Boston Harbor Water System
Part B Water System Plan

Thurston County Public Works
Thurston County, Washington

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Certificates of Engineers

Thurston County

Boston Harbor
Part B Water System Plan

The material and data contained in this report were prepared under the direction and supervision of the undersigned, whose seals as professional engineers, licensed to practice in the State of Washington, are affixed below.



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Table of Contents

1 Introduction 1-1
1.1 History 1-2
1.2 Part B WSP Review and Approval Process 1-2
2 Water System Description 2-1
2.1 Service Area Characteristics 2-1
2.1.1 Zoning 2-5
2.1.2 Nearby Purveyors 2-5
2.1.3 Service Area Policies 2-5
2.2 Existing System Description 2-5
2.2.1 Source of Supply 2-6
2.2.2 Water Rights 2-6
2.2.3 Treatment 2-7
2.2.4 Storage 2-7
2.2.5 Pressure Zones 2-7
2.2.6 Distribution System 2-7
2.3 Related Planning Documents 2-8
2.4 Operations and Maintenance Program 2-8
2.5 Distribution Facilities Design and Construction Standards 2-9
3 Planning Data and Demand Forecast 3-1
3.1 Water Production History 3-1
3.2 Service Connections and Population Served 3-3
3.3 Water Consumption History 3-4
3.4 Water Balance and Distribution System Leakage 3-6
3.5 Water Use Factors and Equivalent Residential Units 3-9
3.6 Water Demand Forecast 3-9
4 Water Rights and System Analysis 4-1
4.1 Water Rights Self-Assessment 4-1
4.2 Source Capacity Analysis 4-3
4.3 Storage Capacity Analysis 4-4
4.4 Distribution System Analysis 4-7
4.4.1 Hydraulic Model 4-7
4.4.2 Pressure Analysis 4-9
4.4.3 Fire Flow Analysis 4-10
4.5 System Capacity Summary 4-13
4.6 Water Quality Assessment 4-14
5 Wellhead Protection Program 5-1
5.1 Wellhead Protection Area 5-1
5.2 Potential Sources of Contamination 5-5
5.3 Wellhead Protection Program Implementation 5-5
6 Capital Improvement Program 6-1
6.1 Methodology 6-1
6.2 Planned Improvements 6-1
7 Financial Program 7-1
7.1 Past and Present Financials 7-1
7.2 Sources and Uses of Funds 7-3
7.2.1 Internal Sources of funds 7-3
7.2.2 External Sources of Funds 7-4

7.2.3 Uses of Funds....7-7
7.3 Capital Funding Plan....7-8
7.4 Assessment of Rates....7-12
7.5 Conclusion....7-13

Tables

Table 2-1. Boston Harbor Water System Service Area and Zoning....2-5
Table 2-2. Boston Harbor Water System Sources....2-6
Table 2-3. Boston Harbor Water Rights....2-6
Table 2-4. Boston Harbor Distribution System Piping....2-8
Table 3-1. Monthly Well Production (gallons)1, 2014-2019....3-1
Table 3-2. Average and Maximum Day Production, and Peaking Factor, 2014–2019....3-3
Table 3-3. Annual Water System Connections and Growth Rates....3-3
Table 3-4. Population Estimates for the Boston Harbor Service Area (2014-2019)....3-4
Table 3-5. Historical Water Consumption (gallons), 2014-2019[1]....3-4
Table 3-6. Monthly Water Consumption (gallons), 2014-20191....3-5
Table 3-7. 2019 Water Balance....3-7
Table 3-8. Non-Revenue Water and Distribution System Leakage (gallons)....3-8
Table 3-9. Equivalent Residential Unit (ERU) Analysis....3-9
Table 3-10. Water Demand Growth Rates, 2019-2039....3-10
Table 3-11. Water Demand Forecast....3-11
Table 4-1. Water Rights Self-Assessment....4-2
Table 4-2. Boston Harbor System-wide Source Capacity Analysis....4-3
Table 4-3. Boston Harbor Storage Capacity Analysis (current operational storage band)....4-4
Table 4-4. Boston Harbor Storage Capacity Analysis (with modified three-foot operational storage band, highest meter only)....4-6
Table 4-5. Calibration Accuracy....4-9
Table 4-6. Available Fire Flow by Hydrant and Deficiencies....4-11
Table 4-7. System Capacity Analysis Summary....4-14
Table 4-8. Water Quality Monitoring Schedule....4-14
Table 5-1. Wellhead Protection Area Contaminant Source List....5-5
Table 6-1. Boston Harbor Capital Improvement Program....6-4
Table 7-1. Maintenance & Operations Fund (4200)....7-2
Table 7-2. Capital Fund (4210)....7-3
Table 7-3. Revenue Requirement Analysis....7-8
Table 7-4. Revenue Requirement Analysis....7-10
Table 7-5. Capital Reserve Analysis....7-12
Table 7-6. Historical Water Rates....7-13
Table 7-7. EPA Affordability Calculation....7-14
Table 7-8. Water Rates with Annual Rate Increases....7-15

Figures

Figure 2-1. Boston Harbor Service Area....2-3
Figure 3-1. Monthly Water Production (2016-2019)....3-2
Figure 3-2. Percent Share of Total Consumption by Customer Category (Average 2015-2019)....3-5
Figure 3-3. Monthly Consumption (2015-2019)....3-6
Figure 3-4. Average Day and Maximum Day Demand Forecast Through 2039....3-11
Figure 4-1. Fire Flow Test Locations for Model Calibration....4-17
Figure 4-2. Maximum System Pressures....4-18
Figure 4-3. 2020 Peak Hour Demand Pressures....4-19

Figure 4-4. 2030 Peak Hour Demand Pressures 4-20
Figure 4-5. 2040 Peak Hour Demand Pressures 4-21
Figure 4-6. 2020 Available Fire Flow 4-22
Figure 4-7. 2030 Available Fire Flow 4-23
Figure 4-8. 2040 Available Fire Flow 4-24
Figure 4-9. System Pressures with Boston Harbor Marina at 1,500 gpm Fire Flow 4-25
Figure 5-1. Wellhead Protection Area for Boston Harbor Water System Wells 5 and 6 5-3

Appendices

Appendix A Part B WSP Review Process Documentation A-1
Appendix B SEPA Documentation B-1
Appendix C Coliform Monitoring Plan C-1
Appendix D Water Rights Documentation D-1
Appendix E Fire Flow Requirements E-1
Appendix F Lead and Copper Monitoring Plan F-1
Appendix G 2023 Boston Harbor Water Facilities Inventory G-1
Appendix H Wellhead Protection Program Supplemental Materials H-1
Appendix I Thurston County Development Standards for Water and Sewer Systems I-1

1 Introduction

The Boston Harbor Water System (Boston Harbor) is a Group A Community Water System located in northern Thurston County (DOH ID 07850R). This Part B Water System Plan (Part B WSP) has been prepared to meet those portions of the requirements of WAC 246-290-100(4) that are applicable only to Boston Harbor. The Thurston County Public Works (TCPW) Part A Water System Plan and Satellite Management Agency Plan (Part A WSP), which addresses the general management of all water systems owned and operated by TCPW, including Boston Harbor, has been previously prepared and submitted for approval to the Washington State Department of Health (DOH).

This Part B WSP, in combination with the Part A WSP, supersedes prior water system planning efforts related to Boston Harbor. The previous planning effort was documented in the 1996 Boston Harbor Water System Connection Capacity Study.

This Part B WSP is organized as follows:

- Chapter 1 (Introduction) provides a summary of the history of the Boston Harbor Water System and documentation of the review and approval process related to this Part B WSP.
- Chapter 2 (Water System Description) describes the Boston Harbor service area, water system infrastructure, and operations and maintenance program.
- Chapter 3 (Water Demand Forecast) provides a review of recent historical water production and consumption, and a 20-year forecast of water demands.
- Chapter 4 (Water Rights and System Analysis) provides an analysis of the system's water rights; source, storage, and distribution system capacity; and, compliance with water quality regulations.
- Chapter 5 (Wellhead Protection Program) describes the elements of TCPW's wellhead protection program that pertain specifically to Boston Harbor.
- Chapter 6 (Capital Improvement Program) identifies the planning capital projects to address system deficiencies.
- Chapter 7 (Financial Program) provides a summary of the water system's recent historical financial data and the plan for funding needed improvements into the future.

1.1 History

The Boston Harbor Water System was formerly owned and operated by a private company called “Boston Harbor Water Systems Corporation.” The name would seem to imply that maybe there was more than one Boston Harbor water system at the time, although that is not known for certain. Water right application G2-00630 was submitted on December 16, 1970, for two existing and one new well, and the subsequent water right certificate was issued on June 11, 1973. The report of examination for water right G2-00630 stated that the two wells had a combined capacity of 50 gpm and that the system also had two storage reservoirs with a combined capacity of 40,000 gallons. Since the report of examination mentions two existing wells and two existing storage reservoirs, it is assumed that the Boston Harbor water system existed prior to the water right application. On August 6, 1975, water right application G2-23917 was submitted for a fourth well; and, on October 1, 1976, water right certificate G2-23917 was issued.

During the 1980s, Boston Harbor Water Systems Corporation was unable to meet current standards for providing a safe, usable and dependable water supply for the Boston Harbor area and, under pressure from DOH, the water system was taken over by Thurston County. A water system study for the Boston Harbor Water System, dated May 1987, was prepared by R. W. Beck & Associates. Thurston County submitted water right application G2-27271 on March 1, 1988, for two new wells to be located on Boston Harbor Elementary School property, approximately one mile east of the community of Boston Harbor. Well 5 was completed on July 27, 1988, and Well 6 was completed on December 1, 1989. Subsequently the Boston Harbor Water System was redesigned in 1989 and almost completely replaced in 1990. Water right certificate G2-27271 was issued on November 4, 1991.

The 1996 report by D. R. Strong Consulting Engineers evaluated system demand and capacity, and obtained system approval for service of up to 340 equivalent residential units (ERUs) as of October 21, 1996. The system remains approved for 340 ERUs as of the date of this Part B WSP writing.

1.2 Part B WSP Review and Approval Process

This Part B WSP must be reviewed by DOH and the Thurston County Community Planning and Economic Development Department prior to approval. In addition, TCPW must make the plan available for review by adjacent purveyors and hold a public consumer meeting. Documentation related to these review processes, including the Local Government Consistency Determination Form and comments issued on the Draft Part B WSP, are included in Appendix A.

TCPW completed the required State Environmental Policy Act (SEPA) process related to this Part B WSP. Documentation of the SEPA checklist and determination is provided in Appendix B.

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2 Water System Description

Subjects addressed in this chapter of the Part B WSP are:

- Service Area Characteristics
- Existing System Description
- Related Planning Documents
- Operations and Maintenance Program
- Distribution Facilities Design and Construction Standards

2.1 Service Area Characteristics

The Boston Harbor Water System is located about 6.7 miles north of downtown Olympia on the east side of the mouth of Budd Inlet. It is accessed from Olympia via East Bay Drive, which turns into Boston Harbor Road and ends at Boston Harbor.

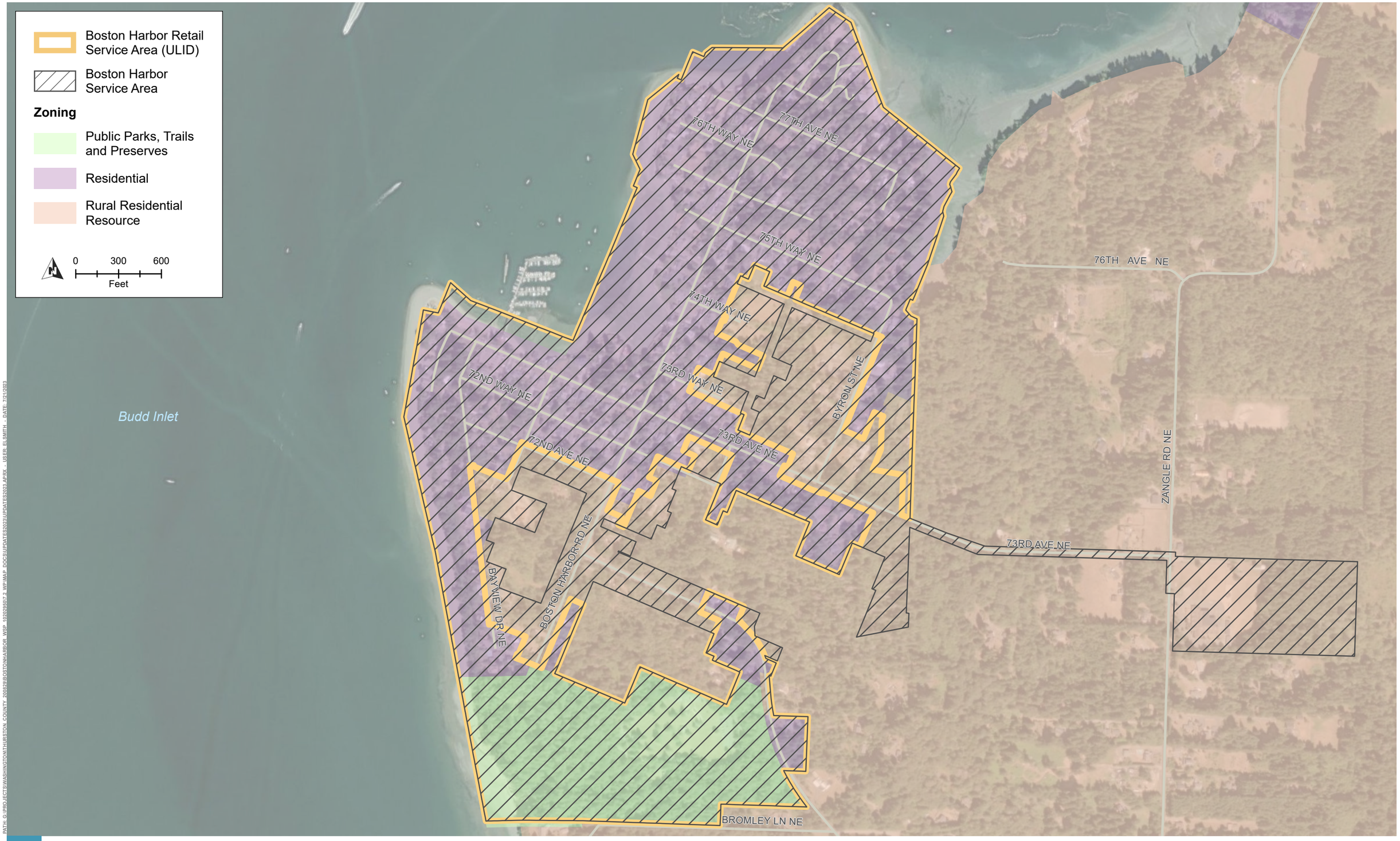
Figure 2-1 displays Boston Harbor's water service area. Shown on this map are the Retail Service Area and the Service Area.

The Retail Service Area is based on the boundary of the original Utility Local Improvement District (ULID), under which the Boston Harbor Water System was created. It is within the Retail Service Area that the Boston Harbor Water System must meet the "Duty to Serve" requirements as set forth by the Municipal Water Law. The Retail Service Area is approximately 223 acres in size.

The Service Area includes the Retail Service Area as well as all parcels that currently front the system's water mains, with the exception of parcels that front the transmission main that extends west along 73rd Avenue NE from the reservoir to just east of Byron Street NE (see Figure 4-3 for demarcation of transmission pipe location). The total Service Area is approximately 327.5 acres in size.

[Note: Vertical elevation data referenced in this document are based on the NAVD88 vertical datum.]

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SERVICE AREA AND ZONING
FIGURE 2-1

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2.1.1 Zoning

Current zoning within the Service Area is also depicted on Figure 2-1. Table 2-1 summarizes the zoning within the Service Area.

Table 2-1. Boston Harbor Water System Service Area and Zoning

Zoning	Area (acres)	% of Service Area
Residential 1/1	170.84	52.2%
Rural Residential Resource 1/5	107.53	32.8%
Public Parks, Trails, and Preserves	46.50	14.2%
Waterbody[1]	2.63	0.8%
Total	**327.50**	**100%**

[1] Portion of County GIS layer for Service Area that extends into Budd Inlet.

2.1.2 Nearby Purveyors

There are several other water systems located near the Boston Harbor Water System. The largest nearby purveyor, and the only one adjacent to Boston Harbor's Service Area, is the Lews Water System (DOH ID 60490), owned and operated by Thurston PUD.

There are several other small private water systems near Boston Harbor including Jensen Short Plat, Zangle, C and C Water, and Bells Addition. None of these purveyors' service areas are directly adjacent to the Boston Harbor service area.

2.1.3 Service Area Policies

Service area policies are described in the Part A WSP. Boston Harbor must follow the Rural Area Service Criteria.

2.2 Existing System Description

Descriptions of key components of the Boston Harbor Water System are provided in the following sections. Locations are shown on figures in Chapter 4, associated with system analysis.

2.2.1 Source of Supply

The Boston Harbor Water System has two active wells (Well 5 and Well 6), both located on Boston Harbor Elementary School property, approximately one mile east from the center of Boston Harbor. Wells 1 through 4 and a spring are previous sources that have been inactive since 1990. Table 2-2 summarizes information about the Boston Harbor water system's active sources. Source meters were installed on each well in February 2021.

Table 2-2. Boston Harbor Water System Sources

Source Name	Diameter (in)	Completed Depth (ft)	Screened Interval (ft)	Capacity (gpm)
Well 5	6	537.7	499.6 to 530.3	65
Well 6	8	543.3	508.0 to 538.7	65

2.2.2 Water Rights

The Boston Harbor Water System has three water rights dating from 1970 to 1988, and totaling 300 gpm and 150 acre feet per year. Water rights for the Boston Harbor Water System are summarized in Table 2-3.

Table 2-3. Boston Harbor Water Rights

Water Right No.	Instantaneous Right (gpm)	Annual Right (afy[1])	Priority Date	Points of Withdrawal
G2-00630	50	56 Additive[2]	12/16/1970	3 Wells, SW1/4, NW1/4, Sec 14, T19N, R2W
G2-23917	100	34 Additive[2] 56 Non-Additive[3]	8/6/1975	1 Well, SW1/4, NE1/4, Sec 14, T19N, R2W
G2-27271	150	60 Additive[2] 90 Non-Additive[3]	3/1/1988	Wells 5 and 6, SW1/4, NW1/4, Sec 14, T19N, R2W
Totals	**300**	**150**		

[1] Acre feet per year.

[2] Additive water rights contribute to the total water rights available for the water system.

[3] Non-additive water rights do not contribute to the total water rights available for the water system. They can be used to withdraw water from a source if an additive right from a different source is not exercised.

2.2.3 Treatment

The Boston Harbor Water System provides disinfection by injection of sodium hypochlorite. The system also provides iron and manganese treatment using Katalox Light media in filter vessels. Sodium hypochlorite is injected upstream of the filters to help maintain oxidizing conditions across the filters and a chlorine residual. Backwash from the iron and manganese filters is discharged to the Boston Harbor Sewer System. This system was recently updated, with DOH approval granted in May 2019, to the Katalox Light media, allowing the system to treat water at peak hour demand flow rates.

2.2.4 Storage

The Boston Harbor Water System has one water storage reservoir, located on Boston Harbor Elementary School property near Wells 5 and 6. The reservoir is a welded steel tank 31 feet in diameter, with a base elevation of 126 feet, an outlet elevation of 127 feet, and an overflow elevation of 216.5 feet, based on system drawings. The reservoir drawing further indicates a high level alarm elevation of 216.0 feet, an all-pumps-off level of 215.5 feet, a lead pump on level of 213.5 feet, and a lag pump on level of 211.5 feet.

The reservoir contains 5,645 gallons per foot of water. The top of the outlet to lag pump on level is 85.5 feet, which is a volume of 477,090 gallons. However, since the water system relies on the water level in this reservoir to maintain a regulatory minimum operating pressure of 30 psi, the minimum operating level in this reservoir is higher than the outlet elevation of 127 feet, and therefore the effective storage volume is less than 477,090 gallons. Determination of the actual minimum operating level and effective volume is described in Chapter 4.

2.2.5 Pressure Zones

The Boston Harbor water system operates as a single pressure zone. There are no booster pumps in the water system; the hydraulic grade is set by the reservoir. Boston Harbor Elementary School is the highest connection in the system at 142 feet above sea level. The next highest connection is at 121 feet above sea level. These elevations determine the storage requirements of the reservoir to maintain adequate pressure throughout the system during maximum day and fire flow scenarios, which are described in Chapter 4.

2.2.6 Distribution System

The water distribution system consists of approximately 26,500 feet of water mains, ranging in size from 1.5 to 10 inches in diameter. Table 2-4 presents a summary of

distribution piping (excluding service pipes). Unknown pipe diameters are likely to be less than six inches in diameter. Pipe material is unknown throughout much of the system, and so no breakdown of pipe length by material type is possible at this time.

Table 2-4. Boston Harbor Distribution System Piping

Pipe Size (in)	Length (ft)
1.5	2,035
2	567
2.5	314
3	19
6	4,873
8	13,341
10	3,133
Unknown	2,277
Total	**26,559**

2.3 Related Planning Documents

Planning documents pertinent to operation of the Boston Harbor Water System include:

- North Thurston County Coordinated Water System Plan Area-Wide Supplement, 1996, Thurston County Department of Water and Waste Management.
- Boston Harbor Water System Connection Capacity Study, 1997, D. R. Strong Consulting Engineers, Inc.
- Thurston County Department of Water and Waste Management Satellite Management Agency Plan for Water System Ownership and Operation, 1997, revised 1998. Thurston County Department of Water and Waste Management.

2.4 Operations and Maintenance Program

Thurston County's water utility operations and maintenance program are described in the Part A WSP. This includes programmatic elements that pertain to all County-operated water systems, such as descriptions of the County's water system

management and personnel, preventive maintenance program, emergency response program, and cross connection control program. Also contained in this portions of the Part A WSP are elements specific to Boston Harbor, such as details regarding this system's operation and control, and water quality monitoring program. Boston Harbor's coliform monitoring plan is provided as Appendix C to this Part B WSP.

2.5 Distribution Facilities Design and Construction Standards

Thurston County's distribution facilities design and construction standards are described in the Part A WSP. All County standards and policies described in the Part A WSP are applicable to the Boston Harbor Water System.

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3 Planning Data and Demand Forecast

This chapter provides a summary of historical water production and consumption for the Boston Harbor Water System (Boston Harbor), as well as a forecast of future water demand.

3.1 Water Production History

Water production is defined as the total volume of water withdrawn from Boston Harbor's groundwater wells. Boston Harbor withdraws groundwater through two wells, and meters the total volume withdrawn collectively from the wellfield. Source meters were installed at each well in February 2021. Prior to that, combined well discharge was recorded through a single wellfield meter. Volume is reported in gallons. Boston Harbor's monthly production history for 2014-2019 is presented in Table 3-1, based upon wellfield meter records (individual well source meters were not yet installed). Figure 3-1 provides a monthly comparison for the years 2016 to 2019. Total annual production generally trends downward over the 2014 – 2019 period.

Table 3-1. Monthly Well Production (gallons)1, 2014-2019

Month	2014	2015	2016	2017	2018	2019
Jan	226,300[2]	1,577,000	1,937,600	1,543,762	1,058,974	1,055,824
Feb	2,157,300	1,540,000	1,783,900	1,103,900	917,018	832,315
Mar	2,247,600	1,743,700	1,969,770	1,573,000	966,379	948,068
Apr	2,437,900	1,968,900	2,092,000	1,273,100	1,009,441	1,065,668
May	2,693,000	2,714,800	2,696,860	2,012,100	1,600,989	1,588,161
Jun	3,324,290	4,359,700	2,675,616	2,291,300	2,070,202	2,174,002
Jul	5,079,800	4,834,420	3,501,900	3,632,400	3,091,260	2,710,999
Aug	3,995,400	3,972,628	3,564,198	3,751,900	2,787,123	2,463,665
Sep	2,899,700	2,387,412	1,708,920	2,311,900	1,457,104	1,454,187
Oct	1,869,400	2,119,888	1,217,676	2,500,000	1,106,486	1,169,879
Nov	1,412,500	1,993,928	1,122,736	978,354	1,011,393	1,129,286
Dec	1,838,500	1,953,038	917,346	945,936	1,063,275	1,156,887
Total Annual Production	**30,181,690**	**31,165,414**	**25,188,522**	**23,917,652**	**18,139,644**	**17,748,941**

Notes:
[1]Data Source: Spreadsheet "2008-2019 BH Only.xlsx" provided by Thurston County.
[2]Data for January 2014 is incomplete.

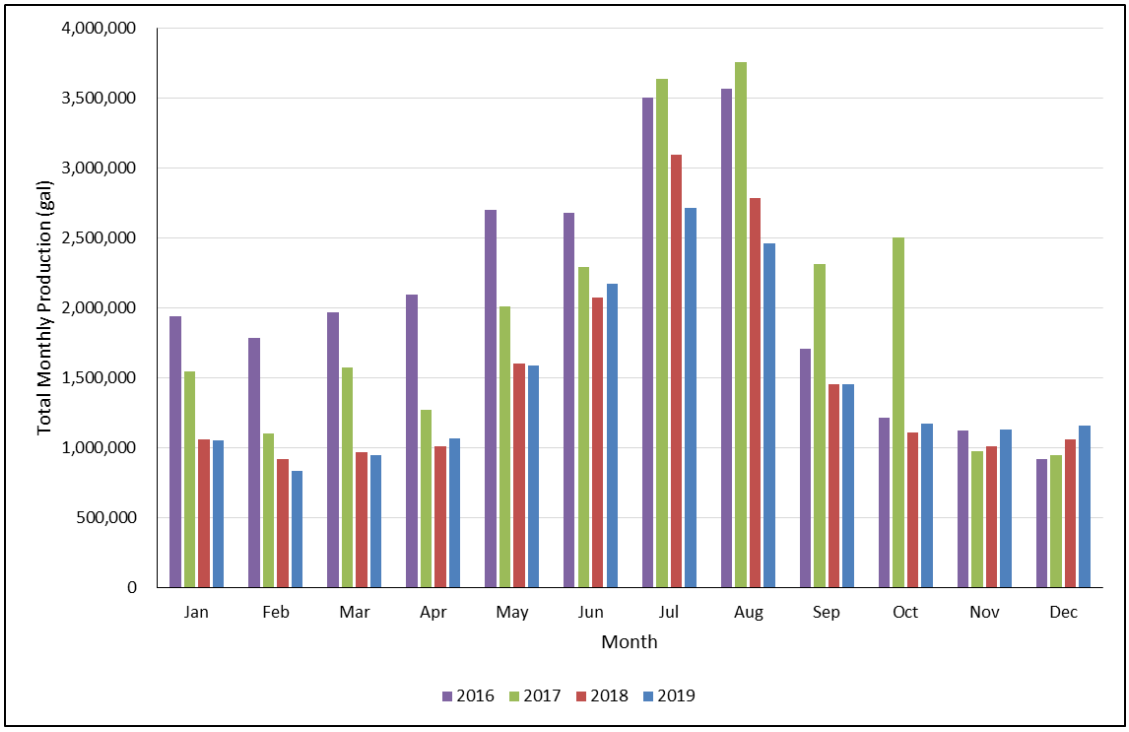


Figure 3-1. Monthly Water Production (2016-2019)

Table 3-2 summarizes average day and maximum day production from 2014 to 2019. Average day production is the total volume produced in a calendar year, divided by the number of days in that year. Maximum day production is defined as the highest volume of water produced on a single day in the calendar year, typically occurring in the summer. Source meter readings are taken daily Monday through Friday. An average daily reading is taken for Saturday and Sunday. Table 3-2 includes the peaking factor for each year, which is determined by dividing the maximum day production by the average daily production.

Average day production has averaged approximately 67,000 gallons per day (gpd) over the past six years, and approximately 55,000 gpd over the past three years. Maximum day demand averaged approximately 180,000 gallons over the past six years, and approximately 129,000 over the past three years. The average peaking factor during these same time periods is 2.69 and 2.36, respectively. The latter factor was used to develop the maximum day demand forecast because maximum day production has trended down over the past several years.

Table 3-2. Average and Maximum Day Production, and Peaking Factor, 2014–2019

	2014	2015	2016	2017	2018	2019	6 Year Average	3 Year Average
Maximum Day Production (gal)	260,400	277,600	155,300	151,400	123,211	111,818	179,955	128,810
Average Day Production (gpd)	82,690	85,385	68,821	65,528	49,698	48,627	66,823	54,618
Peaking Factor	3.15	3.25	2.26	2.31	2.48	2.30	2.69	2.36

Data Source: Spreadsheet "2008-2019 BH Only.xlsx" provided by Thurston County.

3.2 Service Connections and Population Served

Table 3-3 displays the annual number of connections in Boston Harbor from 2010 to 2019, as well as the annual growth rate and rolling three year average growth rates. Boston Harbor has added between zero and four connections annually for the past 10 years.

Table 3-3. Annual Water System Connections and Growth Rates

	2010	2011	2012[1]	2013	2014	2015	2016	2017	2018	2019
Total Connections[2]	271	272	272	275	276	280	281	283	284	286
Annual Growth Rate	1.50%	0.37%	0.00%	1.10%	0.36%	1.45%	0.36%	0.71%	0.35%	0.70%
3-Year Average Growth Rate[3]	1.00%	1.00%	0.62%	0.74%	0.46%	0.97%	0.72%	0.84%	0.47%	0.59%

Notes:
[1]No data available in 2012, therefore, connection count was assumed the same as in 2011.
[2]Data Source: Spreadsheet "BH Historical Connections.xlsx" provided by Thurston County.
[3]Three year average growth rate based on the current year and two prior years. For example, the 2018 three year average growth rate is the average of growth rates for 2018, 2017, and 2016.

Table 3-4 displays the recent historical population estimates for Boston Harbor. Boston Harbor is located in rural Thurston County, and therefore has no published population estimate for the service area. To estimate population, the number of residential connections to the system was multiplied by the rural average household occupancy rate in the County (2.46 persons per household) to estimate the population served by the system.

Table 3-4. Population Estimates for the Boston Harbor Service Area (2014-2019)

	Population Estimates					
	2014	2015	2016	2017	2018	2019
Number of Residential Connections[1,2]	266	270	271	273	274	276
Household Occupancy Rate[3]	2.46	2.46	2.46	2.46	2.46	2.46
Estimated Population Served	**654**	**664**	**667**	**672**	**674**	**679**

[1]Data Sources: Spreadsheets "BH Historical Connections.xlsx" and "BH Historical Water Sales.xlsx" provided by Thurston County.
[2]Number of residential connections determined by subtracting the number of non-residential connections, defined by customer class (10 connections), from the total number of connections.
[3]Source: Thurston County Comprehensive Plan, Housing Element.

3.3 Water Consumption History

Boston Harbor maintains billing record summaries for water sold to each customer account. Consumption is measured in several customer categories, which for the purposes of this analysis, are grouped into two main categories: residential and non-residential. Table 3-5 displays annual consumption by these two customer categories, as well as the recent four-year average consumption. Figure 3-2 graphically depicts the percent share of total water consumption by each customer category.

Table 3-5. Historical Water Consumption (gallons), 2014-2019[1]

Connection Type	2014	2015	2016	2017	2018	2019	Average ('15-'19)[2]
Residential	9,594,574	16,487,079	16,465,156	15,408,553	15,798,942	14,682,820	15,768,510
Non-Residential	400,569	1,346,864	2,087,675	1,576,522	955,039	1,340,919	1,461,404
Total	**9,995,143**	**17,833,943**	**18,552,831**	**16,985,075**	**16,753,981**	**16,023,739**	**17,229,914**
Average Day Sales (gpd)	27,384	48,860	50,830	46,407	45,901	43,901	47,180

Notes:
[1]Data Source: Spreadsheet "BH Historical Water Sales.xlsx" provided by Thurston County.
[2]Data for 2014 is incomplete, and therefore not included in the average.

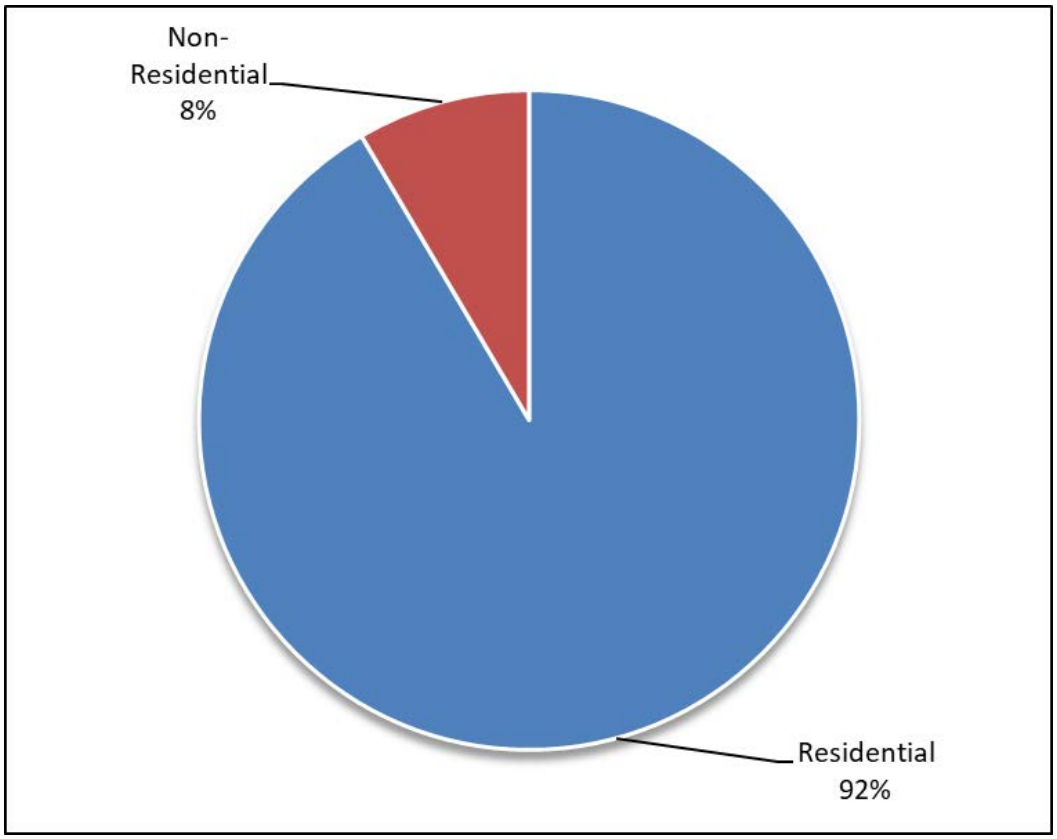


Figure 3-2. Percent Share of Total Consumption by Customer Category (Average 2015-2019)

Monthly billed water consumption for 2014-2019 is provided in Table 3-6. The monthly and annual distribution of reported and actual water use may differ somewhat from this representation since billing numbers are based on meter read dates, which lag behind actual use. Monthly distribution of water consumption is shown in Figure 3-3.

Table 3-6. Monthly Water Consumption (gallons), 2014-20191

Month	2014	2015	2016	2017	2018	2019	Average ('15 – '19)
Jan	--	1,084,615	1,007,167	904,362	994,107	1,086,747	1,015,400
Feb	--	838,740	1,038,052	922,845	853,849	776,611	886,019
Mar	--	1,000,757	1,356,565	1,031,380	789,641	751,104	985,889
Apr	--	1,005,290	1,588,572	895,775	841,777	991,571	1,064,597
May	--	1,129,039	1,496,741	1,035,090	1,341,463	1,172,303	1,234,927
Jun	--	2,508,927	2,188,895	1,824,387	1,800,316	2,249,416	2,114,388

Month	2014	2015	2016	2017	2018	2019	Average ('15 – '19)
Jul	2,657,083	2,844,547	2,296,053	2,829,624	3,044,113	2,430,461	2,688,960
Aug	2,354,682	2,920,259	2,602,666	2,725,824	2,567,525	2,167,270	2,596,709
Sep	2,118,418	1,282,655	2,393,263	2,026,205	1,883,008	1,705,582	1,858,143
Oct	1,178,691	1,026,353	773,051	1,090,614	916,068	947,215	950,660
Nov	779,416	989,312	805,790	750,064	774,120	896,448	843,147
Dec	906,853	1,203,450	1,006,015	948,905	947,993	849,010	991,075

Notes:
[1]Data Source: Spreadsheet "BH Historical Water Sales.xlsx" provided by Thurston County.

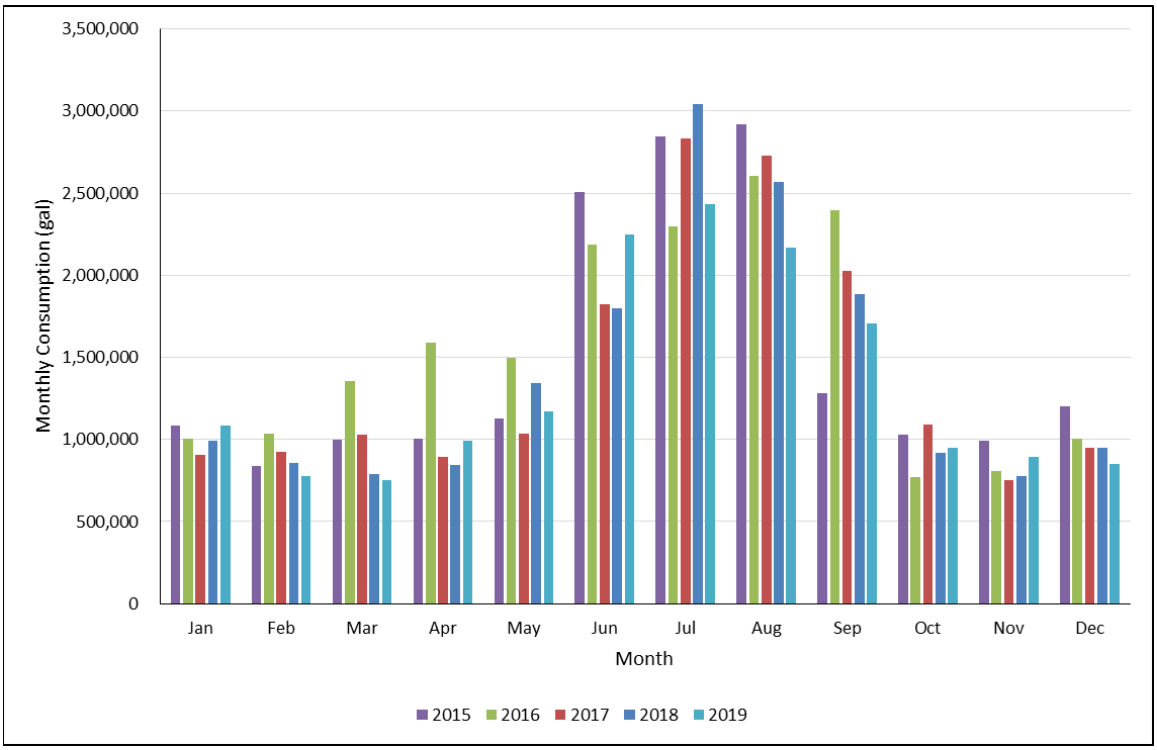


Figure 3-3. Monthly Consumption (2015-2019)

3.4 Water Balance and Distribution System Leakage

A water balance is an accounting of all water that is produced. Boston Harbor's 2019 water balance is shown in Table 3-7. The table is a slightly modified version of the format recommended for use by the American Water Works Association.

Table 3-7. 2019 Water Balance

	Level 1	Level 2	Level 3	Volume (gal)	Percent of Produced Water
Water Produced	Revenue Water	Billed Authorized Consumption	1. Billed Water Exported	0[1]	0%
			2. Billed Metered Consumption	16,023,739[2]	90%
			3. Billed Unmetered Consumption	0[1]	0%
	Non-Revenue Water	Unbilled Authorized Consumption	4. Unbilled Metered Consumption	689,377[3]	4%
			5. Unbilled Unmetered Consumption	0[1]	0%
		Apparent Losses	6. Unauthorized Consumption	0[4]	0%
			7. Customer Metering Inaccuracies	0[4]	0%
		Real Losses	8. Known Leakage	0[4]	0%
			9. Assumed Leakage	1,035,825[5]	6%
Total				17,748,941[6]	100%

Notes:
[1]This category does not apply to Boston Harbor.
[2]Data Source: Spreadsheet "BH Historical Water Sales.xlsx" provided by Thurston County.
[3]Data Source: Spreadsheet "2016-2019 Water Usage Tracking Utilities.xlsx" provided by Thurston County.
[4]Boston Harbor does not track this number; therefore zero was used in the water balance.
[5]Water Production minus all other categories.
[6]Data Source: Spreadsheet "2008-2019 BH Only.xlsx" provided by Thurston County.

The water balance allocates the water produced to different categories at three different levels.

Level 1 allocates the water to either Revenue Water or Non-Revenue Water. As implied by the names, Revenue Water generates income while Non-Revenue Water does not. This is helpful in understanding what percent of water production generates income for Boston Harbor. Additionally, non-revenue water needs to be factored into the demand forecast. Boston Harbor's water production is divided into 90% Revenue Water and 10% Non-Revenue Water.

Level 2 splits Non-Revenue Water into the following three sub-categories, which are useful in identifying potential additional revenue sources and identifying the magnitude of leaks or other losses that could be addressed:

- **Unbilled Authorized Consumption:** Includes uses such as water system flushing, firefighting, and unbilled contractor use. Typically, it is standard practice not to charge for uses falling into this sub-category. However, it is always a prudent idea to review these uses to ensure that a legitimate revenue opportunity is not missed. Boston Harbor tracks water used for system flushing.

- **Apparent Losses:** Includes unauthorized uses and customer meter inaccuracies, both of which are lost revenue opportunities. Boston Harbor does not track this kind of consumption.

- **Real Losses:** Includes various types of system leaks. A certain level of leakage is unavoidable; however, leakage beyond that level should be repaired to avoid unduly burdening both the natural resource and the physical infrastructure. Any amount that cannot be assigned to another category is considered a real loss under the American Water Works Association's protocol, as well as per the formula for calculating distribution system leakage (DSL) under Washington State's Water Use Efficiency Rule.

Level 3 further splits water into additional sub-categories to support further estimation and water management.

A longer history of non-revenue water is provided in Table 3-8.

Table 3-8. Non-Revenue Water and Distribution System Leakage (gallons)

Year	Water Produced[1]	Authorized Consumption[2]	Billed Consumption[2]	Non-Revenue Water[3]		DSL[3]	
				Quantity	Percent of Production	Quantity	Percent of Production
2016	25,188,522	23,007,059	18,552,831	6,635,691	26%	2,181,463	9%
2017	23,917,652	19,274,681	16,985,075	6,932,577	29%	4,642,971	19%
2018	18,139,644	17,688,050	16,753,981	1,385,663	8%	451,594	2%
2019	17,748,941	16,713,115	16,023,739	1,725,202	10%	1,035,826	6%
3-Year Average	22,415,273	19,989,930	17,430,629	4,984,644	21%	2,425,343	9%

Notes:
[1]Data Source: Spreadsheet "2008-2019 BH Only.xlsx" provided by Thurston County.
[2]Data Source: Spreadsheet "BH Historical Water Sales.xlsx" provided by Thurston County.
[3]DSL is a portion of non-revenue water. Other portions of non-revenue water are displayed in Table 3-7. Assumed leakage is the non-revenue portion assumed to be DSL.

Boston Harbor's distribution system leakage has averaged nine percent of production from 2017-2019. This may be higher than typical due to the anomalous high value in 2017 when the utility was having accuracy issues with customer meters potentially underreporting and source meters overreporting. Thurston County replaced source and customer meters after 2017 to resolve the issue. Therefore, Thurston County does not need to develop a water loss control program for the Boston Harbor Water System.

3.5 Water Use Factors and Equivalent Residential Units

The use of Equivalent Residential Units (ERUs) is a method to relate all types of water uses as an equivalent use by single-family households. One ERU represents the average amount of water consumed by a single family household and is calculated by dividing the system-wide total single family water consumption by the number of single family connections. Table 3-9 summarizes single family residential water consumption from 2015-2019, the number of single family residential connections, and the calculated ERU values.

Table 3-9. Equivalent Residential Unit (ERU) Analysis

	2015	2016	2017	2018	2019	3-year average	4-year average
Residential Annual Consumption (gallons)	16,487,079	16,465,156	15,408,553	15,798,942	14,682,820	15,296,772	15,588,868
Residential Connections	270	271	273	274	276	274	274
Gallons/ERU	61,063	60,757	56,442	57,660	53,199	55,767	57,014
GPD/ERU	**167.3**	**166.0**	**154.6**	**158.0**	**145.7**	**153**	**156**

The three year average for the value of an ERU is representative of recent water use trends. Therefore, the value of an ERU in this plan will be 153 gallons per day.

In Table 3-2, the three year average peaking factor (2.36) is generally representative of water use trends. Therefore, the value of the peaking factor for this plan will be 2.40 (rounded) to account for potential anomalous years.

3.6 Water Demand Forecast

A multistep process was taken to develop the water demand forecast, as described below:

- **Step 1 – Water Demand Growth Rate.** Three data sets were considered for developing the future water demand growth rate, to reflect demographic growth trends: Thurston Regional Planning Council (TRPC) small area population estimates for the Budd/Deschutes Northeast small area, TRPC small area housing estimates for the Budd/Deschutes Northeast small area, and the historical connection growth rate. Housing estimates and historical connection growth rates were well correlated (four-year average growth rates of 0.52 percent and 0.53 percent, respectively); therefore, the six-year average connection growth rate (0.66 percent) was applied to estimate demands between 2019 and

2025. The housing estimates provided gradually decreasing growth rates in five-year intervals from 2025 through 2040; the percent decrease in the growth rate for each five year interval was applied to the historical connection growth rate to determine the rate of demand growth in each five-year interval. This method is summarized in Table 3-10.

Table 3-10. Water Demand Growth Rates, 2019-2039

	Time Frame			
	2019-2025	2026-2030	2031-2035	2035-2039
Annual Water Demand Growth Rate (%)	0.66	0.54	0.42	0.30
Percent Reduction of Annual Growth Rate (%)		-22.22	-29.06	-36.70

- **Step 2 - Residential Demands**. The projection for residential demands begins with base year 2020 demands. Demands are projected forward in five-year intervals according to the growth rates in Table 3-10, row "Annual Water Demand Growth Rate (%)".

- **Step 3 – Non-Residential Demands**. Boston Harbor does not expect notable development in the non-residential category during the 20-year planning horizon. Therefore, non-residential demand was held constant from base year 2020 through year 2040.

- **Step 4 – Subtotal Average Day Demand (ADD)**. The ADD subtotal is a summation of the two categories above.

- **Step 5 – Non-Revenue Water**. The percentage of DSL water has been below 10 percent of production, which reflects Boston Harbor's Water Use Efficiency supply side goal for the planning period. Therefore, growth rates in Table 3-10 were applied to the volume of non-revenue water (i.e., same method as residential consumption), which maintains a stable DSL value below 10 percent throughout the 20-year planning period.

- **Step 6 - Total Average Day Demand (ADD)**. The ADD subtotal and non-revenue water added together.

- **Step 7 - Maximum Day Demand (MDD)**. A peaking factor of 2.40 is applied to the ADD for all categories.

Table 3-11 displays the 20-year demand forecast in ADD (including the number of ERUs) and MDD.

Table 3-11. Water Demand Forecast

Water Use Category	Base (2020)			5-Year (2025)		
	No. of ERUs	Demand (gpd)		No. of ERUs	Demand (gpd)	
		ADD	MDD	ADD	ADD	MDD
Residential	265	40,491	97,178	273	41,838	100,411
Non-Residential	24	3,674	8,817	24	3,674	8,817
Subtotal	289	44,165	105,995	297	45,512	109,228
Non-Revenue Water	31	4,758	11,418	31	4,789	11,493
Total Demand	**320**	**48,922**	**117,414**	**329**	**50,300**	**120,721**
Water Use Category	**10-Year (2030)**			**20-Year (2040)**		
	No. of ERUs	Demand (gpd)		No. of ERUs	Demand (gpd)	
		ADD	MDD		ADD	MDD
Residential	281	42,974	103,137	291	44,548	106,914
Non-Residential	24	3,674	8,817	24	3,674	8,817
Subtotal	305	46,647	111,954	315	48,221	115,731
Non-Revenue Water	32	4,925	11,819	33	5,117	12,281
Total Demand	**337**	**51,572**	**123,773**	**349**	**53,338**	**128,012**

As shown in Table 3-11, the Year 10 (2030) water demand is projected to be 51,572 gallons on an average day basis, and 123,773 gallons on a maximum day basis. Demand increases to 53,338 gallons and 128,012 gallons by Year 20 (2040), on average and maximum day bases, respectively. Figure 3-4 graphically depicts recent historical demand and forecasted demand through 2040.

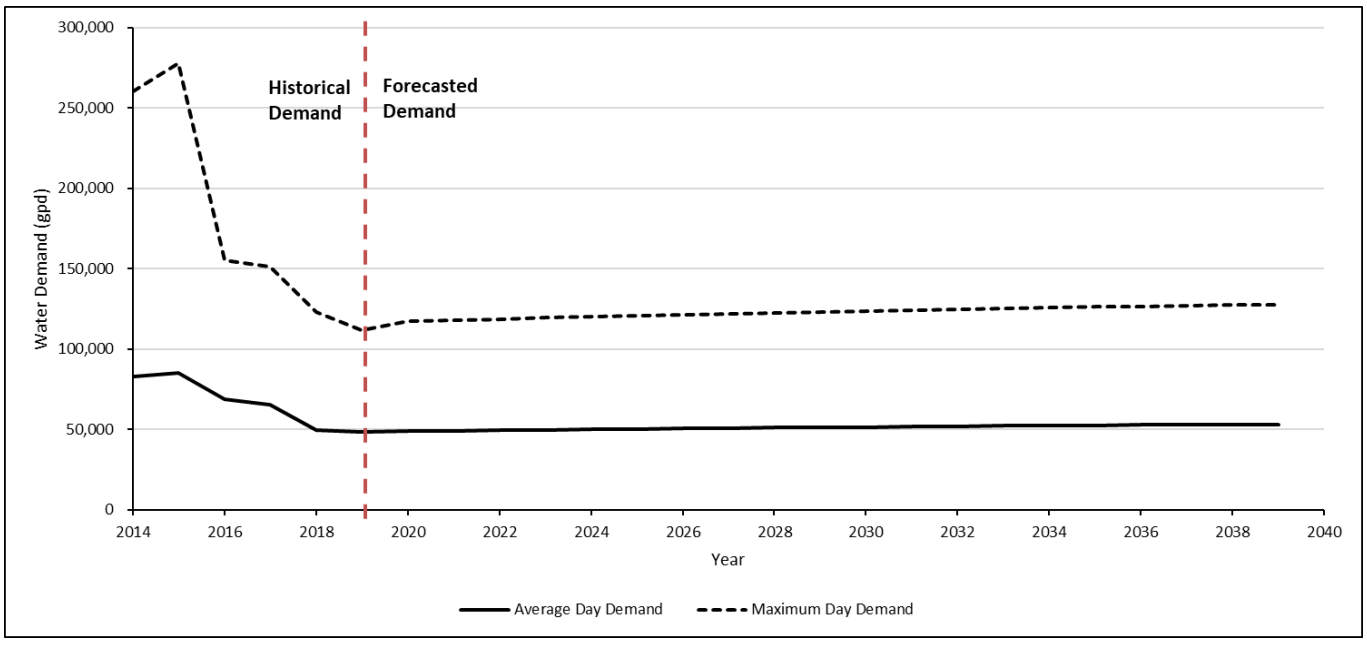


Figure 3-4. Average Day and Maximum Day Demand Forecast Through 2039

Chapter 4 of the Part A WSP describes Boston Harbor's water use efficiency goals. The demand side goal is to "Maintain average day water system usage at or below 200 gpd per connection over the 10-year planning period." This goal does not indicate any further reductions of water use are needed beyond what has already been achieved; therefore, no additional conservation savings are factored into the demand forecast.

4 Water Rights and System Analysis

This chapter contains the water rights self-assessment; source, storage, and distribution system capacity analysis; and, water quality data assessment for the Boston Harbor Water System.

4.1 Water Rights Self-Assessment

Boston Harbor holds Washington State Department of Ecology (Ecology) certified water rights to annually withdraw 150 acre-feet of groundwater per year, with a maximum instantaneous withdrawal of 300 gpm. Documentation of the certified water rights is in Appendix D. The Ecology Water Rights Self-Assessment Form is presented in Table 4-1.

A comparison of actual annual water withdrawal to the existing water right shows the system to be well within its limits. The system's water rights can comfortably supply demands projected over the 20 year planning period.

In its review of the Part A WSP, Ecology made the following comment related to Boston Harbor: "*The authorized source location for Water Rights Nos. G2-00630 AND G2-23917 is the SW1/4 NE1/4 of Section 14, T.19N., R.2 W.W.M. If Boston Harbor Water System Wells 1, 2, 3, and 4 are no longer active, one or more replacement wells must be constructed within the SW 1/4NE1/4 of Section 14 and a Showing of Compliance affidavit filed with Ecology under RCW 90.44.100(3) in order to exercise the 150 gallons per minute authorized under these two rights. Also, any wells that are not being maintained for emergency standby/reserve purposes must be properly decommissioned in accordance with WAC 173-160-381"*. Wells 1-4 are no longer active, and while Boston Harbor intends to only need the use of Wells 5 and 6 to meet the demands of the 20-year planning horizon, the utility does plan to drill an additional well as a backup to Wells 5 and 6 in the future (see Chapter 6 for inclusion of this project in the Capital Improvement Program). This new well would make use of the 150 gpm water right currently associated with Wells 1-4.

Table 4-1. Water Rights Self-Assessment

Water Right Certificate # and Well Name	WFI Source #	Existing Water Rights				Current (2019) Source Production				10-Year (2030) Forecasted Source Production				20-Year (2040) Forecasted Source Production			
		Primary Qi (gpm)	Non-Additive Qi (gpm)	Primary Qa (afy)	Non-Additive Qa (afy)	Total Maximum Qi (gpm)	Current Qi Excess or (deficiency) (gpm)	Total Qa (afy)	Current Qa Excess or (deficiency) (afy)	Total Maximum Qi (gpm)	Current Qi Excess or (deficiency) (gpm)	Total Qa (afy)	Current Qa Excess or (deficiency) (afy)	Total Maximum Qi (gpm)	Current Qi Excess or (deficiency) (gpm)	Total Qa (afy)	Current Qa Excess or (deficiency) (afy)
G2-00630 - Wells 1 through 3	S01, S02, S03	50	--	56	--	0	50	0	56	0	50	0	56	0	50	0	56
G2-23917 - Well 4	S04	100	--	34	56	0	100	0	34	0	100	0	34	0	100	0	34
G2-27271 - Wells 5 and 6	S08	150	--	60	90	78	72	54	6	86	64	58	2	89	61	60	0
	TOTALS	300		150		78	222	54	96	86	214	58	92	89	211	60	90

4.2 Source Capacity Analysis

A source capacity analysis was completed for the Boston Harbor wellfield (Well 5 and Well 6) to determine if the sources are adequate to meet forecasted demands. Boston Harbor is an "open" system with a single zone, meaning there is a reservoir which can serve the entire system. Therefore, source capacity must be sufficient to meet forecasted maximum day demand (MDD).

Once a week in winter and twice a week in summer, water from the well sources is utilized to maintain the filtration system (i.e., filter backwash). Based on source production records, approximately 6,000 gallons of water are used on the day maintenance is conducted. Therefore, the total capacity of the sources is reduced by 6,000 gallons per day in the source capacity analysis to accommodate this use should it occur on the same day as MDD.

Table 4-2 displays the results of the system-wide source capacity analysis. Multiple calculations are made, including reliability checks to ensure capacity is sufficient to meet average day demand (ADD) with the largest source offline, and that capacity can meet MDD while replenishing fire suppression storage.

Table 4-2 indicates that existing source capacities are sufficient to meet MDD (even under the recommended limiting condition of pumping only 20 hours per day), and they can meet ADD with one source offline. Fire flow replenishment cannot occur within three days but can be completed over a four-day period. Existing sources have capacity to serve up to 408 ERUs.

Table 4-2. Boston Harbor System-wide Source Capacity Analysis

	Year			Max[1]
	2020	2030	2040	
Projected Equivalent Residential Units (ERUs)				
Boston Harbor Water System	320	337	349	408
Projected Demand (gpd)				
Average Day Demand	48,922	51,572	53,338	62,500
Maximum Day Demand	117,414	123,773	128,012	150,000
Daily Flow to Replenish Fire Suppression Storage over 72 Hours[2]	30,000	30,000	30,000	30,000
Sources (gpd)				
Well #5 (65 gpm)	93,600	93,600	93,600	93,600
Well #6 (65 gpm)	93,600	93,600	93,600	93,600

	Year			Max[1]
	2020	2030	2040	
Wellfield Total (130 gpm – 24 hours pumping)[3]	181,200	181,200	181,200	181,200
Wellfield Total (130 gpm – 20 hours pumping)[3]	150,000	150,000	150,000	150,000
Source Surplus/(Deficiency) (gpm)				
Maximum Day Demand (24 hour pumping)	63,786	57,427	53,188	31,200
Maximum Day Demand (20 hour pumping)	32,586	26,227	21,988	0
ADD with Largest Source Offline[4]	38,678	36,028	34,262	25,100
Replenish Fire Suppression Storage during MDD (24 hour pumping)[5]	4,986	(1,373)	(5,612)	(27,600)

[1] Maximum number of ERUs that sources can support, assuming 20-hour pumping to meet Maximum Day Demand as the limiting source condition.
[2] Calculated as required fire suppression volume (1,500 gpm x 60 minutes = 90,000 gallons) divided by 3 days.
[3] Wellfield total capacity takes into account water used for filter backwashing and wasting. This is done by subtracting filter maintenance use (6,000 gpd) from the combined wellfield total that is based on 130 gpm.
[4] Assumes only one of the existing wells is online.
[5] Evaluates ability of sources to meet Maximum Day Demand (2-hour pumping) while replenishing fire suppression storage over a 3-day period.

4.3 Storage Capacity Analysis

A storage capacity analysis was completed to determine the ability of the Boston Harbor Reservoir to meet storage requirements of the system. Table 4-3 displays the storage analysis.

Table 4-3. Boston Harbor Storage Capacity Analysis (current operational storage band)

	Year			Max[1]
	2020	2030	2040	
Projected Equivalent Residential Units (ERUs)				
Boston Harbor Water System	320	337	349	717
Projected Demand (gpd)				
Average Day Demand	48,922	51,572	53,338	109,684
Maximum Day Demand	117,414	123,773	128,012	263,241
Peak Hour Demand (gpm)	197	205	210	368
Sources (gpd)				
Wellfield	181,200	181,200	181,200	181,200
Required Storage Volume Components				
Operational Storage (gal)	22,584	22,584	22,584	22,584
Equalizing Storage (gal)	10,621	11,814	12,608	36,305
Standby Storage (gal)	97,845	103,144	106,677	219,367

	Year			Max[1]
	2020	2030	2040	
Fire Suppression Storage (gal)	90,000	90,000	90,000	90,000
Required Storage Volume by Pressure				
Greater than 30 psi (gal)	33,206	34,398	35,193	58,889
Greater than 20 psi (gal)	131,050	137,542	141,869	278,256
Highest Meter Analysis (Boston Harbor School)				
Existing Storage				
Available at 30 psi at Highest Meter	29,218	29,218	29,218	29,218
Available at 20 psi at Highest Meter	159,689	159,689	159,689	159,689
Storage Surplus/(Deficiency) Checks (gal)				
30 psi Storage	(3,987)	(5,180)	(5,974)	--
20 psi Storage	28,639	22,147	17,820	--
Second Highest Meter Analysis				
Existing Storage				
Available at 30 psi at Highest Meter	147,785	147,785	147,785	147,785
Available at 20 psi at Highest Meter	278,256	278,256	278,256	278,256
Storage Surplus/(Deficiency) Checks (gal)				
30 psi Storage	114,580	113,387	112,593	88,896
20 psi Storage	147,206	140,714	136,387	0

[1] Maximum number of ERUs that storage can support, assuming that the limiting storage condition is provision of 20 psi at the second highest meter (see narrative for further explanation).

The operational storage band is assumed to be 4 feet in height which, with a reservoir diameter of 31 feet, equals 22,584 gallons of operational storage. Equalizing storage and standby storage are calculated based on formulae in the DOH water system design manual. Fire suppression storage is based on a goal of 1,500 gpm for 1 hour, or 90,000 gallons. This value is based on the fire flow goal at Boston Harbor Elementary School (see Appendix E for documentation). Nesting of fire suppression storage with standby storage is allowed, so the total required storage at 20 psi only takes into account the larger of either standby storage or fire flow storage, in addition operational and equalizing storage.

The analysis considers storage sufficiency at both the highest meter (Boston Harbor School) and the second highest meter, a residential meter. The difference in elevation between these two meters is 21 feet. At the highest meter, required storage at 20 psi is sufficient throughout the planning period. However, required storage at 30 psi has a small deficiency at all points in the planning period. This deficiency assumes that operational and equalizing storage are depleted. The distribution system analysis provides further detail on the minor storage deficiency related to the meter at the school.

At the second highest meter, both storage at 30 and 20 psi is sufficient throughout the planning period. The maximum number of ERUs that Boston Harbor could serve based on storage requirements for the second highest meter is 717. This is above the total number of approved connections for the system, which indicates the system has sufficient storage to serve all approved connections.

An operational solution to the 30 psi storage deficiency at Boston Harbor School is to reduce the operational storage band from four feet to three feet. This would reduce the 30 psi storage requirement and leave an additional foot of water in the reservoir to elevate pressure once operational and equalizing storage are depleted. Table 4-4 displays an updated storage analysis where the operational band is three feet. This analysis only considers the 30 psi storage requirement at the Boston Harbor school because the analysis in Table 4-3 indicates the 20 psi requirement is met and that storage is sufficient for the second highest meter.

Table 4-4. Boston Harbor Storage Capacity Analysis (with modified three-foot operational storage band, highest meter only)

	Year			Max[1]
	2020	2030	2040	
Projected Equivalent Residential Units (ERUs)				
Boston Harbor Water System	320	337	349	344
Projected Demand (gpd)				
Average Day Demand	48,922	51,572	53,338	52,609
Maximum Day Demand	117,414	123,773	128,012	126,261
Peak Hour Demand (gpm)	197	205	210	208
Sources (gpd)				
Wellfield	181,200	181,200	181,200	181,200
Required Storage Volume Components				
Operational Storage (gal)	16,938	16,938	16,938	16,938
Equalizing Storage (gal)	10,621	11,814	12,608	12,280
Standby Storage (gal)	97,845	103,144	106,677	105,218
Fire Suppression Storage (gal)	90,000	90,000	90,000	90,000
Required Storage Volume by Pressure				
Greater than 30 psi (gal)	27,559	28,752	29,547	29,218
Highest Meter Analysis (Boston Harbor School)				
Existing Storage				
Available at 30 psi at Highest Meter	29,218	29,218	29,218	29,218
Storage Surplus/(Deficiency) Checks (gal)				
30 psi Storage	1,659	466	(328)	0

[1] Maximum number of ERUs that storage can support, assuming that the limiting storage condition is provision of 30 psi at the highest meter (see narrative for further explanation).

Reducing the operational band to three feet results in a surplus of 30 psi storage in the current and 10-year planning horizons. There is a slight deficiency of 328 gallons of 30 psi storage in the 20-year planning horizon. The maximum number of ERUs that can be served with the three foot operational band is 344. The County plans to study this issue further and potentially develop additional solutions as part of project M-9 in the capital improvement plan (Chapter 6).

4.4 Distribution System Analysis

4.4.1 Hydraulic Model

Background

A hydraulic model of the water system was utilized to analyze water system performance capabilities and define improvements necessary to meet system pressure and velocity criteria. The modeling software used is Infowater by Innovyze. The model was used to perform the following:

- Evaluate existing system-wide hydraulic performance and identify deficiencies.
- Evaluate future system-wide performance and identify deficiencies.
- Identify if any system improvements are recommended to resolve identified deficiencies.

In 2020, Thurston County created a GIS database of water system infrastructure included pipes, hydrants, and service meters that were taken from record drawings of the system. Prior to this Part B WSP, a hydraulic model of the water system had not been created. An Infowater model of the system was created using the GIS database. The majority of the piping of the system was constructed at the same time around 1989, therefore roughness coefficients were assumed to be the same for all piping. Model nodes were placed at all hydrant locations, pipe junctions, and where pipe appurtenances were located within the GIS database. All model nodes, except for the Boston Harbor Reservoir, were then assigned an elevation based on a 2017 LiDAR survey[1] completed of the area.

The Boston Harbor Reservoir geometry was entered into the model based on past water system plan information. Wells 5 and 6 and their associated aquifer levels were also entered into the model based on past water system plan information along with their current operating rules. Pipe diameters in the model were based on nominal pipe diameters.

[1] Washington State Department of Natural Resources (DNR) survey with a vertical accuracy of 0.7 feet.

After the physical parameters of the model were updated, demands were then allocated into the model.

Demand Allocation

Demands are allocated to junction nodes in the model that are associated with nearby service connections. Not every service connection is associated with its own individual model node. The GIS database included the location of all water meters in the system. The water system demands from the demand forecast (ADD, MDD, and PHD for 2020, 2030, and 2040), including non-revenue demands, were assumed to be equally divided among all service meters. The demands at each service meter were then allocated to the nearest model node.

Calibration

A steady-state calibration of the model was completed using data collected from two fire hydrant flow tests performed in July 2020. The tests were completed on the far north and south parts of the distribution system (see Figure 4-1). The static and residual pressures measured from the flow tests were then compared to the predicted values in the model. Each test had multiple valve closures to increase the headloss induced by each test. Additionally, the local fire department completed flow tests for the hydrants at Boston Harbor School. These tests were also entered into the model to further validate model results.

Calibration of the model was performed primarily by adjusting roughness factors for pipes.

Although there are no standard industry adopted criteria for calibrating a water system model, the DOH Water System Design Manual includes some referenced guidelines of having predicted model pressures within 2.1 psi to 4.3 psi (5 to 10 feet of water column) of measured values.

Table 4-5 provides a summary of the calibration of the model compared to the calibration goals. All model predicted pressures were within 2.1 psi of measured values when adjusting all pipes to a Hazen-Williams roughness coefficient of C = 143.

Table 4-5. Calibration Accuracy

Test	Field Measured Pressure Values (psi)			Modeled Pressure Values (psi)			Difference between Field and Modeled Pressures		
	Static	Residual	Drop	Static	Residual	Drop	Static	Residual	Drop
1	52	31	21	52.1	33.1	19.0	<2.1 psi	<2.1 psi	<2.1 psi
2	70	36	34	70.0	34.4	35.6	<2.1 psi	<2.1 psi	<2.1 psi
3	31	28	3	31.4	29.4	2.0	<2.1 psi	<2.1 psi	<2.1 psi
4	31	29.5	1.5	31.4	29.1	2.3	<2.1 psi	<2.1 psi	<2.1 psi
5	31	29	2	31.4	29.2	2.2	<2.1 psi	<2.1 psi	<2.1 psi

4.4.2 Pressure Analysis

High System Pressure

The 2019 DOH Water System Design Manual recommends that the maximum system pressure be limited to 80 psi. Previously, the 2009 DOH Water System Design Manual recommended that system pressures not exceed 100 psi.

A model run was done with static system demands (no demands) with the Boston Harbor Reservoir at the overflow elevation. This represents the highest potential pressure conditions within the system. For this scenario, the highest pressure in the system is 89 psi. There are several areas in the system that have pressures above 80 psi and are located at low areas adjacent to Puget Sound. These areas are shown on Figure 4-2.

Low System Pressure

In accordance with WAC 246-290-230, a minimum pressure of 30 psi must be maintained at all customer connections under peak hour demand (PHD) conditions with operational and equalizing storage volumes depleted in the reservoirs. The DOH Water System Design Manual also recommends a maximum pipe velocity of 8 feet per second (ft/s) under PHD conditions.

Steady-state runs of the model were completed using 2020, 2030, and 2040 PHD with operational and equalizing storage depleted. Model runs show that the maximum pipe velocity during PHD is 1.5 ft/s, well below the maximum pipe velocity.

The lowest pressure in the water system during PHD is 24 psi and is located at a high point about 400 feet west of the intersection of Zangle Road NE and 73rd Avenue NE. This highpoint is located along the 10-inch waterline on 73rd Avenue NE that conveys flows from the Boston Harbor Reservoir and into the distribution system. No service connections are located in this area but there is a fire hydrant

that is below the 30 psi threshold. Because there are no service connections in this area, the 10-inch waterline along this stretch is considered a transmission main. As a transmission main, this segment of piping meets the requirements of WAC 246-290-230(9) which requires transmission mains to maintain a pressure of at least 5 psi.

The lowest pressure in the distribution system containing service connections is Boston Harbor Elementary School that has a pressure of 29 psi. The school is located adjacent to the Boston Harbor Reservoir and therefore has lower pressures. However, this situation is resolved by the County's plans to reduce the operational storage band from four feet to three feet, as described in Section 4.3. This will increase the pressure at this location to 31 psi. The County will explore additional solutions to further increase pressure at this location as part of capital improvement project M-9, described in Chapter 6.

Figure 4-3, Figure 4-4, and Figure 4-5, show the system pressures during PHD conditions with operational and equalizing storage depleted for years 2020, 2030, and 2040, respectively. Figures 4-4 and 4-5 depict the increased pressure at the school as a result of the operational band modification.

4.4.3 Fire Flow Analysis

A fire flow run of the hydraulic model was used to determine the maximum fire flow available during maximum day demand (MDD) conditions. The maximum fire flow available is defined as the maximum flow that can be delivered to a fire flow node while keeping distribution system pressures above 20 psi with operational, equalizing, and fire flow storage depleted as well as keeping pipe velocities under a maximum allowable velocity of 10 ft/s. This is then compared to the required fire flow for the node to determine if there is a deficiency.

There are two fire flow goals identified in the system. Hydrants in residential areas have a fire flow goal of 1,000 gpm for 60 minutes (60,000 gallons). The hydrants at the Boston Harbor Marina (a commercial area) and Boston Harbor Elementary School have a fire flow goal of 1,500 gpm for 60 minutes (90,000 gallons).

The available fire flow was determined for all hydrants in the system with operational and equalizing storage depleted as well as fire suppression storage depleted corresponding to the fire flow goal of the hydrant. While a pressure constraint of 20 psi was applied for the distribution system (locations with service connections), only a 5 psi pressure constraint was applied for the segment of transmission main along 73rd Avenue NE.

The analysis found that there are four hydrants in the system that are currently deficient with two additional hydrants that develop slight deficiencies by 2040. Table 4-6 summarizes the available fire flow and deficiencies by forecast year.

Available fire flow is also shown on Figure 4-6, Figure 4-7, Figure 4-8, for forecast years 2020, 2030, and 2040, respectively.

