Lake Whatcom Water & Sewer District

Board Meeting Access Information

Meeting	6:30 pm - 2nd Wed of each month
Schedule	8:00 am - Last Wed of each month

Meeting Access

Meetings are held in person at our Administrative offices at 1220 Lakeway Drive in Bellingham. If you prefer to attend remotely, access information is below.

Join the meeting from your computer, tablet smartphone:

https://meet.goto.com/lwwsd/boardmeeting

You can also dial in using your phone.

Call: +1 (224) 501-3412 **Access Code:** 596-307-141
*Press *6 to mute/unmute your microphone*

New to GoToMeeting? Get the app now and be ready when the meeting starts:

https://meet.goto.com/install

Attending a Meeting

Lake Whatcom Water & Sewer District's regular Board meetings take place on the second Wednesday of each month at 6:30 pm and the last Wednesday of each month at 8:00 am.

Meetings are open to the public per the Open Public Meetings Act.

All meetings are hybrid, available in person or online. If you wish to observe a meeting, but do not plan to actively participate, you may attend anonymously. Turn off your mic & camera, and change your display name to "Observation Only."

Public Comment Periods

Public comment periods are built in to the agenda, one near the beginning of the meeting and one near the end.	Commissioners will listen, but will not respond or engage in dialogue during the comment period. Direct questions or requests are noted by staff for follow-up.	For the sake of time, and to leave plenty of time for scheduled agenda items, public comments are limited to 3 minutes per person and 45 minutes per comment period.	Comments may be submitted at any time through mail, email, our online contact form, or by phone.

For more information about communicating with the Board of Commissioners, please visit our website!

Questions?

If you have questions about attending an upcoming meeting, please contact Administrative Assistant Rachael Hope at rachael.hope@lwwsd.org or 360-734-9224.

LAKE WHATCOM WATER AND SEWER DISTRICT
1220 Lakeway Drive
Bellingham, WA 98229

REGULAR MEETING OF THE BOARD OF COMMISSIONERS

AGENDA

January 28, 2026
8:00 a.m. – Regular Session

1. CALL TO ORDER

2. ROLL CALL

3. PUBLIC COMMENT OPPORTUNITY
   At this time, members of the public may address the Board of Commissioners. Please state your name and address prior to making comments and limit your comments to three minutes. For the sake of time, each public comment period will be limited to 45 minutes.

4. ADDITIONS, DELETIONS, OR CHANGES TO THE AGENDA

5. CONSENT AGENDA

6. SPECIFIC ITEMS OF BUSINESS
   A. Energy Savings Performance Contracts Presentation
   B. Resolution No. 904—Design and Construction Standards Update

7. OTHER BUSINESS

8. STAFF REPORTS
   A. General Manager
   B. Engineering Department
   C. Finance Department
   D. Operations Department

9. PUBLIC COMMENT OPPORTUNITY

10. ADJOURNMENT

AGENDA BILL Item 5		**Consent Agenda**		
DATE SUBMITTED:	January 22, 2026	MEETING DATE:	January 28, 2026	
TO: BOARD OF COMMISSIONERS		FROM: Rachael Hope		
GENERAL MANAGER APPROVAL				
ATTACHED DOCUMENTS		1. See below		
TYPE OF ACTION REQUESTED		RESOLUTION ☐	FORMAL ACTION/ MOTION ☒	INFORMATIONAL/ OTHER ☐

****TO BE UPDATED 01.27.2026****

BACKGROUND / EXPLANATION OF IMPACT

- Payroll taxes for 4th Quarter 2025 totaling $12,935.23
- Payroll for Pay Period #02 (01.03.2026 through 01.16.2026) totaling $57,715.60
- Benefits for Pay Period #02 totaling $62,824.10
- Accounts Payable Vouchers total to be added

FISCAL IMPACT

Fiscal impact is as indicated in the payroll/benefits/accounts payable quantities defined above. All costs are within the Board-approved 2025-2026 Budget.

RECOMMENDED BOARD ACTION

Staff recommends the Board approve the Consent Agenda.

PROPOSED MOTION

A recommended motion is:

"I move to approve the Consent Agenda as presented."

4th Quarter 2025 Payroll Taxes

CHECK REGISTER

Lake Whatcom W-S District

Time: 11:22:12 Date: 01/16/2026

01/20/2026 To: 01/20/2026

Trans	Date	Type	Acct #	Chk #	Claimant	Amount	Memo
156	01/20/2026	Payroll	5	17159	EMPLOYMENT SECURITY DEPT PAID FAMILY & MEDICAL LEAVE	3,691.29	Pay Cycle(s) 10/01/2025 To 12/31/2025 - PFMLA
157	01/20/2026	Payroll	5	17160	EMPLOYMENT SECURITY DEPT. WA CARES FUND	2,994.53	Pay Cycle(s) 10/01/2025 To 12/31/2025 - LTC
158	01/20/2026	Payroll	5	17161	WA ST DEPT OF LABOR AND IND	6,056.72	4TH Quarter L&I: 10/01/2025 - 12/31/2025
155	01/20/2026	Payroll	5	17162	EMPLOYMENT SECURITY DEPARTMENT	192.69	4th Quarter Unemployment: 10/01/2025 - 12/31/2025

401 Water Fund	10,638.11		
402 Sewer Fund	2,297.12		
	12,935.23	Payroll:	12,935.23

I do hereby certify, under penalty of perjury, that the above is an unpaid, just, and due obligation as described herein, and that I am authorized to certify this claim.

Sign _____ **Date** 1/20/2026

General Manager, Justin Clary

Board Authorization - The duly elected board for this district has reviewed the claims listed and approved the payment by motion at the meeting listed below:

_____

Board President, Todd Citron

Attest : _____

Recording Secretary, Rachael Hope

Approved by motion at _____ **Regular** ____ **Special Board Meeting on** _____

Date Approved

CHECK REGISTER

PAYROLL

Lake Whatcom W-S District

Time: 12:57:55 Date: 01/20/2026

01/22/2026 To: 01/22/2026

Trans	Date	Type	Acct #	Chk #	Claimant	Amount	Memo
170	01/22/2026	Payroll	5	EFT		292.48	01/03/2026 - 01/16/2026 PR02
171	01/22/2026	Payroll	5	EFT		292.48	01/03/2026 - 01/16/2026 PR02
172	01/22/2026	Payroll	5	EFT		4,137.71	01/03/2026 - 01/16/2026 PR02
173	01/22/2026	Payroll	5	EFT		3,364.48	01/03/2026 - 01/16/2026 PR02
174	01/22/2026	Payroll	5	EFT		4,318.47	01/03/2026 - 01/16/2026 PR02
176	01/22/2026	Payroll	5	EFT		3,373.14	01/03/2026 - 01/16/2026 PR02
178	01/22/2026	Payroll	5	EFT		2,208.26	01/03/2026 - 01/16/2026 PR02
179	01/22/2026	Payroll	5	EFT		3,588.99	01/03/2026 - 01/16/2026 PR02
180	01/22/2026	Payroll	5	EFT		294.35	01/03/2026 - 01/16/2026 PR02
181	01/22/2026	Payroll	5	EFT		2,781.69	01/03/2026 - 01/16/2026 PR02
182	01/22/2026	Payroll	5	EFT		2,611.02	01/03/2026 - 01/16/2026 PR02
183	01/22/2026	Payroll	5	EFT		292.48	01/03/2026 - 01/16/2026 PR02
184	01/22/2026	Payroll	5	EFT		3,124.18	01/03/2026 - 01/16/2026 PR02
185	01/22/2026	Payroll	5	EFT		739.43	01/03/2026 - 01/16/2026 PR02
186	01/22/2026	Payroll	5	EFT		3,013.38	01/03/2026 - 01/16/2026 PR02
187	01/22/2026	Payroll	5	EFT		3,093.85	01/03/2026 - 01/16/2026 PR02
188	01/22/2026	Payroll	5	EFT		2,278.65	01/03/2026 - 01/16/2026 PR02
189	01/22/2026	Payroll	5	EFT		3,113.80	01/03/2026 - 01/16/2026 PR02
190	01/22/2026	Payroll	5	EFT		1,808.61	01/03/2026 - 01/16/2026 PR02
191	01/22/2026	Payroll	5	EFT		5,138.62	01/03/2026 - 01/16/2026 PR02
192	01/22/2026	Payroll	5	EFT		2,562.98	01/03/2026 - 01/16/2026 PR02
193	01/22/2026	Payroll	5	EFT		3,228.22	01/03/2026 - 01/16/2026 PR02
175	01/22/2026	Payroll	5	17163		146.25	12.10.2025
177	01/22/2026	Payroll	5	17164		1,912.08	01/03/2026 - 01/16/2026 PR02
		401 Water Fund				15,914.56	
		402 Sewer Fund				41,801.04	
						57,715.60	Payroll: 57,715.60

I do hereby certify, under penalty of perjury, that the above is an unpaid, just, and due obligation as described herein, and that I am authorized to certify this claim.

Sign _____ **Date** 01.20.2026

General Manager, Justin Clary

Board Authorization - The duly elected board for this district has reviewed the claims listed and approved the payment by motion at the meeting listed below:

_____

Board President, Todd Citron

Attest : _____

Recording Secretary, Rachael Hope

Approved by motion at _____ **Regular** ____ **Special Board Meeting on** _____

Date Approved

CHECK REGISTER

BENEFITS

Lake Whatcom W-S District

Time: 16:13:59 Date: 01/20/2026

01/22/2026 To: 01/22/2026

Trans	Date	Type	Acct #	Chk #	Claimant	Amount	Memo
194	01/22/2026	Payroll	5	EFT	DEPARTMENT OF RETIREMENT SYSTEMS	7,891.50	Pay Cycle(s) 01/22/2026 To 01/22/2026 - DCP; Pay Cycle(s) 01/22/2026 To 01/22/2026 - ROTH DCP
195	01/22/2026	Payroll	5	EFT	UNITED STATES TREASURY	21,203.92	941 Deposit for Pay Cycle(s) 01/22/2026 - 01/22/2026
196	01/22/2026	Payroll	5	EFT	WA ST PUBLIC EMP RET PLAN 2	6,969.23	Pay Cycle(s) 01/22/2026 To 01/22/2026 - PERS 2
197	01/22/2026	Payroll	5	EFT	WA ST PUBLIC EMP RET PLAN 3	3,316.93	Pay Cycle(s) 01/22/2026 To 01/22/2026 - PERS 3
198	01/22/2026	Payroll	5	EFT	WA ST SUPPORT ENFORCEMENT REGISTERY	888.77	Pay Cycle(s) 01/22/2026 To 01/22/2026 - SUP ENF
199	01/22/2026	Payroll	5	17165	AFLAC	296.36	Pay Cycle(s) 01/22/2026 To 01/22/2026 - AFLAC PRE-TAX; Pay Cycle(s) 01/22/2026 To 01/22/2026 - AFLAC POST-TAX
200	01/22/2026	Payroll	5	17166	AFSCME LOCAL	396.55	Pay Cycle(s) 01/22/2026 To 01/22/2026 - UNION DUES; Pay Cycle(s) 01/22/2026 To 01/22/2026 - UNION FUND
201	01/22/2026	Payroll	5	17167	HRA VEBA TRUST (PAYEE)	590.00	Pay Cycle(s) 01/22/2026 To 01/22/2026 - VEBA
202	01/22/2026	Payroll	5	17168	WA ST HEALTH CARE AUTHORITY	21,270.84	Pay Cycle(s) 01/22/2026 To 01/22/2026 - PEBB MEDICAL; Pay Cycle(s) 01/22/2026 To 01/22/2026 - PEBB ADD LTD; Pay Cycle(s) 01/22/2026 To 01/22/2026 - PEBB SMK Surcharge

401 Water Fund	46,933.55	
402 Sewer Fund	15,890.55	
	62,824.10	Payroll: 62,824.10

I do hereby certify, under penalty of perjury, that the above is an unpaid, just, and due obligation as described herein, and that I am authorized to certify this claim.

Sign _____ **Date** 01.20.2026

General Manager, Justin Clary

Board Authorization - The duly elected board for this district has reviewed the claims listed and approved the payment by motion at the meeting listed below:

_____

Board President, Todd Citron

Attest : _____

Recording Secretary, Rachael Hope

Approved by motion at _____ **Regular** ____ **Special Board Meeting on** _____

Date Approved

AGENDA BILL Item 6.A	**Energy Savings Performance Contracts Presentation**			
DATE SUBMITTED:	January 15, 2026	MEETING DATE:	January 28, 2026	
TO: BOARD OF COMMISSIONERS		FROM: Justin Clary, General Manager		
GENERAL MANAGER APPROVAL				
ATTACHED DOCUMENTS		1. none		
TYPE OF ACTION REQUESTED		RESOLUTION ☐	FORMAL ACTION/ MOTION ☐	INFORMATIONAL /OTHER ☒

BACKGROUND / EXPLANATION OF IMPACT

Components of the District's mission statement, values, and goals include operation in a *cost-efficient manner*, in a way that *protects the environment*, and in a manner that *uses our natural resources wisely*. As a public agency, the District is eligible for a variety of grants that finance the implementation of improvements that increase facility operational energy savings (e.g., a few years ago, the District received rebates for conversion of lighting at the administrative building, operations facility, and Sudden Valley water treatment plant to LED bulbs).

Apollo Solutions Group (Apollo) is a Washington State-based contractor. A division of Apollo provides energy audit and energy savings implementation services. A mechanism for providing these services to local governments is via an energy savings performance contract—Apollo has a contract with the Washington State Department of Enterprise Services (DES) to provide these services to Washington State local governments at no cost to that government (i.e., the District would contract with DES for the services). A representative from Apollo will provide a presentation on this contracting mechanism and be available to answer any questions the Board may have on this opportunity.

FISCAL IMPACT

Should the District proceed with executing an energy savings performance contract, capital cost and operational cost savings will be dependent upon grants secured and energy saving measures implemented.

APPLICABLE EFFECTIVE UTILITY MANAGEMENT ATTRIBUTE(S)

Operational Optimization
Community Sustainability

RECOMMENDED BOARD ACTION

No action is recommended at this time.

PROPOSED MOTION

Not applicable.

AGENDA BILL Item 6.B	**Resolution No. 904 District Design & Construction Standards Update**		
DATE SUBMITTED:	January 21, 2026	MEETING DATE:	January 28, 2026
TO: BOARD OF COMMISSIONERS		FROM: Greg Nicoll, District Engineer	
GENERAL MANAGER APPROVAL			
ATTACHED DOCUMENTS		1. Resolution 904—District Design & Construction Standards Update 2. Revised Design & Construction Standards Showing Revisions	
TYPE OF ACTION REQUESTED		RESOLUTION ☒	FORMAL ACTION/ MOTION ☐ / INFORMATIONAL /OTHER ☐

BACKGROUND / EXPLANATION OF IMPACT

The District participates in many private and public projects that range from simple single family residence water/sewer connections to large complex public works projects such as construction or renovation of sewer lift stations, water pump stations, pipelines, and reservoirs. The District's Design and Construction Standards are applied to all projects in the District. Standardization of design, materials, parts, and construction benefits the District and its customers by increasing efficiency of operations, maintenance, and asset life spans.

The District's Design and Construction Standards have been periodically refined and updated. Updates occur to comply with state agency standards and construction methods and current industry standards, as well as to define configuration, layout, and installation requirements set by the District.

The proposed 2026 edition includes relatively minor revisions since the last edition that was adopted by the board on April 26, 2023. Staff will provide an overview of the revisions during the January 28 meeting and request board consideration of adoption during the meeting.

FISCAL IMPACT

None.

APPLICABLE EFFECTIVE UTILITY MANAGEMENT ATTRIBUTE(S)

Product Quality

RECOMMENDED BOARD ACTION

Staff recommends the Board adopt Resolution No. 904.

PROPOSED MOTION

A recommended motion is:

"I move to adopt Resolution No. 904 as presented."

LAKE WHATCOM WATER AND SEWER DISTRICT
RESOLUTION NO. 904

A Resolution of the Board of Commissioners
Updating the Lake Whatcom Water and Sewer District Design & Construction Standards

WHEREAS, the Lake Whatcom Water and Sewer District ("District") is a special purpose district authorized under Title 57 Revised Code of Washington; and

WHEREAS, the District owns and operates water treatment, storage, and distribution systems located within its service boundaries; and

WHEREAS, the District owns and operates a sewer collection and conveyance system located within its service boundaries; and

WHEREAS, the District Board of Commissioners wishes to require that any repairs to or construction of current or future District-owned infrastructure are completed in accordance with current industry standards to ensure the maximum life of its infrastructure; and

WHEREAS, design and construction standards of the District are defined in the Lake Whatcom Water and Sewer District Design & Construction Standards, which were most recently updated via adoption of Resolution No. 890 during a regularly scheduled meeting of the Board of Commissioners on April 26, 2023; and

WHEREAS, the District wishes to adopt an update to its design and construction standards; and

WHEREAS, the District Board of Commissioners finds that it is in the public interest and will benefit the public safety, health, and welfare to have updated design and construction standards; and

WHEREAS, the foregoing recitals are a material part of this Resolution;

NOW, THEREFORE, BE IT RESOLVED by the Board of Commissioners of the Lake Whatcom Water and Sewer District, Whatcom County, Washington as follows:

Section 1. Lake Whatcom Water and Sewer District Resolution No. 890, including the revision of the Lake Whatcom Water and Sewer District Design and Construction Standards dated April 26, 2023, are hereby repealed in their entirety, and the revision of the Lake Whatcom Water and Sewer District Design and Construction Standards dated January 28, 2026 is hereby adopted and shall be deemed the District's technical standards for all facets of its water and sewer infrastructure within existing and future service boundaries of

the Lake Whatcom Water and Sewer District, Whatcom County, Washington. The updated design and construction standards are attached as Exhibit "A."

Section 2. Any resolutions or parts of resolutions in conflict herewith are hereby repealed insofar as they conflict with the provisions of this Resolution.

Section 3. If any section, subsection, sentence, clause or phrase of this Resolution is for any reason held to be invalid or unconstitutional, such decision shall not affect the validity of the remaining portions of this Resolution. The Board of Commissioners hereby declare that it would have passed this Resolution and each section, subsection, sentence, clause and phrase thereof, irrespective of the fact that any one or more sections, subsections, sentences, clauses or phrases has been declared invalid or unconstitutional, and if, for any reason, this Resolution should be declared invalid or unconstitutional, then the original resolution or resolutions shall be in full force and effect.

Section 4. This Resolution shall be effective immediately.

ADOPTED by the Board of Commissioners of Lake Whatcom Water and Sewer District, Whatcom County, Washington, at a regular meeting thereof, on the 28th day of January, 2026.

_____
Todd Citron, President, Board of Commissioners

ATTEST:

_____
Rachael Hope, Recording Secretary

APPROVED AS TO FORM:

_____
Robert Carmichael, District Legal Counsel

EXHIBIT "A"
LAKE WHATCOM WATER AND SEWER DISTRICT
DESIGN & CONSTRUCTION STANDARDS
JANUARY 28, 2026

DESIGN & CONSTRUCTION STANDARDS

Adopted January 28, 2026
(Resolution 904)

Lake Whatcom Water and Sewer District
1220 Lakeway Drive
Bellingham, WA 98229

(360) 734-9224

This document is available at http://www.lwwsd.org

TABLE OF CONTENTS

CHAPTER 1 DRAWING STANDARDS

1.1 Construction Drawings

1.1.1 Format and Content

Construction drawings for proposed public water and/or sewer facilities shall be prepared in accordance with the following drawing standards and under the direction of a currently-licensed Washington State professional engineer (the Engineer of Record).

Format

- Drawings submitted for review: 50% reduced scale 11-inch x 17-inch sheets
- Final drawings submitted for approval: full scale 24-inch x 36-inch sheets
- Minimum text size 0.08-inch when plotted at full-scale size

Basic Drawing Elements

- North Arrow
- Scale Bar
- Legend (clearly differentiate between existing and proposed features)
- Vicinity Map
- Overall Project Map
- Vertical Datum and Project Benchmark Information
  All projects must be on NAVD88.
- Horizontal Survey Reference Point Information
  All projects must be based on NAD83 (1998) City of Bellingham monument-derived coordinates. Show bearing and distance information between survey reference points.
- Lake Whatcom Water and Sewer District General Notes. General Notes (all Projects) and Water System Notes, Sewer System Notes and/or Electrical, Telecommunication and Automatic Control Notes as appropriate.
- Lake Whatcom Water and Sewer District Standard Details as applicable for type of improvements

Scale for Plan and Profile Drawings

- 1-inch = 20-feet horizontal in areas with existing utilities or improvements
- 1-inch = 50-feet horizontal in areas with little or no existing utilities or improvements
- 1-inch = 2-, 5-, or 10-feet for vertical as appropriate

Topographic and Survey Information

- Right-of-Way (ROW)
- Easements (with Whatcom County Auditor parcel numbers)
- Contour intervals of 1 or 2 feet as appropriate for site and design
- Existing features and improvements such as pavement, concrete, gravel, sidewalks, curbs, utility poles, transformers, telephone pedestals, overhead and underground utilities.

Plans

- Proposed improvements clearly shown and noted
- Design alignment and stake out information (stationing, bearings, distances, and offsets)
- For water mains, lineal footage from water main fitting to fitting
- For sewer mains, lineal footage between exterior faces of manhole structures
- Pipe size and material type called out on each segment

Profiles

- All utility crossings with clearances noted
- Distances from centerline of manhole to manhole
- Distances from exterior face of manhole structure to manhole structure
- Calculated slope between exterior face of manhole structure to manhole structure (actual pipe slope)
- Rim and invert elevations for existing and proposed manhole structures
- Trench dams shown

1.1.2 Plan Review Sets

Submit to the Lake Whatcom Water and Sewer District (District) one full scale 22-inch x 34-inch electronic set of drawings. If there are review comments, the District will return one redlined electronic set. For subsequent re-submittals, submit one (1) electronic set of full-scale drawings.

1.1.3 Final Approval Sets

Once all District review comments have been addressed, the District will request two (2) full-scale 22-inch x 34 inch physical ("hard copy") and one (1) electronic set of the final signed drawings. The District will retain the two (2) physical sets and return one (1) electronic approved set stamped "Approved for Construction".

1.2 Record Drawings

1.2.1 Content

Record drawings shall include the exact as-built location of all water and sewer mains and services and the approximate location of all other underground and above ground utilities, and shall include information defined below.

Basic Information

- Each drawing shall include "Record Drawing" boldly noted on each sheet.
- Line-out design text that has changed and note record information.
- Circle plan design elements that changed and show record information.

Water Mains and Services

- Location, including station, of all vertical and horizontal bends in the water system. Stationing shall be along the length of the extension.
- Location of all water valves, hydrants, hydrant valves, and blow-offs with distance along centerline and distance from the centerline.
- Location of all utilities within easements. This includes distances to the utilities from the easement lines.

- Stationing of service taps on the main. Stationing shall be cumulative along the length of the extension.
- Distance from main to meter.
- Distance from tap to a point opposite (at 90 degrees) the meter along the main, and station this point.
- Distance from this point on the main to the meter (distance at 90 degrees).
- Depth of all services.

Sewer Mains and Service Laterals

- Location of all sanitary sewer manhole structures, inverts, valves and cleanouts on the sewer main.
- Location of all vertical and horizontal bends in the force main system.
- Location of all service lateral saddles on the sewer main from the back-station manhole.
- Stationing of all sewer wyes into the main, located from the back-station manhole.
- Length of service lateral/side sewer stub in lineal feet, and diameter of pipe.
- Distance along mainline from service lateral wye to where end equals 90 degrees from mainline.
- Distance from this point on the main to the end of stub (distance at 90 degrees).
- Depth of services at end of stub.
- Location of cleanouts on the sewer stub.

1.2.2 Construction Record Keeping

All District projects must have full time inspection. A District Inspector will document and maintain construction as-built information. It is the contractor's responsibility to ensure that the Inspector has all as-built information and measurements recorded prior to backfill of facilities. Contractor shall maintain a hard copy of project plans, with revisions accurately shown as constructed, on site throughout construction, and shall submit to the Engineer of Record at completion of the project.

1.2.3 Preparation

A copy of the District Inspector's notes and sketches will be given to the Engineer of Record for preparing the record drawings. For developer-constructed facilities, the developer's engineer shall prepare and stamp (current Washington State professional civil engineers license) the record drawings. For District-constructed facilities, the District's consulting engineer shall prepare and stamp the record drawings.

1.2.4 Review and Submittal Format

Submit one 50% reduced-scale 11-inch x 17-inch set to the District for review. Upon acceptance, the District will request final record drawings. Final record drawings shall include AutoCAD (.dwg) files, an electronic Adobe Acrobat (.pdf) file and Group 4 TIFF files for all plan sheets.

1.2.5 Condition of Final Acceptance

Final record drawings must be received and accepted by the District before final acceptance of the project by the District Board of Commissioners.

CHAPTER 2 DESIGN STANDARDS

2.1 Water Projects

2.1.1 Minimum Design Requirements

Minimum design criteria, unless the District criteria are more stringent, shall be in accordance with the current edition of the "Water System Design Manual" published by the Washington State Department of Health (DOH), Washington Administrative Code Chapter 246-290, Group A Public Water Supplies and other local authority requirements

2.1.2 Minimum Pipe Size

Minimum pipe size for new or replaced water mains is eight (8) inches in diameter, except where pipe replacement projects and engineering hydraulic analysis justifies another size or where future system expansion is not foreseeable, as determined and approved by the District Engineer. Dead-end pipes are not permitted unless allowed under conditions identified in the DOH Water System Design Manual. Blow-offs or fire hydrants shall be installed at low points and permitted dead-ends in the distribution system.

2.1.3 Pipeline Velocity

The maximum velocity for water mains shall be 8 feet per second for all conditions. All mains, branches and dead ends shall be equipped with blowoffs and/or hydrants of adequate size and number to develop a flushing velocity in the main of at least 2.5 feet per second. The Engineer of Record shall consider minimum velocities in pipe sizing to avoid water quality concerns.

2.1.4 Comprehensive Plan Requirements

Water system construction and reconstruction shall be done pursuant to a design that, when fully implemented, will provide the flow requirements of the District's Water System Comprehensive Plan. A latecomer's agreement may be created if the sizing is in excess of that required to serve the proposed development or that required by an associated utility local improvement district (ULID).

2.1.5 Minimum Allowable Pressure

The minimum pressures allowed by the District at any time are 30 pounds per square inch (psi) under peak hourly demand, or 20 psi under maximum day demand and fire flow combined.

2.1.6 Increases in Flow Requirements

When any new development increases the flow requirements, the developer shall be responsible for completion of all upgrades to the existing water system to maintain system compliance with the above standards.

In planning for any development, it shall be the developer's responsibility to ensure adequate water flow and pressure can be obtained to satisfy all domestic and fire flow requirements. The developer shall coordinate with the District and the local fire authority.

2.1.7 Providing for Future Extensions

Upon development, utilities shall be extended and/or replaced past or through their property to allow for future extension, expansion and continuation of the District's distribution system or for conformance with the District's Water System Comprehensive Plan.

2.1.8 Easements

Water mains installed on private property require a minimum ten (10) feet of recorded easement on each side of the pipe, for a total width of twenty (20) feet. Easements for water service connections, where required by the District Administrative Code, shall be a minimum of five (5) feet on each side of the pipe, for a total width of ten (10) feet unless otherwise required by the District Engineer.

2.1.9 Valves

Valves shall be installed along the water main at intervals not to exceed 500 feet. Gate valves shall be placed at all junction points, such that there are valves on each leg of a tee (3 valves), or cross (4 valves).

2.1.10 Fire Hydrants

Fire hydrants shall be installed at a minimum of every 600 feet of water main.

2.1.11 Sampling Stations

A minimum of one sample station per zone is required for each new pressure zone. The District, at its sole discretion, may require sample stations for new developments in existing pressure zones.

2.1.12 Separation from Sanitary Sewer Pipes

Minimum separation of water pipes and sanitary sewer pipes shall be ten (10) feet horizontally for parallel pipe, and eighteen (18) inches vertically with the water pipe on top for perpendicular or oblique crossings, measured from the bottom of the water pipe to the crown of the sewer pipe. Situations occurring with less than the minimum separation as required shall be in accordance with Section C1-9.1, Required Separation Between Water Lines and Sanitary Sewers, of the current edition of the "Criteria For Sewage Works Design" published by the Washington State Department of Ecology.

2.1.13 Pipe Slope and Air/Vacuum Release Valves

Water mains shall be installed at an upward slope to a high point where a combination air/vacuum release valve shall be installed.

2.1.14 Water Booster Stations

All public/District-owned water booster stations shall have at least two pumps and a standby generator.

2.1.15 Retaining Walls

Retaining walls of any height over public water mains or public water service pipes within utility easements or public right-of-way shall be avoided whenever reasonably possible. The intent is to maintain perpetual District access to the pipelines for inspection, maintenance, repair, renewal, or replacement without the need for special equipment or deconstruction/reconstruction of the wall.

Proposed walls constructed over publicly owned pipelines shall be designed to accommodate the intent described above and be approved by the District Engineer and/or General Manager. The District may require the design to be prepared by a Washington State Licensed Professional Engineer.

Retaining walls on private property over private water services pipe shall meet building permit requirements as detailed in the most current edition of Whatcom County Code, Chapter 15.04, Building Codes and the following minimum requirements:

1. Private water services pipes crossing under or through a retaining wall shall be installed in a ductile iron or steel pipe casing at least 4-inches larger in diameter than that of the internal service pipe. The casing pipe shall extend on either side of the wall a distance equal to the depth of the pipe at the wall penetration, plus 4-feet. Casing spacers shall be installed at intervals sufficient to support the pipe in the center of the casing pipe. End seals shall be provided at each end of the casing that permanently block groundwater and soil from entering the annular space between the internal service pipe and casing.
2. Retaining wall drainage shall not connect to the public sanitary sewer system.
3. Prior to construction, submit plans to the District that include plan, elevation, and cross sectional views of the wall which identify the proposed location of private water service pipe, casing, and clearances.
4. For walls that are required by Whatcom County (or other agency with jurisdiction) to be engineered, submit to the District a copy of plans and calculations prepared by a Washington State Licensed Professional Engineer that document wall design and that specify the casing pipe material and alignment needed to resist wall loads.

2.2 Sewer Projects

2.2.1 Minimum Design Requirements

Minimum design criteria, unless the District criteria are more stringent, shall be in accordance with the current edition of the "Criteria for Sewage Works Design" published by the Washington State Department of Ecology.

2.2.2 Minimum Pipe Size

Minimum pipe size for sewer gravity mains is eight (8) inches in diameter except that, in special cases, 6-inch diameter sewer pipes may be approved by the District if they meet the Department of Ecology Guidelines for 6-inch diameter sewer pipes. The minimum size for sewer laterals/side sewers shall be six (6) inches in diameter from the sewer main to the property line. Minimum size pipe for District force mains shall be four (4) inches in diameter unless determined by the Engineer of Record, and approved by the District Engineer, that a smaller diameter must be used.

2.2.3 Providing for Future Extensions

Upon development, utilities shall be extended and/or replaced past or through their property to allow for future extension, expansion and continuation of the District's collection system or for conformance with District’s Comprehensive Sewer Plan.

2.2.4 Easements

A minimum ten (10) feet of recorded easement must be provided on each side of the pipe, for a total width of twenty (20) feet. Easements for sewer service connections, where required by the District Administrative Code, shall be a minimum of five (5) feet on each side of the pipe, for a total width of ten (10) feet unless otherwise required by the District Engineer.

2.2.5 Separation from Water Pipes

Minimum separation of water pipes and sanitary sewer pipes shall be ten (10) feet horizontally for parallel pipe, and eighteen (18) inches vertically with the water pipe on top for perpendicular or oblique crossings, measured from the bottom of the water pipe to the crown of the sewer pipe. Situations occurring with less than the minimum separation as required shall be in accordance with Section C1-9.1, Required Separation between Water Lines and Sanitary Sewers, of the current edition of the "Criteria for Sewage Works Design" published by the Washington State Department of Ecology.

2.2.6 Manholes

Manholes shall be installed in accordance with the District's Standard Details and Section C1-1.6, Manholes Design and Construction, of the current edition of the "Criteria for Sewage Works Design" published by the Washington State Department of Ecology. Manholes shall be placed at each grade and direction change. Distances between manholes shall not exceed 350 feet. Manholes shall be a minimum of five (5) feet deep to the invert of the pipe. Manholes shall be installed at the end of each pipe of 8-inch diameter or greater. Cleanouts shall not be installed on sewer mains.

2.2.7 Manhole Drop Connections

An outside drop connection shall be provided for a sewer pipe entering a manhole at an elevation of 24 inches or more above the manhole invert.

2.2.8 Corrosion Resistant Manholes

Corrosion resistant manholes shall be constructed at force main terminations, as well as two manholes downstream and one manhole upstream of force main terminations. Corrosion resistant manholes shall also be constructed in areas with steep slopes downstream of any force main discharges, where directed by the District Engineer. All coatings shall be applied in accordance with manufacturer's instructions.

Base sections, risers, eccentric reducers, and flat slab tops of new manholes shall be shop-coated. A minimum of two coats of System A Epoxy shall be field-applied to the invert, the finished grade rings, any metallic pipe extending into the manhole, and any damaged shop-coated sections. All grout and cement mortar shall be allowed to cure a minimum of 28 days prior to applying the coating system. Surfaces shall be prepared and epoxy applied in accordance with the coating manufacturer's instructions. Coatings shall be pinhole free with a minimum dry film thickness of 60 mils. The required temperature and humidity shall be maintained for the duration of the curing period.

Existing manholes to be coated:

1. Water blast or sand blast (per manufacturer's recommendations) existing manhole surfaces to be coated. Remove all grease, laitance, and deleterious materials from the concrete

surfaces. Seal off the flow line, as required, to maintain flows while keeping debris out of the sewer. Dry the manhole surfaces to meet manufacturer's requirements. Apply coating in accordance with the coating manufacturer's requirements.

2. If, in the opinion of the District, the existing manhole surfaces are unsuitable for service as corrosion resistant manholes, replace the manhole with new corrosion resistant manholes at no cost to the District.

2.2.9 Grinder Pump Systems

Grinder pump systems, where approved for use by the District Engineer (Section 5.2.2), shall use a minimum of one grinder pump system for each lot served. Each system shall serve no more than one (1) single-family home with an accessory dwelling unit located on the same lot. No more than one residential duplex shall be served by a single grinder pump system. A residential triplex shall be served by, at minimum, a duplex grinder pump system or two simplex systems. The grinder pump system shall comply with Washington State Department of Labor & Industries requirements regarding intrinsically safe electrical equipment.

2.2.10 Pretreatment Systems

Pretreatment system may be required to reduce, eliminate or alter the nature of a pollutant's properties prior to discharging to the public sewer collection system. Pretreatment systems include grease interceptors, oil/water separators, and other units to treat metals, solvents, excessive Biochemical Oxygen Demand (BOD) or total suspended solids, and other constituents.

The District reserves the right to evaluate a waste stream prior to connection and require pretreatment to comply with waste discharge criteria and limits established by District resolution.

Grease Interceptors

Any business involved in the process, preparation, sale, or packaging of human or animal food requires that an exterior (outside) grease interceptor be installed on a separate side sewer. This separate side sewer shall be connected directly, and only, to the food handling areas in the building, with no sanitary connections permitted upstream of the grease interceptor.

Grease interceptors shall comply with the current version of the Uniform Plumbing Code and the Uniform Building Code. The design capacity of the grease interceptor shall be determined by the formula(s) provided in the Uniform Plumbing Code (Appendix H of the Uniform Plumbing Code).

Precast concrete grease interceptors shall be designed for a soil dead load of 150 lbs/cu. ft. and an AASHTO H-20 live load as manufactured by Utility Vault or equivalent.

Oil/Water Separators

Oil/water separator design and sizing shall conform to the Washington State Department of Ecology's Best Management Practices (BMP) for Stormwater Treatment. The separator shall be an American Petroleum Institute (API) or Coalescing Plate Interceptor (CPI).

Oil/water separators shall be designed for a soil dead load of 150 lbs/cu. ft. and an AASHTO HS-20 live load.

Oil/water separators shall include a forebay to collect floatables and large settleable solids with a surface area not less than 20 sq. ft. per 10,000 sq. ft. of area draining into the separator.

2.2.11 Retaining Walls

Retaining walls of any height over public sewer mains or public sewer service pipes within utility easements or public right-of-way shall be avoided whenever reasonably possible. The intent is to maintain perpetual District access to the pipelines for inspection, maintenance, repair, renewal, or replacement without the need for special equipment or deconstruction/reconstruction of the wall. Proposed walls constructed over publicly owned pipelines shall be designed to accommodate the intent described above and be approved by the District Engineer and/or General Manager. The District may require the design to be prepared by a Washington State Licensed Professional Engineer.

Retaining walls on private property over private sewer service pipes shall meet building permit requirements as detailed in the most current edition of Whatcom County Code, Chapter 15.04, Building Codes and the following minimum requirements:

1. Private sewer services pipes crossing under or through a retaining wall shall be installed in a ductile iron or steel pipe casing at least 4-inches larger in diameter than that of the internal service pipe. The casing pipe shall extend on either side of the wall a distance equal to the depth of the pipe at the wall penetration, plus 4-feet. Casing spacers shall be installed at intervals sufficient to support the pipe in the center of the casing pipe. End seals shall be provided at each end of the casing that permanently block groundwater and soil from entering the annular space between the internal service pipe and casing.
2. Retaining wall drainage shall not connect to the public sanitary sewer system.
3. Prior to construction, submit plans to the District that include plan, elevation, and cross-sectional views of the wall which identify the proposed location of private sewer service pipe, casing, and clearances.
4. For walls that are required by Whatcom County (or other agency with jurisdiction) to be engineered, submit to the District a copy of plans and calculations prepared by a Washington State Licensed Professional Engineer that document wall design and that specify the casing pipe material and alignment needed to resist wall loads.

2.3 Electrical, Telecommunication and Automatic Control

2.3.1 Section Application

The requirements in this section apply to District capital projects and Developer Extension Agreement (DEA) projects as defined in the District Administrative Code Section 3.1.17, that modify or install new electrical, telecommunication and/or automatic control components as may be required by either, District Standards, the current edition of the "Water System Design Manual" published by the Washington State Department of Health and Washington Administrative Code Chapter 246-290, Group A Public Water Supplies, the current edition of the "Criteria for Sewage Works Design" published by the Washington State Department of Ecology, or other regulating agency.

2.3.2 Minimum Electrical Design Requirements

Provide all electrical work and materials in accordance with the latest edition of the National Electric Code (NEC), National Electric Safety Code, Washington State Electrical Code and local regulations and ordinances.

2.3.3 Minimum Electrical Service Requirements

The project electrical service shall be configured, or reconfigured, for minimum 277/480 Volt, three-phase, underground power service, in conduit, meeting the requirements of the Electrical Power Provider. All electrical service costs, including all costs associated with reconfiguration and additions to existing facilities, shall be part of the Project cost.

2.3.4 Minimum Telecommunication Service Requirements

The project shall provide cellular or underground telecommunication service. Underground service shall be installed in conduit to the project telecommunication service box. All telecommunication service costs, including all costs associated with reconfiguration and additions to existing facilities, shall be part of the Project cost.

2.3.5 Minimum Automatic Control Requirements

The project shall provide automatic controls using programmable logic controllers at the Project site and additions to a stand-alone computer-based telemetry, control and data logging system owned, operated and maintained by the District. Programmable logic controller (PLC) shall provide local, automatic control of pumps and other equipment at the project site. A computer-based telemetry system shall provide remote control, alarm presentation and data logging activities to the District's headquarters location.

Contractor shall use a District-approved 'panel shop' to design, program, furnish and integrate the system, including but not limited to; provide the instruments panels, provide the PLC(s), control panels and all other instrument system components and integration.

District-approved Panel Shops:

- Quality Controls Corporation – Lynnwood, Washington
- Systems Interface, Inc. – Bothell, Washington
- Technical Systems, Inc. – Lynnwood, Washington

2.3.3 Permits and Testing

The Project developer/contractor shall obtain all permits, licenses, approvals and inspections by the Authority Having Jurisdiction and provide all other arrangements for the work on the Project. Test all circuits for continuity, freedom from ground and proper operation during progress of work. Test Reports on all equipment shall be submitted to the Engineer prior to acceptance. Conduct final testing in the presence of the Engineer. All fees shall be part of the Project cost.

2.3.4 Products

All electrical products shall bear a label from a certified testing laboratory recognized by the State of Washington. Recognized labels in the State of Washington are UL, ETL and CSA-US.

PLC components shall be Allen-Bradley, no substitutions.

Automatic system components, programming and integration are not fully detailed. The District's construction documents (plans and specifications) for the District's most recent capital projects will be used to establish minimum standards for DEA project requirements.

2.3.5 Conduits and Fittings

Galvanized rigid steel (GRS) conduit shall be used in and below all building, structures, in concrete, in corrosive areas, and all other locations, except as noted below. GRS conduit shall be steel, hot dipped galvanized inside and out. The GRS must meet USA Standards Institute C80-1 Underwriters Laboratories Standard UL6, and carry a UL label. Use cast threaded hub fittings and junction boxes for all rigid conduit except in locations not permitted by the NEC.

> *Exception: PVC Schedule 80 conduit, in contact with the earth, may be used with power circuits only, when further than 10-feet from the closest point, measured horizontally, from any structure, including but not limited to manholes, wet wells, concrete pads, etc. The only exception shall be concrete electrical vaults or hand-holes. Conduit shall be gray in color. Fitting shall be of the same material as the raceway and installed with solvent per the Manufacturer's instructions. Conduits, fittings and solvent shall all be manufactured by the same manufacturer.*

GRS conduit shall be used for all instrumentation (signal) circuits.

All underground elbows 90-degrees and greater, including elbows connecting to PVC Schedule 80 conduit, shall be GRS.

Flexible metal conduit shall be used for all final connections to motors and vibrating equipment. Flexible conduit shall be interlocking single strip, hot dipped galvanized and shall have a polyvinyl chloride jacket extruded over the outside to form a flexible watertight raceway. Flexible conduit shall be American Brass Company Sealtite Type VA, General Electric Type UA or equal.

Electrical and power conduit number and size vary per Project requirements. Maintain 12-inch minimum spacing between telemetry and other conduits.

CHAPTER 3 CONSTRUCTION STANDARDS—GENERAL

3.1 Construction Plan Notes

The General Notes apply for all new public facility construction within the District and shall be included in every construction plan set. Water System Notes, Sewer System Notes and Electrical Project Notes shall be included in the plan set as relevant for the type of construction project.

3.1.1 General Notes

See District Standard Detail G1 for General Notes to be included in construction plans.

3.1.2 Water System Notes

See District Standard Details W1 and W2 for Water System Notes to be included in construction plans.

3.1.3 Sewer System Notes

See District Standard Details S1 and S2 for Sewer System Notes to be included in construction plans.

3.1.4 Electrical Project Notes

See District Standard Detail E1 for Electrical Project Notes to be included in construction plans.

3.2 Inspection Requirements

Unless previously authorized by the District, work on water and/or sewer mains shall not proceed without a District Inspector being present. The District may refuse acceptance of any water and/or sewer mains installed without District inspection. To schedule an inspection, the District must receive a hard copy of the construction schedule and a request for inspection at least two (2) full working days before construction activities covered by the schedule begins. The District must be kept advised of changes to the construction schedule. When significant breaks in construction occur, the contractor must provide two (2) full working days' notice before resuming work. The District Inspector shall have the authority to reject defective material and to suspend any work that is not conducted in accordance with these Construction Standards.

Authority of the Engineer, its appointees, assistants and inspectors, shall be per WSDOT 1-05.1. All references to the Engineer or District Engineer shall also mean their appointees, assistants or inspectors as per WSDOT 1-05.2.

All mains shall be inspected by the District Engineer before closure of any excavation. Inspectors shall be provided access to work sites, as necessary, to keep the District informed of the progress of work and the manner in which it is being done, to keep records, to act as liaison between the contractor(s) and the District, and to report any deviations from District-approved plans or specifications. Failure of the Inspector to call the attention of a contractor to faulty work or deviations from the plans, specifications, or these Construction Standards shall not constitute acceptance of work.

Any personal assistance which a District Inspector may provide a contractor will not be construed as the basis of any assumption of responsibility in any manner, financial or otherwise, by the Inspector, the Engineer, or the District.

The presence or absence of a District Inspector on any job will be at the sole discretion of the District. Such presence or absence of an Inspector will not relieve a contractor of responsibility to deliver the construction results specified in the District-approved plans or specifications, or these Construction Standards.

District Inspectors is not authorized to issue instructions or to approve or accept any portion of the work that is contrary to the District-approved plans or specifications, or these Construction Standards. Approvals, acceptances, or instructions, when given, must be in writing and signed by the District Engineer or their designated representative. Inspectors have authority to reject defective material. The failure of an Inspector to reject defective material or any work that deviates from the District-approved plans or specifications, or these Construction Standards, will not constitute acceptance of such work

3.3 Surveying and Staking

Lots and/or property lines shall be surveyed and staked to ensure water and sewer services are installed within the property, recorded easements, and/or rights-of-way. Surveying and staking are the responsibility of the property owner and contractor.

