3) PROPOSED USE: MUNICIPAL (1a) WELL LOG

(4) TYPE OF WORK: Owner's Number of well (if more than one) 2 Method: ROTARY
 NEW WELL

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change in formation.

(5) DIMENSIONS: Diameter of well 10 inches
 Drilled 121 ft. Depth of completed well 121 ft.

MATERIAL	FROM	TO
GRAVEL & SAND & LITTLE CLAY (brown)	0	60
GRAVEL SAND & WATER	60	85
GRAVEL & SAND BROWN CLAY & WATER	85	102
WATER GRAVEL & SAND	102	

(6) CONSTRUCTION DETAILS: Casing installed: 10" Dia. from 0 ft. to 103 ft. WELDED
 - Dia. from ft. to ft.
 - Dia. from ft. to ft.

Perforations: NO
 Type of perforator used
 SIZE of perforations in. by in.
 perforations from ft. to ft.
 perforations from ft. to ft.
 perforations from ft. to ft.

Screens: YES 5' riser; 2' extension
 Manufacturer's Name JOHNSON
 Type STAINLESS STEEL Model No.
 Dia. 10 slot size 40 from 104 ft. to 109 ft.
 Dia. 10 slot size 50 from 109 ft. to 119 ft.

Gravel packed: NO
 Gravel placed from ft. to ft. Size of gravel ft.

Face seal: YES To what depth? 10 ft.
 Material used in seal BENTONITE
 Did any strata contain unusable water? NO
 Type of water Depth of strata ft.
 Method of sealing strata off

(7) PUMP: Manufacturer's Name Type H.P.

(8) WATER LEVELS: Land-surface elevation above mean sea level ... ft.
 Static level 29 ft. below top of well Date 02/20/97
 Artesian Pressure lbs. per square inch Date
 Artesian water controlled by

Work started 02/12/97 Completed 02/20/97

(9) WELL TESTS: Drawdown is amount water level is lowered below static level.
 Was a pump test made? YES If yes, by whom? BRUCE POWERS
 Yield: 475 gal./min with .04 ft. drawdown after 4 hrs.

WELL CONSTRUCTOR CERTIFICATION:
 I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

Recovery data
 Time Water Level Time Water Level Time Water Level

MANE DASHMAN PUMP & WELL DRILL
 (Person, firm, or corporation) (Type or print)

Full recovery in 3 minutes

ADDRESS PO BOX 472
 [SIGNED] *Ralph W. ...* License No. 3045
 Contractor's Registration No. BAKLMPW123LC Date 03/04/97

Date of test 03/03/97
 Hailer test gal./min. 50 ft. drawdown after hrs.
 Air test 500+ gal./min. w/ ulem wet at ft. for 4 hrs.
 Artesian flow g.p.w. Date
 Temperature of water Was a chemical analysis made? YES

RESTRICTIVE COVENANT

The grantor herein is the owner of the following described real estate situated in Whatcom County, State of Washington, to wit:

Tract A of the Plat of Peaceful Valley Division 2a, as recorded in Volume 15 of Plats, pages 44-48, record of Whatcom County Auditor.

The grantee herein, Whatcom County Water District No. 13, owns and operates a well and waterworks supplying water for public use, located within an easement upon the above described real estate, to wit:

Commencing at the Southeast Corner of Tract A of the Plat of Peaceful Valley Division 2a, as recorded in Volume 15 of Plats, pages 44-48, record of Whatcom County Auditor; thence N. 2 00' 00" W., 185.00 feet along the Westerly line of said Tract A; thence N. 88 00' 00" E., 220.00 feet to the center point of the easement. Said easement being a circle with a radius of 100.00 feet.

Which well and waterworks is located upon the land of the grantor and said grantee is required to keep the water supplied from said well free from impurities which might be injurious to the public health.

It is the purpose of these grants and covenants to prevent certain practices hereinafter enumerated in the use of the said grantor's land which might contaminate said water supply.

NOW, THEREFORE, in consideration of One Dollar (\$1.00) in hand paid and other good and valuable consideration received by said grantor, the grantor agrees and covenants with the grantee, its successors and assigns, said covenants to run with the land for the benefit of the grantee, that said grantor, its heirs, successors and assigns will not construct, maintain or suffer to be constructed or maintained upon the said land of the grantor and within 100 feet of the well of the grantee, so long as the same is operated to furnish water for public consumption, and potential source of contamination, such as cesspools, sewers, privies, septic tanks, drain fields, manure piles, barge of any kind or description, barns, chicken houses, rabbit hutches, pigpens, or other enclosures or structures the keeping or maintenance of cows or animals, or storage of liquid or dry chemicals, herbicides, or insecticides.

WITNESS our hands this 22nd day of April, 1996. Peaceful Valley Country Club
by Eileen Foster PRES.
by Judith Lapp TRSAS.

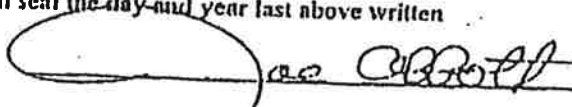

State of Washington)
55
County of Whatcom)

WHATCOM COUNTY
BELLINGHAM, WA
04/24/96 11:39 AM
REQUEST OF: C G HENDE
Shirley Forslos, AUDITOR
BY: J. R. DEWITT
\$7.00 D/RC

I, the undersigned, a Notary Public in and for the above named County and State, do hereby certify that on the 22nd day of April, 1996, personally appeared before me Judith Lapp and Eileen Foster

to me known to be the individuals described in and who executed the within instrument, and acknowledge that they signed and sealed the same as their free and voluntary act and deed, for the uses and purposes therein mentioned.

Given under my hand and official seal the day and year last above written


Notary Public in and for the State of Washington residing at Everett, WA
my commission expires June 19, 1997


Whatcom County Water District # 13
532 Sprague Valley Dr. Maple Falls, WA 98266
360-599-1801

PUBLIC NOTIFICATION LIST
POTENTIAL CONTAMINANT SOURCES

NAME ID PHONE	ADDRESS TYPE	CITY WHP ZONE	STATE ZIP PRIORITY
1 Whatcom County Water District # 13 360-599-1801	532 Sprague Valley Dr. Sewage Leach Field	Maple Falls 5 Yr	WA 98266 Moderate
2 Whatcom County Water District # 13 360-599-1801	532 Sprague Valley Dr. Sewage Treatment Plant	Maple Falls 10 Yr	WA 98266 Moderate
3 Tilbury Quarry 360-988-8793	6559 Limestone Rd. PO Box 37 Hard Rock Mining	Sumas 10	WA 98295 High
4 East Limestone Road	Limestone Rd off Kendall Rd. Illegal dumping	Sumas Sumas	WA 98295 WA 98295

Emergency Responders

NAME	ADDRESS ZIP	CITY PHONE	STATE
Whatcom Co. Sherriff Dept	311 Grand Ave 98225	Bellingham 360-676-6650	WA
Whatcom Co. Fire District # 14	PO Box 14 or 7520 Kendall Rd 98266	Maple Falls 360-599-2823	WA
Whatcom Co. DOT	901 W. Smith Rd 98226	Bellingham 360-676-6759	WA
Paul O'Brein Dept of Ecology NW Region	3190 160th Ave SE 98008-5452	Bellevue 425-649-7130	WA
County Health & Human Svcs	509 Girard Street 98225	Bellingham 360-676-6724	WA

of the above should receive the emergency responder letter with a copy of the map and a copy of the potential contaminant list above.