Table 4-6. Available Fire Flow by Hydrant and Deficiencies

Hydrant Model Node	Fire Flow Goal (gpm)	2020			2030			2040		
		Available Flow (gpm)	Deficiency		Available Flow (gpm)	Deficiency		Available Flow (gpm)	Deficiency	
			gpm	%		gpm	%		gpm	%
J144	1,000	1,246	0	0%	1,241	0	0%	1,238	0	0%
J170	1,000	1,126	0	0%	1,122	0	0%	1,119	0	0%
J174	1,000	1,651	0	0%	1,646	0	0%	1,643	0	0%
J178	1,000	1,649	0	0%	1,645	0	0%	1,642	0	0%
J180	1,000	30	970	97%	26	975	97%	23	977	98%
J26	1,000	1,234	0	0%	1,229	0	0%	1,226	0	0%
J270	1,000	973	27	3%	970	30	3%	968	32	3%
J278	1,000	1,001	0	0%	998	2	0%	996	4	0%
J302	1,000	1,886	0	0%	1,882	0	0%	1,879	0	0%
J340	1,000	1,212	0	0%	1,208	0	0%	1,205	0	0%
J380	1,000	1,290	0	0%	1,285	0	0%	1,282	0	0%
J392	1,000	1,339	0	0%	1,334	0	0%	1,331	0	0%
J402	1,000	1,438	0	0%	1,433	0	0%	1,430	0	0%
J426	1,000	1,237	0	0%	1,233	0	0%	1,230	0	0%
J462	1,000	1,093	0	0%	1,089	0	0%	1,086	0	0%
J542	1,000	1,049	0	0%	1,045	0	0%	1,043	0	0%
J558	1,000	1,043	0	0%	1,040	0	0%	1,037	0	0%
J576	1,000	1,027	0	0%	1,023	0	0%	1,021	0	0%
J596	1,000	1,003	0	0%	1,000	0	0%	997	3	0%
J624	1,000	1,033	0	0%	1,029	0	0%	1,027	0	0%
J64	1,000	1,234	0	0%	1,230	0	0%	1,226	0	0%
J642 (marina)	1,500	979	521	35%	975	525	35%	973	527	35%
J644	1,000	1,170	0	0%	1,166	0	0%	1,163	0	0%
J646 (school)	1,500	711	789	53%	711	789	53%	711	789	53%
J82	1,000	1,244	0	0%	1,239	0	0%	1,236	0	0%

Fire Flow Deficiencies

Below is a description of each of the fire flow deficiencies:

- The hydrant near model node J180 has almost no available fire flow due to the hydrant being at a pressure of 20 psi when fire suppression storage is depleted. This hydrant is located along the segment of transmission pipe on 73rd Avenue NE. If flowing at 1,000 gpm, the pressure at the hydrant is 17 psi. As this hydrant is along a transmission main that typically operates at low pressures and the hydrant is only 3 psi below the pressure constraint, no system improvements are planned to resolve this deficiency. Additionally, a pumper fire truck can be used to boost pressure in a fire event at this location.

- The hydrant near model node J270 is located on Boston Harbor Ext Road NE and is only 3 percent deficient and is being limited by the pressure constraint being reached at a high point along Boston Harbor Road NE north of Burfoot Park. When flowing at the 1,000 gpm fire flow goal, the pressure at the high point drops to 19.2 psi. Because this hydrant is only deficient by 3 percent and the low distribution pressure is less than 1 psi under the 20 psi pressure constraint, no system improvements are planned to resolve this deficiency.

- The hydrant near model node J642 is located adjacent to the Boston Harbor Marina and has a higher fire flow goal of 1,500 gpm. The hydrant has a deficiency of 35 percent and is limited by the pressure constraint being reached at a high point along Boston Harbor Road NE north of Burfoot Park. At the 1,500 gpm fire flow goal, the pressure at the high point drops to 5 psi while most of the system south of 72nd Avenue NE drops to below 20 psi (see Figure 4-9). At a 1,000 gpm fire flow (but keeping the same volume of depleted fire suppression storage), the low pressure in distribution system is 19.5 psi. Because this is a legacy issue, no improvements are planned to address this deficiency in the near-term. Additionally, water supply for fire flows could be pulled directly from Puget Sound with a pump truck at the marina. However, the deficiency could be addressed in the long-term by upsizing the existing 8-inch and 10-inch pipe along 73rd Avenue NE between the marina and the Boston Harbor Reservoir to 12-inch.

- The hydrants near model node J646 correspond to Boston Harbor Elementary School and are deficient by 30 percent. Being adjacent to the Boston Harbor Reservoir, the school is at a high point in the system. At the design flow, the pressure at the school drops to 14 psi. However, all parts of the distribution system remain above 20 psi. The transmission pipe at the high point near the intersection of Zangle Road NE and 73rd Avenue NE drops to 17 psi when at the 1,500 gpm fire flow goal. Because the low pressure for distribution system connections is limited to the school and positive pressure is maintained

throughout the system, no improvements are planned in the near-term for this deficiency. Additionally, a pumper fire truck can be used to boost pressure in a fire event at the school. The County plans to further analyze this issue in the long-term future to determine if additional improvements are warranted (e.g., additional storage at higher elevation or a booster pump to increase pressures to the school under certain conditions). The CIP has included a line-item for consideration in the future.

Distribution System Recommendations

- To obtain a 1,500 gpm fire flow to the marina with fire suppression storage depleted while maintaining a minimum distribution system pressure of 20 psi, the existing 8-inch and 10-inch pipe along 73rd Avenue NE between the marina and the Boston Harbor Reservoir should be upsized to 12-inch (approximately 5,900 feet of pipe). This would also resolve minor deficiencies seen at model nodes J270, J278, and J596. This project is not currently planned to be completed in the near term but may be completed in phases as piping is needed to be replaced.

In addition to the above capital improvement project, the following operational recommendations shall be made due to the pressure results seen in the model:

- The eastern most service connection on 73rd Avenue NE is about 400 feet east of the intersection with Byron St NE. A hydrant exists about 750 feet east of the intersection. No service connections should be allowed further east of this hydrant between here and the Boston Harbor Reservoir. The 10-inch pipe on 73rd Avenue NE in this area should be considered a transmission line due to pressures below 30 psi during PHD conditions and below 20 psi during fire flow conditions.

- The hydrant approximately 1,000 feet west of the intersection of Zangle Road NE and 73rd Avenue NE along the transmission line (near model node J180) should be marked as a low flow hydrant.

4.5 System Capacity Summary

The system capacity analyses presented in Sections 4.1 through 4.4 are summarized in Table 4-6, based on the format recommended in the DOH Water System Design Manual.

Table 4-7. System Capacity Analysis Summary

Water System Component	ERU Capacity	Volume Capacity
Water Rights (Qa and Qi)	Qa: 875 Qi: 1,196	Qa: 150 afy (133,929 gpd) Qi: 300 gpm (432,000 gpd)
Source Pumping Capacity	392	144,000 gpd (20-hr pumping)
Treatment	718	259,200 gpd
Storage	344	29,218 gallons (above 30 psi)
Transmission	N/A	N/A
Water System Service Capacity (in ERUs) = Based on limiting water system components shown above		**344** (based on storage capacity)

[1]Boston Harbor Water System ERU = 153 gallons per day (average day demand) and 361 (maximum day demand).
[2] Not shown above are distribution system limitation ERUs because these are location specific within the distribution system. These are not expected to limit the ERU capacity of the entire system.
[3] Transmission components are shown as N/A because they do not limit system capacity for this system.

4.6 Water Quality Assessment

Table 4-7 provides a summary of Boston Harbor's water quality monitoring schedule. Detailed water quality information is available on DOH's online Sentry database.

Table 4-8. Water Quality Monitoring Schedule

Parameter	Sample Point	Monitoring Frequency
Bacteriological	Distribution	Twice Monthly Oct.–Jun. Once Monthly Jul.–Sept.
Lead and Copper	Distribution	3 Year
Asbestos	Distribution	Waiver - 9 Year
Disinfection By-Products[1]	Distribution	1 Year
Nitrate	Source	1 Year
Inorganic Compounds (Complete IOC)	Source	Waiver – 9 Year
Arsenic	Source	3 Year
Manganese	Source	3 Year
Iron	Source	3 Year
Volatile Organic Compounds (VOCs)	Source	3 Year
Herbicides	Source	Waiver – 9 Year
Pesticides	Source	Waiver – 3 Year
Soil Fumigants	Source	Waiver – 3 Year

Parameter	Sample Point	Monitoring Frequency
Radionuclides	Source	6 Year

[1]Total Trihalomethane and Halo-Acetic Acids

Over the past 10 years, Boston Harbor has occasionally experienced exceedances for disinfection by-products. Exceedances were observed on:

- December 7, 2015
- June 14, 2016
- September 13, 2016
- December 12, 2016

A recirculation pump was installed in the Boston Harbor reservoir in 2017 to address water age and DBP formation. The County experimented with multiple pump settings, including a 12-hour recirculation setting. This setting resulted in exceedances on June 17, 2021 and March 8, 2022. The County has reconfigured the pump setting and no exceedances have been observed since the pump was reconfigured.

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FIRE FLOW TEST LOCATIONS FOR MODEL CALIBRATION

FIGURE 4-1



HDR

MAXIMUM SYSTEM PRESSURES

FIGURE 4-2

2020 BOSTON HARBOR WATER SYSTME PLAN


LEGEND
Parcel
2020 PHD Pressure
<30 psi
30 to 40 psi
>40 psi
Water Main
0
Feet
500
Boston Harbor Marina
Transmission Pipe
Boston Harbor Reservoir
Wells 5 and 6
Boston Harbor Elementary School
DOVER POINT PL NE
77TH AVE NE
76TH AVE NE
75TH WAY NE
74TH WAY NE
73RD WAY NE
72ND WAY NE
73RD AVE NE
72ND AVE NE
72ND LN NE
BOSTON HARBOR RD NE
BOSTON HARBOR EXT RD NE
LIGHTHOUSE LN NE
COMMERCIAL ST NE
BAYVIEW DR NE
HARRIMAN LN NE
BYRON ST NE
ZANGLE RD NE


LEGEND
Parcel
2030 PHD Pressure
<30 psi
30 to 40 psi
>40 psi
Water Main
0
Feet
500
Boston Harbor Marina
LIGHTHOUSE LN NE
BOSTON HARBOR RD NE
DOVER POINT PL NE
77TH AVE NE
76TH AVE NE
75TH WAY NE
74TH WAY NE
73RD WAY NE
72ND WAY NE
BYRON ST NE
ZANGLE RD NE
COMMERCIAL ST NE
72ND AVE NE
72ND LN NE
HARRIMAN LN NE
BAYVIEW DR NE
BOSTON HARBOR EXT RD NE
73RD AVE NE
Transmission Pipe
Boston Harbor Reservoir
Wells 5 and 6
Boston Harbor Elementary School


LEGEND
Parcel
2040 PHD Pressure
<30 psi
30 to 40 psi
>40 psi
Water Main
0
Feet
500
Boston Harbor Marina
Transmission Pipe
Boston Harbor Reservoir
Wells 5 and 6
Boston Harbor Elementary School
DOVER POINT PL NE
77TH AVE NE
76TH AVE NE
75TH WAY NE
74TH WAY NE
73RD WAY NE
72ND WAY NE
73RD AVE NE
72ND AVE NE
72ND LN NE
BOSTON HARBOR RD NE
BOSTON HARBOR EXT RD NE
LIGHTHOUSE LN NE
COMMERCIAL ST NE
BAYVIEW DR NE
HARRIMAN LN NE
BYRON ST NE
ZANGLE RD NE



2020 AVAILABLE FIRE FLOW

FIGURE 4-6

2020 BOSTON HARBOR WATER SYSTME PLAN



2030 AVAILABLE FIRE FLOW

FIGURE 4-7

2020 BOSTON HARBOR WATER SYSTME PLAN


LEGEND
Parcel
Water Main
2040 Fire Flow Results*
Deficient
Meets Goal
*Available fire flow indicated
0
Feet
500
Boston Harbor Marina
(1,500 gpm goal)
J642
973 gpm
J462
1086 gpm
J542
1043 gpm
J558
1037 gpm
J576
1021 gpm
J596
997 gpm
J278
996 gpm
J270
968 gpm
J624
1027 gpm
J426
1230 gpm
J170
1119 gpm
J644
1163 gpm
J340
1205 gpm
J64
1226 gpm
J26
1226 gpm
J82
1236 gpm
J144
1238 gpm
J380
1282 gpm
J392
1331 gpm
J402
1430 gpm
J174
1643 gpm
J178
1642 gpm
J180
23 gpm
J302
1879 gpm
J646
711 gpm
Boston Harbor Reservoir
Wells 5 and 6
Boston Harbor Elementary School
(1,500 gpm goal)
LIGHTHOUSE LN NE
COMMERCIAL ST NE
BOSTON HARBOR RD NE
BOSTON HARBOR EXT RD NE
BAYVIEW DR NE
71ST WAY NE
72ND WAY NE
72ND AVE NE
72ND LN NE
73RD WAY NE
73RD AVE NE
HARRIMAN LN NE
74TH WAY NE
75TH WAY NE
76TH WAY NE
76TH AVE NE
77TH WAY NE
77TH AVE NE
DOVER POINT LN NE
DOVER POINT PL NE
EARLINGS ST NE
BYRON ST NE
ZANGLE RD NE



SYSTEM PRESSURES WITH 1,500 GPM FIRE FLOW AT BOSTON HARBOR MARINA

FIGURE 4-9

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5 Wellhead Protection Program

This chapter presents an update to the Boston Harbor Water System's wellhead protection program (WHPP).

5.1 Wellhead Protection Area

The prior wellhead protection area (WHPA) for Boston Harbor was delineated by Thurston County using the calculated fixed radius (CFR) method. The County updated the WHPA map using its MODFLOW-MODPATH Model v125 for the Boston Harbor water system, updated in 2019 (Figure 5-1). This map displays the locations of: Wells 5 and 6; the 6-month, 1-year, 5-year, and 10-year time of travel zones; groundwater flowlines; and service area boundaries of nearby water systems.

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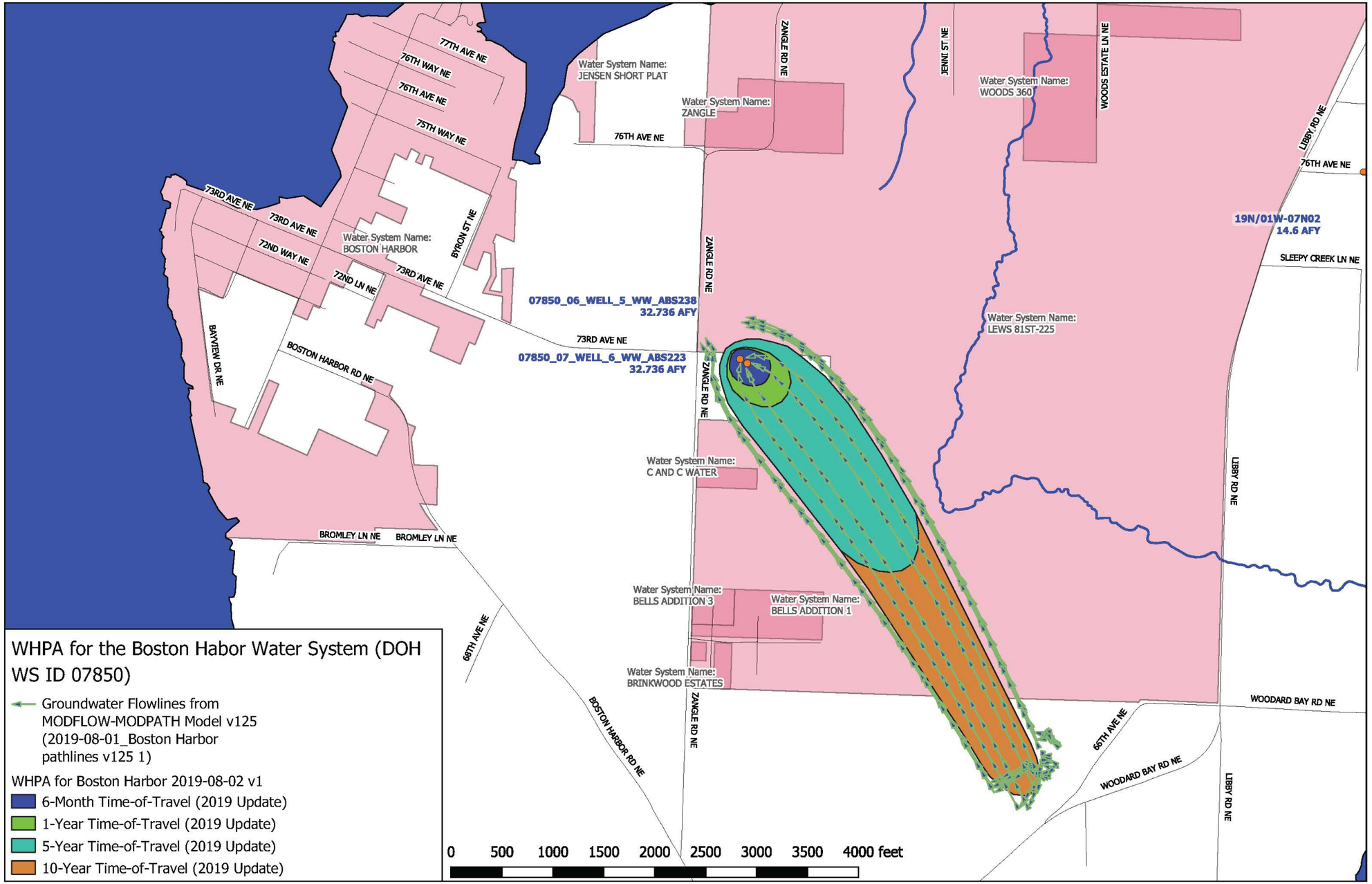


Figure 5-1. Wellhead Protection Area for Boston Harbor Water System Wells 5 and 6

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5.2 Potential Sources of Contamination

Table 5-1 displays potential sources of contamination in the Boston Harbor WHPA.

Table 5-1. Wellhead Protection Area Contaminant Source List

Parcel	Land Use	Contaminant
6-Month Time of Travel		
12913230100	School District #111	Gasoline, oil, antifreeze, pesticides, fertilizers, cleaning products
12913230300	School District #111	Gasoline, oil, antifreeze, pesticides, fertilizers, cleaning products
1-Year Time of Travel		
12913230300	School District #111	Gasoline, oil, antifreeze, pesticides, fertilizers, cleaning products
5-Year Time of Travel		
12913320102	Residential property	Septic System
12913320104	Residential property	
12913320204	Residential property	
12913320304	Residential property	
12913320500	Residential property	
10-Year Time of Travel		
12924120100	Residential property	Septic System
12924120200	Residential property	

Several contaminants of concern to the Boston Harbor wells are within the 6-month and 1-year time of travel at the Boston Harbor Elementary School. Residential properties in the 5- and 10-year are on septic systems which are also potential contaminants of concern.

5.3 Wellhead Protection Program Implementation

The following are action items the County will consider for implementation relative to its WHPP for the Boston Harbor Water System:

- Monitor development in the 5-year and 10-year time of travel zones and proactively engage with any developer who may bring in a potential contaminant source during development and occupation of the land.
- Provide informational letters to property owners in the wellhead protection area. See Appendix H for letter templates and the mailing list.
- Provide notification to all Boston Harbor water system customers in the event of a contamination event. Customer notification is provided in accordance with the Public Notification Plan (Appendix H).
- Utilize trucked water as an emergency contingency supply in the event one or both of the wells become contaminated.

6 Capital Improvement Program

This chapter presents the Capital Improvement Program for the Boston Harbor Water System.

6.1 Methodology

The CIP was prepared by first identifying projects that address water system needs or deficiencies, as documented in earlier chapters of the water system plan. In addition, recurring or periodic capital projects related to system maintenance (e.g., reservoir maintenance and water meter replacement) have also been included in the list of improvements.

A 20-year implementation schedule of the projects was then developed. Generally, projects of higher priority (i.e., those that address current system needs) were scheduled for implementation within the ten-year planning horizon (2024-2033). Projects that serve anticipated future needs associated with system growth, or are less critical to system operation, were scheduled for implementation between 2034 and 2043. Detailed scheduling of the higher priority projects was based primarily upon the County's existing forecast of project implementation timelines.

Planning-level (Association for the Advancement of Cost Engineering Class 4) cost estimates have been developed for each capital project included in the CIP. Pipeline replacement costs for 12-inch ductile iron pipe are estimated at $450 per lineal foot, based on recent pipeline construction bid tabs in the region. This represents a total project cost including design and contingency.

6.2 Planned Improvements

Table 6-1 summarizes the costs and schedule of the planned 20-year improvements for Boston Harbor. Each improvement is briefly described below.

Source Projects

- **S-1: Additional Boston Harbor Well**. As discussed in Section 4.1, Wells 1-4 are no longer active and while Boston Harbor intends to only need the use of Wells 5 and 6 to meet the demands of the 20-year planning horizon, the utility does plan to drill an additional well as a backup to Wells 5 and 6 in the future. This new well would make use of the 150 gpm primary water right that is currently associated with Wells 1-4 and that is not presently used by the system.

Distribution System Projects

- **D-1: Transmission Main Upgrade**. As discussed in Section 4.4.3, to obtain a 1,500 gpm fire flow to the marina with fire suppression storage depleted while maintaining a minimum distribution system pressure of 20 psi, the existing 8-inch and 10-inch pipe along 73rd Avenue NE between the marina and the Boston Harbor Reservoir should be upsized to 12-inch (approximately 5,900 feet of pipe). This would also resolve minor deficiencies seen at three hydraulic model nodes. As this deficiency is a legacy issue and a fire flow of approximately 1,000 gpm can be provided with no concern, this project is not currently planned to be completed in the near term but may be completed in phases as piping is needed to be replaced for other reasons.

- **D-2: Boston Harbor Water Main Replacements & I/I Reduction (American Rescue Plan Act).** Most of the Boston Harbor water system was constructed in the late 1980's and has certain components that were not constructed to current industry standards. Portions of the water system have been constructed with improper connections and/or undersized pipes which has resulted in increased leaks and may also lead to an increase in pipe failures as the system continues to age. Through the ARPA program, the County has obligated funds for the replacement of water and sewer lines associated with the Boston Harbor water and sewer systems. There is an estimated 6,000 feet of undersized and/or outdated water main in the Boston Harbor water system. It is anticipated that most undersized water main will be replaced. The total funds for this project also include STEP sewer tank infiltration & inflow reduction efforts.

Miscellaneous Projects

- **M-1: Water Meter Replacements**. The County's water meter replacement program targets replacement of all service meters every 15 years, on average.

- **M-2: Reservoir Inspection/Cleaning/Repair**. Routine inspection and cleaning of the Boston Harbor Reservoir, on approximately a 5-year cycle.

- **M-3: Watermain Assessment/Repair/Replace**. Periodic assessment of watermain integrity and leak detection, followed by implementation of identified, localized repairs.

- **M-4: Fire Hydrant Repair/Replace**. The County sets aside money to repair and replace fire hydrants within their water systems. The County also uses this funding to install bollards around fire hydrants which experience frequent damage.

- **M-5: Pump Assessment/Repair/Replace**. Periodic assessment, and rehabilitation/replacement as needed, of water system pumps.

- **M-6: Backup Generator Assessment/Repair/Replace**. The County anticipates the need to replace its emergency generators. This project accounts for that.

- **M-7: Filter Media Replacement**. The project involves the replacement of treatment system filter media approximately every 4-5 years.

- **M-8: Part B Water System Plan Update**. This Part B WSP will need to be updated in approximately 10 years.

- **M-9: Boston Harbor School Fire Flow and Pressure Analysis**. As discussed in Section 4.4.3, pressure at the school is modeled to decrease to 14 psi once fire suppression storage in the reservoir is depleted. While no near-term improvements are planned (because this is a localized issue, positive pressures are maintained throughout the system, and a pumper fire truck can be used to boost pressures to the school during a fire event), this project involves future additional evaluation of this issue to determine if a system improvement is warranted. The analysis will consider factors such as the appropriateness of the fire flow goal for the school building (currently 1,500 gpm for a one-hour duration) and potential building modifications or other mitigation efforts that could be made to reduce that goal. The project will also then evaluate the costs and benefits of potential system improvements if they are still deemed necessary, such as additional storage located at an elevation to provide higher pressures or a booster pump station to increase pressures to the school during a fire event.

  The ability of any identified improvements to improve static peak hour demand (PHD) pressure at this location will also be examined. With the operational modification described in this WSP of reducing the operational storage band from four feet to three feet, current and 10-year PHD pressure is above 30 psi, but this is projected to not be the case at the 20-year time horizon. Thus, this issue will be explored at the same time as the fire flow issue.

  The costs for this project are for analysis only and do not relate to capital improvements, as no specific option has yet been identified.

Table 6-1. Boston Harbor Capital Improvement Program

ID	Description	Near-Term (2021-2033)													Long-Term (Beyond 2033)
		2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	
Source Projects															
S-1	Additional Boston Harbor Well														$530,000
Distribution Projects															
D-1	Transmission Main Upgrade (73rd Avenue NE, from marina to reservoir; 12-inch pipe; 5,900 feet length)														$2,655,000
D-2	Boston Harbor Water Main Replacements & I/I Reduction (American Rescue Plan Act)*				$1,425,000	$1,425,000									
Miscellaneous Projects															
M-1	Water Meter Replacements						$5,000	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000	$20,000
M-2	Reservoir Inspection/Cleaning/Repair		$10,000	$40,000				$10,000	$40,000				$10,000	$40,000	$50,000
M-3	Watermain Assessment/Repair/Replace		$20,000	$20,000		$40,000	$35,000	$5,000		$45,000	$35,000	$15,000	$25,000	$5,000	$100,000
M-4	Fire Hydrant Repair/Replace		$10,000		$10,000		$10,000		$10,000		$10,000		$10,000		$10,000
M-5	Pump Assessment/Repair/Replace	$20,000	$20,000	$15,000	$5,000										
M-6	Backup Generator Assessment/Repair/Replace			$20,000	$70,000	$10,000									
M-7	Filter media replacement			$30,000				$30,000				$30,000			$30,000
M-8	Part B Water System Plan Update														$25,000
M-9	Boston Harbor School Fire Flow and Pressure Analysis														$50,000
	TOTAL	**$20,000**	**$60,000**	**$125,000**	**$1,510,000**	**$1,475,000**	**$50,000**	**$50,000**	**$55,000**	**$50,000**	**$50,000**	**$50,000**	**$50,000**	**$50,000**	**$5,820,000**

***Project includes both water and sewer improvements.**

7 Financial Program

The objective of the financial program is to show the water system's financial viability and ability to fund the capital projects identified in Section 6 of this WSP. Washington Administrative Code (WAC) 246-290-100 provides the legal requirements for a WSP. Parts of WAC 246-290-100 relevant to the financial section of the WSP state the WSP must include:

> *"(j) Demonstration of financial viability by providing:*
>
> *(i) A summary of past income and expenses*
>
> *(ii) A one-year balanced operational budget for systems serving 1,000 or more connections or a six year balanced operational budget for systems serving less than on thousand connections*
>
> *(iii) A plan for collecting the revenue necessary to maintain cash flow stability and to fund the capital improvement program and emergency improvements; and*
>
> *(iv) An evaluation that has considered:*
>
> *(A) The affordability of water rates; and*
>
> *(B) The feasibility of adopting and implementing a rate structure that encourages water demand efficiency."*

The subsequent sections of this chapter address these requirements established in the WAC.

7.1 Past and Present Financials

Before Thurston County's three water systems' financial accounts were consolidated into a single Thurston County Water Utility, the Boston Harbor Water System was an independent system owned and operated by Thurston County. It had two funds: Fund 4200, which was a Maintenance and Operating (M&O) fund, and Fund 4210, which was the system's Capital Fund. At the start of 2024, Fund 4200 was consolidated into the newly created Fund 4700, and Fund 4210 was consolidated into the newly created Fund 4750. These newly created funds also include the previous M&O and capital funds of the other two County-owned water systems. This consolidation was financial only, and the three water systems and their service areas remain physically and spatially separate. The M&O Fund (formerly 4200; currently 4700) has three revenue sources: utility revenue which is primarily rate revenue, interest and penalties (i.e., late fees), and other revenue. Expenditures include salaries, wages and benefits, operating costs, intergovernmental services, and capital projects/transfer to reserves. Table 7-1 summarizes the historical results of the M&O Fund.

Table 7-1. Maintenance & Operations Fund (4200)

	Actual						Budget
	2017	2018	2019	2020	2021	2022	2023
Beginning Fund Balance	$263,163	$220,599	$209,287	$167,103	$212,486	$196,492	$221,754
Revenue							
Utility Revenue	$426,065	$469,242	$513,639	$560,896	$565,047	$582,918	$601,800
Interest/Penalties	9,925	13,703	12,816	7,993	2,495	6,780	7,000
Other Revenue	0	6,807	1,844	1,801	1,498	15,518	31,000
Total Revenue	$435,990	$489,752	$528,299	$570,690	$569,041	$605,216	$639,800
Expenditures							
Salaries, Wages & Benefits	$224,529	$233,190	$243,788	$234,877	$269,355	$247,281	$272,931
Operating Costs	104,389	120,844	95,412	100,276	124,838	120,193	199,940
Intergovernmental Service	69,681	63,625	63,926	71,591	81,882	92,629	187,737
Capital Projects/Transfers to Reserves	80,000	80,000	170,000	119,000	110,000	120,000	45,00
Debt Payments	0	0	0	0	0	0	0
Total Expenditures	$478,599	$497,659	$573,126	$525,743	$586,075	$580,102	$705,614
Revenue less Expenditures	($42,609)	($7,907)	($44,827)	$44,947	(17,034)	25,114	(65,814)
Ending Fund Balance[1]	$220,599	$209,287	$167,103	$212,486	$196,492	$221,754	$87,522

[1] Ending fund balance also includes balance sheet impacts and therefore does not always equal beginning balance plus revenue minus expenditures.

The M&O Fund had maintained an average of about $200,000 in the years reviewed, which equals approximately 180 days of Maintenance and Operations expense. The calculation of days of M&O expense excludes capital and debt service costs, which is a common calculation method. Days of water system M&O expense typically range from 45 to 90 days.

The Capital Fund (formerly 4210; currently 4750) has four revenue sources: operating transfer from the M&O fund, Real Estate Excise Tax (REET 2), Interest and Miscellaneous, and capital contributions/connection fees. The capital fund expenses include salaries, wages and benefits, major repairs & maintenance, non-capital projects, capital projects, and intergovernmental services. Table 7-2 summarizes the historical results of the Capital Fund.

Table 7-2. Capital Fund (4210)

	Actual						Budget
	2017	2018	2019	2020	2021	2022	2023
Beginning Fund Balance	$411,614	$425,105	$481,370	$557,775	$457,422	$505,343	$580,041
Revenue							
Operating Transfers from M&O Funds	$80,000	$80,000	$170,000	$119,000	$110,000	$120,000	$45,000
REET 2	0	0	27,647	6,406	51,093	50,330	179,791
COVID ARPA	0	0	0	0	0	19,380	630,620
Interest and Miscellaneous	4,167	6,271	8,656	5,917	2,552	4,501	3,000
Capital Contribution/Connection Fees	0	14,190	30,107	15,421	16,519	0	0
Total Revenue	$84,167	$100,461	$236,410	$146,744	$180,165	$194,211	$858,411
Expenditures							
Salaries, Wages & Benefits	$0	$94	$740	$0	$0	$0	$33,183
Major Repairs & Maintenance	19,159	7,425	27,914	28,431	40,076	0	0
Non-Capital Projects	12,508	4,140	35,697	48,941	29,669	24,646	28,567
Capital Projects	38,081	31,132	91,978	166,177	58,742	89,460	1,027,693
Intergovernmental Services	896	1,232	3,679	2,646	4,598	5,373	7,576
Total Expenditures	$70,644	$44,023	$160,008	$246,195	$133,085	$119,479	$1,097,019
Revenue less Expenditures	$13,523	$56,438	$76,402	($99,451)	$47,080	$74,732	($238,608)
Ending Fund Balance[1]	$425,105	$481,370	$557,775	$457,422	$505,343	$580,041	$312,866

[1] Ending fund balance also includes balance sheet impacts and therefore does not always equal beginning balance plus revenue minus expenditures.

As Tables 7-1 and 7-2 show, the water system has historically had rates and other revenue to sufficiently fund maintenance and operations, and the capital program.

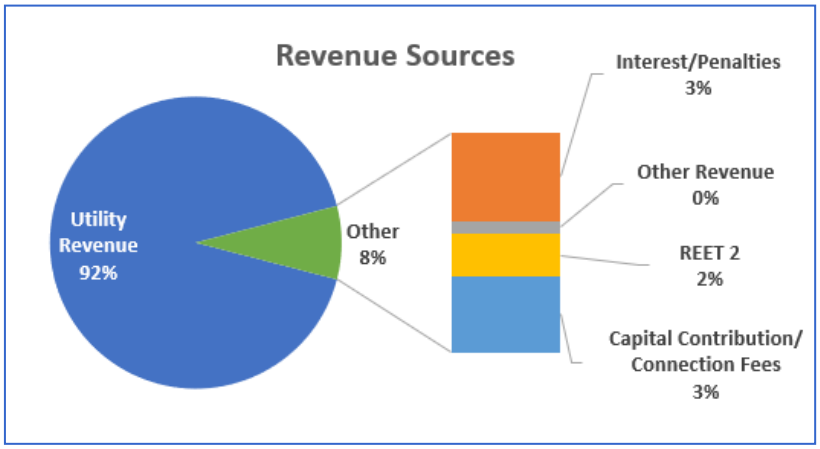
7.2 Sources and Uses of Funds

7.2.1 Internal Sources of funds

The water system's two funds had five types of revenue in the 2017-2020 time period originating from outside sources. The largest source of revenue is rate revenue

which comprises 92% of all revenue. Other revenue sources that are typical to a water system include interest, penalties, and capital contributions. Capital contributions/connection fees are fees that may include contributions from developers to reimburse for capital facilities and connection fees are fees collected when a customer connects to the County's water system.

A source of revenue that is not very common for water utilities is REET. REET 2 is a quarter of a percent tax that a municipality may or may not choose to assess on property sales. Counties may institute this tax on property sales outside of incorporated areas within the County. The proceeds from REET 2 must be used to fund capital for streets, roads, highways, sidewalks, street and road lighting system, traffic signals, bridges, domestic water systems, storm and sanitary sewer systems.



7.2.2 External Sources of Funds

Low Interest Loan Programs

There are outside agency grant and loan funding programs that can be used to fund a portion of the capital plan. Provided below is a summary of potential funding sources that may be available for upcoming capital improvement projects.

- Drinking Water State Revolving Fund
- Public Works Trust Fund
- Rural Development
- Water Infrastructure Finance and Innovation Act
- Other External Funding Sources

A brief description of these low interest loan programs are provided below.

Drinking Water State Revolving Fund (DWSRF). The Washington State Department of Health (DOH) manages these funds. Under the reauthorized Safe Drinking Water Act (SDWA), funding is appropriated to states to develop their DWSRF loan programs. Each state receives annual allocations in the form of a

Capitalization Grant. DWSRF loans are available to all community public water systems, and non-profit, non-community public water systems, except federally owned and state-owned systems. Loans are provided to water systems for capital improvements that increase public health protection and compliance with regulations. Additionally, loans are intended to protect the health of the people of Washington by ensuring safe and reliable drinking water.

Loans are ranked and awarded to communities based on established scoring criteria. As of 2014, US steel and iron products are required for projects fully or partially funded by the DWSRF. Loans must focus on construction and address a single identified problem or need. If multiple areas are applicable and in need of funding, separate loan applications must be submitted. A few notable ineligible projects and activities include projects that focus on future population growth and water systems expansion and purchase of water rights.

Subsidized loans are granted to communities based on affordability determined by an affordability index based on the community's median household income and the water system's water rates. Subsidized loans are awarded based on available funds with a maximum subsidy of 50% principal forgiveness.

The interest rates of the loan are generally 1.0 to 1.5 percent based on a community affordability index calculation. Non-subsidized loans are also assessed a 1.0 percent loan fee interest rate, with a 1.0 percent loan fee, for a term of up to 20 years and a maximum of $5 million. No local match is necessary for the loan.

Public Works Board Loan (Public Works Trust Fund). The Public Works Board (PWB) Loan program is a loan program set up by the Legislature to assist cities, towns, counties, or special districts with funding for different types of public works projects. The program is administered by the Washington State Department of Commerce. Eligible projects include repair, replacement or creation of domestic water systems, sanitary sewer systems storm water sewer systems roads, streets, solid waste and recycling facilities and bridges. Eligible projects must meet policy objectives which include:

- Efficient use of State Resources
- Preservation and enhancement of health and safety
- Abatement of pollution and protection of the environment
- Creation of new, family wage jobs, and avoidance of shifting existing jobs from one Washington State community to another
- Foster economic development
- Efficiency in delivery of goods and services transportation
- Reduce the overall cost of public infrastructure.

There are three types of loans available: construction, pre-construction, and emergency. Projects are awarded based on a scoring method that is then ranked against all other applicants. PWB Loans are awarded to communities by scoring applications based on a set of predetermined criteria then funding the highest scores until budgeted funds are exhausted.

The maximum loans per biennial budget are $10 million for construction, and $1 million for both pre-construction and emergency loans. The terms are variable based on need but can range from 1 to 20 years for construction and emergency loans, and a maximum of 5 years for pre-construction loans. No local match is required for PWB loans. Debt service coverage is not imposed on the PWB loan. The interest rates for non-distressed communities are established by multiplying the average of 11 general obligation bond index rates by 50%.

Communities that are determined to be distressed, as measured by an affordability index similar to the DWSRF, may receive loan forgiveness of up to 5% of principal for construction loans.

U.S. Department of Agriculture, Rural Development (RD). Loan monies are available to rural areas with less than 10,000 population. This program is funded for the preliminary engineering, design, construction, and start-up of new water system facility projects. The application process allows for a thorough review of the engineering, environmental, and financial impacts of proposed projects before extending a loan offer. The RD loan program offers interest rates lower than municipal bonds and up to a 40-year term. The RD loan program requires some form of interim financing, as loan monies are made available after completion of the construction activity.

U.S. Environmental Protection Agency, Water Infrastructure Finance and Innovation Act (WIFIA). This program is eligible for a broad range of water and wastewater infrastructure projects. Interest rates are set at U.S. Treasury rates and can be financed over a maximum of 35 years from substantial completion of the project. The program is limited to projects with a minimum of $20 million for large communities and $5 million for communities with a population less than 25,000. A key limitation to the program is that the WIFIA loan amount cannot exceed 49 percent of the total project costs and the total project costs cannot exceed 80 percent for all federal funding sources.

Provided below are additional external funding sources available to the County for funding capital improvements.

Revenue Bonds. Revenue bonds are another external source of funding for capital projects. The sale of revenue bonds is the most common source of funds for construction of major utility improvements. Water rate revenue and charges are the

main source of funds for debt service (principal and interest) payments. A key benefit of revenue bonds is the exemption of federal income tax.

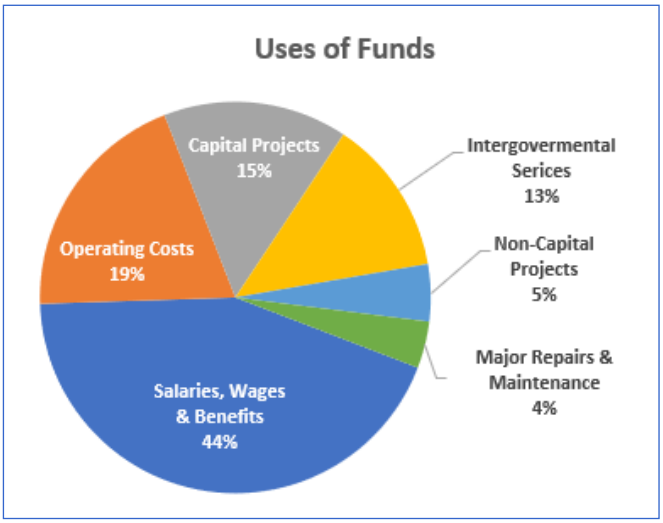
A determination of the utility's ability to repay debt is an important consideration. A debt service coverage ratio (total revenue, less O&M and tax expenses, divided by the debt service payments requiring a coverage ratio) is calculated and the utility's finances are reviewed in order to verify debt payments will be feasible. Coverage ratios of 1.25 (25 percent more than the debt payment) are typical, but coverage of 1.5 is a more prudent financial target for financial planning purposes.

Utility Local Improvement Districts/Special Assessment Districts. Similar to revenue bonds, other bond financing approaches include utility local improvement districts (ULIDs), special assessment districts (SADs) and other funding for projects that serve and benefit a limited service area such as Boston Harbor. The costs of those improvements are shared only by those customers benefiting from those improvements.

While the above list of possible funding opportunities is not exhaustive, it does highlight the most probable outside funding sources available for capital improvement program funding. One key resource in identifying other funding programs is the Infrastructure Assistance Coordinating Council (Council). The Council is a non-profit organization comprised of state and local agencies whose function is to provide assistance in securing funding for infrastructure repair and development. The purpose of the Council is to assist local governments in coordinating funding efforts for infrastructure improvements. This is an important resource as the Council will be aware of any new funding opportunities that may arise.

7.2.3 Uses of Funds

The water system has a typical set of expenses that are summed up into salaries, wages, benefits, operating costs, intergovernmental services, non-capital projects, major repairs & maintenance and capital projects. Salaries, wages and benefits is the largest expense for the water system, comprising 44% of total costs. Operating costs constitute 19% of the water system costs, which contain items such as maintenance and supplies, professional services, utility costs



(e.g., electricity, taxes), and other routine costs.

The remaining 24% of the water system's expenses are funded out of the capital fund, which are capital or capital related costs identified as capital projects, non-capital projects and major repair & maintenance. The water system has funded capital out of rate revenue for a number of years. This is evident because there was no debt service expense in the 2017-2020 period.

7.3 Capital Funding Plan

An important component of the water system plan is the capital funding plan. The development of the capital funding plan begins by projecting revenue sources and uses of funds forward a number of years to determine if the water system's revenue sources are sufficient to fund both operations and capital. The following capital funding plan is conducted using generally accepted rate making methods. To accomplish the capital funding plan, a revenue requirement analysis was used. A revenue requirement is a process of accumulating revenue sources, comparing those utility revenues to utility costs, which produces a balance or deficiency of funds. Table 7-3 shows the elements of a typical revenue requirement analysis.

Table 7-3. Revenue Requirement Analysis

Revenue Requirement
Sources of Funds
+ Rate Revenue
+ Other Revenue
= Total Sources of Funds
Uses of Funds
+ Maintenance & Operations
+ Capital Funding
+ Taxes and Transfers
+ Debt Service
= Total Uses of Funds
(Source of Funds) – (Uses of Funds)
= Balance/(Deficiency) of Funds

Utilizing the method described in Table 7-3, a capital funding plan was created for the water system. The first step is creation of a revenue requirement which

represents the water system's overall costs. Table 7-4 summarizes the revenue requirement component of the capital funding plan for the consolidated M&O fund (Fund 4700).

Table 7-4. Revenue Requirement Analysis (4700)

	Budget		Projected							
	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Beginning Fund Balance	$1,410,845	$499,343	$486,831	$337,542	$339,731	$349,463	$356,815	$358,574	$361,831	$364,125
Sources of Funds										
Utility Revenue	$1,701,100	$1,834,500	$1,951,124	$2,074,944	$2,206,380	$2,349,095	$2,490,040	$2,639,443	$2,797,809	$2,965,678
Interest/Penalties	$27,250	$27,250	$28,887	$30,625	$32,470	$34,473	$36,452	$38,549	$40,772	$43,128
Other Revenue	0	0	0	0	0	0	0	0	0	0
Total Sources of Funds	$1,728,350	$1,861,750	$1,980,011	$2,105,569	$2,238,850	$2,383,568	$2,526,492	$2,677,991	$2,838,581	$3,008,805
Uses of Funds										
Salaries, Wages & Benefits	$525,936	$528,906	$543,982	$559,527	$575,558	$592,092	$609,146	$626,740	$644,892	$663,621
Operating Costs	$327,927	$333,127	$340,953	$349,128	$357,672	$366,606	$375,950	$385,729	$395,968	$406,691
Indirect Costs	$287,542	$293,862	$304,153	$314,870	$326,034	$337,664	$349,782	$362,410	$375,573	$389,295
Transfers to Reserve	$1,490,000	$710,000	$932,000	$870,000	$960,000	$1,070,000	$1,180,000	$1,290,000	$1,410,000	$1,530,000
Capital Projects and Major Maintenance	$8,212	$8,212	$8,212	$9,854	$9,854	$9,854	$9,854	$9,854	$9,854	$9,854
Debt Payments	$235	$155	0	0	0	0	0	0	0	0
Total Uses of Funds	$2,639,852	$1,874,262	$2,129,300	$2,103,380	$2,229,118	$2,376,216	$2,524,733	$2,674,734	$2,836,287	$2,999,461
Cumulative Balance/(Deficiency)	($911,502)	($12,512)	($149,289)	$2,189	$9,732	$7,352	$1,759	$3,257	$2,294	$9,344

The revenue requirement projects deficiencies through 2026, but shows that an annual rate adjustment that follows a rate model provided by FCS Group would provide adequate revenue to fund the Maintenance and Operations and maintain healthy fund balance with above 60 days of Maintenance and Operations.

A key component of the revenue requirement is capital funding. Capital funding can be accomplished through a combination of ways: current rate revenue, reserves (rate revenue saved from prior years), grants, and/or debt. The water system does not currently have debt and this analysis does not assume any new debt issues. Overall capital was assumed to be funded from a combination of reserve funds and current rate revenue. Table 7-5 summarizes the capital reserve and funding analysis for the consolidated capital fund (Fund 4750).

Table 7-5. Capital Reserve Analysis (4750)

	Budget		Projected							
	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Beginning Fund Balance	$2,107,542	$3,198,866	$3,463,881	$3,997,223	$3,833,300	$3,855,047	$6,714,922	$7,728,512	$8,856,558	$10,122,697
Capital Revenue										
ARPA	$1,175,000	$1,175,000	0	0	0	0	0	0	0	0
Interest & Miscellaneous	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000
Capital Contributions	0	0	$267,384	$274,240	$281,096	$2,262,480	$308,520	$315,376	$335,944	$349,656
ULID Payments	$7,500	0	0	0	0	0	0	0	0	0
Operating Transfers from M&O Fund	$1,490,000	$710,000	$932,000	$870,000	$960,000	$1,070,000	$1,180,000	$1,290,000	$1,410,000	$1,530,000
Total Capital Revenue	$2,682,500	$1,895,000	$1,209,384	$1,154,240	$1,251,096	$3,342,480	$1,498,520	$1,615,376	$1,755,944	$1,889,656
Capital Expenses										
Salaries, Wages & Benefits	$75,507	$67,015	$68,951	$70,947	$73,008	$75,134	$77,329	$79,594	$81,933	$84,347
Predesign Studies	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000
Non-Capital Projects	0	0	0	0	0	0	0	0	0	0
Capital Projects	$1,345,000	$1,460,000	$550,000	$1,190,000	$1,099,000	$350,000	$350,000	$350,000	$350,000	$350,000
Indirect Costs	$6,969	$52,970	$7,091	$7,215	$7,342	$7,470	$7,602	$7,736	$7,873	$8,012
Total Capital Expenditures	**$1,477,476**	**$1,629,985**	**$676,042**	**$1,318,163**	**$1,229,349**	**$482,605**	**$484,931**	**$487,330**	**$489,805**	**$492,359**
Ending Fund Balance	$3,198,866	$3,463,881	$3,997,223	$3,833,300	$3,855,047	$6,714,922	$7,728,512	$8,856,558	$10,122,697	$11,519,994

7.4 Assessment of Rates

Given the potential rate adjustments noted in this chapter, the water system should be able to adequately fund the capital program as well as continue to fund operations at the current service levels.

The water system's rates have two components: a fixed charge per ERU, and a charge per 100 cubic feet of water consumption. Table 7-6 shows the water system's historical water rates.

Table 7-6. Historical Water Rates

Year	Fixed Service Charge per ERU (after tax)	Consumption Charge Per 100 Cubic Feet (after tax)
2016	$24.69	$1.85
2017	$27.16	$2.04
2018	$29.88	$2.24
2019	$35.86	$2.69
2020	$43.03	$2.83
2021	$43.03	$2.83
2022	$44.32	$2.91
2023	$46.54	$3.06

Assuming an average monthly water usage of 700 cubic feet, the 2023 monthly bill for a residential customer was $77.57. The water rates were not adjusted in 2021, but the County has historically adjusted rates annually to reflect the increasing cost of providing water service.

Another aspect of the water system's water rates that should be considered is affordability to the customers. A common method of determining if water rates are affordable is to calculate the water rates as a percentage of median household income (MHI). The Environmental Protection Agency (EPA) has historically stated that the annual water cost billed to customers that is in excess of 2 percent of MHI is considered unaffordable. Table 7-7 summarizes the affordability calculation where the average annual single family bill with 700 cubic feet of monthly consumption is shown as a percent of MHI.

Table 7-7. EPA Affordability Calculation

	2016	2017	2018	2019	2020	2021
Median Household Income (MHI)	$87,443	$88,564	$89,612	$95,664	$98,247	$100,900
Estimated Annual Single Family Water Bill	$452	$497	$547	$656	$754	$754
Water Costs as % of MHI	0.5%	0.6%	0.6%	0.7%	0.8%	0.7%

For Table 7-7, the MHI was taken from the U.S. Census Bureau for Thurston County Census Tract 121, within which the Boston Harbor Water System is located. Years 2020 and 2021 MHI were estimated using the 10-year average MHI annual growth of 2.7%. For the Boston Harbor Water System water rates to exceed the EPA 2% affordability threshold, rates would have to increase in excess of 167%. It should be noted that Census Tract 121 has a MHI that is approximately 30% higher than Thurston County as a whole.

Due to the consolidation of three water systems' financial accounts into a single Thurston County Water Utility, the County is implementing a rate model provided by FCS Group in which water rates will be adjusted annually until each service area shares the same base and usage rates in 2028. The water rates for all County service areas will then be adjusted equally each year after 2028. Assuming rate adjustments based on this rate model starting in 2024, the annual water bill as a percent of MHI will likely remain below 1.5 percent. Table 7-8 summarizes the water system's rates with the recommended blended rate model, applied to both components of the rate.

Table 7-8. Water Rates with Annual Rate Increases

Year	Fixed Service Charge per ERU (after tax)	Consumption Charge Per 100 Cubic Feet (after tax)
2024	$50.18	$3.19
2025	$54.12	$3.35
2026	$58.37	$3.50
2027	$62.97	$3.67
2028	$67.92	$3.84
2029	$72.17	$4.08
2030	$76.68	$4.34
2031	$81.47	$4.61
2032	$86.57	$4.90
2033	$91.98	$5.20

7.5 Conclusion

The Boston Harbor Water System has been historically well funded. Rate increases of around 5 or 6 percent per year will both help keep the revenue up with inflationary pressures as well as fund the proposed capital plan.

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Appendix A Part B WSP Review Process Documentation

THURSTON COUNTY
WASHINGTON
SINCE 1852

COUNTY COMMISSIONERS

Carolina Mejia-Barahona
District One
Gary Edwards
District Two
Tye Menser
District Three

**COMMUNITY PLANNING &
ECONOMIC DEVELOPMENT DEPARTMENT**

Creating Solutions for Our Future

Joshua Cummings, Director

February 16, 2023

Elena Fernandez
Thurston County Public Works
9605 Tilley Rd. S., Ste, C
Olympia, WA 98512

SUBJECT: Project 2022106215
Local government Consistency Review for Boston Harbor Water System Plan

Dr. Ms. Fernandez:

Review of the above noted project is complete. The signed Local Government Consistency review checklist is enclosed, along with a memorandum from Thurston County Public Health dated February 2, 2023.

Please let me know if you have any questions.

Brett Bures

Brett Bures
Development Services Manager
Thurston County
Community Planning and Economic Development+

CC:
Tim Wilson, Water Resources Manager, Thurston County Public Works
Trevin Taylor, Sr. Environmental Coordinator, Thurston County Public Works

THURSTON COUNTY
WASHINGTON
SINCE 1852

COUNTY COMMISSIONERS
Carolina Mejia
District One
Gary Edwards
District Two
Tye Menser
District Three

PUBLIC HEALTH AND
SOCIAL SERVICES DEPARTMENT

David Bayne, MPH
Director
Dimyana Abdelmalek, MD, MPH
Health Officer

MEMORANDUM

February 2, 2023

TO: Brett Bures, Building and Planning Manager

FROM: Stephanie Kenny, Thurston County Environmental Health

SUBJECT: Project 2022106215 XD, Boston Harbor Water System Plan Part B Review

The above referenced application has been routed to this agency for review and comment. The applicant has prepared an updated water system plan for Boston Harbor (ID# 07850R) to fulfill a requirement by Washington State Department of Health Office of Drinking Water (DOH ODW) for periodic updates. As a condition to grant approval of the updated water system plan by DOH ODW, the applicant is required to route a copy to Thurston County for Local Government Consistency Review.

Environmental Health has completed a review of the local consistency statement sections D and E. Sections D and E sections do not appear to be in conflict with Thurston County Coordinated Water System and Groundwater Area Management plans.

Additional comments:

- Figure 2-1 shows that the water system service area has expanded compared to the Thurston GeoData map. The retail service area is the original ULID but the Boston Harbor Service Area is larger, it also includes properties outside the ULID that are adjacent to water service lines. The system is not in a coordinated water system plan area and no public water system service area is encroached upon due to the expansion. This is acceptable. The update will be sent to TC Geodata.
- Part B 2.1.2 states that Lews in the only water system adjacent to Boston Harbor. Lews does not show as directly adjacent on TC GeoData. Jensen Short Plan is the only directly adjacent water system. It touches a northeast corner. Let me know if your records do not agree.

If you or the applicant has any questions regarding Environmental Health's review of this application, I can be reached at (360) 867-2630.

Sincerely,

Stephanie Kenny

Stephanie Kenny
Environmental Health Specialist
Thurston County Environmental Health

SCANNED

Washington State Department of Health

Local Government Consistency Determination Form

Water System Name: Boston Harbor PWS ID: 07850 R

Planning/Engineering Document Title: Water System Plan Plan Date: September 2021

Local Government with Jurisdiction Conducting Review: Thurston County Community Planning

Before the Department of Health (DOH) approves a planning or engineering submittal under Section 100 or Section 110, the local government must review the documentation the municipal water supplier provides to prove the submittal is consistent with **local comprehensive plans, land use plans and development regulations** (WAC 246-290-108). Submittals under Section 105 require a local consistency determination if the municipal water supplier requests a water right place-of-use expansion. The review must address the elements identified below as they relate to water service.

By signing this form, the local government reviewer confirms the document under review is consistent with applicable local plans and regulations. If the local government reviewer identifies an inconsistency, he or she should include the citation from the applicable comprehensive plan or development regulation and explain how to resolve the inconsistency, or confirm that the inconsistency is not applicable by marking N/A. See more instructions on reverse.

Local Government Consistency Statement	For use by water system: Identify the page(s) in submittal	For use by local government: Yes or Not Applicable
a) The water system service area is consistent with the adopted land use and zoning within the service area.	2-3 to 2-5	yes
b) The growth projection used to forecast water demand is consistent with the adopted city or county's population growth projections. If a different growth projection is used, provide an explanation of the alternative growth projection and methodology.	3-9 to 3-11	yes
c) For cities and towns that provide water service: All water service area policies of the city or town described in the plan conform to all relevant utility service extension ordinances.	N/A	N/A
d) Service area policies for new service connections conform to the adopted local plans and adopted development regulations of all cities and counties with jurisdiction over the service area.	WSP Part A 1-14	
e) Other relevant elements related to water supply are addressed in the water system plan, if applicable. This may include Coordinated Water System Plans, Regional Wastewater Plans, Reclaimed Water Plans, Groundwater Management Area Plans, and the Capital Facilities Element of local comprehensive plans.	2-8	

I certify that the above statements are true to the best of my knowledge and that these specific elements are consistent with adopted local plans and development regulations.

T T

Signature

12/20/22

Date

Trevis Taylor

Printed Name, Title, & Jurisdiction

From: Brett Bures
To: Aaron Tormanen
Cc: Joe Plahuta; Trevin Taylor
Subject: RE: 2020105467, 2022106215, and 2023105415: Thurston County WSPs updates need additional docs
Date: Monday, January 29, 2024 12:42:01 PM
Attachments: image003.png

Hi Aaron:

As discussed, the Local Government Consistency Determination Forms that were signed for the following Water System Plans are still applicable and the comments and changes to these plans meet the existing approved LGCD's previously signed:

- Grand Mound WSP: 2020105467, approved in 2021.
- Boston Harbor WSP: 2022106215, approved 2/16/2023

Please let me know if you need further clarification or have any questions.

Thanks.

NOTICE
Beginning February 21, 2023, the Planning Services Division will be providing assistance in the Building Development Center between 10 a.m. and 2 p.m. Monday through Friday. This temporary schedule is in place until further notice. Please visit www.thurstoncountybdc.com for up to date information, hours of operation, and services provided remotely.

Brett Bures | **Development Services Manager**
Thurston County Community Planning & Economic Development
3000 Pacific Ave SE, Suite 100, Olympia, Washington 98501
Main (360) 786-5471 | **Fax** (360) 754-2939 | **TDD** (800) 833-6388
brett.bures@co.thurston.wa.us | www.thurstoncountybdc.com
This communication is a public record and may be subject to disclosure under the Washington State Public Records Act, RCW 42.56.

From: Aaron Tormanen <aaron.tormanen@co.thurston.wa.us>
Sent: Monday, January 29, 2024 11:54 AM
To: Brett Bures <brett.bures@co.thurston.wa.us>
Cc: Joe Plahuta <joe.plahuta@co.thurston.wa.us>; Trevin Taylor <trevin.taylor@co.thurston.wa.us>
Subject: FW: 2020105467, 2022106215, and 2023105415: Thurston County WSPs updates need additional docs

Hi Brett,

Thanks again for meeting today. Based on our conversation, would you be able to confirm that CPED does not need to revisit the Local Government Consistency Determination review for the three County Water System Plans in the email below after the changes in the attached memo are made (including extending the planning period through 2033)?

Thank you,

Aaron Tormanen
Water Resources Utility Planner
Thurston County Public Works
aaron.tormanen@co.thurston.wa.us
Office: (360) 867-2078 | Cell: (360) 628-4492

From: Elena Fernandez <elena.fernandez@co.thurston.wa.us>
Sent: Tuesday, January 9, 2024 9:20 AM
To: Brett Bures <brett.bures@co.thurston.wa.us>; Stephanie Kenny <stephanie.kenny@co.thurston.wa.us>
Cc: Trevin Taylor <trevin.taylor@co.thurston.wa.us>; Joe Plahuta <joe.plahuta@co.thurston.wa.us>; Tim Wilson <tim.wilson@co.thurston.wa.us>; Aaron Tormanen <aaron.tormanen@co.thurston.wa.us>
Subject: 2020105467, 2022106215, and 2023105415: Thurston County WSPs updates need additional docs

Hi Bret and Stephanie,

Thurston County Water Resources received comments from WA Department of Health (DOH) concerning the Tamoshan/Satellite Management Agency (SMA), Boston Harbor, and Grand Mound Water System Plans (WSP). These comments required a few changes, outlined in the attached memo. Overall, the changes are primarily financial, increase the projection from 6 to 10 years, and refine the capacity analysis.

Because of these comments, DOH requires a statement from Environmental Health and the Planning Depts. stating the comments and changes to these plans meet the existing (approved) Local Government Consistency Determinations (LGCD) for these plans. Below are the CPED project numbers and LGCD status:

- Grand Mound WSP: 2020105467, approved in 2021.
- Boston Harbor WSP: 2022106215, approved 2/16/2023
- Tamoshan/SMA WSP: 2023105415, submitted for review 11/21/2023

If changes are still aligned with the existing LGCD documentation on file, please send a write up stating as such and that no additional review is required. If they are deemed out of compliance with the previously approved documents, please let me know how we can rectify that situation. If there is additional paperwork needed to get these items into a queue or you need to complete your assessment, please let me know asap. Closing this loop is time sensitive.

To answer questions regarding the process and documentation required by DOH, I've cc:'d the Utilities Planner (Aaron Tormanen), Utilities Engineer (Joe Plahuta), and Water Resources Manager (Tim Wilson). Please CC: me on those questions.

Thanks,

Elena

Elena Fernandez | Environmental Coordinator, M.S.
Thurston County Public Works
9605 Tilley Road S. | Olympia, WA 98512

Ph: (360) 867-2342 | C: (360) 485-2279

Public Works

Date: Tuesday, June 8, 2021
Location: Microsoft Teams meeting
Time: 1:30 pm – 2:15 pm

AGENDA

ATTENDANCE

☒April Leigh
☐Dana Bowers
☒Mark Mazeski
☒Jenifer Ramsey
☒Torren Valdez

ITEMS

- Introductions
- Brief background on Thurston County's progress on their WSPs and some related information
- Questions for Mark regarding WSP Informational Customer Meeting:
    - What information is required for this meeting? What is typically presented?
        - No hard requirements regarding the information presented in this meeting.
        - Helpful to discuss 10-year improvement plans and water use metrics, which provides context for water use efficiency (WUE) goal setting.
        - Going through the SMA/WSPs (one or both may be applicable, depending on audience) chapter by chapter may also be helpful.
        - Torren will need to look into having the contractor put together materials and, perhaps, presenting at these meetings.
            - Depends on budget and contract – we would have to amend our existing contract with the consultant.
    - We are planning to combine this meeting with the WUE Goal Setting meeting – are there any potential issues with combining the two?
        - This is totally fine.
    - Will advertise these meeting using the ODW's website and using bill inserts.
        - This is fine as well.
        - The WUE goal setting meeting must be advertised to the public, which is why we are advertising on ODW's website.

        - The bill inserts will ensure that Thurston County water system customers are properly notified ahead of the meeting.
    - Any additional questions that arise from discussion.
        - Copies of the presentations and notes can be used as documentation to be provided to Thurston County Board of County Commissioners. This will ensure that customer comments from the meeting are documented and considered.
- Meeting wrap up and close.

WATER SYSTEMS PLAN

ONLINE OPEN HOUSES

Learn about the 5-year plan to manage your county water utilities.

Tamoshan
Tuesday 6-7 p.m.
Aug. 24, 2021

Grand Mound
Wednesday 6-7 p.m.
Aug. 25, 2021

Boston Harbor
Thursday 6-7 p.m.
Aug. 26, 2021

THURSTON COUNTY
WASHINGTON
SINCE 1852

Register online:
co.thurston.wa.us/publicworks/sewerwaterutilities.html
Call 360-867-2088 for details. TTY/TTD call 711 or 1-800-833-6388

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Boston Harbor Water System Plan Informational & Water Use Efficiency Goal Setting Meeting

Thurston County Public Works Department

Water Resources – Technical Services Group

Welcome!

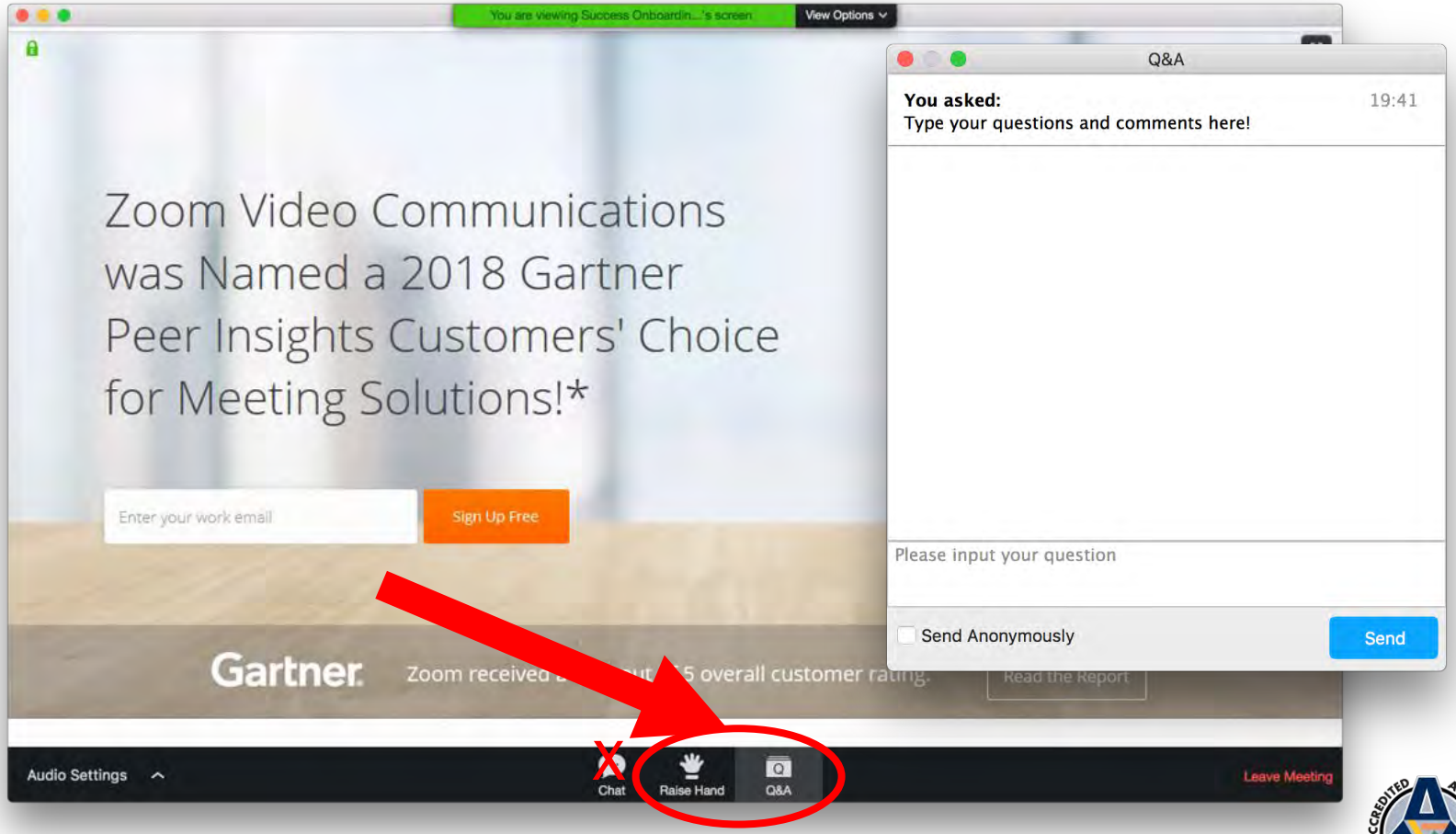
- Microphones, cameras are turned off by default
- A recording of this presentation will be posted online along with questions & answers
- For more information & online comments https://www.co.thurston.wa.us/publicworks/Watersystemsplan.html





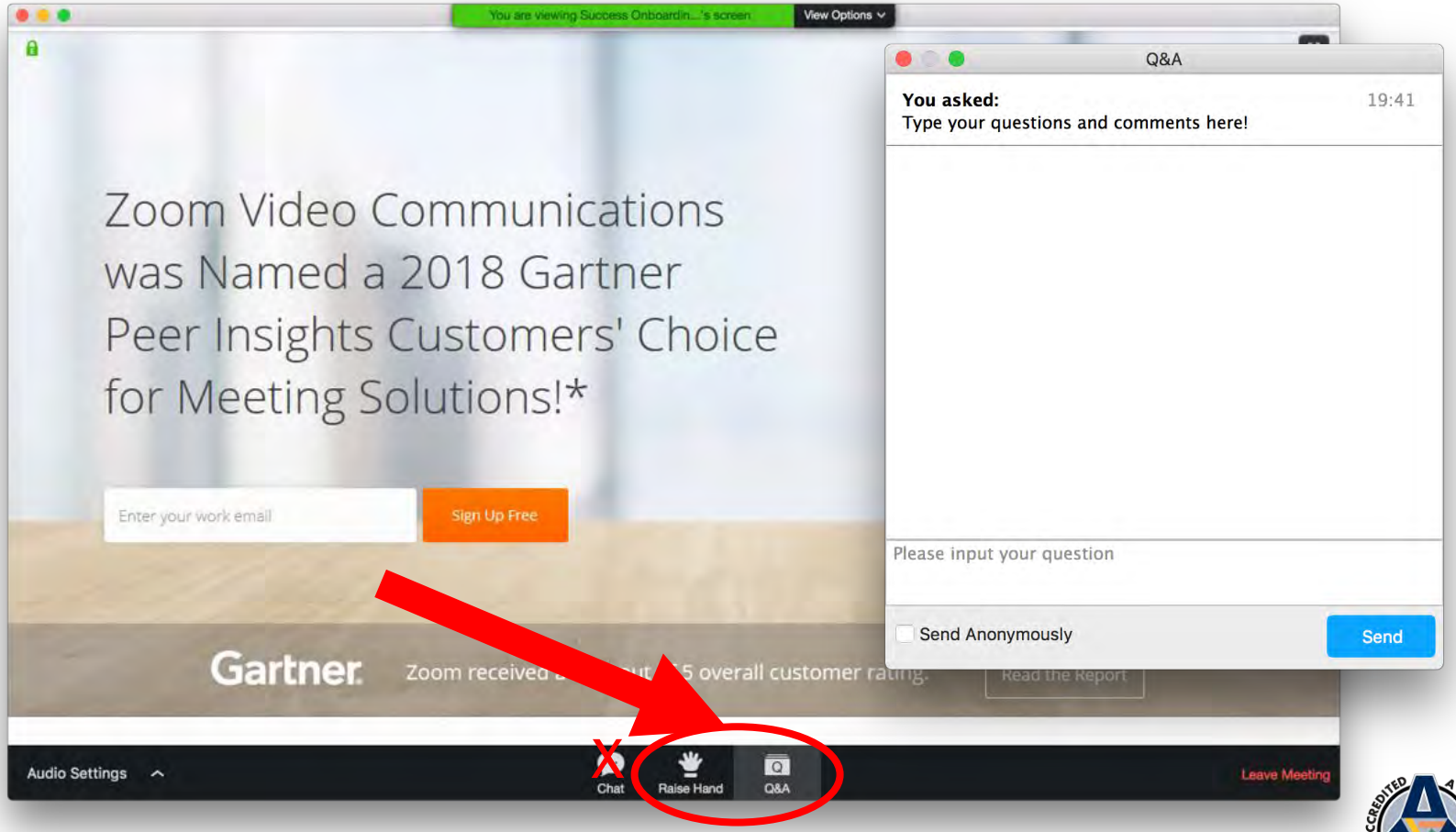
Zoom Instructions

- Use Q&A to submit questions, comments or requests for technical assistance.
- Question and answer periods will be provided during the presentation.