3.4 Excavation Safety

Where shoring, sheet piling, sheeting, bracing, lagging, or other supports are necessary to prevent cave-ins or damage to existing structures, it shall be the responsibility of the contractor to design, furnish, place, maintain, and remove supports in accordance with applicable laws, codes, and safety requirements, including Chapter 296-155 of the Washington Administrative Code, A Safety Standards for Construction Work, Part N, Excavation, Trenching, and Shoring. Design, planning, installation, and removal of sheeting, shoring, piling, lagging, and bracing shall be accomplished in such a manner as to maintain the undisturbed state of soil below and adjacent to excavation.

CHAPTER 4 CONSTRUCTION STANDARDS—WATER PROJECTS AND WATER SERVICES

4.1 General Requirements

4.1.1 District Water Permit

A District water permit is required prior to installation of a water service.

4.1.2 Construction Standards and Uniform Plumbing Code

All water project improvements shall be installed per the District Construction Standards. Water service pipes shall be installed per the Uniform Plumbing Code (UPC), to the edition, amendments, standards and exemptions adopted by Whatcom County, as detailed in the most current edition of the Whatcom County Code, Chapter 15.04, Building Codes.

4.1.3 Easements

Private water services shall be installed solely on the property being served and/or within appropriate recorded easements and rights-of-way.

4.1.4 Developer Extension Agreement Projects

The developer is responsible for installing the water service from the water main to property line for new main construction. The property owner is responsible for installing water service from property line to building. The developer will provide the District with the meter assemblies specified by the District. The District will install meter assemblies following property owner request for service and after all permits and connection fees are paid in full.

4.1.5 Installation, Maintenance, & Repair

The property owner is responsible for service pipe installation, maintenance and repair from the meter to the building. For new services, the District will tap the water main, install a service saddle, corporation stop, service pipe, meter assembly and meter box.

4.1.6 Separation from Side Sewer Services

Per the UPC Section 720.1, water pipes shall not be located within the same trench as a side sewer pipe unless: 1) the bottom of the water pipe shall be not less than 12-inches above the top of the side sewer pipe, 2) the water pipe shall be placed on a solid shelf excavated at one side of the common trench with a clear horizontal distance of not less than 12-inches from the sewer pipe, and 3) water pipes crossing a sewer pipe must be placed not less than twelve (12) inches above the sewer pipe.

4.1.7 Pressure Reducing Valves

It is the responsibility of the property owner to supply and install a pressure reducing valve (PRV) for their service. Pressure reducing valves shall be installed downstream of the meter and dual check valve directly behind the meter box. Property owners that elect not to install a PRV must record a hold harmless agreement with the Whatcom County Auditor before the District will provide service. Hold harmless agreements are available at the District office.

4.1.8 Privately-owned Water Booster Systems

Privately-owned water booster systems are not allowed as a means of obtaining water service where the pressure at the service's meter is recorded below 30 psi. The only exceptions are certain existing Sudden Valley lots covered by District Resolution No. 410 and other specific areas approved by the District's Board of Commissioners. Each application is subject to cross-connection control analysis by the District. Booster pump installations will be required to install a reduced pressure backflow device.

4.1.9 Pre-Construction Meeting

The contractor shall schedule a pre-construction meeting with the District prior to beginning construction. At the pre-construction meeting, the District will approve the contractor's water service alignment and the approximate location of either: connection to the water main, connection to a water stub that may have been previously extended to a property line, or connection to a water lateral used by an adjacent property that was constructed to allow joint use of the lateral and future connection.

4.1.10 Inspections

The District must inspect and approve the PRV prior to start of water service.

CHAPTER 5 CONSTRUCTION STANDARDS—SEWER PROJECTS AND SEWER SERVICES

5.1 General Requirements

5.1.1 Contractor Requirements

Contractors installing, modifying, or repairing side sewer services shall have a current Sewer Services Contractor's Certification Agreement and surety bond on file at the District.

5.1.2 Construction Standards and Uniform Plumbing Code

All sewer project improvements shall be installed per the District Construction Standards. Sewer service pipes shall be installed per the District Construction Standards and the Uniform Plumbing Code (UPC), to the edition, amendments, standards and exemptions adopted by Whatcom County, as detailed in the most current edition of the Whatcom County Code, Chapter 15.04, Building Codes.

5.1.3 District Sewer Permit

A District sewer permit is required prior to installation, repair or modifications to any side sewer service. Main sewer pipe shall be in use and operational before the sewer permit will be issued.

5.1.4 Easements

Side sewer services shall be installed only on the property being served and/or within appropriate recorded easements and rights-of-ways.

5.1.5 Authorization to Connect to Sewer Main

The contractor shall connect the sewer lateral to the sewer main at the location identified and authorized by the District. The contractor shall schedule and attend an onsite pre-construction meeting with the District to obtain authorization to connect prior to sewer lateral installation.

5.1.6 Other Permits

The contractor shall obtain and abide by encroachment permits or other permissions which may be required from Whatcom County, Sudden Valley Community Association, or other entity having jurisdiction over roads and streets, prior to commencing sewer service work. Restoration shall be done in a manner approved by the appropriate jurisdiction.

5.1.7 Ground and Surface Water Drain Connections Prohibited

No downspouts, footing drains, foundation/crawl space sump pumps, yard drains, or any other source of ground or surface waters are allowed to connect to a side sewer or other sewer main or appurtenance.

5.2 Side Sewer Services into Gravity Mains

5.2.1 Installation, Maintenance, & Repair

The property owner is responsible for using a contractor on the current District's Bonded Side Sewer Contractor list. The contractor shall install the sewer service connection from the sewer

main to the building, which includes connecting to an existing service tee or sewer lateral. The contractor may install a new service tee when approved by the District Engineer. The contractor is responsible for installing a cleanout at the property line and additional cleanouts per the District Standard Drawings, and restoration per the District Standard Drawings.

The property owner is responsible for maintenance and repair of the side sewer service from the property line to the building, as well as any blockages throughout the entire sewer service connection from the building to the sewer main.

5.2.2 Grinder Pumps

Grinder pumps may be installed only in special circumstances where the District Engineer authorizes such use because the installation of a gravity system is either not possible or other circumstances warrant the District Engineer's approval of a grinder pump system. Grinder pump design shall be in accordance with Sections C1-10.1 and C1-10.2 of the current edition of the "Criteria for Sewage Works Design" published by the Washington State Department of Ecology and District Standard Drawings.

A complete grinder pump system submittal shall be submitted to and reviewed by the District for conformance to the District's design and construction standards prior to scheduling a pre-construction meeting or start of on-site sewer system work. Items noted as non-conforming shall be corrected, and a revised submittal shall be supplied. Submittal review does not relieve the contractor from full compliance with the District's Design and Construction Standards.

The contractor shall be responsible for removing groundwater to provide a firm, dry subgrade for the structure, and shall guard against flotation or other damage resulting from ground water or flooding. The grinder pump station shall not be set into the excavation until the installation procedures and excavation have been inspected and approved by the District.

The grinder pump station shall include a standard, 4-inch diameter inlet grommet for inlet piping. The contractor shall not insert inlet piping beyond the factory-approved "stop." The basin may not be dropped, rolled, or laid on its side for any reason.

Installation shall be accomplished so that 1- to 3-inches of access way, below the bottom of the lid, extends above the finished grade line. The finished grade shall slope away from the unit. The diameter of the hole shall be large enough to allow for the concrete anchor.

A 6-inch minimum layer of naturally rounded aggregate, clean and free flowing, with particle size of not less than ⅛-inch or more than ¾-inch shall be used as bedding material under each unit. A concrete anti-flotation collar sized according to manufacturer's instructions, shall be pre-cast to the grinder pump station tank or poured in-place. The grinder pump station, with its anti-flotation collar, shall have a minimum of four lifting eyes for loading and unloading purposes. The unit shall be leveled and filled with water to the bottom of the inlet to prevent the unit from shifting while the concrete is poured. The concrete must be manually vibrated to ensure there are no voids. If it is necessary to pour the concrete to a higher level than the inlet piping, an 8-inch sleeve is required over the inlet prior to the concrete being poured.

Backfill of clean, native earth, free of rocks, roots, and foreign objects shall be thoroughly compacted in lifts not exceeding 12 inches to a final Proctor density of not less than 85%. Improper backfilling may result in damaged access ways.

The electrical control panel shall be installed and wired to the grinder pump station in accordance with all applicable codes.

5.2.3 Pre-Construction Meeting

The contractor shall schedule a pre-construction meeting with the District prior to beginning construction. At the pre-construction meeting, the District will approve the contractor's side sewer alignment, and authorize the side sewer/sewer lateral alignment, the location of the grinder pump (if applicable), and the approximate location of either: connection to the sewer main, connection to a sewer stub that may have been previously extended to a property line, or connection to a lateral used by an adjacent property that was constructed to allow joint use of the lateral and future connection.

5.2.4 Inspections

The District must inspect all side sewer services prior to backfill. Services backfilled without an inspection shall be re-exposed and the full length tested at the contractor's expense prior to District approval.

Bedding & Backfill Inspection. The entire sewer service pipe from the main to the cleanout adjacent to the building must be inspected and approved by the District prior to backfill. Pipe backfilled before inspection will be rejected.

Leak Test. The contractor shall test the sewer service pipe in accordance with Standard Detail S2. All testing shall be witnessed by appropriate District personnel.

Grinder Pump Inspection (if applicable and allowed by the District). The private grinder pump station may be located inside or outside of the building. If located inside the building, the installation shall be subject to inspection by the Whatcom County Building Official (or his or her designee). If located outside of the building, the grinder pump station shall be subject to inspection by the District.

5.3 Pressure Side Sewer Services into Force Mains

5.3.1 Design

The property owner is responsible for the design of the pressure side sewer service installation, including the grinder pump station at the building, for systems connecting to District force mains. The property owner shall engage a civil engineer licensed in the State of Washington to prepare hydraulic calculations, determine pipe size, determine air release and air vacuum valve requirements, and select the appropriate model of grinder pump for the specific installation. Grinder pump design shall be in accordance with Sections C1-10.1 and C1-10.2 of the current edition of the "Criteria for Sewage Works Design" published by the Washington State Department of Ecology.

The private grinder pump package shall consist of at least a grinder pump, basin, cover, check valve, controls, transfer switch, and interior and exterior visual and audible alarms (with battery

backup for high level alarm), provided by Environment-One (E-One Model D Series Package Grinder Pump System).

Where required, air relief and combination air relief/vacuum relief valves shall be manufactured by Valmatic, ARI, or equivalent approved by the District, for sewer service, and installed per the manufacturer's directions. All valves shall be fully accessible to enable the property owner's operation, maintenance, and repair.

5.3.2 Developer Extension Agreement Projects

The developer is responsible for installing the customer service shutoff valve, check valve, check valve vault, and service pipe from the main to check valve for new sewer side service construction.

5.3.3 Installation, Maintenance and Repair

The property owner is responsible for installation, maintenance, and repair of the side sewer service from the property line to the building, including the grinder pump station, check valve, and check valve vault.

For individual permits, the District shall tap the force main and install the saddle, customer service shutoff valve, service pipe to the property line and check valve assembly at property line (note for developer extension agreements, the developer installs these items during construction of the new main). The developer shall be responsible for reimbursement of District labor, equipment, and material costs, as defined in the District's current Master Fees and Charges Schedule, for connection to the force main.

5.3.4 Pre-Construction Meeting

The contractor shall schedule a pre-construction meeting with the District prior to beginning construction. At the pre-construction meeting, the District will authorize the side sewer alignment and the location of connection to the main or sewer lateral near the property line.

5.3.5 Inspections

The District must inspect all side sewer services prior to backfill. Services backfilled without an inspection shall be re-exposed and the full length tested at contractor's expense prior to District approval.

Bedding & Backfill Inspection. Sewer service pipe from the main to the cleanout adjacent to building must be inspected and approved by the District prior to backfill.

Pressure Test. With all joints exposed, the District must witness a successful hydrostatic pressure test in accordance with Washington State Department of Transportation (WSDOT) Section 7-09.3(23) at 150 psi for all pipe and fittings between the grinder pump and the customer service shut-off valve (or point of connection to gravity sewer).

Grinder Pump Inspection. The private grinder pump station may be located inside or outside of the building. If located inside the building, the installation shall be subject to inspection by the Whatcom County Building Official (or his or her designee). If located outside of the building, the grinder pump station shall be subject to inspection by the District.

Start-up and Testing. The private grinder pump station shall be commissioned and tested for proper operation prior to submittal of a request for final inspection. At the final inspection the District will witness proper operation of the station as demonstrated by a trained professional.

Final Inspection. Startup/testing must be complete for final inspection.

5.4 Sewer System Appurtenances

5.4.1 Grease Interceptor and Oil/Water Separator Installation

The building sanitary side sewer shall be connected to the service lateral at least four (4) feet downstream from the interceptor providing the slope of the lateral is 2 percent or more.

Grease interceptors or oil/water separators may be installed in either planter or vehicle areas. In vehicular areas, the unit shall be constructed to meet AASHTO H-20 live load standards. In all cases the installation site shall provide and ensure ease of access, maintenance, and visual inspection and will be provided with a hinged, locking hatch.

A manhole shall be installed where the grease interceptor or oil/water separator discharges into the District's sanitary sewer for monitoring purposes or at an upstream location approved by the District. If physical conditions preclude the installation of a monitoring manhole on the District main, the contractor shall install, with District approval, an inspection chamber.

CHAPTER 6 CONSTRUCTION STANDARDS—DETAILS

General Details

G1-G3	General Notes
G4	Typical Trench and Backfill Detail
G5	Water Project Record Drawing Documentation
G6	Sewer Project Record Drawing Documentation
G7	Maintenance Vehicle Turnaround
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GENERAL NOTES

These Standard Details, together with the most current versions of the District's full Design and Construction Standards (DCS) and the District Administrative Code, incorporated herein by reference, shall govern all District design and construction activities.

1. All work and materials shall meet the requirements of the most current editions of the Lake Whatcom Water and Sewer District (District) Design and Construction Standards, Lake Whatcom Water and Sewer District Construction Contract Documents and Project Specifications (for Public Works Projects), the instructions and recommendations of the Manufacturer of the material concerned and select specifications within the Standard Specifications for Road, Bridge and Municipal Construction as prepared by Washington State Department of Transportation (WSDOT) and with all other regulatory agency requirements and permits including but not limited to work within Whatcom County right–of–way shall meet Whatcom County (County) design and construction requirements. In case of a conflict between the above standards, the more stringent shall apply. All work and materials shall be subject to the approval of the District Engineer.

2. Contractor shall obtain encroachment permits or other permissions which may be required from the County, Sudden Valley Community Association, or other entity having jurisdiction over roads and streets, prior to commencing work. For work areas impacting traffic, a traffic control plan must be approved prior to work.

3. Contractor shall provide and maintain all Temporary Erosion Control and Sedimentation (TESC) in accordance with the most current edition of the Storm Water Management Manual for Western Washington (SWMMWW), Volume II, by the Washington State Department of Ecology, Publication Number 14–10–055. Contractor shall use required and necessary Best Management Practices (BMPS) described therein and as may be further described or detailed on the project drawings.

4. Before the start of construction, Contractor shall follow all applicable laws regarding utility locating and notifications in accordance with Washington's Dig Law (RCW 19.122). Excavation must coordinate with a Utility Notification Center and locate marks must align with the APWA Uniform Color Code. Contractor shall not begin excavation until utility notification period is complete.

5. A preconstruction meeting is required with the District and Contractor performing the work before the start of construction.

6. Authority of Engineer, its appointees, assistants and inspectors, shall be per WSDOT 1–05.1. All references to the Engineer or District Engineer shall also mean its appointees, assistants and inspectors as per WSDOT 1–05.2.

7. The Contractor shall be solely responsible for the safety of all workers and shall comply with all appropriate state safety and health standards, codes, rules, and regulations, including, but not limited to, those promulgated under the Washington Industry Safety and Health Act RCW 49.17 (WISHA) and as set forth in Title 296 WAC (Department of Labor and

Industries).

8. Inspection of work and materials shall be in accordance with WSDOT 1–05.6. Removal of unauthorized or defective work shall be in accordance with WSDOT 1–05.7.

9. The Contractor shall take all steps necessary to ensure that the existing facilities remain fully operational during all stages of construction, including but not limited to providing bypass pumping, standby storage, emergency generators and pump trucks, as necessary during service interruptions or outages.

10. No inspections or tie–ins to District's facilities shall be performed on a Friday, Weekend or District Holiday.

11. All pipes shall be bedded in bedding material meeting the requirements of WSDOT 9–03.12(3). The bedding cross–section shall be blocked with Control Density Fill (CDF) per WSDOT 3.07.3(1)E a minimum of every 800 feet and the trench drained to daylight or to a storm drain in accordance with District Standard Detail G10.

12. Backfill above the pipe zone bedding within County ROW and Sudden Valley, within the roadway section or at driveway crossings shall consist of crushed surfacing top course material meeting the requirements of WSDOT 9–03.9(3). Backfill within private driveways shall consist of material meeting the requirements of WSDOT 9–03.19. Backfill in other areas shall consist of material meeting the requirements of WSDOT 9–03.15, except as shown on the plans or details. Backfilling of trenches shall be in accordance with WSDOT 7.08.3(3).

13. Pea gravel shall not be used for pipe bedding or trench/excavation backfill material. The District may approve limited use of pea gravel where hazardous site conditions exist that pose an immediate threat to workers or public. Pea gravel, if approved for use by the Engineer, shall be a clean mixture free from organic matter meeting the following gradation (passing by weight a US standard sieve); 100% passing 1/2", 95–100% passing 3/8", 0–10% passing #8, and 0–3% passing #200.

14. Backfill shall be compacted to minimum 95% modified Proctor within traffic areas and minimum 90% modified Proctor in landscape and open areas.

15. Tracer wire installation is required on all District owned pipe, electrical conduits and communication lines/conduits. Tracer wire is also required on private side sewers. Install tracer wire per District Standard Detail E6. In addition to tracer wire, install 2–inch wide detectable marking tape 12 to 18 inches above the pipe or conduit. Detectable marking tape shall meet the requirements of WSDOT 9–15.18 and be color coded blue for water, green for sewer, red for electrical and orange for telecommunication.

16. Public water mains and any sanitary sewer pipe or other non–potable conveyance system shall maintain a minimum of 10–feet horizontal separation (parallel alignment) and a minimum 18–inch vertical separation (parallel alignment and crossings at angles including

perpendicular with the sewer pipe below the water pipe), measured as the closest distance between outside of pipes, in accordance with the most current editions of the Washington State Department of Health (DOH) Water System Design Manual Section 6.3.4 and the Department of Ecology (DOE) "Criteria for Sewage Works Design" Section C1–9.

When local conditions prevent these separations, with the approval of the District Engineer, installations shall follow the requirements outlined for unusual conditions in the referenced DOH and DOE manuals which includes details for specific pipe materials, pipe segment lengths, joint separation requirements, concrete encasement and/or pipe casings. If a pressure sewer cannot be installed with a minimum 18–inch separation from a water pipe at a crossing, then the pressure sewer shall be constructed only under the water pipe with the sewer pipe in a casing (casing material per the DOE manual) extending at least 10–feet on each side of the crossing.

17. Control Density Fill (CDF), if required, shall meet the requirements of WSDOT 3.07.3(1)E..

18. From the main to the property line, sewer pipes and water pipes shall maintain a minimum horizontal separation of 10–feet. When local conditions prevent the 10–feet separation, separation shall be per District Standard Detail G9, Water Pipe and Sewer Pipe Trench Detail, Unusual Conditions. Separation of water service pipes and sewer pipes within private property shall be per District Standard Detail G8.

19. Contractor shall remove all debris and excess excavation; repair all damage, and restore the site, public or private, to pre–construction conditions.

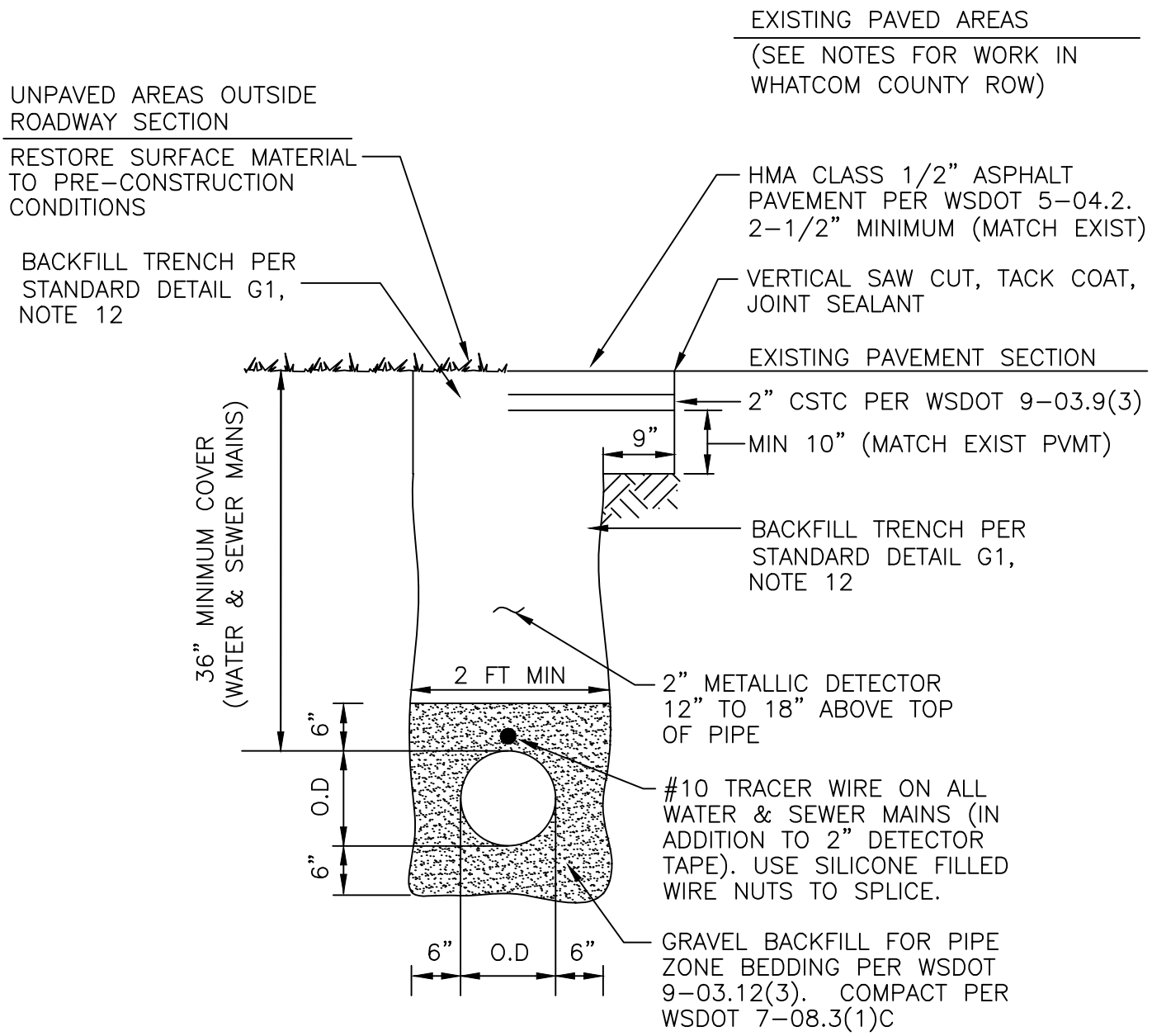
20. Where mains or services are placed within a ditch area, the buried depth shall be at least 30–inches below the bottom of the ditch, measured from the crown of the pipe to the bottom of the ditch.

21. During excavation, maintain a minimum 12" clearance zone in all directions around all District facilities. Only safe and careful work methods as defined by RCW 19.122.020(32) are permitted within this zone.

22. All work within Whatcom County Right Of Way (ROW) shall meet the requirements of the most current edition of the Whatcom County Development Standards, Section 512.

23. The Lake Whatcom Water and Sewer District is located within the Lake Whatcom Watershed where seasonal clearing activity limitations established by Whatcom County Code 20.51.410 are in force. Clearing activity, which includes trench excavation/backfill and other land disturbance, that will result in exposed soils exceeding 500 square feet shall be prohibited from October 1 through May 31.

24. References to the Uniform Plumbing Code (UPC) shall be to the edition, amendments standards and exemptions adopted by Whatcom County, as detailed in the most current edition of the Whatcom County Code, Chapter 15.04, Building Codes.



NOTES:

1. With respect to trench repairs and pavement overlays, in the event of conflict between this detail and Whatcom County Standard Drawing Numbers 512.F-1 and 512.F-2, the more stringent standard shall apply.

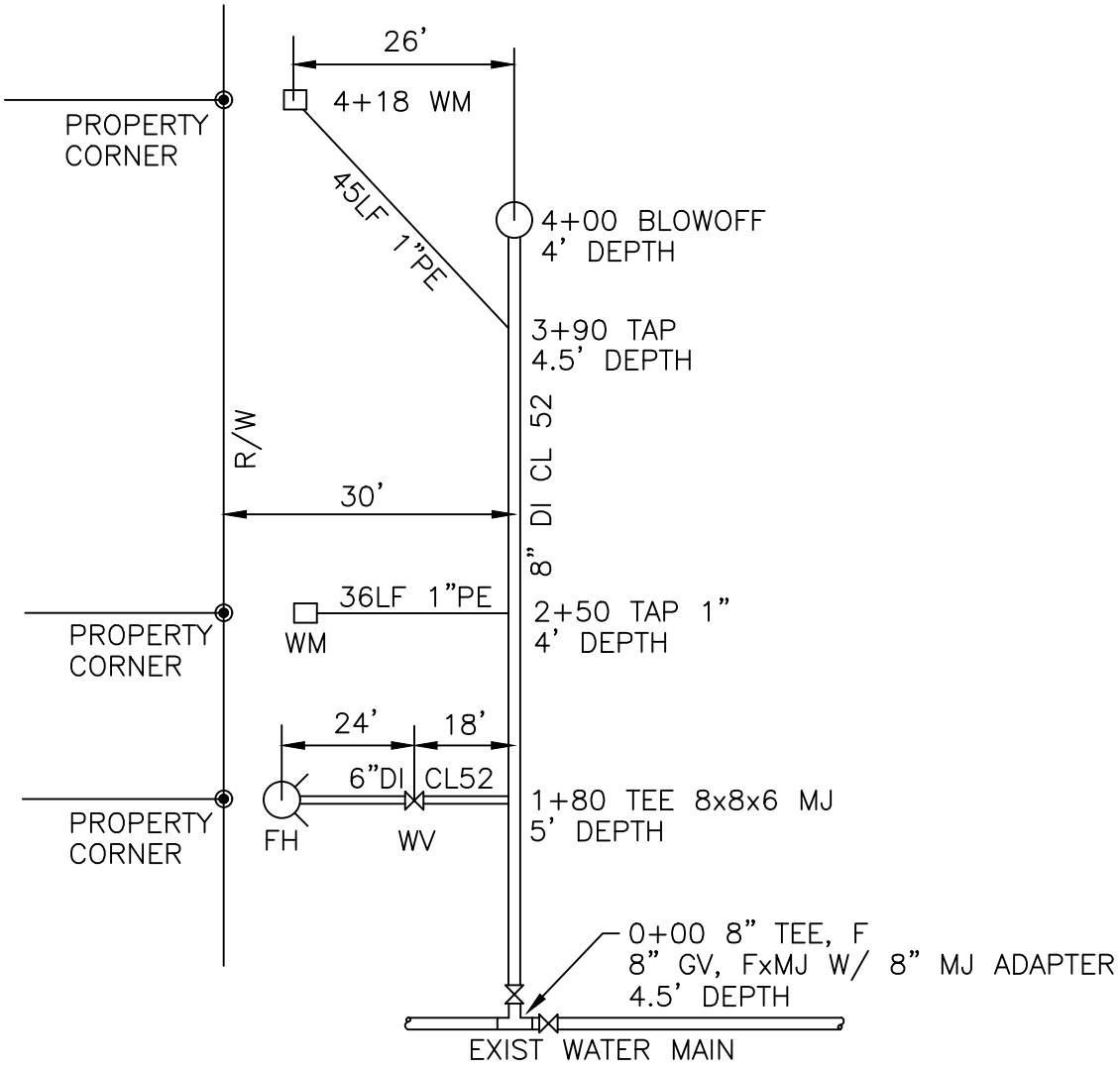
2. Standard utility locations within county-maintained public road prisms as shown in the 2012.09.25 version of Whatcom County Standard Drawing No. 512.D-1 shall apply.

LAKE WHATCOM WATER & SEWER DISTRICT

TYPICAL TRENCH AND BACKFILL DETAIL

STANDARD DETAIL

G4



EXAMPLE RECORD DRAWING

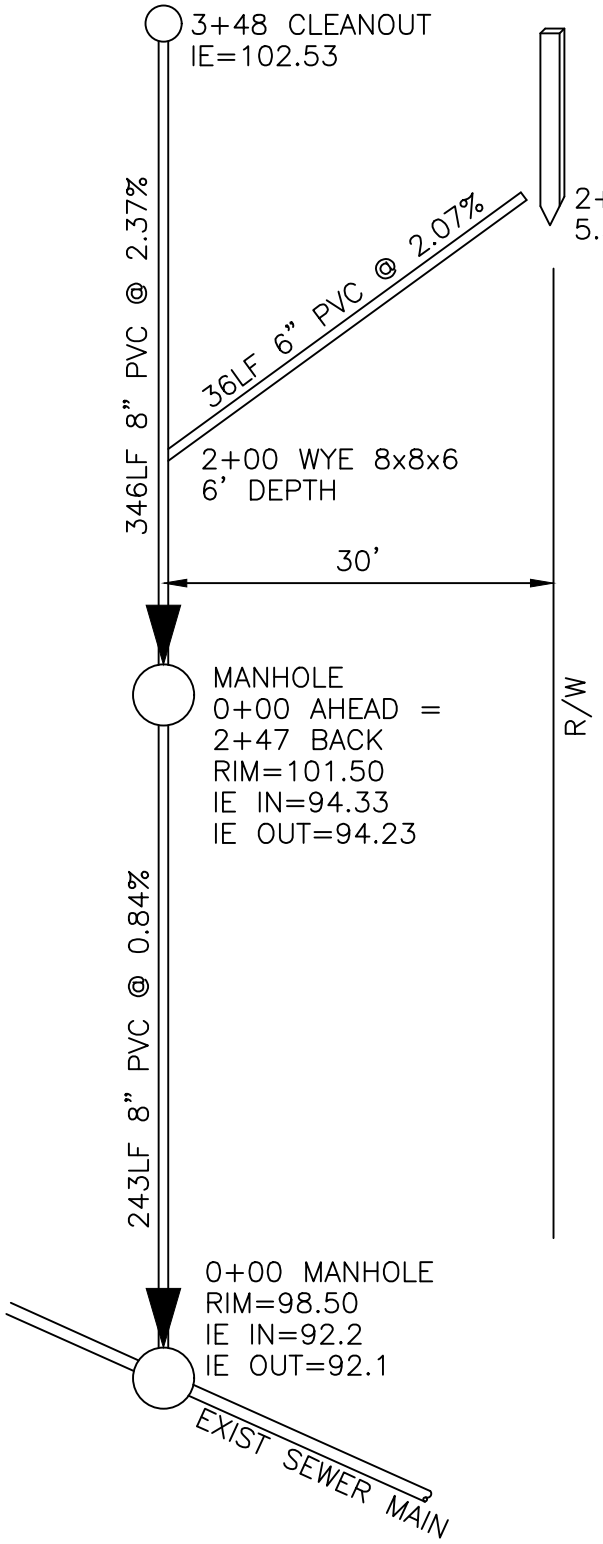
NOTES:

CONTRACTOR SHALL PROVIDE RECORD DRAWINGS MEETING THE FOLLOWING MINIMUM REQUIREMENTS:

1. Water Mains. Show alignment dimensions to right–of–way, easements, and road centerlines. Show stationing and depth of fittings, valves, and service taps along the main.

2. Fire Hydrants, Blowoffs, and other Appurtenances. Show length & material between tees, valves, hydrants, blowoffs, etc. Show station/offset of appurtenance if skewed from 90–degrees from main.

3. Water Services & Sampling Stations. Show tap station along main and size of tap. Show length & material of water service connection from main to meter box or sampling station.



EXAMPLE RECORD DRAWING

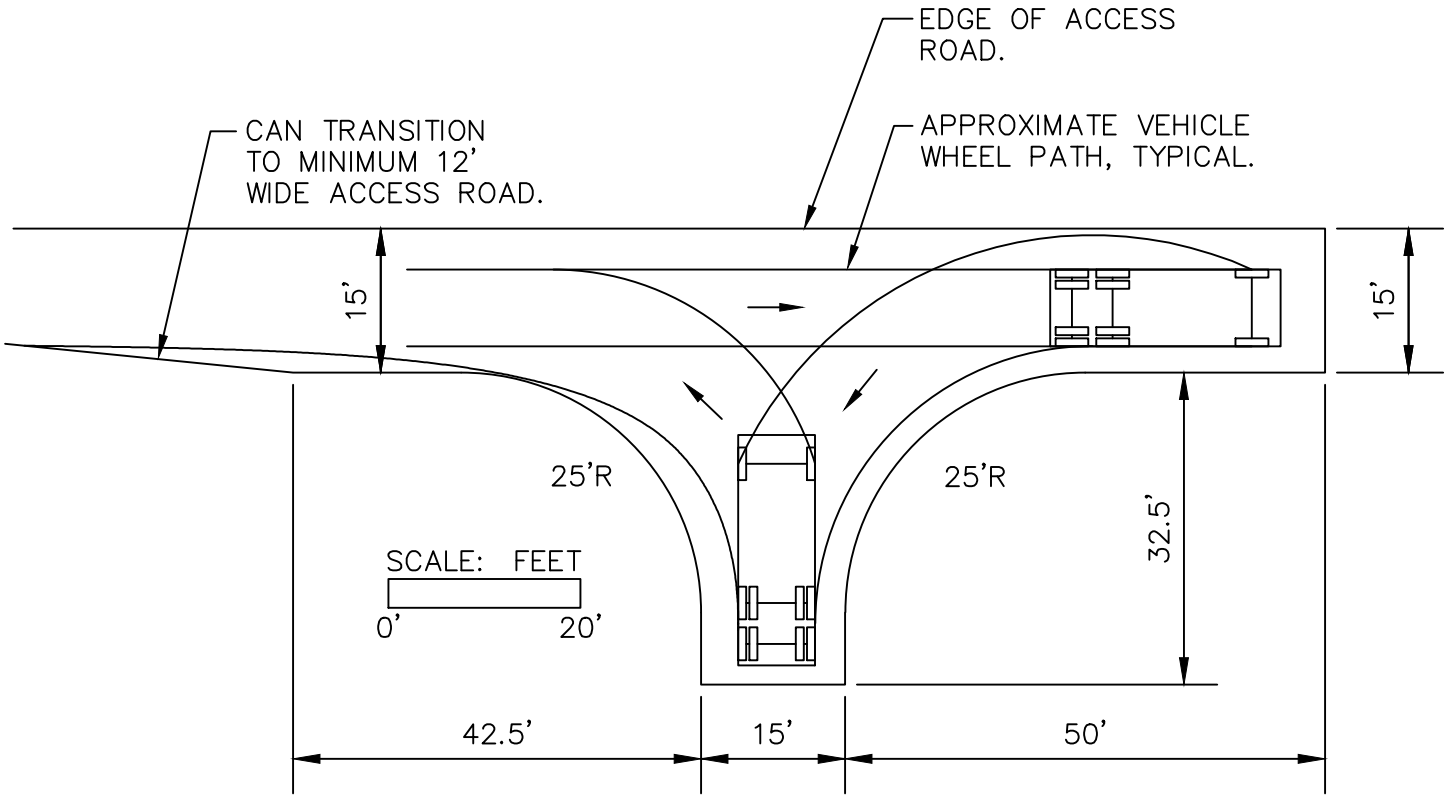
NOTES:

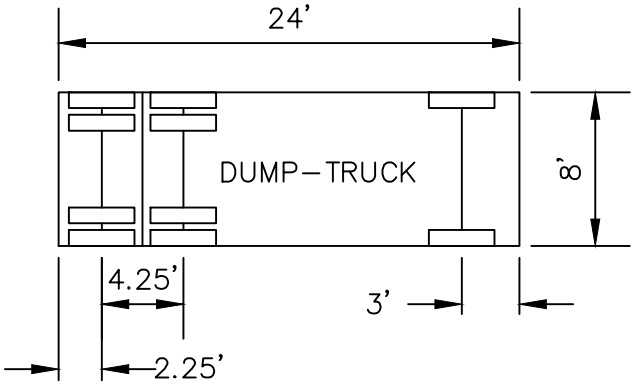
CONTRACTOR SHALL PROVIDE RECORD DRAWINGS MEETING THE FOLLOWING MINIMUM REQUIREMENTS:

1. Manholes. Show stationing ahead (0+00) and stationing back, rim elevation, and invert elevations.

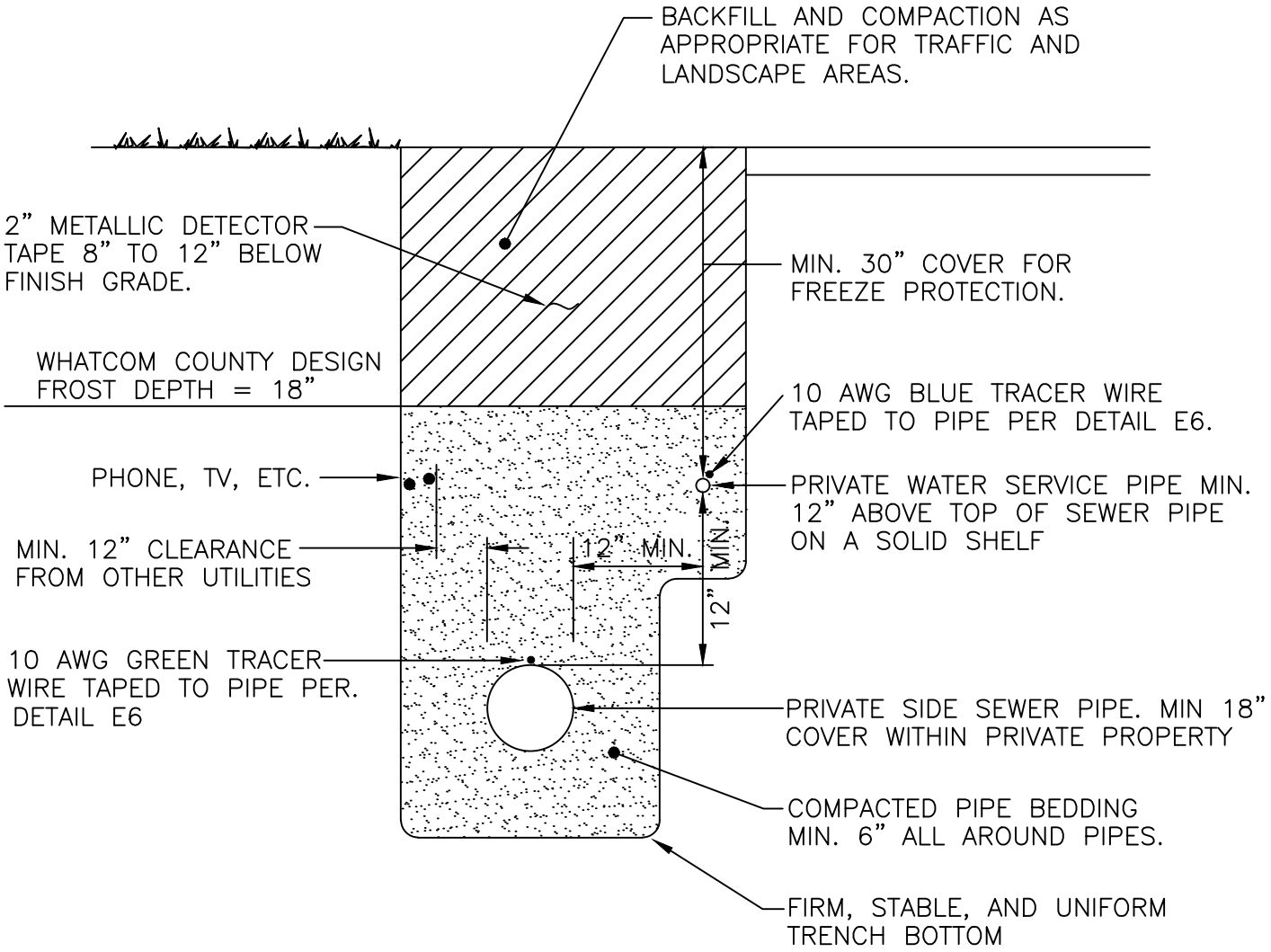
2. Sewer Mains. Show alignment dimensions to right-of-way, easements, and road centerlines. Show station and depth of service wyes and tees along the main. Show actual plan view length of pipe between manhole walls with material and slope.

3. Sewer Laterals. Show distances between bends, size, material, and length of pipe. Show station, offset, and depth at end of stub or cleanout.





DESIGN VEHICLE



NOTES:

1. Side sewer pipes and water service pipes shall not be installed in the same trench unless the above common trench detail is adhered to (UPC 720.1).

2. Water service pipes crossing a sewer pipe shall be a minimum of 12–inches above the top of the sewer pipe (UPC 720.1(3)).

3. When a common trench is used for water service and side sewer pipes, both pipes shall be bedded in material meeting WSDOT 9–03.12(3) Gravel Backfill for Pipe Zone Bedding as shown in following table:

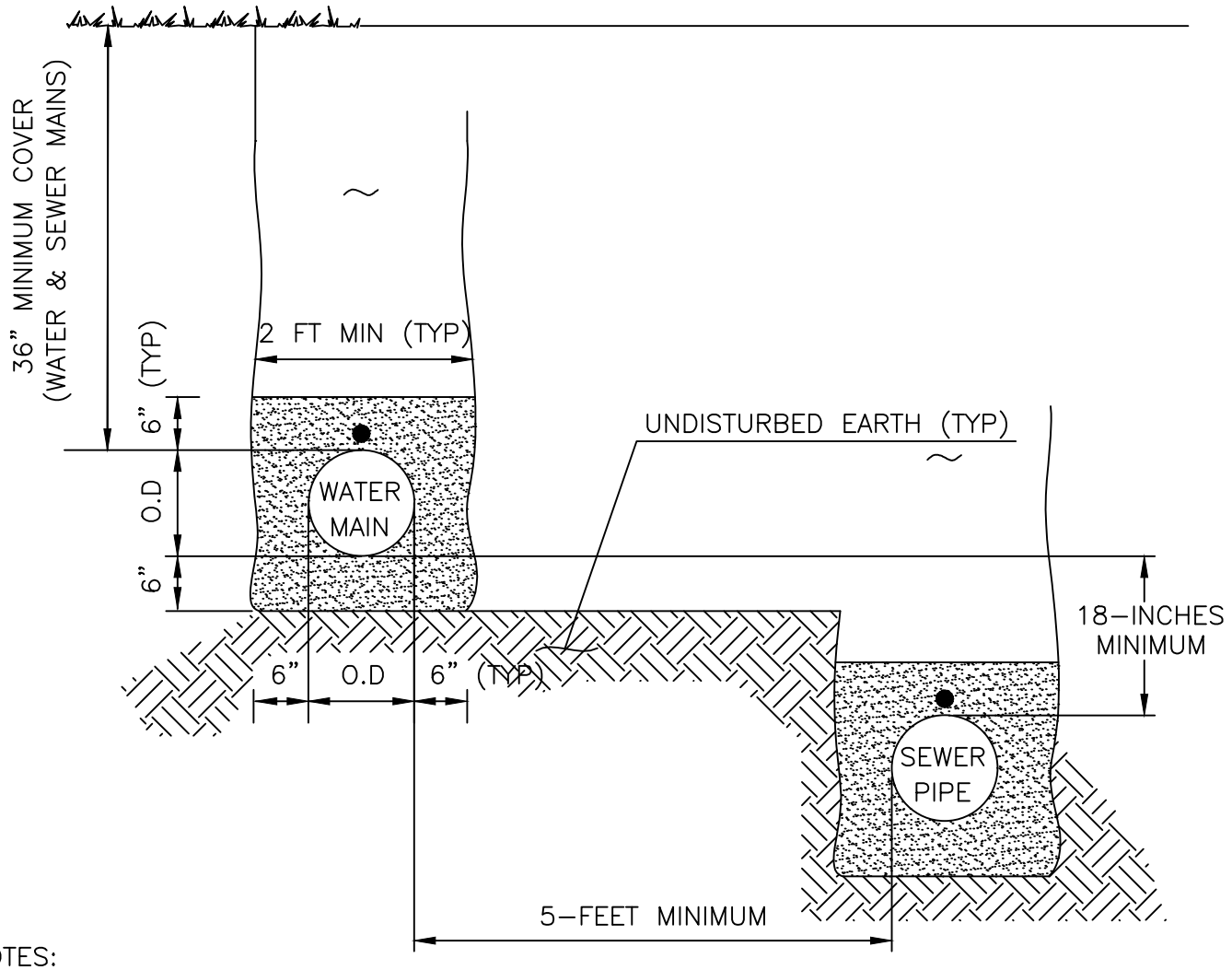
Sieve Size	Percent Passing by Weight
1.5"	99–100
1"	75–100
5/8"	50–100
U.S. No. 4	20–80
U.S. No. 40	3–24
U.S. No 200	10.0 max
Sand Equivalent	35 min.