Water District Manager
Telephone: 360-599-1801

LETTER OF NOTIFICATION - WELLHEAD PROTECTION PLAN

Dear Business Owner,

Whatcom County Water District No. 13 is developing a Wellhead Protection Program as required by the State Department of Health. Wellhead protection involves protecting the land area surrounding our wells in order to prevent contamination of the drinking water supply. Part of this plan requires notification to all potential sources of contamination of their responsibility helping prevent contamination to our water source. The district has two wells; the main well is north of the golf course on the first fairway, the backup well is near the entrance to the country club. (see map).

We are informing you of the sensitivity of your business location with regard to our wellhead protection area. This should serve as a reminder that any hazardous material spilled onto the ground, put into a septic system or an abandoned well, or traveling along an irrigation well's casing, has the potential of contaminating our drinking water supply. Some potential contamination sources are:

- Dumping motor oil, gasoline, antifreeze or similar fluids onto the ground.
- Leaking fuel storage tanks and distribution lines.
- Accidental spillage or improper application of pesticides or fertilizers.
- Improper use or failure of a septic system or dumping unwanted chemicals or industrial wastewater into your septic system.

Because everyone plays a role in wellhead protection, local residents are also being contacted with similar information. We are fortunate to have a good supply of high quality drinking water in Peaceful Valley. Please help us keep it that way for our continued good use, and for those that come along after us. Thank you for your attention to this matter. If you have any questions about the plan, please feel free to contact me.

Sincerely,

Kelly Wynn
Operations Manager Telephone: 599-1801

Whatcom County Water District # 13
532 Sprague Valley Dr. Maple Falls, WA 98266
360-599-1801

Dear Emergency Responder,

Whatcom County Water District No. 13 is developing a Wellhead Protection Program as required by the state Department of Health. Wellhead Protection includes a program to help protect the land area surrounding our source wells.

As part of this program, our water system must coordinate with the local agencies responsible for incident/spill response procedures. Using the results of the susceptibility assessment and the findings of the wellhead protection inventory, local emergency responders are asked to evaluate whether changes in incident/spill response procedures are needed to better protect groundwater within wellhead protection areas. If a public water system's source water is determined to be vulnerable to surface activities, special procedures may need to be incorporated into local emergency response plans.

A map depicting the wellhead protection areas is enclosed for your review along with a list of potential contaminant sources. Table 1 shows the susceptibility and vulnerability ratings for our wells. These criteria refer to the likelihood of the source water being contaminated. The susceptibility rating is based on aquifer conditions, while vulnerability refers to the actual construction and condition of the wells.

Source Number	Susceptibility	Vulnerability
SO1	Moderate	Low
SO2 (backup well)	N/A	N/A

Please be aware that residential and irrigation wells are allowed within the Peaceful Valley Wellhead Protection Area, therefore any spill, not just those proximate to the District's wellheads, should be treated with extreme caution. Also note the close proximity of our source wells to the Kendall Road, making adequate hazardous spill response on this road imperative.

An acknowledgement of receipt of this letter from your office, and/or a response regarding your spill response plan, would be appreciated. Thank you for your attention to this matter. If you have any questions about the plan, please feel free to contact me @ 360-599-1801.

Sincerely,

Kelly Wynn
Operations Manager

LETTER OF NOTIFICATION - WELHEAD PROTECTION PLAN

Dear Residents,

The Whatcom County Water District #13 water system is developing a wellhead protection program as required by the State Department of Health. Wellhead protection involves protecting the land area surrounding our wells. This plan will help prevent the contamination of our drinking water supply.

Part of this plan is a letter of notification to all potential sources of contamination to our wells, including residents. Many of us live within the wellhead protection zones surrounding the wells. The district has two wells; the main well is north of the gold course on the first fairway, the backup well is near the entrance to the country club.

This letter is intended to inform you of the location of our wells and to serve as a reminder that hazardous materials put into the ground (or in septic systems) can contaminate our drinking water supply. Some examples of hazardous materials are....

- Household chemicals including cleaners, bleach, and furniture polish.
- Home improvement supplies including paint, paint thinner, and other solvents
- Automotive fluids including motor oil, gasoline, antifreeze or similar products.
- Lawn and garden supplies including fertilizers and pesticides.

These materials should only be used and disposed of according to manufacturers label instructions. Any of these and other unwanted or unused hazardous materials can be disposed of free of charge at:

HOUSEHOLD HAZARDOUS WASTE DISPOSAL

RDS Inc., 4916 La Bounty Place, Ferndale, WA
For Recycling Information Call Recycling Hotline 676-5723
And

Most Service Stations Accept Used Motor Oil and other Auto Fluids for Free

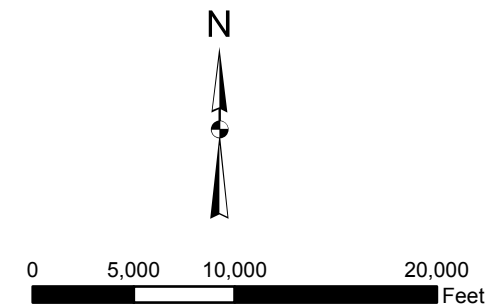
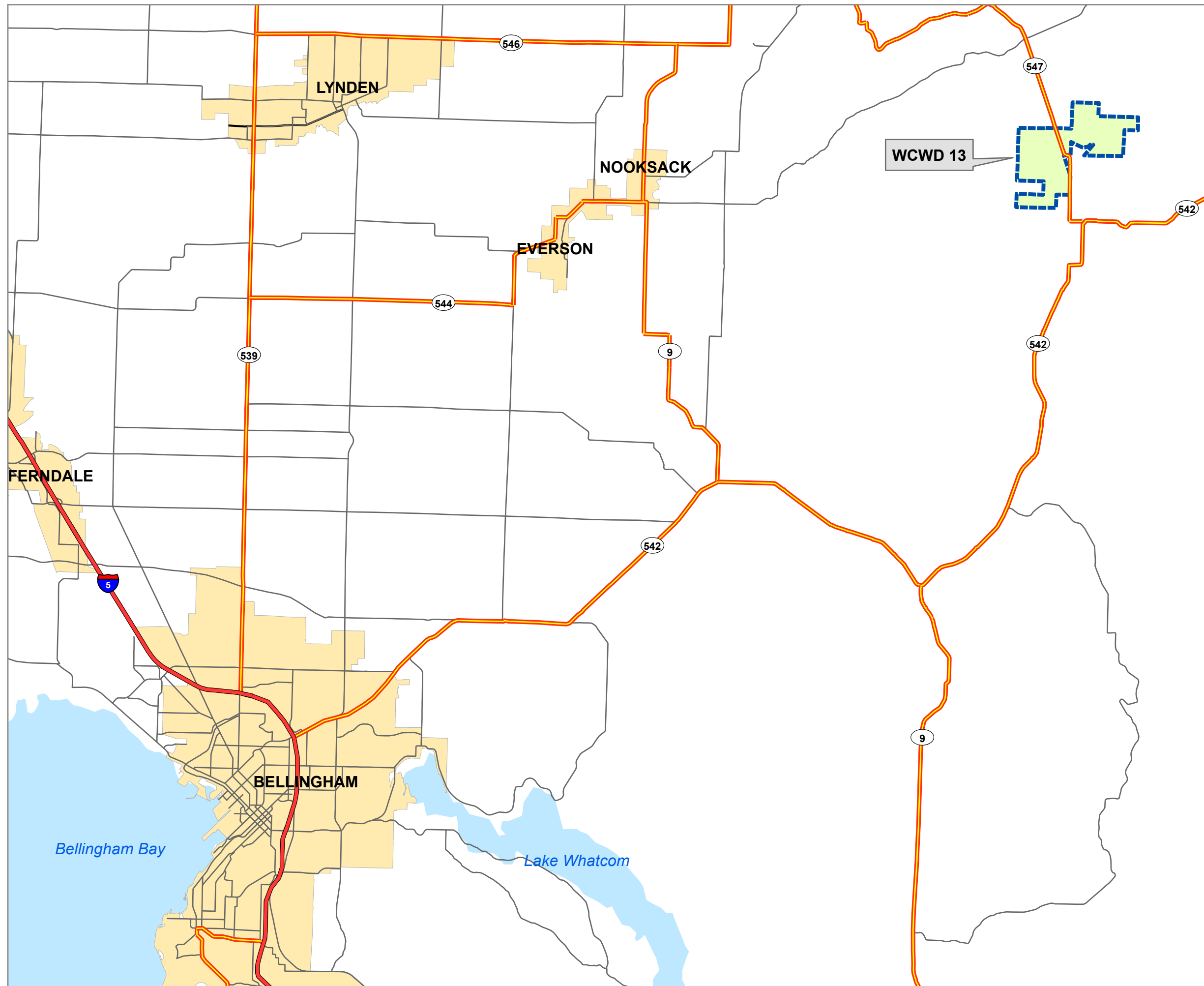
In addition, private residential wells within the district's wellhead protection area provide a potential pathway for contamination to our aquifer. Wells provide a rapid pathway into groundwater from within and along the outside of the well's casing. If you have an existing residential well or intend to establish one, please insure that the well is constructed properly and you are careful maintaining an acceptable sanitary control zone. Information and brochures are available from the Department of Ecology regarding safe well practices.