Zoom Instructions

- Raise your hand if you would like to ask a question through the microphone, you will be called on.
- Type your question directly in the Q&A to ask your question by text.



Introductions



Tim Wilson
Water Resources Manager



April Leigh
Outreach Supervisor



Torren Valdez
Project Manager & Water Resources Planner

Agenda

- Overview
- Thurston County Part A Water System Plan
- Boston Harbor Part B Water System Plan
- Water Use Efficiency (WUE) & WUE Goal Setting

Overview

- Description of Water System Plans and Water Use Efficiency (WUE) Program
  - Seeking feedback on WUE Goals
- Why is this important?
  - Compliance with state law and DOH requirements
  - Eligibility for grants and loans
  - Setting water utilities up for continued success
- DOH requires a customer informational meeting and a water use efficiency goal setting meeting

What is a Water System Plan?

Public Works is updating Water System Plans (WSPs):

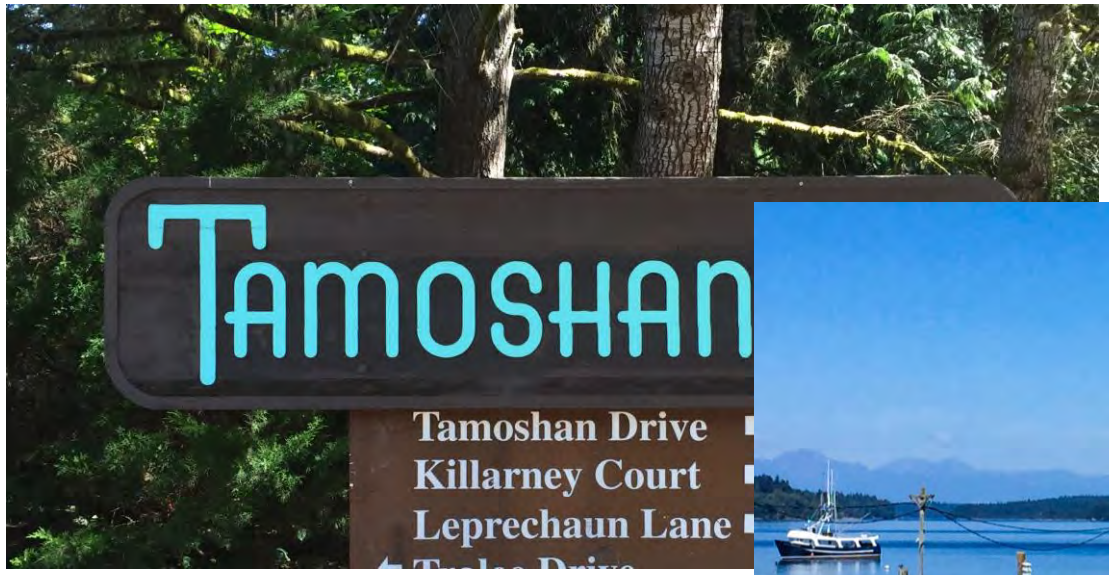
- Part A - Satellite Management Agency Plan
- Part B – Boston Harbor and Grand Mound

WSPs cover:

- Management practices
- Programs and policies
- Water use efficiency

Updated every 5–10 years

- Part A required every 5 years







Part A

Thurston County Utilities Water Systems Plan

What is in the Part A WSP?

General polices and standards used to manage and operate all water systems owned and operated by Thurston County.

- Service Area Policies
- Performance and Design Criteria
  - Includes System Capacity Standards
- Overview of Capital Improvements Program
- Water Use Efficiency Program

What is in the Part A WSP?

Thurston County's Operation and Maintenance Program:

- Certification Requirements and Personnel,
- System Operation and Control procedure for each water system,
- Maintenance Practices and Schedules,
- Water Quality Monitoring procedure,
- Emergency Response Program, and
- Cross-Connection Control Program

What is in the Part A WSP?

Part A satisfies DOH Satellite Management Agency (SMA) requirements and Municipal Water Law requirements.

- Necessary for Thurston County to continue operating water system.
- Ensures eligibility for grants and loans

Part B

Boston Harbor Water Utility Water System Plan



What is in a Part B WSP?

Part B WSPs are required for:

- Expanding systems - Grand Mound
- Systems serving outside of the approved retail service area - Boston Harbor
- Systems making additions, extensions, or changes to water source or system infrastructure

What is in a Part B WSP?

Ensures service is provided at lowest cost while protecting community health, Part B WSPs identify:

- Current water demands for a particular water system,
- Future water needs based on current trajectory, and
- That available resources are applied efficiently.

What is in a Part B WSP?

Includes technical, managerial, and financial plans to ensure the sustainability of service, quality, and supply of water into the future.

- Source Protection Program
- Capital Improvement Plan (CIP)

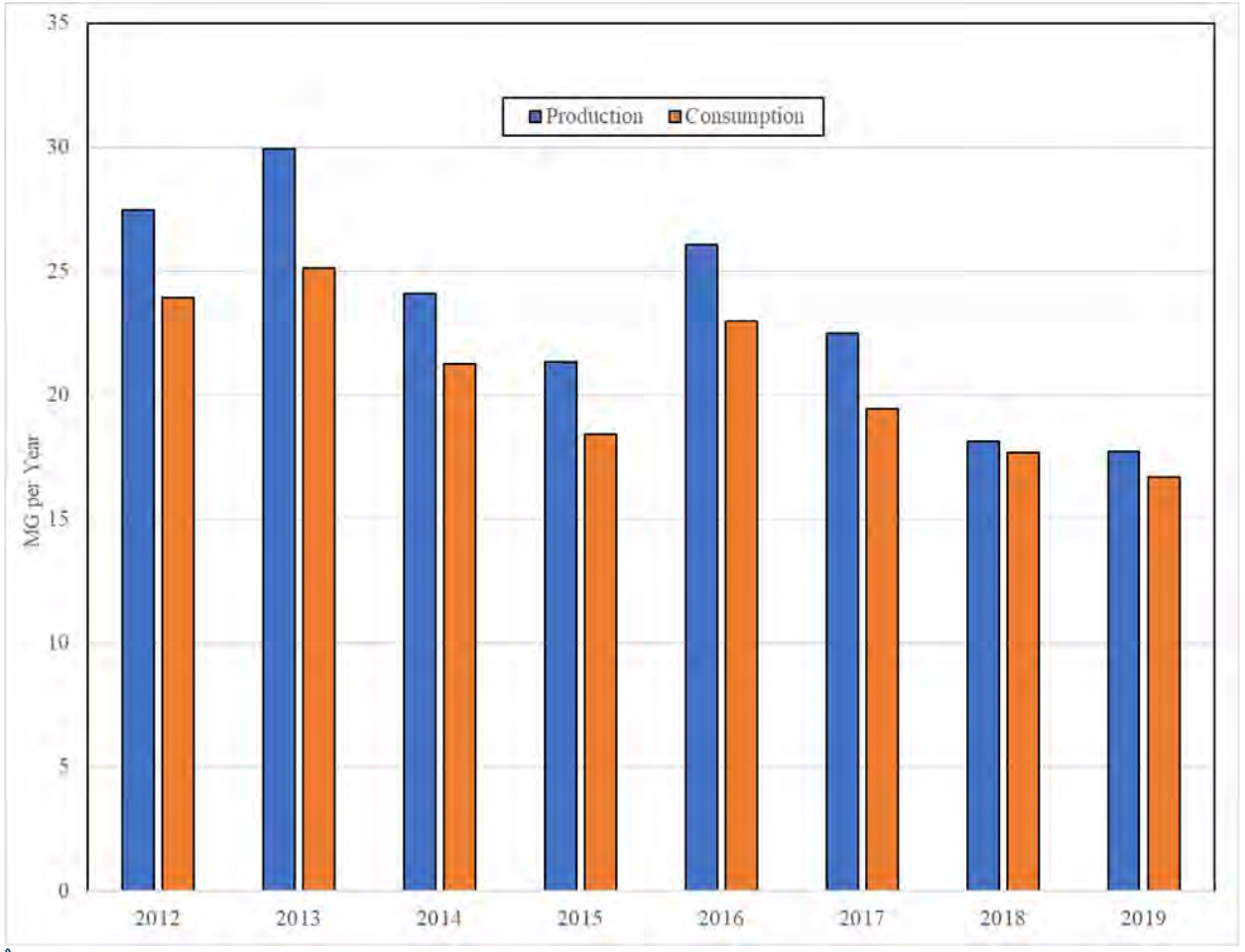
Boston Harbor Water Capital Improvement Plan (CIP)

	2021	2022	2023	2024	2025	2026	CFP Total (2020-2026)
Non- Capital Expenses							
BH Water System Plan (WSP) Update						$10,000	**$10,000**
Satellite Management Agency Plan (SMA Plan) Update						$5,000	**$5,000**
Water Meter Replacements						$5,000	**$5,000**
Reservoir Inspection/Cleaning		$10,000					**$10,000**
Capital Expenses							
BH Well/Abandonment						$45,000	**$45,000**
BH Water Treatment Building Improvements							**$0**
BH 2021-2024 Water Infrastructure Improvement Program	**$20,000**	**$50,000**	**$125,000**	**$155,000**	**$0**	**$10,000**	**$360,000**
Reservoir Repairs			$40,000				**$40,000**
Watermain Assessment/Repair/Replace		$20,000	$20,000	$60,000			**$100,000**
Fire Hydrant Repair/Replace		$10,000		$10,000		$10,000	**$30,000**
Pump Assessment/Repair/Replace	$20,000	$20,000	$15,000	$5,000			**$60,000**
Backup Generator Assessment/Repair/Replace			$20,000	$80,000			**$100,000**
Filter media replacement			$30,000				**$30,000**

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ACCREDITED AGENCY A•P•W•A

Boston Harbor Water Use



- MG = Million Gallons
- Blue columns are the amount of water produced or pumped into the reservoir each year.
- Orange columns are the amount of water consumed each year.

Boston Harbor Water Use, continued

Year	Production (MG)	Consumption (MG)	DSL* (MG)	% DSL	3-Year DSL % Avg.	Estimated Connections	GPD** per Connection
2012	27.48	23.93	3.56	12.95%		272	241
2013	29.95	25.13	4.82	16.10%		275	250
2014	24.10	21.26	2.84	11.79%	13.75%	276	211
2015	21.33	18.41	2.92	13.68%	13.77%	280	180
2016	26.09	23.01	3.08	11.80%	12.45%	281	153
2017	22.47	19.27	3.19	14.21%	13.01%	283	188
2018	18.14	17.69	0.45	2.49%	9.50%	284	171
2019	17.75	16.71	1.04	5.84%	7.51%	286	160

*Distribution System Leakage (DSL) ** Gallons Per Day (GPD)

Boston Harbor Water Use Efficiency (WUE)

- Distribution System Leakage (Leakage) represents the amount of water that entered the distribution system but was lost.
  - Can include documented leaks or overflows as well as apparent leaks.
- Leakage was >10% until 2018 but has been <10% since.
  - 3-Year Leakage Average >10% requires implementation of a water loss control action plan.
- Water production and consumption has decreased overall since 2012, with 3-Year Leakage Averages <10% since 2018.

Summary of the Boston Harbor Water System

- Total Annual Water Production and Consumption has decreased since 2012, decreasing from 2016 spike.
- Annual Leakage and 3-Year Leakage Averages were above the 10% mark from 2012 to 2017 but <10% from 2018 to present.
  - Water loss control action plan is not required.

Summary of the Boston Harbor Water System, Continued

- Estimated Gallons-Per-Day (GPD) per Connection has trended down since 2012.
- Boston Harbor Part B WSP is currently in development and should be adopted in Spring 2022.

Questions?

Water Use Efficiency Goal Setting

Boston Harbor Water System



What is Water Use Efficiency (WUE) Program?

- A plan intended to increase water demand efficiency and provide safe and reliable water supply.
- Goals:
  - Improve water production and distribution efficiency.
  - Enhance efficient use by customers.
- Achieved through water saving activities and adopting policies, ordinances, bylaws, and resolutions.
- A WUE Program is required in Part A WSPs for each water system.

Proposed WUE Goals – Boston Harbor Water System

Proposed WUE goals for Boston Harbor over 10-year planning period:

- Reduce household usage 3% by 2030.
- **Demand Side Goal**: Maintain average day water system usage at or below 200 gallons-per-day per connection.
- **Supply Side Goal**: Maintain leakage below 10% of production.
- Grand Mound and Tamoshan have similar goals.

Next Steps

1. Complete updates to the Boston Harbor Part B WSP and to the Part A WSP – September and October 2021
2. State Environmental Policy Act (SEPA) comment period – September and October 2021
3. Department of Health (DOH) Review – November 2021
4. Board of County Commissioners Briefing – November 2021
5. Public Hearing – January 2022
6. Board adopts WSPs and DOH accepts WSPs– February 2022

What you can do

- How can I continue to conserve water?
  - https://www.co.thurston.wa.us/publicworks/Docs/Water%20Utilities/TCPW_BostonHarborCCR_2021.pdf
- How can I comment on the WSPs or on the WUE Goals?
  - https://www.co.thurston.wa.us/publicworks/Watersystemsplan.html

Questions?

Water Utility Contact Information



Thurston.wa.us/publicworks



Torren.Valdez@co.Thurston.wa.us



@Thurston_PW



(360) 867-2088

STATE OF WASHINGTON
DEPARTMENT OF HEALTH
SOUTHWEST DRINKING WATER REGIONAL OPERATIONS
111 Israel Road Southeast • PO Box 47823 • Olympia, Washington 98504-7823
Tel: (360) 236-3030 • Fax: (360) 236-3029 • TDD/TTY 711

NOTE: County responses to ODW comments are provided in bold beneath each comment.

April 12, 2023

Tim Wilson, Water Resources Manager
Thurston County Public Works
9605 Tilley Road South
Olympia, Washington 98512-1092

Subject: Boston Harbor Water System, ID #07850R, Thurston County
Water System Plan Part B, ODW Project #22-0315

Dear Mr. Wilson:

Thank you for submitting the draft Boston Harbor Part B Water System Plan (WSP), received by the Office of Drinking Water (ODW) on March 23, 2022. The following comments must be addressed before ODW can approve the WSP:

CHAPTER 2 - WATER SYSTEM DESCRIPTION

1. Fig. 2-1, p. 2-3. The purpose of the service area expansion isn't clear. While the furthest eastward expansion includes the sources themselves, it does not include the elementary school, which appears to be served by the system and as such should be included. There are several unexplained "islands" or exclusions. What is the purpose of these, and what would happen if a private well fails in one of those areas and property owners seek to connect?
   The map has been updated to incorporate the school, as noted. The portions of the Service Area located outside of the Retail Service Area are defined as stated toward the bottom of Page 2-1, so as to include only those parcels that currently front the system's water mains, except for the transmission line. Any "islands" or exclusions are simply parcels that were not included in the ULID and that do not front a main. As such, the system was not designed to provide service to them.
2. Section 2.2.1, p. 2-6. Please indicate if each well is equipped with its own source meter, as required by WAC 246-290-496(1)(a).

   Both wells have meters, installed in February 2021. A statement to the effect has been added.
3. Section 2.2.1, p. 2-6. Please clarify the actual pumping capacity of each well. The draft WSP lists two pumping capacities: Chapter 2 refers to 65 gpm each, while Chapter 4 refers to 60 gpm each. (See also #13 below.)

Wells are rated for 65 gpm each, 130 gpm total.

CHAPTER 3 - PLANNING DATA & DEMAND FORECAST

4. Section 3.1, p. 3-1. Please clarify the meter(s) used when determining annual source production during the period 2017-2019 (e.g., individual well discharge before treatment; combined well discharge after treatment).
   Clarified in Chapter 3 that 2014-2019 were wellfield records (i.e., combined well discharge) and that source meters were installed in February 2021.

5. Section 3.1, p. 3-3. Operations and maintenance duties are described in Part A of the WSP. We do not know if source meter readings are recorded daily or at some other frequency. Are MDD values given in the draft Part B plan based on actual recorded daily source meter readings, or are they calculated/estimated using another method?

   Readings are taken daily Monday through Friday. Weekend day readings are the average of the two weekend days. Text added to section 3.1 to clarify this point.

6. Table 3-7, p. 3-7. What does "exported" mean here? If it doesn't apply to Boston Harbor, is there value in including it in the table?

   This is where wholesale water would be tracked. Boston Harbor does not sell wholesale water to any other system. But this category is included in the table as it is a standard table format to show the full suite of categories in the typical water balance calculation and noting which ones do not apply to Boston Harbor.

7. Table 3-7, p. 3-7. Note 4 in the table clarifies "real losses" (as discussed on following page) are not tracked. This does not enable the system to accurately identify water leakage. On the following page, note 3 in Table 3-8 distinguishes between non-revenue, of which real loss is one category, and distribution system leakage; yet the text preceding the table indicates non-revenue includes real loss.

   Real losses include known leakage and assumed leakage. Boston Harbor does not know of any specific leakage, but we did calculate assumed leakage, thereby identifying the quantity of leakage (though not necessarily the source thereof). On footnote 3 on table 3-8, a clarifying note has been added indicating that DSL is included within non-revenue water.

8. Table 3-8, p. 3-8. The "anomalous high value in 2017" of distribution system leakage is noted on the following page but is not explained. What happened, and what has the County done to keep it from happening again?

   In 2017, the Boston Harbor utility was having issues with both customer meters and source meters. Some customer meters were likely underreporting and the source meter was overreporting. Subsequently, all source meters and customer meters were replaced. Text added at top of Page 3-9 to note this.

9. Section 3.6, p. 3-11. The production data used to estimate future MDD in the plan was from 2014-19. We checked water use efficiency reports for 2020 and 2021. They showed MDD values higher than the 20-year projections in the plan. Since it appears the 2020 and 2021 values are not anomalies, please revise the demand forecast accordingly.

   The MDD value provided on the 2021 WUE report is 129,600 gpd. The MDD-to-MMADD (maximum month ADD) ratio for this year is approximately 1.27. The MDD value was not provided on the 2020 WUE report; using the MDD-to-

MMADD ratio from 2021, we estimate an MDD of approximately 153,700, but 2020 was an anomalous year due to the COVID-19 pandemic.

Per the data in chapter 3 (Table 3-2), MDD was in the high 200,000's in 2014 and 2015. MDD dropped precipitously throughout the decade to a low of 111,818 in 2019 and is reliably stable at lower values. The three year average of 2017 through 2019 is 128,810. Excluding the anomalous year of 2020, the 2021 value is right in that same zone, compared to the 6-year average of approximately 180,000. Additionally, ADD has similarly reduced and stabilized at a lower value over the past decade, but with a less extreme drop, thereby reducing the peaking factor. For these reasons, the peaking factor was kept at 2.4 (which is rounded up from the 2.36 3-year average from the production data in Table 3-2). Based on this, no revision to the demand forecast has been made.

10. Section 3.6, p. 3-12. Figure 3-4 indicates MDD exceeded the 24-hour pumping capacity of the two wells during the period 2014-15. When operating continuously at 120 gpm, the two wells can produce about 170,000 gallons in a 24-hour period. However, Figure 3-4 shows MDD above 200,000 gallons. Is the information the result of data error or other reason?

    That is a historical data point; storage was used to supplement demand on that day. Such an event is not projected to occur again, based on the analysis presented in the WSP.

CHAPTER 4 - WATER RIGHTS & SYSTEM ANALYSIS

11. Section 4.2, p. 4-3. Is the source capacity presented in the plan consistent throughout the year, or can periods of drought or high withdrawal rates lower the water table (thus reducing pumping capacity) or otherwise limit daily production? Is the pumping level in each well measured seasonally as required by WAC 246-290-415(10)?
    The County has not historically recorded this data but will start doing so.

12. Section 4.2, p. 4-3. Please estimate net productive capacity of the system's wellfield, considering treatment uses (filter backwash, filter to waste). The net productive capacity of the wells should be used to determine the equalizing storage requirement and assess equivalent residential unit (ERU) capacity with the sources pumping 20 hours per day. The gross source production should be used in assessing ERU capacity based on water rights (annual and instantaneous withdrawal limits), neither of which is a constraint right now.

    A typical volume of water used for treatment maintenance is approximately 6,000 gallons of water in a day (once a week in winter, and twice per week in summer) based on source records. This volume was removed from the source capacity for the source and storage analysis. Narrative in section 4.2 and tables throughout chapter 4 have been updated to reflect this.

13. Section 4.2, p. 4-3. Please clarify the actual pumping capacity of each well. The draft WSP lists two pumping capacities: Chapter 2 refers to 65 gpm each, while Chapter 4 refers to 60 gpm each. (See also #3 above.)

    Well capacity is rated at 65 gpm per well, or 130 gpm total.

14. Section 4.4.2, p. 4-9. Under normal operating conditions, the pressure available to the elementary school is less than the minimum requirement of 30 psi during peak hour demand. Based on operational and equalizing storage constraints, the system has no

room to grow. Each additional unit of demand will increase the equalizing storage requirement and further decrease the available head to the school.

Added an additional storage capacity table (the new Table 4-4) and narrative to show what happens if the operational band is reduced from four feet to three feet. This results in a maximum ERU capacity of 344. This provides more room for the system to grow. The County will implement this operational procedure to improve pressure at the school. Added text at the end of section 4.4.2 to note this will be further evaluated with project M-9 and that part of the solution could be to reduce the operational band.

15. Section 4.4.3, p. 4-10. The fire marshal should evaluate each case presented in the report where fire flow and/or distribution system pressure is inadequate. Please include the fire marshal comments in the revised WSP.

    The County has communicated with the fire marshal regarding available fire flows. See Appendix E for documentation; no response from the fire marshal was received.

16. Section 4.4, p. 4-12. Please describe and include, as appendices, any policies, or regulations you have adopted to prevent adding service connections to the section of pipeline along 73rd Avenue designated as a transmission main. Since this section of 73rd Avenue is within the service area boundaries, it suggests that service would be available to applicants fronting the pipeline.

    Figure 2-1 has been revised to remove these properties from the Service Area (i.e., only the pipeline itself is shown as being "in the Service Area" along the transmission line). No connections can be added adjacent to this portion of the pipeline. The County has no other specific policies or regulations related to this.

17. Section 4.5, p. 4-13. Please provide the rated capacity of the manganese filtration system.

    Two filters, 90 gpm per filter, which equates to 259,200 gpd. This equates to 718 ERUs on a max day.

18. Section 4.5, p. 4-13. Table 4-6 lists the storage capacity as 715 ERU; however, this does not account for the equalizing storage constraints described above. Please revise the capacity assessment accordingly.

    With the operational band adjustment described above, the storage capacity is 344 ERUs. Table has been updated to show this.

19. Section 4.6, p. 4-14. There were several quarters with DBP exceedances in 2015 and 2016. Please describe the operational strategies used to correct the historical issues and prevent future exceedances. If this information is in Part A of the WSP, please provide a reference to the appropriate section.

    A recirculation pump was added in 2017 to address water age and DBP formation in the Boston Harbor reservoir. Several configurations tested and the County has not seen an exceedance since March 2022. Text added to plan.

CHAPTER 5 - WELLHEAD PROTECTION PROGRAM

20. Section 5.1, p. 5-1. The description of the system's previous calculated fixed radius (CFR) wellhead protection area (WHPA) is inaccurate. ODW's Source Water Assessment Program (SWAP) does not identify or assign CFR-based WHPAs. The

mapping system merely collects those WHPAs reported to us by water purveyors. The County itself would have identified the previous CFR WHPA. If a reference is desired, it could point to the process outlined on pp. 23-25 of DOH's Wellhead Protection Program Guidance publication. Or, it could simply say that the County previously used a CFR-based WHPA for this system but has now modeled it.
Text revised to indicate that the County utilized the CFR method and that the WHPAs have been updated.

21. Although Figure 5.1 (repeated as Attachment 1 to Appendix H) depicts the 2019 modeled WHPA, it still says "draft." Is the County's intent to adopt this new WHPA as a part of this plan? (If so, our SWAP map will be adjusted after plan approval.)

    Yes, this is the new WHPA. "Draft" has been removed from figure title. Note that this map was produced in 2019 and may not show the most up-to-date retail service areas for the water systems in the vicinity of the wells. For the most up-to-date map of the Boston Harbor retail service area, see figure 2-1.

22. Section 5.3, p. 5-6. This section lists several wellhead protection program action items that the County will consider. Please clarify which of these items are currently implemented. If they are not currently implemented, please describe the plan to implement them. Please check to be certain Appendix H includes the entire mailing list; the list that was submitted seems brief. Also, emergency notification is missing outside of the warning agreement with the school and must be provided.

    Bullet points for the school have been removed; the school is treated the same as other utility customers. An additional bullet was added regarding notification to all customers in the event of a contamination event per the public notification plan. Public notification plan was added to Appendix H.

CHAPTER 6 - CAPITAL IMPROVEMENT PLAN

23. Section 6.2, p. 6-2. Because the deficiency in equalizing storage constrains future connections, complete Project M-9 (school fire flow and pressure analysis) as soon as possible. We will maintain the number of approved connections at the current level (340) until the analysis is completed.
This issue is less immediate with the change in operational storage described in the response to question 14. The County intends to implement project M9 within the 20 year horizon.

CHAPTER 7 - FINANCIAL PROGRAM

24. Table 7-1, p. 7-2. Are "penalties" late fees? Does the County's program include the ability to modify or eliminate these for low-income customers or those who are part of another payment plan?
Yes, penalties are late fees. A minor note has been added to Page 7-1 to note this. Late fees are waived when a customer enters a payment plan. Late fee policies are described in chapter 15.12.630 of the Thurston County Code.

APPENDIX A - PART B WSP REVIEW PROCESS DOCUMENTATION

25. Local Government Consistency Determination Form. This is meant to be completed by planning staff as reviewed against the county comprehensive plan, in this case, the coordinated water system plan for this area (ref. A-e, "other relevant elements" on following

page). It should not be completed by Public Works.
The LGC was provided to the correct department and signed. Updated version is in Appendix A.

26. Please append signed meeting minutes, if available, to the provided slideshows. Why did the open house announcements refer to only five years? We can approve plans for up to ten years. We note that the capital improvement program only goes out for six years. Is the County requesting approval for only a five- to six-year timespan?

    The five year comment in the presentation was erroneous (i.e., simple a typo). The County is submitting the plan for 10-year approval. The CIP goes out to 10 years.

    The County does not have signed minutes from this meeting. But notes from a meeting between County and DOH staff have been included in Appendix A, wherein the meeting documentation requirements (which have been met) were outlined.

MISCELLANEOUS

27. Page I (preface). The WSP must be signed by both engineers before we can approve it.
    Engineer signatures included with updated submittal.

28. Appendix G. Please update WFI prior to approval.

    Appendix updated with 2023 WFI.

29. Appendix H. An emergency response coordinator must be assigned, if not by name, then position. See also comments in 4.b & c above.

    The Utility Operations Supervisor is the emergency response coordinator. The emergency response program is in Appendix F of the Part A WSP.

DEPARTMENT OF ECOLOGY

On March 28, 2022, a copy of this WSP was sent to the Department of Ecology (Ecology). Ecology has issued the following comments on this WSP:

> Water rights appear to be more than adequate for the next 20 years, and we have no concerns about this system. Provided that the criteria for statutory amendment are met under RCW 90.44.100(3), Thurston County is reminded to file a Showing of Compliance affidavit when the proposed new well is constructed under Water Rights Nos. G2-00630 and G2-293917.
> **No change required. County will file a Showing of Compliance if new well is constructed.**

The Department's review of your WSP and design does not confer or guarantee any right to a specific quantity of water. Our review is based on your representation of available water quantity. If the Washington Department of Ecology, a local planning agency, or other authority responsible for determining water rights and water system adequacy determines that you have use of less water than you represent, the number of approved connections may be reduced commensurate with the actual amount of water and your legal right to use it.

CLOSING

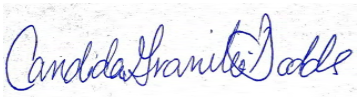
Please submit a copy of the revised .pdf in entirety to the box.com folder you originally submitted to. If you don't have a box.com folder with us, please contact our admin team at swro.admin@doh.wa.gov prior to submittal so that one can be set up to drop your revised WSP and respond to all comments. To expedite our review, please provide a summary of your response to comments and a complete WSP that is bookmarked and hyperlinked.

Regulations establishing a schedule for fees for review of planning, engineering, and construction documents have been adopted (WAC 246-290-990). Please note that we have included an invoice for **$**1,206.00 for the review of the water system plan. This fee covers our cost for review of the initial submittal, plus the review of one revised document. Please remit your complete payment within thirty days of the date of this letter. If paying by check or money order, mail to: DOH, Revenue Section, P.O. Box 1099, Olympia, WA 98507-1099. Or if you prefer, you can now pay online—follow the instructions at *Online Payment Guide* 331-688.(PDF).

If you have any questions, please contact Deborah Johnson at 253-433-3054 or by e-mail at deborah.johnson@doh.wa.gov, or Candida Granillo-Dodds at 564-669-3170 or by e-mail at candida.granillo-dodds@doh.wa.gov.

Sincerely,





Deborah Johnson
Office of Drinking Water, Regional Planner

Candida Granillo-Dodds, P.E. (CA)
Office of Drinking Water, Regional Engineer

Enclosures

cc: Jeff Hansen, HDR Engineering, Inc.
Joe Plahuta, Thurston Co. Public Works
Stephanie Kenny, Thurston County Public Health & Social Services
Southwest Region, Department of Ecology

From:	Granillo-Dodds, Candida M (DOH)
To:	Jones, Meredith L (DOH); Joe Plahuta; Aaron Tormanen
Cc:	Grimm, Regina (DOH); Seyfert, Kacie A (DOH)
Subject:	RE: Thurston County Part A WSP/SMA Plan/Tamoshan SWSMP, Boston Harbor Part B WSP, and Grand Mound Part B WSP--Comments
Date:	Friday, December 27, 2024 12:10:33 PM
Attachments:	image003.png image004.png image005.png image006.png

Hi Joe & Aaron,
I wanted to let you know that we agree with the 2033 plan approval period for the Boston Harbor system (item 1 below). The storage analysis in Table 4-4 shows a deficiency maintaining 30 psi at the highest meter when you reach 344 ERU between 2030 and 2040. When I interpolate, this deficiency does not occur before 2033. When ready, our approval language will show the storage capacity as the limiting factor and that you have the capacity to serve 344 ERU. Based on the current usage in the WSP of 320 ERU and 278 existing connections, this would be a total of 302 connections:

Total Water Budget (ERUs)	344
Current Usage (ERUs)	320
Water Available for Additional Connections (ERUs)	24
Existing Number of Connections (connections)	278
Total Number of Service Connections (assumes all future connections serve single family residences)	302

Thanks, please let us know if you have any questions.

Candida Granillo-Dodds, P.E.
Pronouns: she/her
Environmental Engineer 3
Southwest Drinking Water Regional Operations
Office of Drinking Water
Washington State Department of Health
candida.granillo-dodds@doh.wa.gov
doh.wa.gov | 564-669-3170

From: Jones, Meredith L (DOH) <Meredith.Jones@doh.wa.gov>
Sent: Thursday, December 19, 2024 4:24 PM
To: Joe Plahuta <joe.plahuta@co.thurston.wa.us>; Aaron Tormanen <aaron.tormanen@co.thurston.wa.us>
Cc: Grimm, Regina (DOH) <Regina.Grimm@DOH.WA.GOV>; Granillo-Dodds, Candida M (DOH) <Candida.Granillo-Dodds@doh.wa.gov>; Seyfert, Kacie A (DOH) <Kacie.Seyfert@doh.wa.gov>

Subject: Thurston County Part A WSP/SMA Plan/Tamoshan SWSMP, Boston Harbor Part B WSP, and Grand Mound Part B WSP--Comments

Hello Joe and Aaron,

Thank you for submitting the revisions to the plans noted above and for taking the time to talk with me last week. The following are the remaining items needed for plan approvals:

1. **Projections for a 2033 Plan Approval Period**
    a. Boston Harbor. *This is under review, and we will let you know as soon as this is completed.*
2. **SEPA**
    a. Boston Harbor. Please provide a copy of the signed and dated SEPA checklist, which is available on the SEPA register.
3. **LGC:**
    a. Grand Mound. The Thurston County Planning or Environmental Health Department must sign section e of the LGC form indicating consistency with local plans and regulations.
4. **WUE Goal Adoption by Governing Body:**
    a. Boston Harbor
    b. Grand Mound
    c. Tamoshan
5. **WSP Approval by Governing Body:**
    a. Boston Harbor
    b. Grand Mound
    c. Tamoshan
6. **Ecology Approval:**
    a. Boston Harbor
    b. Grand Mound
    c. Tamoshan

Additional Information/Recommendations (Not Required for Water System Plan Approval):

Kacie Seyfert, our Coliform Program Manager, has also reviewed your Coliform Monitoring Plans and strongly recommends using this template (DOH 331-036, Preparing a Coliform Monitoring Plan). This template will help you compile all of the information needed to conduct routine coliform sampling, as well as respond quickly and effectively to a coliform positive sample. Please reach out to Kacie (cc'd above) if you have any questions or would like to discuss this further.

If you have any questions at all, please feel free to let me know.

Meredith Jones, RS
Environmental Planner, SW Region
Office of Drinking Water
Division of Environmental Public Health
Washington State Department of Health
meredith.jones@doh.wa.gov
doh.wa.gov | 564-233-1394



THURSTON COUNTY WATER & SEWER

Utilities News

THURSTON COUNTY
WASHINGTON
SINCE 1852

Issue 1 Spring 2025

Think Before You Flush

Thurston County needs your help keeping fats, oils, grease, and other harmful products from clogging your plumbing and wastewater pipes!

Fats, Oils, & Grease:

Do not pour fats, oils, and grease (FOG) down your drain. FOG turns solid once cooled, and if poured down your drain, it can clog household plumbing and cause sewer backups into your toilet, tub, or sink. FOG also increases maintenance costs on the sewer system through higher treatment costs, increased need for pumping of STEP tanks, and the potential to cause sewer overflows.

Help protect the sewer system by collecting FOG in an empty metal can and disposing of it in the garbage once it cools. FOG includes cooking oils, mayonnaise, meat drippings, butter, gravy, and sauces.

Garbage Disposals:

Use garbage disposals less often because they can clog your plumbing with food scraps and grease. The grease will solidify in the pipes and can cause a backup. It can also cause problems at pump stations and sewage treatment plants. Even if you have a garbage disposal, scrape all solid food particles off your dishes into the trash before rinsing them in the sink.

Thurston County Water System Plans and Water Use Efficiency Goals

Public Works will present updated Water System Plans (WSPs) and Water Use Efficiency (WUE) goals to the Board of County Commissioners this spring. Proposed goals include maintaining residential water use under 200 gallons/day per connection and keeping system leakage below 10%. A public meeting date will be posted online. An open house will be held on April 15, 5:30–6:30 p.m. at Public Works (9605 Tilley Rd S) and online. Details are on the Water & Sewer webpage here: **bit.ly/46ILTFS** or scan the code below.

Keep Meters and STEP Tanks Cleared

Please keep your water meter clear of debris and vegetation. Utility operators need clear access to take readings and perform routine maintenance. Additionally, Boston Harbor and Olympic View customers must keep STEP tank lids and alarm panels visible and accessible at all times.

Thurston County Water & Sewer Utilities Advisory Committee

The Thurston County Water & Sewer Utility Advisory Committee meets online on the second Wednesday of every other month via MS Teams. The next meeting is May 14, 2025.

Change in Transaction Fees for Online Payments

Thurston County Public Works uses Point & Pay to collect secure online utility payments. Effective immediately, the transaction fees associated with credit and debit card payments have changed as follows:

- **New Option** – Debit card payments can now be processed as a debit instead of credit only.
- All debit card payments processed as debit will change from a flat fee to a 1% fee.
- The fee for credit card payments processed as credit will be reduced from 2.35% to 2.30%.

There is no change to the minimum fee of $2.00 for all transactions.

Backflow Prevention Device Testing Requirements

Water utility customers with a backflow prevention device must be tested annually by a state-certified tester. You can arrange this testing yourself, or Thurston County can arrange testing for $65 per standard device. If you make your own arrangements, Thurston County must receive proof of testing by **May 31, 2025**. If proof of testing is not received, Thurston County will arrange for the device to be tested, and a $65 fee will be added to your utility bill. If you have a device, you will receive a letter in late spring reminding you of your options.

Upcoming Utilities Office Closures

Memorial Day
Monday, May 26, 2025

Juneteenth
Thursday, June 19, 2025

Water & Sewer Utilities

- APWA Accreditation Program
- Engineering
- Garbage & Recycling
- Noxious Weeds
- Parks & Trails
- Projects
- Public Works Locations
- Road Operations
- Water Resources
  - Stormwater
  - Water & Sewer Utilities
    - Annual Water Quality Reports
    - Paying Your Bill
    - Update Contact Information
    - Water & Sewer Utilities General Facility Charges
    - Water System Plan and Water Use Efficiency Goals
- Where Do I Take My?
- Parks & Trails

Water System Plans and Water Use Efficiency Goals

Water System Plans and Water Use Efficiency Goal Presentation

- Public Works has held two open houses, presenting the Water System Plans and Water Use Efficiency Goals.
- The Water System Plans and Water Use Efficiency Goals that are to be adopted by the BoCC this spring were discussed.
- If you missed the presentations, you can view the slides.

Formal Public Hearing and BoCC Adoption of WUE Goals and WSPs

- Date: June 3, 2025
- Time: 3:30pm
- Location: Thurston County Atrium Board Room - 3000 Pacific Ave SE, Olympia, WA 98501
- Purpose: Receive Public Comment on Proposed Water Use Efficiency goals, and adopt the goals along with Thurston County's Part A Water System Plan (includes Satellite Management Agency Plan and Tamoshan Small Water System Management Plan), Part B Boston Harbor Water System Plan, and Part B Grand Mound Water System Plan.

Water System Plans Documents

- Part A/SMA/Tamoshan Water System Plan
- Boston Harbor Part B Water System Plan
- Grand Mound Part B Water System Plan

Proposed Water Use Efficiency Goals

The WUE goals for the Boston Harbor water system for the next 10 years are as follows:

1. Demand Side Goal: Maintain average day water system demand at or below 200 gallons-per-day per connection (gpd/conn) over the 10-year planning period.
2. Supply Side Goal: Maintain distribution system leakage (DSL) below 10 percent of production over the 10-year planning period.

The WUE goals for the Grand Mound water system for the next 10 years are as follows:

1. Demand Side Goal: Maintain average day residential water usage at or below 200 gpd/conn over the 10-year planning period.
2. Supply Side Goal: Maintain DSL below 10 percent of production over the 10-year planning period.

The WUE goals for the Tamoshan water system for the next 10 years are as follows:

1. Demand Side Goal: Maintain average day water system usage at or below 200 gpd/conn over the 10-year planning period.
2. Supply Side Goal: Maintain DSL below 10 percent of production over the 10-year planning period.

Comments or Questions

For comments or questions regarding the Water System Plans or Water Use Efficiency Goals, please contact Aaron Tormanen, Water Resources Utility Planner, by email at aaron.tormanen@co.thurston.wa.us or by phone at (360) 628-4492.

Thurston County Water & Sewer Utilities Water System Plans and Water Use Efficiency Goals webpage edit history
https://www.thurstoncountywa.gov/departments/public-works/water-resources/water-sewer-utilities/water-system-plans-and-water-use-efficiency-goals

Departments
- Assessor
- Medic One
- Find a Meeting
- Auditor
- Board of County Commissioners
- Board of Equalization
- Central Services
- Civil Service
- Community Planning and Economic Development (CPED)
- Coroner
- County Clerk
- District Court
- Documents and Agreements
- Drop Off Locations for the Thurston County Art Contest
- Emergency Management
- Fair Advisory Board
- Food and Yard Waste
- Historic Commission

Water System Plan and Water Use Efficiency Goals

Water System Plan and Water Use Efficiency Goal Presentation

- Public Works is holding an information open house presentation on April 15, 5:30pm-6:30pm
- The Water System Plans and Water Use Efficiency Goals that are to be adopted by the BoCC this spring will be discussed.
- Participate in the meeting:

1. In-person at Thurston County Emergency Management - 9521 Tilley Rd SW, Olympia, WA 98512
2. MS Teams at the following link - Join Meeting (Meeting ID: 288 107 720 978 / Passcode: yJ3XB6oq)

Formal Public Hearing and BoCC Adoption of WUE Goals and WSPs

- Date: TBD, Check back again
- Time: TBD, Check back again
- Location: Thurston County Atrium Board Room - 3000 Pacific Ave SE Olympia, WA 98501
- Purpose: Receive Public Comment on Proposed Water Use Efficiency goals, and adopt the goals along with Thurston County's Part A Water System Plan (includes Satellite Management Agency Plan and Tamoshan Small Water System Management Plan), Part B Boston Harbor Water System Plan, and Part B Grand Mound Water System Plan.

Water System Plan Documents

- Part A/SMA/Tamoshan Water System Plan
- Boston Harbor Part B Water System Plan
- Grand Mound Part B Water System Plan

Departments
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Water System Plans and Water Use Efficiency Goals

Water System Plans and Water Use Efficiency Goal Presentation

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- he Water System Plans and Water Use Efficiency Goals that are to be adopted by the BoCC this spring were discussed.
- If you missed the presentations, you can view the slides.

Formal Public Hearing and BoCC Adoption of WUE Goals and WSPs

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- Time: 3:30pm
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- Purpose: Receive Public Comment on Proposed Water Use Efficiency goals, and adopt the goals along with Thurston County's Part A Water System Plan (includes Satellite Management Agency Plan and Tamoshan Small Water System Management Plan), Part B Boston Harbor Water System Plan, and Part B Grand Mound Water System Plan.

Water System Plans Documents

- Part A/SMA/Tamoshan Water System Plan
- Boston Harbor Part B Water System Plan
- Grand Mound Part B Water System Plan

Nisqually Valley News
321 N. Pearl St.
Centralia, WA 98531 US
(360) 506-5860
accounting@yelmonline.com

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INVOICE

BILL TO
Thurston County Commissioner Office
3000 Pacific Ave SE
Olympia, WA 98501

SHIP TO
Thurston County Commissioner Office
3000 Pacific Ave SE
Olympia, WA 98501

INVOICE #	DATE	TERMS	DUE DATE
2908246	05/01/2025	Net 30	05/31/2025

CUSTOMER NO.	AD #
1043315	133542

DATE	ACTIVITY	DESCRIPTION	QTY	RATE	AMOUNT
05/01/2025	Legal Advertising	Notice of Public Hearing Runs 5/1 AD#133542	1	143.22	143.22

Notice of Public Hearing
Runs 5/1
AD#133542

SUBTOTAL	143.22
TAX	0.00
TOTAL	143.22
BALANCE DUE	**$143.22**

DESCRIPTION Legal Ad #133542 NTC of Public Hearing
APPROVER TMW DATE 6-9-2025

AMOUNT $143.22
ACCOUNTING _____ DATE _____
CODING 4700-460-53400-RA1-
GRANT PROJECT 5410090-0000-04
CONTRACT/PO _____

AFFIDAVIT
OF PUBLICATION
STATE OF WASHINGTON
COUNTY OF THURSTON

Tina Anderson, and/or Ronda Pogorelc and/or Cheyenne Denman says that she is the legal clerk of

NISQUALLY VALLEY NEWS

which has been established, published in the English language, and circulated continuously as a weekly newspaper in the City of Yelm, and in Thurston County, Washington, general circulation in Thurston County for more than six (6) months prior to the date of the first publication of the notice hereto attached, and that the Nisqually Valley News is an approved newspaper by the Superior Court of Thurston County. And that the attached is a true copy and was published in regular issues (and not in supplement form) of said newspaper as LEGAL # 133542 RE:Notice of Public Hearing

once each week for a period of 1 week(s)

commencing on **05/01/2025** and ending on **05/01/2025**

and both regularly distributed to its subscribers during all of said period. That the full amount of the fee charged for the foregoing publication is the sum of **$ 143.22**

Cheyenne Denman

Subscribed and sworn to before me 05/01/2025

Ronda Lee Pogorelc

Notary Public in and for the State of Washington, residing at

Chehalis

RONDA LEE POGORELC NOTARY PUBLIC STATE OF WASHINGTON My Comm. Expires February 23, 2027 No. 175878

133542 Notice of Public Hearing

NOTICE OF PUBLIC HEARING Before the BOARD OF THURSTON COUNTY COMMISSIONERS

PURPOSE: Public hearing to receive public comment on water use efficiency goals for the Thurston County-owned water utilities:

DATE: June 3, 2025

TIME: 3:30 p.m. (or as soon thereafter as the matter may be heard)

PLACE: The Atrium Commissioners Meeting Room, Room 110
3000 Pacific Ave
Olympia, Washington 98501

CONTACT PERSON:
Tim Wilson
TELEPHONE: 360-786-5831

The public is invited to attend the hearing and present oral and written comments. Anyone wishing to testify may appear and be heard. You may also connect remotely and be heard; information will be posted on the Board of County Commissioners public meetings and hearings web page: https://www.thurstoncountywa.gov/departments/board-county-commissioners/meetings-public-hearings-and-work-session-agendas.

If unable to attend, written comments may be submitted by mail or email no later than **5:00 p.m., June 2, 2025**. Send by mail to **Tim Wilson, Water Resources Manager**, Thurston County Public Works, 9605 Tilley Road S, Olympia, Washington, 98512, or via email to **tcpw.hearings@co.thurston.wa.us**.

Disability Accommodations: Persons with disabilities requiring reasonable accommodations at the hearing should call the Reasonable Accommodation Coordinator at 360-786-5440. Persons with speech or hearing disabilities may call via Washington Relay: 711 or 800-833-6388.

DATED: April 28, 2025

BOARD OF COUNTY COMMISSIONERS
Thurston County, WA

BY: Amy Davis
Clerk of the Board

Pub: Nisqually Valley News
May 1, 2025

TRUTEE'S SALE PRIORITY

Seattle, WA 98104 For questions call toll-free: (866) 925-0241 Trustee Sale Number: WA-24-1002444-SW Sale Line: 800-280-2832 or Login to: http://www. qualityloan.com IDSPub #0236446 5/1/2025 5/22/2025

Pub: Nisqually Valley News
May 1 & 22, 2025

THURSTON COUNTY LEGALS

Dependency
Goebel, fka Wagner

Notice and Summons by Publication No: 25-7-00129-34 (Dependency) (SMPB) (Optional Use) Superior Court of Washington, County of Thurston Family and Juvenile Court
Dependency of:
SOPHIEA GOEBEL,
fka WAGNER
D.O.B.: 02/06/2025

To: KYLE GOEBEL, Parent; and UNKNOWN BIOLOGICAL FATHER
WHOM IT MAY CONCERN, UNKNOWN BIOLOGICAL FATHER, OR ANYONE EXPRESSING A PATERNAL INTEREST IN THE ABOVE-NAMED CHILD:

A Dependency Petition was filed on February 12, 2025 (Date); A Fact Finding hearing will be held on this matter on: June 11, 2025 at 1:30 p.m. at **Thurston County Family and Juvenile Court, 2801 32nd Avenue SW, Tumwater, Washington 98501.**

You should be present at this hearing.

The hearing will determine if your child is dependent as defined in RCW 13.34.030(6).

This begins a judicial process which could result in permanent loss of your parental rights. If you do not appear at the hearing, the court may enter a dependency order in your absence.

To request a copy of the Notice, Summons, and Dependency Petition, call DCYF at 360-807-7081 or 1-800-562-6926. To view information about your rights, including right to a lawyer, go to www.atg.wa.gov/DPY

Dated: April 9, 2025,
by Linda Myhre Enlow,
Thurston County Clerk.

Pub: Nisqually Valley News
May 1, 8 & 15, 2025

133549 Dependency
Terry

Notice and Summons by Publication No: 25-7-00363-34 (Dependency) (SMPB) (Optional Use) Superior Court of Washington, County of Thurston Family and Juvenile Court
Dependency of:
ANASTASIA TERRY
D.O.B.: 09/24/2023

To: UNKNOWN BIOLOGICAL FATHER, Parent;
WHOM IT MAY CONCERN, UNKNOWN BIOLOGICAL FATHER, OR ANYONE EXPRESSING A PATERNAL INTEREST IN THE ABOVE-NAMED CHILD:

A Dependency Petition was filed on April 18, 2025 (Date); A Fact Finding hearing will be held on this matter on: June 23, 2025 at 1:30 p.m. at **Thurston County Family and Juvenile Court, 2801 32nd Avenue SW, Tumwater, Washington 98501**.

You should be present at this hearing.

The hearing will determine if your child is dependent as defined in RCW 13.34.030(6).

This begins a judicial process which could result in permanent loss of your parental rights. If you do not appear at the hearing, the court may enter a dependency order in your absence.

To request a copy of the Notice, Summons, and Dependency Petition, call DCYF at 360-807-7081 or 1-800-562-6926. To view information about your rights, including right to a lawyer, go to www.atg.wa.gov/DPY

Dated: April 28, 2025,
by Linda Myhre Enlow,
Thurston County Clerk.

Pub: Nisqually Valley News
May 1, 8 & 15, 2025

133367 Dependency
Threet

Notice and Summons by Publication No: 24-7-00926-34 (Dependency) (SMPB) (Optional Use) Superior Court of Washington, County of Thurston Family and Juvenile Court
Dependency of:
SINCERE THREET
D.O.B.: 04/15/2024

To: UNKNOWN BIOLOGICAL FATHER;
WHOM IT MAY CONCERN, UNKNOWN BIOLOGICAL FATHER, OR ANYONE EXPRESSING A PATERNAL INTEREST IN THE ABOVE-NAMED CHILD:

A Dependency Petition was filed on December 31, 2024 (Date); A Fact Finding hearing will be held on this matter on: June 2, 2025 at 1:30 p.m. at **Thurston County Family and Juvenile Court, 2801 32nd Avenue SW, Tumwater, Washington 98501**.

You should be present at this hearing.

The hearing will determine if your child is dependent as defined in RCW 13.34.030(6).

This begins a judicial process which could result in permanent loss of your parental rights. If you do not appear at the hearing, the court may enter a dependency order in your absence.

To request a copy of the Notice, Summons, and Dependency Petition, call DCYF at 360-807-7081 or 1-800-562-6926. To view information about your rights, including right to a lawyer, go to www.atg.wa.gov/DPY

Dated: April 4, 2025,
by Linda Myhre Enlow,
Thurston County Clerk.

Pub: Nisqually Valley News
April 24, 2025
May 1 & 8, 2025

133542 Notice of Public Hearing

NOTICE OF PUBLIC HEARING Before the BOARD OF THURSTON COUNTY COMMISSIONERS

PURPOSE: Public hearing to receive public comment on water use efficiency goals for the Thurston County-owned water utilities:

DATE: June 3, 2025

TIME: 3:30 p.m. (or as soon thereafter as the matter may be heard)

PLACE: The Atrium Commissioners Meeting Room, Room 110
3000 Pacific Ave
Olympia, Washington 98501

CONTACT PERSON:
Tim Wilson
TELEPHONE: 360-786-5831

The public is invited to attend the hearing and present oral and written comments. Anyone wishing to testify may appear and be heard. You may also connect remotely and be heard; information will be posted on the Board of County Commissioners public meetings and hearings web page: https://www.thurstoncountywa.gov/departments/board-county-commissioners/meetings-public-hearings-and-work-session-agendas.

If unable to attend, written comments may be submitted by mail or email no later than **5:00 p.m., June 2, 2025**. Send by mail to **Tim Wilson, Water Resources Manager**, Thurston County Public Works, 9605 Tilley Road S, Olympia, Washington, 98512, or via email to **tcpw.hearings@co.thurston.wa.us**.

Disability Accommodations: Persons with disabilities requiring reasonable accommodations at the hearing should call the Reasonable Accommodation Coordinator at 360-786-5440. Persons with speech or hearing disabilities may call via Washington Relay: 711 or 800-833-6388.

DATED: April 28, 2025

BOARD OF COUNTY COMMISSIONERS Thurston County, WA

BY: Amy Davis
Clerk of the Board

Pub: Nisqually Valley News
May 1, 2025

133541 RFQ
No. 034-2025-Sw-R002

REQUEST FOR QUALIFICATIONS (RFQ) NO. 034-2025-SW-R002 THURSTON COUNTY PUBLIC WORKS DEPARTMENT SOLID WASTE DIVISION

OWNER ADVISORY & CONSTRUCTION MANAGEMENT SERVICES FOR THURSTON COUNTY WARC RECONFIGURATION DESIGN-BUILD PROJECT, CP# C90010

RESPONSE DEADLINE: May 30, 2025, 3:00 p.m.

Thurston County, Washington, Public Works Department is soliciting Qualifications for Owner Advisory & Construction Management Services for the Thurston County Waste and Recovery Center Reconfiguration Project. These services will be for the duration of the project including planning, design, and construction phases. Qualifications will be evaluated for experience/past performance, key personnel, and project approach.

Complete RFQ information can be found online at: https://www.thurstoncountywa.gov/ContractOpportunities

For questions, contact: Dawn Ashton at (360) 867-2279 or dawn.ashton@co.thurston.wa.us

DATED: April 29, 2025

BOARD OF COUNTY COMMISSIONERS
Thurston County, WA

BY: Amy Davis
Clerk of the Board

Pub: Nisqually Valley News
May 1, 2025

133365 Termination
Kenneth Schoneck

Notice and Summons by Publication No: 25-7-00247-34 (Termination) (SMPB) (Optional Use) Superior Court of Washington County of Thurston Family and Juvenile Court
In re the Welfare of:
KENNETH SCHONECK
D.O.B.: 02/09/2016

To: RAYLYNN SEVIER, Mother;
WHOM IT MAY CONCERN, UNKNOWN BIOLOGICAL FATHER, OR ANYONE EXPRESSING A PATERNAL INTEREST IN THE ABOVE-NAMED CHILD:

A Petition to Terminate Parental Rights was filed on March 11, 2025 (Date); A Fact Finding hearing will be held on this matter on: June 2, 2025 at 1:30 p.m. at **Thurston County Family and Juvenile Court, 2801 32nd Avenue SW, Tumwater, Washington 98501**.

You should be present at this hearing.

The hearing will determine if your parental rights to your child are terminated. If you do not appear at the hearing, the court may enter an order, in your absence, terminating your parental rights.

To request a copy of the Notice, Summons, and Termination Petition, call DCYF at 360-807-7081 or 1-800-562-6926 To view information about your rights, including right to a lawyer, go to http://www.atg.wa.gov/TRM

Dated: April 4, 2025,
by Kym Foster,
Linda Myhre Enlow,
Thurston County Clerk.

Pub: Nisqually Valley News
April 24, 2025
May 1 & 8, 2025

133364 Termination
Schoneck

Notice and Summons by Publication No: 25-7-00244-34 (Termination) (SMPB) (Optional Use) Superior Court of Washington County of Thurston Family and Juvenile Court
In re the Welfare of:
ALICE SCHONECK
D.O.B.: 08/10/2017

To: RAYLYNN SEVIER, Mother;
WHOM IT MAY CONCERN, UNKNOWN BIOLOGICAL FATHER, OR ANYONE EXPRESSING A PATERNAL INTEREST IN THE ABOVE-NAMED CHILD:

A Petition to Terminate Parental Rights was filed on March 11, 2025 (Date); A Fact Finding hearing will be held on this matter on: June 2, 2025 at 1:30 p.m. at **Thurston County Family and Juvenile Court, 2801 32nd Avenue SW, Tumwater, Washington 98501**.

You should be present at this hearing.

The hearing will determine if your parental rights to your child are terminated. If you do not appear at the hearing, the court may enter an order, in your absence, terminating your parental rights.

To request a copy of the Notice, Summons, and Termination Petition, call DCYF at 360-807-7081 or 1-800-562-6926 To view information about your rights, including right to a lawyer, go to http://www.atg.wa.gov/TRM

Dated: April 4, 2025,
by Kym Foster,
Linda Myhre Enlow,
Thurston County Clerk.

Pub: Nisqually Valley News
April 24, 2025
May 1 & 8, 2025

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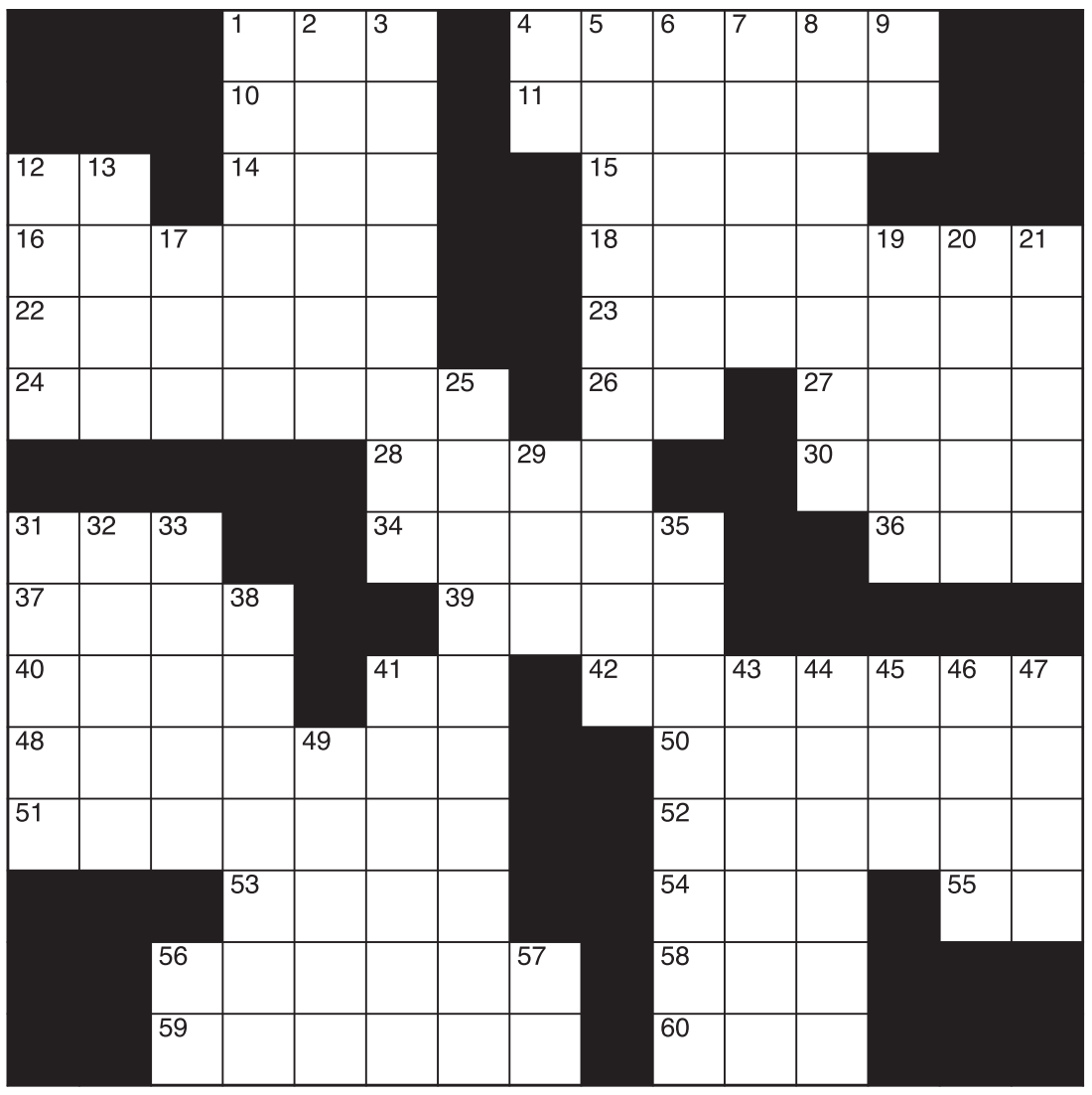


Clean out the garage and sell it in the Classifieds for a pocket full of cash.

NISQUALLY VALLEY NEWS
CLASSIFIEDS
360-458-2681
BUY IT - SELL IT - FIND IT

METRO Crossword

May 1, 2025



SOLUTION IN CLASSIFIEDS SECTION

CLUES ACROSS
1. State in southwestern India
4. Pashto
10. Corpuscle count (abbr.)
11. Supervised release from prison
12. Greeting
14. Type of drug
15. __ Sagan, astronomer
16. Every year
18. Nasal cavities
22. Nova __, province
23. In an inactive way
24. Cream-colored root
26. Nervous system disease
27. Guitarist Clapton
28. Three came to see Baby Jesus
30. Lebowski's nickname
31. Play a role
34. Not fresh
36. Where golfers begin
37. Negatives
39. Wild goat
40. Releasing hormone
41. Makes up
42. Fastens
48. Exists in large numbers
50. A connecting word
51. A phase of the heartbeat
52. Northern Ireland county
53. An independent ruler or chieftain
54. Pacific sea bream
55. Commercial
56. Azure
58. Doctor of Education
59. Protected oneself against loss
60. Car mechanics group

CLUES DOWN
1. Pastes for filling crevices
2. Acquire
3. Heralds
4. News group
5. Exact copies
6. Particles
7. Noted 20th C. performer Lena
8. Tempted
9. Midway between north and east
12. Slotted, hinged metal plate
13. South American hummingbird
17. Neither
19. Walk with confidence
20. Omit when speaking
21. Imperial Chinese currency
25. A bakery specializing in French pastry
29. Talk incessantly
31. Ethnic group of Nigeria
32. Longtime NY Times film critic
33. Beginners
35. Makes a trade
38. Sleep
41. Not moving
43. Popular drink: Pina __
44. Potential benefits
45. A place you can get stuck in
46. Ancient Greek City
47. Chalcedony
49. Rover
56. Digraph
57. Investment vehicl

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SUDOKU

6		4				5	1	
		7	4		3	8		6
8		2	6					4
4	6					1		
		9		1		4		2
1		8	9				5	
		5	1		9	2		
9		1		6		7		
2	4		7	8		3		1

Level: Beginner

Here's How It Works:
Sudoku puzzles are formatted as a 9x9 grid, broken down into nine 3x3 boxes. To solve a sudoku, the numbers 1 through 9 must fill each row, column and box. Each number can appear only once in each row, column and box. You can figure out the order in which the numbers will appear by using the numeric clues already provided in the boxes. The more numbers you name, the easier it gets to solve the puzzle!

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THURSTON COUNTY
WASHINGTON
SINCE 1852

Board of County Commissioners	Business Meeting	Tuesday, June 3, 2025

Summary of Timed Items
2:00 PM – Business Meeting
3:30 PM – Public Hearing(s)

2:00 PM – Business Meeting

I. Call Meeting to Order

1. **Pledge of Allegiance – District 3**
2. **Land Acknowledgement**
3. **Approval of Agenda**

II. Presentations

1. **Proclamation – LGBTQ+ Pride Month**
   The Board of County Commissioners will proclaim June 2025 as LGBTQ+ Month in Thurston County.

III. Public Comment

IV. County Manager's Update

V. Consent Agenda (1 through 8)
Proposed action: Move to approve the consent agenda.

1. **Item:** Resolution for Revised Agriculture Advisory Committee Bylaws
   Department: Community Planning and Economic Development
   Contact: Ashley Arai, Director of Community Planning and Economic Development
   Consent action: Move to approve the revised Agricultural Committee Bylaws, as recommended by the Agricultural Committee.

2. **Item:** Appointment to the Hotel and Motel Commission
   Department: Commissioners Office
   Contact: Amy Davis, Clerk of the Board
   Consent action: Move to appoint Gabby Schoolcraft to the Hotel and Motel Commission for the term of June 1, 2025 through June 1, 2028.

3. **Item:** Removal of a Veterans Advisory Board Member
   Department: Commissioners Office
   Contact: Amy Davis, Clerk of the Board
   Consent action: Move to remove Poe Liufau from the Thurston County Veterans Advisory Board as prescribed in Thurston County Code 2.122.030(c).

4. **Item:** Professional Services Agreement for Oracle Stabilization
   Department: Information Technology
   Contact: Sherrie Ilg, Director of Information Technology
   Consent action: Move to approve the sole source contract with Baker Tilly to assist with stabilization of the Oracle implementation for an amount not to exceed $330,000.00 for the term of no more than seven months, and authorize the Director of Information Technology to execute the agreement and any amendments that do not exceed 10%.

5. **Item:** Black Lake Regatta Application
   Department: Sheriff's Office
   Contact: Ruben Mancillas, Undersheriff
   Consent action: Move to approve the regatta application from the Pacific NW Boat Racing Association to hold a race event on Black Lake from July 12 to July 13, 2025.

6. **Item:** Request for Proposals for Electronic Commissary for the Thurston County Corrections Facility
   Department: Sheriff's Office
   Contact: Ruben Mancillas, Undersheriff
   Consent action: Move to authorize the Sheriff's Office to issue a Request for Proposals for Electronic Commissary Services for the Thurston County Corrections Facility.

7. **Item:** Voucher List – May 5
   Department: Auditor's Office
   Contact: Joe Wolfe, Financial Services Manager
   Consent action: Move to approve the voucher list for the week of May 5, 2025 for the combined amount of $2,199,239.13.

8. **Item:** Voucher List – May 12
   Department: Auditor's Office
   Contact: Joe Wolfe, Financial Services Manager
   Consent action: Move to approve the voucher list for the week of May 12, 2025 for the combined amount of $3,505,840.72.

Department Items

VI. Central Services

1. **Item:** Amendments to Procurement Policy 201 and Attachment (A) 201-01
   Contact: Rebecca Kirby, Procurement and Contracts Program Manager
   Proposed action: Move to approve the resolution amending the Thurston County Procurement Policy 201 and Attachment A - 201-01 (previously 201-02) and removal of Attachment B - 201-03, to incorporate 2024 legislative changes.

VII. Public Health and Social Services

1. **Item:** Amendment #6 to the Washington State Department of Health 2025-2027 Consolidated Contract #CLH32070
   Contact: Jennifer Freiheit, Director of Public Health and Social Services
   Proposed action: Move to approve Amendment #6 to the Washington State department of Health Consolidated Contract CLH32070, providing an additional $436,100.00 for a revised maximum consideration of $6,091,760.00 for the duration of January 1, 2025 through December 31, 2027 and authorize the director of designee of Public Health & Social Services to sign the amendment.

VIII. Public Works

1. **Item:** Resolution Adopting Water System Plans for Thurston County-Owned Water Systems
   Contact: Tim Wilson, Water Resources Manager
   Proposed action: Move to approve a resolution adopting Thurston County Part A Water System Plan/Satellite Management Agency Plan and Tamoshan Small Water System Management Plan, Boston Harbor Part B Water System Plan and Grand Mound Part B Water System Plan.

2. **Item:** Contract Award for Shawn Drive SW at Unnamed Tributary to Dempsey Creek Fish Passage Project, CP# C63024
   Contact: Marcus Storvick, Senior Civil Engineer
   Proposed action: Move to award the contract for the Shawn Drive SW at Unnamed Tributary to Dempsey Creek Fish Passage project, CP# C63024 to Simmons & Sons Contracting, Inc. of Montesano, WA in the amount of $849,854 and to authorize the Director of Public Works to execute the contract and any change orders for this project due to unforeseen conditions only (not for changes in scope) for up to 10% of the contract ($84,985 or an aggregate of $934,839).

3. **Item:** Project Prospectus and Local Agency Agreement for the Chehalis Western Trail Preservation Project Phase 1, CP# C53001
   Contact: Ben Enfield, Senior Civil Engineer
   Proposed action: Move to approve the Project Prospectus and Local Agency Agreement, awarding $1.621 million in federal funding, with the Washington State Department of Transportation for the Chehalis Western Trail Preservation Phase 1 project, CP# C53001, and authorize the Director of Public Works to execute the agreement and all subsequent amendments and supplements.

IX. Commissioners Reports

1. Commissioners report on external boards, commissions, etc.

X. Adjournment

3:30 PM – Public Hearings(s)

1. **Item:** Resolution for Proposed Water Use Efficiency Goals for Thurston County Water Utilities
   Department: Public Works
   Contact: Tim Wilson, Water Resources Manager
   Proposed action: (1) Move to close the public hearing. **(2)** Move to approve the resolution adopting Water Use Efficiency Goals for the Thurston County owned water utilities.

RESOLUTION NO. 16527

A **RESOLUTION** of the Board of County Commissioners adopting Thurston County's Part A Water System Plan (Satellite Management Agency Plan and Tamoshan Small Water System Management Plan), Part B Boston Harbor Water System Plan, and Part B Grand Mound Water System Plan.

Whereas, Thurston County Public Works owns and operates three potable water systems in the Boston Harbor, Grand Mound, and Tamoshan communities, respectively, as a Satellite Management Agency (SMA) authorized by the Washington State Department of Health (DOH).

Whereas, A Small Water System Management Plan (SWSMP) is required for water systems that are smaller than 1,000 connections and are not proposing to make infrastructure changes to increase connections or expand the service area, such as the Tamoshan water system.

Whereas, SMAs are required to periodically submit planning documents to DOH according to WAC 246-295-050 and SWSMPs are required to periodically submit planning documents to DOH according to WAC 246-290-105.

Whereas, the expanding water systems of Grand Mound and Boston Harbor are required by DOH to each have their own dedicated Water System Plans under WAC 246-290-100.

Whereas, the Water System Plans updates provide guidance for planning and managing the County's drinking water production, supply, storage, and capital facilities through 2033, and it is the responsibility of the County to provide water that meets Washington State drinking water quality standards to the customers.

Whereas, County staff held virtual Water System Plans informational customer meetings via teleconference for the Boston Harbor, Grand Mound, and Tamoshan water systems on August 26, August 25, and August 24, 2021, respectively.

Whereas, the County shared drafts of the Water System Plans with the public on the County's website and solicited public comment and feedback on the drafts.

Whereas, County staff held another open house informational presentation relating to the Water System Plans for the public virtually and in-person at the Tilley Road campus on April 15, 2025.

NOW THEREFORE, the Board of County Commissioners of Thurston County, Washington, does resolve as follows:

Section 1. The Board of County Commissioners hereby adopts the Thurston County Part A Water System Plan/Satellite Management Agency Plan and Tamoshan Small Water System Management Plan as attached to this Resolution as "Exhibit A" and incorporated fully by this reference.

Section 2. The Board of County Commissioners hereby adopts the Thurston County Boston Harbor Part B Water System Plan as attached to this Resolution as "Exhibit B" and incorporated fully by this reference.

Section 3. The Board of County Commissioners hereby adopts the Thurston County Grand Mound Part B Water System Plan as attached to this Resolution as "Exhibit C" and incorporated fully by this reference.

Section 4. This Resolution shall be in full force and in effect immediately upon adoption by the Board of County Commissioners.

ADOPTED: June 3, 2025

BOARD OF COUNTY COMMISSIONERS
Thurston County, Washington

ATTEST:

Clerk of the Board

TYE MENSER, Chair

APPROVED AS TO FORM:

JON TUNHEIM PROSECUTING ATTORNEY

By:

Deputy Prosecuting Attorney

WAYNE FOURNIER, Vice-chair

RACHEL GRANT, Commissioner

CAROLINA MEJIA, Commissioner

EMILY CLOUSE, Commissioner

RESOLUTION NO. 16528

A **RESOLUTION** relating to establishing water use efficiency goals for Thurston County's Boston Harbor, Grand Mound, and Tamoshan water systems.