LAKE WHATCOM WATER & SEWER DISTRICT

COMMON TRENCH DETAIL: PRIVATE WATER SERVICE PIPE AND SIDE SEWER PIPE

STANDARD DETAIL

G8



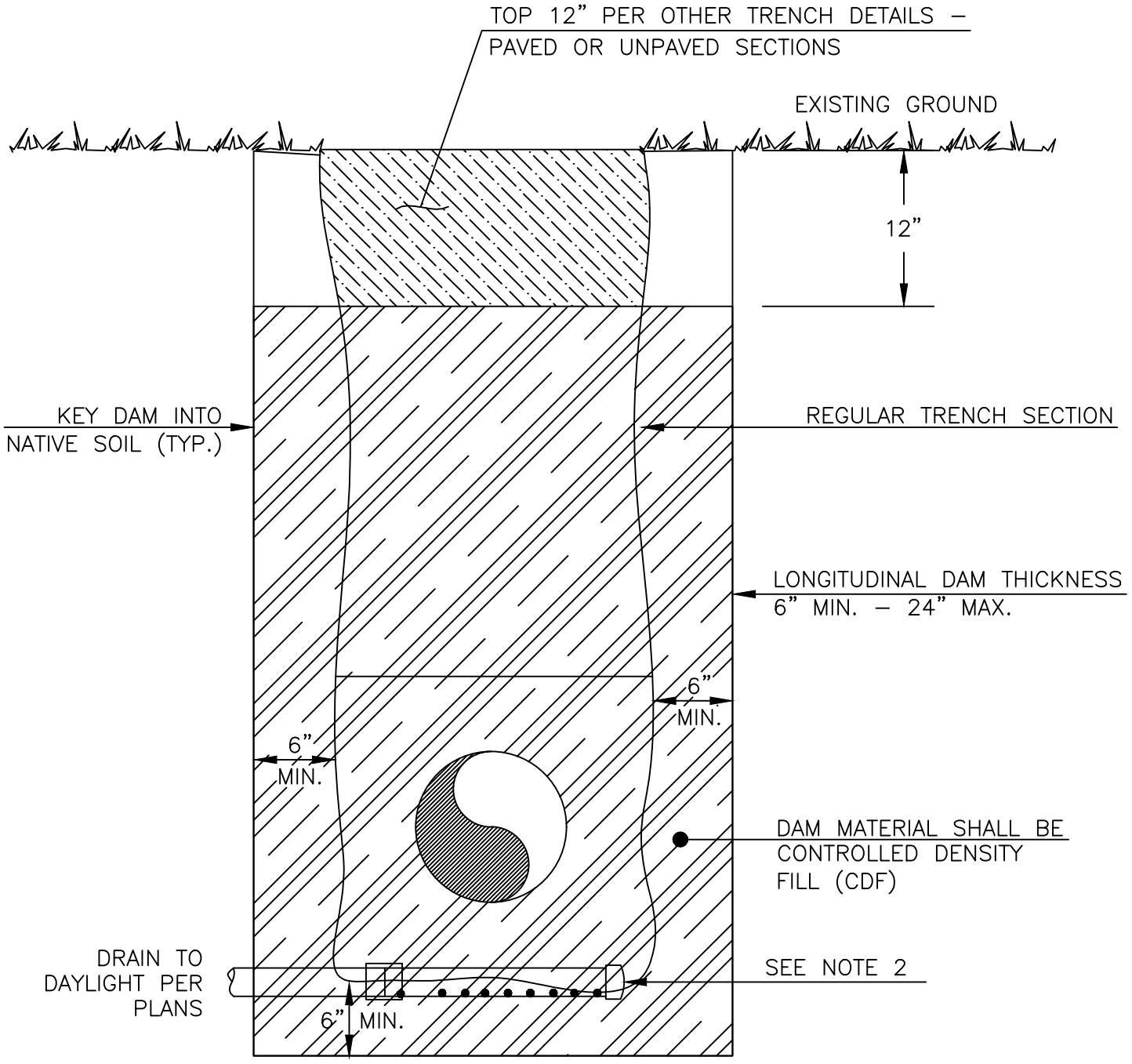
NOTES:

1. When local conditions prevent the required 10—feet horizontal separation (parallel alignment) and minimum 18—inch vertical separation between public water mains and any sanitary sewer pipe, with the approval of the District Engineer, details of DOE "Criteria for Sewage Works Design" Section C1—9.1.2 shall be followed.

2. The water main shall be laid on a bench of undisturbed earth with the bottom of the water main at least 18—inches above the crown of the sewer and shall have at least 5—feet of horizontal separation at all times. Additional mitigation efforts, such as impermeable barriers, may be required by the appropriate state and local agencies.

3. If the 18—inch vertical separation cannot be obtained, the sewer shall be constructed of materials and joints that are equivalent to water main standards of construction and shall be pressure tested to ensure water tightness prior to backfilling. Adequate restraint should be provided to allow testing to occur. See DOE "Criteria for Sewage Works Design Section C1—9.1.2.

4. Trench bedding, backfill, tracer wire, detector tape and restoration per Standard Detail G4.



NOTES:

1. Trench dams shall be located as per General Notes or per project plan and profile sheets.

2. Install 4–inch PVC cap, perforated drain pipe with holes facing down, coupler, and solid PVC pipe 1 to 2 feet outside the limits of the CDF on the uphill side of the trench dam. Install drain rock (WSDOT 9–03.12(4)) 6–inches on all sides of perforated pipe. Separate drain rock from other material using geotextile for underground drainage per WSDOT 9–33.2, Tables 1 & 2, Moderate Survivability, Class C.

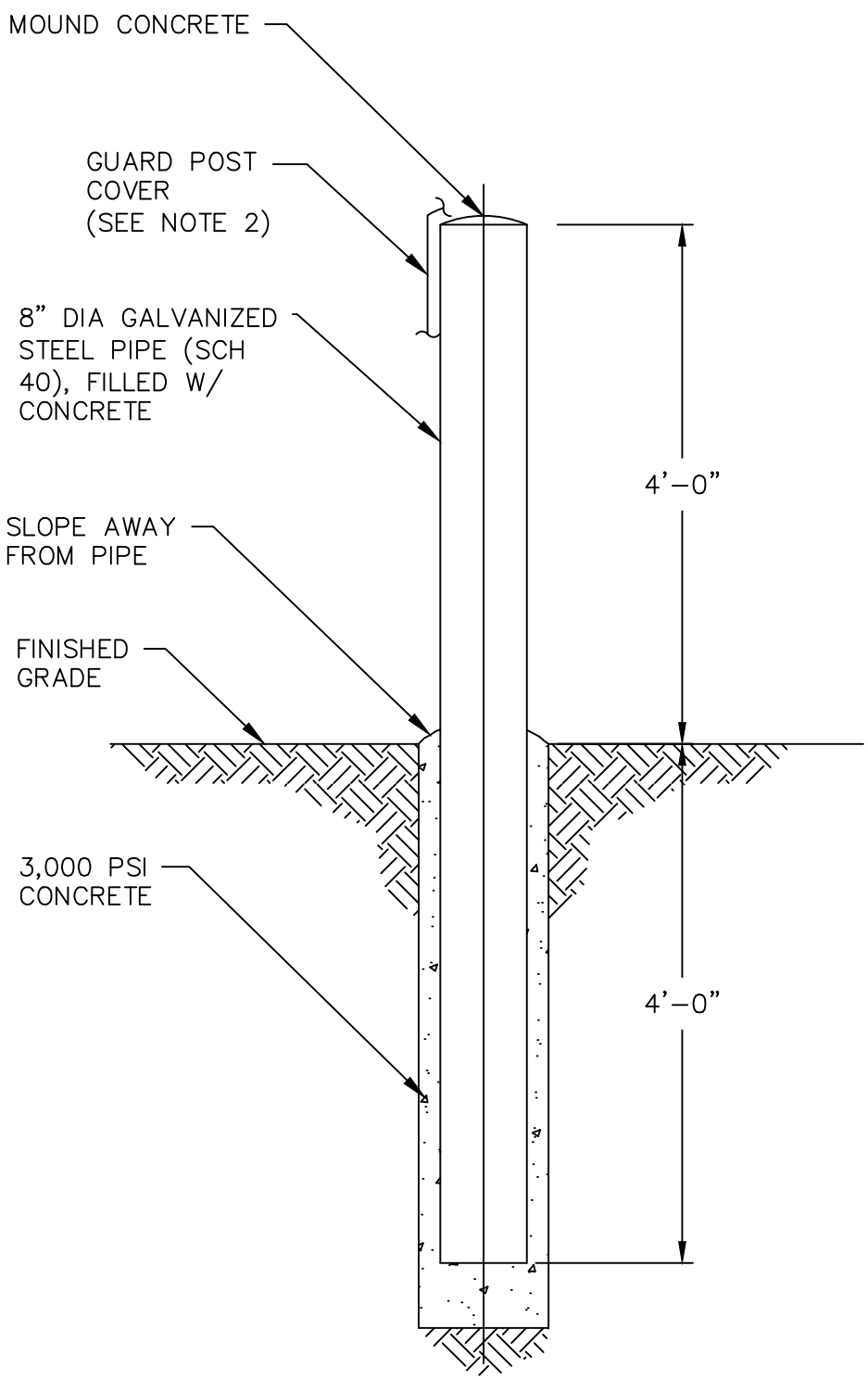
LAKE WHATCOM WATER & SEWER DISTRICT

TRENCH DAM WITH DRAIN

STANDARD DETAIL

G10

1/28/2026



NOTES:

1. The exact location of the bollards shall be determined by the engineer in the field.

2. Furnish and install idealshield 6-inch, sch80, yellow dome top guard post cover, or equal.

LAKE WHATCOM WATER & SEWER DISTRICT

BOLLARD DETAIL

STANDARD DETAIL

G11

1/28/2026

WATER SYSTEM NOTES

These Standard Details, together with the most current versions of the District's full Design and Construction Standards (DCS) and the District Administrative Code, incorporated herein by reference, shall govern all District design and construction activities.

1. Water distribution system materials, trenching, bedding, installation, backfilling, disinfection, and testing shall meet the requirements of WSDOT 7–09.

2. All water piping and appurtenances in contact with potable water shall be certified under NSF–61 for potable water use in accordance with WAC 246–290–220.

3. Water main pipe shall be class 52 ductile iron per WSDOT 9–30.1(1) and encased in polyethylene encasement per WSDOT 9–30.1(2). HDPE pipe may be substituted with approval of the District Engineer, subject to pipe rating based on the specific design/installation conditions and materials conforming to WSDOT 9.30.1(6) and 9.30.2(10). Fittings for ductile iron pipe shall meet the requirements of WSDOT 9–30.2(1).

4. Water Main Appurtenances. Gate valves shall be resilient–seated gate valves complying with WSDOT 7–12 and WSDOT 9–30.3(1) and American Water Works Association (AWWA) C515. Gate Valves shall have a min. pressure rating of 200 psi. A cast iron valve box with a concrete collar (18"x 8"x 6") and an approved marking post shall be installed with each valve in accordance with WSDOT 7–12.3(1) for all valves not installed in pavement. Valves not in pavement shall have a 24" x 24" x 6" concrete collar cast around the valve box. Where a valve operating nut is more than 3–ft below grade a valve nut stem extension must be installed.

5. Pressure reducing valves (1–1/2" and larger) shall be Cla–Val or approved alternate.

6. Before being placed into service, new water mains and appurtenances shall be pressure tested in accordance with WSDOT 7–09.3(23). The District Engineer shall witness pressure testing. Contractor shall provide the District Engineer 48–hrs notice prior to conducting water main pressure tests, flushing and disinfection.

7. Before being placed into service, new water mains or extensions to existing mains shall be flushed and disinfected by the Contractor in accordance with WSDOT 7–09.3(24) and the most current edition of the AWWA Standard C651, Disinfecting Water Mains.

Mains shall be chlorinated so that a chlorine residual concentration of not less than 25 mg/L remains in the water after standing 24–hrs in the pipe. The initial chlorine content of the water shall not be less than 50 mg/L (WSDOT 7–09.3(24)B). Following the minimum 24–hr retention period, treated water shall be flushed from the pipe until the replacement water throughout its length is not in excess of that normally carried in the water supply system. Contractor shall provide two chlorine concentration test reports to show the initial chlorine concentration is at least 50 mg/L, and to show the 24–hr residual chlorine concentration is at least 25 mg/L. After this 24–hr chlorination period, contractor shall flush the main in accordance with WSDOT 7–09.3(24)N. After a 16–hr rest period the Contractor shall coordinate

District collection of 2 water samples for bacteriological (bac–t) testing. Cost of bac–t testing shall be borne by the Contractor. Water samples must satisfactorily pass bac–t testing requirements (testing includes but is not limited to testing for total coliforms, fecal coliforms and E.coli found in the water sample) meeting current Washington State Department of Health (DOH) Standards. Both sets of samples must pass for the main to be approved for release and for the contractor to proceed with final tie–in(s) to existing mains.

Disinfection and testing extensions from existing mains and final tie–in(s) to existing mains, where the distance is 18 feet or less, shall follow WSDOT 7–09.3(23)A.

All tests must be performed by a DOH–certified testing laboratory and sample–taking shall be performed by a District certified operator (employee). Bacteriological samples must be collected by the District. Chlorinated flush water must be dechlorinated and disposed of in accordance with WSDOT 7–09.3(24)A. If disposal is to the District's sanitary sewer system, Contractor shall coordinate with District staff to ensure the rate of disposal does not overload the District's sewer system.

Alternative methods for disinfecting water mains following the most current edition of the AWWA Standard C651 may be allowed and must be approved in advance by the District.

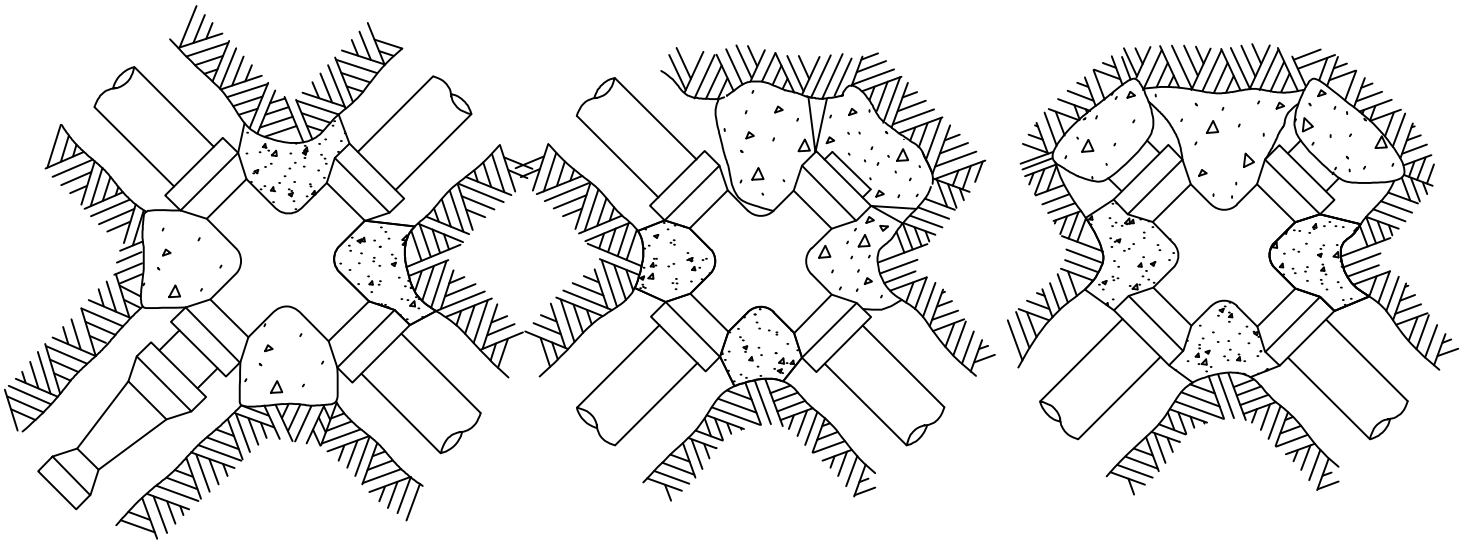
8. Water service connections shall be installed per WSDOT 7–15. Lot corners shall be staked prior to service connection installations to assure services are installed in correct locations as shown on the approved plans.

9. New services shall be pressure tested along with the new main. No use of water through a newly installed service shall be allowed until water main and service installation has been inspected, pressure tested, chlorinated and a satisfactory bacteria test received. After installation, the service connection shall be flushed prior to connecting the meter. No service is to be covered until the District's Inspector has inspected the initial installation. All corporations must be in an ON position and all angle valves must be in the OFF position. Service flow testing shall be done after water main pressure testing. During the inspection, every water service connection shall be turned on to its full capacity to check flow and guarantee that each water service connection has been flushed.

10. The private water service on the customer side of the water meter shall meet the requirements of the Uniform Plumbing Code (UPC).

11. In accordance with District Administrative Code Section 4.3.6, all customers are required to install a Pressure Reducing Valve (PRV) downstream on the customer side of the water meter to protect their plumbing systems from high pressure surges. A PRV inspection by District personnel is required prior to occupancy. See Standard Detail W11.

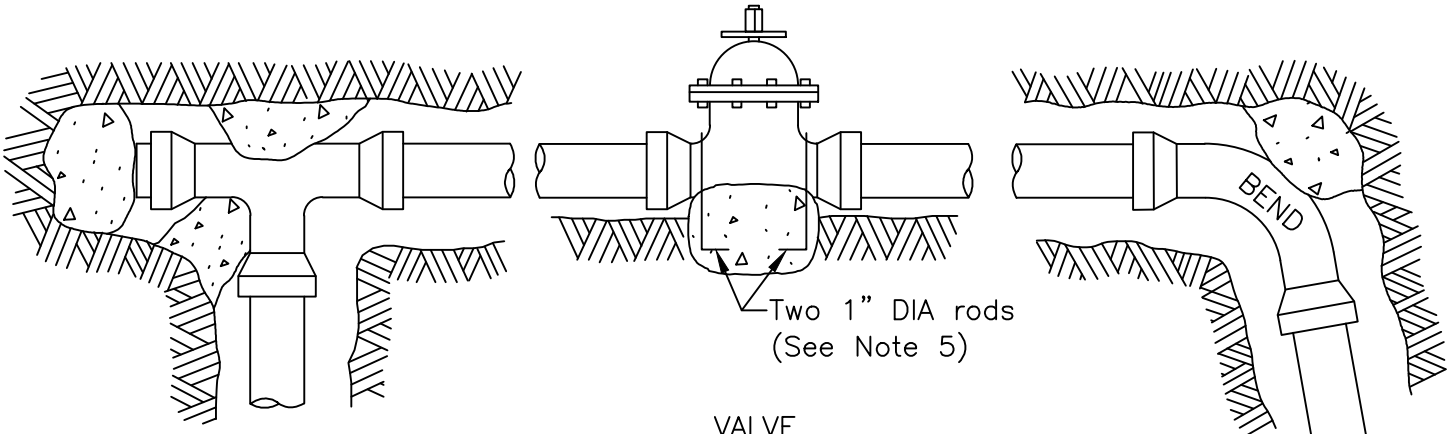
12. In accordance with WAC 246–290–490 and District Resolution No. 858, all cross–connections between the District's water distribution system and a consumer's water system shall be eliminated or controlled by the installation of a District approved backflow preventer commensurate with the degree of hazard. The District's Cross–Connection Control Program is available for review at the District office or on the District website (www.lwwsd.org).



UNBALANCED CROSS
(Use column A)

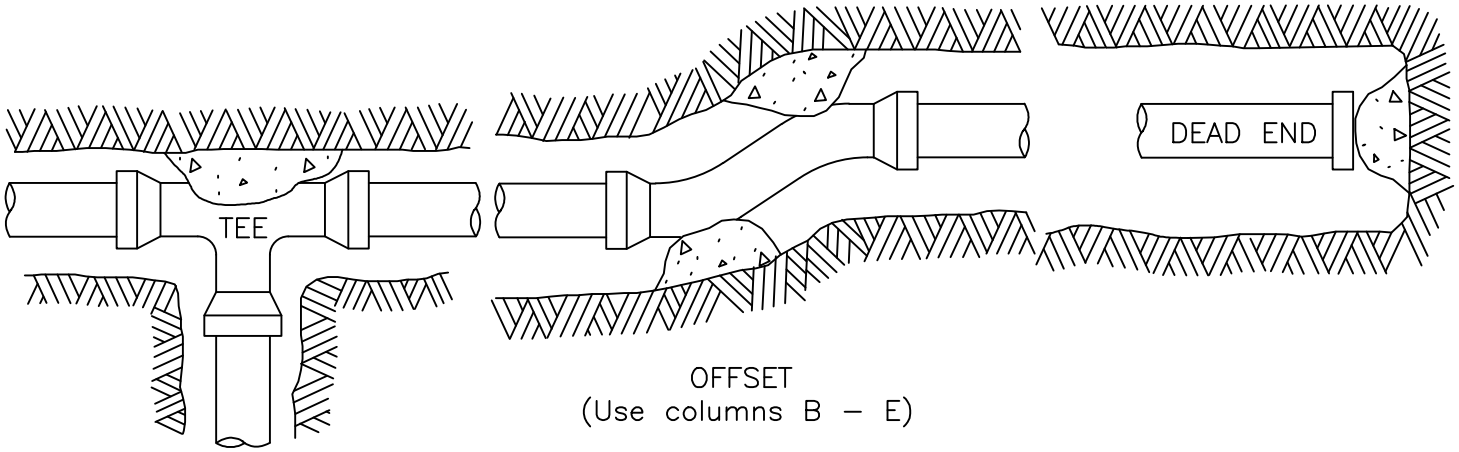
PLUGGED CROSS
(Use column A)

PLUGGED CROSS
(Use column B)



PLUGGED TEE
(Use column B)

VALVE
(Use column A)



OFFSET
(Use columns B – E)

BASED ON WSDOT STANDARD PLAN
B–90.40–00 DATED 6/8/06.

LAKE WHATCOM WATER & SEWER DISTRICT

CONCRETE THRUST BLOCK
Sheet 1 of 2

STANDARD DETAIL

W3

3/11/2020

NOTES:

1. Contractor may substitute restrained joints & fittings with the approval of the district engineer. Calculation of the restrained pipe required length on each side of fittings for max pressure and soil type are required. Calculations shall be sealed by a professional engineer and submitted for review and approval.

2. Contractor to provide blocking adequate to withstand full test pressure.

3. Divide thrust by safe bearing load to determine required area (in square feet) of concrete to distribute load.

4. Areas to be adjusted for other pressure conditions.

5. Provide two 1" minimum diameter rods on valves up through 10" diameter. Valves larger than 10" require special tie rod design.

Size	Test Pressure PSI	Thrust at Fittings in Pounds				
		A	B	C	D	E
		Tee and Dead Ends	90° Bend	45° Bend	22.5° Bend	11.25° Bend
4"	250	3,140	4,440	2,405	1,225	615
6"	250	7,070	9,995	5,410	2,760	1,385
8"	250	12,565	17,770	9,620	4,905	2,465
10"	250	19,635	27,770	15,030	7,660	3,850
12"	250	28,275	39,985	21,640	11,030	5,545
14"	250	38,485	54,425	29,455	15,015	7,545
16"	250	50,265	71,085	38,470	19,615	9,855

Soil Type	Safe Bearing Load PSF
Muck, peat, etc.*	0
Soft clay	1,000
Sand	2,000
Sand and gravel	3,000
Sand and gravel cemented with clay	4,000
Hard shale	10,000

*Restrained joints required in all cases.

BASED ON WSDOT STANDARD PLAN B-90.40-00 DATED 6/8/06.

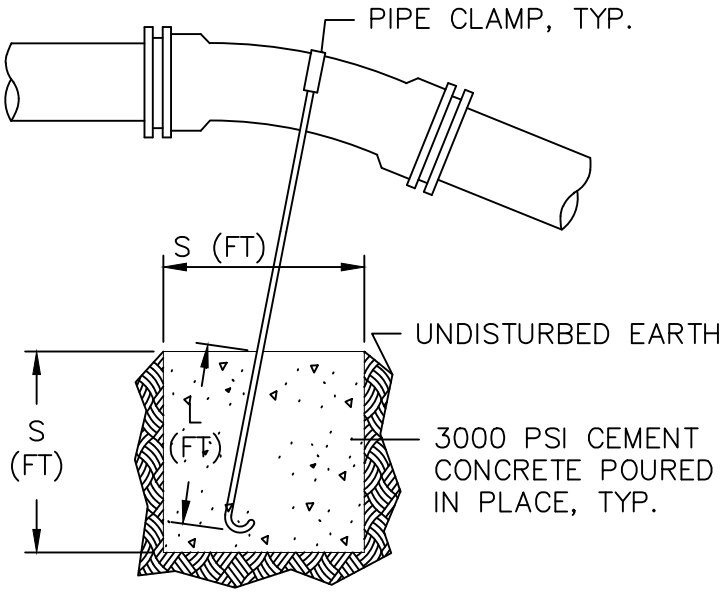
LAKE WHATCOM WATER & SEWER DISTRICT

CONCRETE THRUST BLOCK
Sheet 2 of 2

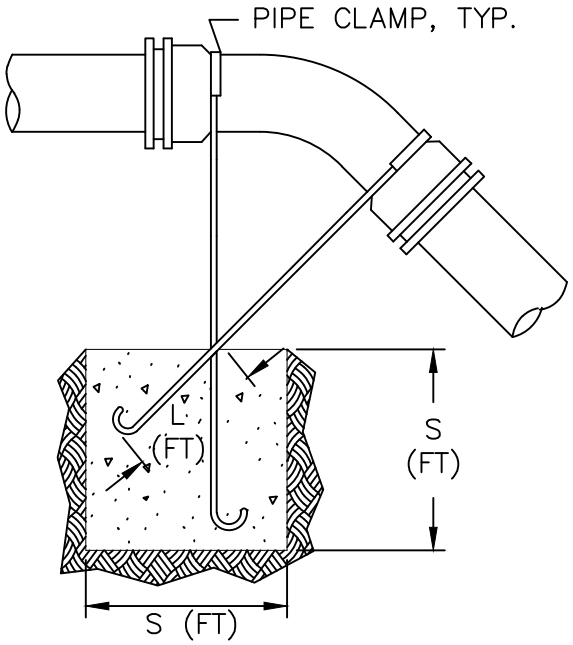
STANDARD DETAIL

W4

5/1/2014



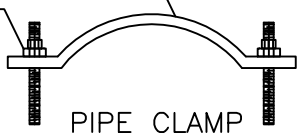
BLOCKING FOR 11.25°, 22.5° OR 33.75° VERTICAL BENDS



BLOCKING FOR 45° VERTICAL BENDS

DIMENSION TABLE							
PIPE DIAM.	TEST PRESSURE (PSI)	BEND ANGLE	CONCRETE VOLUME (Cubic–Ft)	CUBE SIZE "S" (FT)	TIE ROD DIAM. (IN)	DEPTH OF RODS IN CONCRETE "L" (IN)	PIPE CLAMP SIZE (DxW)
4"	300	11.25°	8	2.0	5/8"	18"	3/8" X 2"
		22.5°	11	2.2		24"	
		33.75°	17	2.6			
		45°	30	3.1			
6"	300	11.25°	11	2.2	5/8"	24"	1/2" X 2–1/2"
		22.5°	25	2.9			
		33.75°	41	3.5			
		45°	68	4.1			
8"	300	11.25°	16	2.5	5/8"	24"	1/2" X 2–1/2"
		22.5°	47	3.6			
		33.75°	70	4.1	3/4"		
		45°	123	5.0			
12"	250	11.25°	32	3.2	5/8"	24"	3/4" X 3"
		22.5°	88	4.5	7/8"		
		33.75°	132	5.1			
		45°	232	6.1		30"	

GALVANIZED STEEL BAR, PER TABLE
STAINLESS STEEL HARDWARE



PIPE CLAMP

BASED ON ALDERWOOD WATER & WASTEWATER STANDARD WD–12 11–2015

NOTES:

1. Tie rods shall be stainless steel, diameter as specified.
2. Location shall be approved by the District prior to installation.

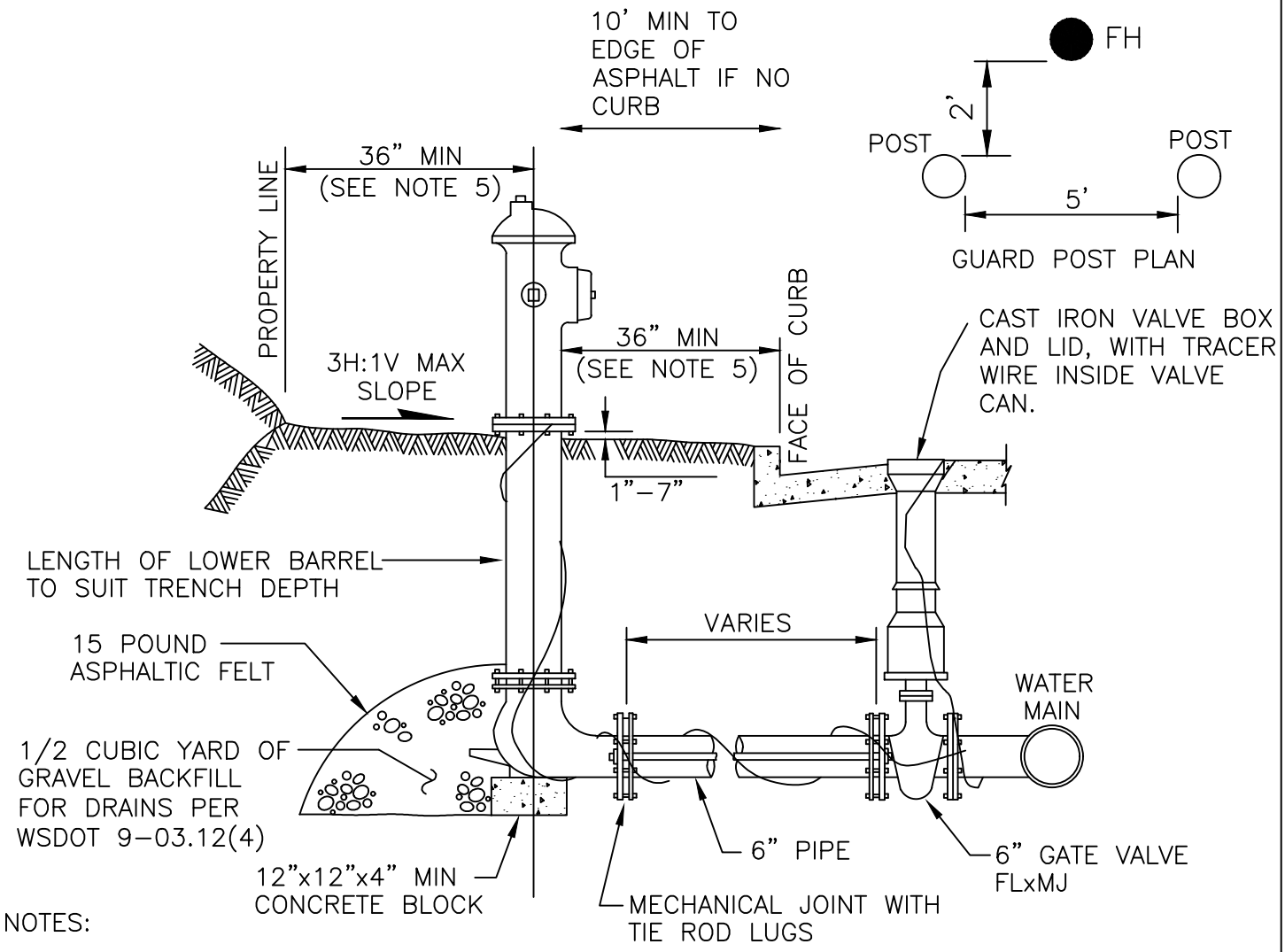
LAKE WHATCOM WATER & SEWER DISTRICT

CONCRETE THRUST BLOCK
FOR CONVEX VERTICAL BENDS

STANDARD DETAIL

W5

1/28/2026



NOTES:

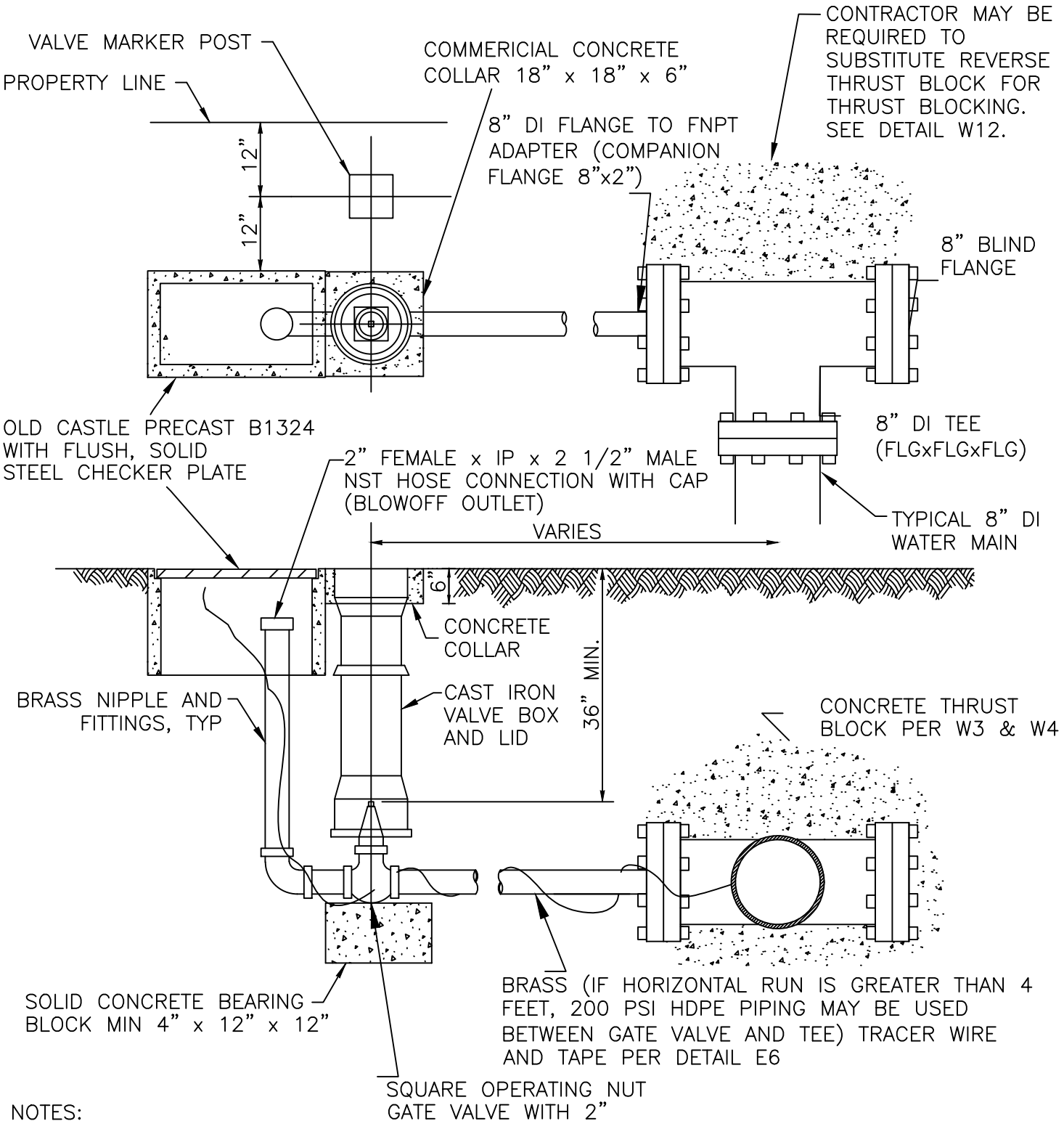
1. Fire hydrants shall be 5–1/4" compression type MJ foot with National Standard Thread on 2–1/2" side ports, and 5" Stortz connection fitting on the steamer port. District standard fire hydrant manufacturers/models are: American Flow Control – Waterous Pacer 250, M&H – Style 929 Reliant, Clow – Medallion, and EJ 5CD250 3 nozzle with standard operating nut. Hydrant caps & bells shall be painted bright industrial yellow in accordance with South Whatcom Fire Authority and Whatcom County Fire District #4 requirements. Hydrant barrel extensions shall be provided and installed as required.

2. Shackle rods shall be installed with Romac ductile lugs. Tie rods shall be ¾" diameter Type 316 stainless steel (for up to 12" diameter main) with Type 316 stainless steel hardware. Restrained joints may be substituted for tie rods with approval of District Engineer.

3. Ground surface within 36" of hydrant shall be smooth and clear of obstructions on all sides.

4. A minimum of two guard posts shall be provided. Guard posts per Bollard Detail S11). Bollard locations shall be per the District.

5. If required setbacks cannot be achieved, alternate setbacks subject to approval by District Engineer.



NOTES:

1. Valve and piping to valve shall be 2" unless otherwise noted on plans.

3. Locate blowoff outlet near property corner if possible.

4. An 8–inch gate valve (FLxMJ) is required on the tee if future water main extension is possible.

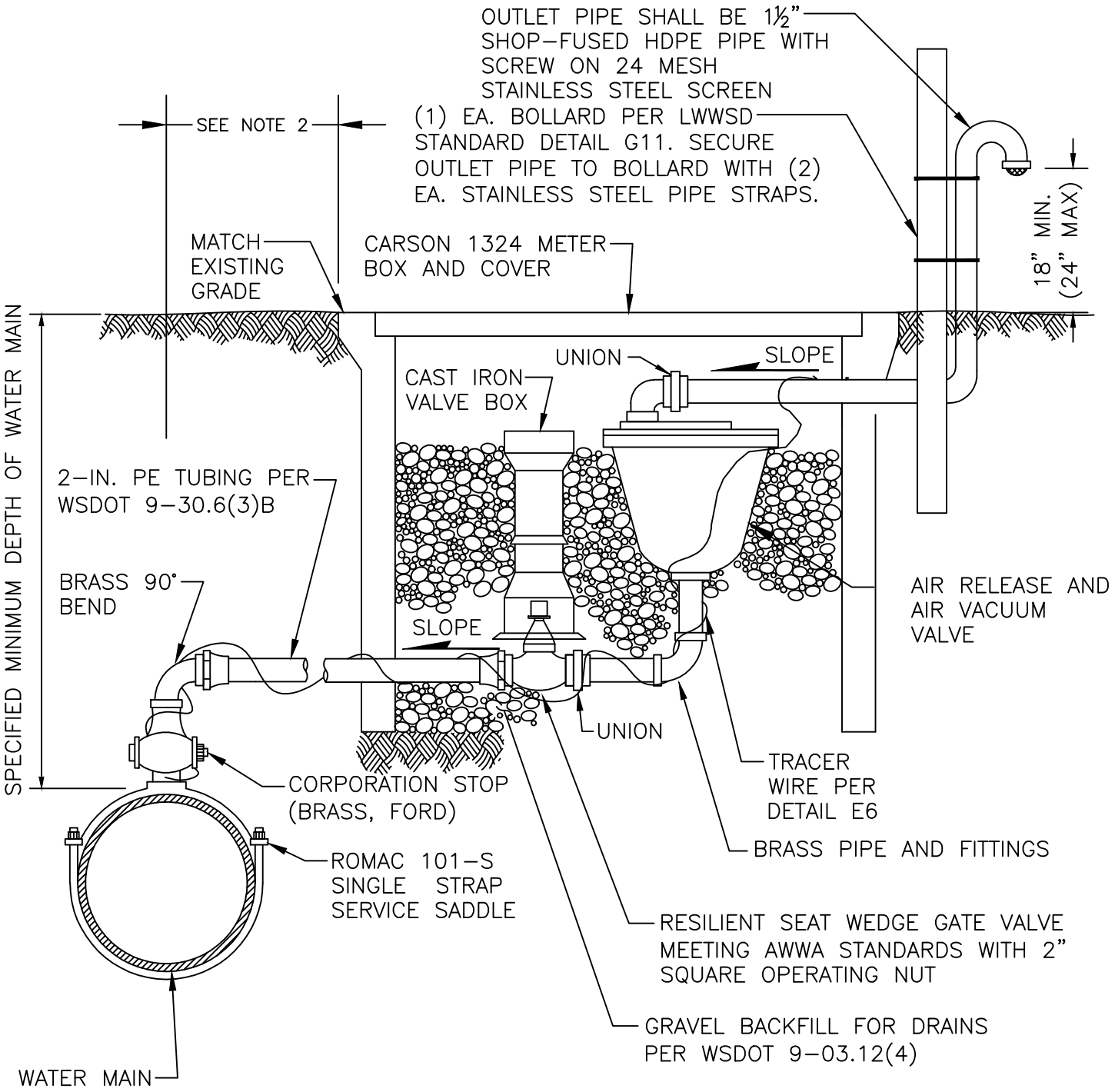
LAKE WHATCOM WATER & SEWER DISTRICT

2 INCH BLOWOFF ASSEMBLY

STANDARD DETAIL

W7

3/11/2020



NOTES:

1. The Air/Vacuum Release Valves shall be 2-inch combination air-release/vacuum relief valve, single body, double orifice, APCO Series 145C or approved alternate. Locate at the high point of the main, tap top of main.

2. Air/Vacuum Release assembly shall be installed along the right-of-way at location staked by engineer.

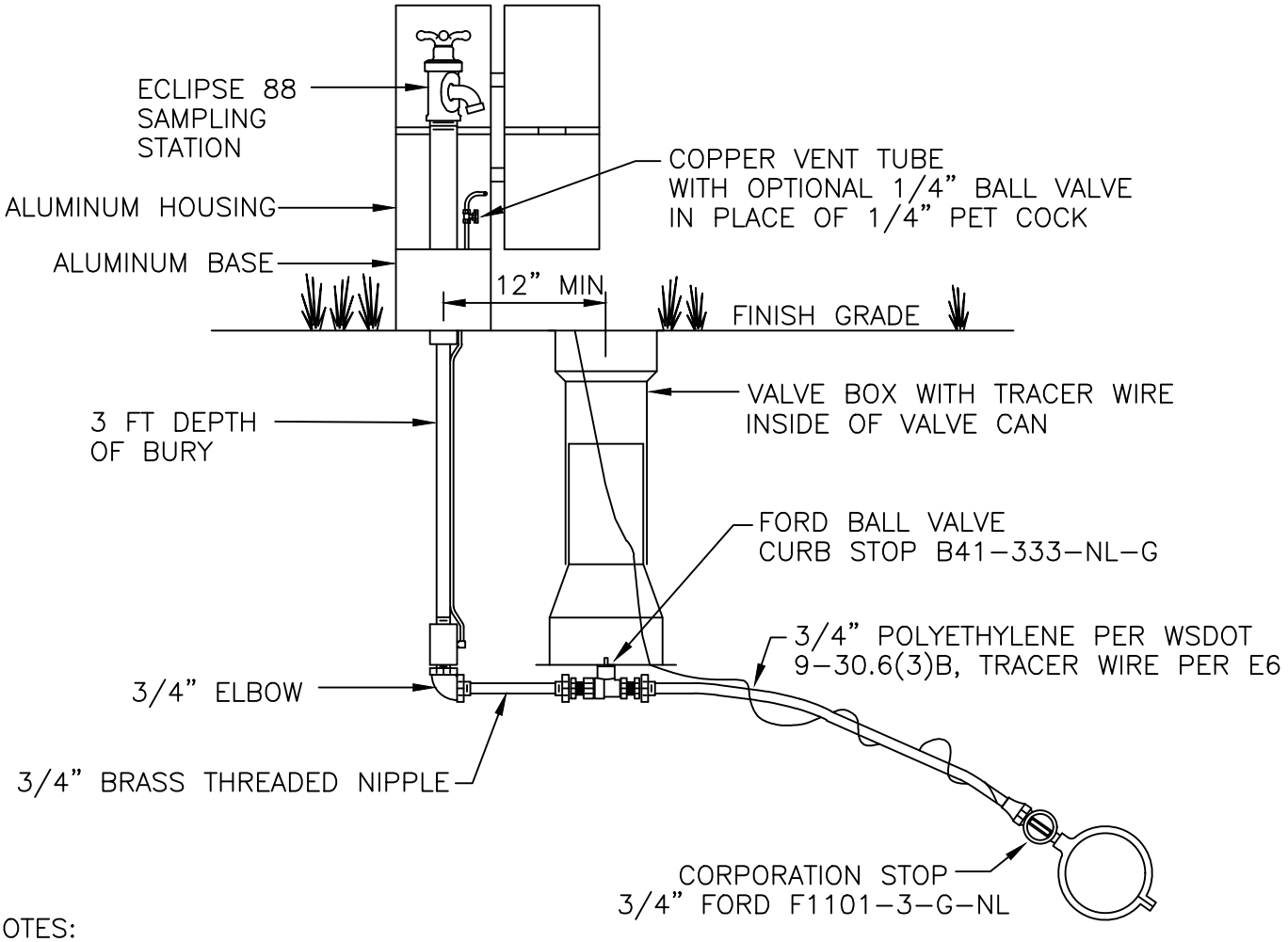
BASED ON WSDOT STANDARD PLAN B-90.30-00 DATED 6/8/06.