We are fortunate to have a very good supply of drinking water here in Peaceful Valley. It should be everyone's intent to keep it that way for our continued good use, and for those that come along after us. Thank you for following these guidelines. If you have any questions about this matter, please feel free to contact me.

Sincerely,


Kelly Wynn
Operations Manager
Telephone: 360-599-1801

APPENDIX H

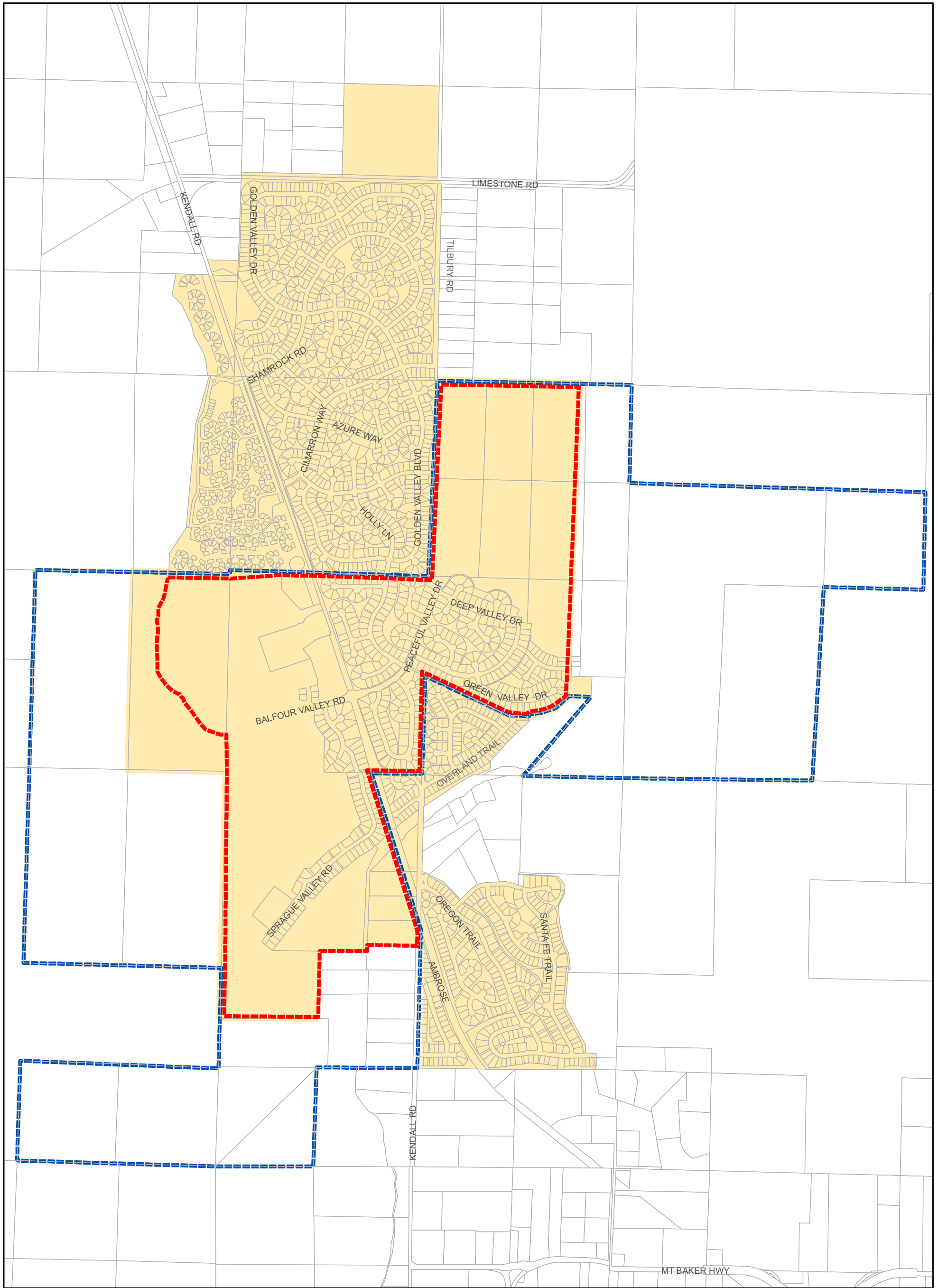


- LEGEND:**
- INTERSTATE
 - HIGHWAYS
 - ARTERIAL ROADS
 - CITY LIMITS
 - W.C. WATER DISTRICT #13
 - WATER BODIES





**WHATCOM COUNTY
 WATER DISTRICT #13**
 SMALL WATER SYSTEM MANAGEMENT PLAN
 FIGURE 1
 LOCATION MAP

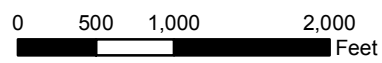

Gray & Osborne, Inc.
 CONSULTING ENGINEERS

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LEGEND:

-  SEWER SERVICE AREA
-  W.C. WATER DISTRICT #13/WATER SERVICE AREA
-  COUNTY UGA
-  PARCELS

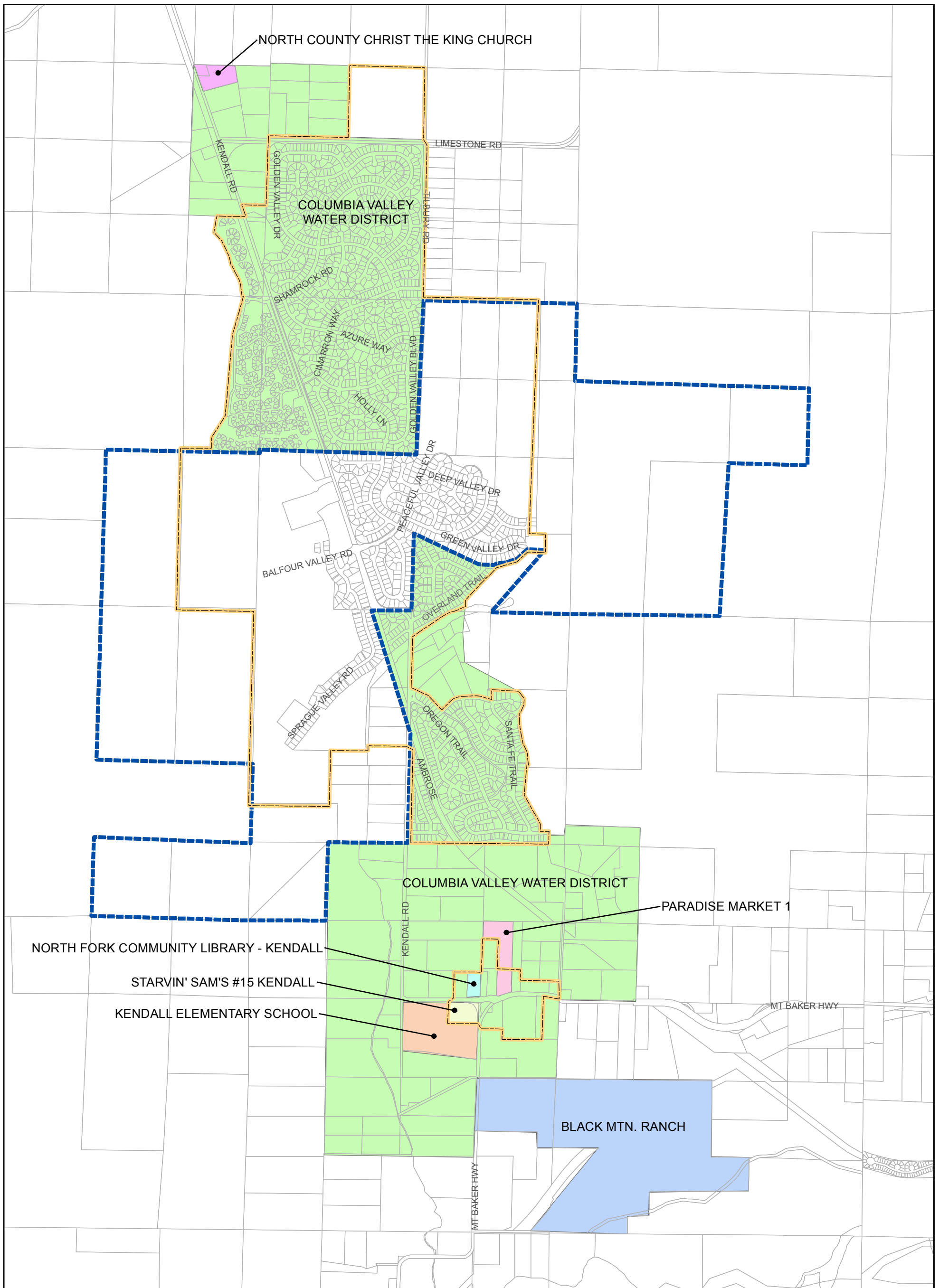


**WHATCOM COUNTY
WATER DISTRICT #13**

SMALL WATER SYSTEM MANAGEMENT PLAN
FIGURE 2
SERVICE AREA AND UGA

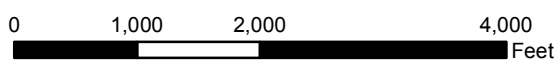

Gray & Osborne, Inc.
CONSULTING ENGINEERS

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LEGEND:

- | | |
|--------------------------------|--|
| PARCELS | KENDALL ELEMENTARY SCHOOL |
| COUNTY UGA | NORTH FORK COMMUNITY LIBRARY - KENDALL |
| W.C. WATER DISTRICT #13 | PARADISE MARKET 1 |
| BLACK MTN. RANCH | STARVIN' SAM'S #15 KENDALL |
| COLUMBIA VALLEY WATER DISTRICT | |

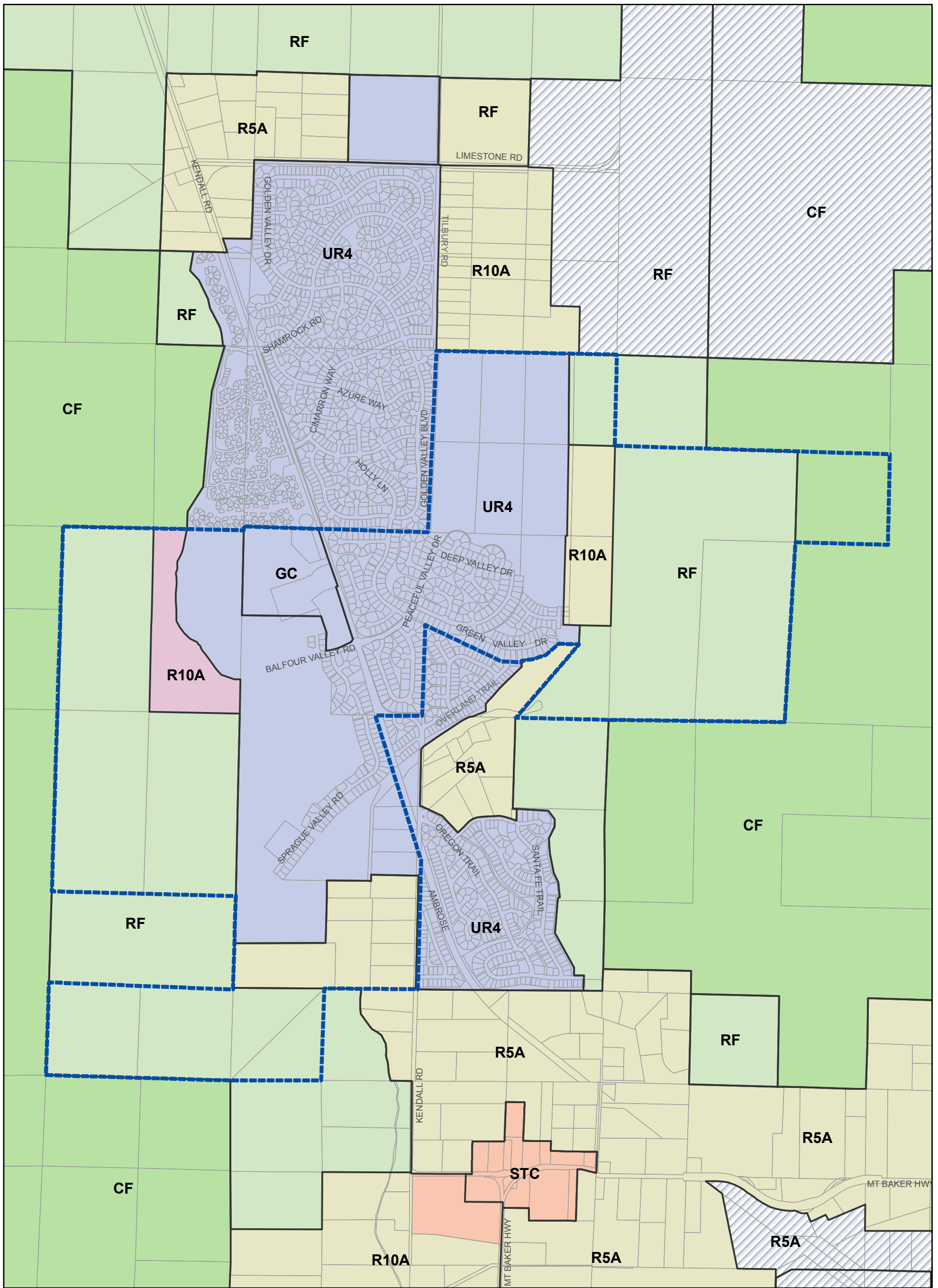


**WHATCOM COUNTY
WATER DISTRICT #13**

SMALL WATER SYSTEM MANAGEMENT PLAN
FIGURE 3
ADJACENT PURVEYORS

Gray & Osborne, Inc.
CONSULTING ENGINEERS

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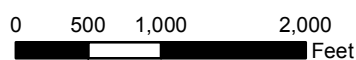
LEGEND:

- W.C. WATER DISTRICT #13
- PARCELS
- C-FOREST
- MRL
- R-FOREST
- RURAL
- RURAL COMMUNITY
- UGA
- UGAR

ZONING DESIGNATIONS

- URBAN RESIDENTIAL**
- UR4 Urban Resid. 4 Units/Acre
- RURAL**
- R5A Rural 1 Unit/5 Acres
- R10A Rural 1 Unit/10 Acres
- RESOURCES**
- CF Commercial Forestry
- COMMERCIAL**
- GC General Commercial
- STC Small Town Commercial

Source: 2016 Whatcom County Comprehensive Plan

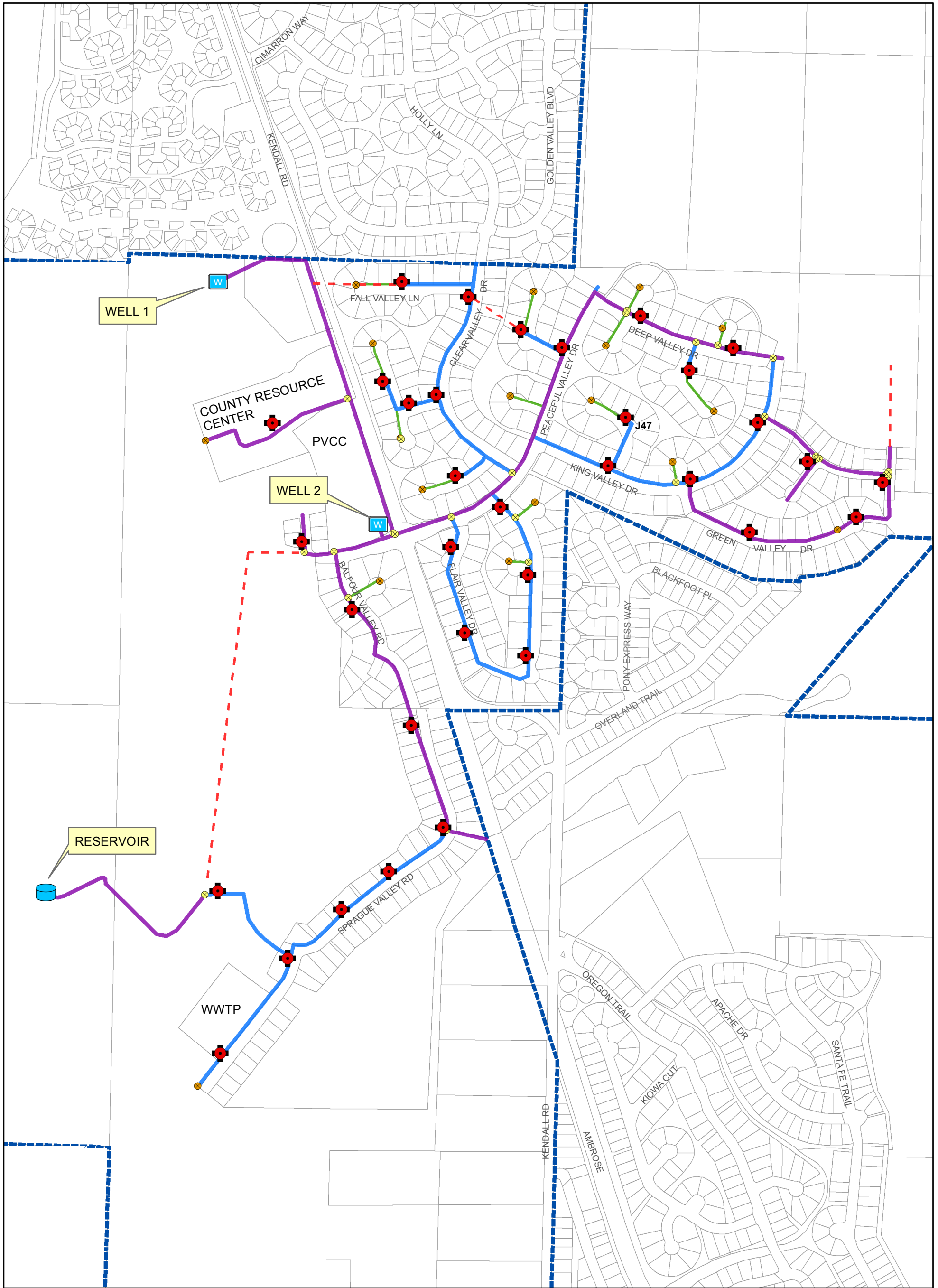


**WHATCOM COUNTY
WATER DISTRICT #13**









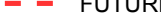


SMALL WATER SYSTEM MANAGEMENT PLAN
FIGURE 4
ZONING

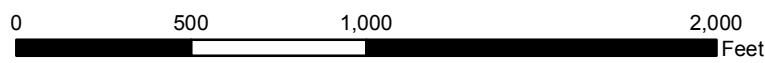
Gray & Osborne, Inc.
CONSULTING ENGINEERS

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LEGEND:

- | | | | |
|---|-------------------|---|---------------|
|  | RESERVOIR | PIPE SIZE | |
|  | WELL |  | 4 INCH |
|  | VALVE |  | 6 INCH |
|  | BLOWOFF |  | 8 INCH |
|  | FIRE HYDRANT |  | FUTURE 8 INCH |
|  | DISTRICT BOUNDARY | | |
|  | PARCELS | | |