Whereas, the Washington State Legislature adopted the Municipal Water Supply-Efficiency Requirements Act (House Bill 1338, commonly referred to as the Municipal Water Law) in 2003 to address the increasing demand on the state's water resources and to provide certainty and flexibility of municipal water rights.

Whereas, the Washington State Department of Health (DOH) established the Water Use Efficiency (WUE) Rule of January 22, 2007, based on House Bill 1338's requirement that DOH establish water use efficiency requirements for municipal water providers.

Whereas, WAC 246-290-830 outlines the requirements for municipal water suppliers to establish WUE goals through a process in which consumers and the public are given the opportunity to participate and provide comment.

Whereas, County staff worked with the Utility Advisory Committee to propose WUE goals for all service areas.

Whereas, the County shared drafts of the WUE goals with the public on the County's website and solicited public comment and feedback on the drafts.

Whereas, County staff held open houses with each served community on WUE goal setting.

Whereas, the Board of County Commissioners held a formal public hearing for the adoption of the WUE goals on June 3, 2025.

Whereas, these WUE goals are also included in Chapter 4 of the Thurston County Part A Water System Plan.

NOW THEREFORE, the Board of County Commissioners of Thurston County, Washington, does resolve as follows:

Section 1. The WUE goals for the Boston Harbor service area for the next 10 years are as follows:

a. Demand Side Goal: Maintain average day water system demand at or below 200 gallons-per-day per connection (gpd/conn) over the 10-year planning period.
b. Supply Side Goal: Maintain distribution system leakage (DSL) below 10 percent of production over the 10-year planning period.

Section 2. The WUE goals for the Grand Mound service area for the next 10 years are as follows:

a. Demand Side Goal: Maintain average day residential water usage at or below 200 gpd/conn over the 10-year planning period.

b. Supply Side Goal: Maintain DSL below 10 percent of production over the 10-year planning period.

Section 3. The WUE goals for the Tamoshan service area for the next 10 years are as follows:

a. Demand Side Goal: Maintain average day water system usage at or below 200 gpd/conn over the 10-year planning period.
b. Supply Side Goal: Maintain DSL below 10 percent of production over the 10-year planning period.

Section 4. This Resolution shall be in full force and in effect immediately.

ADOPTED: June 3, 2025

BOARD OF COUNTY COMMISSIONERS
Thurston County, Washington

ATTEST:

Clerk of the Board

TYE MENSER, Chair

APPROVED AS TO FORM:

JON TUNHEIM PROSECUTING ATTORNEY

WAYNE FOURNIER, Vice-chair

By:

Deputy Prosecuting Attorney

RACHEL GRANT, Commissioner

CAROLINA MEJIA, Commissioner

EMILY CLOUSE, Commissioner

Appendix B SEPA Documentation

THURSTON COUNTY
WASHINGTON
SINCE 1852

Community Planning & Economic Development
2000 Lakeridge Dr. S.W. Olympia, WA 98502
(360)786-5490 / (360)754-2939 (Fax)
TDD Line (360) 754-2933
Email: permit@co.thurston.wa.us
www.co.thurston.wa.us/permitting

SEPA ENVIRONMENTAL CHECKLIST

Purpose of checklist:

Governmental agencies use this checklist to help determine whether the environmental impacts of your proposal are significant. This information is also helpful to determine if available avoidance, minimization or compensatory mitigation measures will address the probable significant impacts or if an environmental impact statement will be prepared to further analyze the proposal.

Instructions for applicants:

This environmental checklist asks you to describe some basic information about your proposal. Please answer each question accurately and carefully, to the best of your knowledge. You may need to consult with an agency specialist or private consultant for some questions. You may use "not applicable" or "does not apply" only when you can explain why it does not apply and not when the answer is unknown. You may also attach or incorporate by reference additional studies reports. Complete and accurate answers to these questions often avoid delays with the SEPA process as well as later in the decision-making process.

The checklist questions apply to all parts of your proposal, even if you plan to do them over a period of time or on different parcels of land. Attach any additional information that will help describe your proposal or its environmental effects. The agency to which you submit this checklist may ask you to explain your answers or provide additional information reasonably related to determining if there may be significant adverse impact.

Instructions for Lead Agencies:

Please adjust the format of this template as needed. Additional information may be necessary to evaluate the existing environment, all interrelated aspects of the proposal and an analysis of adverse impacts. The checklist is considered the first but not necessarily the only source of information needed to make an adequate threshold determination. Once a threshold determination is made, the lead agency is responsible for the completeness and accuracy of the checklist and other supporting documents.

Use of checklist for nonproject proposals:

For nonproject proposals (such as ordinances, regulations, plans and programs), complete the applicable parts of sections A and B plus the SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS (part D). Please completely answer all questions that apply and note that the words "project," "applicant," and "property or site" should be read as "proposal," "proponent," and "affected geographic area," respectively. The lead agency may exclude (for non-projects) questions in Part B - Environmental Elements –that do not contribute meaningfully to the analysis of the proposal.

THURSTON COUNTY
WASHINGTON
SINCE 1852

THURSTON COUNTY
Community Planning and Economic Development
ENVIRONMENTAL CHECKLIST

*** * * * OFFICIAL USE ONLY * * * ***

Folder Sequence # _____

Project # : _____

Related Cases: _____

Date Received:_____ **By:** _____

*** * * * OFFICIAL USE ONLY * * * ***

A. Background [HELP]

1. Name of proposed project, if applicable:

Boston Harbor Water System 2020 Draft Water System Plan

2. Name of applicant:

Thurston County Public Works

3. Address and phone number of applicant and contact person:

Elena Fernandez, Environmental Coordinator (360-867-2342)
9605 Tilley Rd. S., Suite C
Olympia, WA 98512

4. Date checklist prepared:

August 31, 2021

5. Agency requesting checklist:

WA State Dept. of Health

6. Proposed timing or schedule (including phasing, if applicable):

This Plan is expected to be adopted in 2021. It provides a water demand forecast for 20 years. It also identifies capital improvement projects for a 20-year planning period. An updated Plan will be completed in 10 years. This Plan will not directly result in construction.

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.

This plan is a non-project action that will not directly result in construction. Specific projects outlined in this plan will require a separate SEPA review, except for those projects or actions that are categorically exempt from the SEPA process. Any plan amendments would also be subject to a SEPA review. The Plan is required to be updated every 10 years.

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.

The Plan examines potential water conservation savings. It also reiterates policies relevant to the water system and are outlined in more detail in Thurston County Public Works' Part A Water system plan, which covers topics related to all county-owned and operated water systems.

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain.

No known government approvals of other proposals are pending that would directly impact properties covered by this Plan.

10. List any government approvals or permits that will be needed for your proposal, if known.

N/A

11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.)

This Plan summarizes Boston Harbor's existing water system. It also establishes the water utility's policies and criteria in accordance with the Thurston County Comprehensive Plan framework. It projects future water demands and analyzes existing water system to recommend improvements to correct deficiencies and meet future water service needs. The Plan provides Thurston County Public Works with a guide to continue effective management of this water utility.

12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist.

The Plan covers the Boston Harbor water service area, located in northern Thurston County.

B. Environmental Elements [HELP]

1. Earth [help]

a. General description of the site: (check one):

- [X] Flat
- [ ] Rolling
- [ ] Hilly
- [ ] Steep Slopes
- [ ] Mountainous

Other:

b. What is the steepest slope on the site (approximate percent slope)?

Slopes vary from 0-25%.

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any agricultural land of long-term commercial significance and whether the proposal results in removing any of these soils.

All soil types are present, including clay, sand, gravel, and peat.

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.

No.

e. Describe the purpose, type, total area, and approximate quantities and total affected area of any filling, excavation, and grading proposed. Indicate source of fill.

The Plan is a non-project action and will not directly result in construction. Projects and activities outlined in the Plan will undergo SEPA review and a checklist will be completed, unless the project is SEPA exempt.

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe.

N/A.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?

None. This Plan is a non-project action that will not directly result in construction.

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any:

N/A

2. Air [help]

a. What types of emissions to the air would result from the proposal during construction, operation, and maintenance when the project is completed? If any, generally describe and give approximate quantities if known.

This Plan is a non-project action and will not directly result in construction. A SEPA checklist will be prepared for each project or action, except for those that are categorically exempt from SEPA.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.

No.

c. Proposed measures to reduce or control emissions or other impacts to air, if any:

No emissions will be generated. This Plan is a non-project action and will not directly result in construction. A SEPA checklist will be prepared for each project or action, except for those that are categorically exempt from SEPA.

3. Water [help]

a. Surface Water: [help]

1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into.

Puget Sound (Budd Inlet) bounds the western portion of the Boston Harbor Water Service Area.

2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans.

This Plan is a non-project action and does not directly result in construction. Adoption of this plan may lead to specific projects which may require work within areas of concern. Each project outlined in the Plan will require its own environmental evaluation unless categorically exempt from SEPA.

3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material.

N/A. This Plan is a non-project action and does not directly result in construction.

4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known.

No.

5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.

No, this plan is a non-project action that does not directly result in construction. Adoption of this plan may lead to specific projects which may require work within areas of concern. Each project outlined in the Plan will require its own environmental evaluation unless categorically exempt from SEPA.

6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.

No.

b. Ground Water: [help]

1) Will groundwater be withdrawn from a well for drinking water or other purposes? If so, give a general description of the well, proposed uses and approximate quantities withdrawn from the well. Will water be discharged to groundwater? Give general description, purpose, and approximate quantities if known.

The Plan discusses optimizing the current water supply wells to provide additional supply to meet future growth. The Plan is a non-project action that will not directly result in construction. Some projects outlined in the plan will require their own SEPA checklist, unless categorically exempt from SEPA.

2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals. . . ; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.

Because this Plan will not directly result in construction, no waste material will be discharged into the ground.

c. Water runoff (including stormwater):

1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.

No runoff of water will occur as a result of adopting this plan. The Plan will not directly result in construction.

2) Could waste materials enter ground or surface waters? If so, generally describe.

No.

3) Does the proposal alter or otherwise affect drainage patterns in the vicinity of the site? If so, describe.

No.

d. Proposed measures to reduce or control surface, ground, and runoff water, and drainage pattern impacts, if any:

N/A.

4. Plants [help]

a. Check the types of vegetation found on the site:

_X_ deciduous tree: alder, maple, aspen, other
_X_ evergreen tree: fir, cedar, pine, other
_X_ shrubs
_X_ grass
_X_ pasture
____ crop or grain
____ Orchards, vineyards or other permanent crops.
_X_ wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other
____ water plants: water lily, eelgrass, milfoil, other
____ other types of vegetation

b. What kind and amount of vegetation will be removed or altered?

None. This Plan is a non-project action that will not directly result in construction. However, specific projects described in the Plan may require work in areas of concern. Each project will require its own SEPA checklist, unless categorically exempt from SEPA.

c. List threatened and endangered species known to be on or near the site.

N/A, as this Plan is a non-project action that will not directly result in construction. However, specific projects listed in this planning document may require work in specific areas. Each project will require its own SEPA checklist, unless categorically exempt from SEPA.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any:

N/A, as this Plan is a non-project action that will not directly result in construction. However, specific projects listed in this planning document may require work in specific areas. Each project will require its own SEPA checklist, unless categorically exempt from SEPA.

e. List all noxious weeds and invasive species known to be on or near the site.

N/A, as this Plan is a non-project action that will not directly result in construction. However, specific projects listed in this planning document may require work in specific areas. Each project will require its own SEPA checklist, unless categorically exempt from SEPA.

5. Animals [help]

a. List any birds and other animals which have been observed on or near the site or are known to be on or near the site.

Examples include:

birds: hawk, heron, eagle, songbirds, other:

mammals: deer, bear, elk, beaver, other:
fish: bass, salmon, trout, herring, shellfish, other _____

b. List any threatened and endangered species known to be on or near the site.

This Plan is a non-project action and will not directly result in construction. Environmental studies associated with a specific project's SEPA checklist will describe any known species, unless categorically exempt from SEPA.

c. Is the site part of a migration route? If so, explain.

N/A, as this is a planning document covering the entire water service area. However, specific projects outlined in the Plan may require work within specific areas. Each project will require its own SEPA checklist, unless categorically exempt from SEPA.

d. Proposed measures to preserve or enhance wildlife, if any:

N/A, as this is a planning document covering the entire water service area. However, specific projects outlined in the Plan may require work within specific areas. Each project will require its own SEPA checklist, unless categorically exempt from SEPA.

e. List any invasive animal species known to be on or near the site.

N/A, as this is a planning document covering the entire water service area. However, specific projects outlined in the Plan may require work within specific areas. Each project will require its own SEPA checklist, unless categorically exempt from SEPA.

6. Energy and Natural Resources [help]

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.

N/A

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.

No.

c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any:

The Plan discusses water conservation measures. If implemented, water demand decreases as well as the associated energy cost of pumping water.

7. Environmental Health [help]

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe.

1) Describe any known or possible contamination at the site from present or past uses.

N/A, as this is a planning document covering the entire water service area. However, specific projects outlined in the Plan may require work within specific areas. Each project will require its own SEPA checklist, unless categorically exempt from SEPA.

2) Describe existing hazardous chemicals/conditions that might affect project development and design. This includes underground hazardous liquid and gas transmission pipelines located within the project area and in the vicinity.

N/A, as this plan does not directly result in construction. However, specific projects may require their own SEPA checklist, unless categorically exempt.

3) Describe any toxic or hazardous chemicals that might be stored, used, or produced during the project's development or construction, or at any time during the operating life of the project.

None.

4) Describe special emergency services that might be required.

None.

5) Proposed measures to reduce or control environmental health hazards, if any:

None.

b. Noise

1) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?

N/A: This is a planning document covering the entire water service area. However, each project in this Plan will require its own environmental evaluation, unless categorically exempt from SEPA.

2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site.

N/A: This is a planning document covering the entire water service area. However, each project in this Plan will require its own environmental evaluation, unless categorically exempt from SEPA.

3) Proposed measures to reduce or control noise impacts, if any:

None.

8. Land and Shoreline Use [help]

a. What is the current use of the site and adjacent properties? Will the proposal affect current land uses on nearby or adjacent properties? If so, describe.

Areas within the water service area include residential and commercial use. Adoption of the Plan itself will not affect current land uses.

b. Has the project site been used as working farmlands or working forest lands? If so, describe. How much agricultural or forest land of long-term commercial significance will be converted to other uses as a result of the proposal, if any? If resource lands have not been designated,

how many acres in farmland or forest land tax status will be converted to nonfarm or nonforest use?

No.

1) Will the proposal affect or be affected by surrounding working farm or forest land normal business operations, such as oversize equipment access, the application of pesticides, tilling, and harvesting? If so, how:

No.

c. Describe any structures on the site.

There are many different types of existing and proposed new structures within the water service area, ranging in size from single family homes to residential developments.

d. Will any structures be demolished? If so, what?

No.

e. What is the current zoning classification of the site?

Zoning varies across the service area and includes residential and rural residential zoning categories.

f. What is the current comprehensive plan designation of the site?

N/A: This is a planing document covering the entire water service area.

g. If applicable, what is the current shoreline master program designation of the site?

N/A

h. Has any part of the site been classified as a critical area by the city or county? If so, specify.

The water service area is located in a primarily Critical Aquifer Recharge Area (CARA) Classification 3.

i. Approximately how many people would reside or work in the completed project?

This water service area's population is approximately 680 people.

j. Approximately how many people would the completed project displace?

N/A

k. Proposed measures to avoid or reduce displacement impacts, if any:

N/A

L. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:

Consistency checklists have been completed by Thurston County.

m. Proposed measures to reduce or control impacts to agricultural and forest lands of long-term commercial significance, if any:

Individual projects in this Plan will be reviewed for consistency with existing land uses and plans.

9. Housing [help]

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.

N/A

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.

N/A

c. Proposed measures to reduce or control housing impacts, if any:

N/A

10. Aesthetics [help]

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?

N/A: This is a planning document.

b. What views in the immediate vicinity would be altered or obstructed?

N/A: This is a planning documnet.

b. Proposed measures to reduce or control aesthetic impacts, if any:

N/A: This is a planning document.

11. Light and Glare [help]

a. What type of light or glare will the proposal produce? What time of day would it mainly occur?

N/A: This is a planning document.

b. Could light or glare from the finished project be a safety hazard or interfere with views?

N/A: This is a planning document.

c. What existing off-site sources of light or glare may affect your proposal?

N/A: This is a planning document.

d. Proposed measures to reduce or control light and glare impacts, if any:

N/A: This is a planning document.

12. Recreation [help]

a. What designated and informal recreational opportunities are in the immediate vicinity?

N/A: This is a planning document for the entire service area.

b. Would the proposed project displace any existing recreational uses? If so, describe.

No.

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any: N/A

13. Historic and cultural preservation [help]

a. Are there any buildings, structures, or sites, located on or near the site that are over 45 years old listed in or eligible for listing in national, state, or local preservation registers ? If so, specifically describe.

There are none known.

b. Are there any landmarks, features, or other evidence of Indian or historic use or occupation? This may include human burials or old cemeteries. Are there any material evidence, artifacts, or areas of cultural importance on or near the site? Please list any professional studies conducted at the site to identify such resources.

N/A

c. Describe the methods used to assess the potential impacts to cultural and historic resources on or near the project site. Examples include consultation with tribes and the department of archeology and historic preservation, archaeological surveys, historic maps, GIS data, etc.

N/A

d. Proposed measures to avoid, minimize, or compensate for loss, changes to, and disturbance to resources. Please include plans for the above and any permits that may be required.

N/A

14. Transportation [help]

a. Identify public streets and highways serving the site or affected geographic area and describe proposed access to the existing street system. Show on site plans, if any.

Public streets exist within the water service area as depicted on the location vicinity map within the Plan.

b. Is the site or affected geographic area currently served by public transit? If so, generally describe. If not, what is the approximate distance to the nearest transit stop?

No. The nearest public transportation stop is along Intercity Transit bus route #21.

c. How many additional parking spaces would the completed project or non-project proposal have? How many would the project or proposal eliminate?

None.

d. Will the proposal require any new or improvements to existing roads, streets, pedestrian, bicycle or state transportation facilities, not including driveways? If so, generally describe (indicate whether public or private).

No.

e. Will the project or proposal use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.

No.

f. How many vehicular trips per day would be generated by the completed project or proposal? If known, indicate when peak volumes would occur and what percentage of the volume would

be trucks (such as commercial and nonpassenger vehicles). What data or transportation models were used to make these estimates?

None.

g. Will the proposal interfere with, affect or be affected by the movement of agricultural and forest products on roads or streets in the area? If so, generally describe.

No.

h. Proposed measures to reduce or control transportation impacts, if any:

N/A

15. Public Services [help]

a. Would the project result in an increased need for public services (for example: fire protection, police protection, public transit, health care, schools, other)? If so, generally describe.

No.

b. Proposed measures to reduce or control direct impacts on public services, if any.

N/A

16. Utilities [help]

a. Check utilities currently available at the site:

electricity [X] natural gas [ ] water [X] refuse service [X] telephone [X] sanitary sewer [X]

septic system [X] Other Cable TV

b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed.

The projects included in this plan focus on upgrades to and rehabilitation of the existing water system.

C. Signature [HELP]

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature: _____

Name of signee Trevin Taylor

Position and Agency/Organization Sr. Environmental Coordinator, Thurston County Public Works

Date Submitted: 9/9/21

D. Supplemental sheet for nonproject actions [HELP]

(**IT IS NOT NECESSARY** to use this sheet for project actions)

Because these questions are very general, it may be helpful to read them in conjunction with the list of the elements of the environment.

When answering these questions, be aware of the extent the proposal, or the types of activities likely to result from the proposal, would affect the item at a greater intensity or at a faster rate than if the proposal were not implemented. Respond briefly and in general terms.

1. How would the proposal be likely to increase discharge to water; emissions to air; production, storage, or release of toxic or hazardous substances; or production of noise?

The Plan evaluated the capacity of the current water system and identifies projects to improve it or resolve deficiencies. No impacts to the above mentioned categories are anticipated.

Proposed measures to avoid or reduce such increases are:

N/A: Each project will undergo environmental review unless categorically exempt from SEPA.

2. How would the proposal be likely to affect plants, animals, fish, or marine life?

The Plan will not directly affect plants, animals, fish, or marine life. Projects identified in the Plan's CIP will undergo environmental review unless categorically exempt from SEPA.

Proposed measures to protect or conserve plants, animals, fish, or marine life are: N/A

3. How would the proposal be likely to deplete energy or natural resources?

No depletion of energy or natural resources is associated with this Plan.

Proposed measures to protect or conserve energy and natural resources are: N/A

4. How would the proposal be likely to use or affect environmentally sensitive areas or areas designated (or eligible or under study) for governmental protection; such as parks, wilderness, wild and scenic rivers, threatened or endangered species habitat, historic or cultural sites, wetlands, floodplains, or prime farmlands?

No impacts to environmentally sensitive areas or protected areas are anticipated. Each project outlined in this Plan will undergo environmental review unless the project is categorically exempt from SEPA.

Proposed measures to protect such resources or to avoid or reduce impacts are: N/A

5. How would the proposal be likely to affect land and shoreline use, including whether it would allow or encourage land or shoreline uses incompatible with existing plans?

There will be no affect upon shoreline or land use with adoption of this Plan. Each project in this Plan will undergo environmental review, unless categorically exempt from SEPA.

Proposed measures to avoid or reduce shoreline and land use impacts are: N/A

6. How would the proposal be likely to increase demands on transportation or public services and utilities?

There will be no increased demands on transportation infrastructure as part of the Plan. The Plan focuses on meeting public water needs across the 20-year planning period.

Proposed measures to reduce or respond to such demand(s) are: N/A

7. Identify, if possible, whether the proposal may conflict with local, state, or federal laws or requirements for the protection of the environment.

The Plan was prepared to be compatible with local, state, and Federal laws and requirements for the protection of the environment. An agency review draft was sent to DOH for review and comment. All review comments will be addressed prior to finalizing the plan.

BLUE FILE

COUNTY COMMISSIONERS

Carolina Mejia
District One

Gary Edwards
District Two

Tye Menser
District Three

THURSTON COUNTY
WASHINGTON
SINCE 1852

PUBLIC WORKS
An Accredited Agency of the
American Public Works Association

Jennifer D. Walker, Director

MEMORANDUM

TO: Garret Peck, SEPA Coordinator, Department of Ecology

FROM: Elena Fernandez, Environmental Coordinator, Thurston County Public Works

DATE: 10/21/2021

SUBJECT: Boston Harbor Water System 2020 Draft Water System Plan SEPA Determination of Nonsignificance comment period extension

Thurston County Public Works realizes the comment period was left short for the Department of Ecology's review of the subject project. We will gladly accept comments from the Department of Ecology about the subject project's SEPA Determination of Nonsignificance (DNS) until 17:00 on 11/10/2021.

We appreciate the Department's efforts in reviewing the project.

ATTACHMENTS: SEPA Determination of Nonsignificance

THURSTON COUNTY
WASHINGTON
SINCE 1852

COUNTY COMMISSIONERS
Carolina Mejia
District One
Gary Edwards
District Two
Tye Menser
District Three

PUBLIC WORKS
An Accredited Agency of the
American Public Works Association

Jennifer D. Walker, Director

DETERMINATION OF NONSIGNIFICANCE

Applicant: Trevin Taylor
Thurston County Public Works Department
9605 Tilley Road SW, Suite C
Olympia, WA 98512-9140

Point of Contact: Elena Fernandez
Thurston County Public Works Department
9605 Tilley Road SW, Suite C
Olympia, WA 98512-9140

Phone: (360) 867-2342

Title: Boston Harbor Water System 2020 Draft Water System Plan

Project No.: 904068

Description of Proposal: Thurston County Public Works is updating their county-wide water system plan summarizing Boston Harbor's existing water system. This plan also establishes the water utility's policies and criteria in accordance with the Thurston County Comprehensive Plan framework. It projects future water demands and analyzes existing water systems to recommend improvements to correct deficiencies and meet future water service needs. It will provide Thurston County Public Works with a guide to continue effective management of this water utility. SEPA notification was submitted to supplement public outreach efforts conducted over the past year.

Location of Proposal: N/A: Non-project action

Legal Description: N/A: Non-project action

Threshold Determination: The lead agency for this proposal has determined that it does not have a probable significant adverse impact upon the environment. An Environmental Impact Statement is not required under RCW 43.21C.030(2)(C). This decision was made after review by the

Lead Agency of a completed Environmental Checklist and other information on file with the Lead Agency. This information is available to the public upon request.

Jurisdiction: Thurston County

Lead Agency: Thurston County Public Works

Responsible Official: Trevin Taylor, Senior Environmental Coordinator

Responsible Official Signature: _____ Date 10/18/21

Trevin Taylor, Thurston County Public Works
Senior Environmental Coordinator

Address: Thurston County Public Works Department
9605 Tilley Road SW, Suite C
Olympia, WA 98512

Phone: (360) 867-2271

Date of Issue: Same as signature

Appeal Deadline: 14 days post signature

There is a 14-day comment period for this Determination of Nonsignificance (DNS). The lead agency and other agencies with jurisdiction over the proposal may issue or continue processing any necessary approvals.

Appeals: Threshold determinations may be appealed pursuant to TCC 17.09.160 if: (1) a written notice of appeal, meeting the requirements of TCC 17.09.160(4), and the appropriate appeal fee is received by the Thurston County Resource Stewardship Department within fourteen (14) calendar days of the date of issuance of the threshold determination.

Note: The issuance of this Determination of Nonsignificance does not constitute project approval. The applicant must comply with all applicable requirements of Thurston County Departments and/or the Hearing Examiner prior to receiving permits.

CC: Department of Ecology
Noll Steinweg (WDFW)
Nisqually Tribe
Squaxin Indian Tribe
Chehalis Tribe
Trevin Taylor, Thurston County Public Works
Ramiro Chavez, Thurston County Manager
Utility subscribers (*Postcard*)

The environmental threshold determination is based on analysis of information contained in the following documents and recommendations:

- SEPA checklist
- Boston Harbor Water System Plan 2020 Draft Water System Plan

Appendix C Coliform Monitoring Plan

Coliform and Disinfection By-Products Monitoring Plan

General Information

The Boston Harbor Water System, Public Water System ID number 07580R is located in Thurston County.

The Community's coliform monitoring plan sample locations are shown on the map included in this document. The water system consists of one ground water source.

All source water is treated at the pump station located at 7300 Zangle Road, prior to being consumed by any customers. Treatment consists of the addition of chlorine as well as iron and manganese removal (Greensand filtration).

The distribution system includes one 500,000-gallon standpipe reservoir.

Reservoir	Location	Capacity
Main	**7300 Zangle Road**	**500,000 gallons**

Sampling Information

To represent the water consumed by all the customers, it is important to collect chlorine samples from the one pressure zone, rotating sites in the zone each week. Since there is only one zone, the utility rotates the four Coliform sampling sites each month for chloroform monitoring. Site selection is also very important because each sample must be collected without contamination from the sampling faucet. Currently the Community utilizes only customer service connections and follow strict cleaning and flushing of the outdoor faucets before sampling.

Field Equipment

Staff utilizes a HACH chlorine analyzer for collecting chlorine residual levels for each Coliform sample. Thurston County Health Laboratory conducts the Coliform analysis. The laboratory contacts our offices for changes in normal hours of operation to ensure the Boston Harbor Community can alter the sampling schedule during holidays. A 24-hour contact number of the laboratory is kept in our offices in the event of an emergency.

In the event of a positive routine Coliform sample, the laboratory will contact our office within 24 hours of confirmation of the positive sample. The Community must repeat the sample at the location of the previous positive and a sample within 5-service connections up gradient and within 5-service connections down gradient for a total of three samples. Upon any positive sample, the County will also pull one sample from the well head, prior to treatment. These samples must be analyzed for total and fecal Coliform and be collected with 24 hours of the notice from the laboratory. Each sample location is listed in one of the four routes included in this plan. Repeat routes are included that correspond to each routine route. Each repeat sample list contains the repeat address and both the up gradient and down gradient locations. If the Community does not collect the

confirmation samples or if the repeat sample is also positive, the Community must follow their Public Notification Plan.

The weekly Coliform sampling includes field parameter of free chlorine residual in addition to the sampling date and time. Monthly coliform testing is submitted to DOH through Thurston County Environmental Health, and Thurston County Public Works submits our monthly chlorination report each month to DOH by the 10th of the month.

Coliform Monitoring Plan Maintenance

A copy of the current Coliform Monitoring Plan is kept at the Public Works Department in the Utility Managers office. A digital copy of the Coliform Monitoring Plan is also embedded in the Utility Managers computer.

Coliform Monitoring Plan Database Operations and Functions

The ColiPlan file is located in the c:\coliform folder of the Utility Managers computer. The database is on the "O" Drive: ***O:\UtilityOps\All Utilities\Coliform monitoring\BH Coliform and Disinfection By-Products Monitoring Plan 2024.doc***
The file is located in this folder and contains a digital copy of this Water System Plan Update Coliform Monitoring Plan.

Routine Coliform Sample Rotation Schedule

Month	Routine Site (s)	Month	Routine Site (s)
January	R 1 / R 3	July	R 1 / R 5
February	R 2 / R 5	August	R 3 / R 4
March	R 3 / R 4	September	R 1 / R 2
April	R 5 / R 1	October	R 4 / R 3
May	R 4 / R 3	November	R 2 / R 5
June	R 1 / R 2	December	R 1 / R 3

R1= 7126 Boston Harbor road **R2= 436 72nd Way** **R3= 547 77th Avenue**
R4= 7043 Bayview Drive **R5= 7409 Byron St NE**

Routine Disinfection By-products Sampling will be done at sample ports located at the farthest distance from the well and reservoir.

Currently those sample locations are at
7043 Bayview Drive, Olympia WA and **547 77th Ave Olympia WA**.

Boston Harbor Water System

PWS System #07580R
Route 1

DATE	TIME	ADDRESS (Sample ID)	Cl^2 Residual
__/__/__	__: __	**7126 Boston Harbor Road**	_____

WAC Notes

Chapter 246-290-300: Minimum Coliform samples 1 per month. Presence of Coliform require repeat sample set within 24 hours of notification (a) site of previous presence, (b) within 5 services Upgradient and (c) 5 services Downgradient of site with presence. Repeat sites located by printing repeat form for address of positive sample! Additional information is also available in the Coliform Monitoring Plan

Boston Harbor Water System

PWS System #07580R
Route 2

DATE	TIME	ADDRESS (Sample ID)	Cl^2 Residual
__/__/__	__: __	**436 72nd Way**	_____

WAC Notes

Chapter 246-290-300: Minimum Coliform samples 1 per month. Presence of Coliform require repeat sample set within 24 hours of notification (a) site of previous presence, (b) within 5 services Upgradient and (c) 5 services Downgradient of site with presence. Repeat sites located by printing repeat form for address of positive sample! Additional information is also available in the Coliform Monitoring Plan

Boston Harbor Water System

PWS System #07580R
Route 3

DATE	TIME	ADDRESS (Sample ID)	Cl^2 Residual
__/__/__	__: __	**547 77th Avenue**	_____

WAC Notes

Chapter 246-290-300: Minimum Coliform samples 1 per month. Presence of Coliform require repeat sample set within 24 hours of notification (a) site of previous presence, (b) within 5 services Upgradient and (c) 5 services Downgradient of site with presence. Repeat sites located by printing repeat form for address of positive sample! Additional information is also available in the Coliform Monitoring Plan

Boston Harbor Water System

PWS System #07580R
Route 4

DATE	TIME	ADDRESS (Sample ID)	Cl^2 Residual
__/__/__	__: __	**7043 Bayview Dr**	_____

WAC Notes

Chapter 246-290-300: Minimum Coliform samples 1 per month. Presence of Coliform require repeat sample set within 24 hours of notification (a) site of previous presence, (b) within 5 services Upgradient and (c) 5 services Downgradient of site with presence. Repeat sites located by printing repeat form for address of positive sample! Additional information is also available in the Coliform Monitoring Plan

Boston Harbor Water System

PWS System #07580R
Route 5

DATE	TIME	ADDRESS (Sample ID)	Cl^2 Residual
__/__/__	__: __	**7409 Byron St. NE**	_____

WAC Notes

Chapter 246-290-300: Minimum Coliform samples 1 per month. Presence of Coliform require repeat sample set within 24 hours of notification (a) site of previous presence, (b) within 5 services Up gradient and (c) 5 services Down gradient of site with presence. Repeat sites located by printing repeat form for address of positive sample! Additional information is also available in the Coliform Monitoring Plan

Boston Harbor Water System

PWS System #07580R

Alternate or Investigative Routes (AI)

DATE	TIME	ADDRESS (Sample ID)	Cl^2 Residual
__/__/__	__: __	**7019 Boston Harbor Extension AI-1**	_____
__/__/__	__: __	**7300 Zangle Road (reservoir) AI-2**	_____
__/__/__	__: __	**440 76th Way NE AI-3**	_____
__/__/__	__: __	**7337 Boston Harbor Rd AI-4**	_____
__/__/__	__: __	**312 73rd Avenue NE AI-5**	_____

WAC Notes

Chapter 246-290-300: Minimum Coliform samples 1 per month. Presence of Coliform require repeat sample set within 24 hours of notification (a) site of previous presence, (b) within 5 services Up gradient and (c) 5 services Down gradient of site with presence. Repeat sites located by printing repeat form for address of positive sample! Additional information is also available in the Coliform Monitoring Plan

REPEAT
Boston Harbor

Repeat Sample Data Entry Form

Route 1R
PWS #07580R
Boston Harbor Water System

DATE	TIME	ADDRESS	Cl^2 Residual
__/__/__	__: __	7028 Boston Harbor Rd	_____Down gradient (1R-D)
__/__/__	__: __	7126 Boston Harbor Rd	_____Repeat (1R)
__/__/__	__: __	508 72nd Ave	_____Up gradient (1R-U)
__/__/__	__: __	7300 Zangle Road	_____ Well Head (S08)

WAC Notes

Chapter 246-290-300: Minimum Coliform samples 1 per month. Presence of Coliform require repeat sample set within 24 hours of notification (a) site of previous presence, (b) within 5 services Up gradient and (c) 5 services Down gradient of site with presence. Repeat sites located by printing repeat form for address of positive sample! Additional information is also available in the Coliform Monitoring Plan

REPEAT
Boston Harbor

Repeat Sample Data Entry Form

Route 2R
PWS #07580R
Boston Harbor Water System

DATE	TIME	ADDRESS	Cl^2 Residual	
__/__/__	__:__	406 72nd Way	_____	Down gradient (2R-D)
__/__/__	__:__	436 72nd Way	_____	Repeat (2R)
__/__/__	__:__	439 72nd Way	_____	Up gradient (2R-U)
__/__/__	__:__	7300 Zangle Road	_____	Well Head (S08)

WAC Notes

Chapter 246-290-300: Minimum Coliform samples 1 per month. Presence of Coliform require repeat sample set within 24 hours of notification (a) site of previous presence, (b) within 5 services Up gradient and (c) 5 services Down gradient of site with presence. Repeat sites located by printing repeat form for address of positive sample! Additional information is also available in the Coliform Monitoring Plan

REPEAT
Boston Harbor

Repeat Sample Data Entry Form

Route 3R
PWS #07580R
Boston Harbor Water System

DATE	TIME	ADDRESS	Cl^2 Residual	
__/__/__	__:__	**630 77th Avenue**	_____	**Down gradient (3R-D)**
__/__/__	__:__	**547 77th Avenue**	_____	**Repeat (3R)**
__/__/__	__:__	**529 77th Avenue**	_____	**Up gradient (3R-U)**
__/__/__	__:__	**7300 Zangle Road**	_____	**Well Head (S08)**

WAC Notes

Chapter 246-290-300: Minimum Coliform samples 1 per month. Presence of Coliform require repeat sample set within 24 hours of notification (a) site of previous presence, (b) within 5 services Up gradient and (c) 5 services Down gradient of site with presence. Repeat sites located by printing repeat form for address of positive sample! Additional information is also available in the Coliform Monitoring Plan

REPEAT
Boston Harbor

Repeat Sample Data Entry Form

Route 4R
PWS #07580R
Boston Harbor Water System

DATE	TIME	ADDRESS	Cl^2 Residual	
__/__/__	__: __	**6947 Bayview Dr**	_____	**Down gradient (4R-D)**
__/__/__	__: __	**7043 Bayview Dr**	_____	**Repeat (4R)**
__/__/__	__: __	**7114 Bayview Dr**	_____	**Up gradient (4R-U)**
__/__/__	__: __	**7300 Zangle Road**	_____	**Well Head (S08)**

WAC Notes

Chapter 246-290-300: Minimum Coliform samples 1 per month. Presence of Coliform require repeat sample set within 24 hours of notification (a) site of previous presence, (b) within 5 services Up gradient and (c) 5 services Down gradient of site with presence. Repeat sites located by printing repeat form for address of positive sample! Additional information is also available in the Coliform Monitoring Plan

REPEAT
Boston Harbor

Repeat Sample Data Entry Form

Route 5R
PWS #07580R
Boston Harbor Water System

DATE	TIME	ADDRESS	Cl^2 Residual
__/__/__	__:__	**7434 Byron St NE**	_____ **Down gradient (5R-D)**
__/__/__	__:__	**7409 Byron St NE**	_____**Repeat (5R)**
__/__/__	__:__	**7425 Byron St NE**	_____**Up gradient (5R-U)**
__/__/__	__:__	**7300 Zangle Road**	_____ **Well Head (S08)**

WAC Notes

Chapter 246-290-300: Minimum Coliform samples 1 per month. Presence of Coliform require repeat sample set within 24 hours of notification (a) site of previous presence, (b) within 5 services Up gradient and (c) 5 services Down gradient of site with presence. Repeat sites located by printing repeat form for address of positive sample! Additional information is also available in the Coliform Monitoring Plan

System Name: Boston Harbor	**Date Plan Completed:** June 2010 **Date Plan Modified:** September 2024
Name of Plan Preparer Kevin Patching **Position** Utility Operations Supervisor	**Day Time Phone No.** 360-867-2288
State Reviewer _____ **Signature**	**Date Last Review:** **/ / /**

O:\UtilityOps\All Utilities\Coliform monitoring\BH Coliform and Disinfection By-Products Monitoring Plan 2024.doc



Boston Harbor Water System
Coliform Monitoring Sample Locations

- Routine Sample Site
- Repeat Sample Site
- Triggered Sample Site

N

Appendix D Water Rights Documentation

S. F. No. 219-B—OS—(Rev. 7-70).

$10.00 examination fee should accompany each application.

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

PRIORITY
Date 12-16-70
Time 11 AM
Accepted EEA

APPLICATION FOR A PERMIT

To Appropriate Public Ground Waters
OF THE STATE OF WASHINGTON

Application No. G. W. 11457

I, BOSTON HARBOR WATER SYSTEMS CORPORATION
(Name of applicant)

of ROUTE # 3 Box 568 OLYMPIA, WASHINGTON 98501
(Complete post office address)

do hereby make application for a permit to appropriate the following described public ground waters of the State of Washington, subject to existing rights. This application is made under the provisions of Chap. 263 of the Session Laws of 1945, and amendments thereto of the State of Washington and subject to the rules and regulations of the Department of Ecology.

1. *The proposed appropriation will be from* 3 Wells
(Well, tunnel, infiltration trench)

located 7 Miles north of Olympia, at BOSTON HARBOR
(Give approximate distance and direction from nearest city or town)

Area (Leave blank) *Sub-area* (Leave blank)

Zone (Leave blank)

Applicant's name or number of well or other works, if any TWO wells in use now

2. *The quantity of water which applicant intends to withdraw for beneficial use is* 1200

gallons per minute; ..... *acre feet per year.*

3. *The use or uses to which water is to be applied* Community Domestic Supply
(Domestic supply, irrigation, municipal, manufacturing, industrial use, etc.)

4. *The time during which water will be required each year* ~~Year Round~~ Continuously

5. *Location of well or other works for withdrawal of water: In county of* Thurston

#1-530'N & 600'E; #2-580'N & 580'E; #3-190'S & 225'W from Center, Sec. 14

(a) T19NR2W Dofftemyer D.C. No 39
(Give distance and bearing from nearest corner of section or legal subdivision)

being within the ..... *of Sec.* 1, *Twp.* 19 *N., Rge.* 2 (E. or W.)
(Give smallest legal subdivision)

that part of Tract Designated

or (b) *If within limits of recorded platted property, town or city:* Lot ....., Block .....,
D.C. No. 39 included within Govt's Nos 4, and Reserve Tract of the plat of Boston Harbor, within NW¼ SW¼; Also Sec. 14, T. 19N., R. 2W.W.M.
of within
(Give name of plat or addition) (If within town or city, give name)

(c) *Show this location on accompanying section plat. Other adequate maps or drawings will be acceptable.*

6. DESCRIPTION OF WORKS:

(a) Well will be Drilled (Dug or drilled) and have a diameter of 6 inches inches and an estimated depth of 125 ' feet.

(b) Tunnels or trenches to be described: (Attach additional sheets if needed for full description.)

(c) Distribution system to be described:
6inch to 4 inch to 3 inch for Boston Harbor community

(d) If pumps are to be used, give size and type: 5 horse, Cent 3 horse Submerc & 1½ Horse. Cent

(e) Give capacity and type of motor or engine to be used: Electric

(f) If the location of the well, tunnel, or other works is less than one-fourth mile from a natural stream or stream channel, give the distance to the nearest point on each of such channels and the difference in elevation between the stream bed and the ground surface at the source of development:

(g) Ownership of each existing well or other works from which ground water is withdrawn within a radius of one-quarter mile and the distance and direction from well or other works being reported herein: None

(Name)	(Direction)	(Distance)
(Name)	(Direction)	(Distance)
(Name)	(Direction)	(Distance)

SUPPLY THE FOLLOWING INFORMATION ACCORDING TO USE PROPOSED:

7. For Municipal Supply: To supply the city, town, or community of Boston Harbor, in the county of Thurston, having a present population of 700, and an estimated population of 1500, in 19 80.

8. For Irrigation: Number of acres to be irrigated ..... acres.

9. *Legal Description of Property on which water is to be used for all purposes other than municipal supply:*

(Copy legal description from deed)
(If more space is required, attach separate sheet)

by Boston Harbor Water Systems Corporation

AREAS SERVED WITHIN Sec. 11, 13 & 14 in T. 19N, R. 2W. W.M.

(On accompanying plat show location of the existing wells or works)

10. *What interest do you have in the above described property?* Owner

(Owner, lessee, contract buyer, etc.)

11. *Do you have any other water rights appurtenant to the above described property?* _____

If so, from what source? Franchise from the County Commissioners

12. *Construction work will begin on or before* 2 Wells now in use and new well

13. *Construction work will be completed on or before* April 1971

14. *Water will be put to complete beneficial use on or before* May 1971

W J Cayley Pres
(Signature of applicant)

15. *Name and address of owner of land on which well or works are located:*

Boston Harbor Water Systems Corporation (Name) Rt 3 Box 568 (Address) Olympia, Wash

(Signature of legal landowner)

Signed in the presence of us as witnesses:

Charles L Mitchell (Name) office. (Address of witness)

(Name) (Address of witness)

STATE OF WASHINGTON,
COUNTY OF THURSTON. } ss.

This is to certify that I have examined the foregoing application, together with the accompanying maps and data, and return the same for correction or completion as follows:

_____

_____

In order to retain its priority, this application must be returned to the Department of Ecology, with corrections, on or before _____, *19*____

WITNESS my hand this _____ *day of* _____, *19*

_____
Department of Ecology.

S. F. No. 7361—(Rev. 6-70).

CERTIFICATE RECORD NO. -, PAGE NO. G 2-00630 C

STATE OF WASHINGTON, COUNTY OF Thurston

CERTIFICATE OF GROUND WATER RIGHT

(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 thereunder.)

THIS IS TO CERTIFY *That* BOSTON HARBOR WATER SYSTEMS CORPORATION

of Olympia, Washington, *has made proof to the satisfaction of the Department of Ecology of a right to the use of the public ground waters of the State of Washington from* three (3) wells

located within that part of Isaac Doffimyer D.L.C. No. 69 included within SWSW; and Reservoir Tract of the plat of Boston Harbor, within NWNW. ALL within

Sec. 14, *Twp.* 19 *N., R.* 2 W. *W.M.*,

for the purpose(s) of community domestic supply

under and specifically subject to provisions contained in Ground Water Permit No. 10296

issued by the Department of Ecology and that said right to the use of said ground waters has been perfected in accordance with the laws of Washington, and is hereby confirmed by the Department of Ecology and entered of record in Volume - *at page* G 2-00630 C ; *that the priority of the right hereby confirmed dates from* December 16, 1970 ; *that the quantity of ground water under the right hereby confirmed for the aforesaid purposes, is limited to an amount actually beneficially used for said purposes, and shall not exceed* 50 gallons per minute; 56 acre-feet per year during entire year for community domestic supply.

A description of the lands to which such ground water right is appurtenant is as follows:

Area served by Boston Harbor Water Systems Corporation within Sec. 11, 13, and 14 in T. 19 N., R. 2 W.W.M.

The right to use of 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 ground water right is specifically subject to relinquishment for nonuse of water as provided in RCW 90.14.180.

Given under my hand and seal of this office at Olympia, Washington, this 11th *day of* June, *19* 73.

JOHN A. BIGGS, *Director*
Department of Ecology

Engineering Data
OK

by
R. Jerry Bollen, Assistant Director

S. P. No. 7154—(Rev. 6-70).

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

Permit to Appropriate Public Waters of the State of Washington

Book No. 21 of Ground Water Permits, on page 10296 under Application No. 11497

BOSTON HARBOR WATER SYSTEMS CORPORATION

of Olympia, Washington

is, pursuant to the Report of Examination which has been accepted by the applicant, hereby granted a permit to appropriate the following described public ground waters of the State of Washington, subject to existing rights and to the limitations and provisions set out herein.

Priority date of this permit is December 16, 1970

Source(s) of the proposed ground water appropriation ~~is~~/are three (3) wells

The quantity of water appropriated shall be limited to the amount which can be beneficially applied and not to exceed 500 gallons per minute; 336 acre-feet per year, to be used for the following purposes: community domestic supply

, as more definitely set out below.

Approximate location(s) of the point(s) of withdrawal ~~is~~/are: #1: 550 feet north and 600 feet east; #2: 580 feet north and 580 feet east; #3: 190 feet south and 225 feet west; ALL from center of Sec. 14

being within that part of Isaac Doffemyer D.L.C. No. 69 included within SW¼NE¼; and Reservoir Tract of the plat of Boston Harbor, within NE¼SW¼ ALL within

~~S~~Sec. 14, Twp. 19 N., Rge. 2 W. W.M., Thurston County,

The use, or uses, to which water is to be applied:

Community

Domestic/~~municipal~~ supply: 500 gallons per minute; 336 acre-feet per year, during entire year.

Irrigation: gallons per minute; acre-feet per year from to , each year, for the irrigation of acres.

Other use(s): gallons per minute; acre-feet per year, from to each year, for

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

Area served by Boston Harbor Water Systems Corporation within Sec. 11, 13 and 14 in T. 19 N., R. 2 W.W.M.

ADDITIONAL LIMITATIONS AND PROVISIONS: The installation and maintenance of an access port as described in Ground Water Bulletin No. * shall be required prior to issuance of final Certificate of Water Right.

DESCRIPTION OF PROPOSED WORKS: #1 6 3# #2 6 3# #3 6

The well will be dr111ed and have a diameter of ___ inches, and depth of 125 feet.
(Dug or drilled)

Description of tunnel or infiltration trench: _____

DEVELOPMENT SCHEDULE:

Construction work shall begin on or before Started

and shall thereafter be prosecuted with reasonable diligence and completed on or before

May 1, 1972

and complete application of water to proposed use shall be made on or before

May 1, 1973

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 10th day of May, 1971.

JOHN A. BIGGS, *Director*
Department of Ecology

by Edward F. Fiedler

ENGINEERING DATA
OK A.F.

5-173 pa

Progress Sheet—Ground Water Application

Boston Harbor Water Systems ~~Corp.~~
Route 3, Box 568
NAME Olympia, Washington 98501 Assigned to

G. W. APPLI. NO. 11407 PERMIT NO. 10296 CERT. NO. G200630C A

AMENDED CANCELLED

Application received 12-16-70 Initial $10.00 fee received 12-16-70
Statement of additional examination fee $ Sent Received
Application returned for completion or correction Received

TEMPORARY PERMIT: Approved by Issued

PUBLICATION:
O.K.'d by [illegible] Date 1-18-71 Notice sent 1-20-71
Protests
Filed
Affidavit received and checked OK HWH 3/8/71 Time expired 4-2-71
Amended notice sent Affidavit received
Time expires

DEPT. OF GAME REPORT

EXAMINATION Made 1-14-71 by
O.K.'d for permit by
Statement of permit fee sent 4-27-71 Amount $ 20.00 Received

PERMIT NO. 10296 ISSUED 5-10-71

BEGINNING OF CONSTRUCTION: Notice sent Stated Filed
Extension fee $ Extended to
Extended to

WELL DRILLER'S REPORT: Sent 5-17-71 Filed acknowledge 6-10-71 / 6-11-73

COMPLETION OF CONSTRUCTION: Notice sent 5-17-71 Filed 6-10-71
$2.00 extension fee Extended to
To

PROOF OF APPROPRIATION: Sent 6-10-71 Filed
$2.00 extension fee Extended to

Statement of certificate fee sent $ Received 5-18-73

CERTIFICATE OF GROUND WATER RIGHT No. G200630C A ISSUED 6-11-73

STATE PRINTING PLANT OLYMPIA, WASHINGTON

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

APPLICATION FOR PERMIT
TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

☐ SURFACE WATER ☒ GROUND WATER

$10.00 MINIMUM STATUTORY EXAMINATION FEE REQUIRED WITH APPLICATION

(GRAY BOXES FOR OFFICE USE ONLY)

APPLICATION NO.	W.R.I.A.	COUNTY	PRIORITY DATE	TIME	ACCEPTED
223917	13	34 Thurston	8-6-75	2:30 pm	CTF

APPLICANT'S NAME: Boston Harbor Water Systems, Corp.

TELEPHONE NUMBER: 943-4806

DATE & PLACE OF INCORPORATION IF APPLICANT IS A CORPORATION: 1962 Olympia, Washington

ADDRESS (STREET): P. O. Box 2564 (CITY): Olympia (STATE): Washington (ZIP CODE): 98507

1. SOURCE OF SUPPLY

IF SURFACE WATER	IF GROUND WATER
SOURCE (NAME OF STREAM, LAKE, SPRING, ETC.) (IF UNNAMED, SO STATE)	SOURCE (WELL, TUNNEL, INFILTRATION TRENCH, ETC.): Well
TRIBUTARY OF	SIZE AND DEPTH: 8" - Approx. 400'

2. USE

USE TO WHICH WATER IS TO BE APPLIED (DOMESTIC SUPPLY, IRRIGATION, MINING, MANUFACTURING, ETC.)
Community Domestic Supply

CUBIC FEET PER SECOND OR GALLONS PER MINUTE: 100 ☐ CFS ☒ GPM

ACRE FEET PER YEAR:

TIMES DURING YEAR WATER WILL BE REQUIRED
Continuously for ~~every day~~. Community domestic Supply

IF IRRIGATION, NUMBER OF ACRES	NUMBER OF HOMES OR UNITS, IF DOMESTIC	ESTIMATED POPULATION 20 YEARS FROM THIS DATE IF MUNICIPAL SUPPLY
	~~164 Residential~~ 200	500
DATE PROJECT WILL BE STARTED: Approx. August 1975	DATE PROJECT WILL BE COMPLETED: Approx. September 1975	

3. LOCATION OF POINT OF DIVERSION/WITHDRAWAL

ON ACCOMPANYING PLATS OR MAPS, ACCURATELY MARK AND IDENTIFY EACH POINT OF DIVERSION. GIVE MEASURED DISTANCE AND BEARING, OR NORTH-SOUTH AND EAST-WEST DISTANCES FROM NEAREST SECTION CORNER.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE (E. OR W.) W.M.	COUNTY
~~Pump house Tract of the plat of Boston Harbor, within SW¼NE¼ of~~ 650' N & [redacted]' East from Cent of 14	14	19	R 2 W	Thurston

560' N of S Line & 450 620' E of Cent. Sec. 14

DO YOU OWN THE LAND ON WHICH THIS SOURCE IS LOCATED. IF NOT, INSERT NAME & ADDRESS OF OWNER
Yes

4. IF THIS IS WITHIN THE LIMITS OF A RECORDED PLATTED PROPERTY, COMPLETE THIS SECTION

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)
		Pump House tract of the plat of Boston Harbor

5. LEGAL DESCRIPTION OF PROPERTY *ON WHICH WATER IS TO BE USED*

COPY LEGAL DESCRIPTION FROM DEED; OR ATTACH COPY OF DEED. TAX STATEMENT DESCRIPTIONS ARE NOT ACCEPTABLE. ALSO OUTLINE THIS PROPERTY ON THE MAPS OR PLATS SUBMITTED WITH THIS APPLICATION.

OR Area served by Boston Harbor Water Systems Corporation within Sec. 11, 13, and 14 in T. 19 N., R. 2 W.W.M.

CONTINUE ON REVERSE SIDE

WHAT IS YOUR INTEREST IN THE PROPERTY ON WHICH THE WATER IS TO BE USED (PROPERTY OWNER, LESSEE, CONTRACT PURCHASER, ETC.)

To serve the people of Boston Harbor

ARE THERE ANY EXISTING WATER RIGHTS APPURTENANT TO THE LAND ON WHICH THE WATER IS TO BE USED

[X] YES [ ] NO

IF YES, FROM WHAT SOURCE AND UNDER WHAT AUTHORITY

Thurston County Dept. of Ecology Certificate record no. 891795 pg. no. G 2-00630 C

State of Washington Dept. of Ecology, Permit to Appropriate Public Waters of the State of Washington, Book No. 21 of Groung Water Permits, on page 10296 under Application no. 11457 ~~.~~

Cert 1012 for a spring 0.30 CFS.

6. SIGNATURES

Pres. John Bergford

APPLICANT'S SIGNATURE

Boston Harbor Water Systems Corp.

LEGAL LANDOWNER'S SIGNATURE

LEGAL LANDOWNER'S ADDRESS

IF 10 ACRE-FEET OR MORE OF WATER IS TO BE STORED AND/OR IF THE WATER DEPTH WILL BE 10 FEET OR MORE AT THE DEEPEST POINT, A STORAGE PERMIT MUST BE FILED IN ADDITION TO THIS PERMIT. THESE FORMS CAN BE SECURED, TOGETHER WITH INSTRUCTIONS, FROM THE DEPARTMENT OF ECOLOGY.

REMARKS (TYPE OF SYSTEM PROPOSED)

This water system is under order from the Washington Utilities and Transportation Commission to Develope a new water source. Present requirement to serve existing customers will require over 100 gpm more.

Plans are to drill through th existing well (well # 1) to a lower water table. Well # 1 is only producing 10 gpm.

Delete old well WB 9/23/76

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY } ss.

This is to certify that I have examined the foregoing application together with the accompanying maps and data, and return the same for correction or completion as follows: .....

.....

.....

In order to retain its priority, this application must be returned to the Department of Ecology, with corrections, on or before ....., 19.....

Witness my hand this .....*day of* ....., 19.....

.....
Department of Ecology

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

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.)

CERTIFICATE NUMBER	PERMIT NUMBER	APPLICATION NUMBER	PRIORITY DATE
G2-23917C	G2-23917P	G2-23917	August 6, 1975

NAME
BOSTON HARBOR WATER SYSTEMS, CORP.

ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
PO Box 2564	Olympia	Washington	98507

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.

PUBLIC WATER TO BE APPROPRIATED

SOURCE
well

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE-FEET PER YEAR
	100	90

QUANTITY, TYPE OF USE, PERIOD OF USE
90 acre-feet per year — community domestic supply — continuously

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION/WITHDRAWAL
360 feet north and 620 feet east from the center of Sec. 14

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
SE¼NE¼	14	19	2 E	13	Thurston

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY WATER TO BE USED ON

Area served by Boston Harbor Water Systems Corporation within Sec. 11, 13, and 14, T. 19 N., R. 2 W.W.M.

PROVISIONS

The access port as required on your permit, shall be maintained at all times.

In no instance shall the total annual withdrawal under all rights exceed 90 acre-feet annually.

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 Olympia, Washington, this 1st *day of* October, *19* 76.

JOHN A. BIGGS, *Director*
Department of Ecology

by E. W. Anselstine
E. W. Anselstine, Regional Manager

ENGINEERING DATA
OK

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	APPLICATION NUMBER	PRIORITY DATE	
G2-23917P	G2-23917	August 6, 1975	

NAME
BOSTON HARBOR WATER SYSTEMS, CORP.

ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
PO Box 2564	Olympia	Washington	98507

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.

PUBLIC WATER TO BE APPROPRIATED

SOURCE
well

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE-FEET PER YEAR
	100	90

QUANTITY, TYPE OF USE, PERIOD OF USE
90 acre-feet per year | community domestic supply | continuously

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION/WITHDRAWAL
560 feet north and 620 feet east from the center of Sec. 14

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
SW¼NE¼	14	19	2 W	13	Thurston

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY WATER TO BE USED ON

Area served by Boston Harbor Water Systems Corporation within Sec. 11, 13, and 14, T. 19 N., R. 2 W.W.M.

DESCRIPTION OF PROPOSED WORKS

well - 8" x 400'

DEVELOPMENT SCHEDULE

BEGINNING DATE	COMPLETION DATE	DATE COMPLETE APPLICATION OF WATER TO BE MADE
Started	June 1, 1977	June 1, 1978

PROVISIONS

The installation of an access port as described in Ground Water Bulletin No. 1 shall be required prior to issuance of final certificate of water right.

Permittee is advised that notice of proof of appropriation of water (under which final certificate of water right issues) should not be filed until the permanent diversion facilities have been installed together with a mainline system capable of delivering the recommended quantity of water to an existing or proposed distribution system within the area to be served.

In no instance shall the total annual withdrawal under all rights exceed 90 acre-feet annually.

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 2nd *day of* July, *19* 76

JOHN A. BIGGS, *Director*
Department of Ecology

ENGINEERING DATA
OK P

by B. W. Asselstine
Regional Manager

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

CC 6-1-77

COMPUTER INPUT
- [X] APPLICATION
- [ ] PERMIT
- [ ] CERTIFICATE
- [ ] OTHER

PROGRESS SHEET

THURSTON ☐ SURFACE WATER ☒ GROUND WATER

NAME			TELEPHONE NO.
BOSTON HARBOR WATER SYSTEMS, CORPORATION			943-4806
ADDRESS	**(CITY)**	**STATE**	**(ZIP CODE)**
P. O. Box 2564	Olympia	Washington	98507
ASSIGNED TO		**TELEPHONE NO.**	**DATE ASSIGNED**
ADDRESS	**(CITY)**	**(STATE)**	**(ZIP CODE)**

APPLICATION NO. G 223917	PERMIT NO. P	CERTIFICATION NO. C
DATE AMENDED	DATE CANCELLED	W.R.I.A.

APPLICATION

DATE APPLICATION RECEIVED 8-6-75	INITIAL $10.00 FEE RECEIVED [X] YES [ ] NO	DATE FEE RECEIVED 8-6-75
STATEMENT OF ADDITIONAL EXAMINATION FEE $	DATE SENT	DATE RECEIVED
DATE RETURNED FOR COMPLETION OR CORRECTION		DATE RECEIVED

TEMPORARY PERMIT

APPROVED BY	DATE ISSUED

PUBLICATION

APPROVED BY GBL	DATE APPROVED 8-20-75	DATE NOTICE SENT 8-21-75
PROTESTED BY AND DATE		

DATE AFFIDAVIT RECEIVED 10-27-75	CHECKED BY GBL	TIME EXPIRED 11-16-75	DATE AMENDED NOTICE SENT	DATE AFFIDAVIT RECEIVED	TIME EXPIRED

DEPARTMENT OF GAME AND FISHERIES REPORT

APPROVED	PROVISO	PROTEST

EXAMINATION

DATE EXAMINATION MADE 6/10/76 office	MADE BY WB	DATE REPORT OF EXAM. WRITTEN	WRITTEN BY	CHECKED BY
DATE PERMIT FF REQUESTED 5-20-76	AMOUNT DUE $20.00		DATE RECEIVED 5-27-76 P	

PERMIT

PERMIT APPROVED BY P	DATE APPROVED 7-2-76	PERMIT NO. P	DATE ISSUED 7-2-76

BEGINNING OF CONSTRUCTION

DATE NOTICE SENT	DATE FILED	EXTENSION FEE
EXTENDED TO		EXTENDED TO

WELL DRILLER'S AND/OR CONSTRUCTION REPORT

DATE SENT —	DATE FILED 7/8/76, by applicant WB 7-8-76

COMPLETION OF CONSTRUCTION

DATE NOTICE SENT	DATE FILED	EXTENSION FEE
EXTENDED TO		EXTENDED TO

PROOF OF APPROPRIATION

DATE SENT	DATE FILED	EXTENSION FEE	EXTENDED TO

DATE CERTIFICATE FEE REQUESTED	AMOUNT DUE	DATE RECEIVED	DATE APPROVED FOR CERTIFICATE 8-11-76	APPROVED BY

CERTIFICATION

PROOF EXAM. REQUIRED [ ] YES [ ] NO	CERTIFICATE NUMBER	DATE ISSUED 10-1-76

REMARKS No PA

PROGRESS

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

CC 6-1-77

COMPUTER INPUT
- [X] APPLICATION
- [ ] PERMIT
- [ ] CERTIFICATE
- [ ] OTHER

PROGRESS SHEET

THURSTON ☐ SURFACE WATER ☒ GROUND WATER

NAME			TELEPHONE NO.
BOSTON HARBOR WATER SYSTEMS, CORPORATION			943-4806
ADDRESS	(CITY)	STATE	(ZIP CODE)
P. O. Box 2564	Olympia	Washington	98507

ASSIGNED TO	TELEPHONE NO.	DATE ASSIGNED
ADDRESS	(CITY)	(STATE) (ZIP CODE)

APPLICATION NO.	PERMIT NO.	CERTIFICATION NO.
G 223917	P	C
DATE AMENDED	DATE CANCELLED	W.R.I.A.

APPLICATION

DATE APPLICATION RECEIVED	INITIAL $10.00 FEE RECEIVED	DATE FEE RECEIVED
8-6-75	[X] YES [ ] NO	8-6-75
STATEMENT OF ADDITIONAL EXAMINATION FEE $	DATE SENT	DATE RECEIVED
DATE RETURNED FOR COMPLETION OR CORRECTION		DATE RECEIVED

TEMPORARY PERMIT

APPROVED BY	DATE ISSUED

PUBLICATION

APPROVED BY	DATE APPROVED	DATE NOTICE SENT
GBL	8-20-75	8-21-75
PROTESTED BY AND DATE		

DATE AFFIDAVIT RECEIVED	CHECKED BY	TIME EXPIRED	DATE AMENDED NOTICE SENT	DATE AFFIDAVIT RECEIVED	TIME EXPIRED
10-27-75	GBL	11-16-75			

DEPARTMENT OF GAME AND FISHERIES REPORT

APPROVED	PROVISO	PROTEST

EXAMINATION

DATE EXAMINATION MADE	MADE BY	DATE REPORT OF EXAM. WRITTEN	WRITTEN BY	CHECKED BY
5/10/76 office	WB			
DATE PERMIT FEE REQUESTED	AMOUNT DUE		DATE RECEIVED	
5-20-76	$20.00		5-27-76 P	

PERMIT

PERMIT APPROVED BY	DATE APPROVED	PERMIT NO.	DATE ISSUED
P	7-2-76	P	7-2-76

BEGINNING OF CONSTRUCTION

DATE NOTICE SENT	DATE FILED	EXTENSION FEE
EXTENDED TO	EXTENDED TO	

WELL DRILLER'S AND/OR CONSTRUCTION REPORT

DATE SENT	DATE FILED
←	7/8/76 by applicant CWF 8-9-76

COMPLETION OF CONSTRUCTION

DATE NOTICE SENT	DATE FILED	EXTENSION FEE
EXTENDED TO	EXTENDED TO	

PROOF OF APPROPRIATION

DATE SENT	DATE FILED	EXTENSION FEE	EXTENDED TO

DATE CERTIFICATE FEE REQUESTED	AMOUNT DUE	DATE RECEIVED	DATE APPROVED FOR CERTIFICATE	APPROVED BY
			8-11-76	

CERTIFICATION

PROOF EXAM. REQUIRED	CERTIFICATE NUMBER	DATE ISSUED
[ ] YES [ ] NO	C	10-1-76

REMARKS

No PA

PROGRESS

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

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 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
March 1, 1988	G 2-27271	G 2-27271 P	

NAME
Thurston County Department of Public Works Attn: Clint Dice

ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
2000 Lakeridge Drive SW	Olympia	Washington	98502

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.

PUBLIC WATER TO BE APPROPRIATED

SOURCE
Wells 5 and 6

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE-FEET PER YEAR
	150	150

QUANTITY, TYPE OF USE, PERIOD OF USE
150 acre feet per year Municipal supply As needed
(90 acre feet, supplemental to existing rights and 60 acre feet per year primary)

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION—WITHDRAWAL
Well 5: 550 feet North and 350 feet East of the West quarter corner of Section 13.
Well 6: 550 feet North and 550 feet East of the West quarter corner of Section 13.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
SWANW¼	13	19	2W	13	Thurston

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 the Boston Harbor Water System.

DESCRIPTION OF PROPOSED WORKS

2 wells, 6" diameter by 537.7 feet deep, existing and 8" diameter by 250 feet deep, proposed.

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE:	COMPLETE PROJECT BY THIS DATE:	WATER PUT TO FULL USE BY THIS DATE:
Started	April 1, 1991	April 1, 1993

PROVISIONS

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 the access port.

At such time that the Department of Ecology determines the regulation and management of the subject waters is necessary and in the public interest, an approved measuring device shall be installed and maintained in accordance with RCW 90.03.360 and WAC 508-64-020 through WAC 508-64-040.

In all cases, applicants are urged to locate their wells as far inland as is reasonablebecause of the uncertainty of the amount of seawater intrusion that may be experienced in the future.

When the chloride concentration exceeds 250 mg/L, the withdrawal rate shall be reduced or the pump setting raised to reduce the chloride level to below 250 mg/L.

All water wells constructed within the state shall meet the minimum standards for construction and maintenance as provided under RCW 18.104 (Washington Water Well Construction Act of 1971) and Chapter 173-160 WAC (Minimum Standards for Construction and Maintenance of Water Wells.)

A well log of the completed well shall be submitted by the driller to the Department of Ecology within thirty (30) days of completion of this well. This well log shall be complete and all information concerning the static water level in the completed well, in addition to any pump test data, shall be submitted as it is obtained.

In accordance with WAC 173-160-205 wells shall not be located within certain minimum distances of potential sources of contamination. These minimum distances shall comply with local health regulations as appropriate. In general, wells shall be located at least 100 feet from a sewer, septic tank privy, or other source of contamination. Wells shall not be located within 1,000 feet of a solid waste landfill.

The Water Resources Act of 1971 specifies certain criteria regarding utilization and management of the waters of the State in the best public interest. Issuance of this permit was based on sufficient waters available, at least during portions of the year. However, it is pointed out to the permittee that his use of the water may be subject to regulation at certain times, based on the necessity to maintain water quantities sufficient for preservation of the natural environment.

"The total annual withdrawal under this authorization and Ground Water Certificates G 2-00630 C and G 2-23917 C shall not exceed 150 acre feet per year."

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 *Washington, this* 23rd *day of* October, *19* 89

Christine O. Gregoire, Director
Department of Ecology

by Gregg E. Hueman

ENGINEERING DATA
OK

State of Washington
Department of Ecology

APPLICATION FOR PERMIT
TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

☐ SURFACE WATER ■ GROUND WATER

$10.00 MINIMUM STATUTORY EXAMINATION FEE REQUIRED WITH APPLICATION

(GRAY BOXES FOR OFFICE USE ONLY)

APPLICATION NO.	W.R.I.A.	COUNTY	PRIORITY DATE	TIME	ACCEPTED
G2-27271	13	Thurston	3-1-88 Received	2:12	KL

APPLICANT'S NAME — PLEASE PRINT
THURSTON COUNTY
ATTN: LORETTA SWANSON
THURSTON CO. PUBLIC WORKS

Bus. Tel. 786-5485
Home Tel. ____
Other Tel. ____

ADDRESS (STREET) 2000 LAKERIDGE DR SW (CITY) OLYMPIA (STATE) WA (ZIP CODE) 98502

DATE & PLACE OF INCORPORATION IF APPLICANT IS A CORPORATION —

1. SOURCE OF SUPPLY

IF SURFACE WATER	IF GROUND WATER
SOURCE (NAME OF STREAM, LAKE, SPRING, ETC.) (IF UNNAMED, SO STATE)	SOURCE (WELL, TUNNEL, INFILTRATION TRENCH, ETC.) 2 WELLS
TRIBUTARY N/A	SIZE AND DEPTH 2-8" @ 250' DEPTH

2. USE

USE TO WHICH WATER IS TO BE APPLIED (DOMESTIC SUPPLY, IRRIGATION, MINING, MANUFACTURING, ETC.)
~~Commercial Municipal~~ DOMESTIC & SCHOOL SUPPLY

ENTER QUANTITY OF WATER REQUESTED USING UNITS OF: CUBIC FEET PER SECOND (CFS) ____ **OR** GALLONS PER MINUTE (GPM) 150 ACRE FEET PER YEAR ____

TIMES DURING YEAR WATER WILL BE REQUIRED MUNICIPAL SATELLITE SYSTEM - WATER REQUIRED ALL TIMES THRUGHOUT THE YEAR

IF IRRIGATION, NUMBER OF ACRES	IF DOMESTIC USE, NUMBER OF UNITS BY TYPE, E.G. 1-HOME, 1-MOBILE HOME, 2-CAMPSITES, ETC.	IF MUNICIPAL USE, ESTIMATED POPULATION 20 YEARS FROM TODAY
DRILLING	286 RESIDENCES, 1 ELEM. SCHOOL	

DATE PROJECT WAS OR WILL BE STARTED	DATE PROJECT WAS OR WILL BE COMPLETED
MARCH 28, 1988	MAY 27, 1988

3. LOCATION OF POINT OF DIVERSION/WITHDRAWAL

3A. IF IN PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)	SECTION	TOWN	RANGE	ALSO, PLEASE ENCLOSE A COPY OF THE PLAT AND MARK THE POINT(S) OF WITHDRAWAL OR DIVERSION
			13	19	2W	

3B. IF NOT IN PLATTED PROPERTY

ON ACCOMPANYING SECTION MAPS, ACCURATELY MARK AND IDENTIFY EACH POINT OF DIVERSION. SHOW NORTH-SOUTH AND EAST-WEST DISTANCES FROM NEAREST SECTION CORNER OR PROPERTY CORNER.