LAKE WHATCOM WATER & SEWER DISTRICT

COMBINATION
AIR RELEASE / AIR VACUUM
VALVE ASSEMBLY

STANDARD DETAIL

W8



NOTES:

1. Sampling stations shall be buried 3' bury, with a 3/4-inch FIP inlet, and a (3/4-inch hose or unthreaded) nozzle.

2. All stations shall be in a lockable, nonremovable, aluminum cast housing. Housing shall be painted green.

3. When opened, the station shall require no key for operation, and the water will flow in an all brass waterway.

4. All working parts will be of brass or stainless steel and be removable from above ground with no digging.

5. Exterior piping shall be brass pipe.

6. A vent tube will enable each station to be pumped free of standing water to prevent freezing and to minimize bacteria growth.

7. Sampling station shall be Eclipse No. 88, manufactured by Kupferle Foundry, St. Louis, MO 63102.

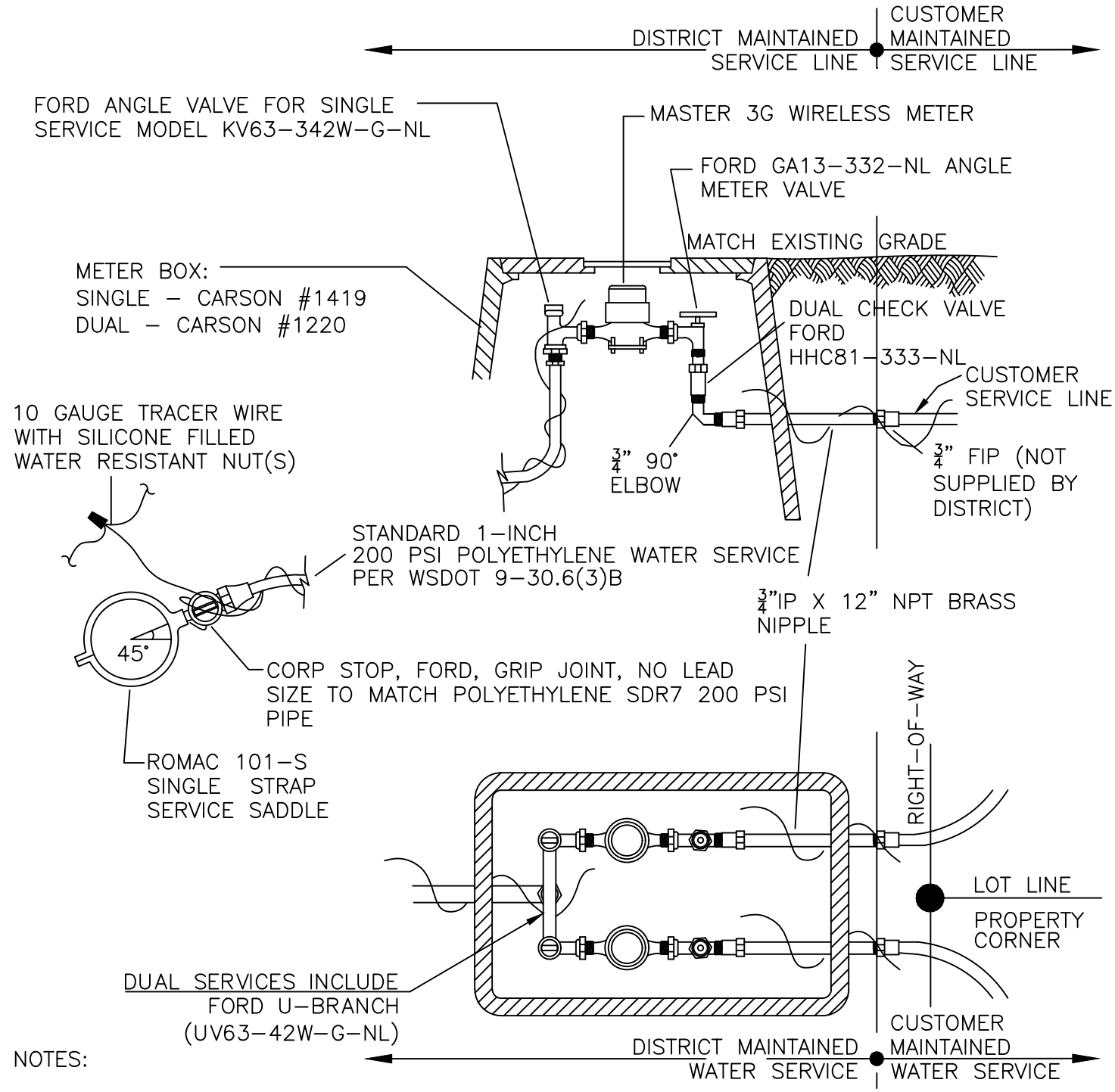
LAKE WHATCOM WATER & SEWER DISTRICT

WATER SAMPLING STATION

STANDARD DETAIL

W9

1/28/2026



NOTES:

1. Private water service fittings shall be in accordance with WSDOT 9-30.6 except that PEX-a-tubing is not allowed and only compression (grip joint) fittings on private water services are allowed. All fittings shall be brass.
2. The water service pipe shall have a minimum of 30 inches depth and a maximum of 36 inches depth, including under ditch sections.
3. Meter boxes in traffic areas shall be rated for H-20 loading with a reader lid.
4. Standard water service connection for a single family residence is 1-inch. It is the customer's responsibility to determine if a larger diameter service is required for any reason, including but not limited to satisfying local agency fire flow requirements and pipe sizing in accordance with the UPC.

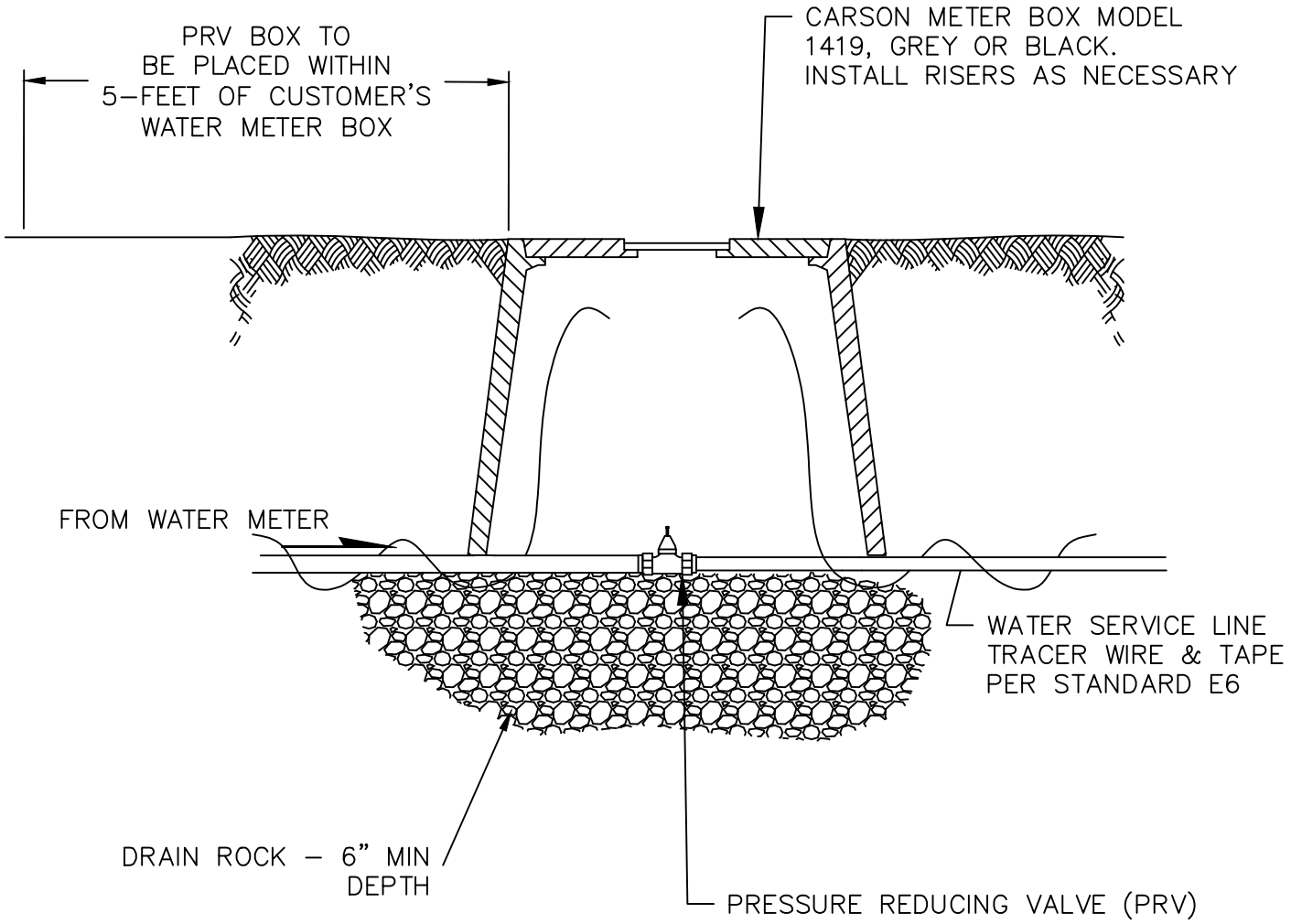
LAKE WHATCOM WATER & SEWER DISTRICT

WATER METER ASSEMBLY

STANDARD DETAIL

W10

1/28/2026



NOTES:

1. The pressure reducing valve assembly shall be located on the customer's property downstream of the water meter box assembly.
2. A pressure reducing valve is required for all private water services.
3. All fittings shall be brass.
4. Installation, maintenance and operation of the pressure reducing valve is the responsibility of the property owner.

LAKE WHATCOM WATER & SEWER DISTRICT

PRIVATE SERVICE PRESSURE REDUCING VALVE

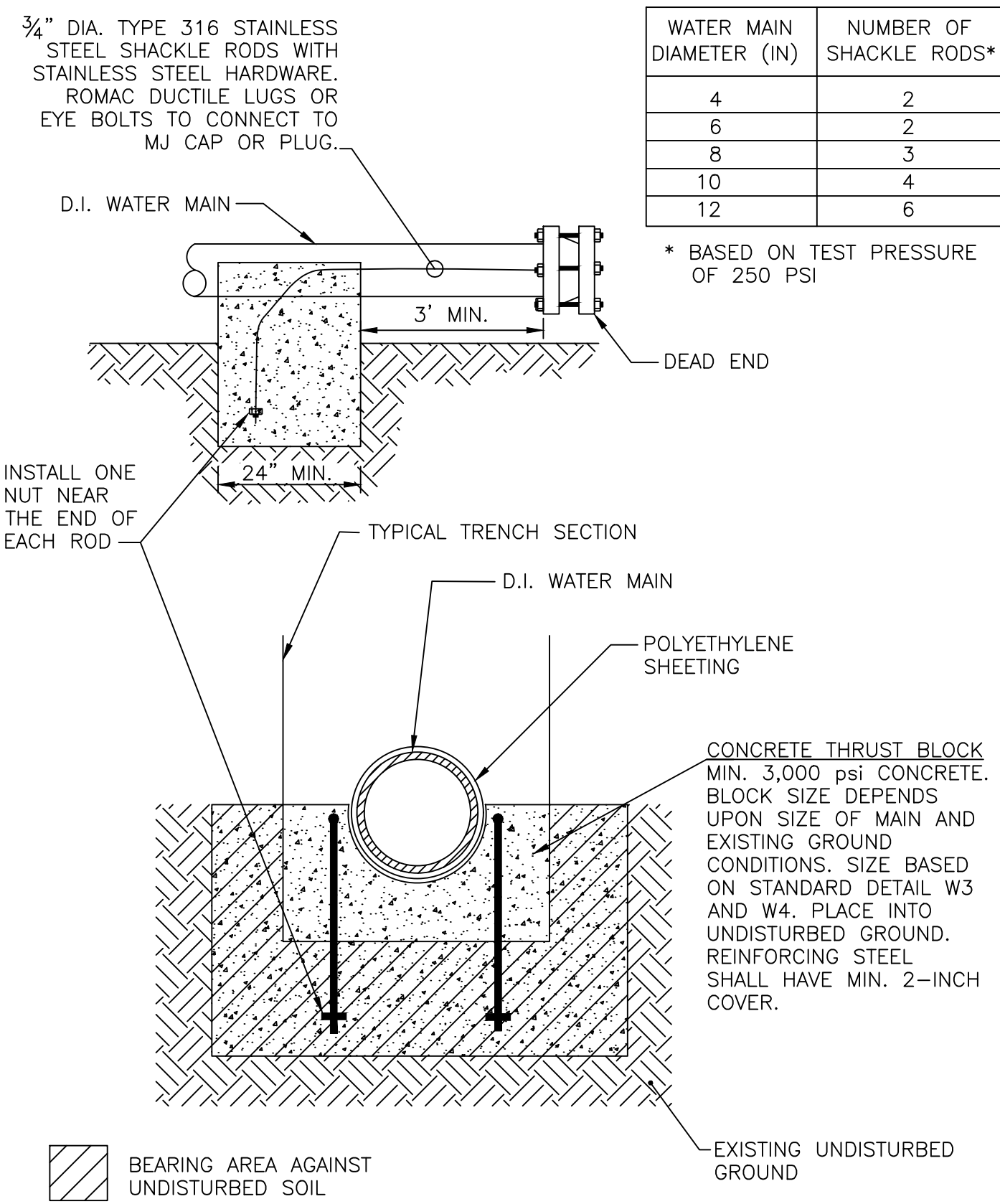
STANDARD DETAIL

W11

1/28/2026

WATER MAIN DIAMETER (IN)	NUMBER OF SHACKLE RODS*
4	2
6	2
8	3
10	4
12	6

* BASED ON TEST PRESSURE OF 250 PSI



LAKE WHATCOM WATER & SEWER DISTRICT

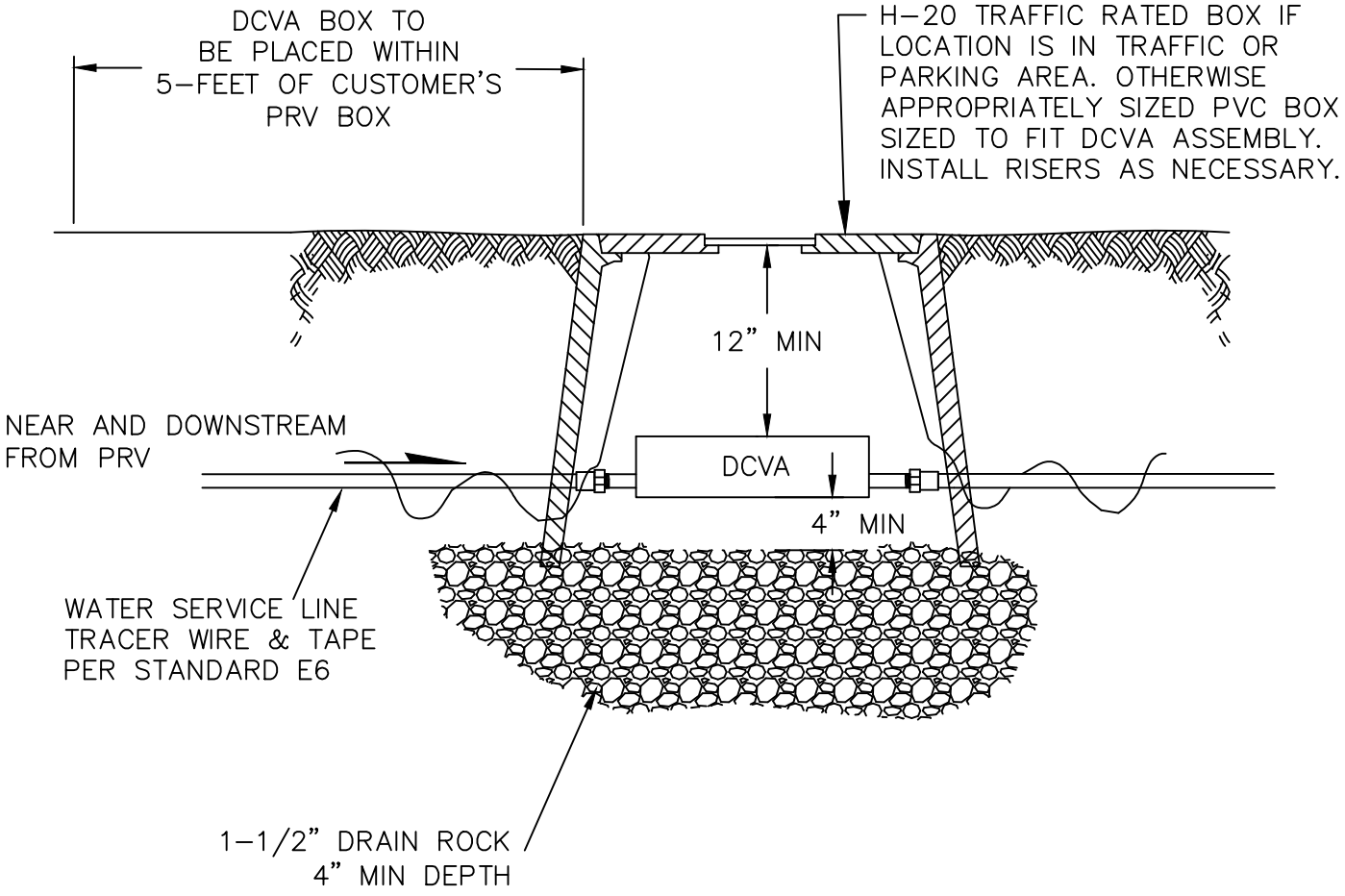
REVERSE THRUST BLOCK

NOT TO SCALE

STANDARD DETAIL

W12

3/11/2020



DOUBLE CHECK VALVE ASSEMBLY REQUIREMENTS:

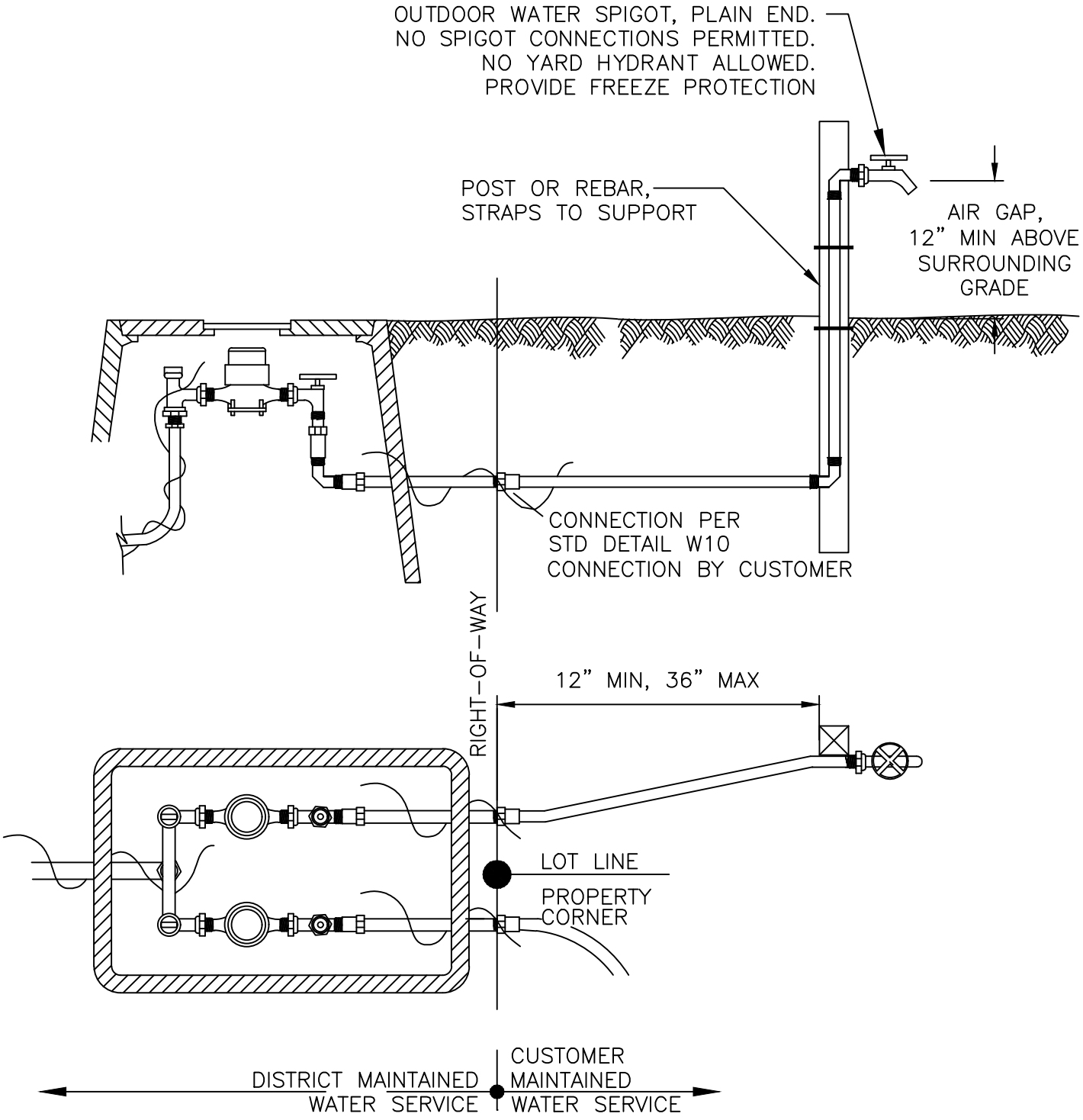
1. In accordance with the District's Cross Connection Control Program, a double check valve assembly shall be installed by the property owner in accordance with this standard detail when plumbing or activity present on the property requires a double check valve assembly.
2. A Washington State Department of Health approved double check valve assembly (DCVA) shall be installed a minimum of 12-inches below grade in a box near the property line just beyond the private pressure reducing valve (PRV).
3. After installation, installed DCVA shall be tested by a certified backflow assembly tester and the test report submitted to the District's Cross Connection Control Program Manager (crossconnection@lwwsd.org).
4. Ongoing testing and reporting is required in accordance with the District's Cross Connection Control Program.

LAKE WHATCOM WATER & SEWER DISTRICT

SINGLE FAMILY RESIDENCE
PRIVATE DOUBLE CHECK VALVE ASSEMBLY

STANDARD DETAIL

W13



TEMPORARY CONSTRUCTION WATER – CONDITIONS TO TURN ON METER

1. Plain end outdoor spigot must be installed as detailed above before the District will turn on water for construction. No spigot connections are permitted.
2. Billing for both water and sewer begins when temporary construction water has been turned on by the District.
3. Remove temporary construction water assembly to install PRV and to complete private water service before occupancy.

LAKE WHATCOM WATER & SEWER DISTRICT

TEMPORARY CONSTRUCTION WATER
OUTDOOR SPIGOT - NO SPIGOT CONNECTIONS PERMITTED

STANDARD DETAIL

W14

SEWER SYSTEM NOTES:

These Standard Details, together with the most current versions of the District's full Design and Construction Standards (DCS) and the District Administrative Code, incorporated herein by reference, shall govern all District design and construction activities.

1. Sewer system materials, trenching, bedding, installation, backfilling, and testing shall meet the requirements of WSDOT 7–05 and WSDOT 7–17 and District standards detailed herein.

2. Gravity sewer pipe shall be ASTM D3034–SDR 35 PVC per WSDOT 9–05.12(1). In certain applications, the District may require class 52 ductile iron pipe, per WSDOT 9–30.1(1), encased in polyethylene encasement per WSDOT 9–30.1(2).

3. Gravity sewer service connections are required. Grinder pump systems shall only be installed in such special circumstances where installation is approved by the District Engineer (DCS 5.2.2). A submittal of a compliant grinder pump system is required before scheduling a pre–construction meeting.

4. Pressure sewer pipe shall be class 52 ductile iron pipe per WSDOT 9–30.1(1) encased in polyethylene encasement per WSDOT 9–30.1(2) or PVC C900 class 150 per WSDOT 9–30.1(5). HDPE may be substituted with the approval of the District Engineer (pipe rating, resins, physical properties, dimensions and tolerances must be as specified in the American Water Works Associations (AWWA) Manual C901 for the specific design conditions).

5. Sewer service connections (comprised of the service lateral and side sewer) from the public sewer main to the cleanout adjacent to the building must be installed, modified or repaired by a contractor on the District's current Bonded Side Sewer Contractor list.

6. All sewer system installations, modifications, or repairs shall be inspected prior to backfill.

7. All gate valves for sewer force mains shall have a cast iron valve box with a commercial concrete collar (18" x 18" x 6") with each valve. Valves not in pavement shall have a 24" x 24" x 6" concrete collar cast around the valve box.

8. Service laterals, from main or manhole to private property line, shall meet the requirements of WSDOT 7–18. Service laterals shall have a minimum slope of 2%. Service laterals shall maintain a minimum cover of 36–inches and 30 inches under ditches. Service laterals and cleanout/test tee at property line shall be minimum 6–inches in diameter.

9. Side sewers within private property shall meet the requirements of the District Standards detailed herein. Gravity side sewers shall have a minimum slope of 2%. Minimum size for gravity side sewer pipes shall be 4–inches for a single family residence and 6–inches for a multi–family residence up to a 4–plex. See Standard Detail S10 for requirements regarding layout (bends) and cleanouts. Sewer cleanouts shall be installed per WSDOT 7–19.

10. Grout for manholes shall be a polyurethane chemical grout or non–shrinking cementitious grout, containing no gypsum or calcium sulfate Di–hydrate (CaSO42H2O), conforming to WSDOT 9–20.3(2), such as Blueline, Rapid Set Cement All or approved equivalent. Grout shall be installed according to manufacturer's instructions.

11. All sewer pipe and appurtenances shall be flushed and cleaned prior to being put into service. Debris shall not be allowed into the existing sewer system.

12. The District Engineer shall witness testing. Contractor shall provide the District Engineer 48–hours notice prior to conducting tests or sampling.

13. Sewer mains shall be tested after backfill by the low–pressure air test method per WSDOT 7–17.3(2)F. PVC pipe shall have a mandrel passed through it to check for any deflections in the pipe per WSDOT 7–17.3(2)G. All sewers shall be television inspected and video delivered to the District, with all costs borne by Contractor, before acceptance. Connection to the existing system is not permitted until final acceptance.

14. Side sewers on private property shall be cleaned and tested by either a low pressure air test or exfiltration water test at the option of the Contractor, as per WSDOT 7–17.3(2)A. An air test is acceptable when air is slowly supplied to the plugged pipe section until the internal air pressure reaches 4 psi and maintains for 5 minutes with no pressure loss.

Water testing may be done in lieu of an air test and shall follow WSDOT 7–17.3(2)B. As stated therein, leakage shall be no more than 0.28 gph per inch diameter per 100 feet of sewer, with a hydrostatic head of 6 feet above the crown at the upper end of the test section, or above the natural ground water table at the time of test, whichever is higher. The length of pipe tested shall be limited so that the pressure at the lower end of the Section tested does not exceed 16 feet of head above the invert.

Where the test head is other than 6 feet, the maximum leakage shall not exceed the amount determined from the following equation:

$$\text{Maximum leakage (in gallons per hour)} = 0.28 \times (\sqrt{H}/\sqrt{6}) \times D \times (L/100)$$

Where:

D = diameter (in.)

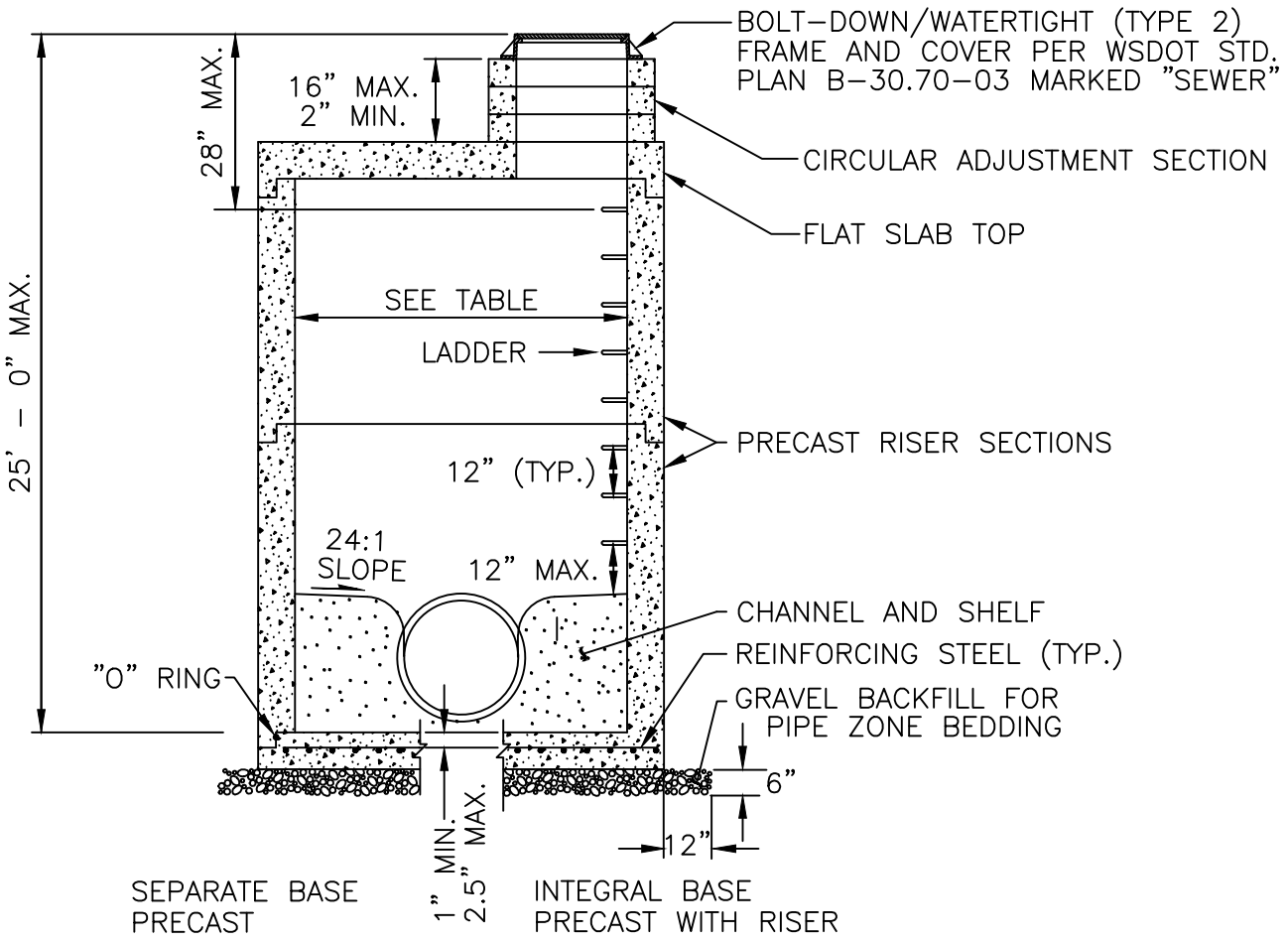
L = length of pipe (ft.)

H = test head (ft.)

All testing shall be witnessed by appropriate District personnel.

15. Downspouts, foundation/crawl space sump pumps, yard drains, or any outside drains shall not be connected to sanitary sewer mains or sewer service connection.

16. Contractor shall prepare Record Drawings of all new sanitary sewer main and service lateral construction in accordance with Lake Whatcom Water and Sewer District Design Standards Section 1.2.1 (Record Drawings) and Standard Detail G6.



MANHOLE DIMENSION TABLE						
DIAM	MIN. WALL THICKNESS	MIN. BASE THICKNESS	MAXIMUM KNOCKOUT SIZE	MINIMUM DISTANCE BETWEEN KNOCKOUTS	PIPE ALLOWANCES PIPE MATERIAL WITH MAX. INSIDE DIAM.	
					ALL METAL	SOLID WALL PVC
48"	4"	6"	36"	8"	30"	30"
54"	4.5"	8"	42"	8"	36"	36"
60"	5"	8"	48"	8"	42"	42"
72"	6"	8"	60"	12"	54"	48"
84"	8"	12"	72"	12"	60"	48"
96"	8"	12"	84"	12"	72"	48"

NOTES:

1. Knockouts shall have a wall thickness of 2" minimum to 2.5" maximum.
2. No steps are required when height is 4' or less.

BASED ON WSDOT STANDARD PLANS B–15.60–02 AND B–10.20–01.

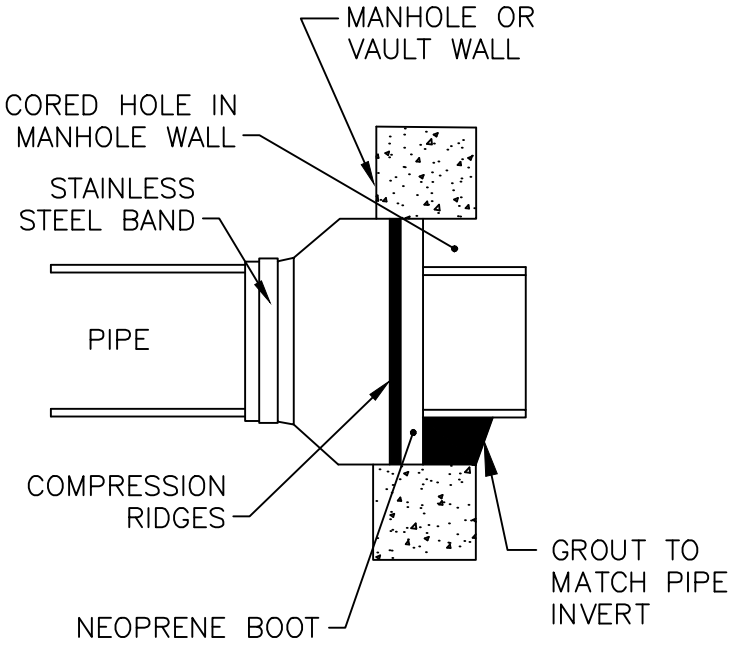
LAKE WHATCOM WATER & SEWER DISTRICT

SANITARY SEWER MANHOLE TYPE 3

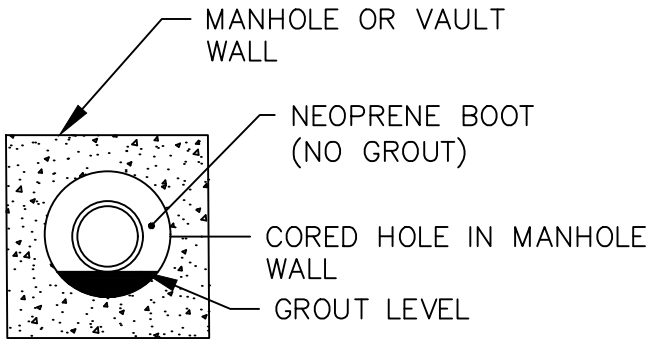
STANDARD DETAIL

S3

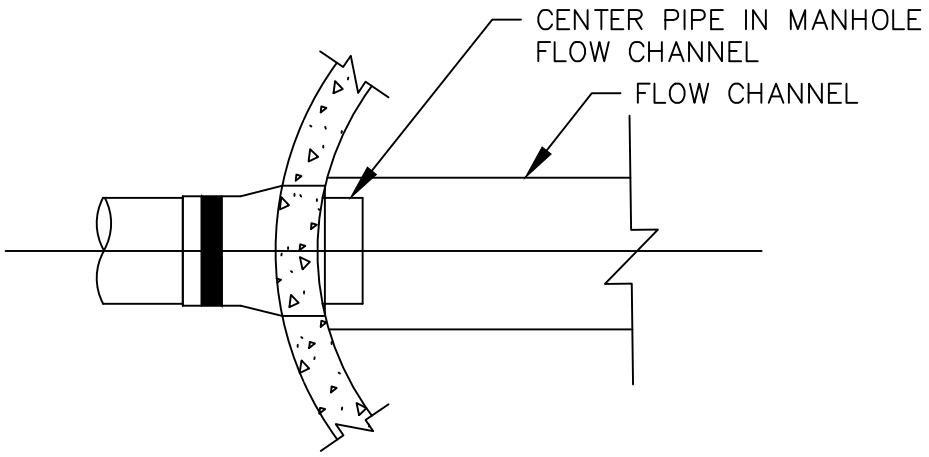
9/20/2017



FLEXIBLE SEAL ADAPTER – PROFILE VIEW



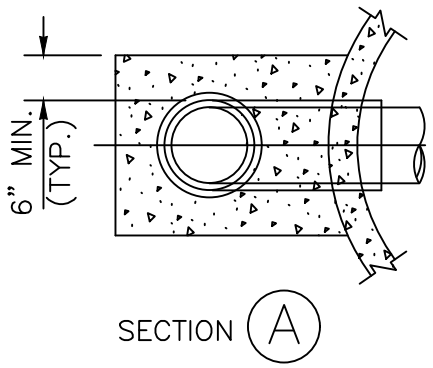
GROUT DETAIL

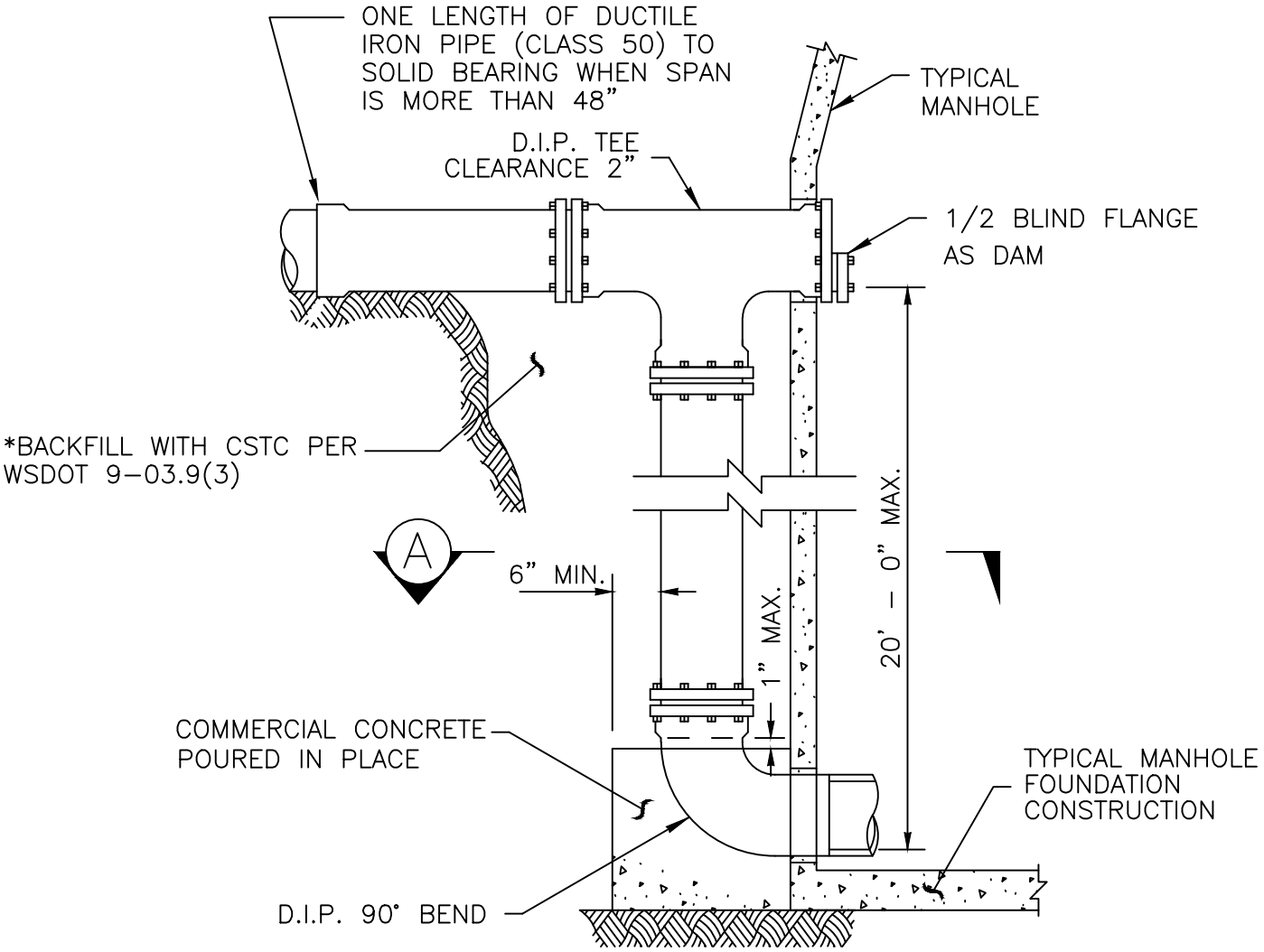


FLEXIBLE SEAL ADAPTER– PLAN VIEW

NOTES:

1. All manhole connections shall be 100% watertight.
2. All pipe shall extend 2" into manhole.
3. Pipe to manhole connection shall use a flexible connector, Kor–N–Seal Series 106, or approved equal. Flexible neoprene boot on the flexible seal adapter shall be a minimum of ⅜" thick per ASTM C–443, and shall be held in place with an internal expanding stainless steel band.
4. Deflection at the adapter must not exceed manufacturer's recommendation. If slope of pipe at penetration exceeds recommended deflection, cast or core hole at an angle such that deflection does not exceed manufacturer's recommendations.





NOTES:

1. Outside drop manholes shall be installed only where approved by the District.
2. All pipe shall be minimum Class 52 ductile iron pipe.
3. * Differs from WSDOT Std. Plan B-85.50-01

BASED ON WSDOT STANDARD PLAN B-85.50-01 DATED 6/10/08.