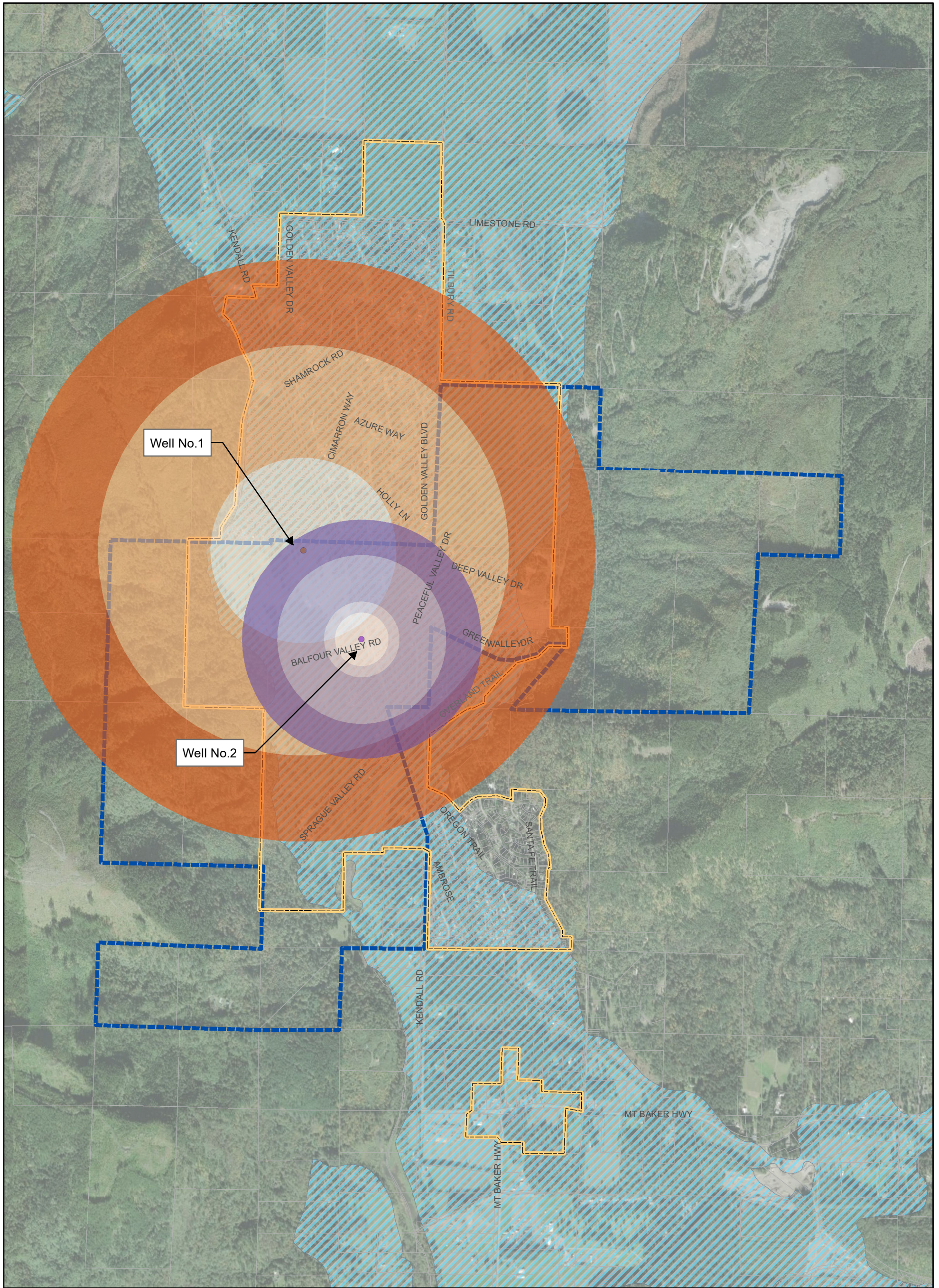


**WHATCOM COUNTY
WATER DISTRICT #13**





SMALL WATER SYSTEM MANAGEMENT PLAN
FIGURE 5
WATER SYSTEM



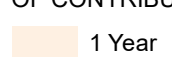
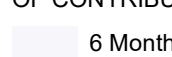






Gray & Osborne, Inc.
CONSULTING ENGINEERS

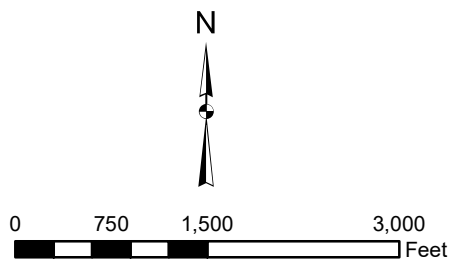
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LEGEND:


-  W.C. WATER DISTRICT #13
-  COUNTY UGA
-  PARCELS
-  AQUIFERS

- | | |
|---|---|
|  WELL 1 |  WELL 2 |
| WELLHEAD ZONE OF CONTRIBUTION | WELLHEAD ZONE OF CONTRIBUTION |
|  1 Year |  6 Month |
|  5 Year |  1 Year |
|  10 Year |  5 Year |
| |  10 Year |

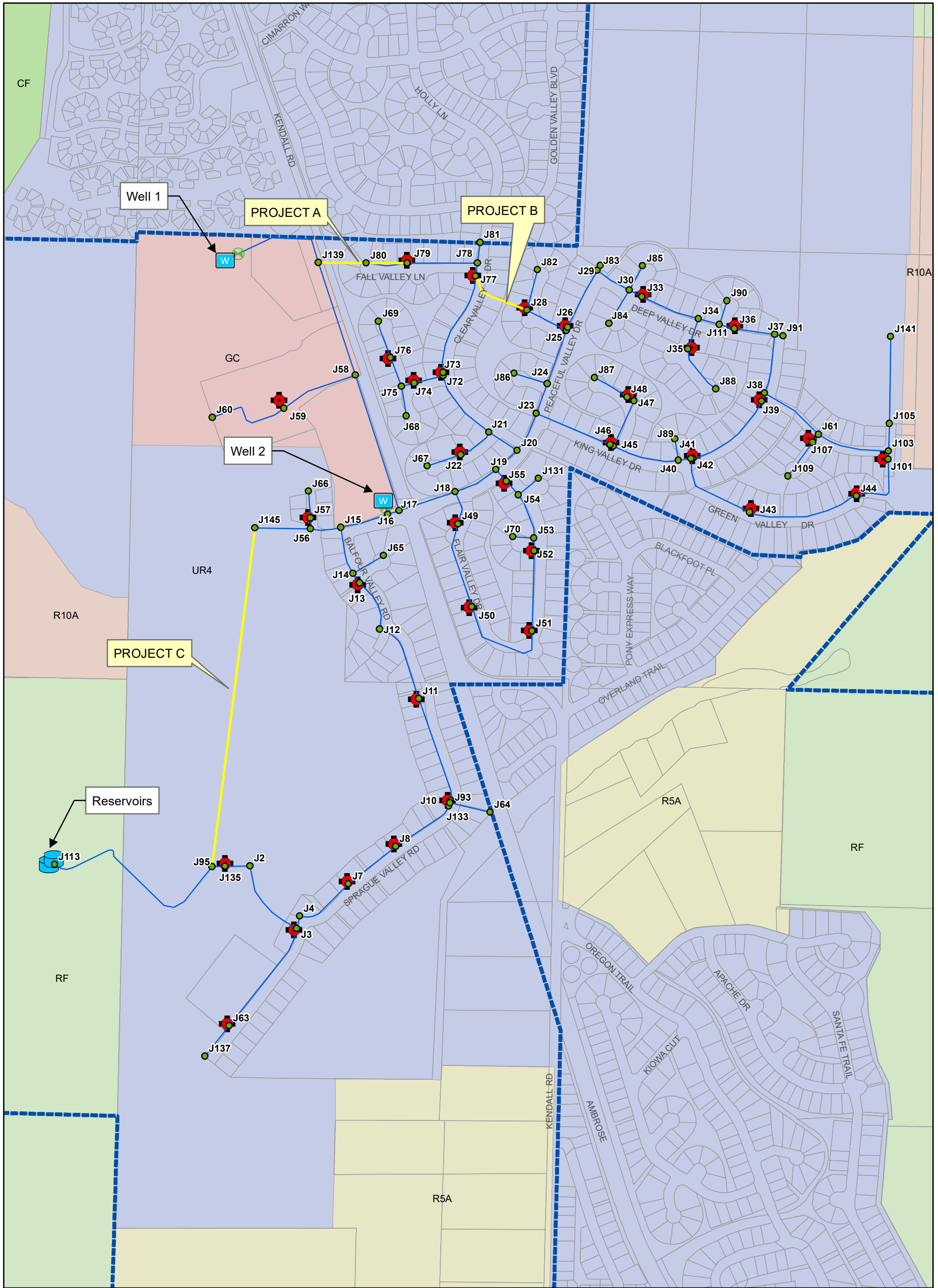


**WHATCOM COUNTY
WATER DISTRICT #13**

SMALL WATER SYSTEM MANAGEMENT PLAN
FIGURE 6
AQUIFER AREAS AND
WELLHEAD PROTECTION AREAS


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CONSULTING ENGINEERS

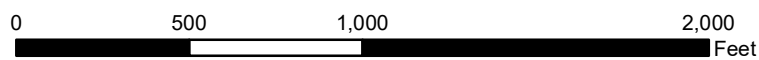
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LEGEND:


- NODE/JUNCTION "JXX" NODE IDENTIFIER
- TANK
- W WELL/RESERVOIR
- PROJECTS
- WATER MAIN
- ⊕ FIRE HYDRANT
- ▭ DISTRICT BOUNDARY
- ▭ PARCELS

Project Labels



**WHATCOM COUNTY
WATER DISTRICT #13**

SMALL WATER SYSTEM MANAGEMENT PLAN
FIGURE 7
HYDRAULIC MODEL AND CIP


Gray & Osborne, Inc.
CONSULTING ENGINEERS

M:\Whatcom County WD 13\119416 Small Water System Management Plan\GIS\Map\Model.mxd