ALSO, ENTER BELOW THE DISTANCES FROM THE NEAREST SECTION OR PROPERTY CORNER TO THE DIVERSION OR WITHDRAWAL. SEE SITE PLAN
500' EAST OF ZANGLE, 100' SOUTH OF NO. PROPERTY LINE.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE (E. OR W.) W.M.	COUNTY
ASSESSOR'S PARCEL # 12913230100	13	19	2W	THURSTON

POW #1 500 ft North and 350 ft East POW #2 550 North and 550 EAST
Both from the 1/4 Corner of Section 13

4. DO YOU OWN THE LAND ON WHICH THIS SOURCE IS LOCATED. IF NOT, INSERT NAME & ADDRESS OF OWNER
OLYMPIA SCHOOL DISTRICT rep. Mr. GEORGE BARNEY

5. LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

ATTACH A COPY OF THE LEGAL DESCRIPTION OF THE PROPERTY (ON WHICH THE WATER WILL BE USED) TAKEN FROM A REAL ESTATE CONTRACT, PROPERTY DEED OR TITLE INSURANCE POLICY. OR, COPY CAREFULLY IN THE SPACE BELOW.

HQ
OSHS — ATTACHED —

NORTH 1/2 OF SW1/4 OF SW1/4 OF NW1/4 OF SECTION 13, TOWNSHIP 19 N, RANGE 2 WEST

RECEIVED
'88 MAR 11 P2:12
DEPARTMENT OF ECOLOGY
SW REGIONAL OFFICE

I have examined this application as required by SEPA and find that it is: ☐ not an "action".
☒ categorically exempt.

3/10/88 — Linda L. Hunt
DATE — SIGNATURE

APPLICATION

ECY 040-14
Rev. 1/88

WHAT IS YOUR INTEREST IN THE PROPERTY ON WHICH WATER IS TO BE USED (PROPERTY OWNER, LESSEE, CONTRACT PURCHASER, ETC.)

INTERLOCAL AGREEMENT BETWEEN THURSTON CO./OLY. SCHOOL DISTRICT

ARE THERE ANY EXISTING WATER RIGHTS RELATED TO THE LAND ON WHICH THE WATER IS TO BE USED (INCLUDING WATER PROVIDED BY IRRIGATION DISTRICTS OR DITCH COMPANIES.) [X] YES [ ] NO

IF YES, FROM WHAT SOURCE (i.e. SURFACE OR GROUND WATER) AND UNDER WHAT AUTHORITY

GROUND WATER FOR EXISTING OLYMPIA SCHOOL DISTRICT WELL. WELL TO BE ABANDONED UPON WATER SYSTEM COMPLETION.

6. **DESCRIPTION OF SYSTEM PROPOSED OR INSTALLED**

(FOR EXAMPLE: SIZE OF PUMP, CAPACITY OF PUMP, PUMP MOTOR HORSE POWER, PIPE DIAMETER, NUMBER OF SPRINKLERS, ETC.)

(PLEASE REFER TO THE ATTACHED ADDITIONAL INFORMATION.)

THE TWO NEW WELLS ARE FOR A MAJOR UPGRADE TO THE EXISTING BOSTON HARBOR WATER SYSTEM, AND TO PROVIDE WATER AND FIRE PROTECTION TO THE BOSTON HARBOR ELEMENTARY SCHOOL. AN ENGINEERING REPORT (BOSTON HARBOR WATER SYSTEM STUDY, MAY 1987) WAS PREPARED BY R.W. BECK & ASSOC. AND APPROVED BY DOE & DSHS IN JUNE 1987. A LID HAS BEEN CREATED, AND GRANTS & LOANS SECURED TO FUND THE PROJECT.

7. REMARKS

*REQUESTING A TEMPORARY PERMIT SO THE WELL DRILLER CAN BEGIN WORK THE LAST WEEK OF MARCH 1988. PLEASE CALL FOR ANY INFORMATION YOU MAY NEED TO EXPEDITE THE PROCESS.

IF 10 ACRE-FEET OR MORE OF WATER IS TO BE STORED AND/OR IF THE WATER DEPTH WILL BE 10 FEET OR MORE AT THE DEEPEST POINT, A STORAGE PERMIT MUST BE FILED IN ADDITION TO THIS PERMIT. THESE FORMS CAN BE SECURED, TOGETHER WITH INSTRUCTIONS, FROM THE DEPARTMENT OF ECOLOGY.

SIGNATURES

Loretta Swanson — THURSTON COUNTY PUBLIC WORKS
APPLICANT'S SIGNATURE

OLYMPIA SCHOOL DISTRICT
LEGAL LANDOWNERS NAME (PLEASE PRINT)

Jerry Berney
LEGAL LANDOWNER'S SIGNATURE (OWNER OF PROPERTY DESCRIBED IN ITEM NUMBER 6)

113 E. LEGION OLYMPIA, WA 98501
LEGAL LANDOWNER'S ADDRESS

FOR OFFICE USE ONLY

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY } *ss.*

This is to certify that I have examined this application together with the accompanying maps and data, and am returning it for correction or completion as follows: .....

.....

.....

In order to retain its priority date, this application must be returned to the Department of Ecology, with corrections, on or before....., 19.....

Witness my hand this.....*day of*....., 19.....

.....
Department of Ecology

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

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	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
March 1, 1988	G2-27271	G2-27271 P	G2-27271 C

NAME
Thurston County Department of Public Works (Clint Dice)

ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
2000 Lakeridge Drive SW	Olympia	Washington	98502

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, but is limited to an amount actually beneficially used.

PUBLIC WATERS TO BE APPROPRIATED

SOURCE
Wells 5 and 6

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE-FEET PER YEAR
	150	150

QUANTITY, TYPE OF USE, PERIOD OF USE
150 acre-feet per year Municipal supply As needed
(90 acre-feet, supplemental to existing rights and 60 acre-feet per year primary)

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION-WITHDRAWAL
Well 5: 550 feet north and 350 feet east of the west quarter corner of Section 13.
Well 6: 550 feet north and 550 feet east of the west quarter corner of Section 13.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
SW¼NW¼	13	19	2W	13	Thurston

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 the Boston Harbor Water System.

PROVISIONS

The access port shall be maintained at all times on the well(s).

At such time that the Department of Ecology determines the regulation and management of the subject waters is necessary and in the public interest, an approved metering device shall be installed and maintained in accordance with RCW 90.03.360 and WAC 508-64-020 through -040.

When the chloride concentration exceeds 250 mg/L, the withdrawal rate shall be reduced or the pump setting raised to reduce the chloride level to below 250 mg/L.

All water wells constructed within the state shall meet the minimum standards for construction and maintenance as provided under RCW 18.104, Washington Water Well Construction Act of 1972, and Chapter 173-160 WAC, Minimum Standards for Construction and Maintenance of Wells.

The Water Resources Act of 1971 specifies certain criteria regarding utilization and management of the waters of the state in the best public interest. Use of water may be subject to regulation at certain times, based on the necessity to maintain water quantities sufficient for preservation of the natural environment.

The total annual withdrawal under this authorization and Ground Water Certificates G 2-00630 C and G2-23917 C shall not exceed 150 acre-feet per year.

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 Olympia, Washington,

this 4th *day of* November, *19* 91.

Christine O. Gregoire, Director
Department of Ecology

ENGINEERING DATA
OK GB

by Gale Blomstrom

FOR COUNTY USE ONLY

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

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 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
March 1, 1988	G 2-27271	G 2-27271 P	

NAME
Thurston County Department of Public Works Attn: Clint Dice

ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
2000 Lakeridge Drive SW	Olympia	Washington	98502

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.

PUBLIC WATER TO BE APPROPRIATED

SOURCE
Wells 5 and 6

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE-FEET PER YEAR
	150	150

QUANTITY, TYPE OF USE, PERIOD OF USE
150 acre feet per year Municipal supply As needed
(90 acre feet, supplemental to existing rights and 60 acre feet per year primary)

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION—WITHDRAWAL
Well 5: 550 feet North and 350 feet East of the West quarter corner of Section 13.
Well 6: 550 feet North and 550 feet East of the West quarter corner of Section 13.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
SWANW¼	13	19	2W	13	Thurston

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 the Boston Harbor Water System.

DESCRIPTION OF PROPOSED WORKS

2 wells, 6" diameter by 537.7 feet deep, existing and 8" diameter by 250 feet deep, proposed.

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE:	COMPLETE PROJECT BY THIS DATE:	WATER PUT TO FULL USE BY THIS DATE:
Started	April 1, 1991	April 1, 1993

PROVISIONS

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 the access port.

At such time that the Department of Ecology determines the regulation and management of the subject waters is necessary and in the public interest, an approved measuring device shall be installed and maintained in accordance with RCW 90.03.360 and WAC 508-64-020 through WAC 508-64-040.

In all cases, applicants are urged to locate their wells as far inland as is reasonablebecause of the uncertainty of the amount of seawater intrusion that may be experienced in the future.

When the chloride concentration exceeds 250 mg/L, the withdrawal rate shall be reduced or the pump setting raised to reduce the chloride level to below 250 mg/L.

All water wells constructed within the state shall meet the minimum standards for construction and maintenance as provided under RCW 18.104 (Washington Water Well Construction Act of 1971) and Chapter 173-160 WAC (Minimum Standards for Construction and Maintenance of Water Wells.)

A well log of the completed well shall be submitted by the driller to the Department of Ecology within thirty (30) days of completion of this well. This well log shall be complete and all information concerning the static water level in the completed well, in addition to any pump test data, shall be submitted as it is obtained.

In accordance with WAC 173-160-205 wells shall not be located within certain minimum distances of potential sources of contamination. These minimum distances shall comply with local health regulations as appropriate. In general, wells shall be located at least 100 feet from a sewer, septic tank privy, or other source of contamination. Wells shall not be located within 1,000 feet of a solid waste landfill.

The Water Resources Act of 1971 specifies certain criteria regarding utilization and management of the waters of the State in the best public interest. Issuance of this permit was based on sufficient waters available, at least during portions of the year. However, it is pointed out to the permittee that his use of the water may be subject to regulation at certain times, based on the necessity to maintain water quantities sufficient for preservation of the natural environment.

"The total annual withdrawal under this authorization and Ground Water Certificates G 2-00630 C and G 2-23917 C shall not exceed 150 acre feet per year."

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 *Washington, this* 23rd *day of* October, *19* 89

Christine O. Gregoire, Director
Department of Ecology

by Gregg E. Hueman

ENGINEERING DATA
OK

Clint Dice
786-5133

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

PROGRESS SHEET

COMPUTER INPUT
- ☐ APPLICATION
- ☐ PERMIT
- ☐ CERTIFICATE
- ☐ OTHER

THURSTON 13 ☐ SURFACE WATER ■ GROUND WATER

NAME			TELEPHONE NO.
Thurston County Public Works Clint Dice			786-5133 ~~786-5485~~
ADDRESS	**(CITY)**	**(STATE)**	**(ZIP CODE)**
2000 Lakeridge Drive SW Attn: ~~Loretta Swenson~~	Olympia	WA	98502-6045

ASSIGNED TO	TELEPHONE NO.	DATE ASSIGNED
ADDRESS	**(CITY)**	**(STATE)** **(ZIP CODE)**

APPLICATION NO.	PERMIT NO.	CERTIFICATION NO.
G2272711		
DATE AMENDED	**DATE CANCELLED**	**W.R.I.A.**
		13

APPLICATION

DATE APPLICATION RECEIVED	INITIAL $10.00 FEE RECEIVED	DATE FEE RECEIVED
3-1-88	☑ YES ☐ NO	3-1-88
STATEMENT OF ADDITIONAL EXAMINATION FEE $	**DATE SENT**	**DATE RECEIVED**
DATE RETURNED FOR COMPLETION OR CORRECTION	**DATE RECEIVED**	

TEMPORARY PERMIT

APPROVED BY	DATE ISSUED

PUBLICATION

APPROVED BY	DATE APPROVED	DATE NOTICE SENT
		~~March 22, 1988~~ Resent 5/16/89 LW
PROTESTED BY AND DATE		

DATE AFFIDAVIT RECEIVED	CHECKED BY	TIME EXPIRED	DATE AMENDED NOTICE SENT	DATE AFFIDAVIT RECEIVED	TIME EXPIRED
7-[illegible]2-89	SF	6-30-89			

DEPARTMENT OF GAME AND FISHERIES REPORT

APPROVED	PROVISO	PROTEST

EXAMINATION

DATE EXAMINATION MADE	MADE BY	DATE REPORT OF EXAM. WRITTEN	WRITTEN BY	CHECKED BY
8-3-88	[illegible]	8-17-89	[illegible]	[illegible]
DATE PERMIT FEE REQUESTED	**AMOUNT DUE**		**DATE RECEIVED**	
9-1-89	20.00		9/26/89	

PERMIT

PERMIT APPROVED BY	DATE APPROVED	PERMIT NO.	DATE ISSUED
SF	9/28/89	P	10-23-89

BEGINNING OF CONSTRUCTION

DATE NOTICE SENT	DATE FILED	EXTENSION FEE
	Started	
EXTENDED TO	**EXTENDED TO**	

WELL DRILLER'S AND/OR CONSTRUCTION REPORT

DATE SENT	DATE FILED
	8-15-88

COMPLETION OF CONSTRUCTION

DATE NOTICE SENT	DATE FILED	EXTENSION FEE
4/11/91	5/8/91	
EXTENDED TO	**EXTENDED TO**	

PROOF OF APPROPRIATION

DATE SENT	DATE FILED	EXTENSION FEE	EXTENDED TO
5/9/91	8-8-91		
DATE CERTIFICATE FEE REQUESTED	**AMOUNT DUE**	**DATE RECEIVED**	**DATE APPROVED FOR CERTIFICATE**	**APPROVED BY**
	DC 8.8.91	8-8-91	8-14-91	DW

CERTIFICATION

PROOF EXAM. REQUIRED	CERTIFICATE NUMBER	DATE ISSUED
☐ YES ☒ NO	[illegible]	11/4/91

REMARKS

ECY 040-1-80

Appendix E Fire Flow Requirements

Jeff,

See response from Thurston County Fire Code Specialist, Bobby May, below regarding the fire flow requirements for Boston Harbor Elementary.

Gabe

From: Bobby May <bobby.may@co.thurston.wa.us>
Sent: Tuesday, June 16, 2020 6:41 AM
To: Gabe Raso <gabe.raso@co.thurston.wa.us>
Subject: FW: Boston Harbor Elementary Fire Flow

Gabe,

After reviewing the letter that you have provided, I would determine that the Fire flow for the school would be 1,500 GPM for 60 Minutes at 20 PSI

From: Chris Edmark <chris.edmark@co.thurston.wa.us>
Sent: Monday, June 15, 2020 2:37 PM
To: Bobby May <bobby.may@co.thurston.wa.us>
Subject: FW: Boston Harbor Elementary Fire Flow

Hi Bobby,
Please respond.
Thanks

From: Gabe Raso <gabe.raso@co.thurston.wa.us>
Sent: Monday, June 15, 2020 1:07 PM
To: Chris Edmark <chris.edmark@co.thurston.wa.us>; Bobby May <bobby.may@co.thurston.wa.us>
Subject: Boston Harbor Elementary Fire Flow

Hello,

I have a fire flow question I hope you can help me with. We are updating our Boston Harbor Water System plan and are moving into hydraulic modeling. To do this, I need to confirm the fire flow requirements for Boston Harbor Elementary. Based on the letter (attached) dated October 14, 1996 from then Assistant Fire Marshal Donald German, the fire flow requirement was 1,500 GPM @ 20 PSI. However, no duration was stated (e.g. 1,500 GPM @ 20 PSI for 60 minutes). The original review letter based the fire flow on the following:

…the construction of an elementary school approximately 26,788 SF. The occupancy is classified E-1 and the construction is Type VN, sprinklered. The submitted plans have been reviewed for compliance with the 1988 edition of the Uniform Fire Code.

Could you verify what the current fire flow requirement (in GPM) and duration (in minutes) is for Boston Harbor Elementary?

Thank you,

Gabe Raso | Utility Planner
Thurston County Public Works

Graves, Dan

From: Joe Plahuta <joe.plahuta@co.thurston.wa.us>
Sent: Tuesday, August 1, 2023 8:13 AM
To: Bobby May
Subject: Boston Harbor Water System Plan

Good morning Bobby,

Public Works is working through the last comments on the Boston Harbor Water System Plan. The Department of Health has asked that the Thurston County Fire Marshall be given the chance to comment on the Plan, specifically the fire flow analysis. Below is a OneDrive link to the Plan document.

Boston Harbor Water System Plan

Fire flow is discussed on pages 4-9 through 4-12. Please let me know if you have any comments.

Thanks,

Joe Plahuta, P.E.
Senior Water Resources Engineer
Thurston County Public Works
Water Resources Division
360-867-2968 Office
360-463-2627 Cell
www.co.thurston.wa.us

Appendix F Lead and Copper Monitoring Plan

Thurston County Boston Harbor Water System
Lead and Copper Monitoring Plan

Background:
The Boston Harbor Water System (DOH ID 07850R) is a Group A water system that is owned and operated by the Thurston County Public Works Department (PWD). As a Group A water system, as defined by the Washington Department of Health (DOH), the Boston Harbor Water System is required to monitor for lead and copper in the drinking water that it provides to the Boston Harbor community.

Requirements:
With a total of 286 connections as of 2019, the Boston Harbor Water System is required to maintain a written list of 10 sample sites where residential water samples can be collected. One water sample must be collected from each sampling site within a set six-month period, with a second set collected during the next six-months, as a standard monitoring requirement set by the DOH. Thurston County PWD maintains a list of 10 residential sampling sites, made up of voluntary residences, that fit within the required site selection tiering, set by 40 CFR.86(a)(3), with four additional sampling locations listed as optional sites.

Sampling procedures:
When a water sample is required from a sample site, Thurston County PWD will notify the residents identified in the sampling site list via e-mail or door-hanger notification. This letter will provide the dates of sample bottle drop off, sample time, and sample bottle pick-up time as well as specific written collection instructions for the resident to follow as they capture the water sample. Residents will be instructed:

- Not to use any water throughout the residence for at least 6 hours, but no more than 12 hours prior to sampling.
- To collect the water sample as a first draw on the date specified, before running water for any other uses.
- To collect the water sample from a commonly used cold-water faucet in their kitchen or bathroom.
- Not to rinse the bottle.
- How to prepare their water sample for Thurston County PWD pick up.

Analysis & Results:
After the water samples are collected, they will be sent to a certified lab to be tested for their respective lead and copper levels. A copy of the lab results will be provided to the respective residents within 30 days of being received by Thurston County PWD from the testing lab. Thurston County PWD will then address any questions or concerns raised by the test results or by the residents. Thurston PWD will conduct an immediate follow-up investigation if notified of a lead or copper actional level exceedance from the water sample analyses. The DOH will be immediately notified of the action level exceedance. All corrective actions and public education requirements will be met by Thurston County PWD by the established deadlines.

Summary of Procedure:

Responsible Party	Timeline	Task
Utilities Operations Supervisor	30 days in advance January 45 days in advance 10-14 days in advance	Notify Administrative Assistance to prepare updated letters for 10 sample site customers. Create Calendar Reminders at the beginning of the year. Keep a list of 10 homes and 5 alternate homes on file with contact information. Assign task to Utility Operator. Order bottle drop off and set up pick up day.
Administrative Assistant	45 days in advance 20-30 day in advance 5-10 days in advance	Verify that the contact information on the list of 15 volunteer homes is accurate. Mail or email letters to the sample sites. Confirm the customer list using the responses. Any without email address or unconfirmed volunteers will receive a door-hang notice from Public Works. Set up sample bottles with instructions in plastic zip lock bag.
Utility Operator	7-10 days in advance 7- days in advance 1-2 days before sample collection day	Initiate VUEworks Work Order. Place a door notice request. Drop off instruction letters and bottles to homeowner site.
Utility Operator	Sample collection day will usually be Tues-Thurs and pick up is before 10:30 a.m.	Pick up sample from property owner at the date/time specified in the original letter to the sampling participant. Water samples are then taken to Thurston Public Works Building B and placed in the sample refrigerator for pick up by Water Management Laboratories for analysis. If a sample is not ready for pick up, alternate arrangements are made with that homeowner to come back. Otherwise, a sample is taken from an alternative location following the same process. Starting with Admin. Verify the

		pick-up of water samples by Water Management Laboratories.
Outside Lab		Completes analysis of results and provides results to Utilities Operators Supervisor.
Utilities Operations Supervisor		**If an action level is exceeded:** DOH will be notified of the analysis results immediately. Public Works will the follow DOH requirements if further action is necessary.
Utilities Operations Supervisor		Notify Administrative Assistant to prepare sample result letters to email out to customers. Public Works also will publish the results online and use these results in the CCR.
Administrative Assistant		Prepare and mail, or e-mail, result letters to participating property owners.

Appendix G 2023 Boston Harbor Water Facilities Inventory

Washington State Department of Health
Division of Environmental Health
Office of Drinking Water

WATER FACILITIES INVENTORY (WFI) FORM

ONE FORM PER SYSTEM

Quarter: 1
Updated: 01/06/2023
Printed: 7/19/2023
WFI Printed For: On-Demand
Submission Reason: No Change

RETURN TO: Central Services - WFI, PO Box 47822, Olympia, WA, 98504-7822 or email wfi@doh.wa.gov

1. SYSTEM ID NO.	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE
07850 R	BOSTON HARBOR	THURSTON	A	Comm

6. PRIMARY CONTACT NAME & MAILING ADDRESS	7. OWNER NAME & MAILING ADDRESS
KEVIN P. PATCHING [SUPERVISOR] 9605 TILLEY RD. SOUTH OLYMPIA, WA 98512	THURSTON COUNTY PUBLIC WORKS MANAGER TIM WILSON 9605 TILLEY RD. SOUTH OLYMPIA, WA 98512
STREET ADDRESS IF DIFFERENT FROM ABOVE	**STREET ADDRESS IF DIFFERENT FROM ABOVE**
ATTN	ATTN
ADDRESS	ADDRESS
CITY STATE ZIP	CITY STATE ZIP

9. 24 HOUR PRIMARY CONTACT INFORMATION		10. OWNER CONTACT INFORMATION	
Primary Contact Daytime Phone: (360) 867-2288		Owner Daytime Phone: (360) 867-2078	
Primary Contact Mobile/Cell Phone: (360) 239-4486		Owner Mobile/Cell Phone: (360) 701-4217	
Primary Contact Evening Phone: (xxx)-xxx-xxxx		Owner Evening Phone: (xxx)-xxx-xxxx	
Fax:	E-mail: pxxxxxk@co.thurston.wa.us	Fax:	E-mail: txxxxxxxxn@co.thurston.wa.us

11. SATELLITE MANAGEMENT AGENCY - SMA (check only one)

- ☐ Not applicable (Skip to #12)
- ☒ Owned and Managed
- ☐ Managed Only
- ☐ Owned Only

SMA NAME: THURSTON COUNTY PUBLIC WORKS SMA Number: 134

12. WATER SYSTEM CHARACTERISTICS (mark all that apply)

☐ Agricultural	☐ Hospital/Clinic	☒ Residential
☒ Commercial / Business	☐ Industrial	☒ School
☐ Day Care	☐ Licensed Residential Facility	☐ Temporary Farm Worker
☒ Food Service/Food Permit	☐ Lodging	☒ Other (church, fire station, etc.):
☐ 1,000 or more person event for 2 or more days per year	☐ Recreational / RV Park	

13. WATER SYSTEM OWNERSHIP (mark only one)				14. STORAGE CAPACITY (gallons)
☐ Association	☒ County	☐ Investor	☐ Special District	
☐ City / Town	☐ Federal	☐ Private	☐ State	500,000

- SEE NEXT PAGE FOR A COMPLETE LIST OF SOURCES -

WATER FACILITIES INVENTORY (WFI) FORM - Continued

1. SYSTEM ID NO.	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE
07850 R	BOSTON HARBOR	THURSTON	A	Comm

15	16	17	18									19			20	21						22	23	24			
	SOURCE NAME	INTERTIE	SOURCE CATEGORY									USE				TREATMENT						DEPTH		SOURCE LOCATION			
Source Number	LIST UTILITY'S NAME FOR SOURCE AND WELL TAG ID NUMBER. Example: WELL #1 XYZ456 IF SOURCE IS PURCHASED OR INTERTIED, LIST SELLER'S NAME Example: SEATTLE	INTERTIE SYSTEM ID NUMBER	WELL	WELL FIELD	WELL IN A WELL FIELD	SPRING	SPRING FIELD	SPRING IN SPRINGFIELD	SEA WATER	SURFACE WATER	RANNEY / INF. GALLERY	OTHER	PERMANENT	SEASONAL	EMERGENCY	SOURCE METERED	NONE	CHLORINATION	FILTRATION	FLUORIDATION	IRRADIATION (UV)	OTHER	DEPTH TO FIRST OPEN INTERVAL IN FEET	CAPACITY (GALLONS PER MINUTE)	1/4, 1/4 SECTION	SECTION NUMBER	TOWNSHIP	RANGE
S01	InAct 07/01/1990 WELL #1		X									X				X						29	60	SW NE	14	19N	02W
S02	InAct 07/01/1990 WELL #2		X									X				X						32	35	SW NE	14	19N	02W
S03	InAct 07/01/1990 WELL #3		X									X				X						75	22	SW NE	14	19N	02W
S04	InAct 07/01/1990 WELL #4		X									X					X					40	150	SW NE	14	19N	02W
S05	InAct 07/01/1990 SPRING					X									X		X						46	SW NE	14	19N	02W
S06	WELL #5 WW ABS238				X							X			N	X						537	65	SW NW	13	19N	02W
S07	WELL #6 WW ABS223				X							X			N	X						543	65	SW NW	13	19N	02W
S08	WF (S06 & S07)			X								X			Y		X	X			X	537	130	SW NW	13	19N	02W

WATER FACILITIES INVENTORY (WFI) FORM - Continued

1. SYSTEM ID NO.	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE
07850 R	BOSTON HARBOR	THURSTON	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?)		271	338
A. Full Time Single Family Residences (Occupied 180 days or more per year)	263		
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	2		
B. Full Time Residential Units in the Apartments, Condos, Duplexes, Dorms that are occupied more than 180 days/year	8		
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)	1	1	1
B. Institutional, Commercial/Business, School, Day Care, Industrial Services, etc.	3	3	1
28. TOTAL SERVICE CONNECTIONS		275	340

29. FULL-TIME RESIDENTIAL POPULATION

A. How many residents are served by this system 180 or more days per year? 880

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?	320	320	320	320	420	520	520	520	420	320	320	320
B. How many days per month is water accessible to the public?	30	28	30	30	30	30	30	30	30	30	30	30

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 that are NOT already included in the residential population?	250	250	250	250	250	250	5	5	5	250	250	250
B. How many days per month are they present?	20	20	20	20	20	15	31	31	15	20	20	15

33. ROUTINE COLIFORM SCHEDULE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	2	2	2	2	2	2	1	1	1	2	2	2

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:** _____

Intentionally left blank

WS ID	WS Name
07850	BOSTON HARBOR

Total WFI Printed: 1

Washington State Department of Health
Division of Environmental Health
Office of Drinking Water

Water Facilities Inventory (WFI)

Report Create Date:	7/19/2023		
Water System Id(s):	07850R		
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		

Appendix H Wellhead Protection Program Supplemental Materials

Public Notification Plan

Public notification is a top priority.

The Boston Harbor water system shall deliver safe and reliable drinking water to their customers 24 hours a day, 365 days a year. If the drinking water supply becomes contaminated, many people can become seriously ill or die. Any time the water system has a situation that poses a risk to public health, the County shall notify their customers, in accordance with state and federal law.

Notifying our water system customers as quickly as possible when their water may not be safe to drink, gives them time to take actions to protect their health.

Formal public notification requirements are required whenever the Boston Harbor water system is in violation of:

- Drinking water quality or monitoring requirements
- Operating under a variance or exemption
- Other situations that pose a public health risk, such as a disruption in service

Notifying our customers in a timely manner about actual or potential threats associated with drinking their tap water can help people make informed decisions affecting their health. Our customers will be notified within 24 hours if there is a serious problem.

Key issues of public interest:

The three tiers will be used to determine the specific requirements for public notification.

- **Tier 1:** Acute health concerns require notification within 24 hours
- **Tier 2:** Chronic health concerns require notification within 30 days
- **Tier 3:** Reporting and monitoring violations require notification within 365 days

Other aspects of the revised public notification rules include:

- An expanded list of violations and situations requiring 24-hour notification
- Simplified health effects language
- Standard language for monitoring violations
- A requirement for the water system to send a copy of all public notifications and the certification of compliance with public notification regulations to the Department of Health
- Allowing notices for individual violations to be combined into the annual Consumer Confidence Report, if public notification requirements can still be met

Thurston County Public Works
Water Resources Division
Utility Operations

News Release

For Immediate Release: *Date*

Contact: Thurston County Public Works Department, Kevin Patching 360-239-4486

Thurston County – Thurston County is advising all water customers to boil their drinking water after recent samples showed the presence of _____. The Washington State Department of Health (DOH) has been notified and Thurston County is working closely with the Division of Drinking Water to find the source of contamination and fix the problem, which may include disinfecting the system. The boil water advisory will remain in effect until further notice.

Kevin Patching, Utility Maintenance and Operations Supervisor, stated "We are doing all we can to eliminate the bacteria from the water system. Safe and reliable drinking water is critical to good health and responding to this kind of emergency is our highest priority," said system spokesperson.

No illnesses related to the community's drinking water have been reported. To correct the problem

(e.g. Chlorine was applied to the entire system on _____.)

The boil water advisory includes several precautionary steps that customers should take. These include using purchased treated bottled water or boiled water for any water that might be consumed: drinking, brushing teeth, dishwashing, preparing food and making ice. Water should be boiled for 3-5 minutes, and then allowed to cool before using.

The advisory will remain in effect until Thurston County and DOH are confident there is no longer a threat of illness to their customers. Once satisfactory results are reported, customers will be notified that the advisory has been lifted.

If you have any questions, please call us at 360-867-2288.

DRINKING WATER WARNING

The _____ Water System, ID _____, located in Thurston County is contaminated with fecal coli form / *E. coli* bacteria.

Fecal coli form/ *E. coli* bacteria were detected/confirmed in the water supply on _____. These bacteria can make you sick and are a particular concern for people with weakened immune systems.

DO NOT DRINK THE WATER WITHOUT BOILING IT FIRST. Bring all water to a boil, let it boil 3-5 minutes, and let it cool before using. Boiled or purchased bottled water should be used for dinking, making ice, brushing teeth, washing dishes, and food preparation until *further notice*. Boiling kills bacterial and other organisms in the water.

Fecal coli forms and E. coli are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems. The symptoms above are not caused only by organisms in drinking water. If you experience any of these symptoms and they persist, you may want to seek medical advice. People at increased risk should seek advice about drinking water from their health care provider.

What happened: What is the suspected or known source of contamination?

The following is being done to correct the problem:

We have consulted with the Washington State Department of Health about this incident. We will notify you when you no longer need to boil the water. We anticipate resolving the problem by _____.

For more information please contact Kevin Patching (360)867-2288 or (360) 239-4486 at Thurston County Public Works, 9605 Tilley Road South Suite D, Olympia, WA 98512. kevin.patching@co.thurston.wa.us

Please share this notice with all the people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

Notice is sent to you by Thurston County Public Works Department, Utility Operations and Maintenance on _____.

COUNTY COMMISSIONERS
Carolina Mejia
District One
Gary Edwards
District Two
Tye Menser
District Three

THURSTON COUNTY
WASHINGTON
SINCE 1852

PUBLIC WORKS
An Accredited Agency of the
American Public Works Association

Jennifer D. Walker, Director

January 31, 2022

Property Owner Name
Address Line 1
Address Line 2

Dear Property Owner Name\Business Name:

To protect the drinking water supply for the customers of Boston Harbor Water System, we are updating our wellhead protection program as required by state law. As part of our wellhead protection program, we mapped the area overlying the short-term recharge zone of our drinking water supply wells. This is called our wellhead protection area.

Following the mapping of the wellhead protection area, we conducted an inventory of potential groundwater contamination sources within the area. The nature of your business and its location within our wellhead protection area means that your activities have the potential to affect our customers' drinking water supply.

We have notified the agency or agencies that regulate(s) your type of business/facility that you are in our wellhead protection area. You should contact them to request technical assistance to help manage your business in a way that will best prevent groundwater contamination. We realize you are already careful to protect the environment as you conduct your business. We hope that learning that you are in our wellhead protection area will result in more precautions to ensure that your activities will not affect our drinking water quality

Sincerely,

Torren Valdez
Water Resources Utility Planner
Thurston County Public Works Department

Attachment: Map of Boston Harbor Water System Wellhead Protection Area

9605 Tilley Road S., Suite C – Olympia, WA 98512-1093 – (360) 867-2300 – FAX (360) 867-2291
TDD line: 711 or 1-800-833-6388

Attachment 1: Wellhead Protection Area (WHPA) for the Boston Harbor Water System.

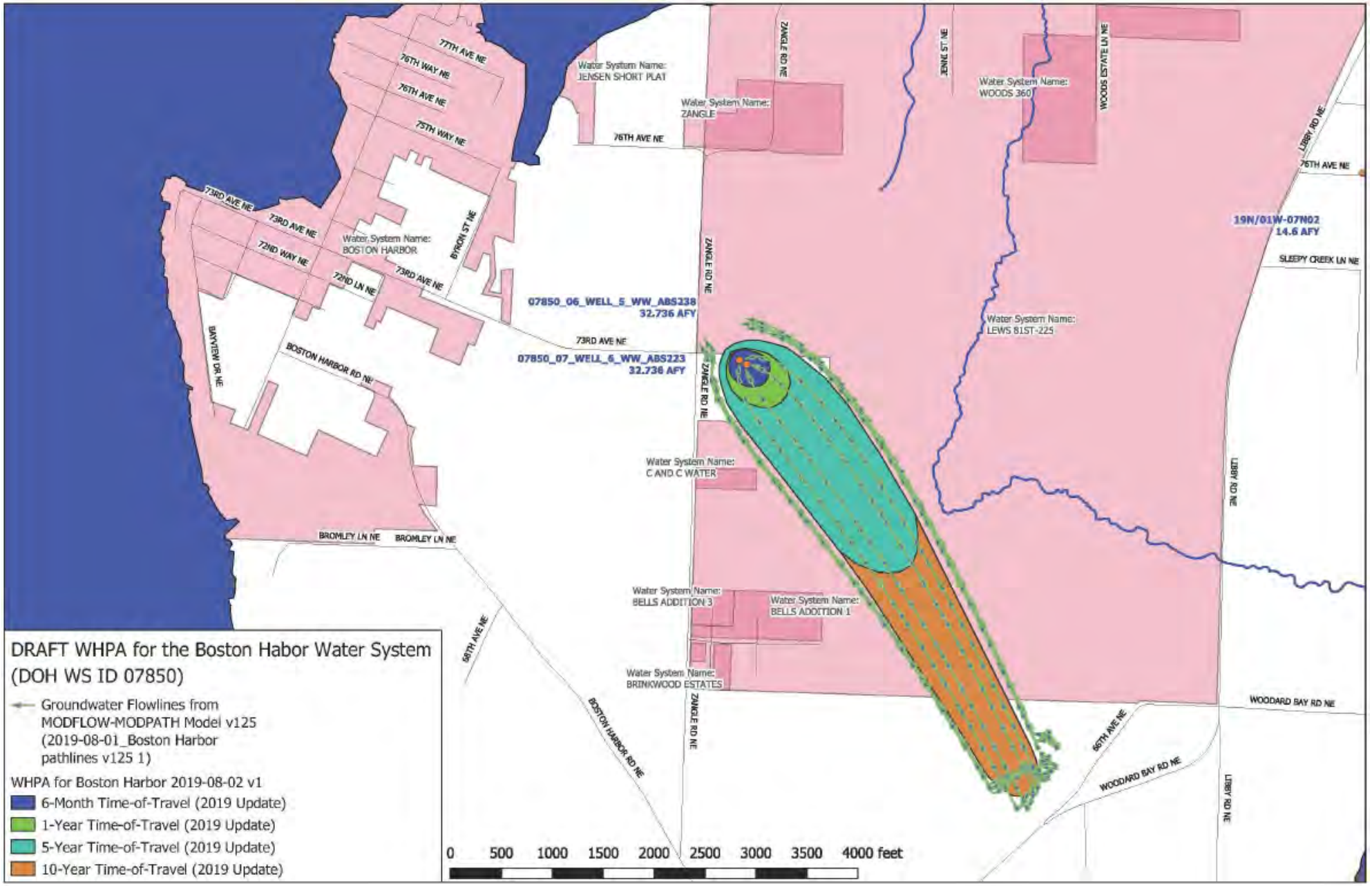


Figure 1: Map created by HDR, Inc.

COUNTY COMMISSIONERS
Carolina Mejia
District One
Gary Edwards
District Two
Tye Menser
District Three

THURSTON COUNTY
WASHINGTON
SINCE 1852

PUBLIC WORKS
An Accredited Agency of the
American Public Works Association

Jennifer D. Walker, Director

March 17, 2022

Agency Name
Mailing Address Line1
Mailing Address Line 2

SITUS: Situs Address

Dear Agency Name:

We are writing to let you know businesses or facilities you regulate are in the Boston Harbor Water System wellhead protection area. The Boston Harbor Water System has **286** service connections and serves about **679** people.

The enclosed map shows the 6-month and 1-, 5- and 10-year time-of-travel boundaries within our wellhead protection area. Please take all reasonable steps to ensure land use activities within this area do not contaminate our drinking water sources. Any groundwater contamination occurring within the wellhead protection area has a high potential to reach our well.

Thank you for your support in protecting our drinking water.

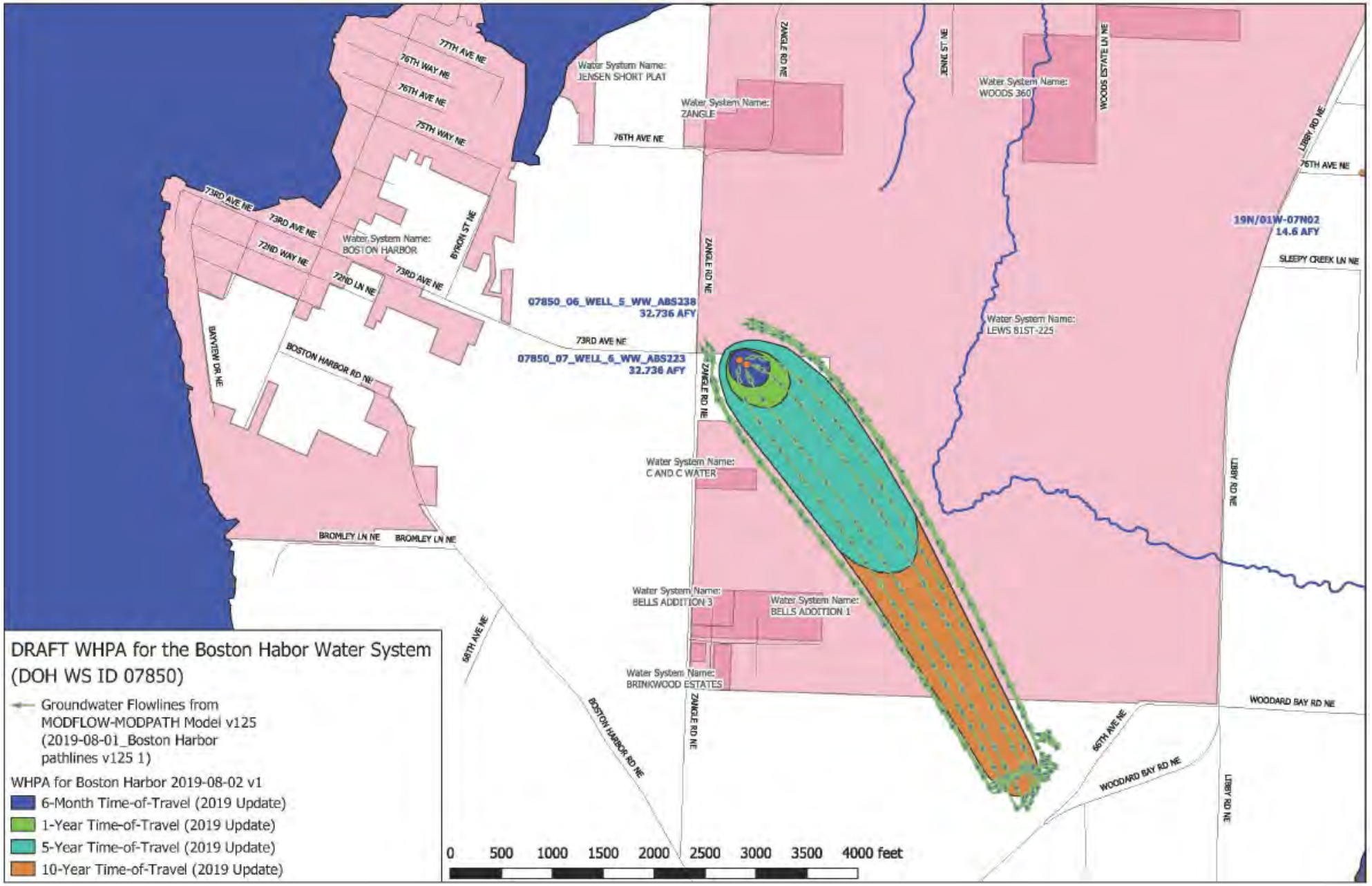
Sincerely,

Torren Valdez
Water Resources Utility Planner
Thurston County Public Works Department

Attachment: Map of Boston Harbor Water System Wellhead Protection

9605 Tilley Road S., Suite C – Olympia, WA 98512-1093 – (360) 867-2300 – FAX (360) 867-2291
TDD line: 711 or 1-800-833-6388

Attachment 1: Wellhead Protection Area (WHPA) for the Boston Harbor Water System.



COUNTY COMMISSIONERS

Carolina Mejia
District One
Gary Edwards
District Two
Tye Menser
District Three

THURSTON COUNTY
WASHINGTON
SINCE 1852

PUBLIC WORKS
An Accredited Agency of the
American Public Works Association

Jennifer D. Walker, Director

March 17, 2022

Property OwnerName
Mailing AddressLine1
Mailing AddressLine2

SITUS: Situs Address

Dear Property Owner Name:

To protect the drinking water supply for the customers of Boston Harbor Water System, we are updating our wellhead protection program as required by state law. As part of our wellhead protection program, we mapped the area overlying the recharge zone of our drinking water supply wells. This is called our wellhead protection area.

Following the mapping of the wellhead protection area, we conducted an inventory of potential groundwater contamination sources within the area. Owning a property which falls within our wellhead protection area means your activities have the potential to affect our customers' drinking water supply. Underground storage tanks, such as those found in onsite septic systems, have the potential to affect our customer's drinking water supply if not properly maintained. Onsite Septic Systems in this areaare regulated by the Thurston County Department of Public Health and Social Services (PHSS) Environmental Health Division.

If you have an onsite septic system you can contact PHSS to request technical assistance with managing your system to prevent groundwater contamination. The Septic Help Line can be reached by leaving a message at 360-867-2669. We hope learning you are in our wellhead protection area will result inmore precautions to ensure your activities will not affect our drinking water quality.

Sincerely,

Torren Valdez
Water Resources Utility Planner
Thurston County Public Works Department

Attachment: Map of Boston Harbor Water System Wellhead Protection Area

Attachment 1: Wellhead Protection Area (WHPA) for the Boston Harbor Water System.

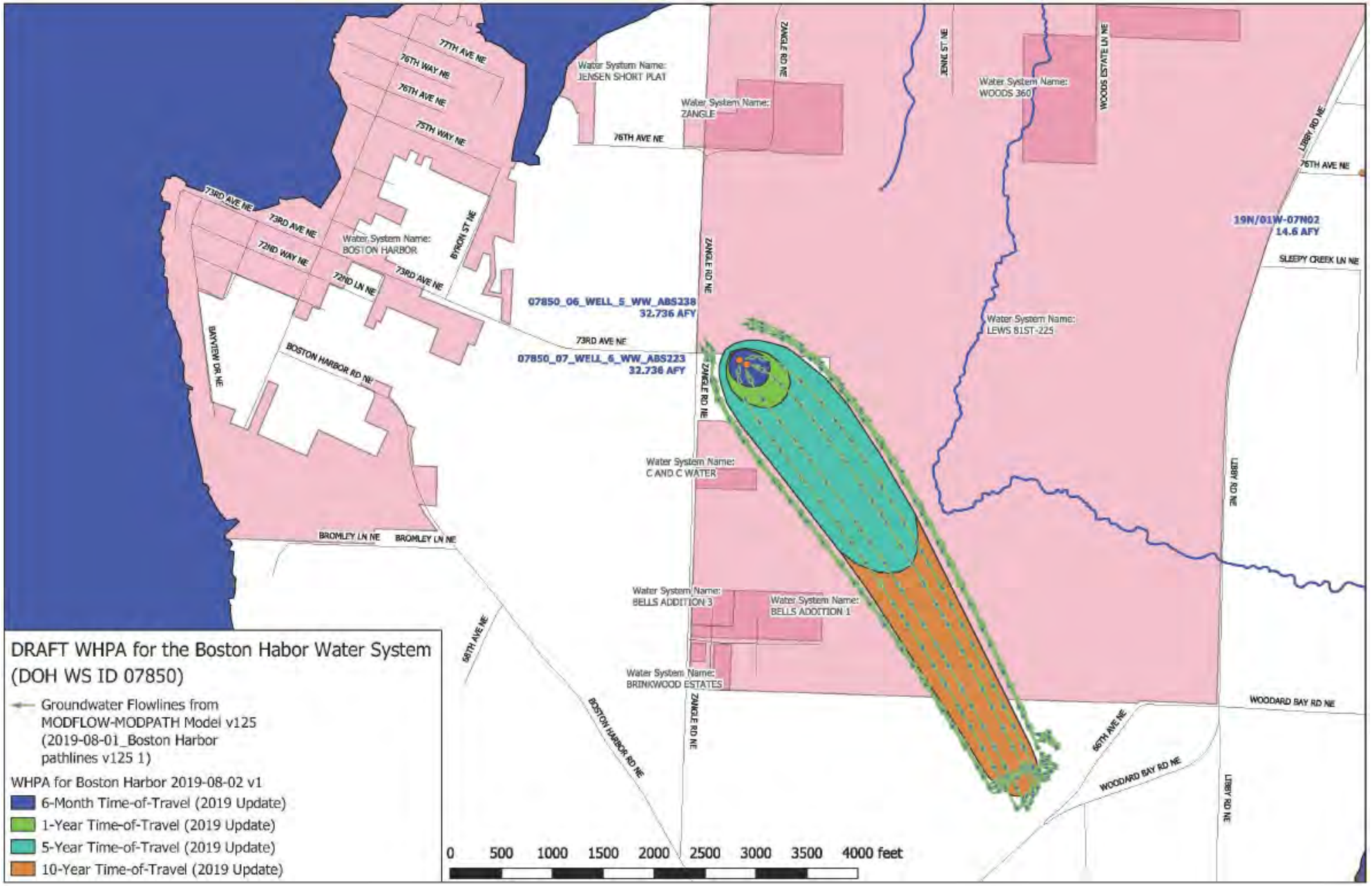


Figure 1: Map created by HDR, Inc.

Use/Template	Situs Parcel No	Mailing Address	City	State	Zip	Situs Street	Situs City	Situs Zip
Agency	12913230100	111 BETHEL ST NE	OLYMPIA	WA	98506	7300 NE ZANGLE RD	OLYMPIA	98506
Agency	12913230300	111 BETHEL ST NE	OLYMPIA	WA	98506			
Septic	12913320102	7036 ZANGLE RD NE	OLYMPIA	WA	98506	7036 NE ZANGLE RD	OLYMPIA	98506
Septic	12913320104	7032 ZANGLE RD NE	OLYMPIA	WA	98506	7032 NE ZANGLE RD	OLYMPIA	98506
Septic	12913320204	7014 ZANGLE RD NE	OLYMPIA	WA	98506	7016 NE ZANGLE RD	OLYMPIA	98506
Septic	12913320304	6938 ZANGLE RD NE	OLYMPIA	WA	98506	6938 ZANGLE RD NE	OLYMPIA	98506
Septic	12913320500	6836 ZANGLE RD NE	OLYMPIA	WA	98506	6836 ZANGLE RD NE	OLYMPIA	98506
Septic	12924120100	2811 76TH AVE NE	OLYMPIA	WA	98506	2222 66TH AVE NE	OLYMPIA	98506
Septic	12924120200	2210 66TH AVE NE	OLYMPIA	WA	98506	2210 NE 66TH AV	OLYMPIA	98506

Appendix I Thurston County Development Standards for Water and Sewer Systems (January 2022) Chapter 1 General Considerations Chapter 3 Drinking Water Appendix 1 Water Details

Chapter 1
GENERAL CONSIDERATIONS

Chapter 1
1.000 General Considerations
1.010 Definitions
1.020 Authority
1.030 Powers of the Director
1.040 Violations
1.050 Disclaimer of Liability
1.060 Purpose
1.070 Applicability
1.080 Administrative Interpretations and Revisions
1.090 Deviation from Standards
1.100 References
1.110 Permits
1.120 Plan Review
1.130 Professional Qualifications
1.140 Inspection
1.150 Errors and Omissions
1.160 Right-of-Way Site Maintenance
1.170 Penalties

1.000 GENERAL CONSIDERATIONS

1.010 Definitions

As used in these standards, unless the context indicates otherwise:

ABUTTING: Having a common boundary.

ACC or ADDITIONAL CAPACITY CHARGE: A charge to properties outside the Grand Mound Utility Local Improvement District 96-2, to fund expansion of the water pumping, storage, and transmission infrastructure to accommodate new development outside the original ULID.

ACCESS: The safe, adequate, and usable ingress/egress (entrance/exit) to a property or use.

APPLICANT: Owner(s) or lessee(s) of property, including their agent(s), who submit an application for development. This may also include person(s) who have contracted to purchase property contingent upon acquiring the necessary permits under these Standards.

BOD or BIOCHEMICAL OXYGEN DEMAND: A measure of the oxygen utilized in the biochemical oxidation of organic matter under standard laboratory procedure in five days at twenty degrees centigrade, expressed in parts per million (mg/l) by weight.

BOND/SURETY: Any document, instrument, or individual bound with and for the acceptable performance, execution, and completion of the work and for the satisfaction of all obligations incurred.

BUILDING SEWER: See SIDE SEWER.

DIRECTOR: The Thurston County Director of Public Works, or authorized designee.

COMMUNITY PLANNING AND ECONOMIC DEVELOPMENT DEPARTMENT: The Thurston County Community Planning and Economic Development Department or its successor.

COMPREHENSIVE PLAN: A plan adopted by the County Council to guide the physical growth and improvement of the County and urban growth management area, including any future amendments and revisions.

CONTROLLED DENSITY FILL: A mixture of Portland cement, fly ash, aggregates, water, and admixtures proportioned to provide a nonsegregating, self-consolidating, free-flowing, and excavatable material that will result in a hardened, dense, nonsettling fill.

DEDICATION: The deliberate appropriating of land by an owner(s) for any general and public uses, reserving to themselves no other rights than such as are compatible with the full exercise and enjoyment of the public uses to which the property is to be devoted. The intent to dedicate will be evidenced by the owner by the presentment for filing of a final plat, short plat, or site plan that shows the dedication thereon. Acceptance by the public will be evidenced by written approval issued by the County of such document for filing with the County Auditor.

DEPARTMENT: The Department of Public Works.

DEVELOPMENT: The division of a parcel of land into two or more parcels; the construction, reconstruction, conversion, structural alteration, relocation, or enlargement of any structure; any mining, excavation, landfill, clearing, or land disturbance; and any use or extension of the use of land.

DEVELOPMENT PERMIT: Any land use permit that must be approved by Thurston County prior to the improvement and development of land or structures.

DEVIATION: A modification of these Standards approved by the Director, per Section 1.090 of Chapter 1 of these Standards.

DIRECTOR: The Director of Public Works or his or her designee or successor.

DSWSS: The Development Standards for Water and Sewer Systems of Thurston County, current edition.

EASEMENT: A right of one owner of land to make lawful and beneficial use of the land of another created by an express or implied agreement.

ECOLOGY: Washington State Department of Ecology.

EFFLUENT: The end product of a wastewater treatment process.

ENGINEER: See Director.

ERU or EQUIVALENT RESIDENTIAL UNIT: Is

A. One separate single-family residence; or

B. With respect to residential multi-family structures, one per single-family unit; or

C. With respect to mobile home or trailer park having more than two single-family residential units or spaces and served through a common meter(s), one per single-family unit or space for the first two and, thereafter, one ERU shall be equal to two single-family units or spaces; or

D. With respect to uses other than residential, except for Grand Mound, one ERU shall be designated for each nine hundred cubic feet per month of water consumed or sewerage discharged as measured at the source; provided that the minimum charge per service account shall not be less than one ERU.

E. For Grand Mound, an ERU shall be designated for each seven hundred cubic feet per month of water consumed or sewerage discharged as measured at the meter; provided, that the minimum charge per service account shall not be less than one ERU.

ESEC or EQUIVALENT SERVICE EXTENSION CHARGE: A charge to properties outside the Grand Mound Utility Local Improvement District 96-2, fund sewer system infrastructure that is equivalent to the assessment on properties within the ULID.

FRANCHISE: A document granted by the County authorizing the use of street rights-of-way by public or private entities, subject to specified conditions.

GENERAL FACILITY CHARGE: A connection charge that represents a portion of the costs associated with the capital plant and facilities.

GRADE: Rate or percent of change in slope, either ascending or descending from or along the street, measured along the centerline of the street or access point.

GRADING: Any excavating or filling of earth materials or any combination thereof.

IMPROVEMENTS: Any act that improves the value of public real and personal property, or that is necessary as a condition of development including, but not limited to, streets and roads complying with the development standards and specifications adopted by the County, public utility and pedestrian facilities, streetlights, landscape features, sewer and water liens, bridge structures, stormwater and drainage facilities, and traffic control devices as are required to be installed as a part of subdivision, short subdivision, large lot subdivision, binding site plan or commercial development.

INDUSTRIAL DISCHARGER: Any nonresidential user who legally discharges wastewater to a sewer system operated by the County for purposes of treatment.

INTERFERENCE: The inhibition or disruption of the sewer system or its treatment processes which will contribute to a violation of any of the requirements of Thurston County's National Pollutant Discharge Elimination System (NPDES) permit requirements as set by the Washington State Department of Ecology, a copy of which is on file at the Department.

MASTER METER: A meter used to supply water service to more than one residential customer or more than one commercial customer through a common meter.

PAVEMENT: The combination of sub-base, base course, and surfacing materials placed on a subgrade to support the traffic load and distribute it to the subgrade.

PERFORMANCE GUARANTEE: A financial guarantee in a form acceptable to the County Attorney to ensure all improvements, facilities, or work required by this ordinance will be completed in compliance with this ordinance, regulations, and approved plans and specifications.

PERMIT: A document or franchise authorized by the County.

PERSON OR OWNER: Means and includes persons, associations, partnerships and/or corporations.

PLAN REVIEWER: The engineering plan reviewer of Thurston County.

PLANS: The plans, profiles, cross sections, elevations, details, and supplementary specifications signed by a licensed professional engineer and approved by the Director of Community Planning and Economic Development that shows the location, character, dimensions, and details of the work to be performed.

PREMISES: A contiguous tract of land, building or group of adjacent buildings under a single control with respect to use of sewage treatment services and responsibility for payment thereof.

PRIVATE SEWER: That portion of the sewer system located on private property where no easements are granted to the County, including pressurized systems and gravity sewer collection systems internal to developments such as apartment complexes, condominiums, townhouses, shopping centers, commercial office parks, mobile home parks, etc. (see Chapter 5 for more specifics). Private sewer systems shall be constructed to County Standards. Maintenance of a private sewer shall be the responsibility of the property owner(s).

PROJECT: General term encompassing all phases of the work to be performed and is synonymous to the term “improvement” or “work.”

PROFESSIONAL ENGINEER:

PUBLIC SEWER SYSTEM: A system of collection and treatment of wastewater located within public rights-of-way and/or utility easements where the County has the responsibility for operation and maintenance of that system.

PUBLIC STREET: Publicly owned and maintained right-of way.

RECORD DRAWINGS: An approved final revision of design drawings or plans, updated to include information showing the true condition or configuration of what has been built. Each record drawing or plan is designated “Record Drawing” by stamp or lettering on the drawing and sealed by a licensed Professional Engineer. The primary function of Record Drawings is to document what was designed and what was actually built, including dimensions, elevations, location, and calculations. Formerly known as as-built or as-constructed drawings, see Section 2.090 of these Standards for additional requirements.

RESIDUAL PRESSURE: The pressure remaining in a water supply while water is flowing.

RESTORATION: All work necessary to replace, repair, or otherwise restore the right-of-way and all features contained within the right-of-way to the same or equivalent condition as before.

REVIEW AUTHORITY: A person, committee, commission, or council responsible for review and final action on a land use or development entitlement or permit.

RIGHT-OF-WAY: All property in which the County has any form of ownership or title and which is held for public street purposes regardless of whether or not any street exists thereon or whether or not it is used, improved, or maintained for public travel.

A. A strip of land acquired by reservation, dedication, forced dedication, prescription, or condemnation and intended to be occupied by a road, crosswalk, railroad, electric transmission lines, oil or gas pipeline, water line, sanitary sewer, stormwater facilities, street trees, and other similar public accesses or public uses

B. Generally, the right of one to pass over the property of another

ROAD: Used interchangeably with street.

SEWER SERVICE AREA: The geographic area described in the Wastewater Engineering and Facilities Plan approved by the Washington State Department of Ecology as required by WAC Chapter 173-240.

SEC or SERVICE EXTENSION CHARGE: A charge to properties outside the Grand Mound Utility Local Improvement District 96-2 as determined by the Special Benefit Study 2002, (on file with the Department) which is equivalent to the assessment on properties within the ULID to fund sewer system infrastructure.

SERVICE LATERAL: See SIDE SEWER.

SERVICE LINE:

SEWER MAIN: A sewer line that conveys wastewater from side sewers, STEP connections, grinder pump connections, lift stations and/or other sewer mains towards a County owned sewer main or treatment facility.

SIDE SEWER: That portion of the sewage collection system which connects the premises to the public sewer system, not operated or maintained by the County and outside of the County right-of-way or easement. The customer is required to keep the side sewer and cleanout in good operating condition and working as designed.

SINGLE-FAMILY RESIDENTIAL UNIT: One or more rooms in a residential building or residential portion of a building which are arranged, designed, used or intended for use as a complete, independent living facility for one family and which includes permanent provisions for living, sleeping, eating, cooking and sanitation. Any duplication of the above permanent provisions, specifically cooking, eating or laundry facilities, will be considered in excess of a single ERU allocation for single parcel and in excess of the allowed sewer service capacity for one ERU. Garages, shops, hobby rooms or any outbuilding with kitchens or cooking facilities, shower stalls, bathtubs or laundry facilities are not to be connected or served by the sewer utility. A sink and toilet are permissible if connected to the existing sewage system. A laundry facility could also be permitted if one does not exist in the residential unit.

SITE PLAN: The development plan for one or more lots on which is shown the existing and proposed conditions of the lot, including topography, vegetation, drainage, flood plains, and walkways; means of ingress and egress; circulation; utility services; structures and buildings; signs and lighting; berms, buffers, and screening devices; surrounding development; and any other information that reasonably may be required in order that an informed decision can be made by the reviewing authority.

STANDARD DRAWING: A standard detail, drawing or plan showing specific dimensions, notes and/or other information reflecting the standards and requirements pertinent to the installation of the feature, appurtenance, system, etc. being shown. Standard Drawings are listed at the end of each Chapter they are associated with and are available from the County in several electronic formats, to be included or referenced in all work associated with what is shown or described on the Standard Drawing.

STANDARD SPECIFICATIONS: The *Standard Specifications for Road, Bridge and Municipal Construction* as published by the Washington State Department of Transportation, current edition, as supplemented by *Development Standards for Water and Sewer Systems*, Thurston County, Washington, Current edition design standards.

STEP or SEPTIC TANK EFFLUENT PUMP – A septic system that collects effluent from a building into a septic tank on-site before being pumped through a small pressure line to gravity sewer collection lines. The effluent pump is controlled by float switches and is monitored by an alarm system on-site.

STREET: An open public way for the passage of vehicles that, where appropriate, may include pedestrian, equestrian, and bicycle facilities. Limits include the outside edge of sidewalks or curbs and gutters, planter strips, paths, walkways, or side ditches, including the appertaining shoulder and all slopes, ditches, channels, waterways, stormwater piping and appurtenances, and other features necessary for proper drainage and structural stability within the right-of-way. The term “street” is used interchangeably with “road.”

SURVEYOR: Any Washington State licensed professional land surveyor who represents the owner.

TAMPERING: The removal, unauthorized alteration, or damage of County owned equipment such as STEP tanks, manholes, clean outs, sewer mains, etc. (should say something about altering or damaging side sewers or cleanout since this could affect what goes into our sewer. Maybe something like customer is required to keep their side sewer in good condition and working as designed)

TCC or Thurston County Code: The Municipal Code of Thurston County, Washington as adopted by the Board of County Commissioners.

TRAFFIC: Movement of motorized and nonmotorized vehicles, persons, cargo, and equestrians through the transportation network comprised of streets, sidewalks, walkways, and shared use paths.

TRAFFIC CONTROL: Those activities necessary to safeguard the general public, as well as all workers, during the construction and maintenance of street and other facilities within the right-of-way.

UGA or Urban Grown Area: The unincorporated area contained within the final urban growth area boundaries identified in the Thurston County Comprehensive Plan on Map M-14. The Grand Mound UGA is the area identified in the Grand Mound Subarea Plan for the Grand Mound Urban Growth Area (Map 6), dated July 1996, or successor document.

ULID or Utility Local Improvement District: The Districts formed by action of the Board of County Commissioner to fund the establishment of water and/or sewer systems within the County.

UNOPENED RIGHT-OF-WAY: A County right-of-way that exists by dedication or deed but for which no vehicular street meeting these Standards has been constructed by the County or other parties.

UPSET: An exceptional incident where a premises unintentionally and temporarily is in a state of noncompliance with discharge limitations due to factors beyond the reasonable control of the customer

and excluding noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation thereof.

UTILITY: Any public or private entity whose principal purpose is to provide electricity, water, sewer, stormwater, gas, radio, television, telephone, and/or other forms of communication utilizing the electromagnetic spectrum to the public.

WASTEWATER: Domestic and industrial waste, sewage or any other liquid waste including that which will be discharged to the public sewer system.

WATER MAIN: A water line designed or used to serve more than one premises

WATER SERVICE LINE: That portion of the public water system connecting a premise to the water main including the tap into the main, the water meter, appurtenances, and the service line from the main to the meter.

WSDOT: Washington State Department of Transportation.

1.020 Authority

This edition of the *Development Standards for Water and Sewer Systems*, commonly known as the DSWSS, is adopted under Title 15 of the Thurston County Code. The Director shall adopt standard specifications for water and sewer service construction and material standards, for the construction and location of water and sewer systems.

1.030 Powers of the Director

The Director shall have the power to:

A. Administer provisions of these standards.

B. Prepare and administer procedures implementing these standards.

C. Prepare and publish, as necessary for public use, a procedures manual or manuals covering these standards.

1.040 Violations

Any violation of this section or any other provision of these Standards declaring conduct unlawful is a misdemeanor and shall be punishable as provided in Thurston County Code (TCC) Title 26. Each person shall be guilty of a separate offense for each and every day any portion of which any violation of this section occurs and shall be punishable accordingly.

1.050 Disclaimer of Liability

Responsibility for complying with the requirements of these Standards and other applicable code provisions rests solely with the permit applicant. Without limitation thereto, the applicant is responsible for determining and accurately representing to the County the following information:

A. Legal descriptions

B. Ownership interests and record title

C. Location of property lines and required setbacks

D. Land use classification (zoning)

E. Stormwater and drainage courses

F. Any other information supplied by the applicant

Thurston County may rely upon all information furnished by the applicant, both oral and written, and any other information acquired by it.

1.060 Purpose

The purpose of these *Development Standards for Water and Sewer Systems* is to ensure that public utility related facilities constructed in Thurston County meet appropriate standards for safety, constructability, durability, and maintainability.

These Standards accomplish the following:

A. Provide clear and specific standards for construction or modification of water and sewer facilities where such facilities distribute drinking water or reclaimed water from; or collect wastewater for delivery to a County facility.

B. Implement and administer the general development regulations contained in the Thurston County Code.

C. Ensure the design and construction of water and sewer facilities in the County service areas complies with all applicable laws, regulations, and standards of good engineering practice.

1.070 Applicability

The DSWSS shall govern all construction, development, re-development, and/or modification of Water, Reclaimed Water, and Sewer infrastructure.

The DSWSS apply to both public and private projects. The DSWSS apply to the infrastructure listed above, for all work located within Thurston County water and/or sewer service areas and for projects outside the service area who seek to connect to Thurston County water and/or sewer infrastructure.

Situations may arise where the application of individual standards in the DSWSS may not sufficiently ensure the protection of public health, safety, and welfare. Accordingly, the Director may impose additional or more stringent standards than those contained in this document or require the modification of plans, specifications, or operations to achieve the necessary public health, safety, and welfare. Modifications may include, but are not limited to, scheduling, phasing, or timing restrictions.

1.080 Administrative Interpretations and Revisions

It is recognized that administrative interpretation of these Standards will be required from time to time. Such interpretations are refinements or explanations of meaning or intent issued by the Director. Requests for administrative interpretations must be submitted in writing to the Director.

Revisions will be issued periodically to keep the document current.

1.090 Deviation from Standards

These Standards represent appropriate practice under most conditions, based on past experience in Thurston County and other jurisdictions. They are intended to provide facilities that are safe and appropriate for use in Thurston County.

Situations will arise where alternatives to these Standards may better accommodate existing conditions, overcome adverse topography, or allow for more cost-effective solutions without adversely affecting safety, operations, maintenance, or aesthetics.

Accordingly, requests for deviations from these Standards will be considered by the Director. Such requests must be submitted to include supporting information demonstrating compliance with the following criteria:

A. The deviation will achieve the intended result with a comparable or superior design and quality of improvement.

B. The deviation will not adversely affect safety or operations.

C. The deviation will not adversely affect maintenance and its associated cost.

D. The deviation will not adversely affect the aesthetic appearance.

E. The deviation will not impact future expansion, development, or redevelopment.

It is recognized that the need for and timing of a deviation request may not be predictable. Requests should be submitted as soon as the need becomes known. No request will be considered until an application for a permit or other approval has been submitted. Known deviation requests that affect lot yield or scope of development must be decided prior to any public hearing or official decision on the application. This is important for public notice and participation in the decision process.

Deviations that affect engineering design, to the extent they are known, must be decided prior to submittal of construction plans. This will prevent wasted effort in the preparation of plans with nonstandard features that cannot be approved.

Any deviation request concerning a provision of the International Fire Code requires concurrence by the Thurston County Fire Marshal. Documentation of concurrence by the Fire Marshal must be submitted with the request.

The Director reserves the right to direct or deny a deviation from these Standards at any time in the interest of public health, safety, and welfare. Formal appeals to deviation requests denied or approved shall be directed to the Hearing Examiner, per TCC 26.05.080.

1.100 References

Except where these Standards provide otherwise (including the additional standards listed in Section 2.010 of Chapter 2 of these Standards), design, construction workmanship, and materials shall be in accordance with the most current edition of the following publications published separately by the Washington State Department of Transportation (WSDOT) or jointly by WSDOT and the Washington State Chapter of the American Public Works Association (APWA):

For access to all WSDOT Manuals, go to http://www.wsdot.wa.gov/publications/manuals/index.htm.

A. WSDOT/APWA Standard Plans for Street, Bridge and Municipal Construction, referred to in these Standards as the WSDOT Standard Plans.

B. WSDOT/APWA Standard Specifications for Street, Bridge and Municipal Construction, referred to in these Standards as the WSDOT Standard Specifications.

C. WSDOT Hydraulic Manual.

D. WSDOT Utility Manual.

E. WSDOT Construction Manual.

In cases where these Standards conflict with the standards or procedures of WSDOT the state requirements shall take precedence for the County projects with state funding.

1.110 Permits

Other permits, approvals, or agreements may be required by the County or other jurisdictions prior to initiating any activities subject to these Standards. Questions regarding such permits, approvals, or agreements should be directed to the County's Community Planning and Economic Development Department.

1.120 Plan Review

Plan review requirements for County-constructed projects are governed by policies and procedures of the Department.

For developer-constructed projects, all plans, reports, drawings, and specifications that support permit or land use applications are to be submitted to the Community Planning and Economic Development Department. Copies of such supporting documentation are forwarded to the appropriate County staff for review.

Construction plan and profile drawings are required for all proposed improvements to water and sewer.

Engineering Record Drawings (previously known as as-built plans) for all construction completed within rights-of-way and easements, conforming to Section 2.090 of these Standards, must be submitted prior to final inspection approval. In some cases, these drawings will be required during the inspection process to approve facilities before the next phase of construction can proceed.

1.130 Professional Qualifications

Licensed professionals who prepare or are responsible for the preparation of plans, drawings, specifications, calculations, technical reports, legal descriptions, etc., for the purpose of obtaining County permits or approvals, shall be registered or authorized to practice in the State of Washington in accordance with Revised Code of Washington (RCW) Title 18. Registration or authorization to practice shall be in the specific technical area pertinent to the documents being prepared. Exceptions to this requirement are specified in RCW Section 18.42.130.

1.140 Inspection

The Director shall have authority to enforce these Standards as well as other referenced or pertinent specifications. The Director shall appoint personnel, as appropriate, to inspect work completed pursuant to these Standards; they shall exercise such authority as the Director may delegate.

Work performed within the public right-of-way, or outside the public right-of-way as mandated by the County land use codes, shall comply with the approved plans and specifications and these Standards. The Director must approve any revision to construction plans before implementation.

It is the responsibility of the developer, contractor, or their agents to have an approved set of plans, permits, and a copy of these Standards on the job site wherever work is being accomplished.

It is the responsibility of the developer, contractor, or their agents to notify the County in advance of the commencement of any authorized work in accordance with permit requirements. A preconstruction conference and/or field review will be required by the Community Planning and Economic Development Department (facilitated and attended by County staff) before the commencement of any work on significant projects.

As requested by the County and outlined in these standards, the applicant/developer will be required to provide tests to substantiate the adequacy and/or placement of construction materials.

1.150 Errors and Omissions

At the discretion of the Director, any significant errors or omissions in the approved plans or information used as a basis for such approvals may constitute grounds for withdrawal of the approvals and/or stoppage of any or all permitted work. It shall be the responsibility of the developer or contractor to show cause as to why such work should continue and make such changes in plans that may be required by the Director before the plans are reapproved.