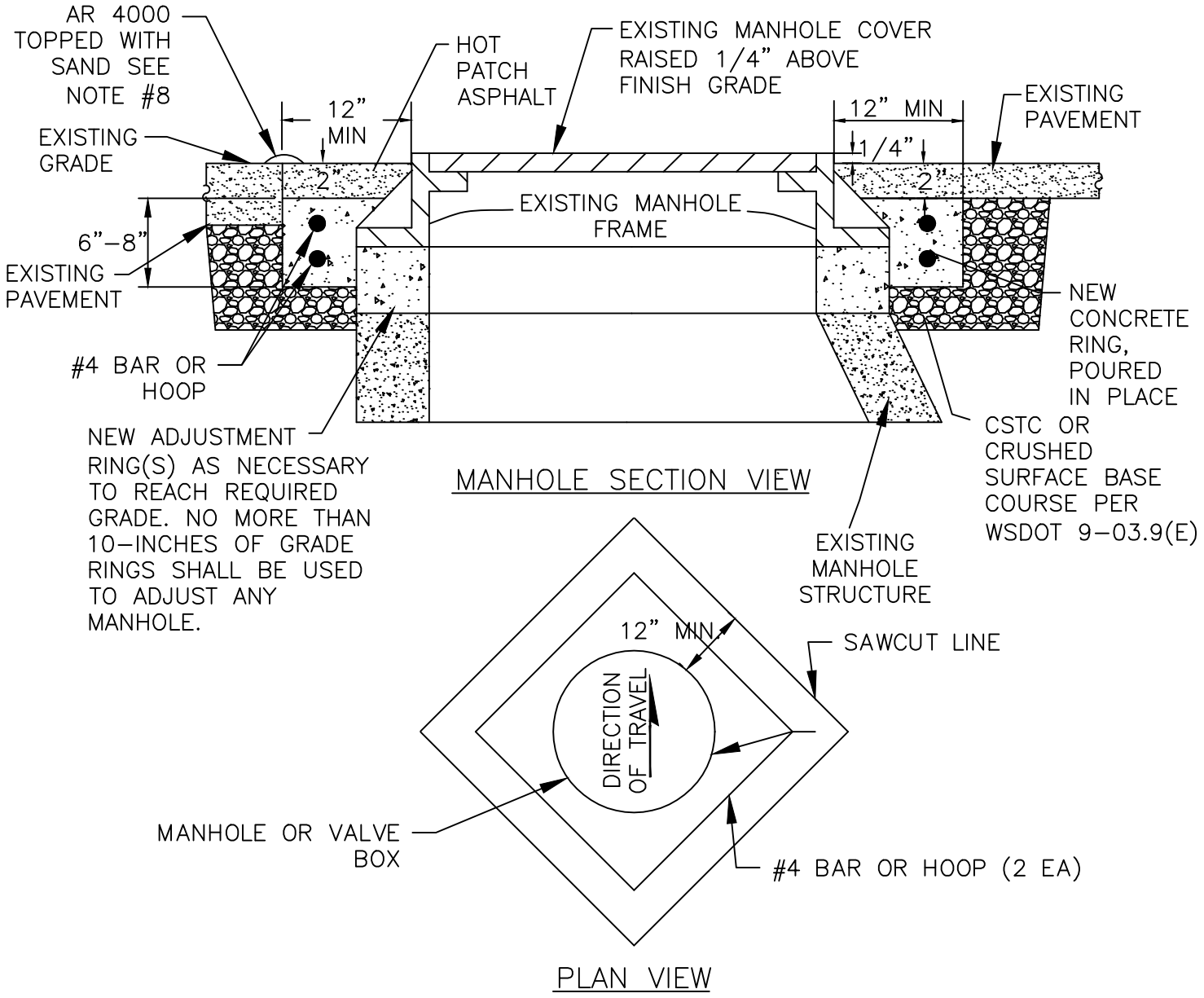
LAKE WHATCOM WATER & SEWER DISTRICT

OUTSIDE DROP SEWER MANHOLE CONNECTION

STANDARD DETAIL

S5

1/28/2026

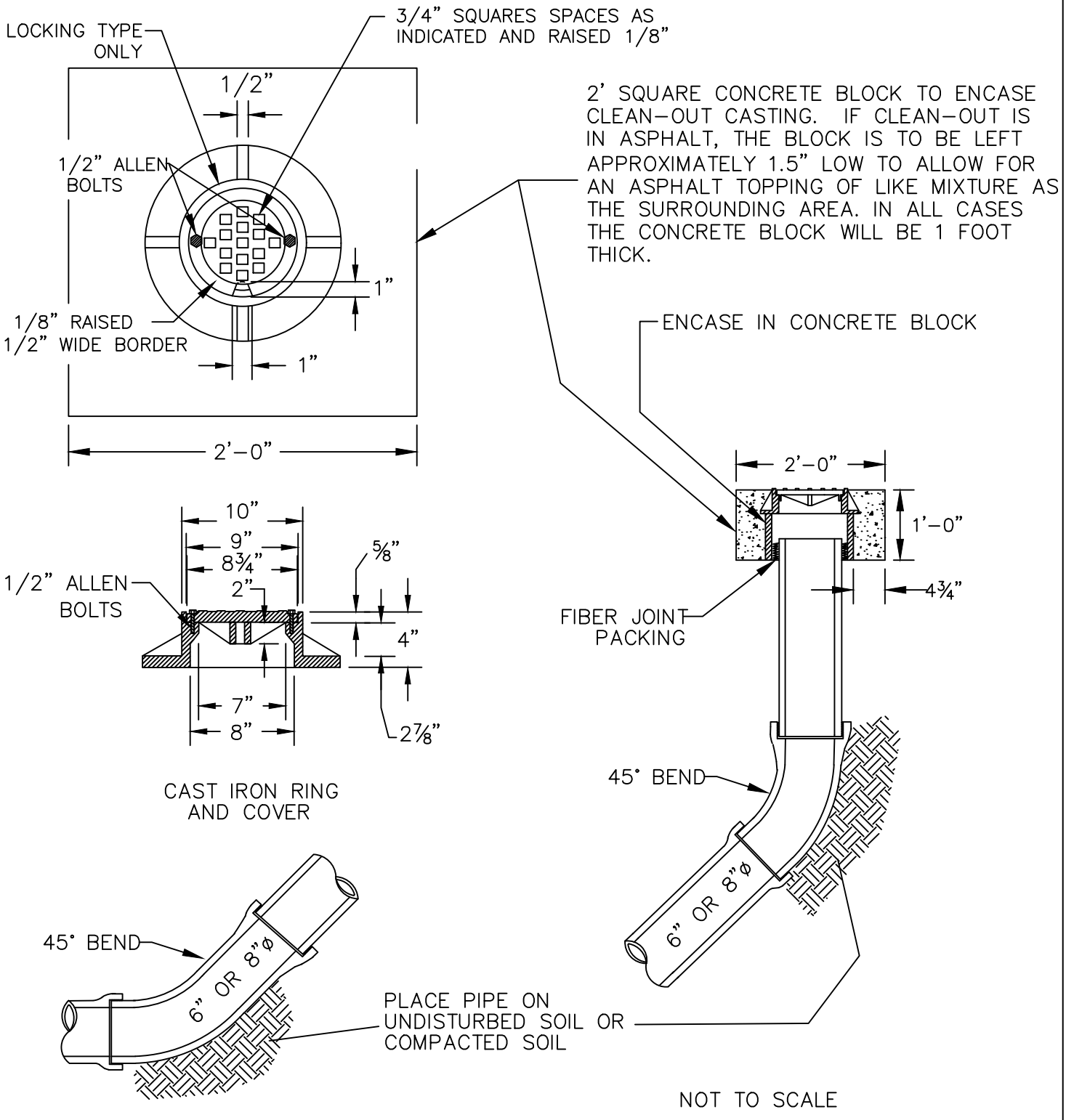


MANHOLE SECTION VIEW

PLAN VIEW

NOTES:

1. All manhole frames and covers shall be removed, cleaned and raised to finished grade.
2. Locations within a paved travel lane shall receive a concrete collar as detailed herein:
   - 2.1. Remove the fill material within the cut pavement to 8–inches below finish grade, or to expose adjustment ring.
   - 2.2. Casting shall be placed so that the smooth edge diamond pattern is oriented with the flow of traffic.
   - 2.3. All joints shall be grouted with material conforming to WSDOT 9–20.3(2).



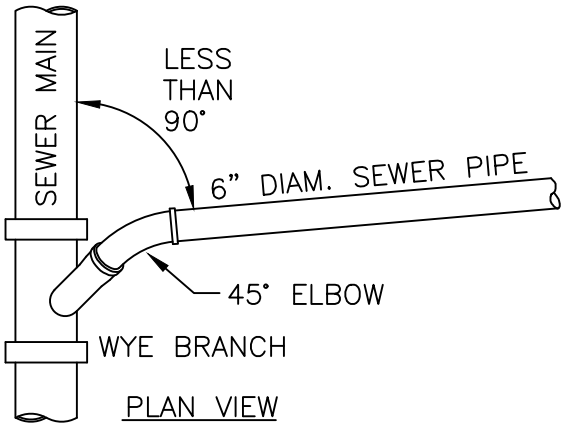
LAKE WHATCOM WATER & SEWER DISTRICT

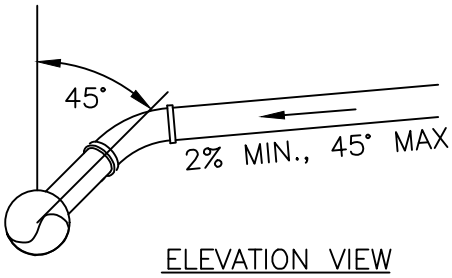
SEWER MAIN CLEANOUT

STANDARD DETAIL

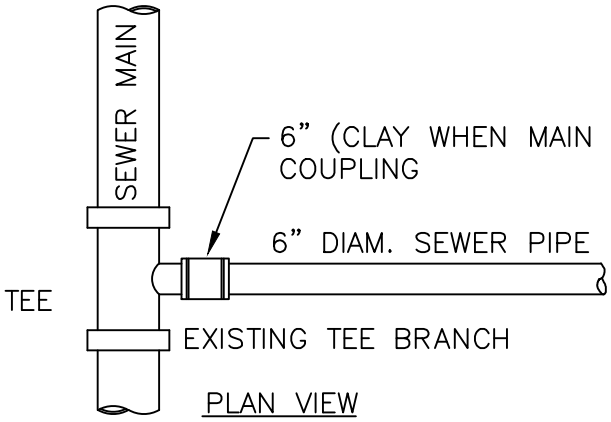
S7

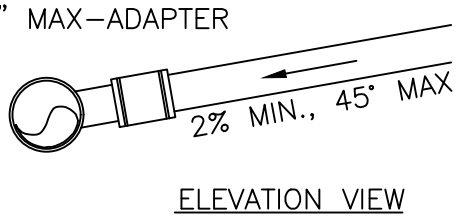
1/28/2026



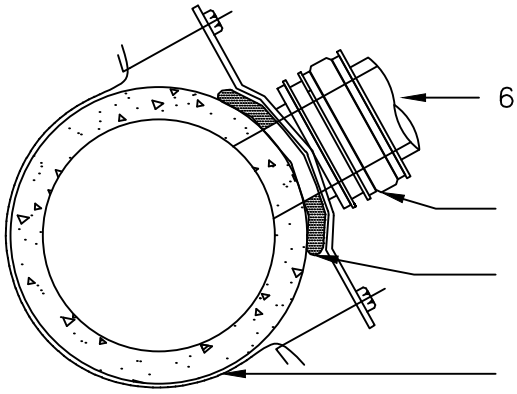


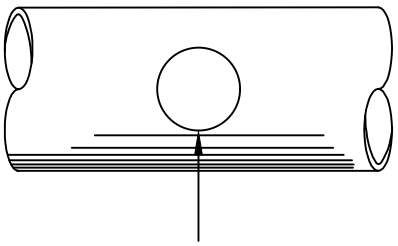
SERVICE LATERAL INSTALLED WITH NEW MAINS





CONNECTION TO EXISTING TEE

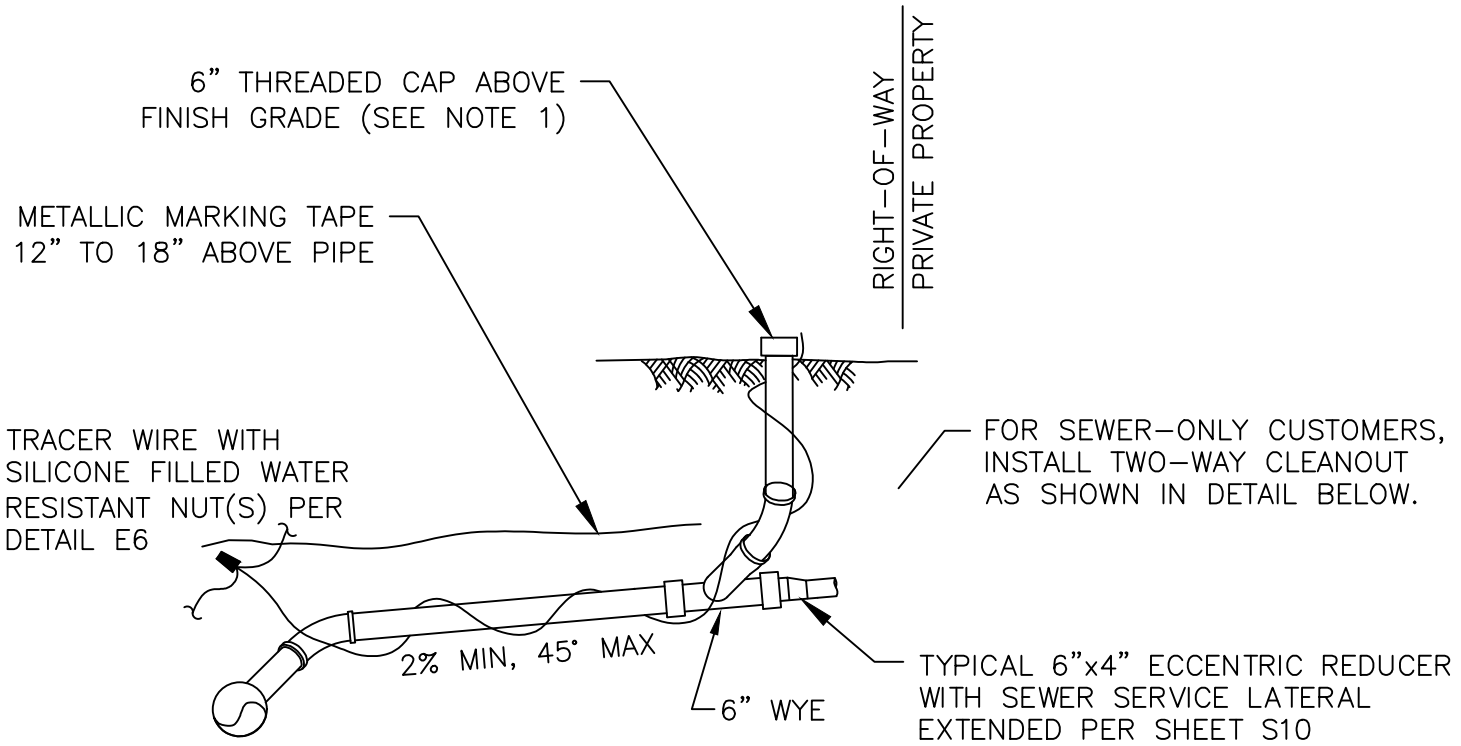




NOTES;

1. Install wye fitting with gaskets for new sewer installations
2. Pipe bedding shall Gravel Backfill for Pipe Zone Bedding per WSDOT 9–03.12(3).
3. Minimum cover to finish grade is 36".
4. Core drill hole then remove coupon. Do not drop coupon into pipe.

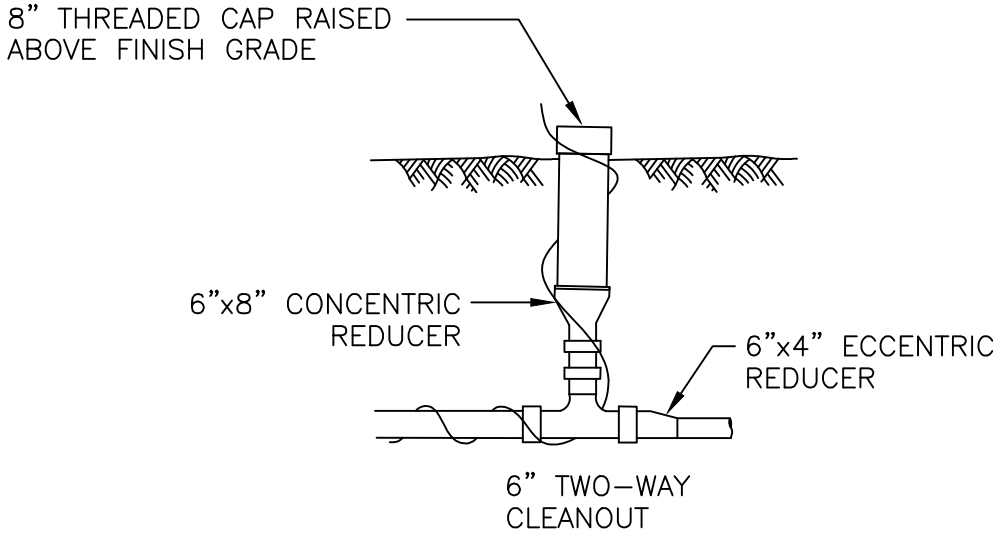
CONNECTION TO EXISTING SEWER (TAP)



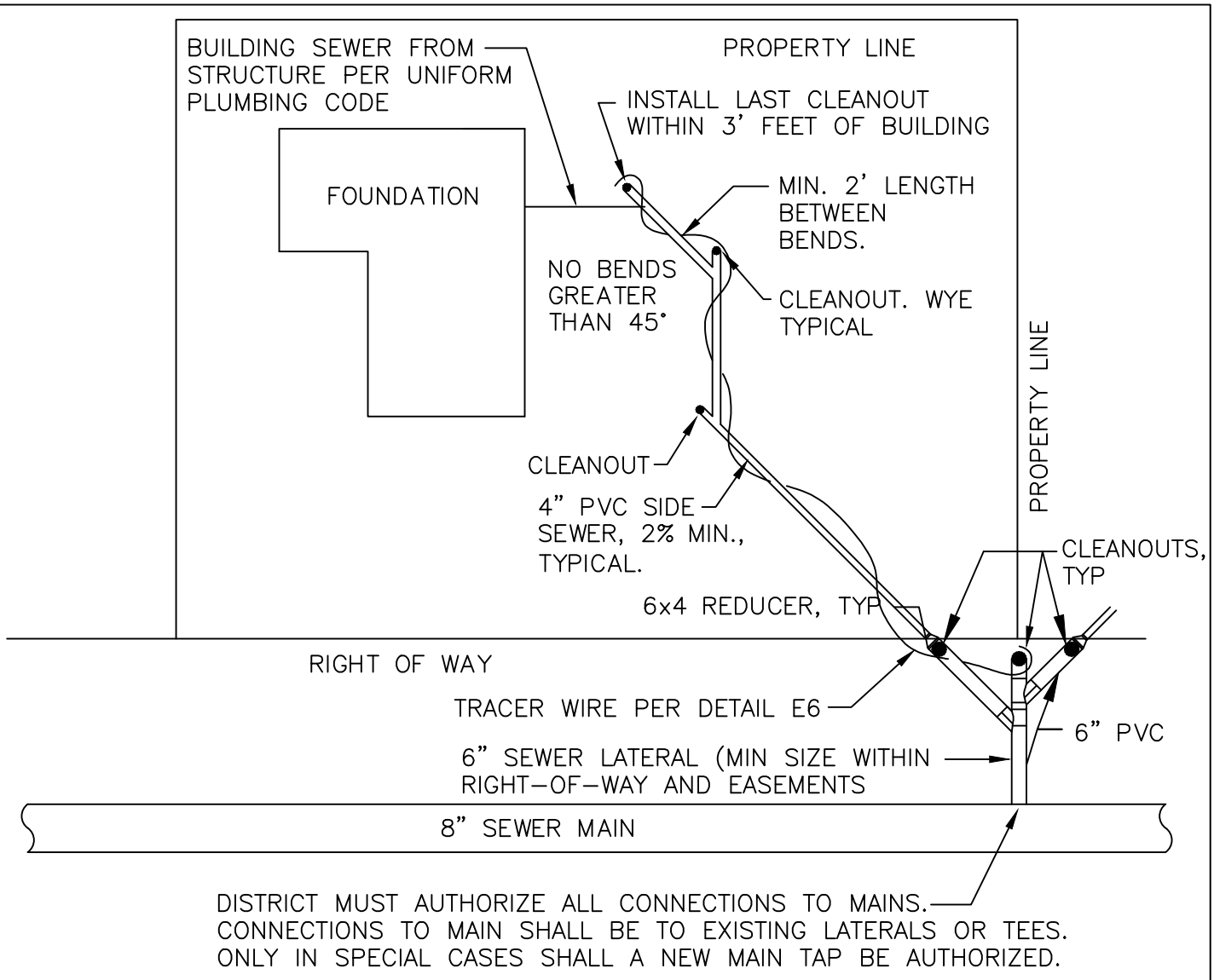
TYPICAL SINGLE SEWER SERVICE LATERAL & CLEANOUT

NOTES:

1. For future sewer service lateral connections install a 6-inch plug immediately upstream of cleanout and stake location with a 2"x4"x8" treated marker post, embedded 4-ft below grade, painted green, and marked with depth to pipe. Wrap cleanout with tracer wire.



CLEANOUT FOR SEWER-ONLY CUSTOMERS.



NOTES:

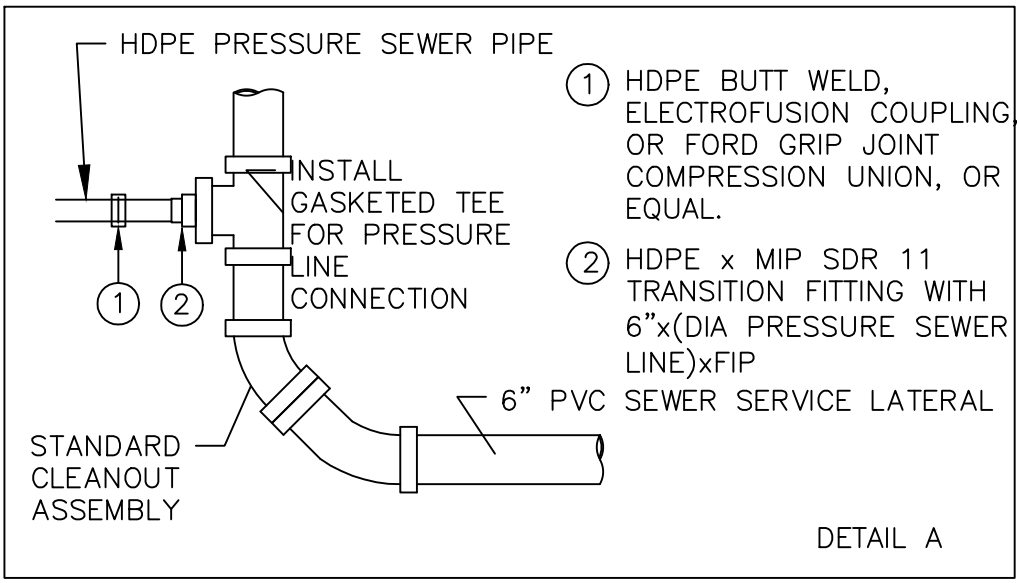
1. All pipe from main to cleanout at foundation shall be PVC ASTM D3034 SDR 35, joints shall conform to ASTM D3212 using elastomeric gaskets conforming to ASTM F477. Fittings shall be injection molded, factory welded, or factory solvent cemented.
2. Minimum 18" of cover from property line to building.
3. Down spouts, sump pumps, outside drains and storm drainage shall not be connected to sewer pipes.
4. Minimum size for side sewer pipe is 4" for single family residence and 6" for multi-family residence up to a 4 plex.
5. Cleanouts on side sewer pipe shall be installed at every change in horizontal alignment in excess of 22 1/2 degrees.
6. Cleanouts shall be installed at intervals not to exceed 100 feet.
7. Cleanouts shall be installed for each aggregate horizontal change in direction exceeding 135 degrees.
8. Transitions of different pipe material type shall be with a MAXADAPTER coupling.
9. Side sewers or service laterals passing under existing or future retaining walls must be installed within a District approved casing pipe per DCS.

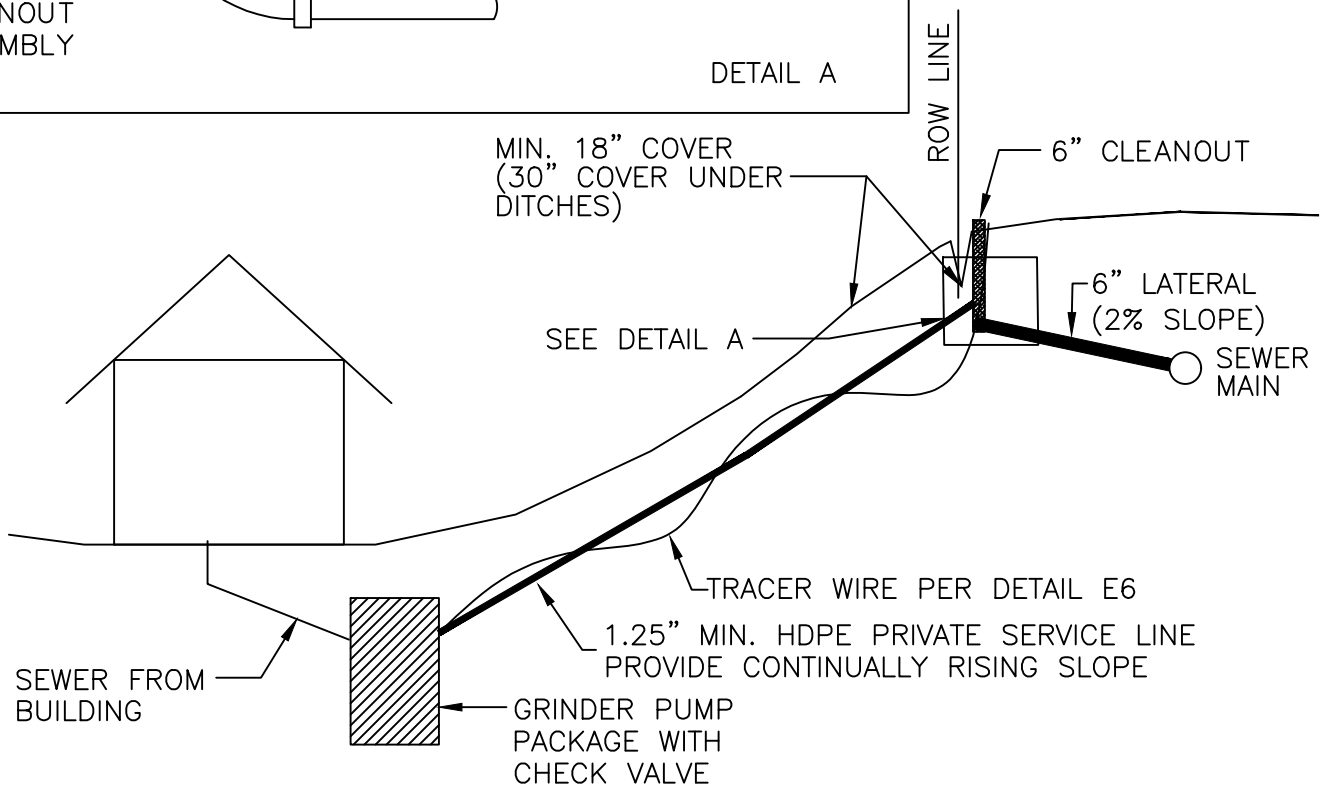
LAKE WHATCOM WATER & SEWER DISTRICT

GRAVITY SIDE SEWER INSTALLATION

STANDARD DETAIL

S10

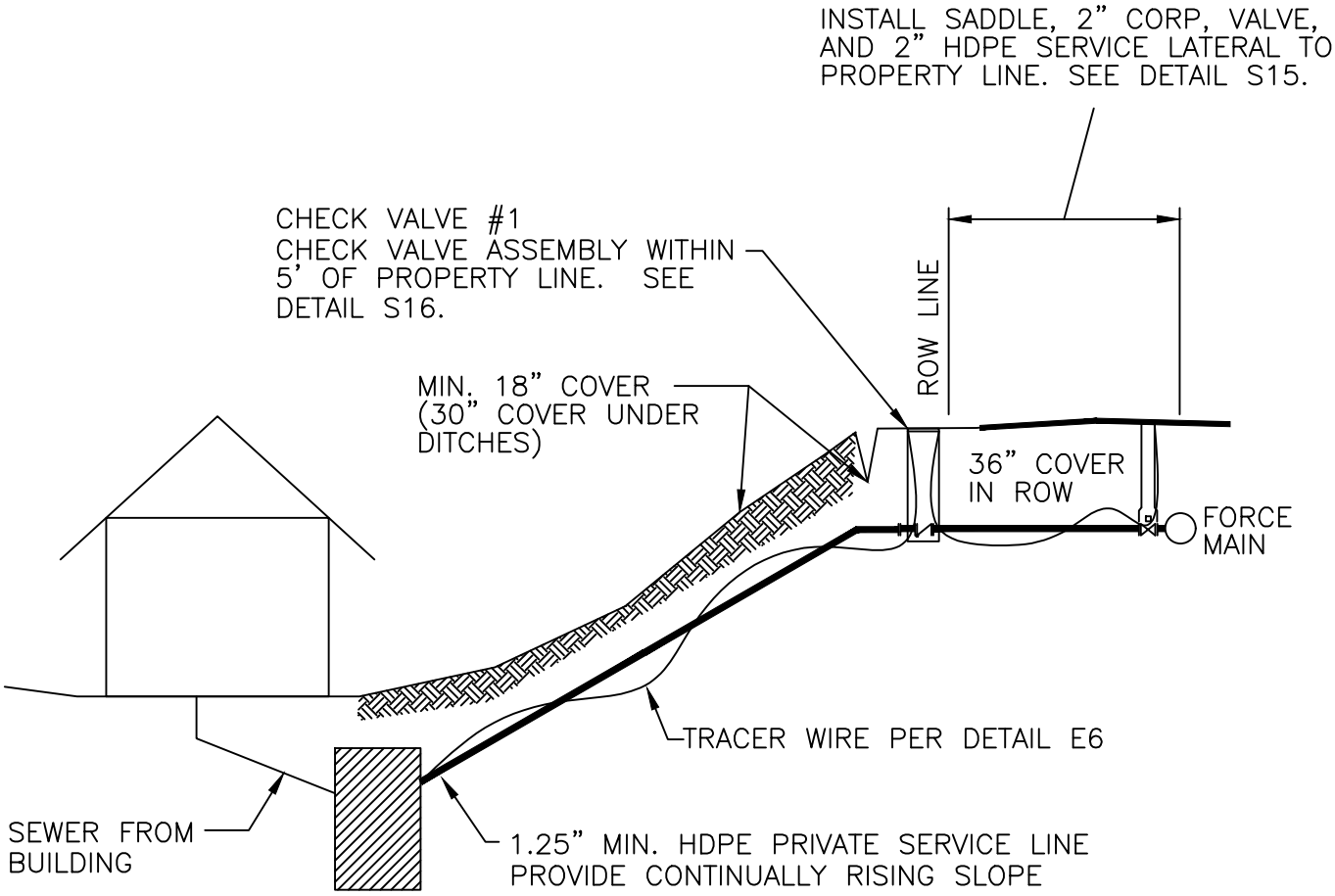




NOTES:

1. Pressure sewer service pipe shall be PE 3408 HDPE conforming to the requirements of ASTM D–3350. Piping shall be SDR11, IPS (OD), pressure rated at 160 PSI, conforming to the requirements of AWWA C901 and ASTM F714. Fittings shall be electro–fusion welded socket joints. or Ford Grip Joints or equal.

2. See Dept. of Ecology (DOE) Criteria for Sewage Works Design, Sections C1–10.1 and C1–10.2 and DCS 5.2.2 for required grinder pump package components.



GRINDER PUMP (CHECK VALVE #2 AT GRINDER PUMP)

NOTES:

1. Pressure sewer service pipe shall be PE 3408 HDPE conforming to the requirements of ASTM D–3350. Piping shall be SDR11, IPS (OD), pressure rated at 160 PSI, conforming to the requirements of AWWA C901 and ASTM F714. Fittings shall be electro–fusion welded socket joints, or Ford Grip Joints or equal.

2. Two check valves are required between the pump station and the force main. One check valve shall be installed within 5' of the right–of–way in the check valve vault. The second valve shall be installed at the grinder pump.

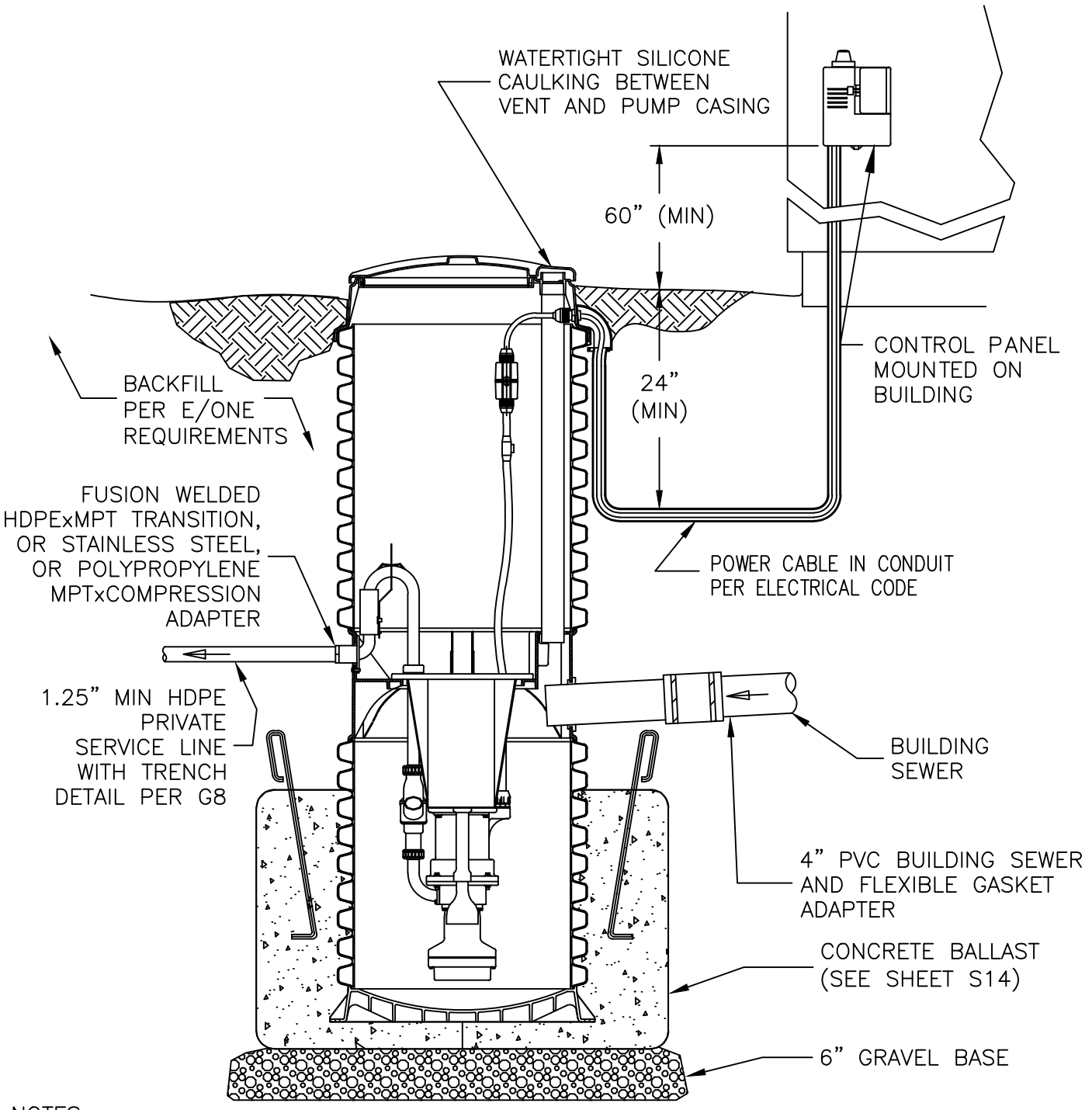
2. See Dept. of Ecology (DOE) Criteria for Sewage Works Design, Sections C1–10.1 and C1–10.2 and DCS 5.2.2 for required grinder pump package components.
3.

LAKE WHATCOM WATER & SEWER DISTRICT

GRINDER PUMP SERVICE TO FORCE MAIN INSTALLATION

STANDARD DETAIL

S12



NOTES:

1. Install E/One tank assembly and panel per manufacturer's installation manual and follow requirements for manufacturer's warranty.
2. All fittings shall be brass or Type 316 stainless steel compression fittings, unless specifically noted otherwise.
3. Alarm panel and electrical inspected by others.

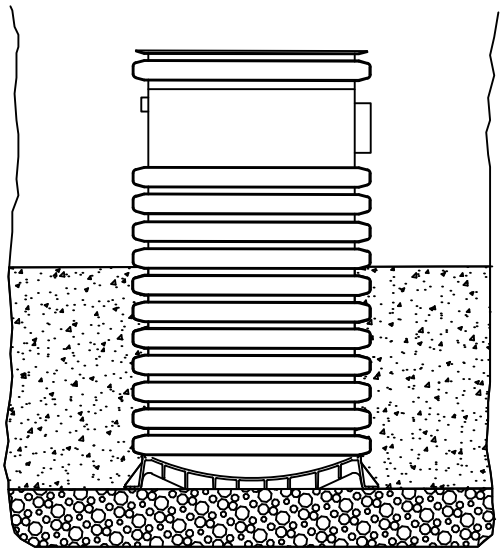
LAKE WHATCOM WATER & SEWER DISTRICT

TYPICAL E/ONE GRINDER PUMP INSTALLATION

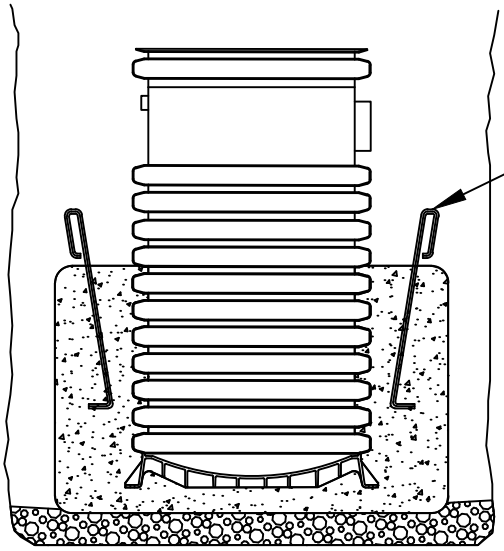
STANDARD DETAIL

S13

1/28/2026



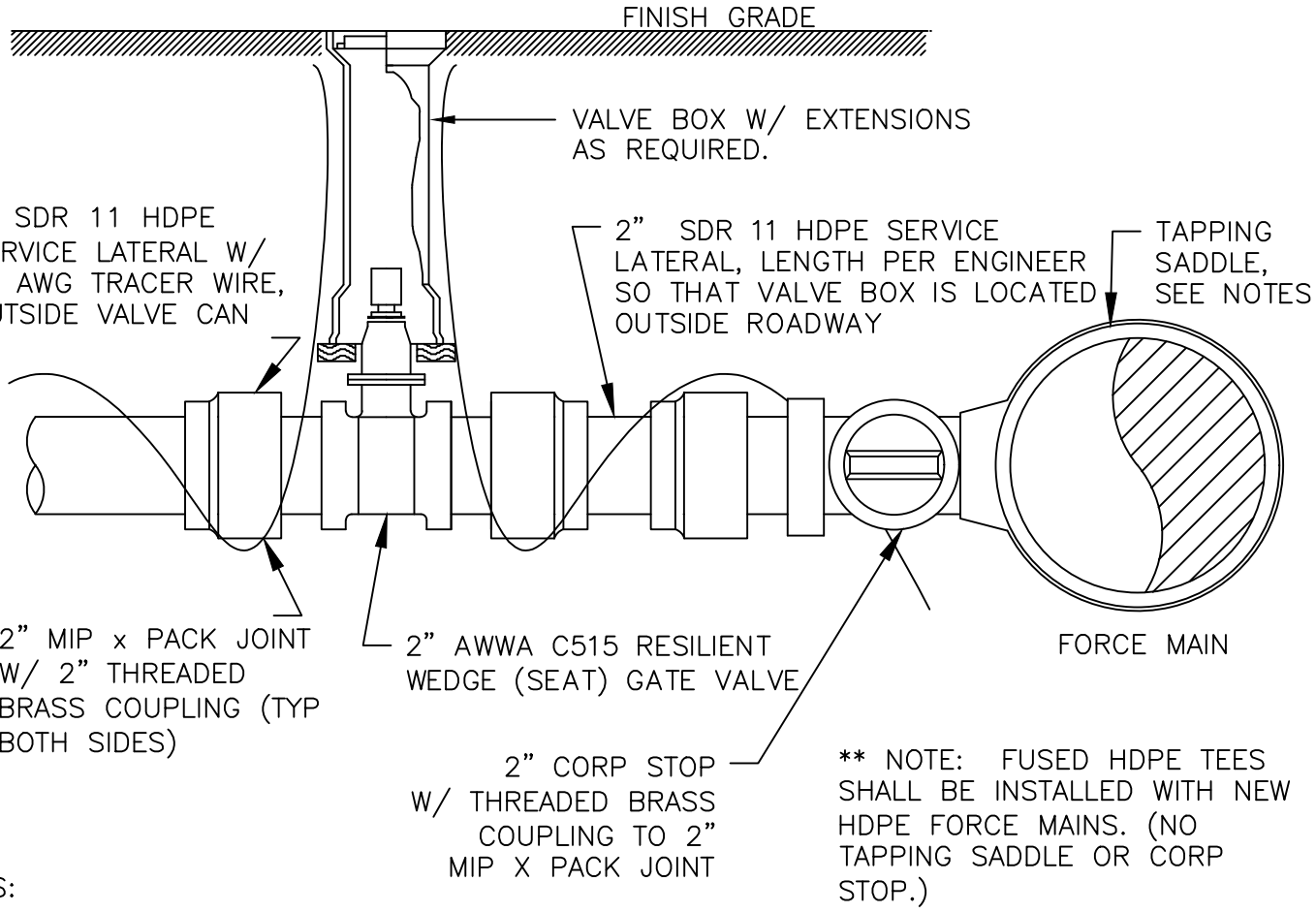
POURED IN PLACE



PRECAST

NOTES:

1. Calculate ballast quantities per manufacturer's recommendations.



NOTES:

1. HDPE Service Saddles. Saddles for use on SDR 17 HDPE mains shall be epoxy or nylon coated ductile iron tapping saddles with a double stainless steel strapping mechanism specifically recommended by the manufacturer for use on HDPE piping. Saddles shall be Romac style 202N–H or approved equal.

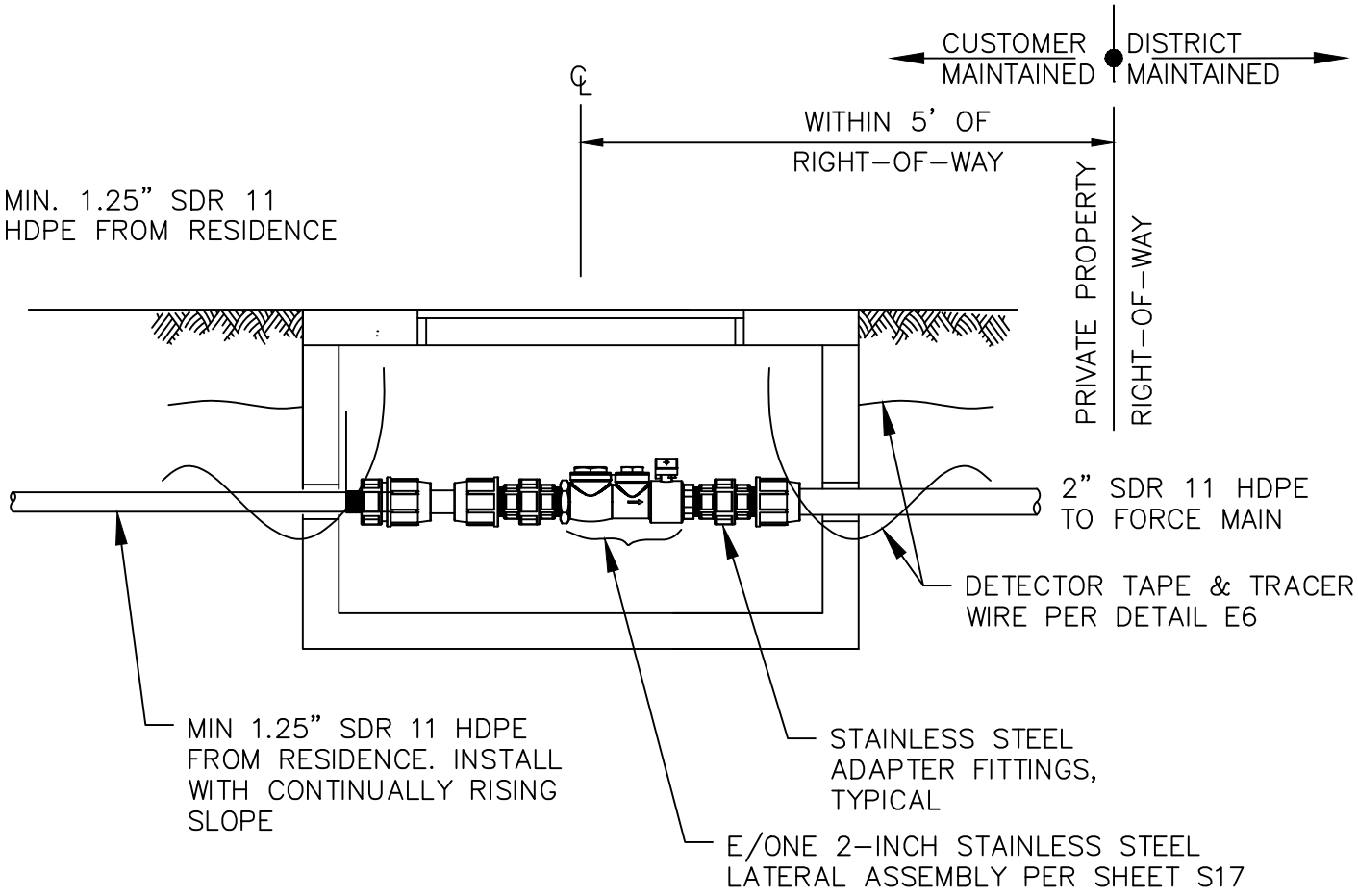
2. PVC Service Saddles. Saddles for use on AWWA C900 PVC mains shall have epoxy or nylon coated ductile iron tapping saddles with a double strap stainless steel strapping mechanism. Service saddles shall be Romac style 202N or approved equal.

3. Ductile Iron Service Saddles. Saddles for use on ductile iron mains shall have epoxy or nylon coated ductile iron tapping saddles with stainless steel tapping mechanism. Service saddles shall be Romac style 101NS or approved equal.

4. Customer Service Shutoff Valves. Shutoff gate valves shall be M&H AWWA C515 resilient wedge type gate valves, or approved equal, in conformance with AWWA C515 and AWWA C550. Bolts, nuts and washers shall be ASTM Type 304 stainless–steel. Gate valve placement shall be outside of travel lanes to a location directed by the Engineer.