APPENDIX I

**WHATCOM COUNTY WATER DISTRICT 13
SMALL WATER SYSTEM MANAGEMENT PLAN
TABLE 9.1**

OPERATIONS & MAINTENANCE

Line #	O&M Revenue	Rate	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
1	Beginning Operating Fund Balance		\$50,000	\$47,838	\$49,033	\$50,259	\$51,516	\$52,804	\$54,124	\$55,477	\$56,864	\$58,285	\$59,742	\$61,236	\$62,767	\$64,336	\$65,945	\$67,593	\$69,283	\$71,015	\$72,790	\$74,610	\$76,475
2	SFR ERUs	1.78%	369	376	383	390	397	404	411	418	425	433	441	449	457	465	473	481	490	499	508	517	526
3	SFR Monthly Service Rate	3.00%	\$21.50	\$23.00	\$25.00	\$25.75	\$26.52	\$27.32	\$28.14	\$28.98	\$29.85	\$30.75	\$31.67	\$32.62	\$33.60	\$34.61	\$35.64	\$36.71	\$37.81	\$38.95	\$40.12	\$41.32	\$42.56
	Commercial ERUs	1.78%	8	8	8	8	8	8	8	8	8	8	9	9	10	10	11	11	12	12	13	13	
	Commercial Monthly Service Rate	3.00%	\$21.50	\$23.00	\$25.00	\$25.75	\$26.52	\$27.32	\$28.14	\$28.98	\$29.85	\$30.75	\$31.67	\$32.62	\$33.60	\$34.61	\$35.64	\$36.71	\$37.81	\$38.95	\$40.12	\$41.32	\$42.56
	Total RCEs		377	384	391	398	405	412	419	426	433	441	450	458	467	475	484	492	502	511	521	530	539
	Estimated Commodity Revenue		\$15,000	\$15,000	\$15,000	\$15,000	\$14,000	\$14,000	\$14,000	\$14,000	\$14,000	\$14,000	\$14,000	\$14,000	\$14,000	\$14,000	\$14,000	\$14,000	\$14,000	\$14,000	\$14,000	\$14,000	\$14,000
4	Total Rate Revenue		\$112,266	\$120,984	\$132,300	\$137,982	\$142,899	\$149,061	\$155,476	\$162,155	\$169,107	\$176,712	\$185,014	\$193,276	\$202,283	\$211,253	\$221,020	\$230,756	\$241,796	\$252,836	\$264,816	\$276,803	\$289,283
5	Non-Rate Revenue	4.50%	\$5,052	\$5,444	\$5,954	\$6,209	\$6,430	\$6,708	\$6,996	\$7,297	\$7,610	\$7,952	\$8,326	\$8,697	\$9,103	\$9,506	\$9,946	\$10,384	\$10,881	\$11,378	\$11,917	\$12,456	\$13,018
6	Investment Interest on Beginning Balance	2.00%	\$1,000	\$957	\$981	\$1,005	\$1,030	\$1,056	\$1,082	\$1,110	\$1,137	\$1,166	\$1,195	\$1,225	\$1,255	\$1,287	\$1,319	\$1,352	\$1,386	\$1,420	\$1,456	\$1,492	\$1,530
7	Total O&M Revenue		\$118,318	\$127,385	\$139,234	\$145,196	\$150,360	\$156,825	\$163,555	\$170,562	\$177,855	\$185,830	\$194,534	\$203,198	\$212,641	\$222,046	\$232,285	\$242,491	\$254,062	\$265,634	\$278,188	\$290,751	\$303,831
O&M Expenses																							
8	Cash O&M Expenses	2.50%	\$95,675	\$98,067	\$100,519	\$103,032	\$105,607	\$108,247	\$110,954	\$113,728	\$116,571	\$119,485	\$122,472	\$125,534	\$128,672	\$131,889	\$135,186	\$138,566	\$142,030	\$145,581	\$149,220	\$152,951	\$156,775
9	Spare		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
10	Spare		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
11	Total O&M Expenses		\$95,675	\$98,067	\$100,519	\$103,032	\$105,607	\$108,247	\$110,954	\$113,728	\$116,571	\$119,485	\$122,472	\$125,534	\$128,672	\$131,889	\$135,186	\$138,566	\$142,030	\$145,581	\$149,220	\$152,951	\$156,775
12	Operating Surplus (Deficiency)		\$22,643	\$29,318	\$38,716	\$42,165	\$44,753	\$48,577	\$52,602	\$56,834	\$61,284	\$66,345	\$72,062	\$77,664	\$83,969	\$90,157	\$97,099	\$103,926	\$112,032	\$120,054	\$128,968	\$137,800	\$147,056
13	Ending Operating Fund Balance		\$72,643	\$77,156	\$87,749	\$92,424	\$96,269	\$101,381	\$106,725	\$112,311	\$118,148	\$124,630	\$131,805	\$138,900	\$146,735	\$154,494	\$163,044	\$171,519	\$181,315	\$191,069	\$201,758	\$212,410	\$223,531
14	Required Operating Reserve, months	6	\$47,838	\$49,033	\$50,259	\$51,516	\$52,804	\$54,124	\$55,477	\$56,864	\$58,285	\$59,742	\$61,236	\$62,767	\$64,336	\$65,945	\$67,593	\$69,283	\$71,015	\$72,790	\$74,610	\$76,475	\$78,387
15	Transfer of Operating Surplus to Capital Fund		\$24,805	\$28,122	\$37,490	\$40,908	\$43,465	\$47,257	\$51,249	\$55,447	\$59,862	\$64,888	\$70,569	\$76,133	\$82,399	\$88,549	\$95,450	\$102,236	\$110,300	\$118,278	\$127,148	\$135,935	\$145,144