1.160 Right-of-Way Site Maintenance

The developer or contractor shall schedule and control work to comply with all applicable provisions of the Thurston County codes and applicable state and federal codes to prevent any hazards to public safety, health, and welfare.

On existing streets, two-way traffic for vehicles, bicycles, and pedestrians shall be maintained at all times unless detour plans or lane closures have been approved in advance by the Board of County Commissioners (BoCC).

Streets, bridges, bikeways, and pedestrian facilities shall be kept free of dirt, debris, or any obstructions. Paved temporary detour(s) shall be provided during the entire time of repair or construction.

Pedestrian and vehicular access to occupied buildings shall be maintained except where written approval from the building owner has been obtained.

On-site grading shall be done in a manner to minimize off-site erosion and siltation in conformance with all statutory requirements, permits, and approved plans.

1.170 Penalties

Failure to comply with these Standards will be cause for withholding or withdrawing approval of plans or drawings, withholding of bonds, final inspection approval or occupancy certificates, and/or other penalties as provided by Thurston County Code or state law.

Chapter 3
DRINKING WATER

Chapter 3
3.000 General
3.030 Main Line
3.035 Pressure Reducing Valve
3.040 Connection to Existing Water Main
3.050 Service Interruption
3.060 Hydrants
3.070 Valves
3.075 Meters
3.080 Casing
3.090 Air and Vacuum Release Valve
3.100 Blowoff Assembly
3.105 Sampling Station
3.106 Fire Service Line
3.110 Backflow Prevention
3.111 Backflow Prevention Assemblies
3.112 Backflow Assembly Installation Requirements
3.120 Service Connection
3.130 Required Separation Between Water Lines and Sanitary Sewers
3.140 Irrigation
3.150 Surveying and Staking
3.160 Trench Excavation
3.165 Thrust Blocking
3.170 Backfilling
3.180 Hydrostatic Tests
3.190 Sterilization and Flushing
3.200 Abandonments
3.300 Groundwater Monitoring Wells
3.310 Asbestos Cement Pipe Abandonment
3.400 Telecommunications Equipment at Drinking Water Utility Sites
Appendix 1: List of Standard Drawings

3.000 General

Any extension of a Thurston County owned water system must be approved by the Department, and all extensions must conform to the most current version of the applicable Thurston County Water System Plan.

In designing and planning for any development, it is the developer's responsibility to see that adequate water for both domestic use and fire protection is attainable. The developer must show in the proposed plans how water will be supplied and whether adequate water volumes at acceptable pressure and velocity will be attained in case of fire. The Director may require additional analysis of the system if it appears that the system might be inadequate.

Anyone who wishes to extend or connect to the County owned water system should contact the Department for a water extension/connection fee estimate. This fee estimate is an estimate of the costs due the County for a waterline extension or connection.

Water meters will be installed by the Department. In new plats, prior to the installation of any water meters, all Department improvements must be completed and approved, including granting of right-of-way or easements, Record Drawings conforming to Section 2.090 of these Standards submitted and approved, or bonded for in accordance with Chapter 2 of these Standards, and all applicable fees must be paid.

Issuance of building permits will not occur until the Director of the Department or their designee has given final approval of the required water system improvements.

Certificate of Occupancy for new developments will not be issued until the Director or their designee has given final approval for all public infrastructure improvements as being both constructed and complete or an acceptable completion surety is in place for the improvements.

3.030 Main Line

A. Main Sizing

Water mains will be sized to provide adequate domestic plus fire flow at the required residual pressure. The quantity of water required will in no case be less than 1,000 gpm at 20 psi residual pressure, and 1,500 gpm at 20 psi for multi-family, commercial, and industrial areas within the UGA. Outside the UGA water mains shall be sized to provide adequate domestic flow at 20 psi residual pressure.

The minimum water main size will be 6 inches diameter where looped. Dead-end mains will be 8 inches diameter to the last fire hydrant. Larger-sized mains are required in specific areas outlined in the current applicable Water System Plan. Nothing shall preclude the County from requiring the installation of a larger-sized main if the County determines a larger size is needed to meet fire protection and domestic requirements or for future service.

All water mains that may be extended or looped will end with an approved gate valve and MJ plug. A blow-off or hydrant may be required.

B. Materials and Chemicals

All materials used for the construction of potable water distribution infrastructure shall conform to NSF 61 and all chemicals must comply with NSF 60.

C. Pipes

All water main pipe will have flexible gasketed joints and will comply with one of the following types:

All water main 4-inch to 16-inch diameter:

- Ductile iron pipe shall meet the requirements of AWWA C151. Ductile iron pipe shall have a cement mortar lining and a 1-mil thick seal coat meeting the requirements of AWWA C104. Ductile iron pipe to be joined using bolted flanged joints shall be Special Thickness Class 53.

All other ductile iron pipe shall be Special Thickness Class 50, minimum Pressure Class 350. Nonrestrained joints shall be rubber gaskets, push-on type, or mechanical joint, conforming to AWWA C111.

- PVC pipe for water mains shall meet the requirements of ANSI/AWWA C900 or ANSI/AWWA C905. PVC pipe shall have the same outside dimensions as ductile iron pipe. PVC pipe for distribution pipelines shall be a minimum of SDR 18. Pipe shall be listed by Underwriters' Laboratories, Inc.
- PVC pipe shall be considered flexible conduit. Joints shall meet the requirements of ASTM D3139 using a restrained rubber gasket conforming to ASTM F477. Solvent welded pipe joints are not permitted.
- HDPE pipe meeting the requirements of ANSI/AWWA C906. Pipe materials shall be high-density polyethylene PE3408 conforming to a minimum cell class 345464 C, D, or E per ASTM D3350. Pipe diameter shall be either iron pipe size per Table 3 and Table 5 of ANSI/AWWA C906. Pipe pressure class shall be as listed in Table 9 of ANSI/AWWA C906 for DR 9 PE3408 material.

All water mains larger than 16-inch diameter will be ductile iron pipe and will conform to AWWA C151, Class 50.

All fire service connections 4-inch diameter and larger shall be ductile iron or HDPE iron pipe. See Section 3.106 for more information.

D. Fittings

All fittings for ductile iron pipe or HDPE pipe will be ductile iron compact fittings conforming to AWWA C153 or AWWA C110 and C111. All fittings will be epoxy coated conforming to AWWA C104. Plain-end fittings with mechanical joint retainer glands installed on the plain ends will be ductile iron. All fittings will be connected by flanges or mechanical joints. Where required, mega-lug retainer glands will be used.

E. Tracer Tape and Toning

All pipe and services will be installed with continuous tracer tape installed 12 inches to 18 inches under the final ground surface, Terra Tape D or approved equal. The tape will be plastic non-biodegradable metal core or backing that can be detected by a standard metal detector, colored blue for water, and labeled "Water".

In addition, toning (tracer) wire will be installed over all pipe, conduit and service lines, colored blue for water. Toning wire will be UL listed for direct bury, Type UF, HDPE or HMWPE-coated, 12-gauge coated copper taped to the top of the pipe to prevent movement during backfilling. Nylon PVC coated THHN wire shall not be used for toning wire. The wire will be laid loosely enough to prevent stretching and damage. The wire will be brought up and tied off at valve body, meter setter, or other fitting or structure as necessary. Sufficient wire to allow a minimum of 2 feet (slack) above final grade shall be coiled/looped into the valve box or structure to ensure the end of the wire will be accessible to hook up to a locator. If there is an existing locate wire contractor will connect new wire to existing wire using approved method.

A 1-pound magnesium anode will be buried with the wire and every 1,000 linear feet thereafter for cathodic protection of the toning wire. All toning wire splices and connections will join wires both mechanically and electrically and will employ epoxy resin or heat-shrink tape insulation.

Toning wire shall be tested by an approved locating company prior to acceptance of the pipe system. All new trace wire installations shall be located using typical low frequency (512Hz) line tracing equipment, witnessed by the County, prior to acceptance. Continuity testing in lieu of actual line tracing shall not be accepted. A written notice from the contractor to the County at least two working days prior to the test is required; such notice is to include information on the relevant experience of the company proposed to complete the testing.

F. Pipe Cover

The minimum cover for all water mains, from top of pipe to finish grade, will be 36 inches for ductile iron, 42 inches for any other material. The maximum cover for all water mains, from top of pipe to finish grade, will be 60 inches for all materials, unless otherwise approved by Thurston County.

G. Water Main Looping, Pressure, and Velocity

Water mains shall be extended and “looped” to the nearest existing water main as part of any commercial or multifamily development, to ensure improved water quality and provide redundancy of service, except where impractical or infeasible due to topography or where an easement(s) are not obtainable. For larger commercial and residential developments, a minimum of two connection points to the existing water system shall be provided.

Outside the UGA no dead-end mains shall be longer than 1,200 linear feet.

Water mains shall be designed not to exceed velocities of 7 feet per second during any flow condition to reduce the chance of water hammer. Pressure of 45 to 60 psi will be maintained at the main during peak-day demands.

H. Markers

Within easements outside of County right-of-way, at each bend in the water main a bend marker shall be placed indicating the angle of the bend and direction of the water main each way. Bend marker posts shall be 4-inch Carsonite CWV-116 posts, or equivalent, stamped with “Caution Water Main.”

3.035 Pressure Reducing Valve

A pressure-reducing valve (PRV) is required on the customer’s side of the meter for all water services that have a static water pressure above 80 psi. All PRVs are owned by the property owner after the initial installation is complete.

For all new construction or remodels for which a building permit is required, with the exception of publics works projects replacing existing water mains and existing service connections, the developer or permittee is required to pay for and install an approved PRV when a PRV is required. The developer or permittee shall then warrant the PRV for one year from the date of installation, after which the property owner is required to maintain the PRV at its own expense.

For PRVs installed as part of a Department project replacing existing water mains and/or existing service connections, the PRV will be maintained by the County for one full year after the date of the initial installation, after which the property owner is required to maintain the PRV at its own expense.

3.040 Connection to Existing Water Main

The developer's engineer will be responsible for determining the scope of work for connection to existing water mains. All cut-ins and taps shall be done under the supervision of a representative of The Department's Water Resources Division. A minimum of ten working days' notice following application at the Community Planning and Economic Development Department is needed to schedule shutdowns. The Department's Water Resources Division, Utility Operations Supervisor will be consulted regarding fittings or couplings required.

It will be the contractor's responsibility to field-verify the location and depth of the existing main and the fittings required to make the connections to the existing mains. All excavation, connections, piping, tapping, valve fittings, services, anchors, blocking, bedding, backfill, compaction, restoration, or other labor and materials required will be furnished and placed by the contractor.

Until such time as a list of Thurston County approved tapping contractors can be obtained from the Department, applicant may use the City of Olympia's list of approved tapping contractors. The Department's Water Resources Division will be notified a minimum of two business days prior to the contractor performing the tap. All taps must be completed under the supervision of a representative of the Department's Water Resources Division and occur between the hours of 8:30am and 3:00pm Monday thru Thursday.

The Department's Water Resources Division will make all shutdowns on existing mains. The contractor may operate the valve under the immediate supervision of the County's Utility Operations Supervisor or their designee.

At any connection to an existing line where a new valve is not anticipated, the existing valve must be pressure tested to County Standards prior to connection. If an existing valve fails to pass the test, the Contractor shall make the necessary provisions to test the new line prior to connection to the existing system or install a new valve and replace the existing valve, at the discretion of Thurston County.

All material required for the connection will be at the site prior to shut down and start of work. Connection to a new section shall only be made after the new section has been tested and disinfected. Connecting pipe will be swabbed with strong chlorine solution such as liquid household bleach with 5%–6% chlorine before making the connection. After work is started, work will proceed continuously, as rapidly as possible, until necessary connection and restoration of service is accomplished. Care shall be taken throughout construction to avoid contamination of materials.

3.050 Service Interruption

Following Community Planning and Economic Development Department issuance of permits for connection to the existing water main, the contractor will give the Department a minimum of ten working days' notice of any planned connection to an existing pipeline. This includes all cut-ins and live taps. Notice is required so any disruptions to existing services can be scheduled. The County will notify customers involved or affected of the water service interruption 48 hours in advance. The contractor will make every effort to schedule water main construction with a minimum interruption of water service. In all situations, the County will dictate scheduling of water main shutdowns so as not to impose unnecessary shutdowns during specific periods to existing customers.

3.060 Hydrants

A. The lead from the main to the fire hydrant will be ductile iron cement mortar-lined Class 50, and no less than 6 inches in diameter and a maximum of 50 feet in length. Greater than 50-foot lengths will require oversizing, as designed by an engineer. Every joint shall be restrained.

B. The gate valve shall be located a minimum of 8 ft from the hydrant unless otherwise approved by the Director.

C. Fire hydrants will have two 2 1/2-inch outlets and one 4 1/2-inch pumper port outlet with PCT threads and 5-inch Storz adaptor, Style 5-37 w/sc cap. All 2 1/2-inch outport threads will be National Standard thread. The valve opening will be 5 1/4-inch diameter. The hydrant will have a positive and automatic barrel drain and will be of the safety or breakaway style. The chain connecting the Storz fitting to the hydrant shall be removed.

D. Hydrants will be M&H Style 129S, Mueller Centurion, or approved equal. All hydrants will be bagged until the system is approved. Developments being served by existing hydrants will be required to upgrade the hydrants to these standards.

E. Hydrants will be painted with Parker Paint Marathon Enamel Safety Yellow paint or equal, if not pre-coated.

F. Unless otherwise required by Thurston County, the following guidelines will apply for hydrant number and location:

1. At least one hydrant will be installed at all intersections.
2. Hydrant spacing of 300 feet will be required in all areas except single-family and duplex residential areas.
3. Hydrant spacing of 600 feet will be required for single-family and duplex residential areas.
4. Where hydrants are providing water to meet the fire flow requirements, where a portion of the facility or building hereafter constructed or moved into or within the jurisdiction, is more than three hundred feet (91.44 m) from a hydrant on a fire apparatus access road, as measured by an approved route around the exterior of the facility or building, on-site fire hydrants and mains shall be provided.
5. For dead-end mains within the UGA, hydrants shall be placed off dead-ends of mains, with a valve, blind flange, and appropriate thrust blocking.

G. Fire hydrants will be set as shown in Thurston County Standard Drawings.

H. Requirement regarding use, size, and location of a fire department connection (FDC) and/or post indicator valve will be determined by the Building Official and the Thurston County Fire Marshal. Location of the FDC will be shown on the water plans.

I. Where hydrants are located within 10 feet of a vehicular travel path, hydrants shall be protected by two or more bollards, each 4-6 inches in diameter and made of steel. The top of bollard shall match the top of hydrant height.

J. Fire hydrants must be installed, tested, and accepted prior to issuance of a certificate of occupancy.

K. Fire hydrants shall be abandoned per Section 3.300.

L. Fire hydrants will not be installed over areas being used for underground stormwater treatment storage.

3.070 Valves

All valves and fittings will be coated ductile iron with ANSI flanges or mechanical joint ends. All existing valves will be operated by County employees only.

Valves will be installed in the distribution system at sufficient intervals to facilitate system repair and maintenance, but in no case will there be less than one valve every 600 feet. There shall be three valves on all TEES and four valves on all crosses in each intersection. All water mains that may be extended or looped will end with an approved gate valve and blind flange. Specific requirements for valve spacing will be made at the plan review stage.

A. System gate valves will be resilient wedge, NRS (Non-Rising Stem), with O-ring seals. Valve ends will be mechanical joint or ANSI flanges. Valves will conform to AWWA 509-80 or AWWA C-515. System gate valves will be M&H, Kennedy, AVK, Mueller, or Clow.

   Gate valves will be used on all 2- to 10-inch lines. Gate valves may be used on 12-inch lines.

B. Butterfly valves. Butterfly valves will conform to AWWA C504-87, Class 150B, with cast iron short body and O-ring stem seals. Butterfly valves will be Mueller, M&H, Clow, Kennedy, or American Flow.

   Butterfly valves may be used for 12-inch lines and will be used on all lines 14 inches and larger.

C. Valve box. All valves will have a standard 950 cast iron water valve box set to grade. If valves are not set in a paved area, a 1-foot by 6-inch-thick circular concrete pad minimum shall be placed around the valve box. Concrete shall extend beyond the valve box by 1-foot minimum. In areas where the valve box falls in the road shoulder, the ditch and shoulder will be graded before placing asphalt or concrete pad. Valve box lids will be ductile iron and shall be anti-kickout.

   Valve marker post. Valve marker posts will be 4-inch Carsonite CWV-116 posts stamped with “Caution Water Valve.” See Thurston County Standard Drawings.

3.075 Meters

At least 10 weeks advance notice to Thurston County shall be given for ordering 3-inch or larger meters. All meters, regardless of size, will be installed by Thurston County.

3.080 Casing

Steel casing pipe will be Schedule 20 steel or equal. Pipe spacers will be Cascade Style CC5 with 8-inch runners as available from Cascade Waterworks or approved equal. Casing pipe and spacers will be sized for pipe being installed. Install minimum of three spacers per section of pipe. The casing pipe will then be sand-packed.

3.090 Air and Vacuum Release Valve

Air and vacuum release valves (ARV) will be ARI combination air release valve or approved equal. Installation will be as shown on Thurston County Standard Drawings.

The installation will be set at the high point of the line when required. Where possible, pipes are to be graded to prevent the need for an air release valve. Air release valves may not be required when services are in the vicinity.

3.100 Blowoff Assembly

Where a fire hydrant is not located at the end of a dead-end main, a blowoff assembly will be required. On water mains that will be extended in the future, the valve that operates the blowoff assembly will be the same size as the main and provided with a concrete thrust block. The pressure rating for blowoff assemblies will be 200 psi. Installation will be as shown on Thurston County Standard Drawings.

3.105 Sampling Station

The number of sampling stations required for subdivisions and other major developments will be determined on a case-by-case basis during plan review An Eclipse #88-SS stainless steel water quality sampling station shall be manufactured by Kupferle or approved equal. See Standard Drawing WA-20 for installation details.

3.106 Fire Service Line

The County shall maintain that part of the fire service line (also referred to as the fire department connection, or FDC) from the connection at the main to and including the valve closest to the main (in most cases the “tapping” valve), which shall be a 4-inch minimum gate valve. The property owner shall own and maintain the fire service line from this valve to and within the building. If the water main is located in public right-of-way (ROW), then the closest valve to the main shall also be in the ROW. If the main is in an easement on private property, then the valve shall be within 2 feet of the main. Toning wire shall be installed on all fire service lines, from the main to the building, per Section 3.030.D.

Only ductile iron or high-density polyethylene (HDPE) pipe, 4-inch minimum nominal diameter, may be used for fire service lines located partly or entirely within a street ROW or water utility easement, except that if hydraulically warranted a 3-inch HDPE may be approved. The tapping valve for a 3-inch HDPE pipe shall remain 4-inch.

Fire service line plans shall be submitted to the County for approval prior to construction.

3.110 Backflow Prevention

All water system connections to serve buildings or properties with domestic potable water, fire sprinkler systems, or irrigation systems will comply with the minimum backflow prevention requirements as established by the Washington State Department of Health and Thurston County in its Cross-Connection Program.

The installation of required backflow devices is necessary to protect the existing water system and users from possible contamination. All backflow prevention assemblies will be of a type and model pre-approved by the Washington State Department of Health or the County.

No cross connections will be created, installed, used, or maintained within Thurston County water service area.

Approved backflow prevention assemblies will be installed at the expense of the user, either at the service connection or within the premises, as determined by the Director.

A backflow prevention assembly is required on all new irrigation services, at all new commercial buildings, and at all existing commercial buildings where there is an expansion or change of use. The Director may require a backflow prevention assembly on any service where they determine there is a potential for a backflow or back siphonage incident.

A reduced pressure (RP) backflow assembly is required at all new commercial buildings and will be required to be installed when a change of use occurs at a commercial building. The RP device shall be installed at the meter.

The County will have the authority to perform regular inspections on all backflow assemblies, both inside and outside any building connected to the County owned water system and will be provided access to the premises to inspect.

The Department must receive and approve the test results of any backflow prevention assembly before releasing the Certificate of Occupancy on any building.

Backflow Prevention Assembly Testers shall hold a current Washington State Department of Health Backflow Assembly Tester Certification and have proof of calibrated test kit.

The Thurston County Fire Marshal will test the fire line and obtain the certificate for underground piping. In any situation, the Thurston County Fire Marshal will not test the fire line until the Department has tested and approved the main up to the fire line. Backflow assemblies for fire protection shall have integrated shutoff valves approved as part of the assembly and shall be separate from any post indicator valve installed on the first service line. Reduced pressure principle detector assemblies shall be required on all fire lines.

3.111 Backflow Prevention Assemblies

Backflow prevention devices for industrial, commercial, and multi-family residential facilities shall be readily accessible to the County's Cross Connection Control Specialist, which normally means in an above ground, insulated enclosure adjacent to the right of way. See Section 3.112 below for more information on location and accessibility.

A. Double-Check Valve Assembly (DCVA). The term "double-check valve assembly" will mean an assembly composed of two independently acting approved check valves, including tightly closing shutoff valves attached at each end of the assembly, and fitted with properly located test cocks. This assembly will only be used for irrigation services rated as a non-health hazard.

B. Double-Check Detector Check Valve Assembly (DCDA). The term "double-check detector check valve assembly" will mean a specially designed assembly composed of a line-sized approved double-check valve assembly with a specific bypass water meter and a meter-sized approved double-check valve assembly. The meter will register accurately for only very low rates of flow and will show a registration for all rates of flow. This assembly will only be used to protect against a non-health hazard and may only be used on fire protection lines rated as a non-health hazard existing as of December 31, 2020.

C. Reduced Pressure Principle Backflow Prevention Assembly (RPBA). The term "reduced pressure principle backflow prevention assembly" will mean an assembly containing two independently acting approved check valves together with a hydraulically operating, mechanically independent pressure differential relief valve located between the check valves and at the same time below the first check valve. The unit will include properly located test cocks and tightly closing shutoff

valves at each end of the assembly. This assembly is allowed on all lines requiring a backflow prevention assembly except fire lines.

D. Reduced Pressure Principle Detector Assembly (RPDA). The term "reduced pressure principle detector assembly" will mean a specially designed assembly composed of a line-sized approved reduced pressure principle backflow prevention assembly with a specific bypass water meter and a meter-sized approved reduced pressure principle backflow prevention assembly. This assembly will be used on all new fire protection services.

   The meter will register accurately for only very low rates of flow and will show a registration for all rates of flow.

Only the types of backflow prevention assemblies listed above shall be allowed.

3.112 Backflow Assembly Installation Requirements

Fire suppression systems connected to the potable water system shall be protected by an approved reduced pressure principle detector assembly as minimum protection. Fire systems using chemicals shall be required to install a reduced pressure detector assembly as minimum protection.

Horizontal and vertical assemblies must be approved by the Washington State Department of Health and Thurston County at the time of installation.

To ensure proper operation and accessibility of all backflow prevention assemblies, the following requirements will apply to the installation of these devices:

A. No part of the backflow prevention assembly will be submerged in water or installed in a location subject to flooding.

B. Assemblies must be installed at the point of delivery of the water supply, before any branch in the line on private property, in a location approved by the Director.

C. The assembly must be protected from freezing and other severe weather conditions.

D. All backflow prevention assemblies to be installed will be of a type and model pre-approved by the State of Washington State Department of Health (Washington Administrative Code 246-290-490) and the Director.

E. Only assemblies that have been approved for vertical installation by the Washington State Department of Health and the Director shall be used when necessary.

F. The assembly will be readily accessible with adequate room for maintenance and testing. Devices 2 inches and smaller will have at least a 6-inch clearance on all sides of the assembly. All assemblies larger than 2 inches will have a minimum clearance of 24 inches on the back side, 24 inches on the test cock side, 12 inches below the device, and 36 inches above the device (refer to Thurston County Standard Drawings). A strainer shall be installed immediately upstream of the assembly except for fire line devices.

G. If written permission is granted by the Director to install the backflow assembly inside of the building, the assembly will be readily accessible during regular working hours of 8:00 a.m. to 5:00 p.m., Monday through Friday.

H. If, after receiving written permission by the Director, an assembly is installed inside the premises and is 4 inches or larger and is installed 4 feet above the floor, it must be equipped with a rigidly and permanently installed scaffolding acceptable to the Director. This installation must also meet the requirements set out by the US Occupational Safety and Health Administration (OSHA) and the State of Washington Occupational Safety and Health Administration (WISHA).

I. Reduced pressure principle assemblies may not be installed in a vault underground or anywhere it may be subject to flooding. All installations of reduced pressure principle assemblies shall be above ground with insulated enclosures where needed.

J. An approved air gap will be located at the relief valve orifice. This air gap will be at least twice the inside diameter of the incoming supply line as measured vertically above the top rim of the drain and in no case less than 1 inch.

K. Where a backflow device is deemed necessary, the assembly and installation plans will be submitted to Thurston County Community Planning and Economic Development Department for approval by the Department prior to installation.

L. Upon completion of installation, the Department's Water Resources Division will be notified, and all devices must be inspected and tested. All backflow devices must be registered with Department's Water Resources Division. Registration with all the required information shall be submitted within five days of installation. Forms must be completed in ink, and legible. An original copy of the registration form can be mailed to the Department's Water Resources Division or a signed scanned pdf may be emailed to TCutilities@co.thurston.wa.us. A test tag shall be installed on the device by the certified tester.

M. The Department's Water Resources Division reserves the right to reject test reports that are not complete and accurate. Submittal of inaccurate test reports shall result in denial of report forms and a requirement to retest the backflow assembly.

N. Any deviation from these installation requirements will be requested in writing by the owner and approved by the Director, or designee, prior to the device installation.

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

3.120 Service Connection

A. All service connections relating to new development will be of the appropriate size as determined by the Department and by the Building Official or Fire Marshal and installed by a licensed developer at the time of mainline construction. After the lines have been constructed, tested, and approved, the owner may apply for a water meter. The County will install a water meter after the application has been made and all applicable fees have been paid. Water meters will be set only after the system is inspected and approved.

B. When water is desired to a parcel fronting an existing main but not served by an existing setter, an application must be made to the County. Upon approval of the application and payment of all applicable fees, a licensed and bonded contractor will tap the main and install the service line. A Department Utility Supervisor shall be notified 2 business days prior to work commencing. A Department Utility Supervisor, or his delegee, shall be present to inspect tap. Department Utility staff will install the meter.

C. Domestic Service lines will be, high-density polyethylene (HDPE) pipe minimum pressure Class 250 psi, Grade PE 4710 iron pipe size (IPS). Service lines will be installed a minimum of 45 degrees off the main. Tracer tape and toning wire wrapped around the pipe shall be installed on all service lines. See Section 3.030E for tracer tape and toning wire requirements.

   Service saddle shall be nylon coated ductile iron with double stainless-steel straps. All clamps will have rubber gaskets. Service saddles shall have tapped IP threads. Romac 202NS or approved equivalent.

   Corporation stops will be ball valve all US lead free brass and will be Ford, Mueller, or AY McDonald with IP threads conforming to AWWA C800. Stainless steel inserts shall be used with compression joints and polyethylene pipe.

D. Specifications for meter setters are shown on Thurston County Standard Drawings.

E. Specifications for meter boxes are shown on Thurston County Standard Drawings.

F. Other than existing ones with an active water utility account as of December 31, 2020, master meters will not be allowed for use in County owned water systems.

3.130 Required Separation Between Water Lines and Sanitary Sewers

The basic separation requirements apply to all nonpotable pipelines of 24-inch diameter or less; larger non-potable pipelines may create special hazards because of flow volumes and joint types and accordingly require additional separation requirements. The special construction requirements given are for the normal conditions found with nonpotable and water systems. More stringent requirements may also be necessary in areas of high groundwater, unstable soil conditions, and so on. Any site conditions not conforming to conditions described in this section will require assessment and approval of the appropriate state and local agencies. In case of conflict between the Thurston County Development Standards for Water and Sewer Systems and the Ecology's *Criteria for Sewage Works Design* regarding requirements for nonpotable and water separation, the most restrictive shall be used.

Standard industry guidance calls for a minimum of 10-foot horizontal separation between the outer walls of potable and nonpotable pipelines in parallel installations, and a minimum of 18-inch vertical separation (potable water line above) between the invert of the potable water line and the crown of the nonpotable line at pipeline crossings (Ten State Standards, WAC 246-290-200). Actual conditions can make it impossible to comply with these standards. If the design of a new or replacement water main cannot provide the standard 10-foot horizontal separation, design engineers should consult *Pipeline Separation Design and Installation Reference Guide (Ecology and DOH 2006)* and the *Washington State Department of Health Water System Design Manual (DOH Publication 331-123, June 2020)*. Provisions allow for parallel potable and nonpotable installations to be as close as 4-feet horizontally if they meet certain conditions. Design engineers should provide justification and demonstrate that the conditions for a pipe separation less than 10-feet are met in the project report.

If the potable line is closer than 18 vertical inches from the nonpotable line at the point of crossing, or the potable line must cross under the nonpotable line, the potable line should be encased with ductile iron or steel pipe designed to withstand a minimum static pressure of 150 psi extending at least 10 feet to either side of the crossing. Additional measures may be necessary to mitigate the risk posed by crossing an existing nonpotable line, especially when it is located above the new water line.

If the developer receives permission from the County to do so, mitigation of close parallel or crossing installations may be applied to the nonpotable line. To allow for future maintenance, the use of casing pipes shall be the standard mitigation.

3.140 Irrigation

All irrigation systems will be installed with backflow prevention assemblies approved by the Washington State Department of Health, and in accordance with Thurston County installation guidelines. The backflow prevention assembly must be located next to the meter, unless otherwise approved by the Director.

Irrigation sprinklers will be situated so as to not wet any impervious surface, such as a public street or sidewalk.

3.150 Surveying and Staking

All surveying and staking shall be performed as required in Chapter 2, Section 2.070 of these Standards.

3.160 Trench Excavation

A. Clearing and grubbing where required will be performed within the easement or public right-of-way as permitted by the County and/or governing agencies. Debris resulting from the clearing and grubbing will be disposed of by the owner or contractor in accordance with the terms of all applicable permits.

B. Trenches will be excavated to the line and depth designated by the County to provide the required minimum cover. See Section 3.030 for required cover. Except for unusual circumstances where approved by the County, the trench sides will be excavated vertically, and the trench width will be excavated only to such widths as are necessary for adequate working space as allowed by the governing agency. All necessary shoring operations will be performed to ensure that the excavation can be carried out in accordance with WISHA and OSHA safety standards. The trench will be kept free of water until joining is complete. Surface water will be diverted so as not to enter the trench. The contractor will maintain sufficient pumping equipment on the job to ensure that these provisions are carried out.

C. The contractor will perform all excavation of every description and whatever substance encountered, and boulders, rocks, roots, and other obstructions will be entirely removed or cut out to the width of the trench and to a depth 6 inches below water main grade. Where materials are removed from below water main grade, the trench will be backfilled with material satisfactory to the County and thoroughly compacted.

D. Trenching and shoring operations will not proceed more than 100 feet in advance of pipe laying without approval of the County and will be in conformance with WISHA and OSHA safety standards.

E. The bottom of the trench will be finished to grade with hand tools in such a manner that the pipe will have bearing along the entire length of the barrel. The bell holes will be excavated with hand tools to sufficient size to make up the joint.

F. The contractor will maintain the presence of a “competent person”, as defined by the Washington State Department of Labor and Industries, when any trench excavation and backfill work is being done at the project site.

3.165 Thrust Blocking

Location of thrust blocking will be shown on the plans. Thrust block concrete will be commercial concrete meeting the requirements of Standard Specifications Section 6-02.3(B) poured against undisturbed earth. A plastic barrier will be placed between all thrust blocks and fittings. See Thurston County Standard Drawings for thrust block locations and calculations.

We will only accept MJ Mega Lug retainers with mega-bond coating, Romac restrained flange couplings, and Romac Grip Ring Retainers with Romabond coating, or approved equal, for restraints. The restraints shall be required to be used in conjunction with thrust blocking.

3.170 Backfilling

Backfilling will not commence until the pipe installation has been inspected and approved.

Backfilling and surface restoration will closely follow installation of pipe so that not more than 100 feet is left exposed during construction hours without approval of the County. Selected backfill material will be placed and compacted around and under the water mains by hand tools to a height of 6 inches above the top of the water main. The remaining backfill will be compacted to 95 percent of the maximum density in traveled areas and 90 percent outside traveled areas. Where governmental agencies other than the County have jurisdiction over roadways, the backfill and compaction will be done to the satisfaction of the agency having jurisdiction. Suitable backfill material, as determined by the County, shall conform to the current WSDOT/APWA Section 7-09 with the exception of gradation of the bedding material to be a maximum size of 1-inch.

3.180 Hydrostatic Tests

Prior to the acceptance of the work, the installation will be subjected to a hydrostatic pressure test by the contractor of 225 psi for a minimum of 15 minutes. See Section 7-09.3(23) Hydrostatic Pressure Test in the current addition of the Standard Specifications for more detail. Any leaks or imperfections developing under said pressure will be immediately remedied by the contractor. The main will be tested between valves. Insofar as possible, no hydrostatic pressure will be placed against the opposite side of the valve being tested. Test pressure will be maintained while the entire installation is inspected by the County. See Section 7-09, Water Mains, of the current Standard Specifications for more detail.

The contractor will provide all necessary equipment and will perform all work connected with the tests. Tests will be made after all connections have been made and the roadway section is constructed to subgrade. This is to include any and all connections as shown on the plan. The contractor will perform a test to assure that the equipment to be used for the test is adequate, in good operating condition, and the air in the line has been released before requesting the County witness the test. Only authorized personnel of the Department will operate isolation valves. The County may require the contractor to perform a final hydrostatic test if there has been any modification to the compacted soils.

See Section 3.110 for testing responsibilities for backflow prevention devices.

3.190 Sterilization and Flushing

Sterilization of the water main will be accomplished by the contractor in accordance with the requirements of the Washington State Department of Health and AWWA Standards and in a manner satisfactory to the County. At no time will chlorinated water from a new main be flushed into a body of water. This includes lakes, rivers, streams, drainage ways, Puget Sound, and any and all other waters where fish or other natural water life can be expected. All dechlorination procedures will meet all local,

state, and federal regulations. The contractor will provide the Department Utility inspector a written copy of their plan or procedures to be used prior to the sterilization process.

Once the line has been installed to County standards it will be super chlorinated by following AWWA Standard ANSI/AWWA C651-14 for Disinfecting Water Mains.

1. Each stick of pipe shall be chlorinated by spraying the ends of the pipe with super chlorinated solution and adding highly concentrated NSF sodium hypochlorite chlorine granules for water disinfection.
2. County water is added to the pipe, using a hydrant or valve, until the pipe is filled, and all air is removed. Once the air is removed, the County shall perform a test of the free chlorine residual in the newly installed pipe to verify it is at least 25 mg/L. The water shall remain in the pipe for 24 hours without disturbance. At the end of 24 hours, the County shall perform a test of the chlorine residual. The chlorine residual at the pipe must be at least 10 mg/L. If during the course of testing, the system water in the line has an elevated pH or free chlorine residual above the expected levels in the distribution system, the sample will not be collected and the line will need to be flushed, dechlorinated, valve closed, and retested.
3. If the water main meets the residual requirements, flush the new water main with County water until the chlorine residual is consistent with the current system residual. Water flushed from the main shall be dechlorinated per the current AWWA method. Highly chlorinated water shall not be allowed to enter the County distributions system.
4. Following flushing, the County will take a bacteriological test samples of the water in the main. If more than one service connection exists, multiple samples will be required. If any initial sample fails and bacteria are present, the disinfection procedure will be repeated starting with super-chlorinating the line. Only after all samples taken show absence of bacteria shall the line be allowed to be placed in service.

3.200 Construction Completion Form

A “Construction Complete Report for Distribution Main Projects” [form number DOH331-147 (3/00)] shall be completed for each project as required per Washington State Department of Health, Drinking Water Program (DOH) and referred to in WAAC 246-290-125(2). The applicable sections of this form shall be completed by the Engineer of Record and submitted with the record drawings. The completed form may be maintained on file at Thurston County and be made available to DOH. Thurston County, at its discretion, may forward a copy of the completed forms to DOH.

3.300 Abandonments

At time of abandonment for any service line, the corporation stop, and saddle shall be removed, and a full circle stainless steel repair band shall be installed.

When a main line or hydrant is abandoned, the abandonment shall occur back to the closest tee or cross, removing the valve and installing a blind flange or plug. The water line being abandoned must be removed. In areas where the tees are lead-in fittings, the whole tee will be removed along with a small section of main. In some situations, where removal of the valve will require significant interruption in service, the Department will allow a blind flange or plug to be placed on existing valve and the valve box filled with sand. This alternative method of abandonment requires pre-approval of the Department.

3.310 Asbestos Cement Pipe Abandonment

Asbestos Cement (AC) pipe being abandoned in place shall be filled with "Pumpable Controlled Density Fill (CDF)" using a Line Pumper to place the required mix. For AC pipe larger than 6 inches in diameter, or for any AC pipe located under a paved roadway section, the Contractor shall pothole and window the pipe every 100 feet to verify the pipe is full. Handling of AC pipe shall be in accordance with Department of Labor and Industries requirements.

New water mains and service connections shall be installed and tested prior to AC water pipe abandonment unless otherwise approved by the Engineer.

3.400 Termination of Service

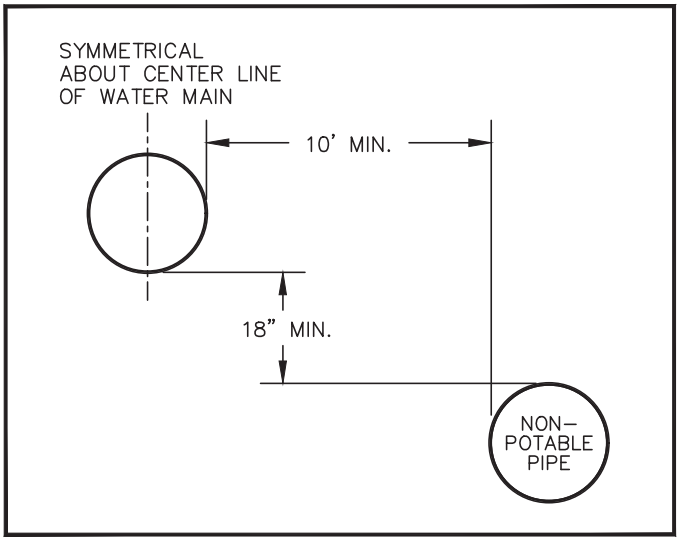
If, in the opinion of Thurston County, failure on the part of any customer to discontinue the use of all cross connections, except in accordance with the Standard, is sufficient cayuse for the immediate discontinuance of public water service to the premises (Washington Administrative Code 246-90-490). Thurston County may install the appropriate backflow prevention device at the owner's expense.

Appendix 1: List of Standard Drawings

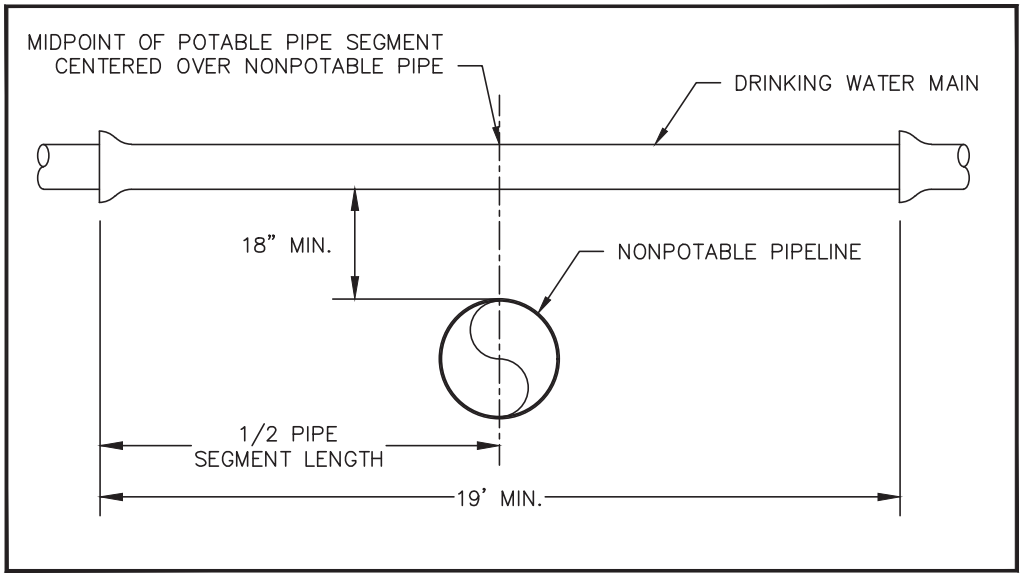
Title	Drawing No.	File Type (DWG includes all drawings in chapter)
Water Nonpotable Separation	WA-01	PDF DWG
Connection to Existing Main	WA-02	PDF DWG
Fire Hydrant	WA-03	PDF DWG
Standard Valve Box	WA-04	PDF DWG
Valve Marker Post & Hydrant Bollard Detail	WA-05	PDF DWG
2" Air and Vacuum Release Valve	WA-06	PDF DWG
2" Blowoff Assembly	WA-07	PDF DWG
2" Temporary Blow-Off Assembly Type "A" and "B"	WA-08	PDF DWG
Typical Installation with Minimum Clearance & Backflow Prevention Device Assembly	WA-09	PDF DWG
2" and Smaller Reduced Pressure (RP) Installation	WA-10	PDF DWG
Standard Reduced Pressure Backflow Assembly 2-1/2" Or Larger	WA-11	PDF DWG
2-1/2" and Larger Double Check Valve Assembly	WA-12	PDF DWG
2" and Smaller Double Check Valve Assembly	WA-13	PDF DWG
1" Dual Water Service	WA-14	PDF DWG
Typical 1-1/2" and 2" Water Service & Meter Setter W/Bypass	WA-15	PDF DWG

Title	Drawing No.	File Type (DWG includes all drawings in chapter)
Large Meter Vault	WA-16	PDF DWG
Standard Blocking Detail	WA-17	PDF DWG
Thrust Block Areas	WA-18	PDF DWG
Thrust Loads	WA-19	PDF DWG
Water Quality Sampling Station	WA-20	PDF DWG
Water Testing – Charging & Flushing	WA-21	PDF DWG
Single Service Connection 1" Diameter To ¾" Setter	WA-22	PDF DWG
Single Service Connection 1" Diameter To 1" Setter	WA-23	PDF DWG
Typical Meter Placement	WA-24	PDF DWG
Blowoff Sizes for Flushing Pipelines	WA-25	PDF DWG
Octave Water Meter with Bypass For 6" and 8" Size	WA-26	PDF DWG
Material List for Octave Water Meter with Bypass For 6" and 8" Size	WA-27	PDF DWG
Pressure Vacuum Breaker Assembly	WA-28	PDF DWG
2-1/2" and Larger Double Check Detector Check Valve Assembly	WA-29	PDF DWG
Spill Resistant Pressure Vacuum Breaker Assembly	WA-30	PDF DWG
Groundwater Monitoring Well Design	WA-31	PDF DWG
Near Building Residential PRV Assembly	WA-32	PDF DWG
Near Street Residential PRV Assembly	WA-33	PDF DWG
13" X 24" X 2" rpm Cover with Cast Iron Read Lid	WA-34	PDF DWG
17" X 30" X 2" rpm Cover with Cast Iron Read Lid	WA-35	PDF DWG

THURSTON COUNTY WATER STANDARD DETAIL



REQUIRED SEPERATION BETWEEN WATER LINES
AND NON–POTABLE LINES, PARALLEL CONSTRUCTION.



TYPICAL UTILITY PIPE CROSSING

NOTE:

NONPOTABLE PIPELINES INCLUDE ALL PIPES TRANSPORTING NONPOTABLE LIQUIDS INCLUDING, BUT NOT LIMITED TO, SEWER AND RECLAIMED WATER.

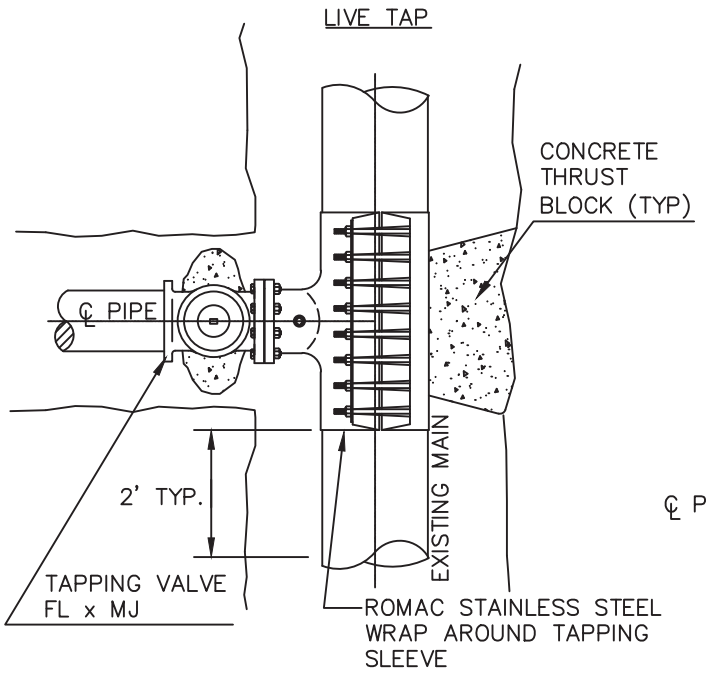
SITUATIONS NOT ADDRESSED ABOVE SHALL FOLLOW THE MORE RESTRICTIVE CRITERIA AS OUTLINED IN "CRITERIA FOR SEWAGE WORKS DESIGN" AND THE "PIPELINE SEPARATION DESIGN AND INSTALLATION GUIDE", DOH, CURRENT EDITION.

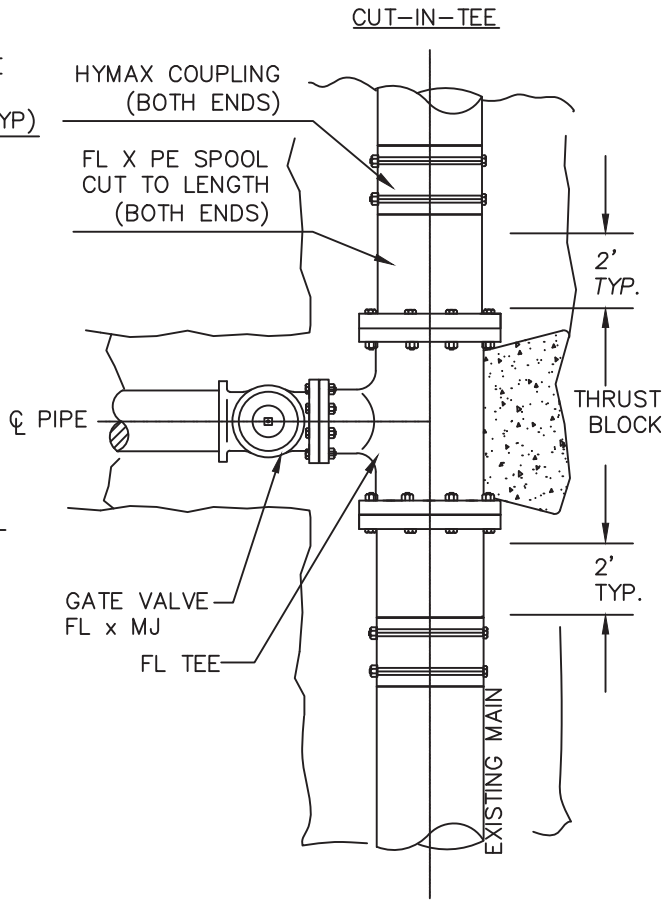
WATER NONPOTABLE SEPARATION

APPR. DATE:	REFER:	FIG NO: WA-01

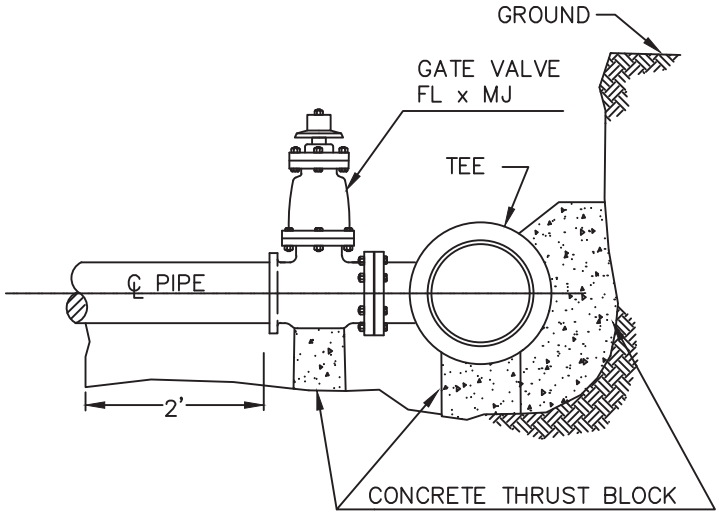
Source; City of Lacey

THURSTON COUNTY WATER STANDARD DETAIL





VALVE AND SLEEVE SHALL BE SUPPORTED AND BACKFILLED AS SHOWN BELOW–RIGHT.



NOTES:
1. 11 MIL PLASTIC OR CONSTRUCTION FABRIC SHALL BE WRAPPED AROUND PIPE AND FITTINGS BEFORE THRUST BLOCKS ARE POURED.
2. SUPPORT VALVE AND SLEEVE CONTINUOUSLY THROUGH INSTALLATION.

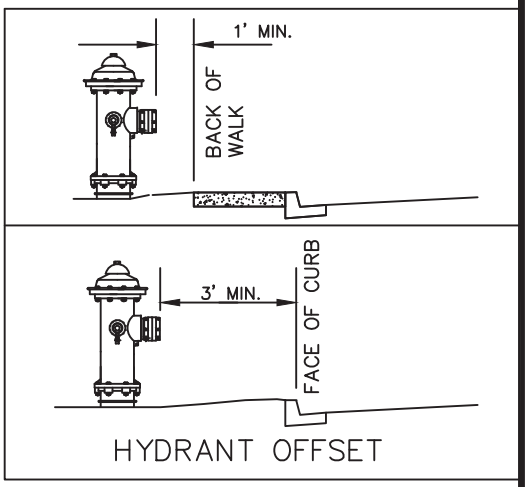
CONNECTION TO EXISTING MAIN

APPR. DATE:		FIG NO:	WA-02

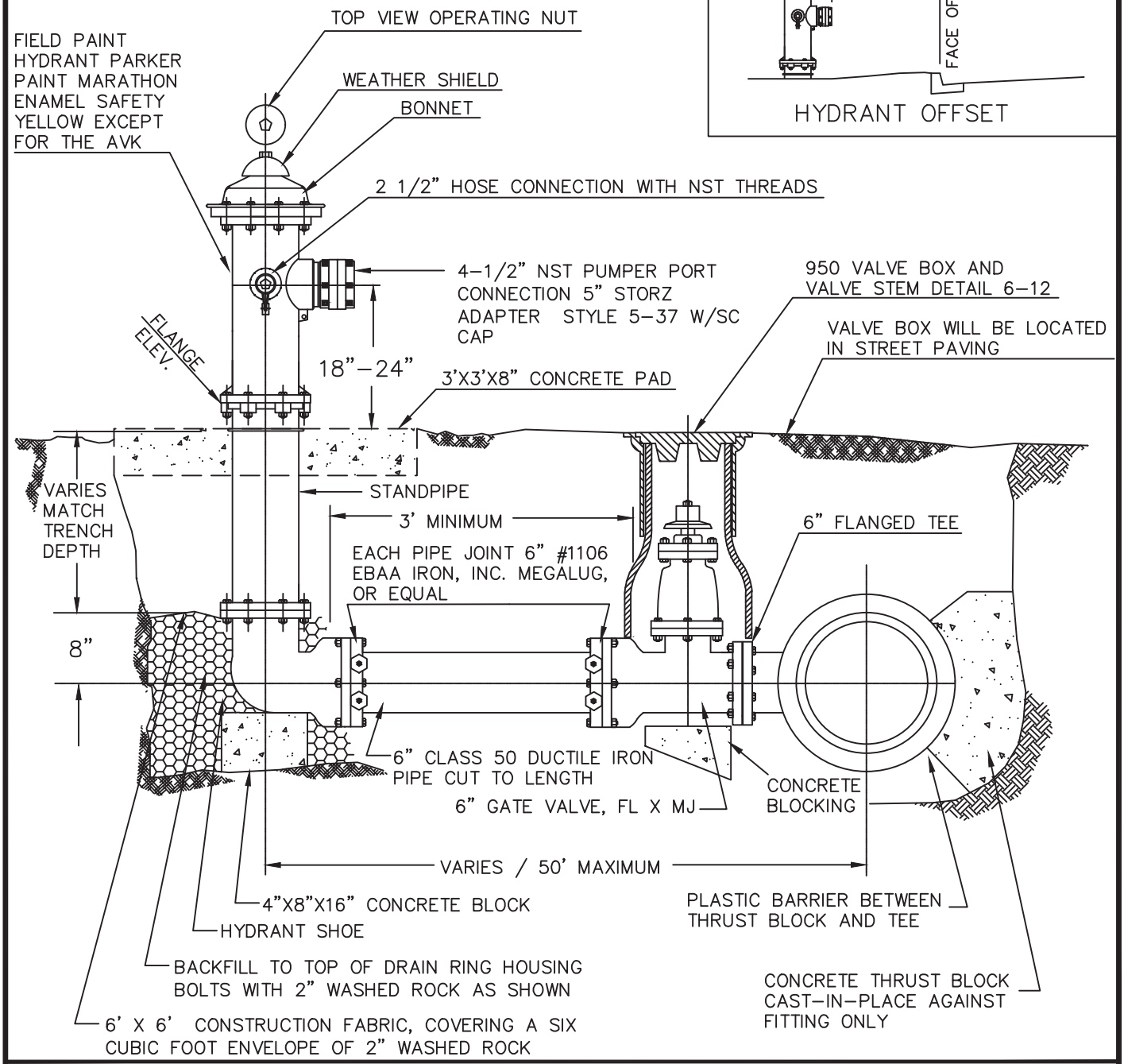
Source; City of Olympia

THURSTON COUNTY WATER STANDARD DETAIL

NOTES:
1. HYDRANTS SHALL BE LOCATED WITH A MINIMUM THREE FOOT RADIUS UNOBSTRUCTED WORKING AREA PROVIDED AROUND ALL HYDRANTS, AND IN NO CASE SHALL BE LOCATED IN SIDEWALK.
2. WHEN R/W IS NOT ADEQUATE, A MINIMUM 5' EASEMENT IS REQUIRED ON ALL SIDES OF THE HYDRANT.
3. HYDRANT SHALL BE M&H STYLE 129S OR MUELLER CENTURION.
4. MINIMUM TWO BOLLARDS REQUIRED WHEN HYDRANT LOCATED WITHIN 10 FEET OF VEHICULAR TRAVEL PATH.



HYDRANT OFFSET

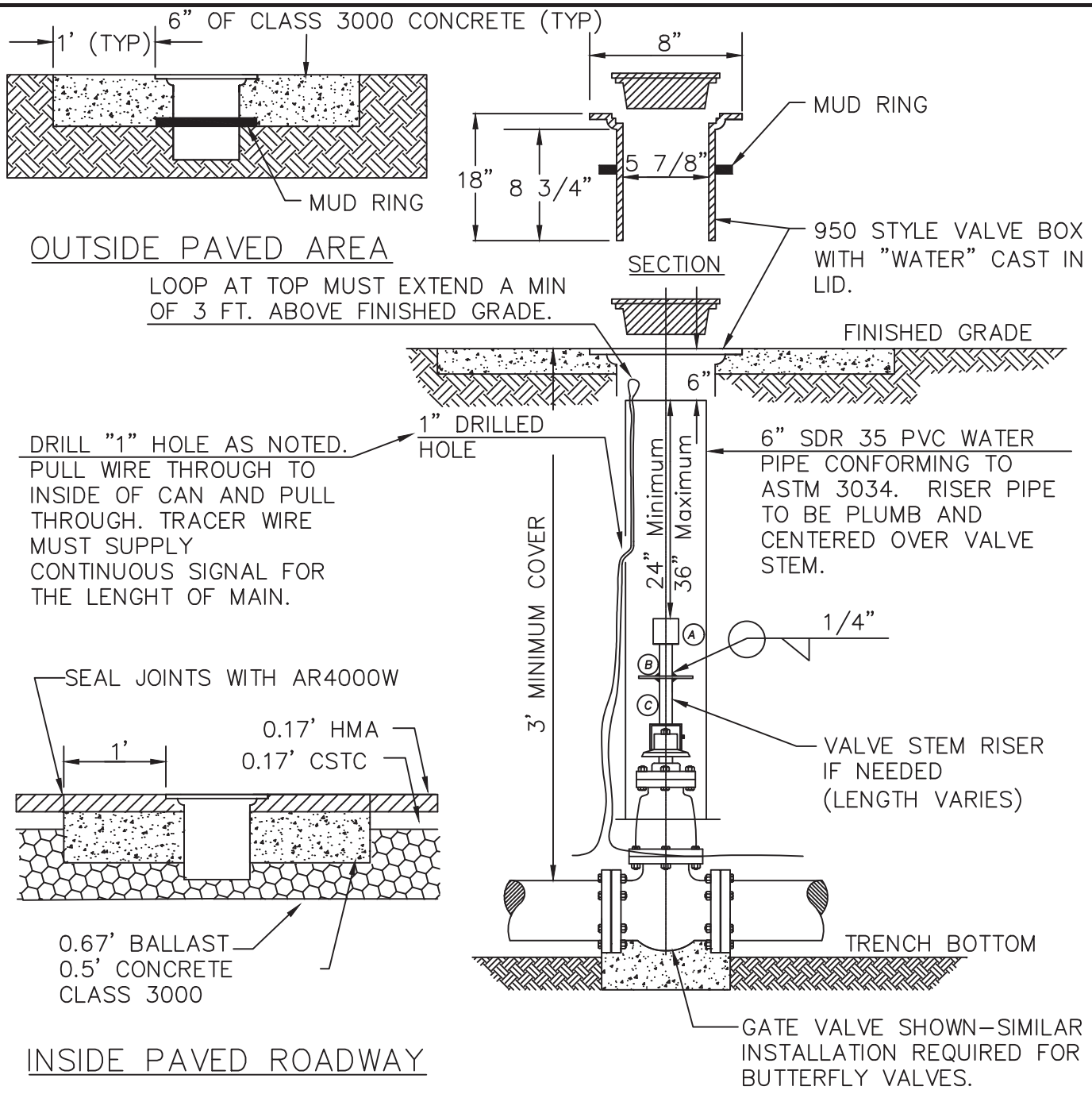


FIRE HYDRANT

APPR. DATE:		FIG NO:	WA-03

Source; City of Olympia

THURSTON COUNTY WATER STANDARD DETAIL



VALVE STEM EXTENSION LEGEND

A. VALVE OPERATING NUT OR 1 7/8" X 1 7/8" X 2" HIGH GRADE STEEL WELDED TO GUIDE PLATE.

B. 3/16" THICK X 5 1/5" DIA STEEL GUIDE PLATE WELDED TO RISER SHAFT.

C. 2"X2"X 3/16" SQUARE STRUCTURAL STEEL TUBING TO FIT OPERATING NUT. LENGTH AS REQUIRED.

NOTE:

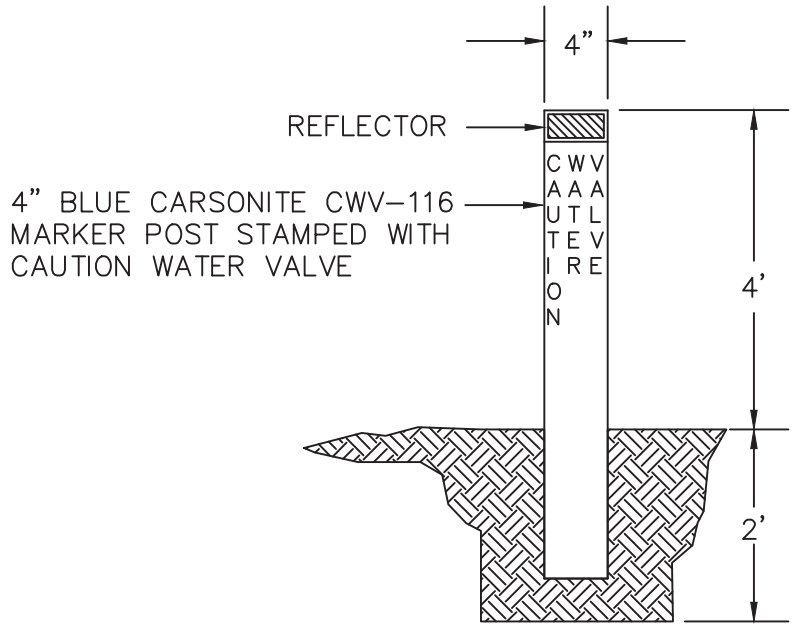
1. ALL WELDS TO SHAFT SHALL BE FILLET WELD ALL AROUND, AS SPECIFIED ABOVE.

STANDARD VALVE BOX

APPR. DATE:		FIG NO:	WA-04

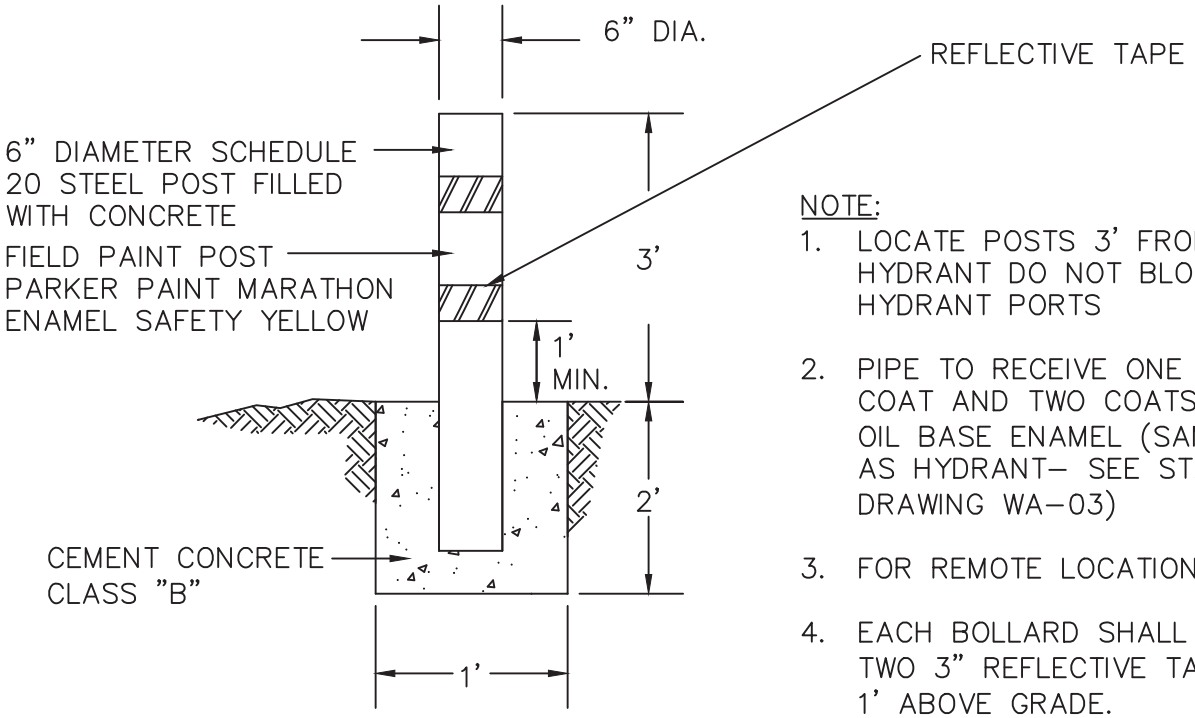
Source; City of Olympia

THURSTON COUNTY WATER STANDARD DETAIL



FRONT

VALVE MARKER POST



HYDRANT BOLLARD

NOTE:

1. LOCATE POSTS 3' FROM HYDRANT DO NOT BLOCK HYDRANT PORTS
2. PIPE TO RECEIVE ONE PRIME COAT AND TWO COATS OUTDOOR OIL BASE ENAMEL (SAME COLOR AS HYDRANT– SEE STANDARD DRAWING WA–03)
3. FOR REMOTE LOCATIONS
4. EACH BOLLARD SHALL HAVE TWO 3" REFLECTIVE TAPE A MIN. 1' ABOVE GRADE.

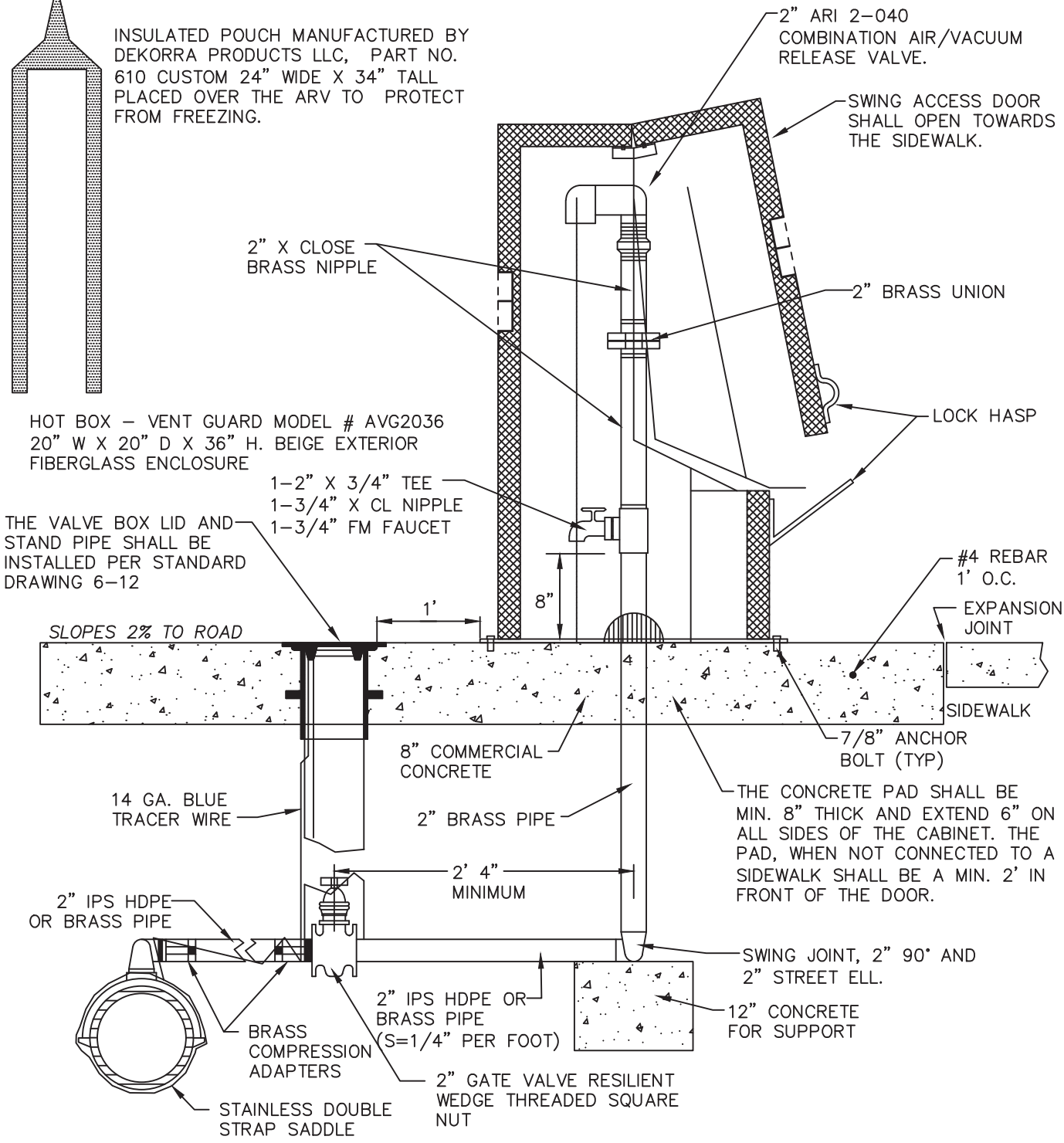
VALVE MARKER POST & HYDRANT BOLLARD DETAIL

APPR. DATE:		FIG NO: WA-05

Source; City of Olympia

THURSTON COUNTY WATER STANDARD DETAIL

INSULATED POUCH MANUFACTURED BY DEKORRA PRODUCTS LLC, PART NO. 610 CUSTOM 24" WIDE X 34" TALL PLACED OVER THE ARV TO PROTECT FROM FREEZING.