5. Valve boxes shall have the word "SEWER" cast into the cover.

6. Fittings. All fittings shall be brass or Type 316 stainless steel.



NOTES:

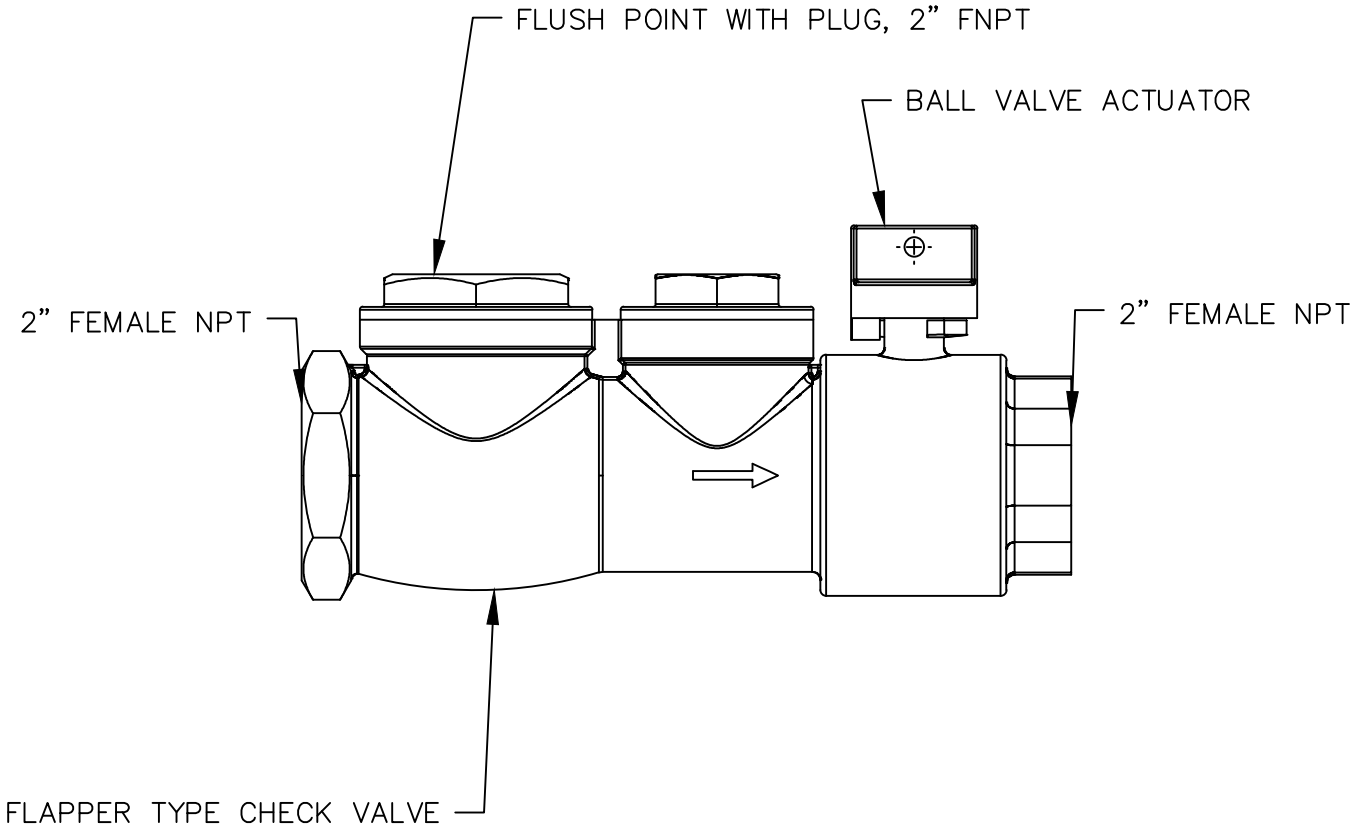
1. Vault. Vault shall be a pre–cast concrete hand hole with a minimum 2'–0" by 3'–0" inside diameter and a maximum 4'–0" inside depth. Hand hole and access hatch shall be traffic rated. Access hatch shall be galvanized steel checker plate with pick holes and bolt down holes in plate and shall be designed for H–20 loading when within or adjacent to roadway or driveways. Lid shall be marked "SEWER" with 2" raised letters. Check valve vaults shall be Utility Vault Model 2436 hand hole or approved equal.

2. Air/Vacuum Valve. Where required, in cases where continually rising slope cannot be obtained, an air relief and combination air relief/ vacuum relief valves shall be installed. Air/Vacuum valve shall be as manufactured by Orenco, Apco, Crispin, ARI, or equivalent for sewer service. All valves shall be on private property and be fully accessible to enable customer's operation, maintenance and repair.

3. Fittings and Adapters. Adapter fittings shall be Type 316 stainless steel or polypropylene. Install with appropriate adapters/union fittings for future maintenance and quick disassembly. All fittings, adapters and pipe shall be rated for minimum 235 psi.

4. Install all fittings and adapters per manufacturer's recommendations.

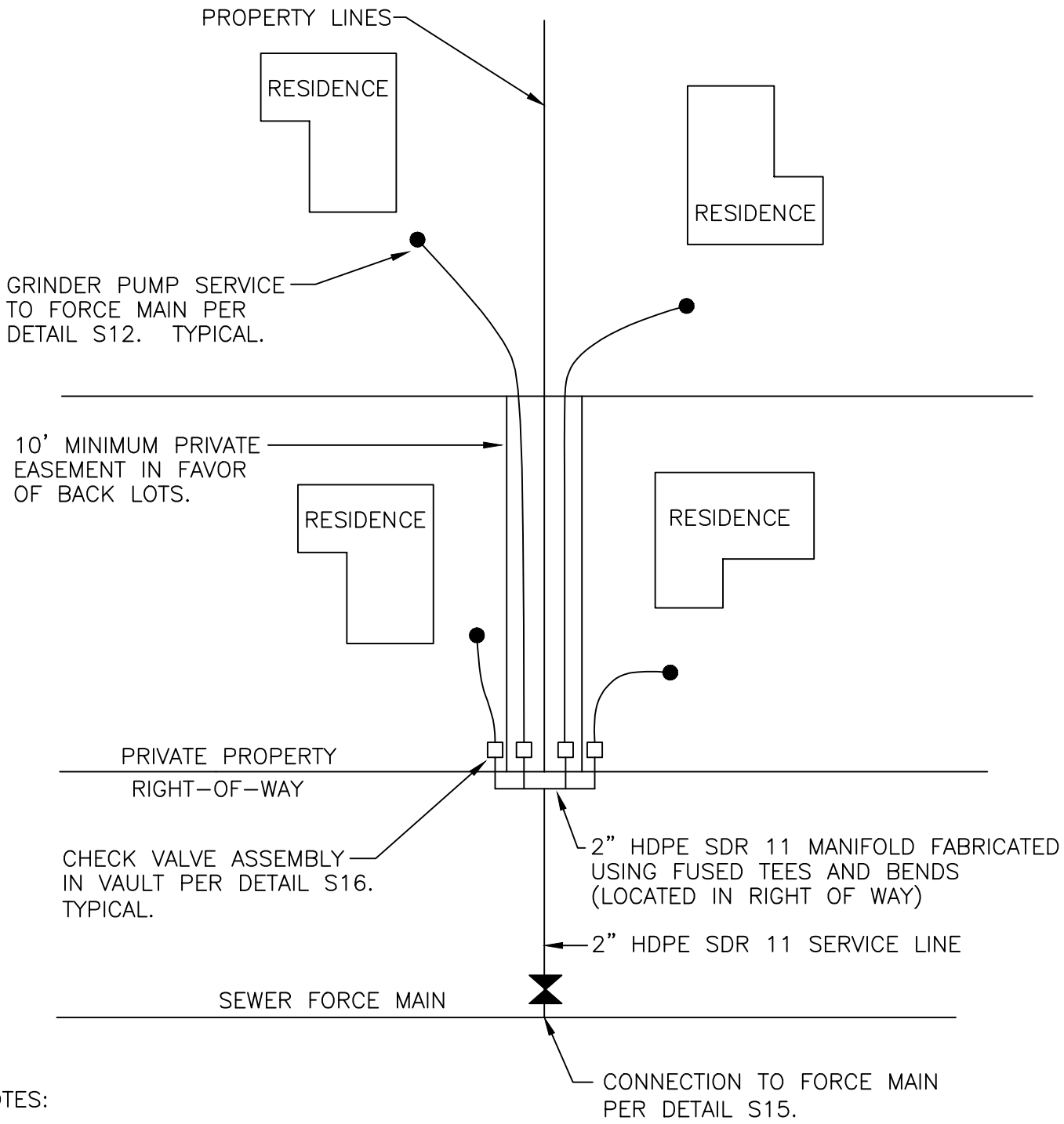
5. Assembly and pipe shall be pressure tested.



NOTES:

1. Assembly shall be brass or Type 316 stainless steel with min 235 psi pressure rating.

2. Assembly is a ball valve curb stop with female pipe threads, valve position stops (open/closed), with flush point and integral check valve. Assembly shall be E/One 2" Lateral Assembly NC0443P01 or approved equal.



NOTES:

1. If approved by the District Engineer, a single 2" service tap may be shared with multiple residences. District will review requests for shared taps on a case by case basis. Property owners desiring to install a shared tap, shall individually but at the same time, submit a sewer permit application with the grinder pump check list for review by the District.
2. Manifold must be fabricated using fused HDPE tees and bends by a contractor certified by a HDPE pipe or fusion machine manufacturer.
3. Install a gate valve and blind flange on all unused connections on the manifold.

LAKE WHATCOM WATER & SEWER DISTRICT

SHARED FORCE MAIN SERVICE TAP

STANDARD DETAIL

S18

2/23/2022

ELECTRICAL, TELECOMMUNICATION AND AUTOMATIC CONTROL NOTES

These Standard Details, together with the most current versions of the District's full Design and Construction Standards (DCS) and the District Administrative Code, incorporated herein by reference, shall govern all District design and construction activities.

1. Provide all electrical work and appurtenances in accordance with the latest edition of the National Electric Code (NEC), National Electric Safety Code, Washington State Electrical Code, and local regulations and ordinances.

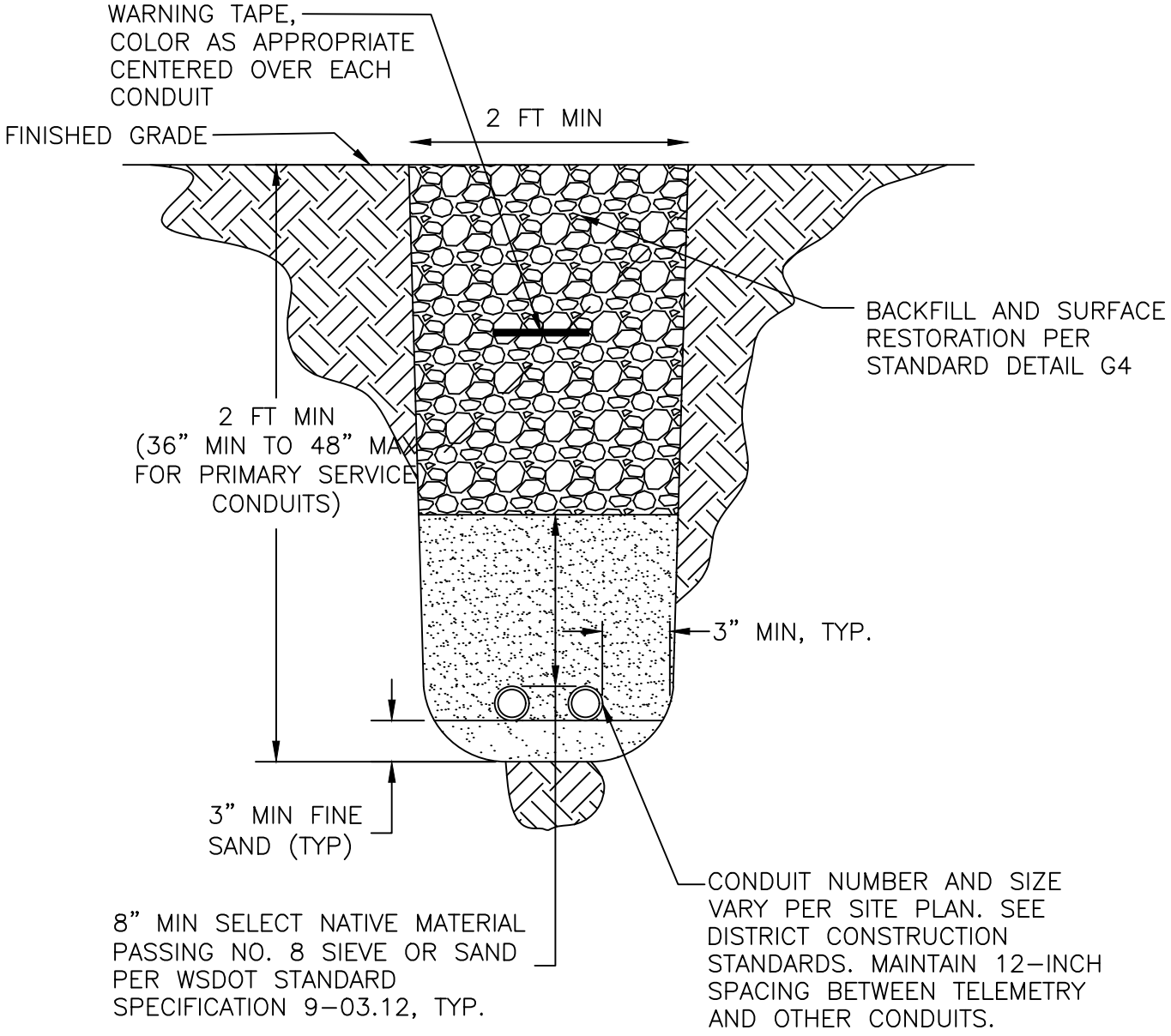
2. All electrical products shall bear a label from a certified testing laboratory recognized by the State of Washington. Recognized labels in the State of Washington are UL, ETL and CSA–US.

3. The contractor shall coordinate and provide all permits, licenses, approvals and inspections by the authority having jurisdiction, and other arrangements for the work on the project. All fees shall be paid by the Contractor.

4. Test reports shall be submitted to the Engineer prior to acceptance.

5. Test all circuits for continuity, freedom from ground and proper operation during progress of work.

6. Conduct final testing in the presence of the District Engineer.



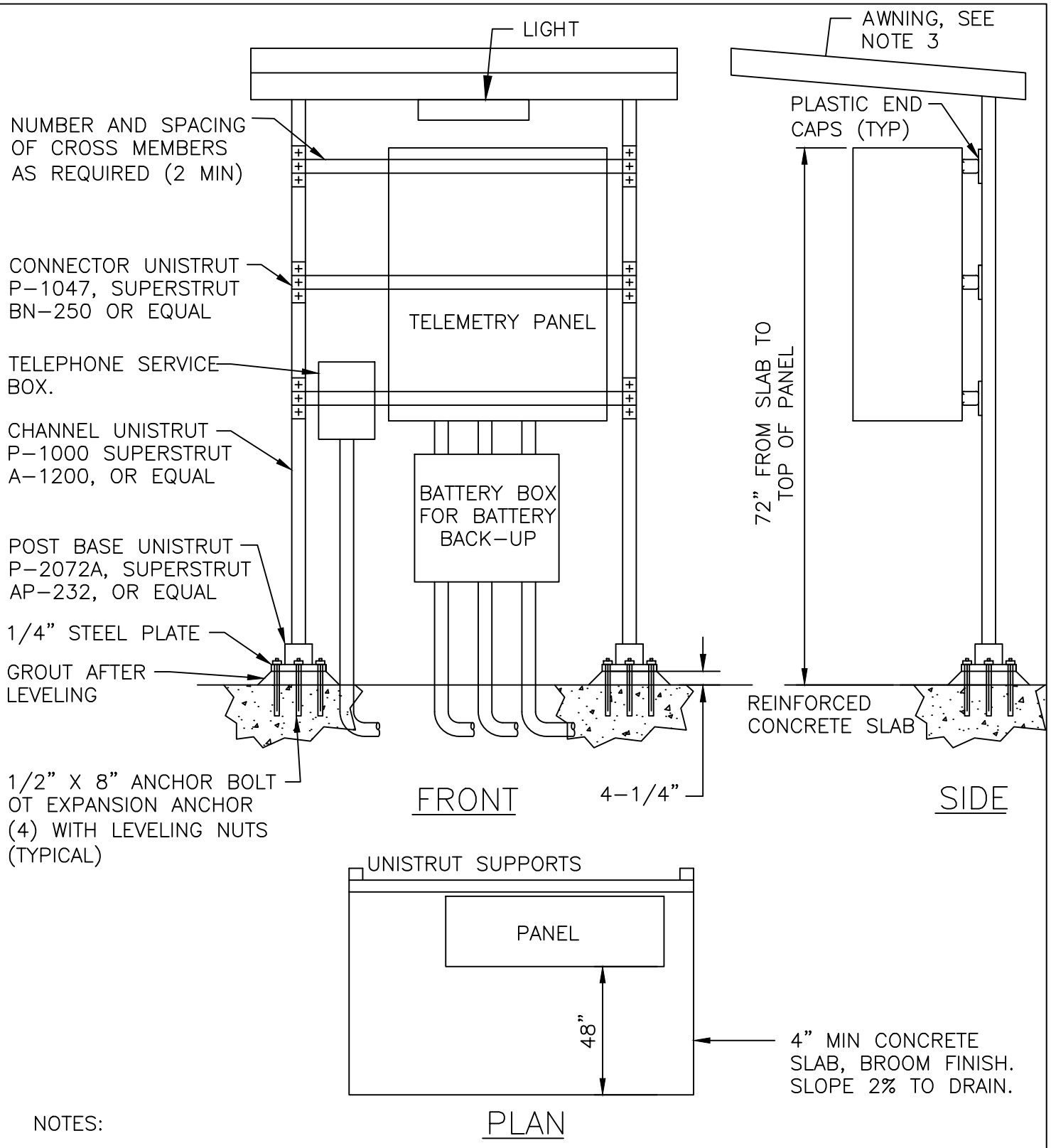
LAKE WHATCOM WATER & SEWER DISTRICT

TYPICAL ELECTRICAL / TELECOMMUNICATION / AUTOMATIC CONTROL TRENCH

STANDARD DETAIL

E2

3/11/2020



NOTES:

1. Rack channels and fittings shall be hot dipped galvanized steel.
2. Telephone service lines shall be installed in conduit, both above and underground.
3. Provide weatherproof awning with standing seam metal roofing, facia, gutters and downspout routed away from shelter. Roof pitch shall be 3/12 pitch.
4. Bollards required, not shown.

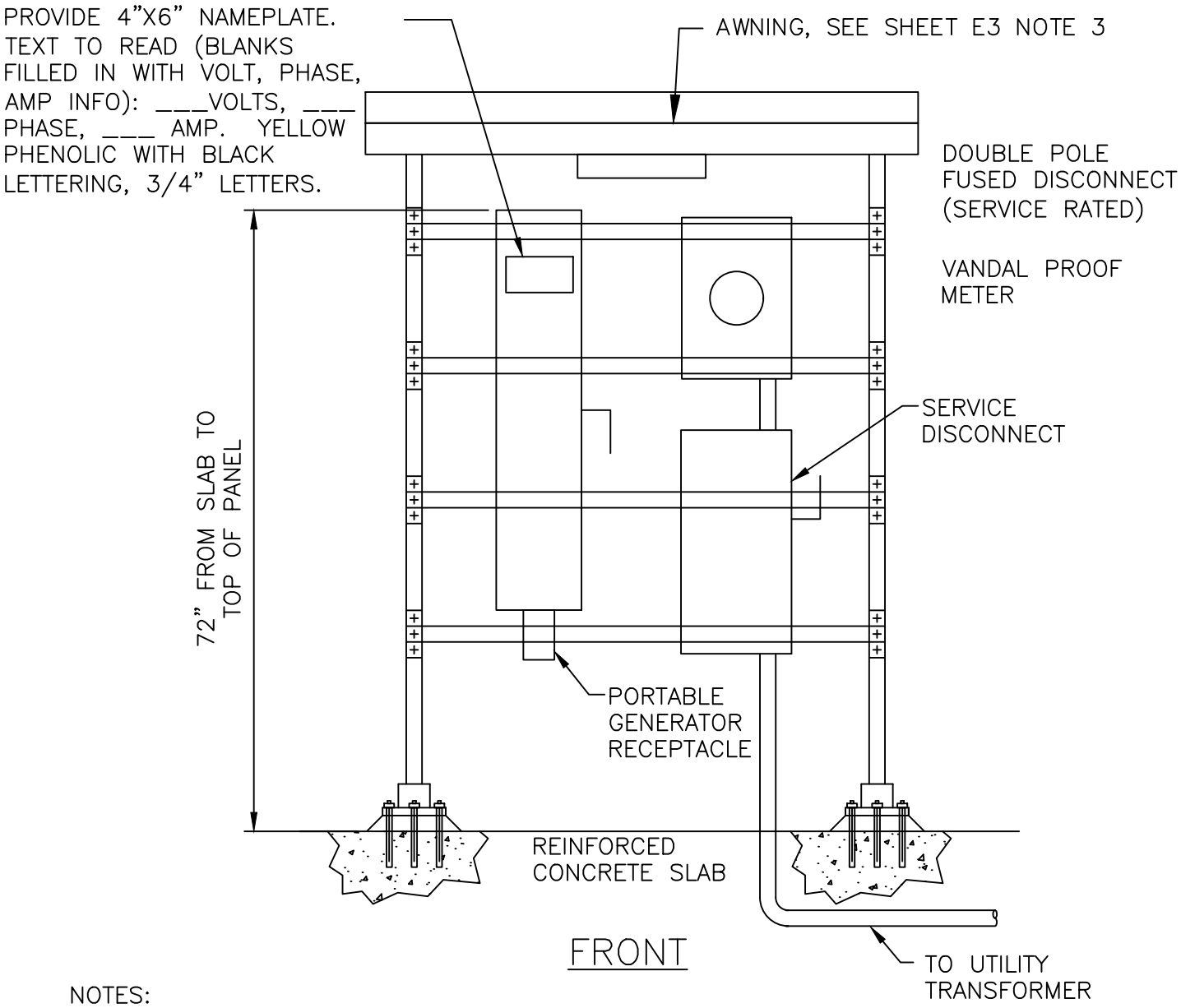
LAKE WHATCOM WATER & SEWER DISTRICT

TELEMETRY PANEL

STANDARD DETAIL

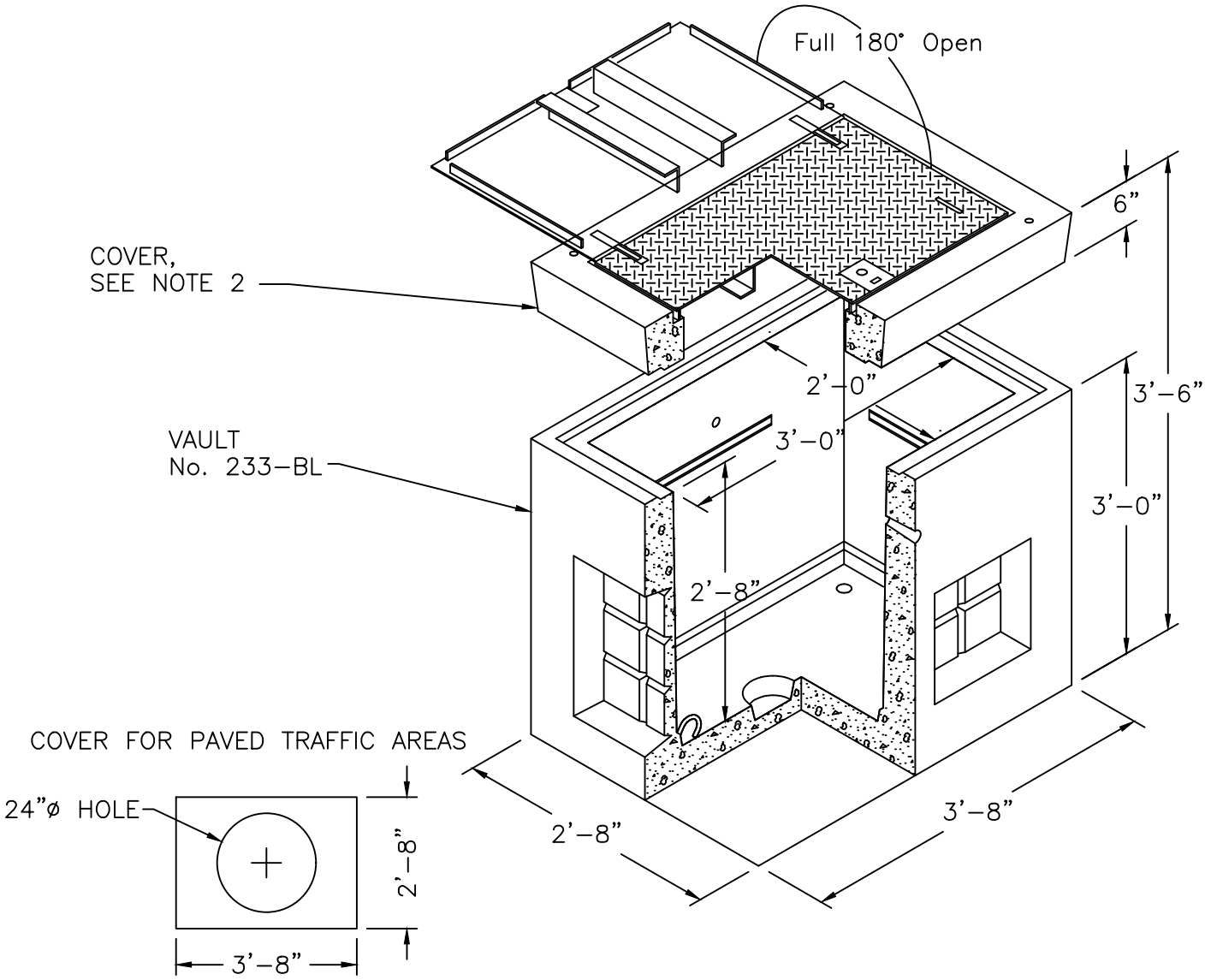
E3

3/11/2020



NOTES:

1. See LWWSD Standard Detail E3 – Telemetry Control Panel for unistrut system and concrete slab requirements. Concrete slab shall extend out 48" from face of panels.
2. Utility equipment may be mounted on back of telemetry panel rack.
3. Portable generator receptacle shall be 480 volt, 3–phase, 4 wire service, 100 amp with reversed contacts (female). Receptacle shall be provided complete with cast back box, angle adapter, gaskets, and a gasketed screw–type, weathertight cap with chain fastener. Receptacle shall be Crouse–Hinds "Arktite", Appleton "Powertite", or approved equal.
4. Manual transfer switch shall be a heavy duty (not general or light duty) double–throw MTS, fused as required to comply with NEC as manufactured by ABB, Cutler Hammer, Square D, Westinghouse, or equal.
5. All equipment shall be fitted with locking mechanisms, keyed to match District locks, that can be locked in both "ON" and "OFF" positions.
5. Bollards required, not shown.



No. 23–24C WITH 4220 DUCTILE IRON COVER AND FRAME.

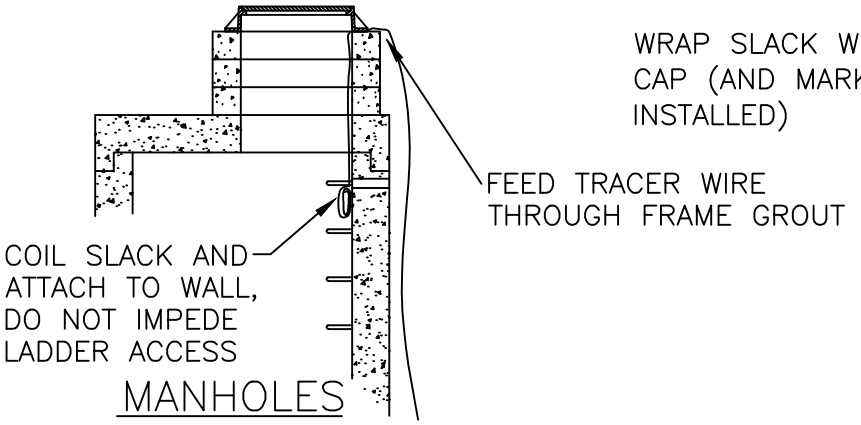
NOTES:

1. Utility Vault base No. 233–LA or approved equal. Dimensions shown as minimum.

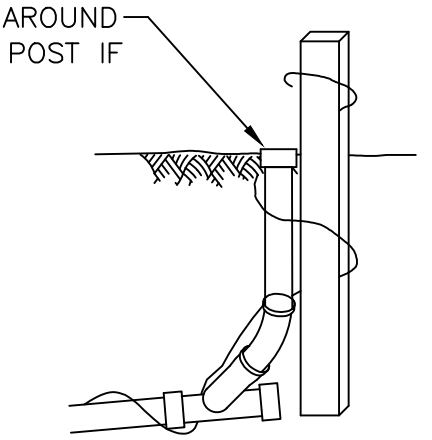
2. Covers shall be rated for H–20 traffic loads. In non–traffic and gravel shoulder areas install hatch cover No. 23–2436P. In paved traffic areas install 4220 Ductile Iron Cover and Frame.

3. Sump knockout in floor, to drain to daylight.

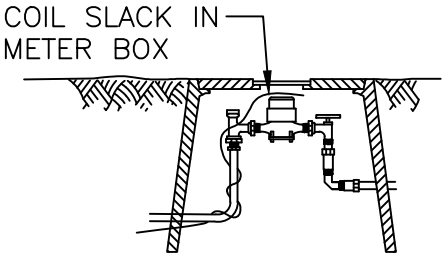
4. Handholes shall be spaced every 500 to 1000 feet and installed at changes in conduit direction.



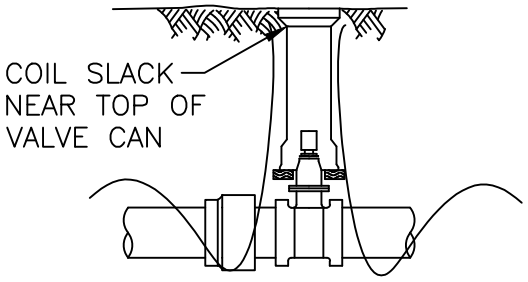
MANHOLES



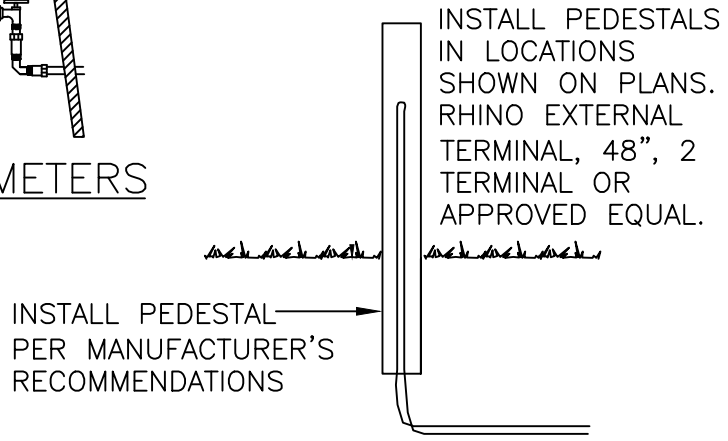
SEWER CLEANOUTS



WATER METERS



VALVE CANS



TRACER WIRE PEDESTAL

NOTES:

1. Tracer wire installation is required on all District owned pipe and communication lines. Tracer wire is also required on sewer service connections and water service connections and private water services.

2. Tracer wire shall be 10 AWG insulated copper wire rated for direct burial in wet locations. Use green insulation for sewer, blue insulation for water, and orange insulation for fiber/communication related utilities.

3. Install tracer wire in continuous lengths (no splices) between surface access points. Any direct bury splices shall be approved and inspected by the District Engineer prior to cover. Splices shall be made with silicone filled wire nuts rated for direct burial in wet locations such as "Ideal Underground Wire Connectors", "Ideal Mudbug Connectors," "Copperhead Snakebite Connectors," or "3M DBR Direct Bury Splice Kit."

4. Tape tracer wire to pipe at 10–foot intervals.

5. Provide at least 2–feet of coiled tracer wire slack at surface access points.

DESIGN & CONSTRUCTION STANDARDS

Adopted ~~February 23, 2022~~
~~(Resolution 881)~~

~~Revised April 26, 2023~~
~~(Resolution 890)~~

~~Adopted February 25~~January 28, 2026
(Resolution ~~XXX~~904)

Lake Whatcom Water and Sewer District
1220 Lakeway Drive
Bellingham, WA 98229

(360) 734-9224

~~Available~~ This document is available ~~on the web~~ at http://www.lwwsd.org

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CHAPTER 1 DRAWING STANDARDS

1.1 Construction Drawings

1.1.1 Format and Content

Construction drawings for proposed public water and/or sewer facilities shall be prepared in accordance with the following drawing standards and under the direction of a currently-licensed Washington State professional engineer (the Engineer of Record).

Format

- Drawings submitted for review: 50% reduced scale 11-inch x 17-inch sheets
- Final drawings submitted for approval: full scale 24-inch x 36-inch sheets
- Minimum text size 0.08-inch when plotted at full-scale size

Basic Drawing Elements

- North Arrow
- Scale Bar
- Legend (clearly differentiate between existing and proposed features)
- Vicinity Map
- Overall Project Map
- Vertical Datum and Project Benchmark Information
  All projects must be on NAVD88.
- Horizontal Survey Reference Point Information
  All projects must be based on NAD83 (1998) City of Bellingham monument-derived coordinates. Show bearing and distance information between survey reference points.
- Lake Whatcom Water and Sewer District General Notes. General Notes (all Projects) and Water System Notes, Sewer System Notes and/or Electrical, Telecommunication and Automatic Control Notes as appropriate.
- Lake Whatcom Water and Sewer District Standard Details as applicable for type of improvements

Scale for Plan and Profile Drawings

- 1-inch = 20-feet horizontal in areas with existing utilities or improvements
- 1-inch = 50-feet horizontal in areas with little or no existing utilities or improvements
- 1-inch = 2-, 5-, or 10-feet for vertical as appropriate

Topographic and Survey Information

- Right-of-Way (ROW)
- Easements (with Whatcom County Auditor parcel numbers)
- Contour intervals of 1 or 2 feet as appropriate for site and design
- Existing features and improvements such as pavement, concrete, gravel, sidewalks, curbs, utility poles, transformers, telephone pedestals, overhead and underground utilities.

Plans

- Proposed improvements clearly shown and noted
- Design alignment and stake out information (stationing, bearings, distances, and offsets)
- For water mains, lineal footage from water main fitting to fitting
- For sewer mains, lineal footage between exterior faces of manhole structures
- Pipe size and material type called out on each segment

Profiles

- All utility crossings with clearances noted
- Distances from centerline of manhole to manhole
- Distances from exterior face of manhole structure to manhole structure
- Calculated slope between exterior face of manhole structure to manhole structure (actual pipe slope)
- Rim and invert elevations for existing and proposed manhole structures
- Trench dams shown

1.1.2 Plan Review Sets

Submit to the Lake Whatcom Water and Sewer District (District) ~~two (2) sets~~one ~~of 50% reduced-scale 11-inch x 17-inch~~full scale 22-inch x 34-inch electronic set of drawings. If there are review comments, the District will return one redlined ~~original~~ electronic set. For subsequent re-submittals, submit ~~two (2)~~one (1) electronic set~~s~~ of ~~50% reduced~~full-scale drawings.

1.1.3 Final Approval Sets

Once all District review comments have been addressed, the District will request ~~three~~ two (~~3~~2) full-scale 22-inch x 34 inch physical ("hard copy") and one (1) electronic set of the final signed drawings~~s to. stamp "Approved for Construction."~~ The District will retain the two (2) physical sets and return one (1) electronic approved set stamped "Approved for Construction".

1.2 Record Drawings

1.2.1 Content

Record drawings shall include the exact~~,~~ as-built~~,~~ location of all water and sewer mains and services and the approximate location of all other underground and above ground utilities, and shall include information defined below.

Basic Information

- Each drawing shall include "Record Drawing" boldly noted on each sheet.
- Line-out design text that has changed and note record information.
- Circle plan design elements that changed and show record information.

Water Mains and Services

- Location, including station, of all vertical and horizontal bends in the water system. Stationing shall be along the length of the extension.
- Location of all water valves, hydrants, hydrant valves, and blow-offs with distance along centerline and distance from the centerline.

- Location of all utilities within easements. This includes distances to the utilities from the easement lines.
- Stationing of service taps on the main. Stationing shall be cumulative along the length of the extension.
- Distance from main to meter.
- Distance from tap to a point opposite (at 90 degrees) the meter along the main, and station this point.
- Distance from this point on the main to the meter (distance at 90 degrees).
- Depth of all services.

Sewer Mains and Service Laterals

- Location of all sanitary sewer manhole structures, inverts, valves and cleanouts on the sewer main.
- Location of all vertical and horizontal bends in the force main system.
- Location of all service lateral saddles on the sewer main from the back-station manhole.
- Stationing of all sewer wyes into the main, located from the ~~back~~ back-station manhole.
- Length of service lateral/side sewer stub in lineal feet, and diameter of pipe.
- Distance along mainline from service lateral wye to where end equals 90 degrees from mainline.
- Distance from this point on the main to the end of stub (distance at 90 degrees).
- Depth of services at end of stub.
- Location of cleanouts on the sewer stub.

1.2.2 Construction Record Keeping

All District projects must have full time inspection. A District Inspector will document and maintain construction as-built information. It is the contractor's responsibility to ensure that the Inspector has all as-built information and measurements recorded prior to backfill of facilities. Contractor shall maintain a hard copy of project plans, with revisions accurately shown as constructed, on site throughout construction, and shall submit to the Engineer of Record at completion of the project.

1.2.3 Preparation

A copy of the District Inspector's notes and sketches will be given to the Engineer of Record for preparing the record drawings. For developer-constructed facilities, the developer's engineer shall prepare and stamp (current Washington State professional civil engineers license) the record drawings. For District-constructed facilities, the District's consulting engineer shall prepare and stamp the record drawings.

1.2.4 Review and Submittal Format

Submit one 50% reduced-scale 11-inch x 17-inch set to the District for review. Upon acceptance, the District will request final record drawings. Final record drawings shall include ~~one full-scale set on Mylar, one full-scale set on paper,~~ AutoCAD (.dwg) files~~,~~, an electronic Adobe Acrobat (.pdf) file and Group 4 TIFF files for all plan sheets.

1.2.5 Condition of Final Acceptance

Final record drawings must be received and accepted by the District before final acceptance of the project by the District Board of Commissioners.

CHAPTER 2 DESIGN STANDARDS

2.1 Water Projects

2.1.1 Minimum Design Requirements

Minimum design criteria, unless the District criteria are more stringent, shall be in accordance with the current edition of the "Water System Design Manual" published by the Washington State Department of Health (DOH), and Washington Administrative Code Chapter 246-290, Group A Public Water Supplies and other local authority requirements.

2.1.2 Minimum Pipe Size

Minimum pipe size for new or replaced water lines mains is eight (8) inches in diameter, except where pipe replacement projects and engineering hydraulic analysis justifies another size or where future system expansion is not foreseeable, as determined and approved by the District Engineer. Dead-end lines pipes are not permitted unless allowed under conditions identified in the DOH Water System Design Manual. Blow-offs or fire hydrants shall be installed at low points and permitted dead-ends in the distribution system.

2.1.3 Pipeline Velocity

The maximum velocity for water mains shall be 8 feet per second for all conditions. All mains, branches and dead ends shall be equipped with blowoffs and/or hydrants of adequate size and number to develop a flushing velocity in the main of at least 2.5 feet per second. The Engineer of Record shall consider minimum velocities in pipe sizing to avoid water quality concerns.

2.1.4 Comprehensive Plan Requirements

Water system construction and reconstruction shall be done pursuant to a design that, when fully implemented, will provide the flow requirements of the District's Water System Comprehensive Plan. Minimum pipe size shall be as identified by the District's Water System Comprehensive Plan. A latecomer's agreement may be created if the sizing is in excess of that required to serve the proposed development or that required by an associated utility local improvement district (ULID).

2.1.5 Minimum Allowable Pressure

The minimum pressures allowed by the District at any time are 30 pounds per square inch (psi) under peak hourly demand, or 20 psi under maximum day demand and fire flow combined.

2.1.6 Increases in Flow Requirements

When any new development increases the flow requirements, the developer shall be responsible for completion of all upgrades to the existing water system to maintain system compliance with the above standards.

In planning for any development, it shall be the developer's responsibility to ensure adequate water flow and pressure can be obtained to satisfy all domestic and fire flow requirements. The developer shall coordinate with the District and the local fire authority.

2.1.7 Providing for Future Extensions

Upon development, utilities shall be extended and/or replaced past or through their property to allow for future extension, expansion and continuation of the District's distribution system or for conformance with the District's Water System Comprehensive Plan.

2.1.8 Easements

Water mains installed on private property require~~A~~ a minimum ten (10) feet of recorded easement ~~must be provided~~ on each side of the pipe, for a total width of twenty (20) feet. Easements for water service connections, where required by the District Administrative Code, shall be a minimum of five (5) feet on each side of the pipe, for a total width of ten (10) feet unless otherwise required by the District Engineer.

2.1.9 Valves

Valves shall be installed along the water main at intervals not to exceed 500 feet ~~per National Fire Protection Association Standard 1142, Standard on Water Supplies for Suburban and Rural Fire Fighting, Annex G.7, Municipal-Type Water System~~. Gate valves shall be placed at all junction points, such that there are valves on each leg of a tee (3 valves), or cross (4 valves).

2.1.10 Fire Hydrants

Fire hydrants shall be installed at a minimum of every 600 feet of water main.

2.1.11 Sampling Stations

A minimum of one sample station per zone is required for each new pressure zone. The District, at its sole discretion, may require sample stations for new developments in existing pressure zones.

~~This seems like a good place to insert requirements for an auto-flusher to maintain chlorine residuals.~~

2.1.12 Separation from Sanitary Sewer ~~Lines~~Pipes

Minimum separation of water ~~lines~~ pipes and sanitary sewer ~~lines~~ pipes shall be ten (10) feet horizontally for parallel pipe, and eighteen (18) inches vertically with the water ~~line~~ pipe on top for perpendicular or oblique crossings, measured from the bottom of the water pipe to the crown of the sewer pipe. Situations occurring with less than the minimum separation as required shall be in accordance with Section C1-9.1, Required Separation Between Water Lines and Sanitary Sewers, of the current edition of the "Criteria For Sewage Works Design" published by the Washington State Department of Ecology.

2.1.13 Pipe Slope and Air/Vacuum Release Valves

Water mains shall be installed at an upward slope to a high point where a combination air/vacuum release valve shall be installed.

2.1.14 Water Booster Stations

All public/District-owned water booster stations shall have at least two pumps and a standby generator.

2.1.15 Retaining Walls

Retaining walls of any height over public water mains or public water service ~~lines~~ pipes within utility easements or public right-of-way shall be avoided whenever reasonably possible. The intent is to maintain perpetual District access to the pipelines for inspection, maintenance, repair, renewal, or replacement without the need for special equipment or deconstruction/reconstruction of the wall. Proposed walls constructed over publicly owned pipelines shall be designed to accommodate the intent described above and be approved by the District Engineer and/or General Manager. ~~-~~The District may require the design to be prepared by a Washington State Licensed Professional Engineer.

Retaining walls on private property over private water services ~~line~~ pipe shall meet building permit requirements as detailed in the most current edition of Whatcom County Code, Chapter 15.04, Building Codes and the following minimum requirements:

1. Private water services ~~lines~~ pipes crossing under or through a retaining wall ~~are~~ shall be installed in a ductile iron or steel pipe casing at least 4-inches larger in diameter than that of the internal service ~~line~~pipe. The casing pipe shall extend on either side of the wall a distance equal to the depth of the pipe at the wall penetration, plus 4-feet. Casing spacers shall be installed at intervals sufficient to support the pipe in the center of the casing pipe. End seals shall be provided at each end of the casing that permanently block groundwater and soil from entering the annular space between the internal service ~~line~~ pipe and casing.
2. Retaining wall drainage shall not connect to the public sanitary sewer system.
3. Prior to construction, submit plans to the District that include plan, elevation, and cross sectional views of the wall which identify the proposed location of private water service ~~line~~pipe, casing, and clearances.
4. For walls that are required by Whatcom County (or other agency with jurisdiction) to be engineered ~~by Whatcom County (or other agency)~~, submit to the District a copy of plans and calculations prepared by a Washington State Licensed Professional Engineer that document wall design and that specify the casing pipe material and alignment needed to resist wall loads.

2.2 Sewer Projects

2.2.1 Minimum Design Requirements

Minimum design criteria, unless the District criteria are more stringent, shall be in accordance with the current edition of the "Criteria for Sewage Works Design" published by the Washington State Department of Ecology.

2.2.2 Minimum Pipe Size

Minimum pipe size for sewer gravity mains is eight (8) inches in diameter except that, in special cases, 6-inch diameter sewer ~~lines~~ pipes may be approved by the District if they meet the Department of Ecology Guidelines for 6-inch diameter sewer ~~lines~~pipes. The minimum size for sewer laterals/side sewers shall be six (6) inches in diameter from the sewer main to the property line. Minimum size pipe for District force mains shall be four (4) inches in diameter unless determined by the Engineer of Record, and approved by the District Engineer, that a smaller diameter must be used.

2.2.3 Providing for Future Extensions

Upon development, utilities shall be extended and/or replaced past or through their property to allow for future extension, expansion and continuation of the District's collection system or for conformance with District's Comprehensive Sewer Plan.

2.2.4 Easements

A minimum ten (10) feet of recorded easement must be provided on each side of the pipe, for a total width of twenty (20) feet. Easements for sewer service connections, where required by the District Administrative Code, shall be a minimum of five (5) feet on each side of the pipe, for a total width of ten (10) feet unless otherwise required by the District Engineer.