CAPITAL

Line #	Capital Revenue	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	
16	Beginning Capital Investment Fund		\$161,795	\$183,553	\$206,157	\$248,506	\$294,735	\$344,049	\$347,884	\$393,275	\$455,280	\$17,051	\$82,004	(\$226,269)	(\$165,216)	(\$82,617)	(\$69,752)	\$24,847	\$124,240	\$236,998	\$357,469	\$490,559	\$632,542
17	Connection Charge Revenue	\$1,939	\$5,817	\$13,573	\$13,573	\$13,573	\$13,573	\$13,573	\$13,573	\$13,573	\$13,573	\$15,512	\$17,451	\$15,512	\$17,451	\$15,512	\$17,451	\$15,512	\$19,390	\$17,451	\$19,390	\$17,451	\$17,451
18	Spare		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
19	Transfer from Operating Surplus (from Line #15)		\$24,805	\$28,122	\$37,490	\$40,908	\$43,465	\$47,257	\$51,249	\$55,447	\$59,862	\$64,888	\$70,569	\$76,133	\$82,399	\$88,549	\$95,450	\$102,236	\$110,300	\$118,278	\$127,148	\$135,935	\$145,144
20	Loan Proceeds		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1	\$2	\$3	\$4
21	Investment Interest on Beginning Balance	2.00%	\$3,236	\$3,671	\$4,123	\$4,970	\$5,895	\$6,881	\$6,958	\$7,866	\$9,106	\$341	\$1,640	\$0	\$0	\$0	\$497	\$2,485	\$4,740	\$7,149	\$9,811	\$12,651	\$12,651
22	Total Capital Fund Revenue		\$33,858	\$45,366	\$55,186	\$59,451	\$62,933	\$67,711	\$71,779	\$76,886	\$82,541	\$80,741	\$89,660	\$91,645	\$99,850	\$104,061	\$112,901	\$118,245	\$132,175	\$140,470	\$153,689	\$163,200	\$175,250
Capital Expenses																							
23	Leak Detection	\$1,200	\$1,200	\$1,236	\$1,273	\$1,311	\$1,351	\$1,391	\$1,433	\$1,476	\$1,520	\$1,566	\$1,613	\$1,661	\$1,711	\$1,762	\$1,815	\$1,870	\$1,926	\$1,983	\$2,043	\$2,104	\$2,167
24	Leak Repair	\$10,000	\$10,000	\$10,300	\$10,609	\$10,927	\$11,255	\$11,593	\$11,941	\$12,299	\$12,668	\$13,048	\$13,439	\$13,842	\$14,258	\$14,685	\$15,126	\$15,580	\$16,047	\$16,528	\$17,024	\$17,535	\$18,061
25	WUE Programmatic Tasks	\$900	\$900	\$955	\$983	\$1,013	\$1,043	\$1,075	\$1,107	\$1,140	\$1,174	\$1,210	\$1,246	\$1,283	\$1,322	\$1,361	\$1,402	\$1,444	\$1,488	\$1,532	\$1,578	\$1,626	\$1,626
26	Water Rate Study	\$10,000	\$10,000	\$10,300																			
27	Equip Well #1 for Portable Generator	\$35,000					\$40,575																
28	Analytical Model for WHPA	\$8,000					\$9,274																
29	Water Rate Study	\$10,000							\$11,941														
30	Replace Distribution Lines - 1,000 LF	\$399,000								\$505,441													
31	Project A: Install 8" Loop from 8" Source Line (Well #1) to 6" line on Fall Valley Rd.	\$284,000										\$381,672											
32	Water Rate Study	\$10,000											\$13,842										
33	Replace Customer Meters	\$50,000													\$73,427								
34	Water Rate Study	\$10,000																					
35	Total Capital Fund Expenses	\$828,100	\$12,100	\$22,763	\$12,837	\$13,222	\$13,619	\$63,876	\$26,389	\$14,881	\$520,769	\$15,788	\$397,934	\$30,592	\$17,252	\$91,196	\$18,302	\$18,851	\$19,417	\$19,999	\$20,599	\$21,217	\$21,854
36	Ending Capital Investment Fund		\$183,553	\$206,157	\$248,506	\$294,735	\$344,049	\$347,884	\$393,275	\$455,280	\$17,051	\$82,004	(\$226,269)	(\$165,216)	(\$82,617)	(\$69,752)	\$24,847	\$124,240	\$236,998	\$357,469	\$490,559	\$632,542	\$785,938

Beginning Fund Balances per August 1, 2020

APPENDIX J

WHATCOM COUNTY WATER DISTRICT #13
IMPROVEMENT A OPTION 1 - STATE ROUTE 547 TO FALL VALLEY LN
ENGINEER'S PRELIMINARY COST ESTIMATE
September 15, 2020

<u>ITEM NO.</u>	<u>DESCRIPTION</u>	<u>ESTIMATED QUANTITY</u>	<u>UNIT</u>	<u>PRICE</u>	<u>AMOUNT</u>
1.	Mobilization, Cleanup, and Demobilization	1	LS	\$22,000.00	\$22,000
2.	Unexpected Site Changes	1	CALC	\$5,000.00	\$5,000
3.	Erosion Control	1	LS	\$2,000.00	\$2,000
4.	Locate Existing Utilities	1	LS	\$2,000.00	\$2,000
5.	Additional Potholing	2	EA	\$500.00	\$1,000
6.	Trench Excavation Safety Systems	1	LS	\$2,000.00	\$2,000
7.	Project Temporary Traffic Control	1	LS	\$6,000.00	\$6,000
8.	Removal of Unsuitable Material	20	CY	\$75.00	\$1,500
9.	Controlled Density Fill	5	CY	\$200.00	\$1,000
10.	PVC C900 Water Pipe, 8 in. Diam. (incl. bedding)	530	LF	\$70.00	\$37,100
11.	PVC C900 Water Pipe, 8 in. Diam. (encased)	60	LF	\$60.00	\$3,600
12.	12-Inch Steel Casing Pipe	60	LF	\$200.00	\$12,000
13.	Additional Fittings	110	LB	\$4.00	\$440
14.	8-Inch Gate Valve	2	EA	\$2,000.00	\$4,000
15.	8-Inch Tapping Tee and Valve	1	EA	\$6,000.00	\$6,000
16.	Jack & Bore Launching and Receiving Pits	1	LS	\$25,000.00	\$25,000
17.	Connection to Existing Water System	2	EA	\$3,000.00	\$6,000
18.	1-Inch Service Connection	8	EA	\$1,500.00	\$12,000
19.	Bank Run Gravel	240	TN	\$30.00	\$7,200
20.	Crushed Surfacing Base Course	24	TN	\$40.00	\$960
21.	HMA Trench Repair	7	TN	\$250.00	\$1,750
22.	Site Restoration and Rehabilitation	1	LS	\$10,000.00	\$10,000
	Subtotal				\$168,550
	Contingency 20%				\$33,710
	Construction Subtotal				\$202,260
	Sales Tax at 8.5% per Washington State Dept of Revenue				\$17,192
	Total Construction Cost:				\$220,000
	Engineering, Admin, Construction Management (25%)				\$55,000
	Easement (130' x 10')				\$13,000
	TOTAL PROJECT COST				\$288,000

WHATCOM COUNTY WATER DISTRICT #13
IMPROVEMENT B OPTION 1 - CLEAR VALLEY DR TO BOULDER VALLEY LN
ENGINEER'S PRELIMINARY COST ESTIMATE
September 15, 2020

<u>ITEM NO.</u>	<u>DESCRIPTION</u>	<u>ESTIMATED QUANTITY</u>	<u>UNIT</u>	<u>PRICE</u>	<u>AMOUNT</u>
1.	Mobilization, Cleanup, and Demobilization	1	LS	\$14,000.00	\$14,000
2.	Unexpected Site Changes	1	CALC	\$5,000.00	\$5,000
3.	Erosion Control	1	LS	\$2,000.00	\$2,000
4.	Locate Existing Utilities	1	LS	\$2,000.00	\$2,000
5.	Additional Potholing	2	EA	\$500.00	\$1,000
6.	Trench Excavation Safety Systems	1	LS	\$2,000.00	\$2,000
7.	Project Temporary Traffic Control	1	LS	\$2,500.00	\$2,500
8.	Removal of Unsuitable Material	15	CY	\$75.00	\$1,125
9.	Controlled Density Fill	5	CY	\$200.00	\$1,000
10.	PVC C900 Water Pipe, 8 in. Diam. (incl. bedding)	360	LF	\$70.00	\$25,200
11.	Additional Fittings	75	LB	\$4.00	\$300
12.	8-Inch Gate Valve	2	EA	\$2,000.00	\$4,000
13.	8-Inch Tapping Tee and Valve	2	EA	\$6,000.00	\$12,000
14.	Connection to Existing Water System	2	EA	\$3,000.00	\$6,000
15.	1-Inch Service Connection	2	EA	\$1,500.00	\$3,000
16.	Bank Run Gravel	160	TN	\$30.00	\$4,800
17.	Crushed Surfacing Base Course	2	TN	\$40.00	\$80
18.	HMA Trench Repair	2	TN	\$250.00	\$500
19.	Site Restoration and Rehabilitation	1	LS	\$20,000.00	\$20,000
Subtotal					\$106,505
Contingency 20%					\$21,301
Subtotal					\$127,806
Sales Tax at 8.5% per Washington State Dept of Revenue					\$10,864
Total Construction Cost:					\$139,000
Engineering, Admin, Construction Management (25%)					\$34,800
Easement (290' x 10')					\$29,000
TOTAL PROJECT COST					\$203,000

APPENDIX K