NOTES:

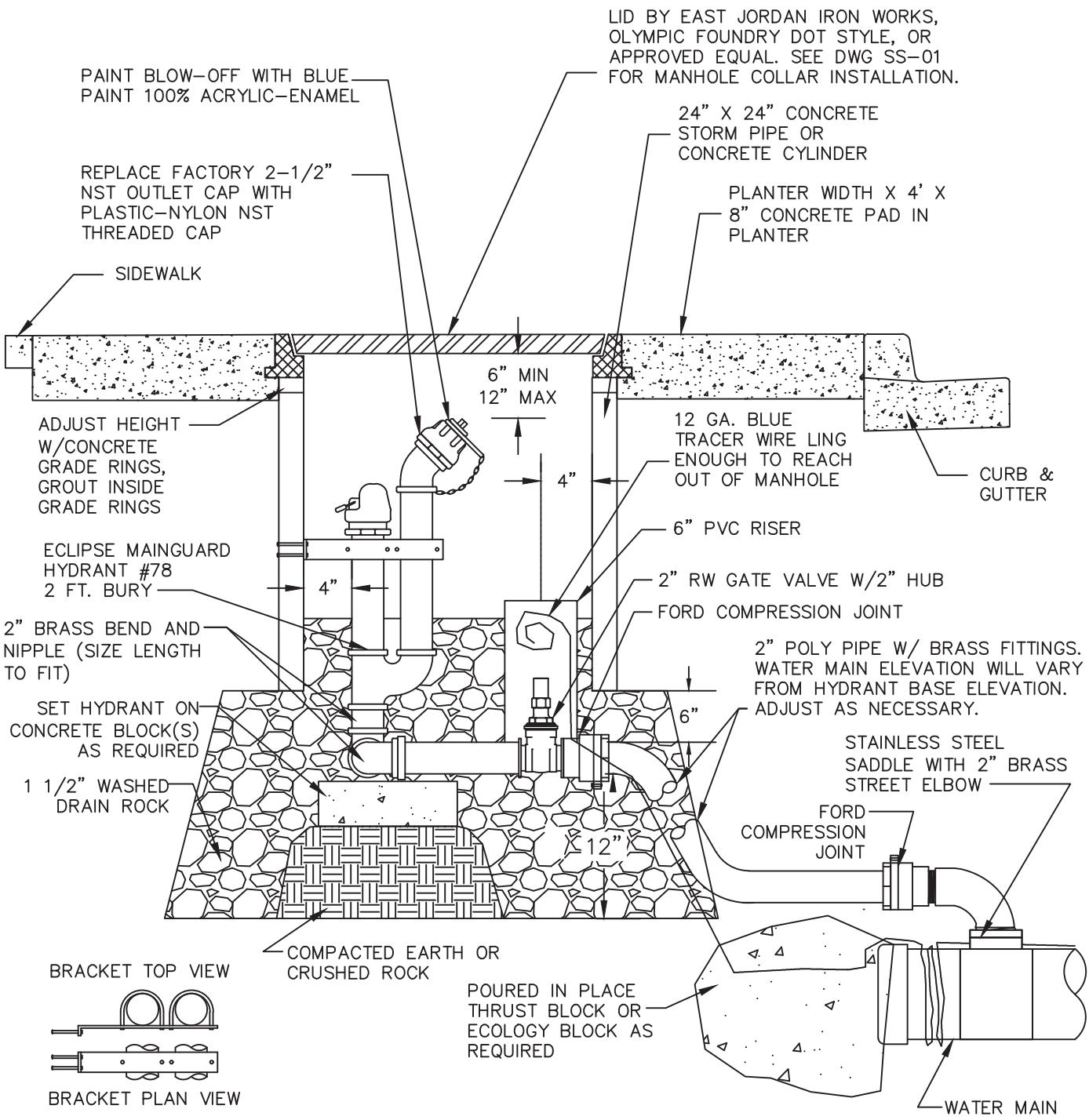
1. VALVE ASSEMBLY SHALL BE SET AT THE HIGH POINT OF THE LINE.
2. ALL AIR/VACUUM RELEASE VALVES SHALL BE INSTALLED BEHIND THE SIDEWALK AT THE NEAREST PROPERTY CORNER AND NOT IN FRONT OF A RESIDENCE.
3. AIR RELEASE VALVES SHALL BE 2" ARI D-040 WITH THERMO PROTECTION ENCASEMENT.
4. ALL FITTINGS AND PIPING SHALL BE DOMESTIC BRASS.
5. CABINET SHALL OPEN TOWARDS THE SIDEWALK.
6. INSTALL THE INSULATED POUCH 602-DT OVER THE ARV UNIT TO PROTECT IT FROM FREEZING.

2" AIR AND VACUUM RELEASE VALVE

APPR. DATE:		FIG NO:	WA-06

Source; City of Olympia

THURSTON COUNTY WATER STANDARD DETAIL



THE BRACKETS SHOULD BE CUSTOM MADE SINCE THE SPACING OR LOCATION OF THE UNIT MAY VARY. ALL PARTS SHALL BE STAINLESS STEEL A MIN. 3/16" THICK, 1-3/4" HIGH. THE NUTS AND BOLTS SHALL BE 3/8" STAINLESS STEEL.

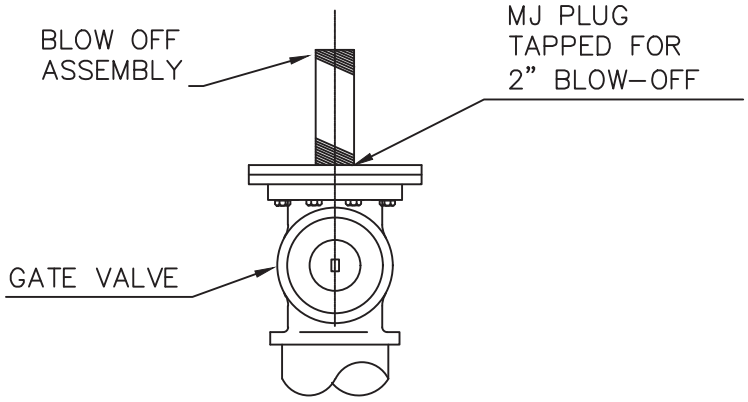
GENERAL NOTES:

1. ALL BRASS PIPING AND FITTINGS SHALL BE DOMESTIC AND MANUFACTURED IN THE U.S.A.
2. IN A CUL-DE-SAC SCENARIO THE BLOW-OFF SHALL END AT THE MIDDLE OF THE SAC.
3. THERE SHALL NOT BE ANY SERVICE CONNECTIONS PAST THE BLOW-OFF

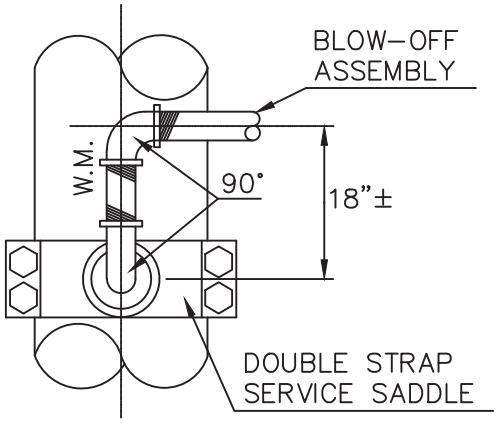
2"-BLOWOFF-ASSEMBLY

APPR. DATE:	REF: CITY OF LACEY	FIG NO: WA-07

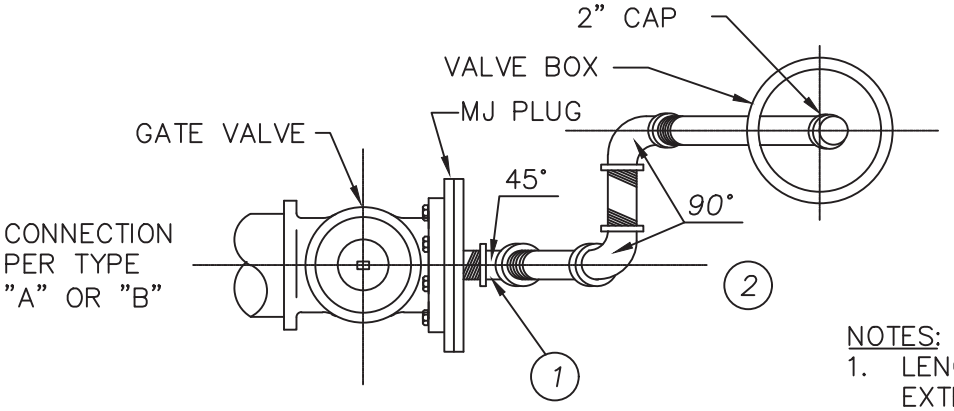
THURSTON COUNTY WATER STANDARD DETAIL



TYPE "A" (END CAP) DEAD END SYSTEM ONLY

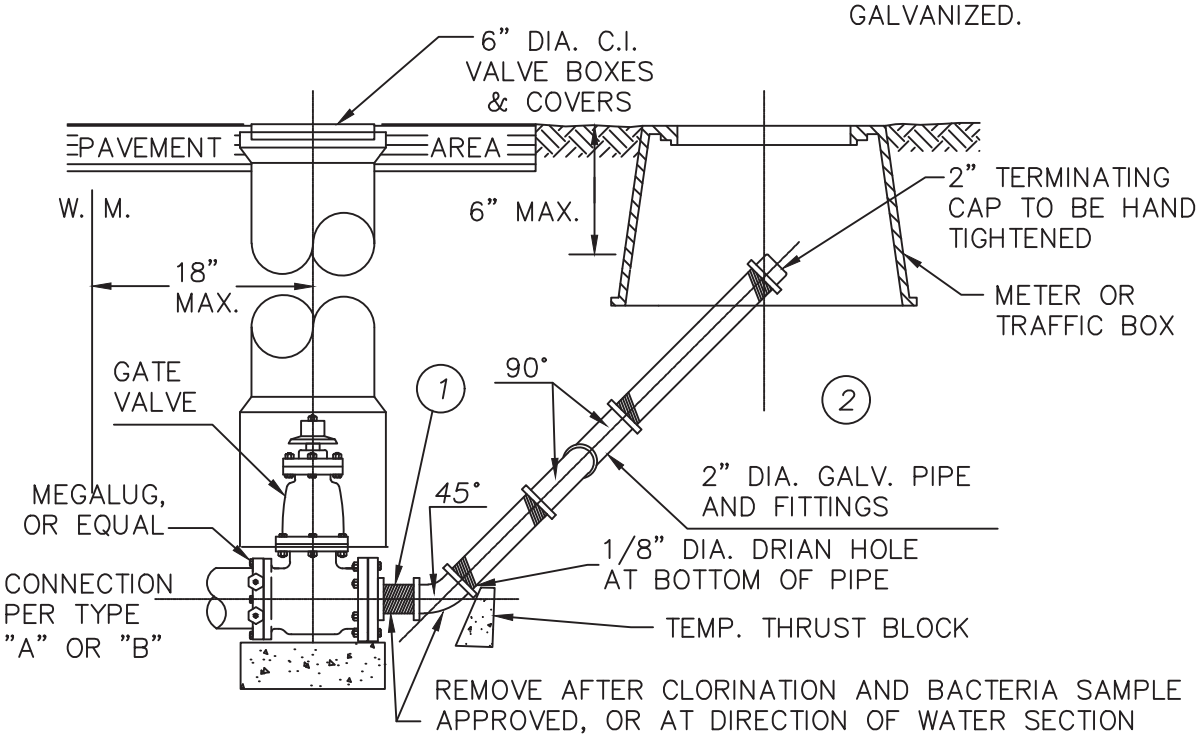


TYPE "B" (TOP/IN-LINE)



PLAN VIEW

NOTES:
1. LENGTH OF PIPE AS DIRECTED TO EXTEND BLOW-OFF TERMINUS BEYOND EDGE OF PAVEMENT.
2. ALL PIPE AND FITTINGS TO BE GALVANIZED.

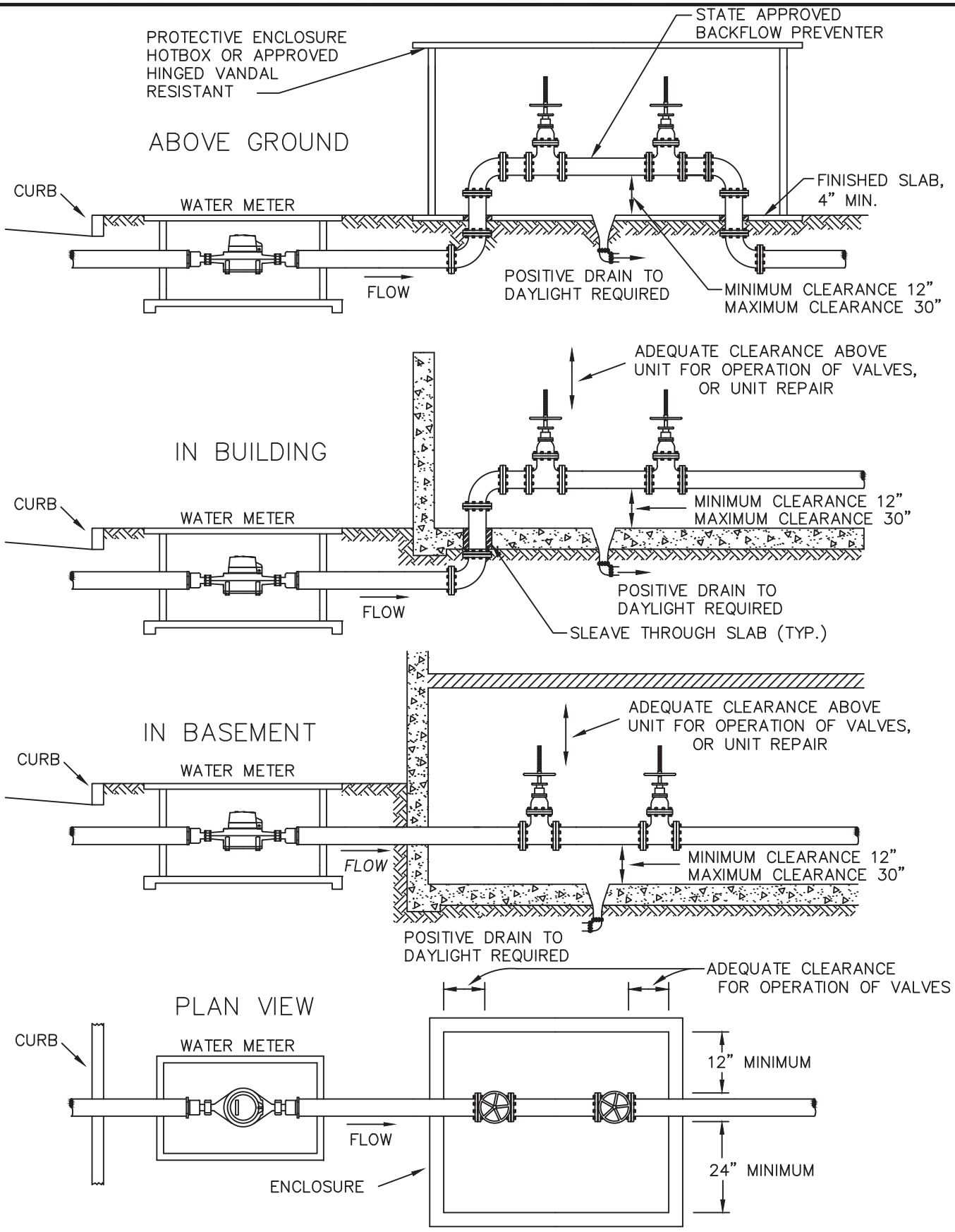


2" TEMPORARY BLOW-OFF ASSEMBLY TYPE "A" AND "B"

APPR. DATE:		FIG NO:	WA-08

Source; City of Olympia

THURSTON COUNTY WATER STANDARD DETAIL

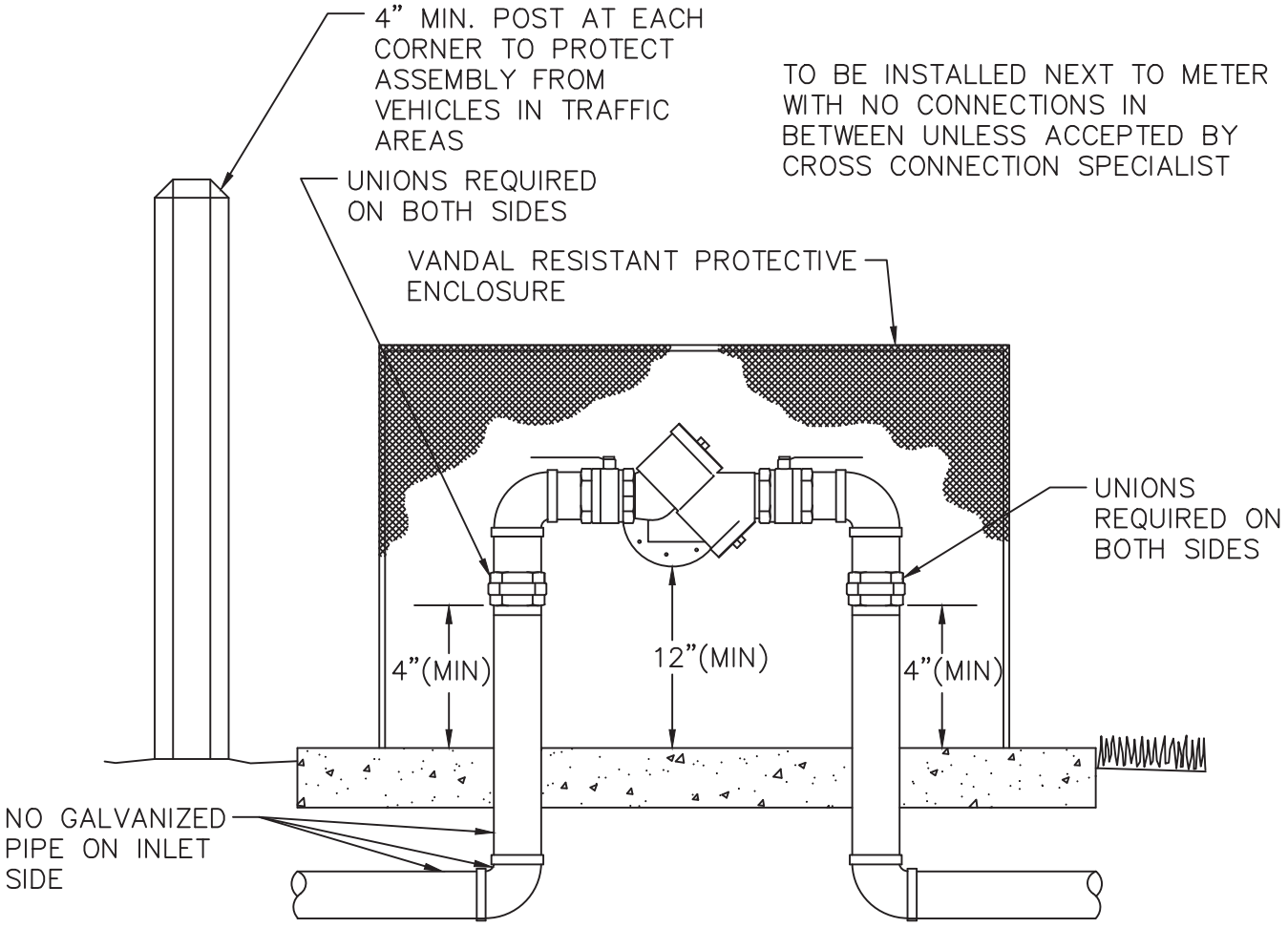


TYPICAL INSTALLATION WITH MINIMUM CLEARANCE & BACKFLOW PREVENTION DEVICE ASSEMBLY

APPR. DATE:		FIG NO:	WA-09

Source; City of Olympia

THURSTON COUNTY WATER STANDARD DETAIL



(ABOVE GROUND INSTALLATION)

NOTE:
1. ENCLOSURE TO BE LOCATED OUTSIDE OF FENCED AREAS.

ALL ITEMS SHALL COMPLY WITH THE FOLLOWING:
1. APPROVED REDUCED PRESSURE BACK FLOW ASSEMBLY SHALL LAY HORIZONTAL ONLY.
2. DESIGNED FOR BACK SIPHONAGE AND BACK PRESSURE.
3. THOROUGHLY FLUSH LINES PRIOR TO INSTALLATION OF BACK FLOW PREVENTER.
4. DO NOT INSTALL IN AN AREA SUBJECT TO FLOODING.
5. NO GALVANIZED PIPE BEFORE ASSEMBLY.
6. VALVE SHALL BE PROTECTED FROM FREEZING CONDITIONS.
7. THE BACK FLOW ASSEMBLY SHALL BE A CURRENT WASHINGTON STATE DEPARTMENT OF HEALTH APPROVED MODEL.
8. A PLUMBING PERMIT IS REQUIRED.

2" AND SMALLER REDUCED PRESSURE (RP) INSTALLATION

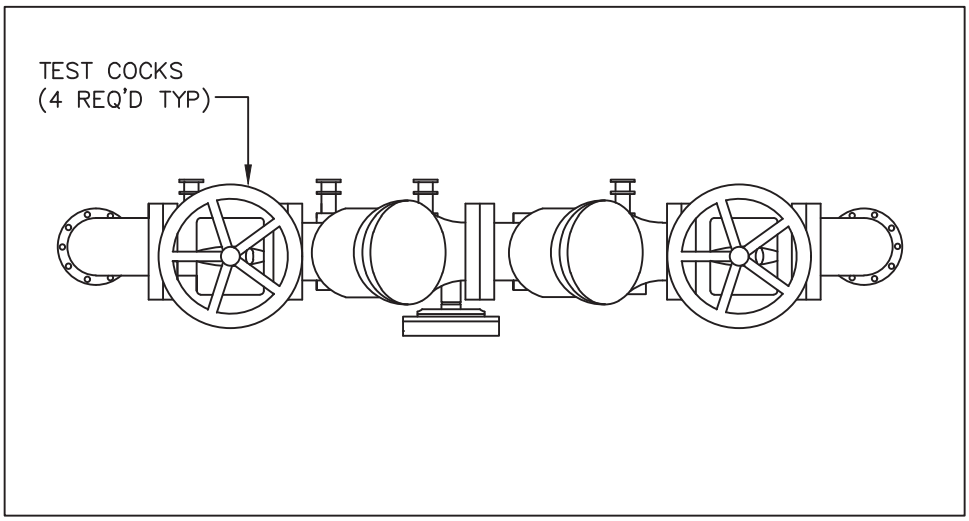
APPR. DATE:		FIG NO: WA-10

Source; City of Olympia

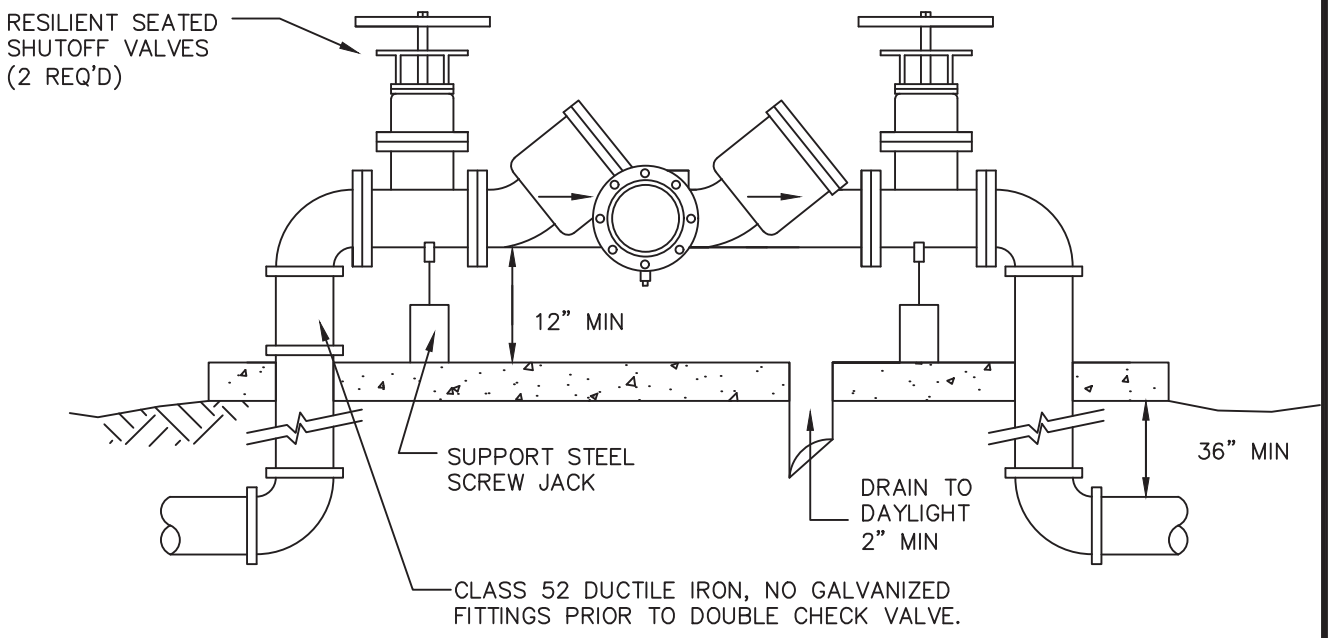
THURSTON COUNTY WATER STANDARD DETAIL

A COUNTY APPROVED VALVE IS REQ'D. BETWEEN THE SUPPLY MAIN AND THE VAULT.

PROVIDE HEAT OR REMOVABLE INSULATED ENCLOSURE ON OUTSIDE APPLICATIONS: PRO–BOX, HOT BOX OR EQUAL INSULATED ENCLOSURES.



TOP VIEW



SIDE VIEW

(ABOVE GROUND INSTALLATION)

NOTES:

ALL ITEMS SHALL COMPLY WITH THE FOLLOWING:

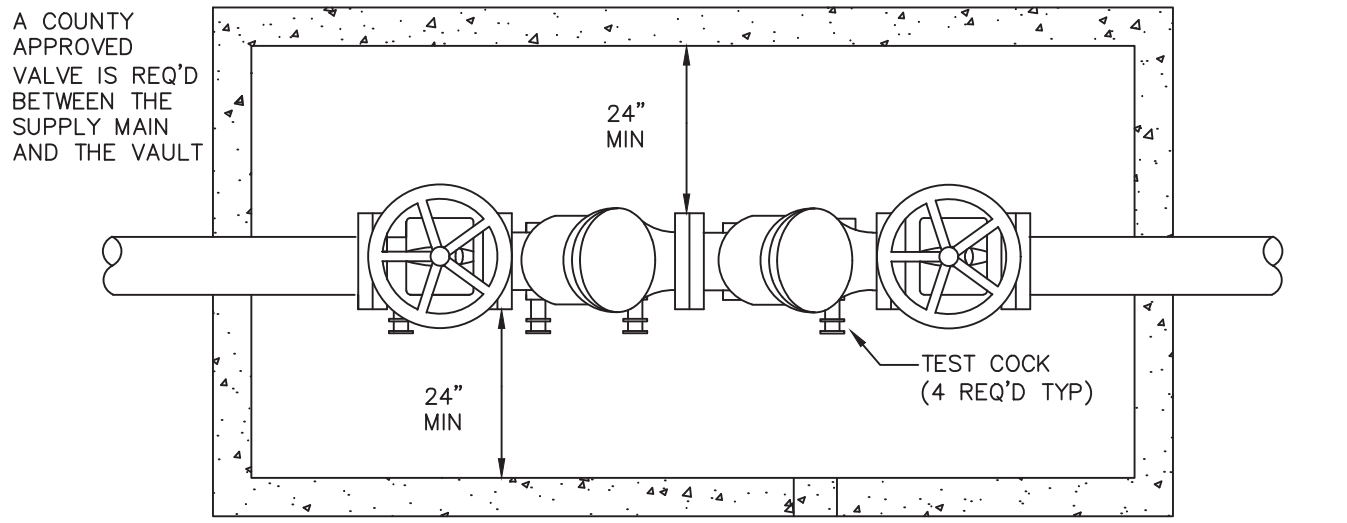
1. APPROVED BY THE WASHINGTON STATE DEPARTMENT OF HEALTH.
2. APPROVED REDUCED PRESSURE BACK FLOW ASSEMBLY TO LAY HORIZONTAL ONLY.
3. DESIGNED FOR BACK SIPHONAGE AND BACK PRESSURE.
4. THE WATER LINE SHALL BE DISINFECTED, FLUSHED, AND PRESSURE TESTED PRIOR TO INSTALLING THE BACK FLOW ASSEMBLY. THE BACK FLOW ASSEMBLY SHALL BE PROTECTED FROM FREEZING AND FLOODING.
5. ALL PIPE, VALVES, AND FITTING JOINTS, FROM SUPPLY MAIN, SHALL BE FLANGED AND RESTRAINED.
6. ALL ENCLOSURES AND AIR–GAP DRAINS SHALL BE PRE APPROVED PRIOR TO INSTALLATION.
7. ALL LOCATIONS SHALL BE PRE APPROVED PRIOR TO INSTALLATION.
8. ENCLOSURES SHALL HAVE A MINIMUM OF 3' CLEARANCE FROM ALL STRUCTURES.
9. THE BACK FLOW ASSEMBLY SHALL BE TESTED AFTER INSTALLATION AND PRIOR TO ACCEPTANCE AND ALSO YEARLY THEREAFTER BY A CERTIFIED BACK FLOW ASSEMBLY TESTER. TEST RESULTS SHALL BE SENT TO THE THURSTON COUNTY PUBLIC WORKS WATER RESOURCE DIVISION.
10. FIRE SERVICES REQUIRE DETECTOR TYPE BACK FLOW PROTECTION ASSEMBLIES.

STANDARD REDUCED PRESSURE BACKFLOW ASSEMBLY 2 1/2" OR LARGER

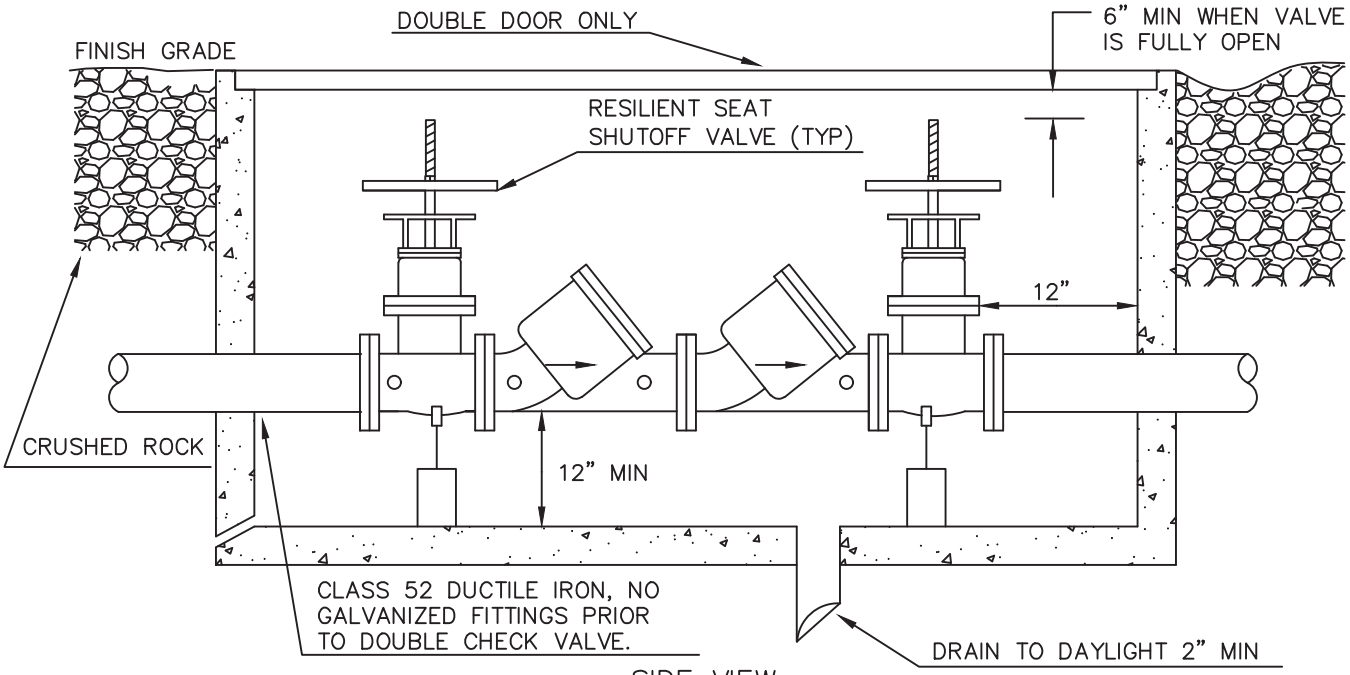
APPR. DATE:		FIG NO:	WA-11

Source; City of Olympia

THURSTON COUNTY WATER STANDARD DETAIL



TOP VIEW



SIDE VIEW

(ABOVE GROUND INSTALLATION)

NOTE:

ALL ITEMS SHALL COMPLY WITH THE FOLLOWING:

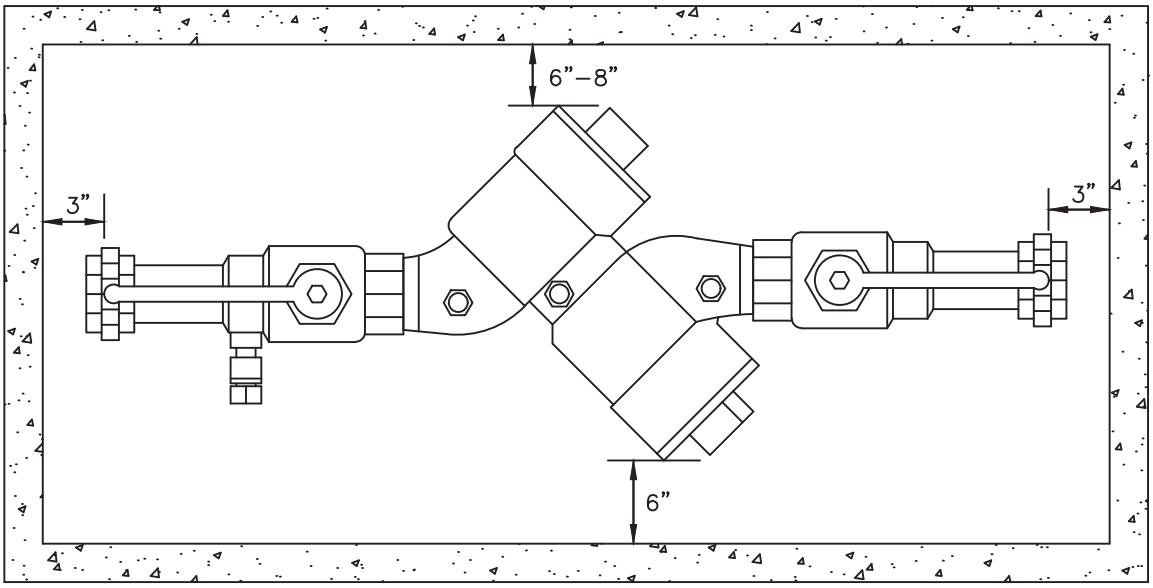
1. DOUBLE CHECK VALVE ASSEMBLY SHALL BE A WASHINGTON STATE DEPT. OF HEALTH APPROVED MODEL.
2. BACK FLOW ASSEMBLY SHALL BE AN APPROVED MODEL W/4 TEST COCKS AND A RESILIENT SEATED SHUT OFF VALVE MOUNTED AT EACH END AND MEET MINIMUM STATE STANDARDS FOR BACK FLOW PROTECTION.
3. THE WATER LINE SHALL BE DISINFECTED, FLUSHED, AND PRESSURE TESTED PRIOR TO INSTALLING THE BACK FLOW ASSEMBLY. THE BACK FLOW ASSEMBLY SHALL BE PROTECTED FROM FLOODING.
4. THE BACK FLOW ASSEMBLY SHALL BE TESTED AFTER INSTALLATION AND PRIOR TO ACCEPTANCE AND ALSO YEARLY THEREAFTER BY A CERTIFIED BACK FLOW ASSEMBLY TESTER. TEST RESULTS SHALL BE SENT TO THE THURSTON COUNTY PUBLIC WORKS WATER RESOURCES DIVISION.
5. ALL PIPE VALVE AND FITTING JOINTS, FROM THE SUPPLY MAIN, SHALL BE FLANGED AND RESTRAINED.
6. FIRE DEPT. CONNECTION SHALL NOT EXIT THROUGH THE TOP OF THE VAULT.
7. GROUT PIPE ENTRANCE AND EXIT, IN VAULT, WITH WATERTIGHT GROUT.
8. ALL VAULTS SHALL BE PRE APPROVED PRIOR TO INSTALLATION.
9. VAULTS SHALL BE INSTALLED AT PROPERTY LINE OR EASEMENT LINE AND ON OWNERS PROPERTY.
10. VAULTS SHALL HAVE A MINIMUM OF 3' CLEARANCE FROM ALL STRUCTURES.
11. FIRE SERVICES REQUIRE DETECTOR TYPE BACK FLOW PROTECTION ASSEMBLIES.

2 1/2" AND LARGER DOUBLE CHECK VALVE ASSEMBLY

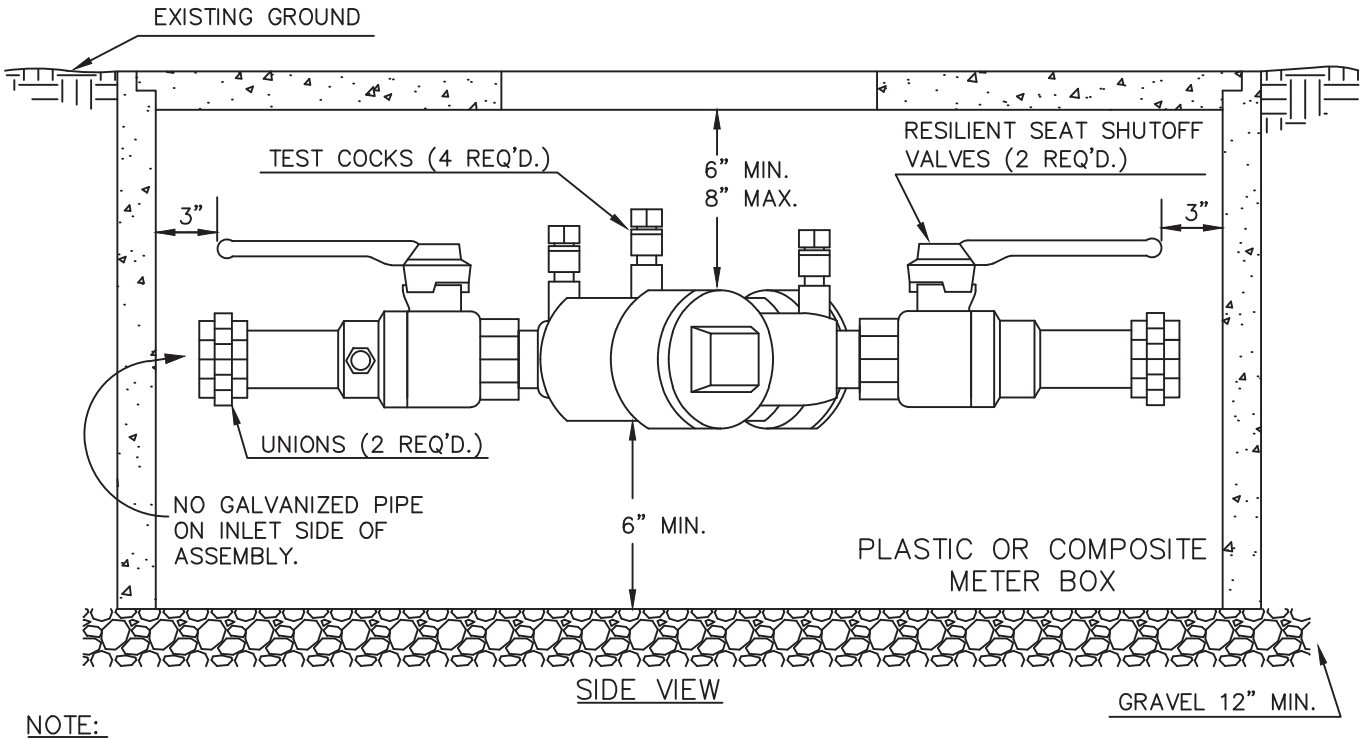
APPR. DATE:		FIG NO:	WA-12

Source; City of Olympia

THURSTON COUNTY WATER STANDARD DETAIL



TOP VIEW



SIDE VIEW

NOTE:

ALL ITEMS SHALL COMPLY WITH THE FOLLOWING:

1. APPROVED DOUBLE CHECK VALVE ASSEMBLY SHALL LAY HORIZONTAL WITH GROUND.
2. DESIGNED FOR BACK SIPHONAGE AND BACK PRESSURE.
3. THOROUGHLY FLUSH LINES PRIOR TO INSTALLATION OF BACK FLOW PREVENTER.
4. NO GALVANIZED PIPE BEFORE ASSEMBLY.
5. THE DCVA MAY BE INSTALLED ABOVE OR BELOW THE GROUND PROVIDED ALL CLEARANCES ARE MET.
6. DO NOT INSTALL IN AN AREA SUBJECT TO FLOODING.
7. VALVE SHALL BE PROTECTED FROM FREEZING CONDITIONS.
8. THE BACK FLOW ASSEMBLY SHALL BE A MODEL CURRENTLY APPROVED BY THE WASHINGTON STATE DEPARTMENT OF HEALTH.
9. A PLUMBING PERMIT IS REQUIRED.

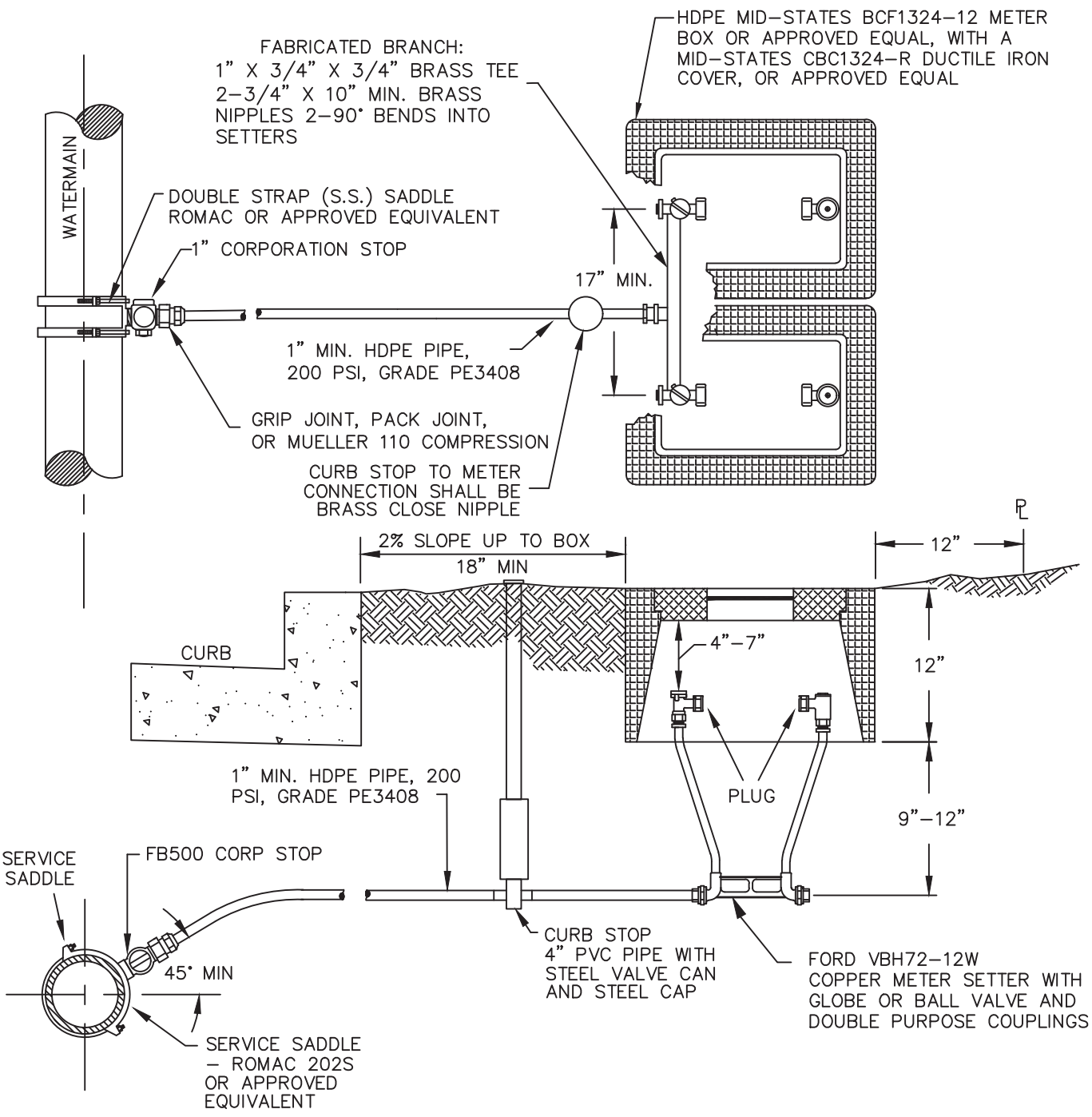
(BELOW GROUND INSTALLATION)

2" AND SMALLER DOUBLE CHECK VALVE ASSEMBLY

APPR. DATE:		FIG NO:	WA-13

Source; City of Olympia

THURSTON COUNTY WATER STANDARD DETAIL



NOTES:

1. CORPORATION STOPS SHALL BE ALL U.S. BRASS, & SHALL BE FORD, MUELLER, OR A.Y. MCDONALD W/ THREADS CONFORMING TO AWWA C-800.
2. ALL SERVICE SADDLES SHALL HAVE RUBBER GASKET, I.P. THREADS, & STAINLESS STEEL DOUBLE STRAPS.
3. ANGLE CHECK VALVE REQUIRED ON ALL WATER METER OUTLETS

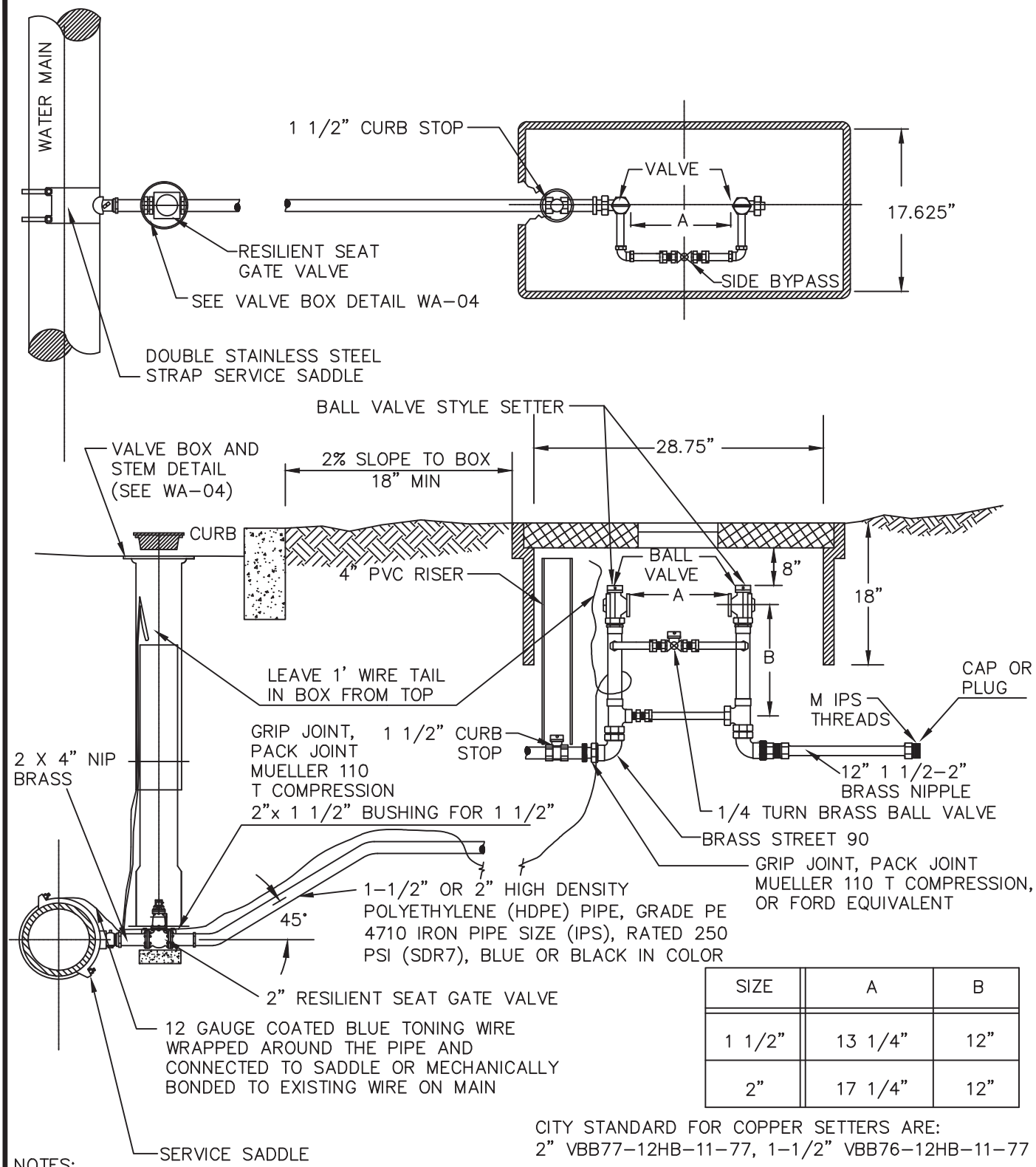
N.T.S.

1" DUAL WATER SERVICE

APPR. DATE:		FIG NO:	WA-14

Source; City of Chehalis

THURSTON COUNTY WATER STANDARD DETAIL



SIZE	A	B
1 1/2"	13 1/4"	12"
2"	17 1/4"	12"

CITY STANDARD FOR COPPER SETTERS ARE:
2" VBB77-12HB-11-77, 1-1/2" VBB76-12HB-11-77

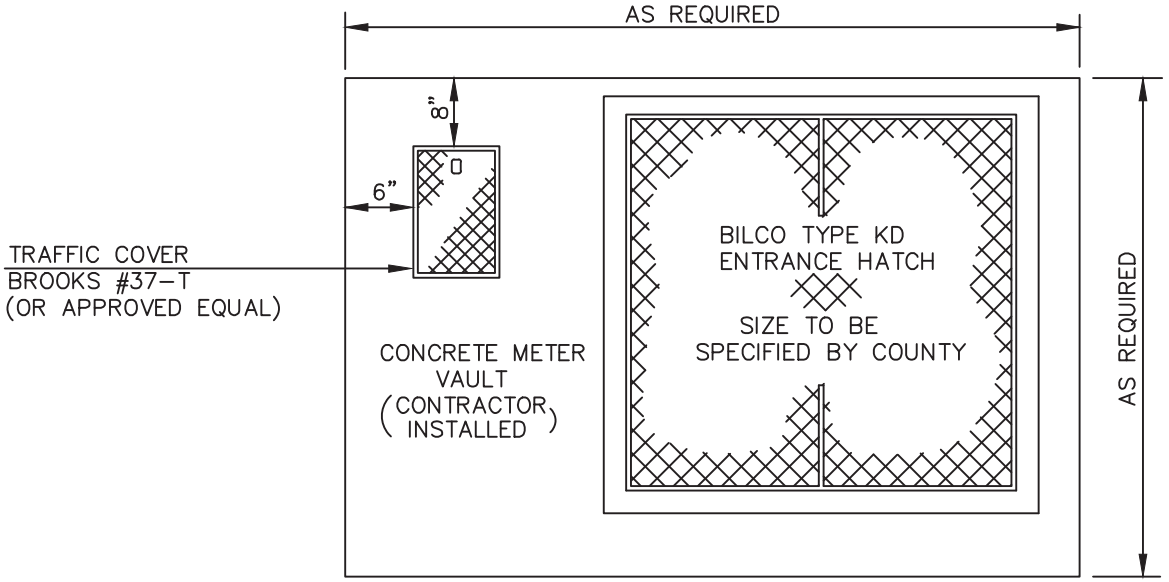
NOTES:
1. ALL SERVICE SADDLES SHALL HAVE RUBBER GASKET AND I.P. THREADS.
2. SETTERS SHALL BE CENTERED IN METER BOXES.
3. STAINLESS STEEL INSERTS REQUIRED FOR ALL PACK JOINTS, OR GRIP JOINTS.
4. METER BOX SHALL BE HDPE CARSON BCF1730-18 OR APPROVED EQUAL, WITH DUCTILE IRON COVER OR APPROVED EQUAL.
5. SEE STANDARD DRAWINGS WA-34 AND WA-35 FOR COVER DETAIL.

TYPICAL 1-1/2" AND 2" WATER SERVICE & METER SETTER W/BYPASS

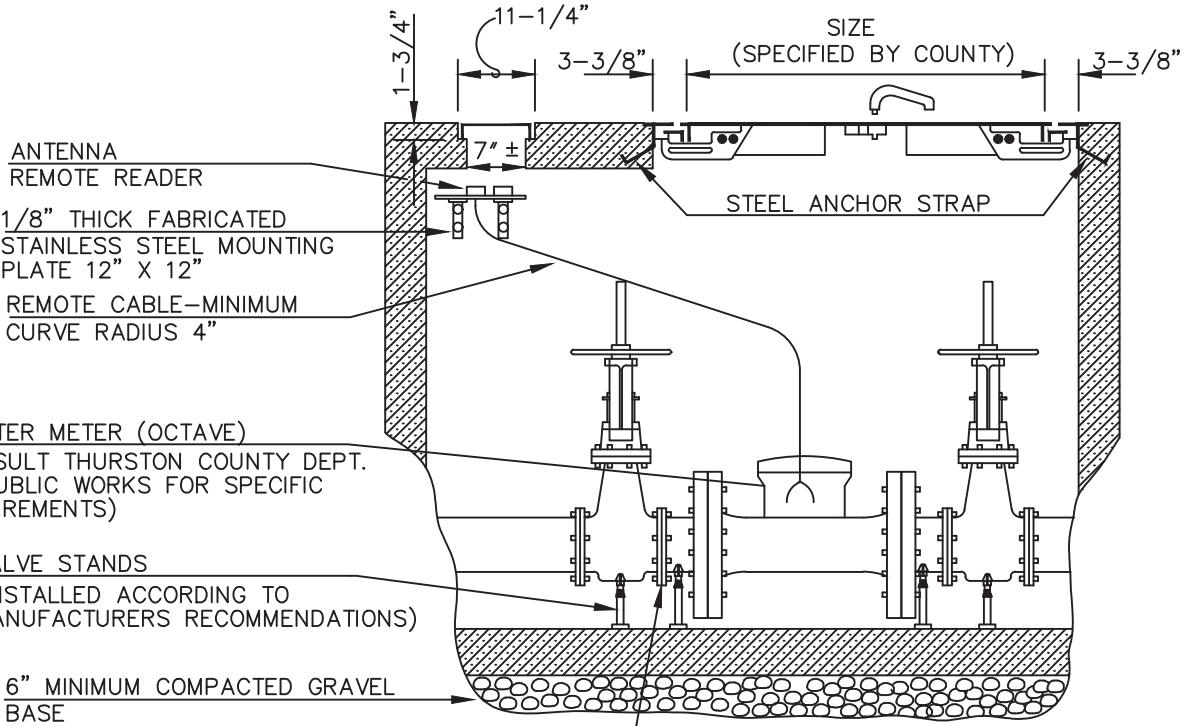
APPR. DATE:		FIG NO:	WA-15

Source; City of Olympia

THURSTON COUNTY WATER STANDARD DETAIL



PLAN VIEW
N.T.S.



ELEVATION VIEW
N.T.S.

NOTES:

1. VAULT SHALL BE DESIGNED BY A STRUCTURAL ENGINEER LICENSED IN THE STATE OF WASHINGTON
2. MOUNTING PLATE TO BE INSTALLED BY CONTRACTOR SO THAT ALL READING REGISTERS ARE VISIBLE THROUGH TRAFFIC COVER, AND CABLE(S) DO NOT INTERFERE WITH ACCESS TO METER.

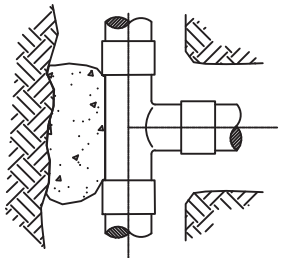
N.T.S.

LARGE METER VAULT

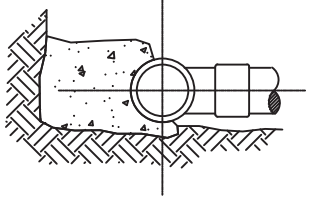
APPR. DATE:		FIG NO:	WA-16

Source; City of Chehalis

THURSTON COUNTY WATER STANDARD DETAIL

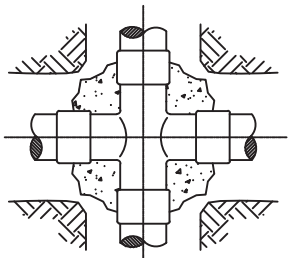


TOP VIEW

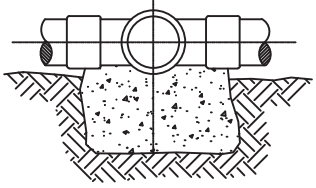


SIDE VIEW

TEE

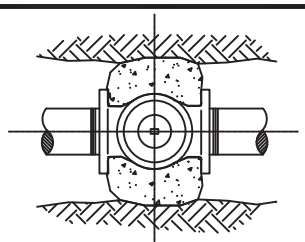


TOP VIEW

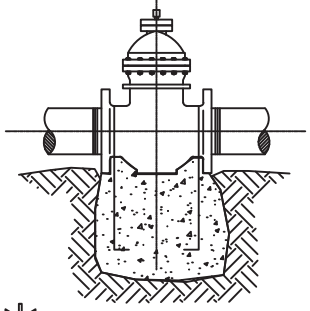


SIDE VIEW

CROSS

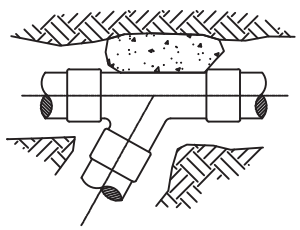


TOP VIEW

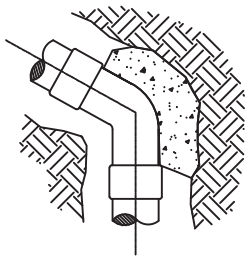


* SIDE VIEW

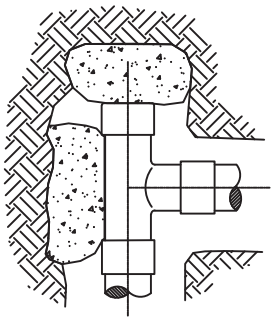
GATE VALVE



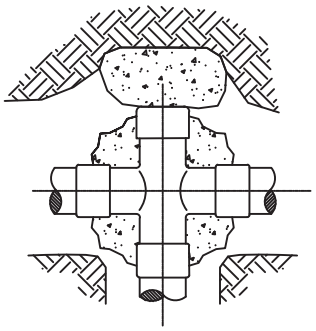
WYE



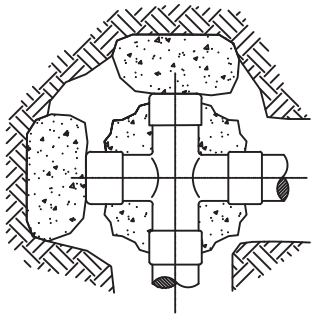
HORIZ. BEND



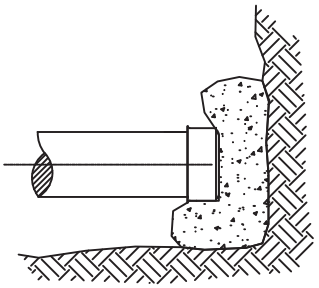
TEE WITH PLUG



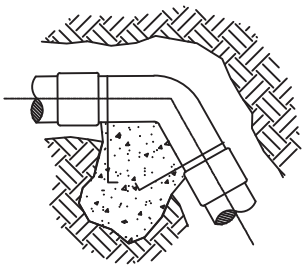
CROSS WITH PLUG



CROSS WITH PLUGS



PLUG OR CAP



45° – 90° VERTICAL BEND

* IF IN THE OPINION OF THE COUNTY ENGINEER THE VALVE IS ON A SLOPE AND/OR THE COVER ON THE PIPE WOULD APPLY UPWARD THRUST, THEN THRUST BLOCKING WILL BE REQUIRED.

NOTES:

1. CONCRETE THRUST BLOCKING TO BE POURED AGAINST UNDISTURBED EARTH.
2. ECOLOGY BLOCKS OR OTHER DRY BLOCKING MAY BE USED WITH COUNTY'S APPROVAL.
3. PLASTIC BARRIER SHALL BE PLACED BETWEEN ALL THRUST BLOCKS & FITTINGS.
4. ANCHOR REBAR SHALL BE #5 ON 12" DIA. AND LESS WITH 30" IMBEDMENT, #5 ON 16"–24" DIAMETER WITH 36" IMBEDMENT.
5. PLUGS TO BE MINIMUM OF 5' FROM TEE, WYE, CROSS ON VALVE.

STANDARD BLOCKING DETAIL

APPR. DATE:		FIG NO: WA-17

Source; City of Olympia

THURSTON COUNTY WATER STANDARD DETAIL

NOTES:

1. BLOCKING SHALL BE CEMENT CONCRETE CLASS "B" POURED IN PLACE AGAINST UNDISTURBED EARTH. FITTING SHALL BE ISOLATED FROM CONCRETE THRUST BLOCK WITH 11 MIL PLASTIC OR SIMILAR MATERIAL.

2. KEEP CONCRETE CLEAR OF JOINTS AND ACCESSORIES.

3. THE REQUIRED THRUST BEARING AREAS FOR SPECIAL CONNECTIONS ARE SHOWN ENCIRCLED ON THE PLANS; e.g. (15) INDICATES 15 SQUARE FEET BEARING AREA REQUIRED.

4. IF NOT SHOWN ON PLANS REQUIRED BEARING AREAS AT FITTINGS SHALL BE PRESSURE(S) AND ALLOWABLE SOIL BEARING STRESS(ES) STATED IN THE SPECIAL SPECIFICATIONS.

5. BEARING AREAS AND SPECIAL BLOCKING DETAILS SHOWN ON PLANS TAKE PRECEDENCE OVER BEARING AREAS AND BLOCKING DETAILS SHOWN ON THIS STANDARD DETAIL.

BEARING AREA OF THRUST BLOCKS IN SQ. FT.

FITTING SIZE	TEE, WYE PLUG OR CAP	90° BEND PLUGGED CROSS	TEE PLUGGED ON RUN A_1	TEE PLUGGED ON RUN A_2	45° BEND	22-1/2° BEND	11-1/4° BEND
4"	1.0	1.4	1.9	1.4	1.0		
6"	2.1	3.0	4.3	3.0	1.6	1.0	
8"	3.8	5.3	7.6	5.4	2.9	1.5	1.0
10"	5.9	8.4	11.8	8.4	4.6	2.4	1.2
12"	8.5	12.0	17.0	12.0	6.6	3.4	1.7
14"	11.5	16.3	23.0	16.3	8.9	4.6	2.3
16"	15.0	21.3	30.0	21.3	11.6	6.0	3.0
12"	19.0	27.0	38.0	27.0	14.6	7.6	3.8
14"	23.5	33.0	47.0	33.0	18.1	9.4	4.7
16"	34.0	48.0	68.0	48.0	26.2	13.6	6.8

NOTE:

ABOVE BEARING BASED ON TEST PRESSURE OF 150 psi AND AN ALLOWABLE SOIL BEARING STRESS OF 2,00 POUNDS PER SQUARE FOOT. TO COMPUTE BEARING AREAS FOR DIFFERENT TEST PRESSURE AND SOIL BEARING STRESSES. USE STANDARD PLAN WA-19

THRUST BLOCK AREAS

APPR. DATE:		FIG NO:	WA-18

Source; City of Lacey

THURSTON COUNTY WATER STANDARD DETAIL

THRUST LOADS

THRUST AT FITTINGS IN POUNDS AT 200 POUNDS PER SQUARE INCH OF WATER PRESSURE

PIPE DIAMETER	90° BEND	45° BEND	22-1/2° BEND	11-1/4° BEND	DEAD END OR TEE
4"	3,600	2,000	1,000	500	2,600
6"	8,000	4,400	2,300	1,200	5,700
8"	14,300	7,700	4,000	2,000	10,100
10"	22,300	12,100	6,200	3,100	15,800
12"	32,000	17,400	8,900	4,500	22,700
14"	43,600	23,600	12,100	6,100	30,800
16"	57,000	30,800	15,700	7,900	40,300

NOTES:

1. BLOCKING SHALL BE CEMENT CONCRETE CLASS "B" POURED IN PLACE AGAINST UNDISTURBED EARTH. FITTING SHALL BE ISOLATED FROM CONCRETE THRUST BLOCK WITH 11 MIL PLASTIC OR SIMILAR MATERIAL.

2. TO DETERMINE THE BEARING AREA OF THE THRUST BLOCK IN SQUARE FEET (S.F.):
EXAMPLE : 12" – 90° BEND IN SAND AND GRAVEL 32,000 LBS 3000 LB/S.F. = 10.7 S.F. OF AREA

3. AREAS MUST BE ADJUSTED FOR OTHER PIPE SIZE, PRESSURES AND SOIL CONDITIONS.

4. BLOCKING SHALL BE ADEQUATE TO WITHSTAND FULL TEST PRESSURE AS WELL AS TO CONTINUOUSLY WITHSTAND OPERATING PRESSURE UNDER ALL CONDITIONS OF SERVICE.

SAFE SOIL BEARING LOADS

FOR HORIZONTAL THRUSTS WHEN THE DEPTH OF COVER OVER THE PIPE EXCEEDS 2 FEET

SOIL	POUNDS PER SQUARE FOOT
MUCK, PEAT	0
SOFT CLAY	1,000
SAND	2,000
SAND & GRAVEL	3,000
SAND & GRAVEL CEMENTED WITH CLAY	4,000
HARD SHALE	10,000

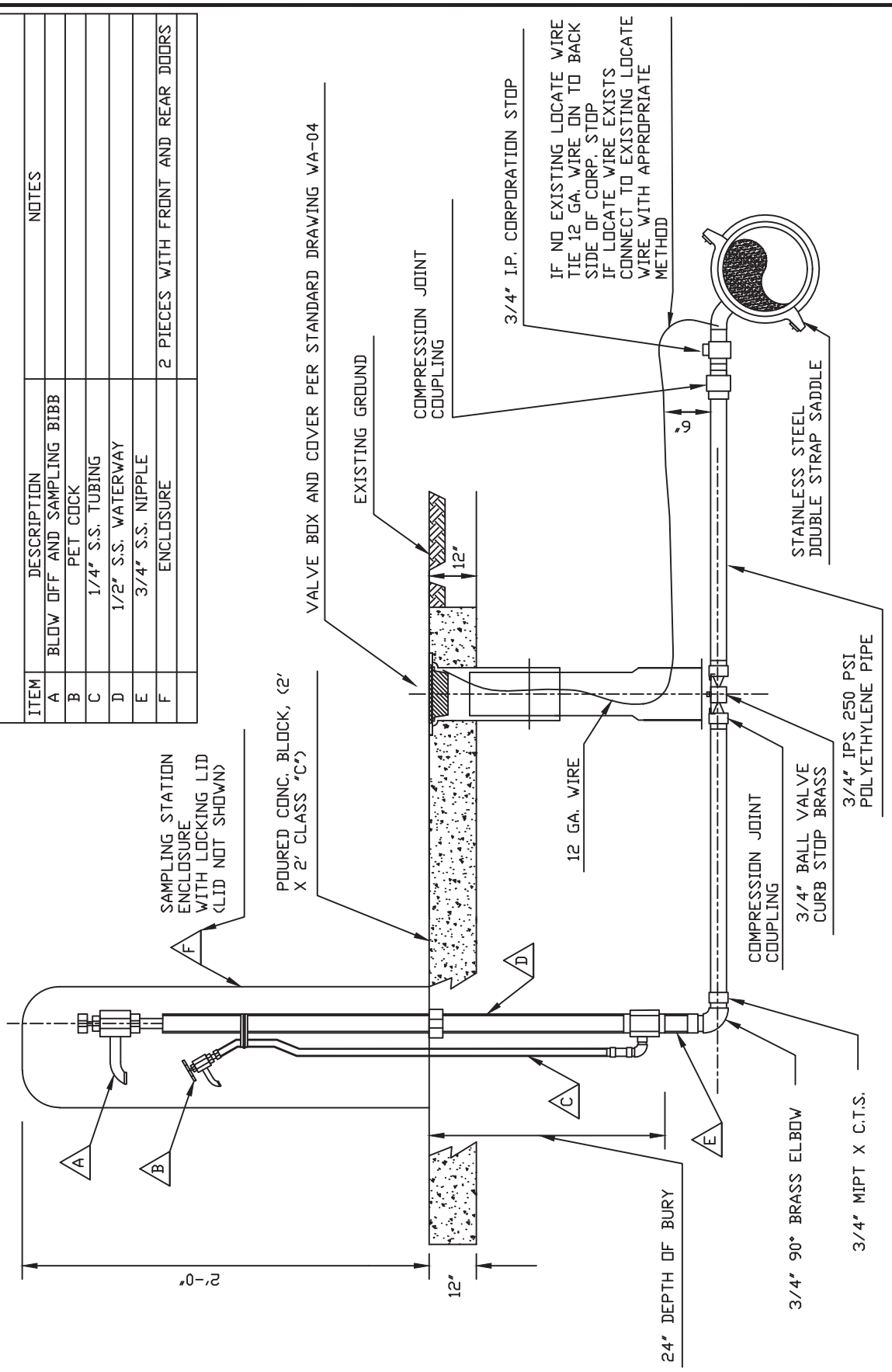
THRUST LOADS

APPR. DATE:		FIG NO:	WA-19

Source; City of Lacey

THURSTON COUNTY WATER STANDARD DETAIL

ITEM	DESCRIPTION	NOTES
A	BLOW OFF AND SAMPLING BIBB	
B	PET COCK	
C	1/4" S.S. TUBING	
D	1/2" S.S. WATERWAY	
E	3/4" S.S. NIPPLE	
F	ENCLOSURE	2 PIECES WITH FRONT AND REAR DOORS



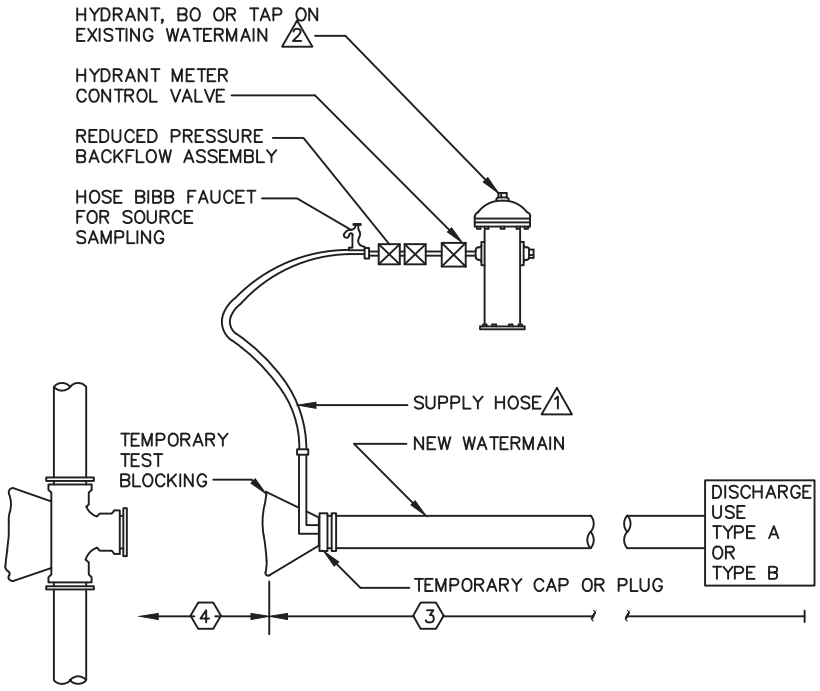
NOTES:
1. SAMPLING STATION SHALL BE MODEL ECLIPSE #88-SS AS MANUFACTURED BY THE KUPFERLE FOUNDRY COMPANY OR APPROVED EQUAL.
2. STAINLESS STEEL PET COCK WILL BE LOCATED BELOW THE SAMPLING BIBB TO ALLOW PUMPING OF REMAINING WATER TO INSURE NON-FREEZING.
3. 1 PUMP SHALL BE FURNISHED WITH EACH STATION.
4. ALL WORKING PARTS SHALL BE OF STAINLESS STEEL AND SERVICEABLE FROM ABOVE GROUND WITH NO DIGGING OR REPLACEMENT NEEDED.
5. ALL STATIONS SHALL BE ENCLOSED IN A LOCKABLE, NONREMOVABLE ALUMINUM HOUSING WITH HINGED OPENING.
6. WHEN OPEN, THE STATION SHALL REQUIRE NO KEY FOR OPERATION, AND WATER WILL FLOW IN AN ALL STAINLESS STEEL WATERWAY.
7. SAMPLING STATION SHALL BE 24" DEPTH OF BURY WITH A 1/2" FIP INLET, AND A 7/16" UNTHREADED BLOW OFF AND SAMPLING BIBB.