2.2.5 Separation from Water ~~Lines~~Pipes

Minimum separation of water ~~lines~~ pipes and sanitary sewer ~~lines~~ pipes shall be ten (10) feet horizontally for parallel pipe, and eighteen (18) inches vertically with the water ~~line~~ pipe on top for perpendicular or oblique crossings, measured from the bottom of the water pipe to the crown of the sewer pipe. Situations occurring with less than the minimum separation as required shall be in accordance with Section C1-9.1, Required Separation between Water Lines and Sanitary Sewers, of the current edition of the "Criteria for Sewage Works Design" published by the Washington State Department of Ecology.

2.2.6 Manholes

Manholes shall be installed in accordance with the District's Standard Details and Section C1-1.6, Manholes Design and Construction, of the current edition of the "Criteria for Sewage Works Design" published by the Washington State Department of Ecology. Manholes shall be placed at each grade and direction change. Distances between manholes shall not exceed 350 feet. Manholes shall be a minimum of five (5) feet deep to the invert of the pipe. Manholes shall be installed at the end of each ~~line~~ pipe of 8-inch diameter or greater. Cleanouts ~~shall only be used on 6-inch diameter or smaller lines, and shall be located not more than 150 feet from a manhole.~~shall not be installed on sewer mains.

2.2.7 Manhole Drop Connections

An outside drop connection shall be provided for a sewer ~~line~~ pipe entering a manhole at an elevation of 24 inches or more above the manhole invert. ~~Inside drops may be used only at the discretion of the District and only on existing manholes.~~

2.2.8 Corrosion Resistant Manholes

Corrosion resistant manholes shall be constructed at force main terminations, as well as two manholes downstream and one manhole upstream of force main terminations. Corrosion resistant manholes shall also be constructed in areas with steep slopes downstream of any force main discharges, where directed by the District Engineer. All coatings shall be applied in accordance with manufacturer's instructions.

Base sections, risers, eccentric reducers, and flat slab tops of new manholes shall be shop-coated. A minimum of two coats of System A Epoxy shall be field-applied to the invert, the finished grade rings, any metallic pipe extending into the manhole, and any damaged shop-coated sections. All grout and cement mortar shall be allowed to cure a minimum of 28 days prior to applying the

coating system. Surfaces shall be prepared and epoxy applied in accordance with the coating manufacturer's instructions. Coatings shall be pinhole free with a minimum dry film thickness of 60 mils. The required temperature and humidity shall be maintained for the duration of the curing period.

Existing manholes to be coated:

1. Water blast or sand blast (per manufacturer's recommendations) existing manhole surfaces to be coated. Remove all grease, laitance, and deleterious materials from the concrete surfaces. Seal off the flow line, as required, to maintain flows while keeping debris out of the sewer. Dry the manhole surfaces to meet manufacturer's requirements. Apply coating in accordance with the coating manufacturer's requirements.
2. If, in the opinion of the District, the existing manhole surfaces are unsuitable for service as corrosion resistant manholes, replace the manhole with new corrosion resistant manholes at no cost to the District.

2.2.9 Grinder Pump Systems

Grinder pump systems, where approved for use by the District Engineer (Section 5.2.2), shall use a minimum of one grinder pump system for each lot served. Each system shall serve no more than ~~once~~ one (1) single-family home with an accessory dwelling unit located on the same lot. No more than one residential duplex shall be served by a single grinder pump system. A residential triplex shall be served by, ~~a~~t, minimum, a duplex grinder pump system or two simplex systems. The grinder pump system shall comply with Washington State Department of Labor & Industries requirements regarding intrinsically safe electrical equipment.

2.2.10 Pretreatment Systems

Pretreatment system may be required to reduce, eliminate or alter the nature of a pollutant's properties prior to discharging to the public sewer collection system. Pretreatment systems include grease interceptors, oil/water separators, and other units to treat metals, solvents, excessive ~~BOD~~ Biochemical Oxygen Demand (BOD) or total suspended solids, and other constituents.

The District reserves the right to evaluate a waste stream prior to connection and require pretreatment to comply with waste discharge criteria and limits established by District resolution.

Grease Interceptors

Any business involved in the process, preparation, sale, or packaging of human or animal food requires that an exterior (outside) grease interceptor be installed on a separate side sewer ~~main~~. This separate side sewer shall be connected directly, and only, to the food handling areas in the building, with no sanitary connections permitted upstream of the grease interceptor.

Grease interceptors shall comply with the current version of the Uniform Plumbing Code and the Uniform Building Code. The design capacity of the grease interceptor shall be determined by the formula(s) provided in the Uniform Plumbing Code (Appendix H of the Uniform Plumbing Code).

Precast concrete grease interceptors shall be designed for a soil dead load of 150 lbs/cu. ft. and an AASHTO H-20 live load as manufactured by Utility Vault or equivalent.

Oil/Water Separators

Oil/water separator design and sizing shall conform to the Washington State Department of Ecology's Best Management Practices (BMP) for Stormwater Treatment. The separator shall be an American Petroleum Institute (API) or Coalescing Plate Interceptor (CPI).

Oil/water separators shall be designed for a soil dead load of 150 lbs/cu. ft. and an AASHTO HS-20 live load.

Oil/water separators shall include a forebay to collect floatables and large settleable solids with a surface area not less than 20 sq. ft. per 10,000 sq. ft. of area draining into the separator.

2.2.11 Retaining Walls

Retaining walls of any height over public sewer mains or public sewer service ~~lines~~ pipes within utility easements or public right-of-way shall be avoided whenever reasonably possible. The intent is to maintain perpetual District access to the pipelines for inspection, maintenance, repair, renewal, or replacement without the need for special equipment or deconstruction/reconstruction of the wall. Proposed walls constructed over publicly owned pipelines shall be designed to accommodate the intent described above and be approved by the District Engineer and/or General Manager. The District may require the design to be prepared by a Washington State Licensed Professional Engineer.

Retaining walls on private property over private sewer service~~s~~ ~~line~~ pipes shall meet building permit requirements as detailed in the most current edition of Whatcom County Code, Chapter 15.04, Building Codes and the following minimum requirements:

1. Private sewer services ~~lines~~ pipes crossing under or through a retaining wall ~~are~~ shall be installed in a ductile iron or steel pipe casing at least 4-inches larger in diameter than that of the internal service ~~line~~pipe. The casing pipe shall extend on either side of the wall a distance equal to the depth of the pipe at the wall penetration, plus 4-feet. Casing spacers shall be installed at intervals sufficient to support the pipe in the center of the casing pipe. End seals shall be provided at each end of the casing that permanently block groundwater and soil from entering the annular space between the internal service ~~line~~ pipe and casing.
2. Retaining wall drainage shall not connect to the public sanitary sewer system.
3. Prior to construction, submit plans to the District that include plan, elevation, and ~~cross-sectional~~cross-sectional views of the wall which identify the proposed location of private sewer service ~~line~~pipe, casing, and clearances.
4. For walls that are required by Whatcom County (or other agency with jurisdiction) to be engineered, submit to the District a copy of plans and calculations prepared by a Washington State Licensed Professional Engineer that document wall design and that specify the casing pipe material and alignment needed to resist wall loads.

2.3 Electrical, Telecommunication and Automatic Control

2.3.1 Section Application

The requirements in this section apply to District capital projects and Developer Extension Agreement (DEA) projects as defined in the District Administrative Code Section 3.1.17, that modify or install new electrical, telecommunication and/or automatic control components as may

be required by either, District Standards, the current edition of the "Water System Design Manual" published by the Washington State Department of Health and Washington Administrative Code Chapter 246-290, Group A Public Water Supplies, the current edition of the "Criteria for Sewage Works Design" published by the Washington State Department of Ecology, or other regulating agency.

2.3.2 Minimum Electrical Design Requirements

Provide all electrical work and materials in accordance with the latest edition of the National Electric Code (NEC), National Electric Safety Code, Washington State Electrical Code and local regulations and ordinances.

2.3.3 Minimum Electrical Service Requirements

The project electrical service shall be configured, or reconfigured, for minimum 277/480 Volt, three-phase, underground power service, in conduit, meeting the requirements of the Electrical Power Provider. All electrical service costs, including all costs associated with reconfiguration and additions to existing facilities, shall be part of the Project cost.

2.3.4 Minimum Telecommunication Service Requirements

The project shall provide cellular or underground telecommunication service. Underground service shall be installed~~,~~ in conduit~~,~~ to the project telecommunication service box. All telecommunication service costs, including all costs associated with reconfiguration and additions to existing facilities, shall be part of the Project cost.

2.3.5 Minimum Automatic Control Requirements

The project shall provide automatic controls using programmable logic controllers at the Project site and additions to a stand-alone computer-based telemetry, control and data logging system owned, operated and maintained by the District. Programmable logic controller (PLC) shall provide local, automatic control of pumps and other equipment at the project site. A computer-based telemetry system shall provide remote control, alarm presentation and data logging activities ~~at~~ to the District's headquarters location.

Contractor shall use a District-approved 'panel shop' to design, program, furnish and integrate the system, including but not limited to; provide the instruments panels, provide the PLC(s), control panels and all other instrument system components and integration.

District-approved Panel Shops:

- Quality Controls Corporation – Lynnwood, Washington
- Systems Interface, Inc. – Bothell, Washington
- Technical Systems, Inc. – Lynnwood, Washington

2.3.3 Permits and Testing

The Project developer/contractor shall obtain all permits, licenses, approvals and inspections by the Authority Having Jurisdiction and provide all other arrangements for the work on the Project. Test all circuits for continuity, freedom from ground and proper operation during progress of work.

Test Reports on all equipment shall be submitted to the Engineer prior to acceptance. Conduct final testing in the presence of the eEngineer. All fees shall be part of the Project cost.

2.3.4 Products

All electrical products shall bear a label from a certified testing laboratory recognized by the State of Washington. Recognized labels in the State of Washington are UL, ETL and CSA-US.

PLC components shall be Allen-Bradley~~, ControlLogix,~~ no substitutions.

Automatic system components, programming and integration are not fully detailed. The District's construction documents (plans and specifications) for the District's most recent capital projects will be used to establish minimum standards for DEA project requirements.

2.3.5 Conduits and Fittings

Galvanized rigid steel (GRS) conduit shall be used in and below all building, structures, in concrete, in corrosive areas, and all other locations, except as noted below. GRS conduit shall be steel, hot dipped galvanized inside and out. The GRS must meet USA Standards Institute C80-1 Underwriters Laboratories Standard UL6, and carry a UL label. Use cast threaded hub fittings and junction boxes for all rigid conduit except in locations not permitted by the NEC.

> *Exception: PVC Schedule 80 conduit, in contact with the earth, may be used with power circuits only, when further than 10-feet from the closest point, measured horizontally, from any structure, including but not limited to manholes, wet wells, concrete pads, etc. The only exception shall be concrete electrical vaults or hand-holes. Conduit shall be gray in color. Fitting shall be of the same material as the raceway and installed with solvent per the Manufacturer's instructions. Conduits, fittings and solvent shall all be manufactured by the same manufacturer.*

GRS conduit shall be used for all instrumentation (signal) circuits.

All underground elbows 90-degrees and greater, including elbows connecting to PVC Schedule 80 conduit, shall be GRS.

Flexible metal conduit shall be used for all final connections to motors and vibrating equipment. Flexible conduit shall be interlocking single strip, hot dipped galvanized and shall have a polyvinyl chloride jacket extruded over the outside to form a flexible watertight raceway. Flexible conduit shall be American Brass Company Sealtite Type VA, General Electric Type UA or equal.

Electrical and power conduit number and size vary per Project requirements. Maintain 12-inch minimum spacing between telemetry and other conduits.

CHAPTER 3 CONSTRUCTION STANDARDS—GENERAL

3.1 Construction Plan Notes

The General Notes apply for all new public facility construction within the District and shall be included in every construction plan set. Water System Notes, Sewer System Notes and Electrical Project Notes shall be included in the plan set as relevant for the type of construction project.

3.1.1 General Notes

See District Standard Detail G1 for General Notes to be included in construction plans.

3.1.2 Water System Notes

See District Standard Details W1 and W2 for Water System Notes to be included in construction plans.

3.1.3 Sewer System Notes

See District Standard Details S1 and S2 for Sewer System Notes to be included in construction plans.

3.1.4 Electrical Project Notes

See District Standard Detail E1 for Electrical Project Notes to be included in construction plans.

3.2 Inspection Requirements

Unless previously authorized by the District, work on water and/or sewer mains~~/lines~~ shall not proceed without a District Inspector being present. The District may refuse acceptance of any water and/or sewer mains~~/lines~~ installed without District inspection. To schedule an inspection, the District must receive a hard copy of the construction schedule and a request for inspection at least two (2) full working days before construction activities covered by the schedule begins. The District must be kept advised of changes to the construction schedule. When significant breaks in construction occur, the contractor must provide two (2) full working days' notice before resuming work. The District Inspector shall have the authority to reject defective material and to suspend any work that is not conducted in accordance with these Construction Standards.

Authority of the Engineer, its appointees, assistants and inspectors, shall be per WSDOT 1-05.1. All references to the Engineer or District Engineer shall also mean ~~its~~ their appointees, assistants or inspectors as per WSDOT 1-05.2.

All mains shall be inspected by the District Engineer before closure of any excavation. Inspectors ~~will~~ shall be provided access to work sites, as necessary, to keep the District informed of the progress of work and the manner in which it is being done, to keep records, to act as liaison between the contractor(s) and the District, and to report any deviations from District-approved plans or specifications. Failure of the Inspector to call the attention of a contractor to faulty work or deviations from the plans, specifications, or these Construction Standards shall not constitute acceptance of work.

Any personal assistance which a District Inspector may provide a contractor will not be construed as the basis of any assumption of responsibility in any manner, financial or otherwise, by the Inspector, the Engineer, or the District.

The presence or absence of a District Inspector on any job will be at the sole discretion of the District. Such presence or absence of an Inspector will not relieve a contractor of responsibility to deliver the construction results specified in the District-approved plans or specifications, or these Construction Standards.

District Inspectors ~~will~~ is not ~~be~~ authorized to issue instructions or to approve or accept any portion of the work that is contrary to the District-approved plans or specifications, or these Construction Standards. Approvals, acceptances, or instructions, when given, must be in writing and signed by the District Engineer or their designated representative. Inspectors have authority to reject defective material. The failure of an Inspector to reject defective material or any work that deviates from the District-approved plans or specifications, or these Construction Standards, will not constitute acceptance of such work

3.3 Surveying and Staking

Lots and/or property lines shall be surveyed and staked to ensure water and sewer services are installed within the property, recorded easements, and/or rights-of-way~~s~~. Surveying and staking are the responsibility of the property owner and contractor.

3.4 Excavation Safety

Where shoring, sheet piling, sheeting, bracing, lagging, or other supports are necessary to prevent cave-ins or damage to existing structures, it shall be the responsibility of the contractor to design, furnish, place, maintain, and remove supports in accordance with applicable laws, codes, and safety requirements, including Chapter 296-155 of the Washington Administrative Code, A Safety Standards for Construction Work, Part N, Excavation, Trenching, and Shoring. Design, planning, installation, and removal of sheeting, shoring, piling, lagging, and bracing shall be accomplished in such a manner as to maintain the undisturbed state of soil below and adjacent to excavation. ~~Failure to maintain shoring in accordance with the submitted shoring plan will result in shut down of the job by the District until required shoring is in place.~~

CHAPTER 4 CONSTRUCTION STANDARDS—WATER PROJECTS AND WATER SERVICES

4.1 General Requirements

4.1.1 District Water Permit

A District water permit is required prior to installation of a water service.

4.1.2 Construction Standards and Uniform Plumbing Code

All water project improvements shall be installed per the District Construction Standards. Water service ~~lines~~ pipes shall be installed per the Uniform Plumbing Code (UPC), to the edition, amendments, standards and exemptions adopted by Whatcom County, as detailed in the most current edition of the Whatcom County Code, Chapter 15.04, Building Codes.

4.1.3 Easements

Private ~~Water~~ water services shall be installed solely on the property being served and/or within appropriate recorded easements and rights-of-way~~s~~.

4.1.4 Developer Extension Agreement Projects

The developer is responsible for installing the water service from the water main to property line for new main construction. The property owner is responsible for installing water service from property line to building. The developer will provide the District with the meter assemblies specified by the District. The District will install meter assemblies following property owner request for service and after all permits and connection fees are paid in full.

4.1.5 Installation, Maintenance, & Repair

The property owner is responsible for service ~~line~~ pipe installation, maintenance and repair from the meter to the building. For new services, the District will tap the water main, install a service saddle, corporation stop, service ~~line~~pipe, meter assembly and meter box.

4.1.6 Separation from Side Sewer Services

Per the UPC Section 720.1, water pipes shall not be located within the same trench as a side sewer pipe unless: 1) the bottom of the water pipe shall be not less than 12-inches above the top of the side sewer pipe, 2) the water pipe shall be placed on a solid shelf excavated at one side of the common trench with a clear horizontal distance of not less than 12-inches from the sewer pipe, and 3) water pipes crossing a sewer pipe must be placed not less than twelve (12) inches above the sewer pipe.

4.1.7 Pressure Reducing Valves

It is the responsibility of the property owner to supply and install a pressure reducing valve (PRV) for their service. Pressure reducing valves shall be installed downstream of the meter and dual check valve directly behind the meter box. Property owners that elect not to install a PRV must record a hold harmless agreement with the Whatcom County Auditor before the District will provide service. Hold harmless agreements are available at the District office.

4.1.8 Privately-owned Water Booster Systems

Privately-owned water booster systems are not allowed as a means of obtaining water service where the pressure at the service's meter is recorded below 30 psi. The only exceptions are certain existing Sudden Valley lots covered by District Resolution No. 410 and other specific areas approved by the District's Board of Commissioners. Each application is subject to cross-connection control analysis by the District. Booster pump installations will be required to install a reduced pressure backflow device.

4.1.9 Pre-Construction Meeting

The contractor shall schedule a pre-construction meeting with the District prior to beginning construction. At the pre-construction meeting, the District will approve the contractor's water service alignment and the approximate location of either: connection to the water main, connection to a water stub that may have been previously extended to a property line, or connection to a water lateral used by an adjacent property that was constructed to allow joint use of the lateral and future connection.

~~4.1.9~~4.1.10 Inspections

The District must inspect and approve the PRV prior to ~~occupancy~~start of water service.

CHAPTER 5 CONSTRUCTION STANDARDS—SEWER PROJECTS AND SEWER SERVICES

5.1 General Requirements

5.1.1 Contractor Requirements

Contractors installing, modifying, or repairing side sewer services shall have a current Sewer Services Contractor's Certification Agreement and surety bond on file at the District.

5.1.2 Construction Standards and Uniform Plumbing Code

All sewer project improvements shall be installed per the District Construction Standards. Sewer service ~~lines~~ pipes shall be installed per the District Construction Standards and the Uniform Plumbing Code (UPC), to the edition, amendments, standards and exemptions adopted by Whatcom County, as detailed in the most current edition of the Whatcom County Code, Chapter 15.04, Building Codes.

5.1.3 District Sewer Permit

A District sewer permit is required prior to installation, repair or modifications to ~~of~~ any side sewer service. Main ~~line~~ sewer pipe shall be in use and operational before the sewer permit will be issued.

5.1.4 Easements

Side sewer services shall be installed ~~on~~ only on the property being served and/or within appropriate recorded easements and rights-of-ways.

5.1.5 Authorization to Connect to Sewer Main

The contractor shall connect the ~~side sewer service~~sewer lateral to the sewer main at the location identified and authorized by the District. The contractor shall schedule and attend an onsite pre-construction meeting with the District to obtain authorization to connect prior to ~~side sewer~~sewer lateral installation.

5.1.6 Other Permits

The contractor shall obtain and abide by encroachment permits or other permissions which may be required from Whatcom County, Sudden Valley Community Association, or other entity having jurisdiction over roads and streets, prior to commencing sewer service work. Restoration shall be done in a manner approved by the appropriate jurisdiction.

5.1.7 Ground and Surface Water Drain Connections Prohibited

No downspouts, footing drains, foundation/crawl space sump pumps, yard drains, or any other source of ground or surface waters are allowed to connect to a side sewer or other sewer main or appurtenance.

5.2 Side Sewer Services into Gravity Mains

5.2.1 Installation, Maintenance, & Repair

The property owner is responsible ~~to contract with~~for using a contractor on the current District's Bonded Side Sewer Contractor list. The contractor shall install the ~~side~~ ~~entire~~ sewer service connection from the sewer main to the building, which includes connecting to an existing service tee or sewer lateral.~~, or installing~~ The contractor may install a new service tee when approved by the District Engineer~~, on the District sewer main,~~. The contractor is responsible for installing a cleanout at the property line and additional cleanouts per the District Standard Drawings, ~~the private service line to the building,~~ and restoration per the District Standard Drawings.

The property owner is responsible for maintenance and repair of the side sewer service from the ~~cleanout at the~~ property line to the building, as well as any blockages ~~of the sewer lateral between the sewer main and property line.~~throughout the entire sewer service connection from the building to the sewer main.

5.2.2 Grinder Pumps

Grinder pumps may be installed only in ~~such~~ special circumstances where~~,~~ the District Engineer authorizes such use because the installation of a gravity system is either not possible or other circumstances warrant the District Engineer's approval of a grinder pump system.~~.~~ ~~The District must authorize the use of a grinder pump system prior to installation.~~ Grinder pump design shall be in accordance with Sections C1-10.1 and C1-10.2 of the current edition of the "Criteria for Sewage Works Design" published by the Washington State Department of Ecology and District Standard Drawings.

A complete grinder pump system submittal shall be submitted to and reviewed by the District ~~Engineer~~ for conformance to the District's design and construction standards prior to scheduling a pre-construction meeting or start of on-site sewer system work. Items noted as non-conforming shall be corrected, and a revised submittal shall be supplied. Submittal review does not relieve the contractor from full compliance with the District's ~~d~~Design and ~~c~~Construction ~~s~~Standards.

The contractor shall be responsible for removing groundwater to provide a firm, dry subgrade for the structure, and shall guard against flotation or other damage resulting from ground water or flooding. The grinder pump station shall not be set into the excavation until the installation procedures and excavation have been inspected and approved by the District.

The grinder pump station shall include a standard, 4-inch diameter inlet grommet for inlet piping. The contractor shall not insert inlet piping beyond the factory-approved "stop." The basin may not be dropped, rolled, or laid on its side for any reason.

Installation shall be accomplished so that 1- to 3-inches of access way, below the bottom of the lid, extends above the finished grade line. The finished grade shall slope away from the unit. The diameter of the hole shall be large enough to allow for the concrete anchor.

A 6-inch minimum layer of naturally rounded aggregate, clean and free flowing, with particle size of not less than ⅛-inch or more than ¾-inch shall be used as bedding material under each unit. A concrete anti-flotation collar ~~and~~ sized according to manufacturer's instructions, shall be pre-cast to the grinder pump station tank or poured in-place. The grinder pump station, with its anti-

flotation collar, shall have a minimum of four lifting eyes for loading and unloading purposes. The unit shall be leveled and filled with water to the bottom of the inlet to prevent the unit from shifting while the concrete is poured. The concrete must be manually vibrated to ensure there are no voids. If it is necessary to pour the concrete to a higher level than the inlet piping, an 8-inch sleeve is required over the inlet prior to the concrete being poured.

Backfill of clean, native earth, free of rocks, roots, and foreign objects shall be thoroughly compacted in lifts not exceeding 12 inches to a final Proctor density of not less than 85%. Improper backfilling may result in damaged access ways.

The electrical control panel shall be installed and wired to the grinder pump station ~~by the contractor using the factory supplied length of 6 conductor, 12 gauge TC-type cable, which shall be installed in Schedule 40 PVC continuous conduit and burial depth shall comply~~in accordance with ~~local~~ all applicable codes.

~~Polyethylene pressure pipe joints shall be flanged, thermal fusion butt welds or made using weld-on compression couplings. Joints in 1.25- to 2-inch diameter pipe shall be made only at pump basins, valves, fittings, and changes in pipe diameter. For pipes larger than 2-inches in diameter, joints between pipe sections shall be thermal fusion butt-welded. All flanges and fittings shall be thermal fusion butt-welded to the pipe. Operators of fusion welding equipment shall be trained and certified by the pipe manufacturer.~~

5.2.3 Pre-Construction Meeting

The contractor shall schedule a pre-construction meeting with the District prior to beginning construction. At the pre-construction meeting, the District will approve the contractor's side sewer alignment, and authorize the side sewer/sewer lateral alignment, the location of the grinder pump (if applicable), and the approximate location of either: connection to the sewer main, connection to a sewer stub that may have been previously extended to a property line, or connection to a lateral used by an adjacent property that was constructed to allow joint use of the lateral and future connection.

5.2.4 Inspections

The District must inspect all side sewer services prior to backfill. Services backfilled without an inspection shall be re-exposed and the full length tested at the contractor's expense prior to District approval.

Bedding & Backfill Inspection. The entire sewer service pipe from the main to the cleanout adjacent to the building must be inspected and approved by the District prior to backfill. Pipe backfilled before inspection will be rejected.

Leak Test. The contractor shall test the sewer service pipe in accordance with Standard Detail S2. All testing shall be witnessed by appropriate District personnel.~~The contractor shall fill the service line with water from a plug inserted in the cleanout at the property line up to the cleanout at the building. The line must hold water with no visible drop in elevation over a period of a minimum of five (5) minutes to pass. The test shall be observed by the District after all lines have been backfilled. Air testing may be done in lieu of a water test. An air test is~~

~~acceptable when air is slowly supplied to the aforementioned plugged pipe section until the internal air pressure reaches 4 psi and maintains for 5 minutes with no pressure loss.~~

Grinder Pump Inspection (if applicable and allowed by the District). The private grinder pump station may be located inside or outside of the building. If located inside the building, the installation shall be subject to inspection by the Whatcom County Building Official (or his or her designee). If located outside of the building, the grinder pump station shall be subject to inspection by the District.

5.3 Pressure Side Sewer Services into Force Mains

5.3.1 Design

The property owner is responsible for the design of the pressure side sewer service installation, including the grinder pump station at the building, for systems connecting to District force mains. The property owner shall engage a civil engineer licensed in the State of Washington to prepare hydraulic calculations, determine pipe size, determine air release and air vacuum valve requirements, and select the appropriate model of grinder pump for the specific installation. Grinder pump design shall be in accordance with Sections C1-10.1 and C1-10.2 of the current edition of the "Criteria for Sewage Works Design" published by the Washington State Department of Ecology.

The private grinder pump package shall consist of at least a grinder pump, basin, cover, check valve, controls, transfer switch, and interior and exterior visual and audible alarms (with battery backup for high level alarm), provided by Environment-One (E-One Model D Series Package Grinder Pump System).

Where required, air relief and combination air relief/vacuum relief valves shall be manufactured by ~~Orenco, APCO, Crispin,~~Valmatic, ARI, or equivalent approved by the District, for sewer service, and installed per the manufacturer's directions. All valves shall be fully accessible to enable the property owner's operation, maintenance, and repair.

5.3.2 Developer Extension Agreement Projects

The developer is responsible for installing the customer service shutoff valve, check valve, check valve vault, and service ~~line~~ pipe from the main to check valve for new sewer side service construction.

5.3.3 Installation, Maintenance and Repair

The property owner is responsible for installation, maintenance, and repair of the side sewer service from the property line to the building, including the grinder pump station, check valve, and check valve vault.

For individual permits, the District shall tap the force main and install the saddle, customer service shutoff valve, service ~~line~~ pipe to the property line and check valve assembly at property line (note for developer extension agreements, the developer installs these items during construction of the new main). The developer shall be responsible for reimbursement of District labor, equipment, and material costs, as defined in the District's current Master Fees and Charges Schedule, for connection to the force main.

5.3.4 Pre-Construction Meeting

The contractor shall schedule a pre-construction meeting with the District prior to beginning construction. At the pre-construction meeting, the District will authorize the side sewer alignment and the location of connection to the main or sewer lateral near the property line.

5.3.5 Inspections

The District must inspect all side sewer services prior to backfill. Services backfilled without an inspection shall be re-exposed and the full length tested at contractor's expense prior to District approval.

Bedding & Backfill Inspection. Sewer service pipe from the main to the cleanout adjacent to building must be inspected and approved by the District prior to backfill.

Pressure Test. With all joints exposed, the District must witness a successful hydrostatic pressure test in accordance with Washington State Department of Transportation (WSDOT) Section 7-09.3(23) at 150 psi for all pipe and fittings between the grinder pump and the customer service shut-off valve (or point of connection to gravity sewer).

Grinder Pump Inspection. The private grinder pump station may be located inside or outside of the building. If located inside the building, the installation shall be subject to inspection by the Whatcom County Building Official (or his or her designee). If located outside of the building, the grinder pump station shall be subject to inspection by the District.

Start-up and Testing. The private grinder pump station shall be commissioned and tested for proper operation prior to submittal of a request for final inspection. At the final inspection the District will witness proper operation of the station as demonstrated by a trained professional.

Final Inspection. Startup/testing must be complete for final inspection.

5.4 Sewer System Appurtenances

5.4.1 Grease Interceptor and Oil/Water Separator Installation

The building sanitary side sewer shall be connected to the service lateral at least four (4) feet downstream from the interceptor providing the slope of the lateral is 2 percent or more. ~~For laterals with a slope of less than 2 percent, the connection point shall be a minimum of eight (8) feet downstream of the separator, or directly connected to the District main.~~

Grease interceptors or oil/water separators may be installed in either planter or vehicle areas. In vehicular areas, the unit shall be constructed ~~as to provide~~ to meet AASHTO H-20 live load ~~capabilities~~standards. In all cases the installation site shall provide and ensure ease of access, maintenance, and visual inspection and will be provided with a hinged, locking hatch.

A manhole shall be installed where the grease interceptor or oil/water separator discharges into the District's sanitary sewer for monitoring purposes or at an upstream location approved by the District. If physical conditions preclude the installation of a monitoring manhole on the District main, the contractor shall install, with District approval, an i~~I~~nspection c~~C~~hamber ~~as manufactured by Pacific North Marketing Ltd, Abbotsford, British Columbia, or equivalent~~.

CHAPTER 6 CONSTRUCTION STANDARDS—DETAILS

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GENERAL NOTES

Added for clarity and connection to other District guidance documents.

These Standard Details, together with the most current versions of the District's full Design and Construction Standards (DCS) and the District Administrative Code, incorporated herein by reference, shall govern all District design and construction activities.

1. All work and materials shall meet the requirements of the most current editions of the Lake Whatcom Water and Sewer District (District) Design and Construction Standards, Lake Whatcom Water and Sewer District Construction Contract Documents and Project Specifications (for Public Works Projects), the instructions and recommendations of the Manufacturer of the material concerned and select specifications within the Standard Specifications for Road, Bridge and Municipal Construction as prepared by Washington State Department of Transportation (WSDOT) and with all other regulatory agency requirements and permits including but not limited to work within Whatcom County right-of-way shall meet Whatcom County (County) design and construction requirements. In case of a conflict between the above standards, the more stringent shall apply. All work and materials shall be subject to the approval of the District Engineer.

2. Contractor shall obtain encroachment permits or other permissions which may be required from the County, Sudden Valley Community Association, or other entity having jurisdiction over roads and streets, prior to commencing work. For work areas impacting traffic, a traffic control plan must be approved prior to work.

3. Contractor shall provide and maintain all Temporary Erosion Control and Sedimentation (TESC) in accordance with the most current edition of the Storm Water Management Manual for Western Washington (SWMMWW), Volume II, by the Washington State Department of Ecology, Publication Number 14-10-055. Contractor shall use required and necessary Best Management Practices (BMPS) described therein and as may be further described or detailed on the project drawings.

Revised to reflect current procedures for utility locating.

4. Before the start of construction, Contractor shall follow all applicable laws regarding utility locating and notifications in accordance with Washington's Dig Law (RCW 19.122). Excavation must coordinate with a Utility Notification Center and locate marks must align with the APWA Uniform Color Code. Contractor shall not begin excavation until utility notification period is complete.

5. A preconstruction meeting is required with the District and Contractor performing the work before the start of construction.

6. Authority of Engineer, its appointees, assistants and inspectors, shall be per WSDOT 1-05.1. All references to the Engineer or District Engineer shall also mean its appointees, assistants and inspectors as per WSDOT 1-05.2.

Added to clarify responsibility

7. The Contractor shall be solely responsible for the safety of all workers and shall comply with all appropriate state safety and health standards, codes, rules, and regulations, including, but not limited to, those promulgated under the Washington Industry Safety and Health Act RCW 49.17 (WISHA) and as set forth in Title 296 WAC (Department of Labor and

Industries).

Reference to WAC 296.800 removed as redundant.

8. Inspection of work and materials shall be in accordance with WSDOT 1–05.6. Removal of unauthorized or defective work shall be in accordance with WSDOT 1–05.7.

9. The Contractor shall take all steps necessary to ensure that the existing facilities remain fully operational during all stages of construction, including but not limited to providing bypass pumping, standby storage, emergency generators and pump trucks, as necessary during service interruptions or outages.

10. No inspections or tie–ins to District's facilities shall be performed on a Friday, Weekend or District Holiday.

11. All pipes shall be bedded in bedding material meeting the requirements of WSDOT 9–03.12(3). The bedding cross–section shall be blocked with Control Density Fill (CDF) per WSDOT 3.07.3(1)E a minimum of every 800 feet and the trench drained to daylight or to a storm drain in accordance with District Standard Detail G10.

12. Backfill above the pipe zone bedding within County ROW and Sudden Valley, within the roadway section or at driveway crossings shall consist of crushed surfacing top course material meeting the requirements of WSDOT 9–03.9(3). Backfill within private driveways shall consist of material meeting the requirements of WSDOT 9–03.19. Backfill in other areas shall consist of material meeting the requirements of WSDOT 9–03.15, except as shown on the plans or details. Backfilling of trenches shall be in accordance with WSDOT 7.08.3(3).

13. Pea gravel shall not be used for pipe bedding or trench/excavation backfill material. The District may approve limited use of pea gravel where hazardous site conditions exist that pose an immediate threat to workers or public. Pea gravel, if approved for use by the Engineer, shall be a clean mixture free from organic matter meeting the following gradation (passing by weight a US standard sieve); 100% passing 1/2", 95–100% passing 3/8", 0–10% passing #8, and 0–3% passing #200.

14. Backfill shall be compacted to minimum 95% modified Proctor within traffic areas and minimum 90% modified Proctor in landscape and open areas.

Revised from "12 to 18 inches below grade" to better assist with pipeline location during excavation.

15. Tracer wire installation is required on all District owned pipe, electrical conduits and communication lines/conduits. Tracer wire is also required on private side sewers. Install tracer wire per District Standard Detail F6. In addition to tracer wire, install 2–inch wide detectable marking tape 12 to 18 inches above the pipe or conduit. Detectable marking tape shall meet the requirements of WSDOT 9–15.18 and be color coded blue for water, green for sewer, red for electrical and orange for telecommunication.

Revised "line" to "pipe" or "main" throughout document for added consistency and clarity. Change made throughout the document.

16. Public water mains and any sanitary sewer pipe or other non–potable conveyance system shall maintain a minimum of 10–feet horizontal separation (parallel alignment) and a minimum 18–inch vertical separation (parallel alignment and crossings at angles including

perpendicular with the sewer pipe below the water pipe), measured as the closest distance between outside of pipes, in accordance with the most current editions of the Washington State Department of Health (DOH) Water System Design Manual Section 6.3.4 and the Department of Ecology (DOE) "Criteria for Sewage Works Design" Section C1-9.

Reference Updated.

When local conditions prevent these separations, with the approval of the District Engineer, installations shall follow the requirements outlined for unusual conditions in the referenced DOH and DOE manuals which includes details for specific pipe materials, pipe segment lengths, joint separation requirements, concrete encasement and/or pipe casings. If a pressure sewer cannot be installed with a minimum 18-inch separation from a water pipe at a crossing, then the pressure sewer shall be constructed only under the water pipe with the sewer pipe in a casing (casing material per the DOE manual) extending at least 10-feet on each side of the crossing.

"ductile iron" removed to allow other pipe materials consistent with DOE manual.

17. Control Density Fill (CDF), if required, shall meet the requirements of WSDOT 3.07.3(1)E..

Reference Updated.

18. From the main to the property line, sewer pipes and water pipes shall maintain a minimum horizontal separation of 10-feet. When local conditions prevent the 10-feet separation, separation shall be per District Standard Detail G9, Water Pipe and Sewer Pipe Trench Detail, Unusual Conditions. Separation of water service pipes and sewer pipes within private property shall be per District Standard Detail G8.

19. Contractor shall remove all debris and excess excavation; repair all damage, and restore the site, public or private, to pre-construction conditions.

20. Where mains or services are placed within a ditch area, the buried depth shall be at least 30-inches below the bottom of the ditch, measured from the crown of the pipe to the bottom of the ditch.

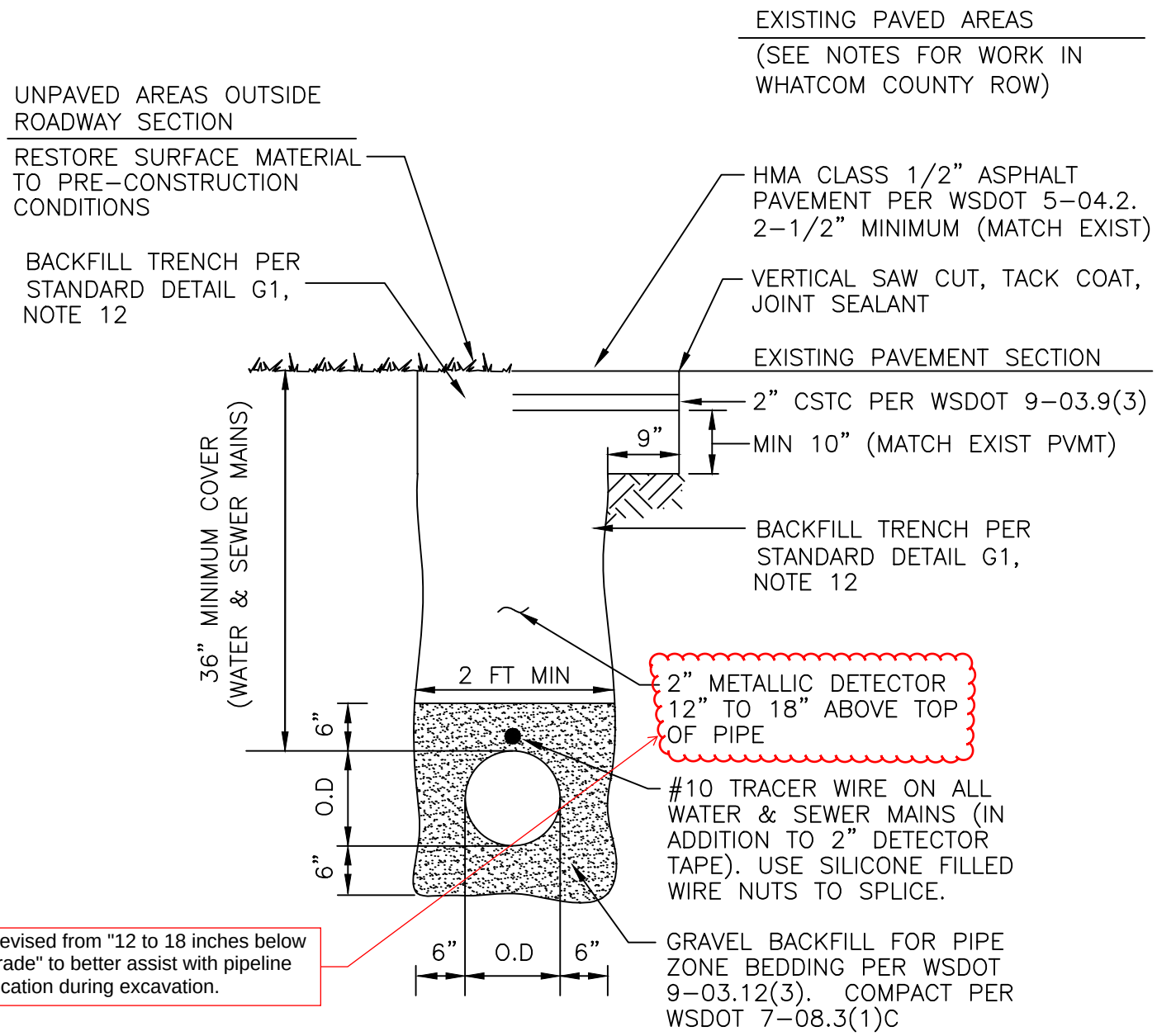
21. During excavation, maintain a minimum 12" clearance zone in all directions around all District facilities. Only safe and careful work methods as defined by RCW 19.122.020(32) are permitted within this zone.

22. All work within Whatcom County Right Of Way (ROW) shall meet the requirements of the most current edition of the Whatcom County Development Standards, Section 512.

23. The Lake Whatcom Water and Sewer District is located within the Lake Whatcom Watershed where seasonal clearing activity limitations established by Whatcom County Code 20.51.410 are in force. Clearing activity, which includes trench excavation/backfill and other land disturbance, that will result in exposed soils exceeding 500 square feet shall be prohibited from October 1 through May 31.

24. References to the Uniform Plumbing Code (UPC) shall be to the edition, amendments standards and exemptions adopted by Whatcom County, as detailed in the most current edition of the Whatcom County Code, Chapter 15.04, Building Codes.

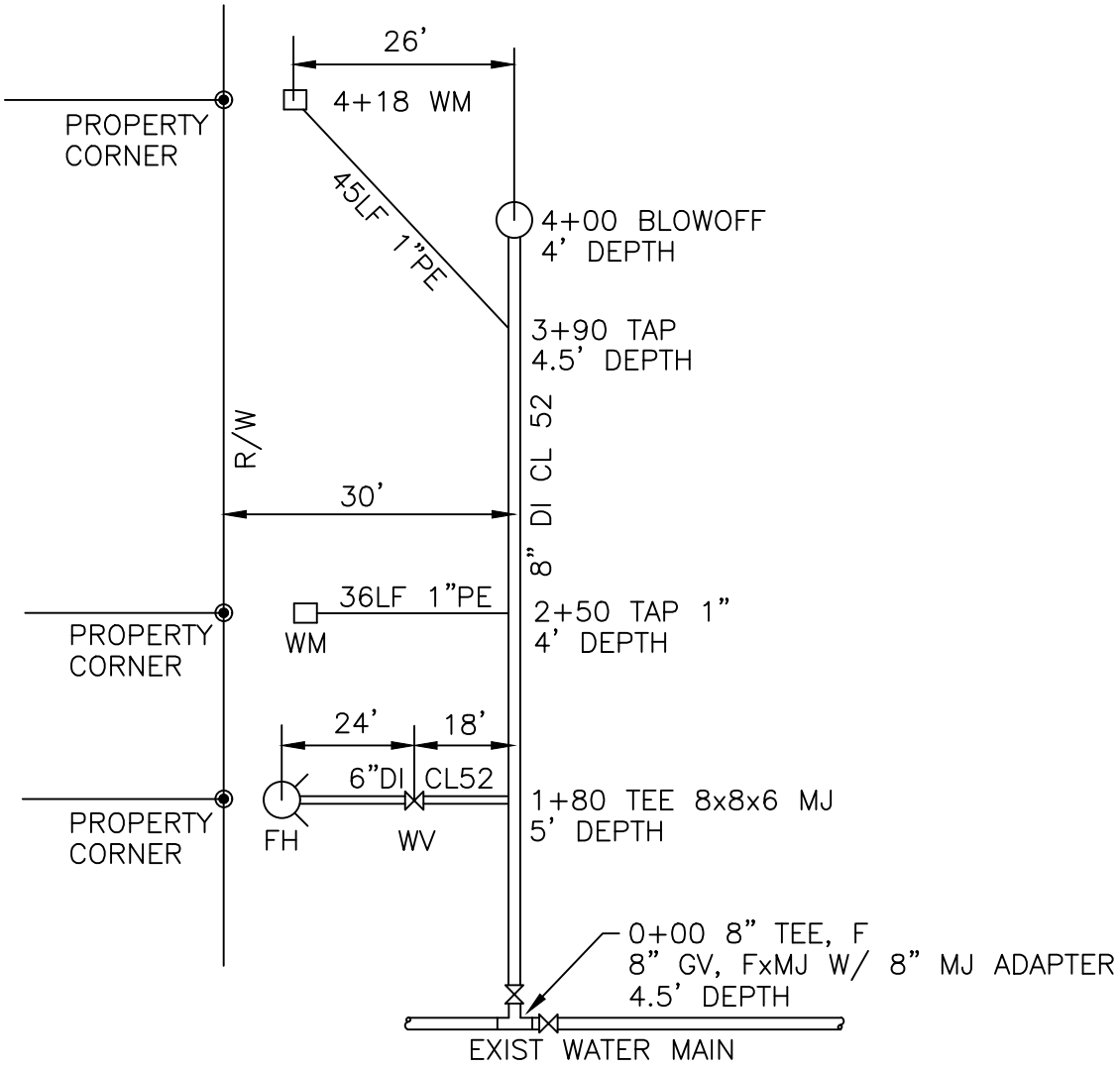
Revised for consistency with Whatcom County Code.



NOTES:

1. With respect to trench repairs and pavement overlays, in the event of conflict between this detail and Whatcom County Standard Drawing Numbers 512.F-1 and 512.F-2, the more stringent standard shall apply.