WATER QUALITY SAMPLING STATION

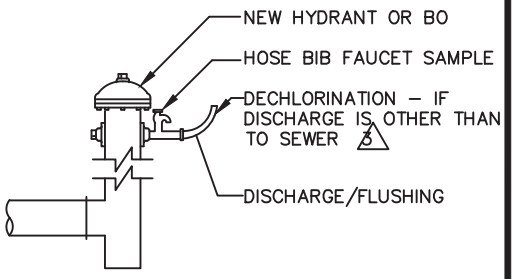
APPR. DATE:	REFER:	FIG NO: WA-20

Source; City of Olympia

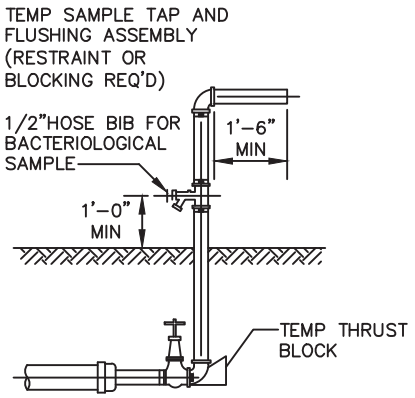
THURSTON COUNTY WATER STANDARD DETAIL



DETAIL 1
TEMPORARY FLUSHING/TESTING CONNECTION



TYPE A



TYPE B

NOTES

1. ALL FITTINGS SHALL BE DUCTILE IRON
2. ALL EXCAVATION SHALL PROVIDE A MINIMUM OF 1'–0" CLEAR AROUND PIPE AND FITTINGS.
3. THESE PLANS ARE FOR DIP AND CIP WATERMAINS 12"OR SMALLER DIA OTHER SIZES AND TYPES SEE PROJECT DRAWINGS
4. REDUCED PRESSURE BACKFLOW ASSEMBLY (RPBA) SHALL BE INSTALLED AS A UNIT (TWO SHUT–OFF VALVES, RELIEF PORT, TWO CHECK VALVES AND FOUR TEST COCKS). WHEN RPBA IS CONNECTED TO HYDRANT AND THE HOSE BIB FAUCET SAMPLE THEY SHALL BE CAPPED WHEN NOT IN USE. ASSEMBLY SHALL BE TESTED WHEN INSTALLED BY A WASHINGTON STATE CERTIFIED BACKFLOW ASSEMBLY TESTER (BAT) AND A CURRENT TEST REPORT SHALL BE ON SITE. FOR INSTALLATION PROCEDURES CALL THE THURSTON COUNTY DEPARTMENT, UTILITY SECTION.
5. WATER MUST BE DE–CHLORINATED UPON DISCHARGE.

LEGEND

1 CLEAN & DISINFECTED POTABLE WATER HOSE ONLY. SIZE FLUSHING RISER PER STD SPEC SEC 7–091.3(23)

△ 2 HYDRANT PERMIT REQUIRED

△ 3 CHECK WITH SEWER UTILITY BEFORE DISCHARGE TO SEWERS

△ 3 INSTALLED BY CONTRACTOR

⬡ 4 CONNECTION PIPE: CONTRACTOR FURNISHED AND INSTALLED

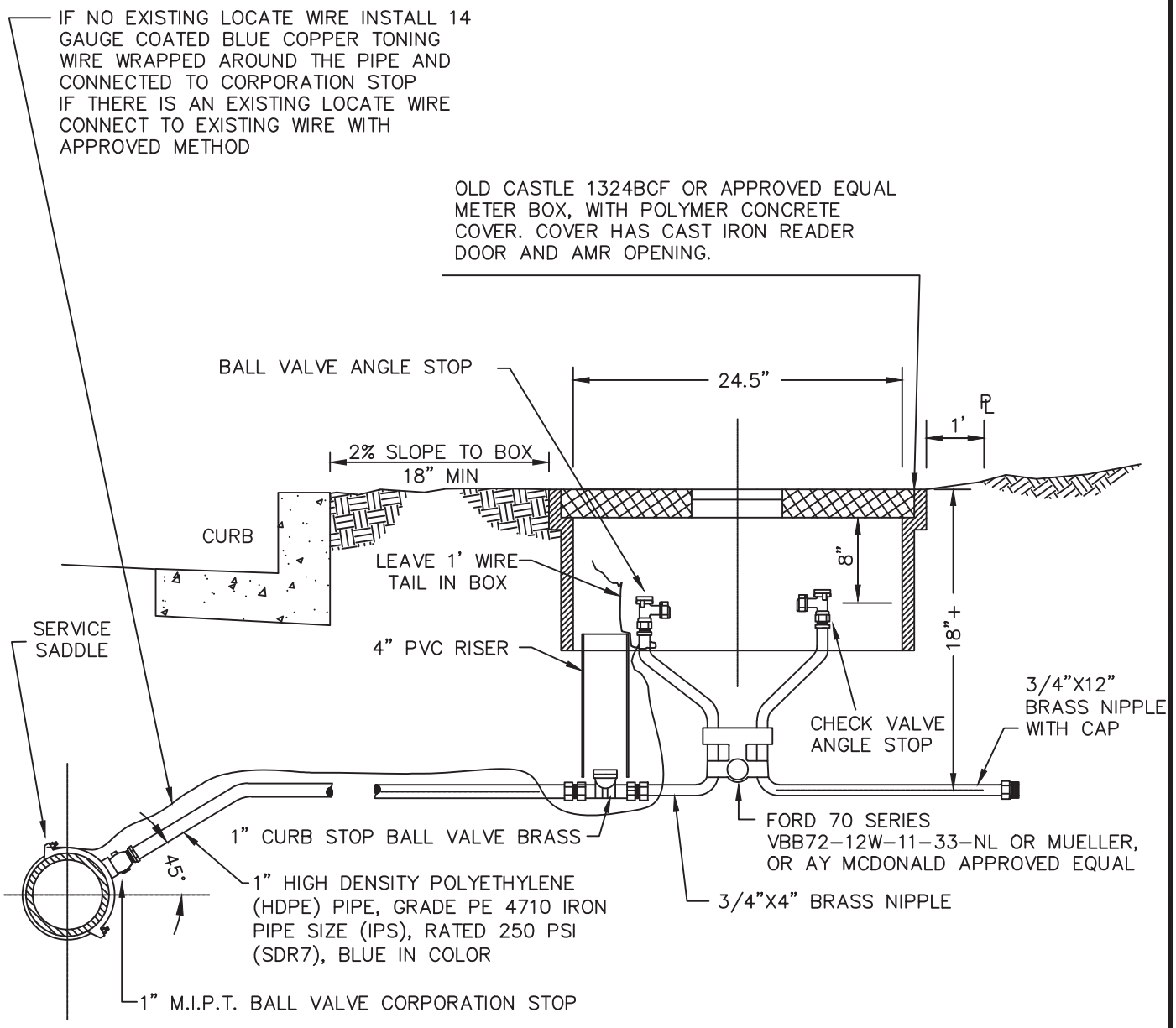
⬡

WATER TESTING – CHARGING & FLUSHING

APPR. DATE:	REFER:	FIG NO: WA-21

Source; City of Olympia

THURSTON COUNTY WATER STANDARD DETAIL



NOTES:

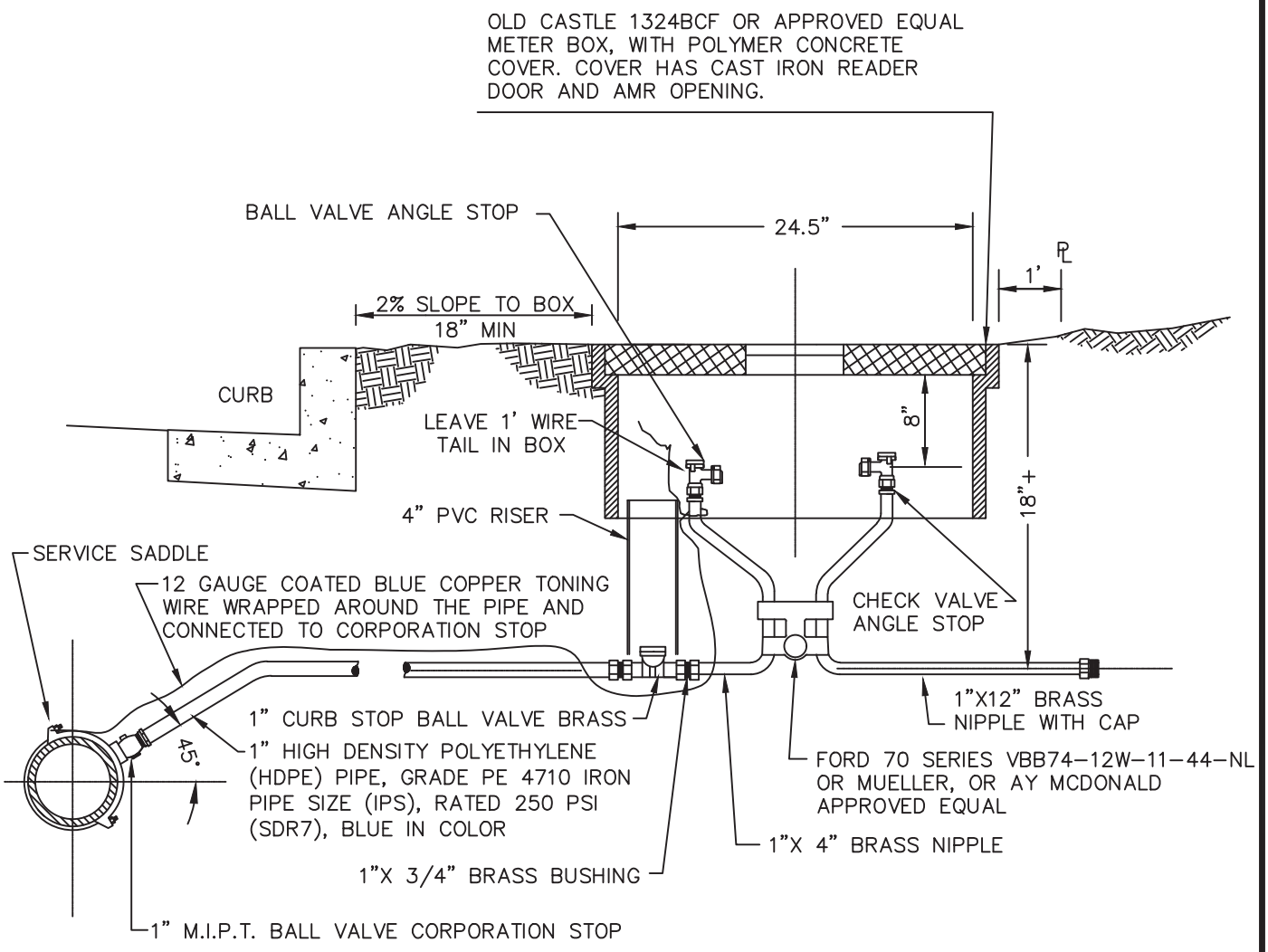
1. THURSTON COUNTY DOES NOT ALLOW THE USE OF RE-SETTERS TO MEET CLEARANCE SPECIFICATIONS.
2. CORPORATION STOPS SHALL BE ALL U.S. BRASS AND SHALL BE FORD, MUELLER, OR AY MCDONALD, WITH THREADS CONFORMING TO AWWA C800. STAINLESS STEEL INSERTS REQUIRED FOR ALL PACK JOINTS OR GRIP JOINTS.
3. SETTER SHALL BE CENTERED IN THE BOX.
4. ALL SERVICE SADDLES SHALL HAVE RUBBER GASKET, I.P. THREADS, AND STAINLESS STEEL DOUBLE STRAPS. TORQUE TO MANUFACTURES SPECIFICATIONS.
5. SEE STANDARD DRAWINGS WA-34 AND WA-35 FOR COVER DETAIL.

SINGLE SERVICE CONNECTION 1" DIAMETER TO 3/4" SETTER

APPR. DATE:		FIG NO: WA-22

Source; City of Olympia

THURSTON COUNTY WATER STANDARD DETAIL



NOTES:

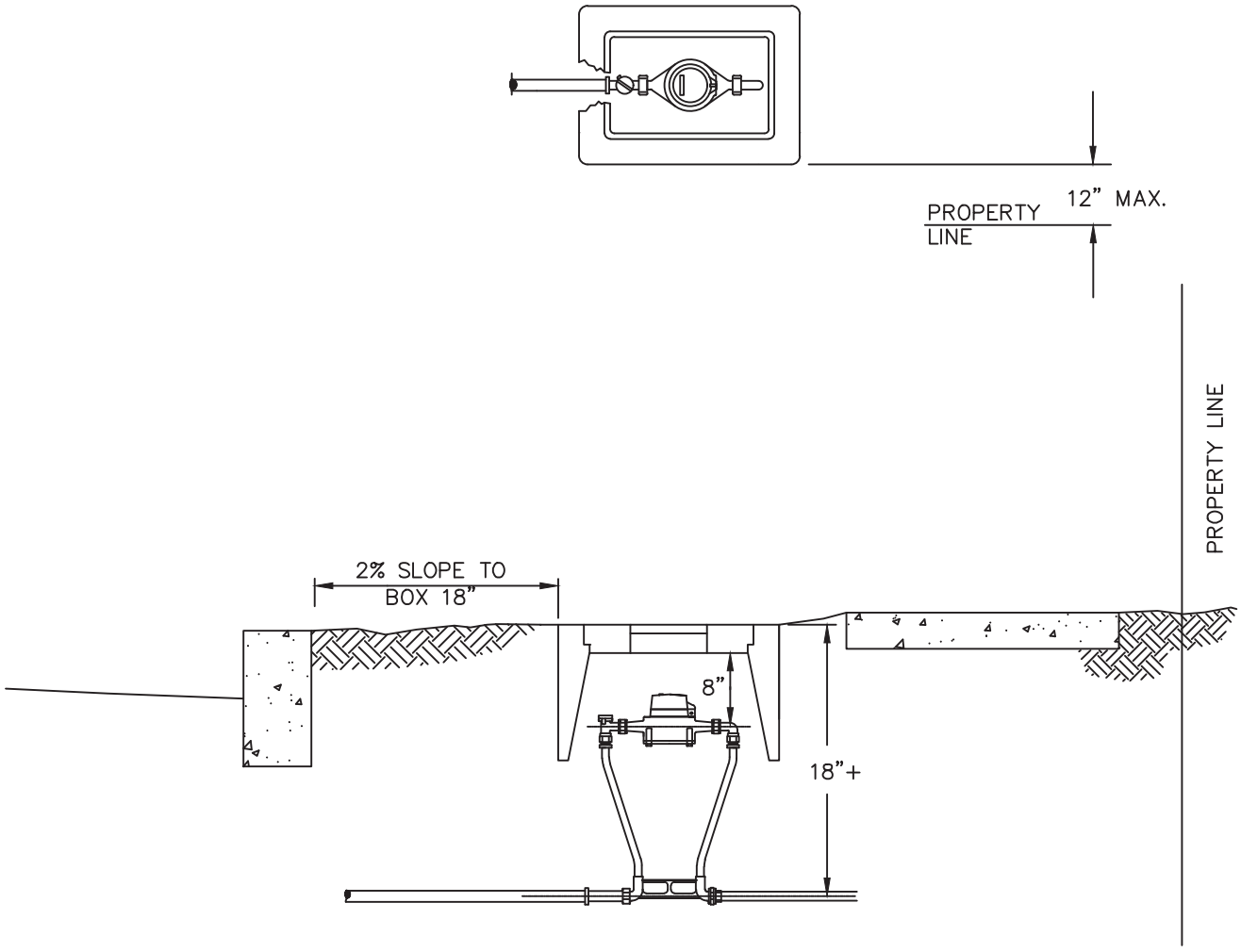
1. THURSTON COUNTY DOES NOT ALLOW THE USE OF RE-SETTERS TO MEET CLEARANCE SPECIFICATIONS.
2. CORPORATION STOPS SHALL BE ALL U.S. BRASS AND SHALL BE FORD, MUELLER, OR AY MCDONALD, WITH THREADS CONFORMING TO AWWA C800. STAINLESS STEEL INSERTS REQUIRED FOR ALL PACK JOINTS OR GRIP JOINTS.
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4. ALL SERVICE SADDLES SHALL HAVE RUBBER GASKET, I.P. THREADS, AND STAINLESS STEEL DOUBLE STRAPS. TORQUE TO MANUFACTURES SPECIFICATIONS.
5. SEE STANDARD DRAWINGS WA-34 AND WA-35 FOR COVER DETAIL.

SINGLE SERVICE CONNECTION 1" DIAMETER TO 1" SETTER

APPR. DATE:		FIG NO:	WA-23

Source; City of Olympia

THURSTON COUNTY WATER STANDARD DETAIL



TYPICAL METER PLACEMENT

APPR. DATE:		FIG NO: WA-24

Source; City of Olympia

THURSTON COUNTY WATER STANDARD DETAIL

REQUIRED OPENINGS TO FLUSH PIPELINES* (40–psi Residual Pressure)

Pipe Size in.	Flow Required to Produce 2.5–fps Velocity gpm	Orifice Size in.	Hydrant Outlet Nozzles	
			Number	Size in.
4	100	15/16	1	2 1/2
6	220	1 3/8	1	2 1/2
8	390	1 7/8	1	2 1/2
10	610	2 5/16	1	2 1/2
12	880	2 13/16	1	2 1/2
14	1,200	3 1/4	2	2 1/2
16	1,565	3 5/8	2	2 1/2
18	1,980	4 3/16	2	2 1/2

* With 40 psi residual pressure, a 2 1/2 in. hydrant outlet nozzle will discharge approximately 1,000 gpm and a 4 1/2 in. hydrant nozzle will discharge approx– imately 2,500 gpm.

NOTE:

1. REFER TO SECTION 7–11.3(12) FLUSHING AND SECTION 7–11.3(12)N FINAL FLUSHING AND TESTING, IN THE STANDARD SPECIFICATIONS.

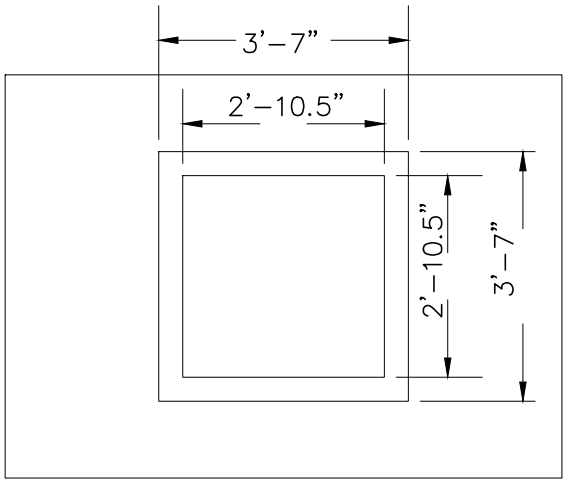
BLOWOFF SIZES FOR FLUSHING PIPELINES

APPR. DATE:

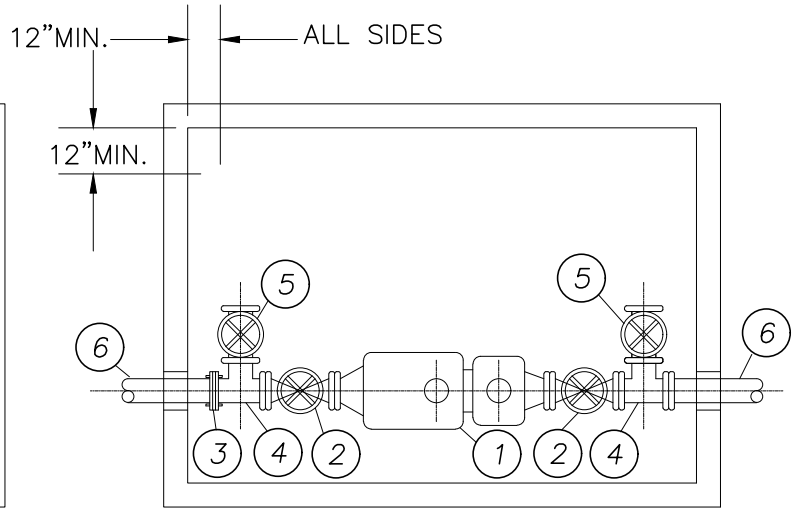
FIG NO: WA-25

Source: City of Olympia

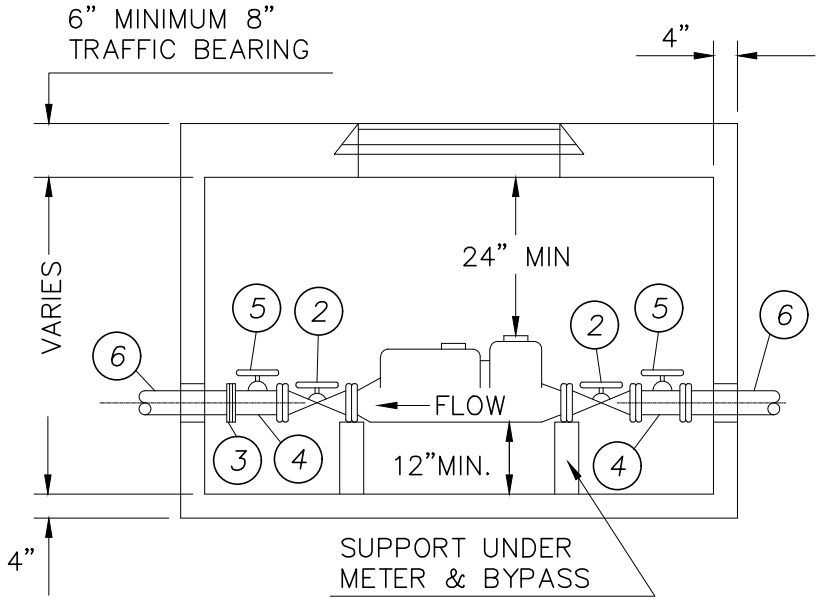
THURSTON COUNTY WATER STANDARD DETAIL



LID COVER



PLAN



ELEVATION

NOTES:

A. FOR 6" & 8" METERS.
B. SEE STANDARD DRAWING WA–27 FOR NOTES.

OCTAVE WATER METER WITH BYPASS FOR 6" AND 8" SIZE

APPR. DATE:		FIG NO:	WA-26

Source; City of Olympia

THURSTON COUNTY WATER STANDARD DETAIL

6 INCH METER INSTALLATION

1. 6" MASTER METER – OCTAVE OR APPROVED EQUAL METERS WITH REMOTE ANTENNA 3G RADIO.
2. 6" FLANGED VALVE WITH HAND WHEEL R.W.
3. 6" FLEX BY FLANGE COUPLING ALL–THREAD TO VAULT WITH 1/4" STEEL PLATE OR 2X DIAMETER OF HOLE.
4. 6" FLANGE X 6" FLANGE X 4" TAPPED TEE C.I. ALL–THREAD TO VAULT WITH 1/4" STEEL PLATE OR 2X DIAMETER OF HOLE.
5. 4" RESILIENT SEAT GATE VALVE.
6. 6" PLAIN END I.P.
7. 10" SLEEVE.

8 INCH METER INSTALLATION

1. 8" MASTER METER – OCTAVE OR APPROVED EQUAL METERS WITH REMOTE ANTENNA 3G RADIO.
2. 8" FLANGED VALVE WITH HAND WHEEL R.W.
3. 8" FLEX BY FLANGE COUPLING ALL–THREAD TO VAULT WITH 1/4" STEEL PLATE OR 2X DIAMETER OF HOLE.
4. 8" FLANGE X 8" FLANGE X 6" TAPPED TEE C.I. ALL–THREAD TO VAULT WITH 1/4" STEEL PLATE OR 2X DIAMETER OF HOLE.
5. 6" RESILIENT SEAT GATE VALVE.
6. 8" PLAIN END I.P.
7. 12" SLEEVE.

NOTES:

A. DRAINAGE MUST BE PROVIDED FOR METER PIT.
B. PIPE LENGTHS MAY BE CHANGED DUE TO VARYING LENGTHS IN METERS USED.
C. METER PIT MAY BE EXYENDED WHEN P.R.V. IS REQUIRED.
D. ON ALL METERS 3" AND ABOVE, A FLLEX–COUPLING SHALL BE INSTALLED IN THE OUTLET LINE WITHIN THE METER BOX. REFER TO NOTE 4.
E. REMOTE SHALL BE LOCATED IN A READILY ACCESSIBLE AREA OUTSIDE THE VAULT AS APPROVED BY THE COUNTY.
F. REMOTE SHALL BE INSTALLED BY THE THURSTON COUNTY AT THE CONTRACTORS EXPENSE.
G. VAULTS SHALL BE EQUIPPED WITH LADDERS.
H. GROUT ANNULAR SPACE BETWEEN VAULT WALL AND PIPE.
I. VAULT DIMENSIONS TO BE BASED ON CONFIGURATION OF METER, BYPASS AND VALVE ASSEMBLY AND MINIMUM CLEARANCES.

SUBMIT THE FOLLOWING PLANS OR SHOP DRAWINGS TO THE ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION.

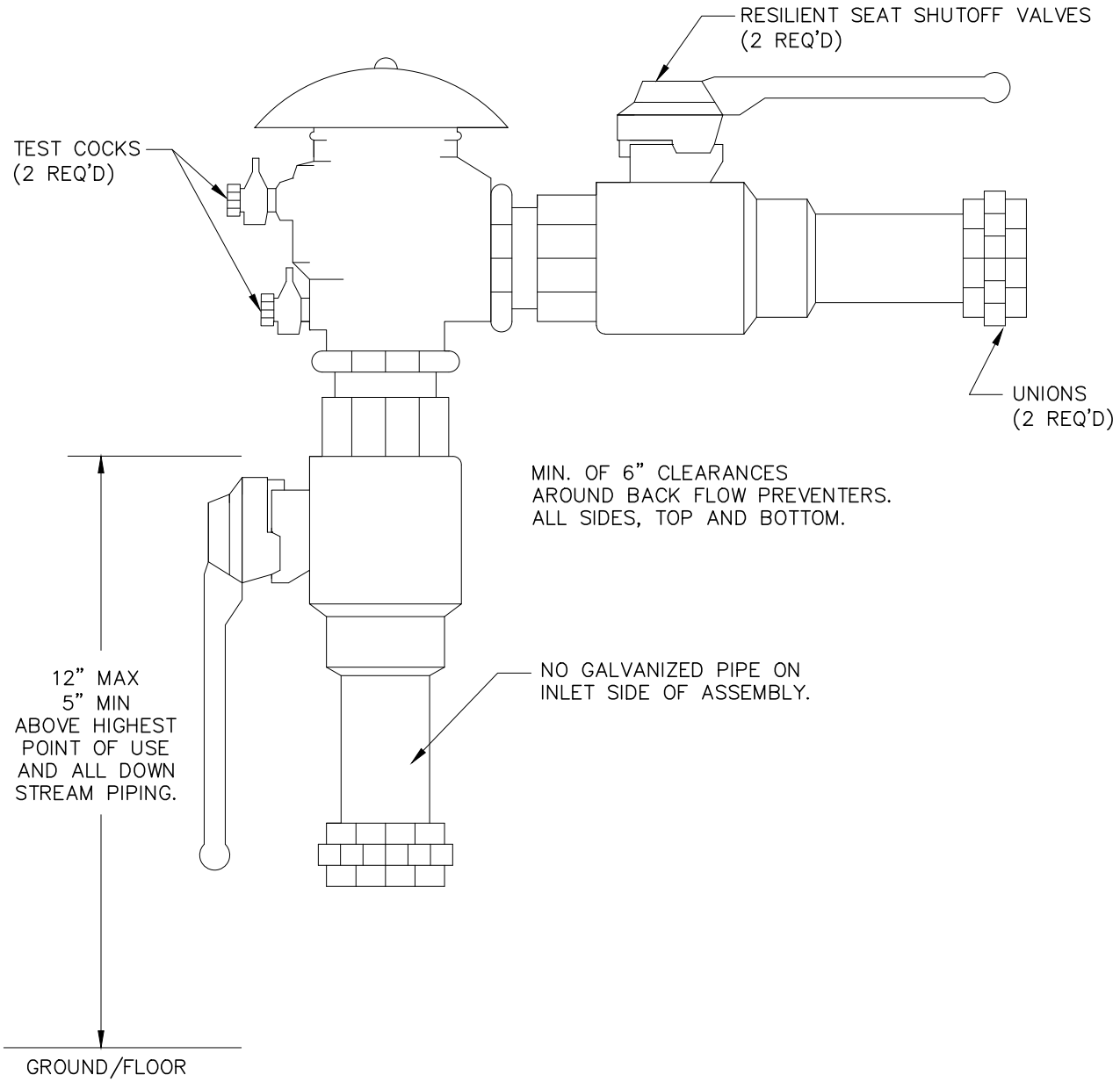
- CONCRETE VAULT: SHOP DRAWINGS FOR PRE–CAST BASE AND VAULT, DESIGNED BY PROFESSIONAL ENGINEER OF THE STATE OF WASHINGTON. A 12 INCH DEEP UNDERDRAIN SYSTEM SHALL BE INSTALLED UNDER THE VAULT. THE CONTRACTOR SHALL INSTALL 12 INCH DEEP ¾" TO 1/2" DRAIN ROCK WRAPPED BY CONSTRUCTION GEOTEXTILE UNDER THE VAULT. THE MINIMUM FOOTPRINT OF UNDERDRAIN AREA SHALL BE 1 FOOT AWAY FROM THE VERTICAL WALL OF THE CONCRETE VAULT. THE CONTRACTOR SHALL FOLLOW VAULT MANUFACTURES GUIDELINES OF INSTRUCTION TO INSTALL THE PRE–CAST VAULT. THE ANNULAR SPACE AND KNOCK–OUTS FOR PIPE GETTING INTO THE VAULT SHALL BE SEALED BEFORE BACKFILL. SEALING SHALL BE MADE WITH MATERIAL APPROVED BY THE ENGINEER AND SHALL EXTEND A MINIMUM OF 8 INCHES INTO THE VAULT WALL IN SUCH A MANNER AS TO FORM A SMOOTH, UNIFORM AND WATERTIGHT JOINT.
- ACCESS HATCHES: PRODUCT DESIGN DRAWINGS TO THE ENGINEER FOR REVIEW AND APPROVAL. VAULT DOORS SHALL BE H–20 TRAFFIC LOADING, NON–SKID, WATERTIGHT, SPRING ASSISTED, OPEN 180°, ALUMINUM HATCH WITH DRAIN CHANNEL. DOUBLE DOORS WILL BE REQUIRED ON LARGER VAULTS AS DETERMINED BY THE ENGINEER.
- POLYPROPYLENE COATED VAULT LADDER: MANUFACTURES CATALOG CUT AND DATA SHEET. STEP HOLE SEALING SHALL BE MADE WITH MATERIAL APPROVED BY THE ENGINEER.

MATERIAL LIST FOR OCTAVE WATER METER WITH BY–PASS FOR 6" AND 8" SIZE

APPR. DATE:		FIG NO: WA-27

Source; City of Olympia

THURSTON COUNTY WATER STANDARD DETAIL



(ABOVE GROUND INSTALLATION)

NOTE:

ALL ITEMS SHALL COMPLY WITH THE FOLLOWING:

1. APPROVED PRESSURE VACUUM BREAKER ASSEMBLY, SHALL BE INSTALLED VERTICALLY.
2. DESIGNED FOR BACK SIPHONAGE ONLY, NOT BACK PRESSURE.
3. NO GALVANIZED PIPE BEFORE ASSEMBLY.
4. THOROUGHLY FLUSH LINES PRIOR TO INSTALLATION OF BACK FLOW PREVENTER.
5. IF A P.V.B.A. IS INSTALLED INDOORS, CONSIDERATION SHALL BE GIVEN TO WATER LEAKAGE IF THE BACK FLOW PREVENTER FAILS. (EXCESSIVE WATER SPILLAGE)
6. DO NOT INSTALL IN AN AREA SUBJECT TO FLOODING.
7. VALVE SHALL BE PROTECTED FROM FREEZING CONDITIONS.
8. THE BACK FLOW ASSEMBLY SHALL BE A CURRENT WASHINGTON STATE DEPARTMENT OF HEALTH APPROVED MODEL.
9. A PLUMBING PERMIT IS REQUIRED.
10. SHALL BE TESTED AFTER INSTALLATION AND YEARLY THEREAFTER BY A WASHINGTON STATE CERTIFIED BACK FLOW ASSEMBLY TESTER. TEST RESULTS SHALL BE SENT TO THURSTON COUNTY PUBLIC WORKS WATER RESOURCES DIVISION.

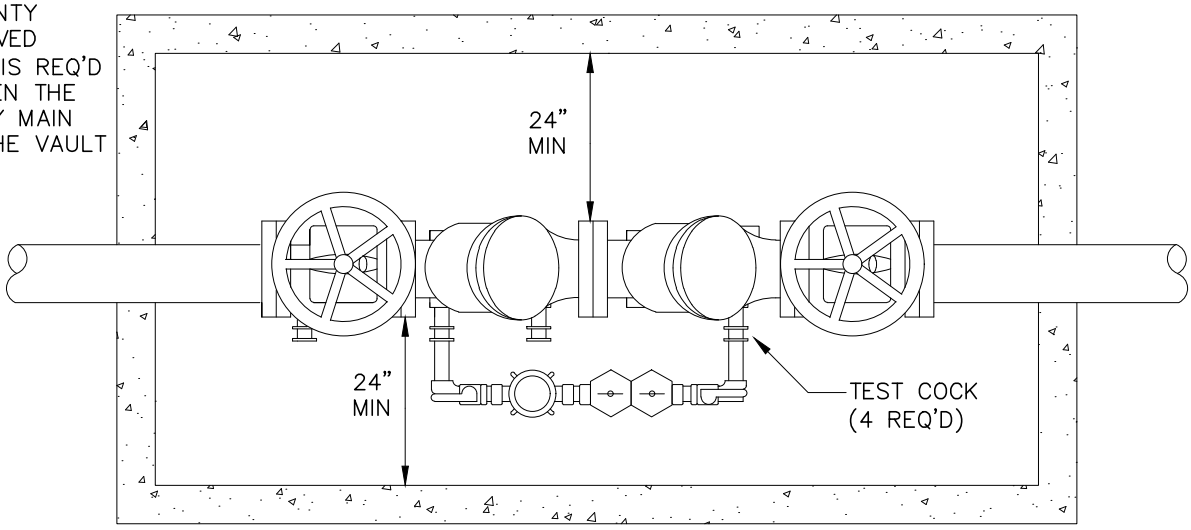
PRESSURE VACUUM BREAKER ASSEMBLY

APPR. DATE:		FIG NO:	WA-28

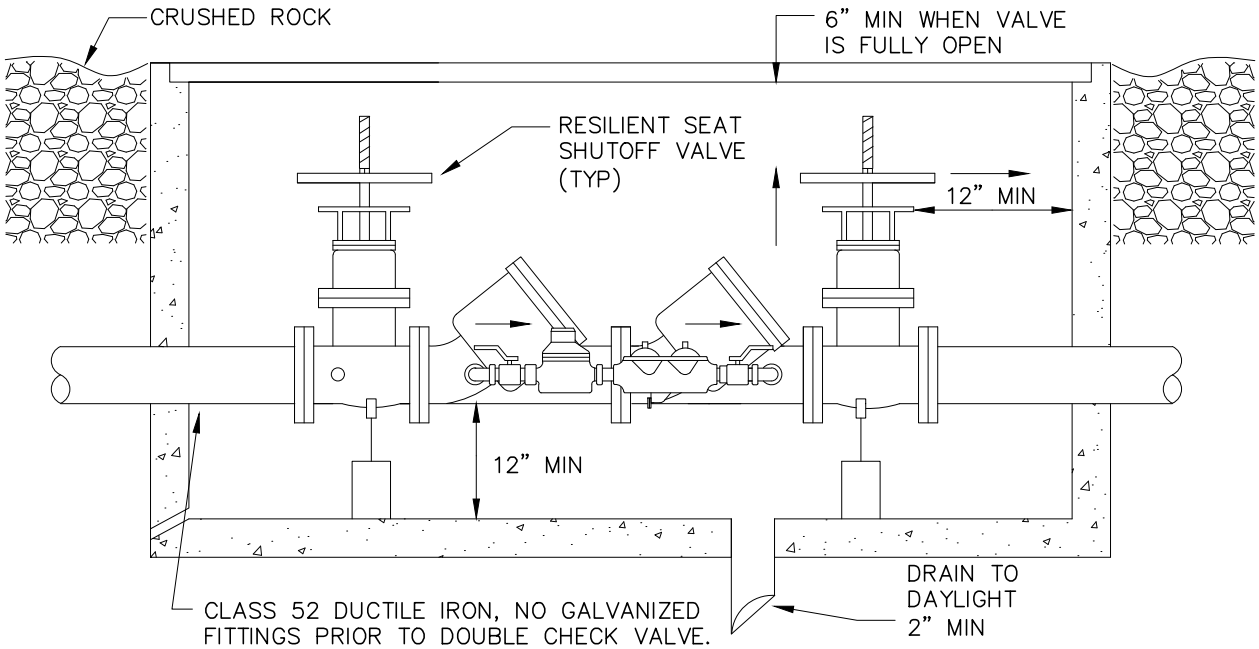
Source; City of Olympia

THURSTON COUNTY WATER STANDARD DETAIL

A COUNTY APPROVED VALVE IS REQ'D BETWEEN THE SUPPLY MAIN AND THE VAULT



TOP VIEW



SIDE VIEW

NOTE:

(ABOVE GROUND INSTALLATION)

ALL ITEMS SHALL COMPLY WITH THE FOLLOWING:

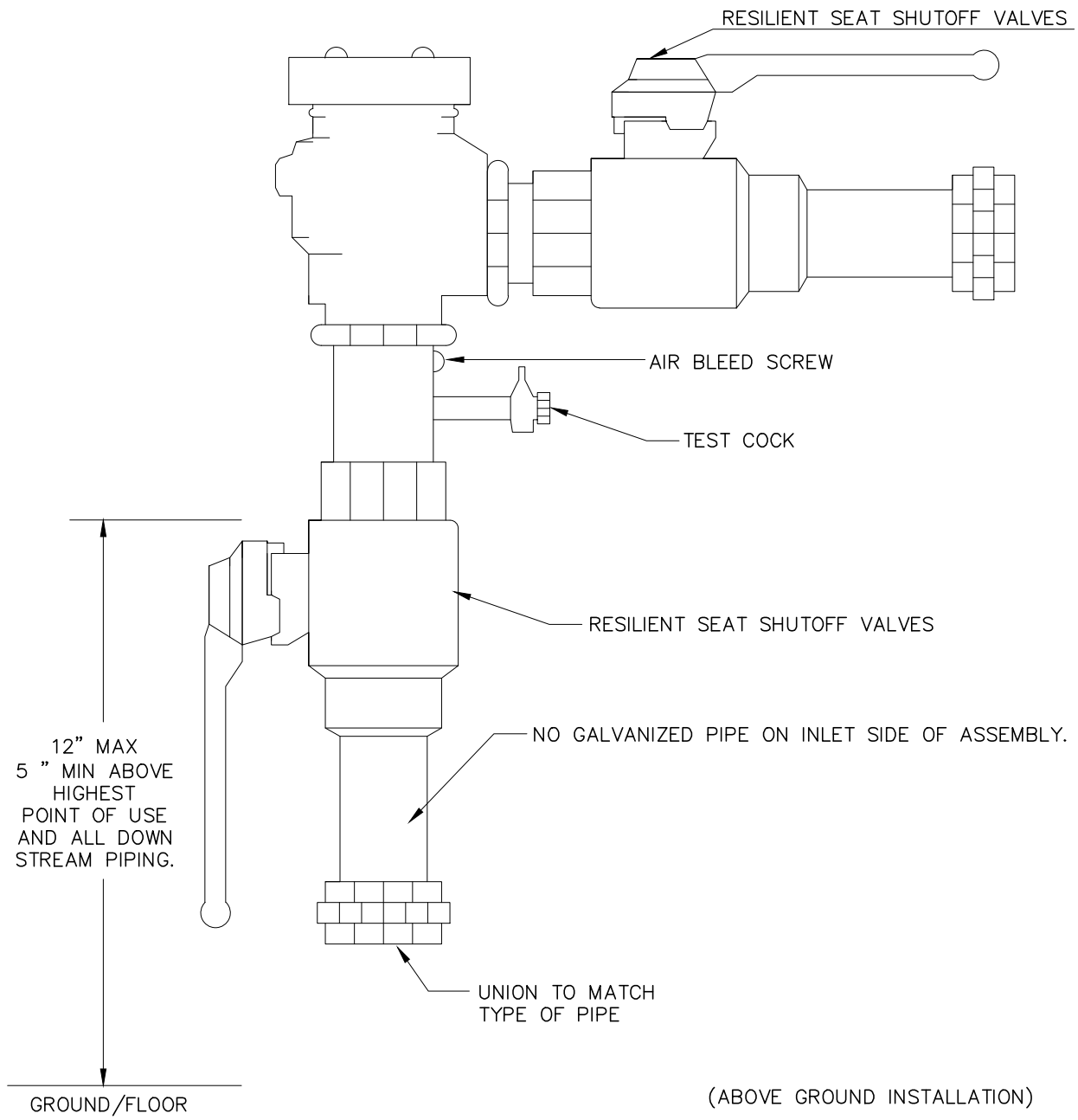
1. DOUBLE CHECK DETECTOR CHECK VALVE ASSEMBLY SHALL BE A MODEL APPROVED BY THE WASHINGTON STATE DEPARTMENT OF HEALTH.
2. BACK FLOW ASSEMBLY SHALL BE AN APPROVED MODEL W/4 TEST COCKS AND A RESILIENT SEATED SHUT OFF VALVE MOUNTED AT EACH END AND MEET MINIMUM STATE STANDARDS FOR BACK FLOW PROTECTION.
3. THE WATER LINE SHALL BE DISINFECTED, FLUSHED, AND PRESSURE TESTED PRIOR TO INSTALLING THE BACK FLOW ASSEMBLY. THE BACK FLOW ASSEMBLY SHALL BE PROTECTED FROM FLOODING.
4. THE BACK FLOW ASSEMBLY SHALL BE TESTED AFTER INSTALLATION AND PRIOR TO ACCEPTANCE AND ALSO YEARLY THEREAFTER BY A CERTIFIED BACK FLOW ASSEMBLY TESTER. TEST RESULTS SHALL BE SENT TO THURSTON COUNTY PUBLIC WORKS WATER RESOURCES DIVISION.
5. ALL PIPE VALVE AND FITTING JOINTS, FROM THE SUPPLY MAIN, SHALL BE FLANGED AND RESTRAINED.
6. GROUT PIPE ENTRANCE AND EXIT, IN VAULT, WITH WATERTIGHT GROUT.
7. ALL VAULTS SHALL BE PRE-APPROVED PRIOR TO INSTALLATION.
8. VAULTS SHALL BE INSTALLED AT PROPERTY LINE OR EASEMENT LINE AND ON OWNERS PROPERTY.
9. VAULTS SHALL HAVE A MINIMUM OF 3' CLEARANCE FROM ALL STRUCTURES.
10. REQUIRED FOR FIRE SUPPRESSION SYSTEMS.

2 1/2" AND LARGER DOUBLE CHECK DETECTOR CHECK VALVE ASSEMBLY

APPR. DATE:		FIG NO:	WA-29

Source; City of Olympia

THURSTON COUNTY WATER STANDARD DETAIL



(ABOVE GROUND INSTALLATION)

NOTE:
ALL ITEMS SHALL COMPLY WITH THE FOLLOWING:

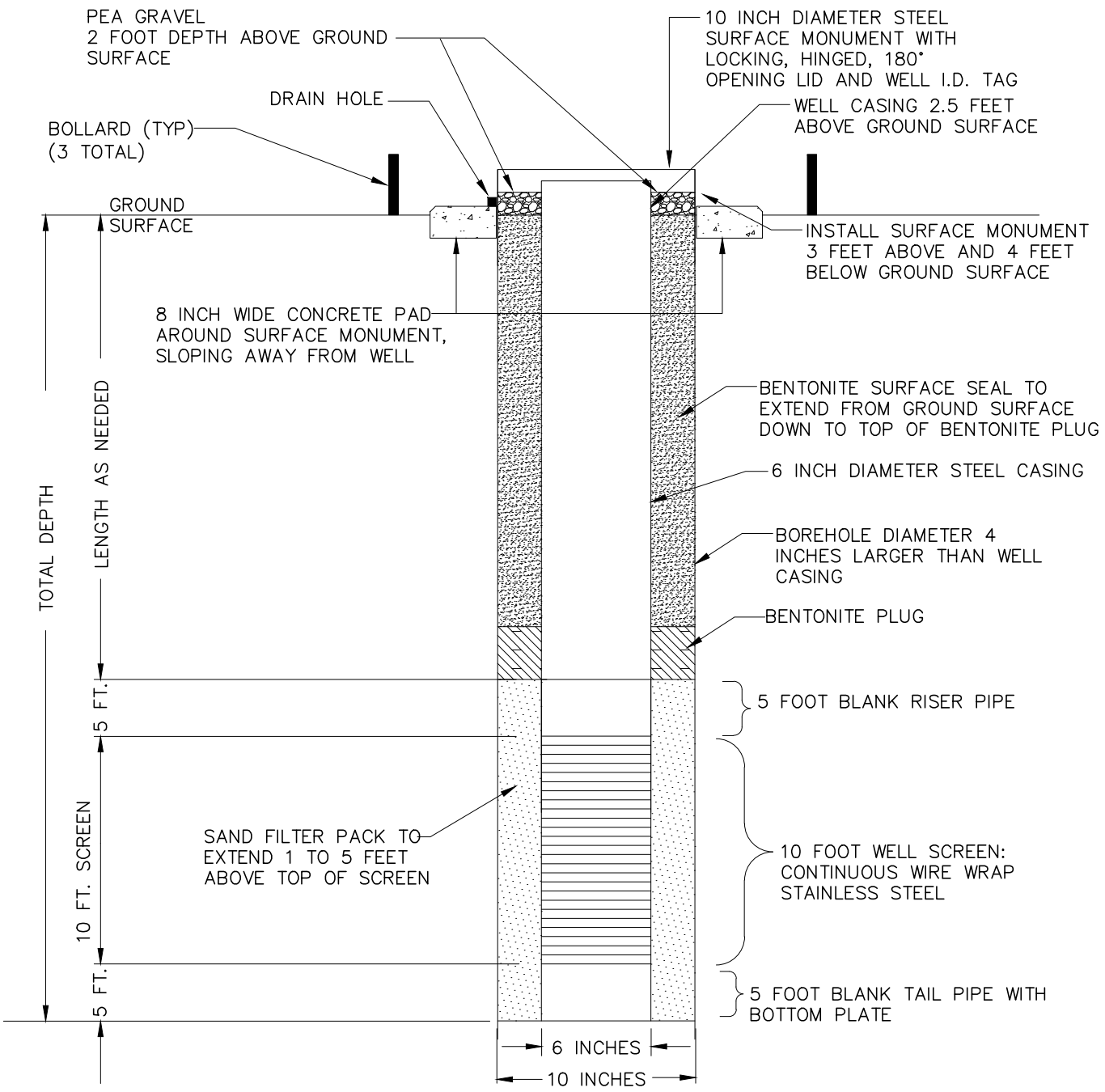
1. NO GALVANIZED ON THE INLET SIDE OF THE ASSEMBLY.
2. SPILL RESISTANT PRESSURE VACUUM BREAKER ASSEMBLY SHALL BE APPROVED PRIOR TO USE.
3. DESIGNED FOR BACK SIPHONAGE ONLY, NOT BACK PRESSURE.
4. THOROUGHLY FLUSH LINES PRIOR TO INSTALLATION OF BACK FLOW PREVENTER.
5. IF A S.V.B.A. IS INSTALLED INDOORS, CONSIDERATION MUST BE GIVEN TO WATER LEAKAGE IF THE BACK FLOW PREVENTER FAILS. (EXCESSIVE WATER SPILLAGE)
6. DO NOT INSTALL IN AN AREA SUBJECT TO FLOODING.
7. SHALL BE PROTECTED FROM FREEZING CONDITIONS.
8. THE BACK FLOW ASSEMBLY SHALL BE A CURRENT WASHINGTON STATE DEPARTMENT OF HEALTH APPROVED MODEL.
9. A PLUMBING PERMIT IS REQUIRED.
10. SHALL BE TESTED AFTER INSTALLATION AND YEARLY THEREAFTER BY A WASHINGTON STATE CERTIFIED BACK FLOW ASSEMBLY TESTER. TEST RESULTS SHALL BE SENT TO THURSTON COUNTY PUBLIC WORKS WATER RESOURCES DIVISION.

SPILL RESISTANT PRESSURE VACUUM BREAKER ASSEMBLY

APPR. DATE:		FIG NO: WA-30

Source; City of Olympia

THURSTON COUNTY WATER STANDARD DETAIL



NOTES:

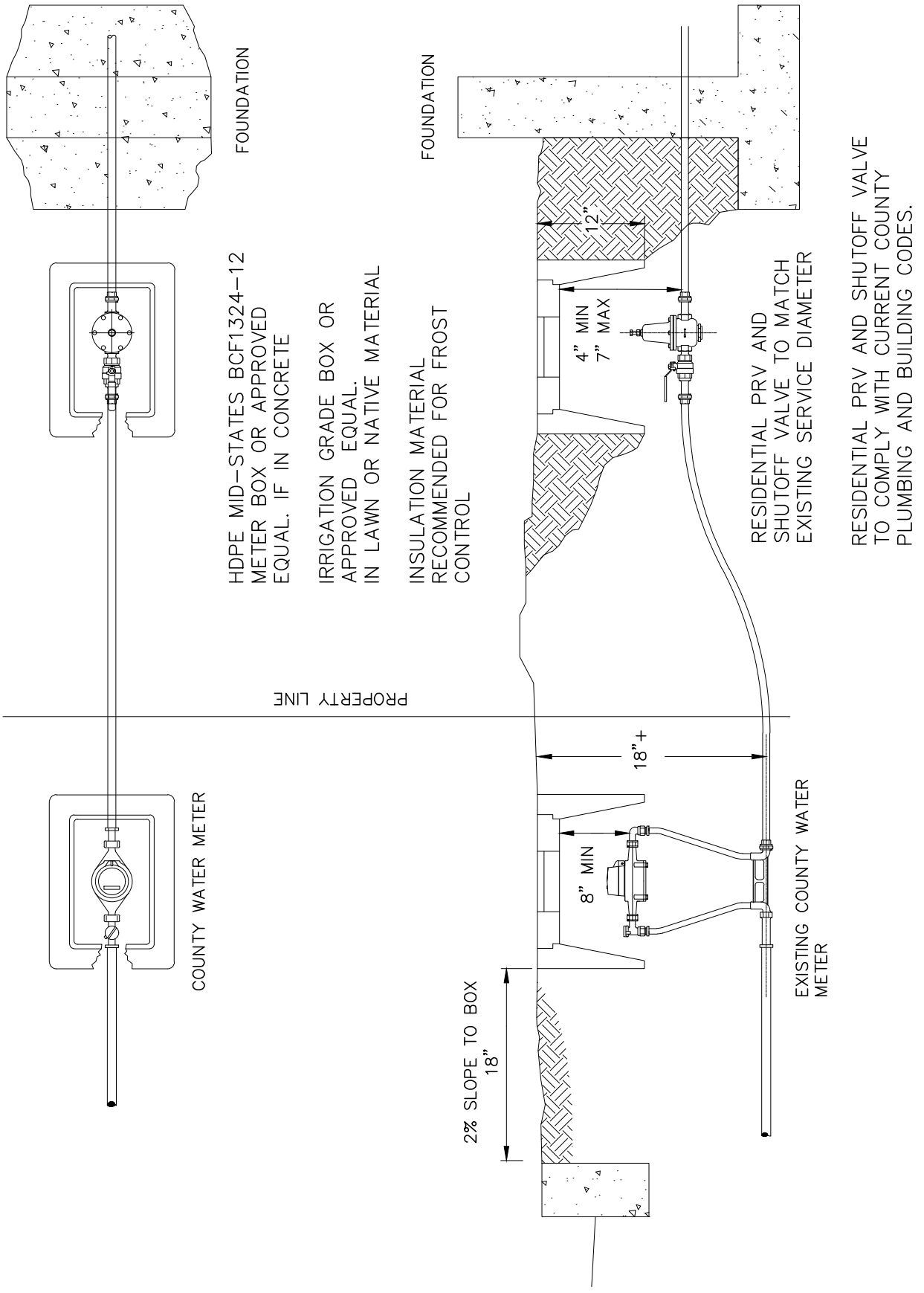
1. THIS WELL DESIGN IS FOR GUIDANCE PURPOSES ONLY. IT MAY BE MODIFIED BY CITY STAFF UPON APPROVAL OF AN EDDS STANDARD DEVIATION REQUEST. FINAL WELL DESIGN MUST COMPLY WITH CHAPTER 173–160 WAC REQUIREMENTS OR BE ACCEPTED BY DEPARTMENT OF ECOLOGY.
2. INSTALL AN INSTRUMENTATION NORTHWEST (INW) DEDICATOR GROUNDWATER SAMPLING SYSTEM WITH GRUNDFOS 20 INCH SUBMERSIBLE PUMP, OR EQUIVALENT AS APPROVED BY DIRECTOR.
3. INSTALL AN AQUISTAR PT2X GROUNDWATER–LEVEL PRESSURE TRANSDUCER WITH DATA LOGGER, CABLING AND SOFTWARE, OR EQUIVALENT AS APPROVED BY COUNTY ENGINEER.
4. MODIFY A 6–INCH WELL SEAL TO ACCOMMODATE THE DEDICATOR GROUNDWATER SAMPLING SYSTEM PLUS TWO ADDITIONAL ACCESS PORTS, WITH DROP TUBES TO BE INSTALLED WITHIN THE WELL CASING. THE TWO ADDITIONAL ACCESS PORTS MUST BE 1/2" DIAMETER (TO ACCOMMODATE A MANUAL WATER LEVEL PROBE) AND 1" DIAMETER (TO ACCOMMODATE A PRESSURE TRANSDUCER).
5. THE SAND FILTER PACK TYPE AND WELL SCREEN SPECIFICATIONS WILL BE DESIGNED AS NEEDED FOR WELL PERFORMANCE AND AQUIFER CHARACTERISTICS.

GROUNDWATER MONITORING WELL DESIGN

APPR. DATE:		FIG NO:	WA-31

Source; City of Olympia

THURSTON COUNTY WATER STANDARD DETAIL

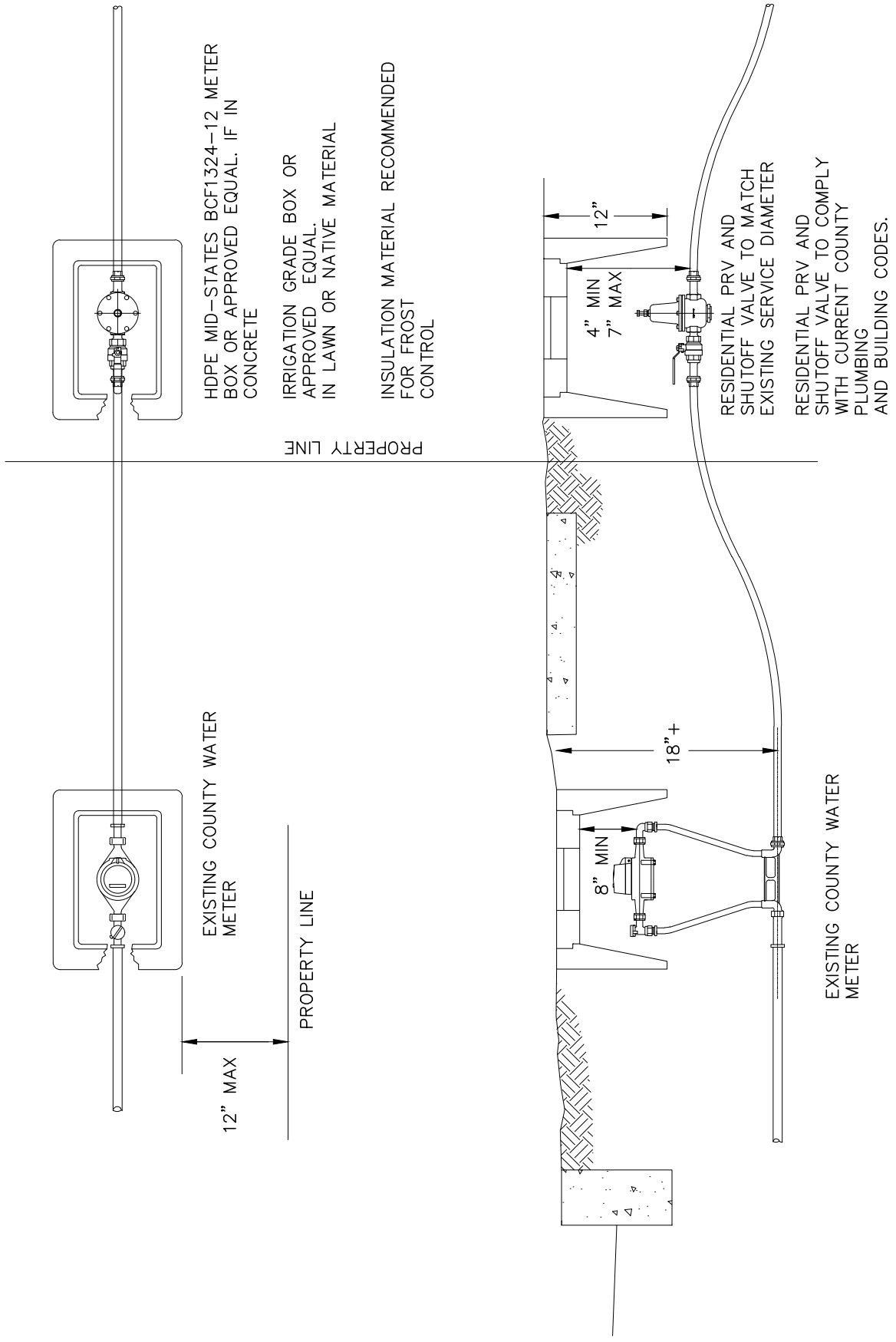


NEAR BUILDING RESIDENTIAL PRV ASSEMBLY

APPR. DATE:		FIG NO:	WA-32

Source; City of Olympia

THURSTON COUNTY WATER STANDARD DETAIL

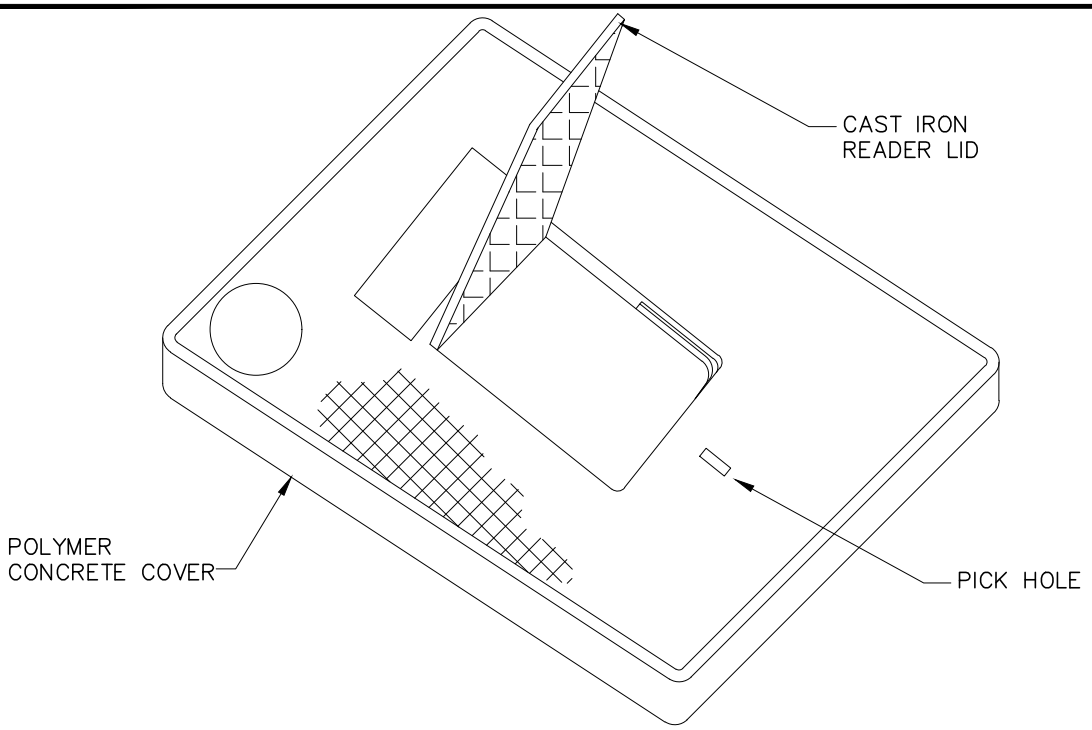


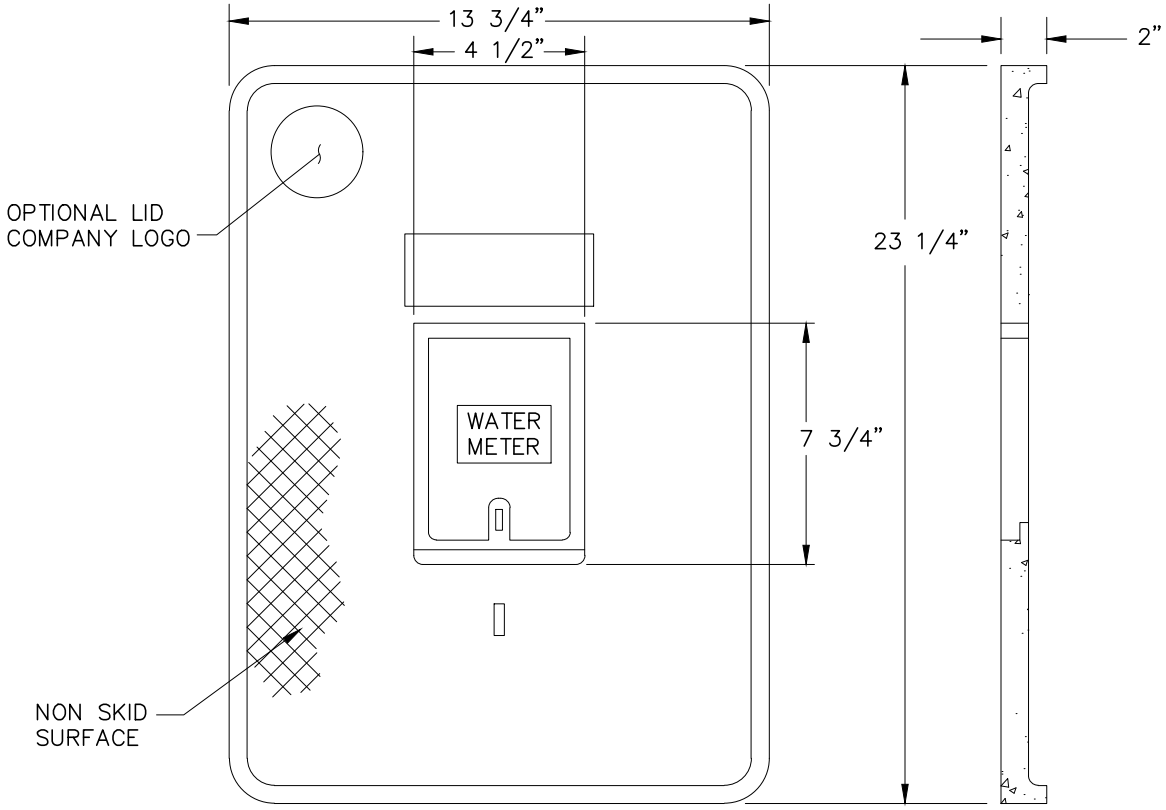
NEAR STREET RESIDENTIAL PRV ASSEMBLY

APPR. DATE:		FIG NO:	WA-33

Source; City of Olympia

THURSTON COUNTY WATER STANDARD DETAIL





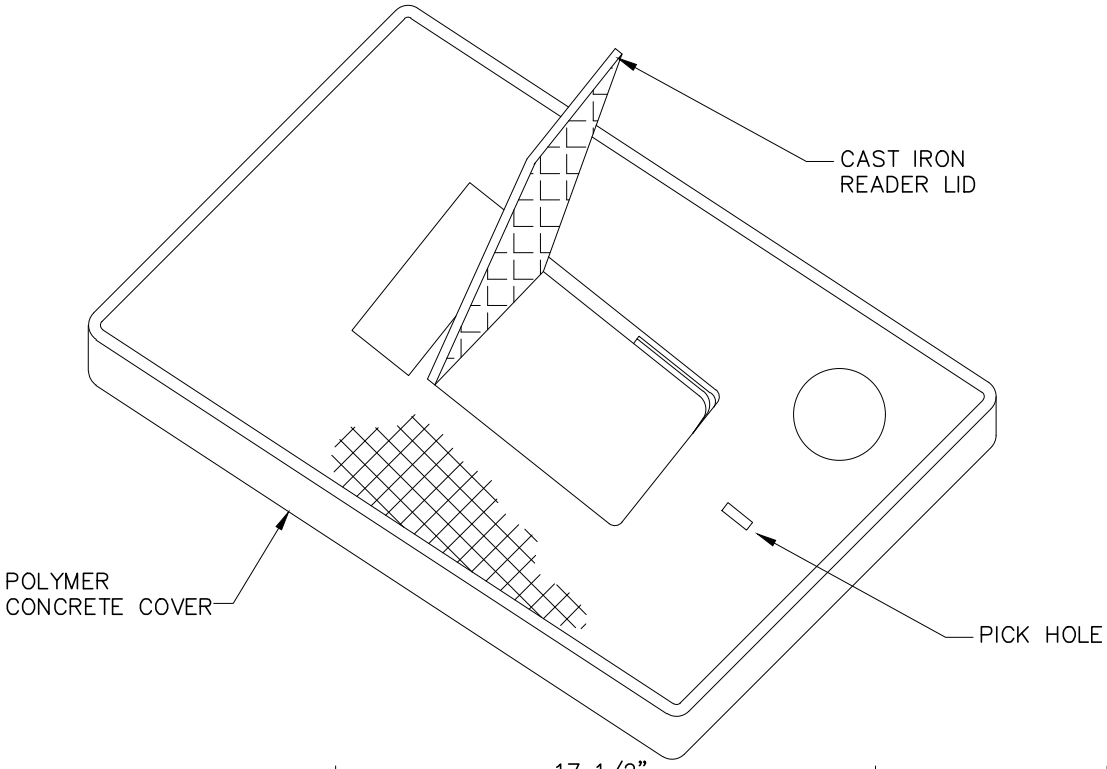
NOTES:
1. LID SHALL HAVE A LOAD RATING OF 20,000 POUNDS WHEN IN TRAFFIC AREA.
2. APPROXIMATE LID WEIGHT 28 POUNDS.

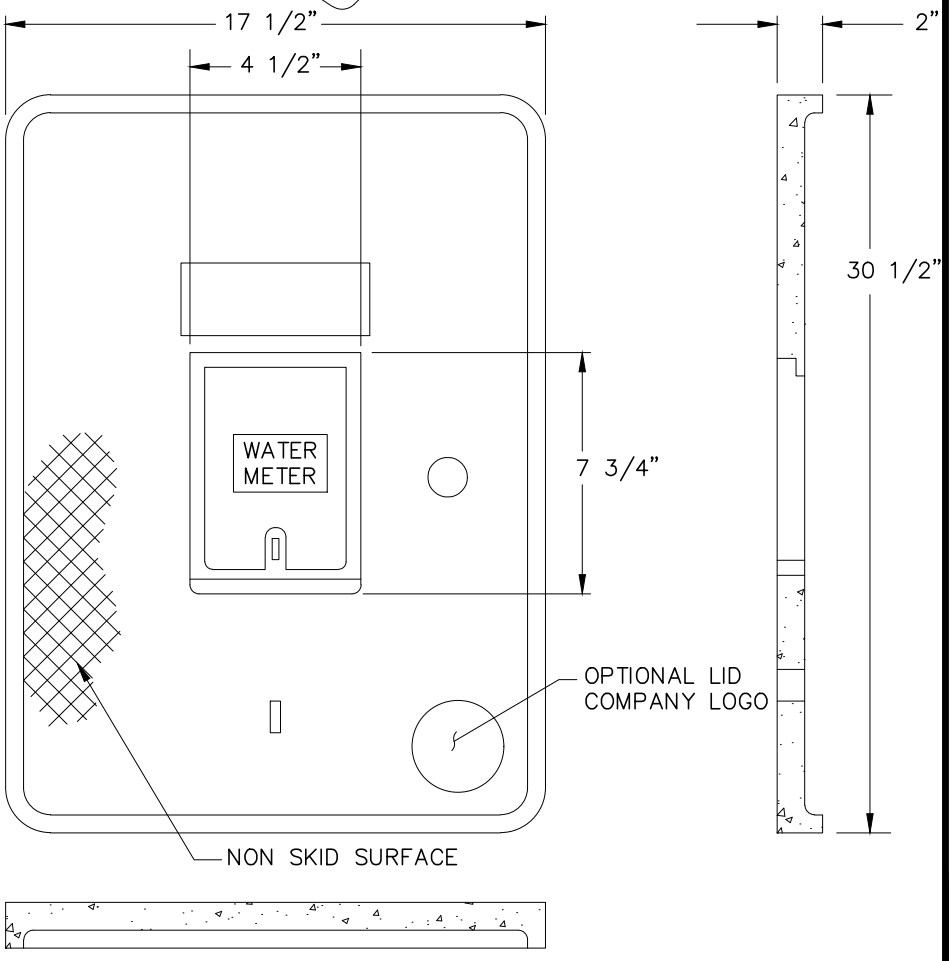
13" X 24" X 2" RPM COVER WITH CAST IRON READ LID

APPR. DATE:		FIG NO:	WA-34

Source; City of Olympia

THURSTON COUNTY WATER STANDARD DETAIL





NOTES:
1. LID SHALL HAVE A LOAD RATING OF 20,000 POUNDS WHEN IN TRAFFIC AREA.
2. APPROXIMATE LID WEIGHT 66 POUNDS.

17" X 30" X 2" RPM COVER WITH CAST IRON READ LID

APPR. DATE:		FIG NO:	WA-35

Source; City of Olympia