2. Standard utility locations within county-maintained public road prisms as shown in the 2012.09.25 version of Whatcom County Standard Drawing No. 512.D-1 shall apply.



EXAMPLE RECORD DRAWING

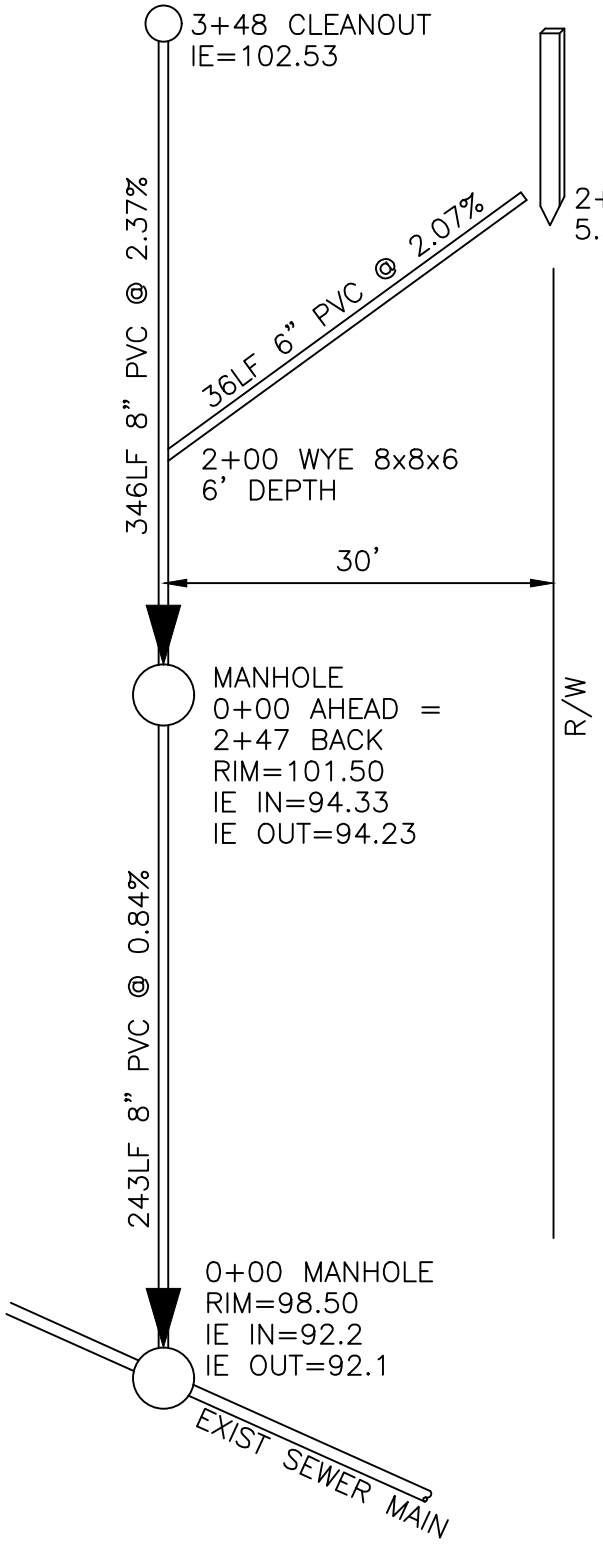
NOTES:

CONTRACTOR SHALL PROVIDE RECORD DRAWINGS MEETING THE FOLLOWING MINIMUM REQUIREMENTS:

1. Water Mains. Show alignment dimensions to right–of–way, easements, and road centerlines. Show stationing and depth of fittings, valves, and service taps along the main.

2. Fire Hydrants, Blowoffs, and other Appurtenances. Show length & material between tees, valves, hydrants, blowoffs, etc. Show station/offset of appurtenance if skewed from 90–degrees from main.

3. Water Services & Sampling Stations. Show tap station along main and size of tap. Show length & material of water service connection from main to meter box or sampling station.



EXAMPLE RECORD DRAWING

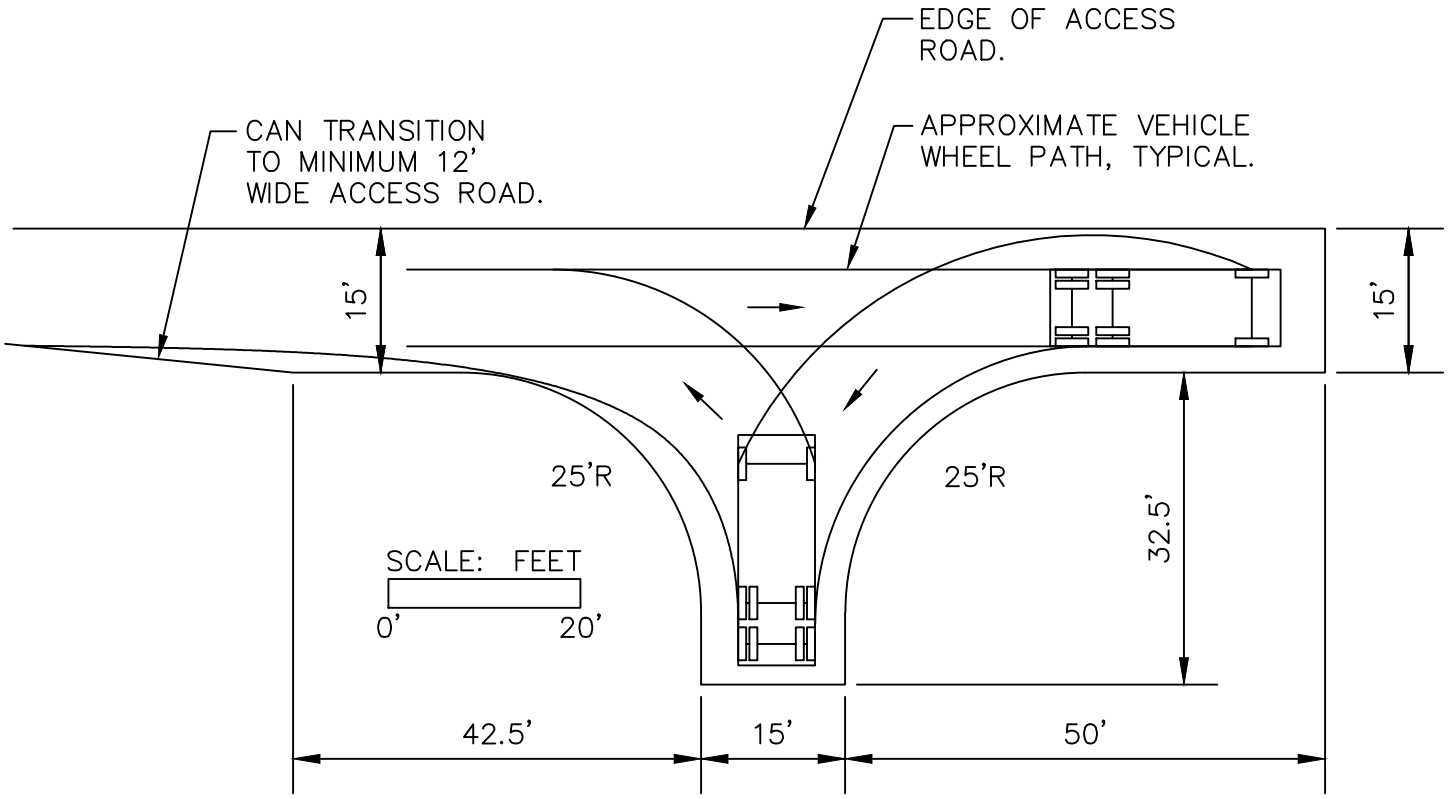
NOTES:

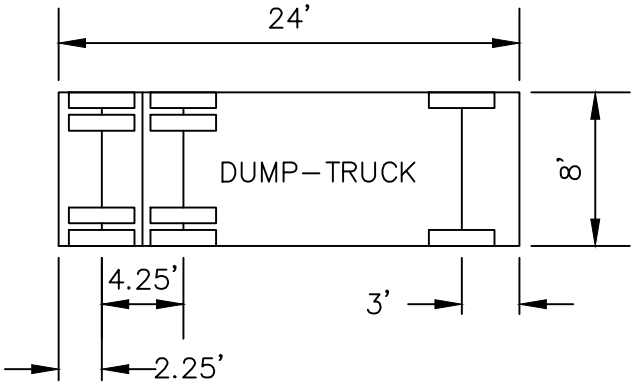
CONTRACTOR SHALL PROVIDE RECORD DRAWINGS MEETING THE FOLLOWING MINIMUM REQUIREMENTS:

1. Manholes. Show stationing ahead (0+00) and stationing back, rim elevation, and invert elevations.

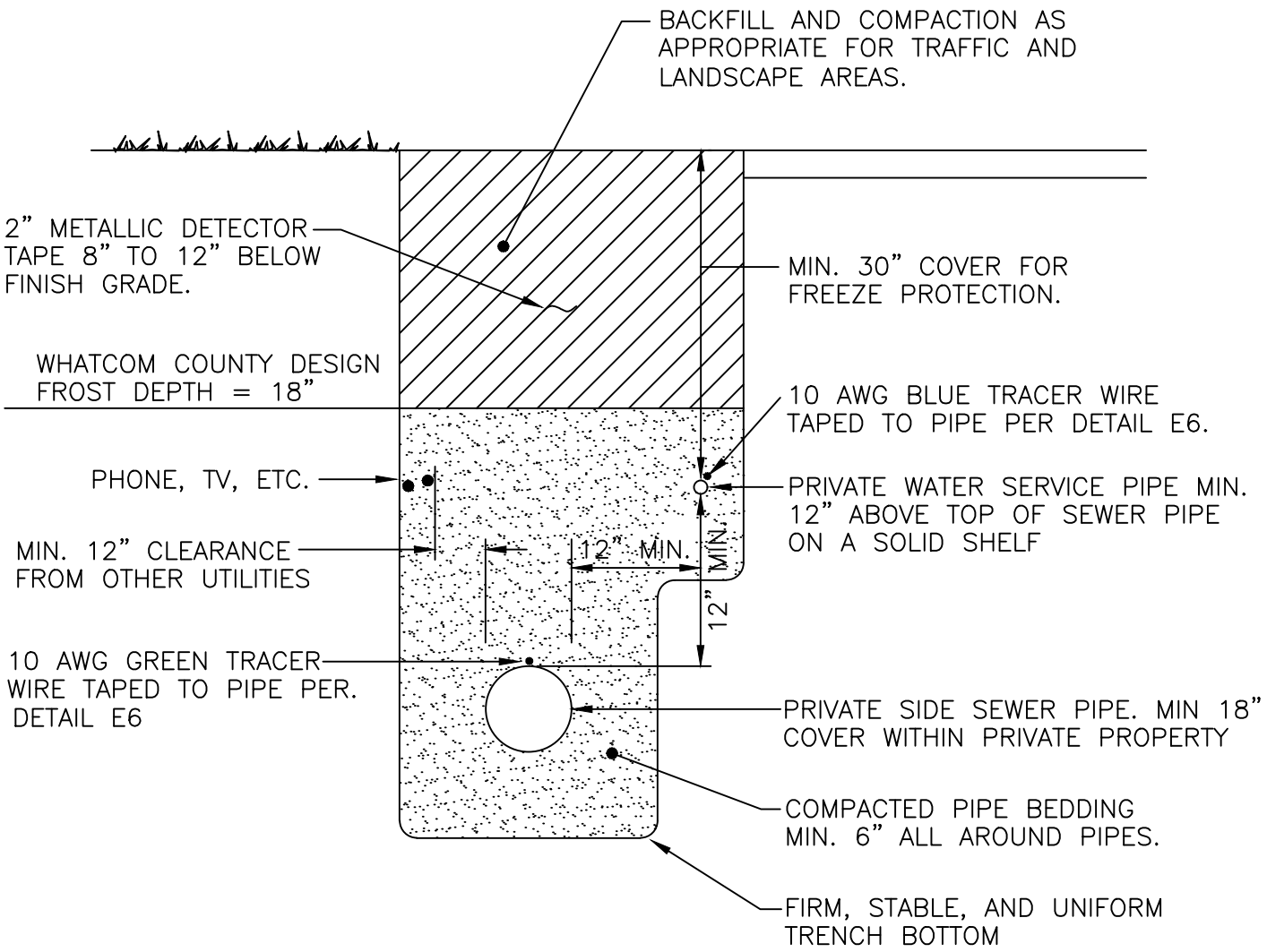
2. Sewer Mains. Show alignment dimensions to right-of-way, easements, and road centerlines. Show station and depth of service wyes and tees along the main. Show actual plan view length of pipe between manhole walls with material and slope.

3. Sewer Laterals. Show distances between bends, size, material, and length of pipe. Show station, offset, and depth at end of stub or cleanout.





DESIGN VEHICLE



NOTES:

1. Side sewer pipes and water service pipes shall not be installed in the same trench unless the above common trench detail is adhered to (UPC 720.1).

2. Water service pipes crossing a sewer pipe shall be a minimum of 12–inches above the top of the sewer pipe (UPC 720.1(3)).

3. When a common trench is used for water service and side sewer pipes, both pipes shall be bedded in material meeting WSDOT 9–03.12(3) Gravel Backfill for Pipe Zone Bedding as shown in following table:

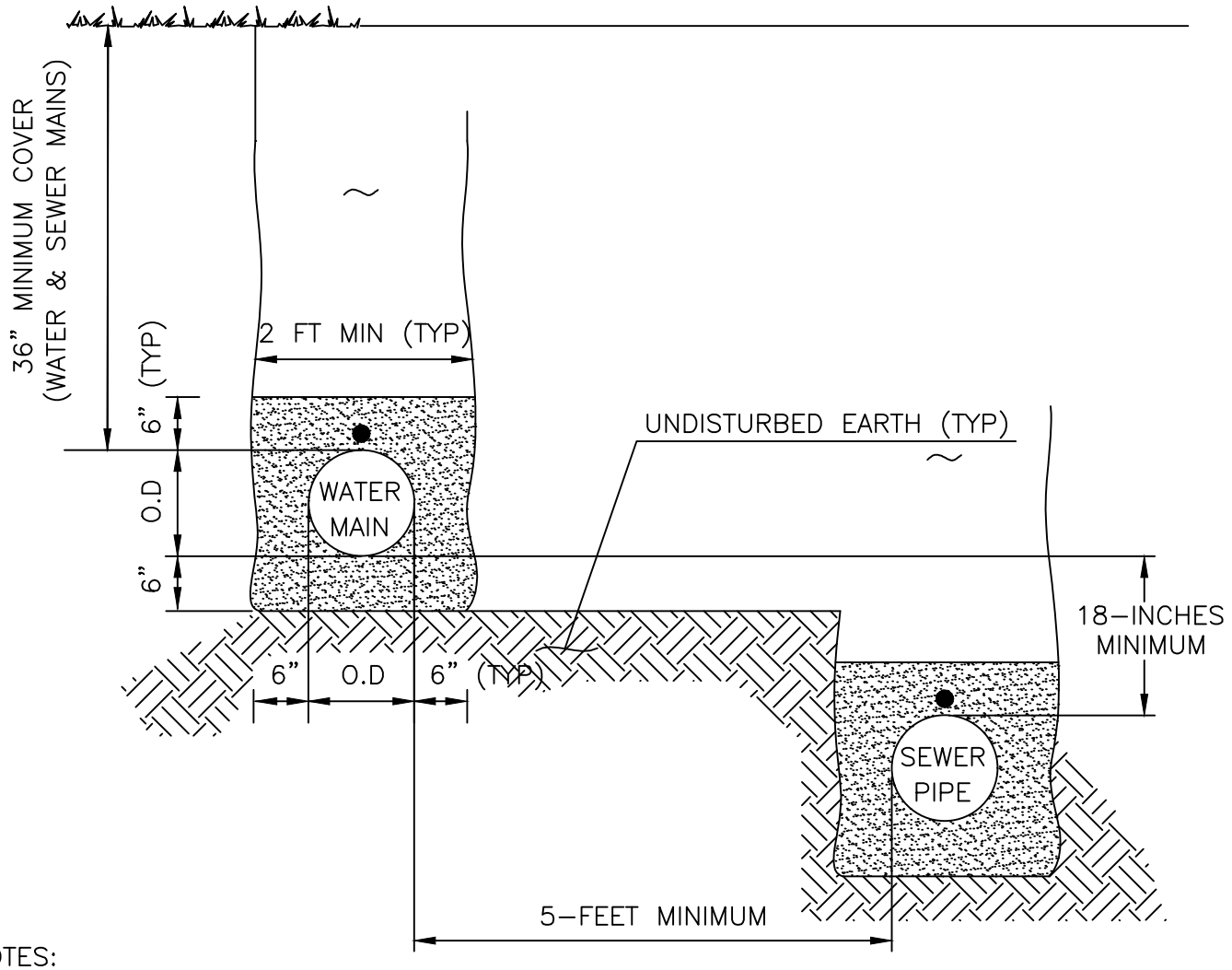
Sieve Size	Percent Passing by Weight
1.5"	99–100
1"	75–100
5/8"	50–100
U.S. No. 4	20–80
U.S. No. 40	3–24
U.S. No 200	10.0 max
Sand Equivalent	35 min.

LAKE WHATCOM WATER & SEWER DISTRICT

COMMON TRENCH DETAIL: PRIVATE WATER SERVICE PIPE AND SIDE SEWER PIPE

STANDARD DETAIL

G8



NOTES:

1. When local conditions prevent the required 10—feet horizontal separation (parallel alignment) and minimum 18—inch vertical separation between public water mains and any sanitary sewer pipe, with the approval of the District Engineer, details of DOE "Criteria for Sewage Works Design" Section C1—9.1.2 shall be followed.

2. The water main shall be laid on a bench of undisturbed earth with the bottom of the water main at least 18—inches above the crown of the sewer and shall have at least 5—feet of horizontal separation at all times. Additional mitigation efforts, such as impermeable barriers, may be required by the appropriate state and local agencies.

3. If the 18—inch vertical separation cannot be obtained, the sewer shall be constructed of materials and joints that are equivalent to water main standards of construction and shall be pressure tested to ensure water tightness prior to backfilling. Adequate restraint should be provided to allow testing to occur. See DOE "Criteria for Sewage Works Design Section C1—9.1.2.

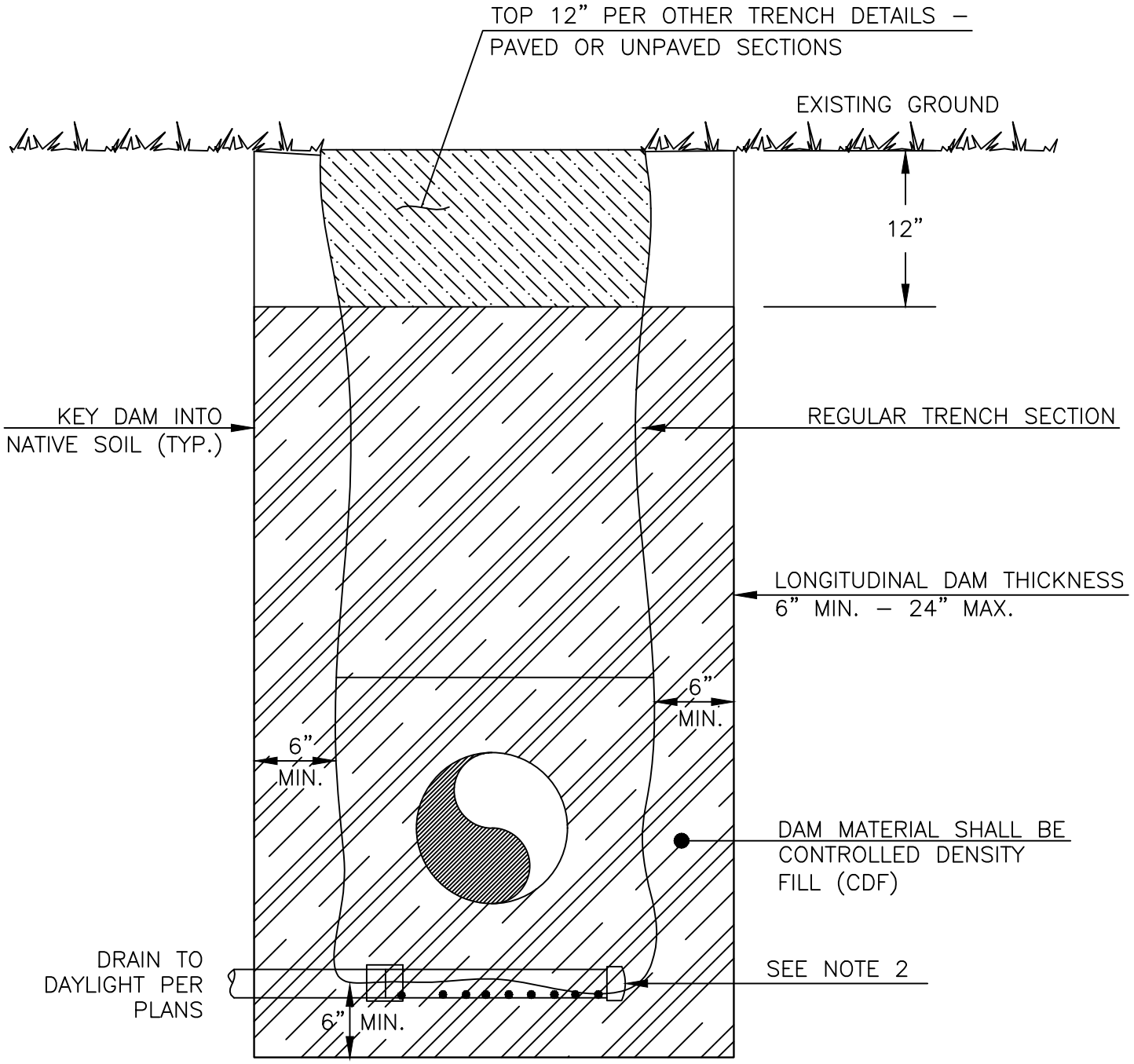
4. Trench bedding, backfill, tracer wire, detector tape and restoration per Standard Detail G4.

LAKE WHATCOM WATER & SEWER DISTRICT

WATER MAIN AND SEWER PIPE TRENCH DETAIL
UNUSUAL CONDITIONS

STANDARD DETAIL

G9



NOTES:

1. Trench dams shall be located as per General Notes or per project plan and profile sheets.

2. Install 4–inch PVC cap, perforated drain pipe with holes facing down, coupler, and solid PVC pipe 1 to 2 feet outside the limits of the CDF on the uphill side of the trench dam. Install drain rock (WSDOT 9–03.12(4)) 6–inches on all sides of perforated pipe. Separate drain rock from other material using geotextile for underground drainage per WSDOT 9–33.2, Tables 1 & 2, Moderate Survivability, Class C.

LAKE WHATCOM WATER & SEWER DISTRICT

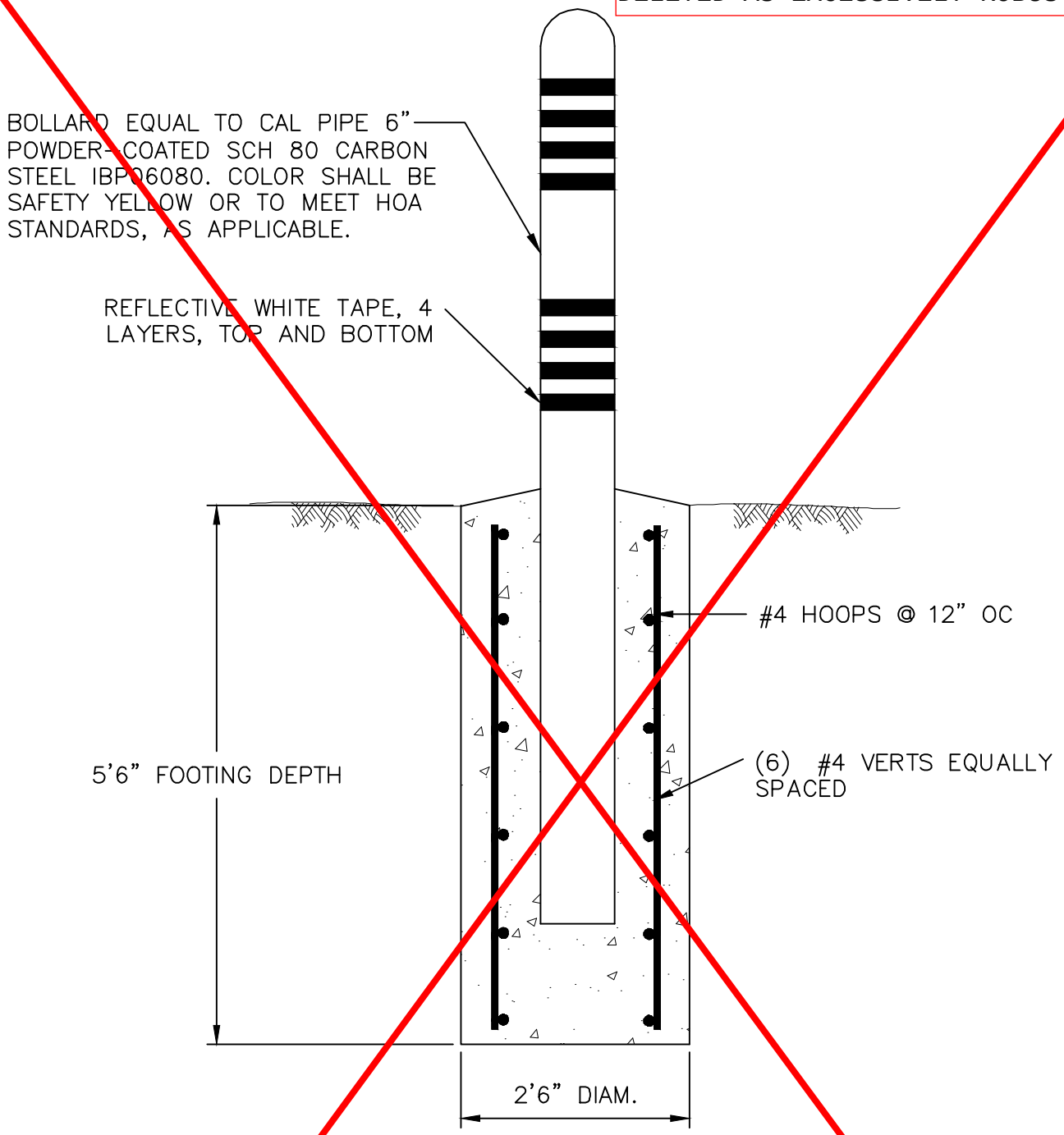
TRENCH DAM WITH DRAIN

STANDARD DETAIL

G10

1/28/2026

DELETED AS EXCESSIVELY ROBUST



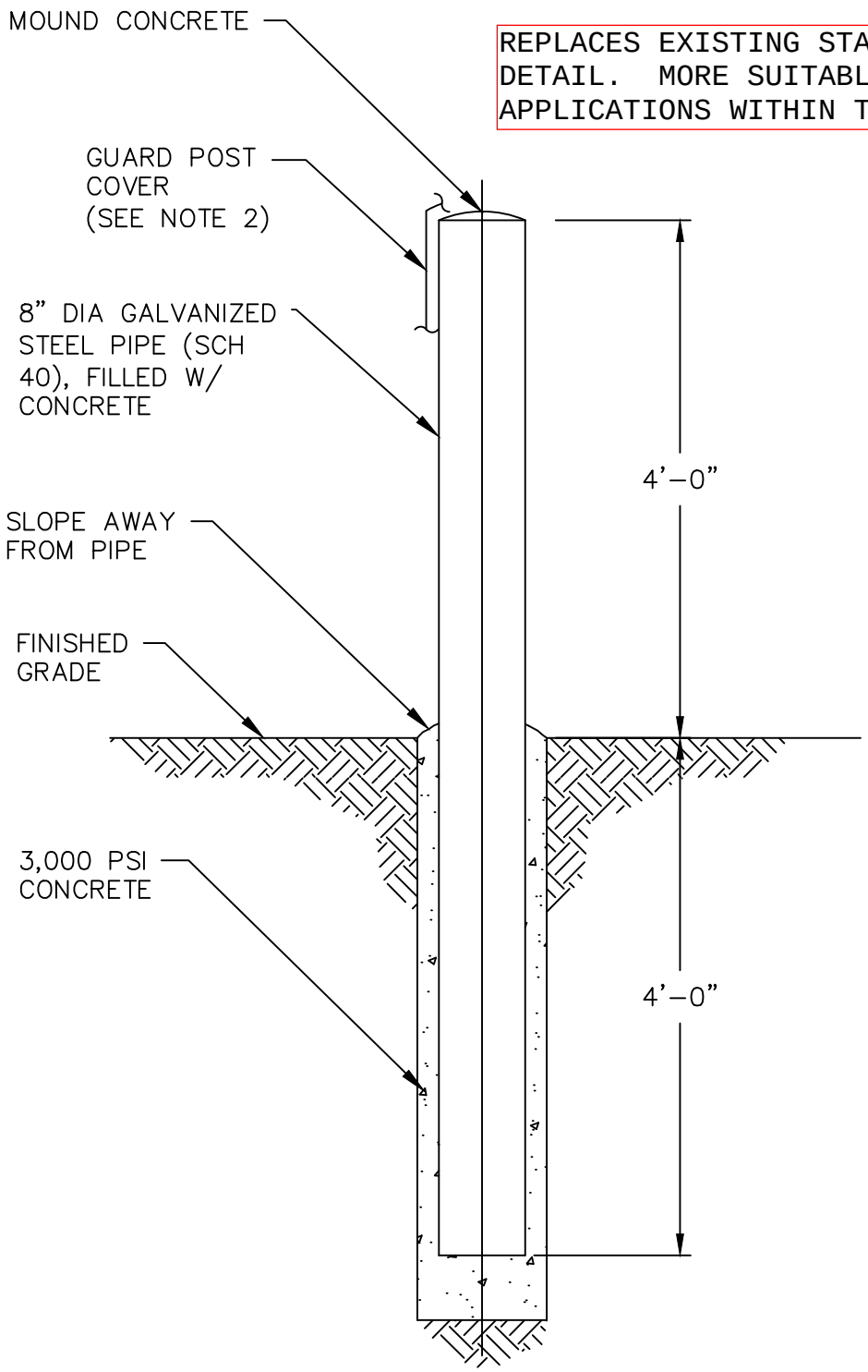
BOLLARD DETAIL (NOT TO SCALE)

NOTES:

1. REINFORCING STEEL SHALL BE WITH ASTM A706, GRADE 60 WITH 16 GAUGE MINIMUM TIE WIRE. USE PRE-CAST CONCRETE BLOCKS TO SUPPORT BARS OFF GROUND WITH MINIMUM 2-INCH CONCRETE PROTECTION ALL SIDES.

2. CONCRETE FOR BOLLARD FOUNDATION SHALL BE MINIMUM 4,500 PSI 28-DAY COMPRESSIVE STRENGTH.

REPLACES EXISTING STANDARD DETAIL. MORE SUITABLE FOR APPLICATIONS WITHIN THE DISTRICT.



NOTES:

1. The exact location of the bollards shall be determined by the engineer in the field.

2. Furnish and install idealshield 6–inch, sch80, yellow dome top guard post cover, or equal.

WATER SYSTEM NOTES

Added for clarity and connection to other District guidance documents.

These Standard Details, together with the most current versions of the District's full Design and Construction Standards (DCS) and the District Administrative Code, incorporated herein by reference, shall govern all District design and construction activities.

1. Water distribution system materials, trenching, bedding, installation, backfilling, disinfection, and testing shall meet the requirements of WSDOT 7-09.

REVISED TO ALLOW HDPE

2. All water piping and appurtenances in contact with potable water shall be certified under NSF-61 for potable water use in accordance with WAC 246-290-220.

3. Water main pipe shall be class 52 ductile iron per WSDOT 9-30.1(1) and encased in polyethylene encasement per WSDOT 9-30.1(2). HDPE pipe may be substituted with approval of the District Engineer, subject to pipe rating based on the specific design/installation conditions and materials conforming to WSDOT 9.30.1(6) and 9.30.2(10). Fittings for ductile iron pipe shall meet the requirements of WSDOT 9-30.2(1).

4. Water Main Appurtenances. Gate valves shall be resilient-seated gate valves complying with WSDOT 7-12 and WSDOT 9-30.3(1) and American Water Works Association (AWWA) C515. Gate Valves shall have a min. pressure rating of 200 psi. A cast iron valve box with a concrete collar (18"x 8"x 6") and an approved marking post shall be installed with each valve in accordance with WSDOT 7-12.3(1) for all valves not installed in pavement. Valves not in pavement shall have a 24" x 24" x 6" concrete collar cast around the valve box. Where a valve operating nut is more than 3-ft below grade a valve nut stem extension must be installed.

REVISED FROM 4-FT

REFERENCE TO OBSOLETE VALVE BOX REMOVED.

5. Pressure reducing valves (1-1/2" and larger) shall be Cla-Val or approved alternate.

REVISED FROM 2-IN

6. Before being placed into service, new water mains and appurtenances shall be pressure tested in accordance with WSDOT 7-09.3(23). The District Engineer shall witness pressure testing. Contractor shall provide the District Engineer 48-hrs notice prior to conducting water main pressure tests, flushing and disinfection.

NOTE REVISED TO CLARIFY TESTING PROCEDURES AND REQUIREMENTS.

7. Before being placed into service, new water mains or extensions to existing mains shall be flushed and disinfected by the Contractor in accordance with WSDOT 7-09.3(24) and the most current edition of the AWWA Standard C651, Disinfecting Water Mains.

Mains shall be chlorinated so that a chlorine residual concentration of not less than 25 mg/L remains in the water after standing 24-hrs in the pipe. The initial chlorine content of the water shall not be less than 50 mg/L (WSDOT 7-09.3(24)B). Following the minimum 24-hr retention period, treated water shall be flushed from the pipe until the replacement water throughout its length is not in excess of that normally carried in the water supply system. Contractor shall provide two chlorine concentration test reports to show the initial chlorine concentration is at least 50 mg/L, and to show the 24-hr residual chlorine concentration is at least 25 mg/L. After this 24-hr chlorination period, contractor shall flush the main in accordance with WSDOT 7-09.3(24)N. After a 16-hr rest period the Contractor shall coordinate

District collection of 2 water samples for bacteriological (bac–t) testing. Cost of bac–t testing shall be borne by the Contractor. Water samples must satisfactorily pass bac–t testing requirements (testing includes but is not limited to testing for total coliforms, fecal coliforms and E.coli found in the water sample) meeting current Washington State Department of Health (DOH) Standards. Both sets of samples must pass for the main to be approved for release and for the contractor to proceed with final tie–in(s) to existing mains.

Disinfection and testing extensions from existing mains and final tie–in(s) to existing mains, where the distance is 18 feet or less, shall follow WSDOT 7–09.3(23)A.

All tests must be performed by a DOH–certified testing laboratory and sample–taking shall be performed by a District certified operator (employee). Bacteriological samples must be collected by the District. Chlorinated flush water must be dechlorinated and disposed of in accordance with WSDOT 7–09.3(24)A. If disposal is to the District's sanitary sewer system, Contractor shall coordinate with District staff to ensure the rate of disposal does not overload the District's sewer system.

Alternative methods for disinfecting water mains following the most current edition of the AWWA Standard C651 may be allowed and must be approved in advance by the District.

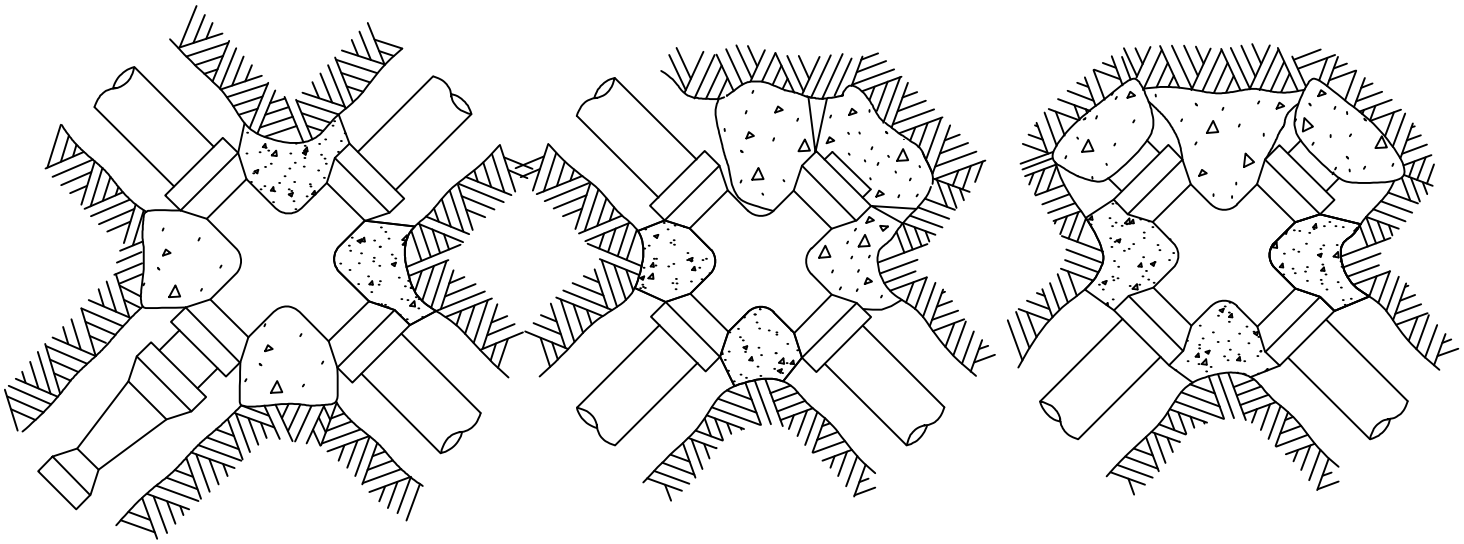
8. Water service connections shall be installed per WSDOT 7–15. Lot corners shall be staked prior to service connection installations to assure services are installed in correct locations as shown on the approved plans.

9. New services shall be pressure tested along with the new main. No use of water through a newly installed service shall be allowed until water main and service installation has been inspected, pressure tested, chlorinated and a satisfactory bacteria test received. After installation, the service connection shall be flushed prior to connecting the meter. No service is to be covered until the District's Inspector has inspected the initial installation. All corporations must be in an ON position and all angle valves must be in the OFF position. Service flow testing shall be done after water main pressure testing. During the inspection, every water service connection shall be turned on to its full capacity to check flow and guarantee that each water service connection has been flushed.

10. The private water service on the customer side of the water meter shall meet the requirements of the Uniform Plumbing Code (UPC).

11. In accordance with District Administrative Code Section 4.3.6, all customers are required to install a Pressure Reducing Valve (PRV) downstream on the customer side of the water meter to protect their plumbing systems from high pressure surges. A PRV inspection by District personnel is required prior to occupancy. See Standard Detail W11.

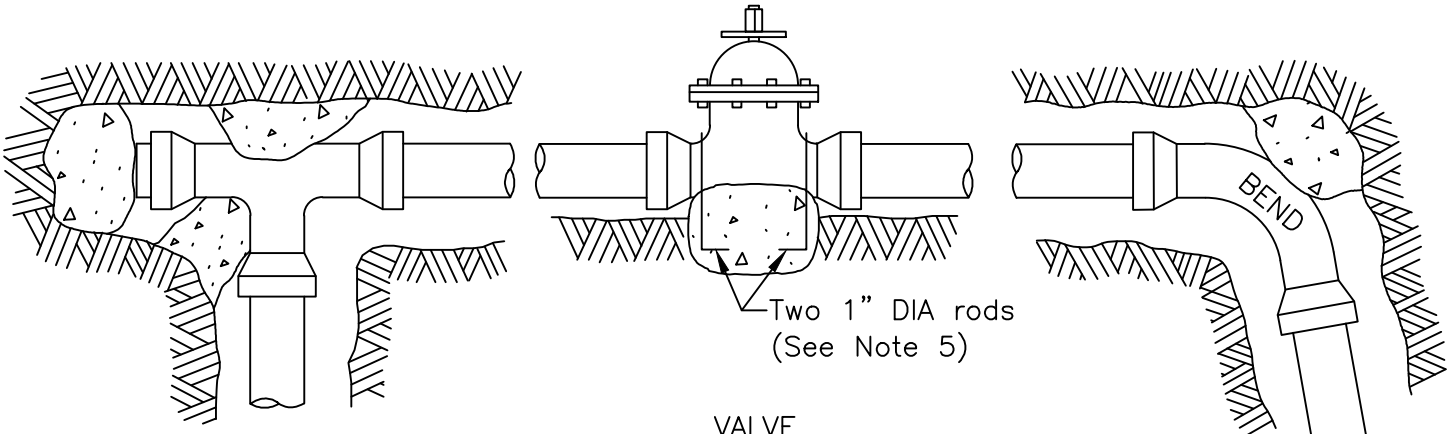
12. In accordance with WAC 246–290–490 and District Resolution No. 858, all cross–connections between the District's water distribution system and a consumer's water system shall be eliminated or controlled by the installation of a District approved backflow preventer commensurate with the degree of hazard. The District's Cross–Connection Control Program is available for review at the District office or on the District website (www.lwwsd.org).



UNBALANCED CROSS
(Use column A)

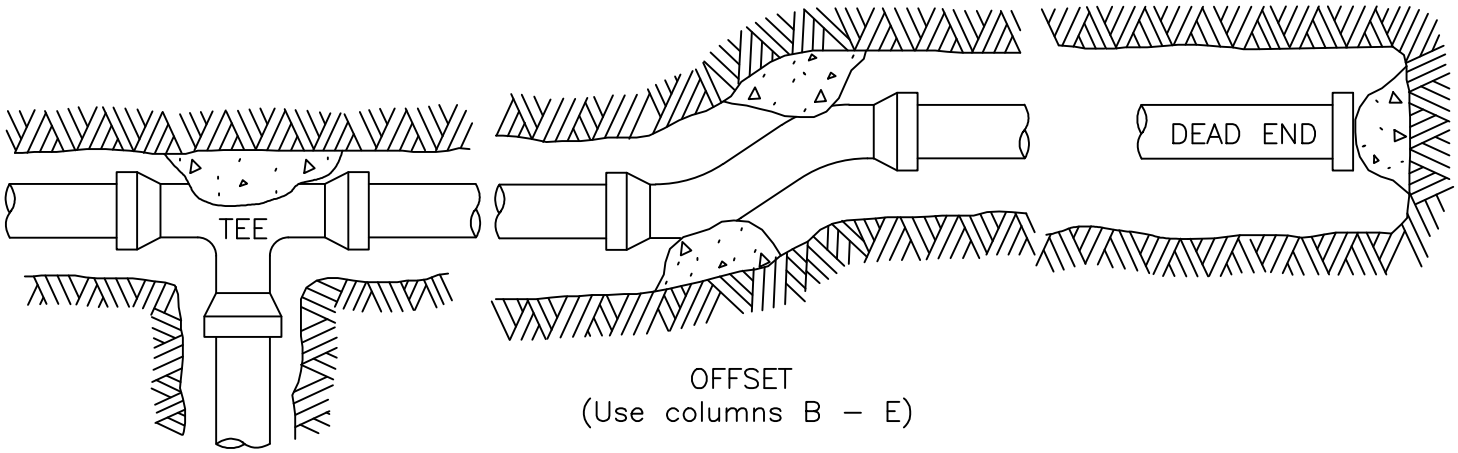
PLUGGED CROSS
(Use column A)

PLUGGED CROSS
(Use column B)



PLUGGED TEE
(Use column B)

VALVE
(Use column A)



OFFSET
(Use columns B – E)

BASED ON WSDOT STANDARD PLAN
B–90.40–00 DATED 6/8/06.

LAKE WHATCOM WATER & SEWER DISTRICT

CONCRETE THRUST BLOCK
Sheet 1 of 2

STANDARD DETAIL

W3

3/11/2020

NOTES:

1. Contractor may substitute restrained joints & fittings with the approval of the district engineer. Calculation of the restrained pipe required length on each side of fittings for max pressure and soil type are required. Calculations shall be sealed by a professional engineer and submitted for review and approval.

2. Contractor to provide blocking adequate to withstand full test pressure.

3. Divide thrust by safe bearing load to determine required area (in square feet) of concrete to distribute load.

4. Areas to be adjusted for other pressure conditions.

5. Provide two 1" minimum diameter rods on valves up through 10" diameter. Valves larger than 10" require special tie rod design.

Size	Test Pressure PSI	Thrust at Fittings in Pounds				
		A	B	C	D	E
		Tee and Dead Ends	90° Bend	45° Bend	22.5° Bend	11.25° Bend
4"	250	3,140	4,440	2,405	1,225	615
6"	250	7,070	9,995	5,410	2,760	1,385
8"	250	12,565	17,770	9,620	4,905	2,465
10"	250	19,635	27,770	15,030	7,660	3,850
12"	250	28,275	39,985	21,640	11,030	5,545
14"	250	38,485	54,425	29,455	15,015	7,545
16"	250	50,265	71,085	38,470	19,615	9,855

Soil Type	Safe Bearing Load PSF
Muck, peat, etc.*	0
Soft clay	1,000
Sand	2,000
Sand and gravel	3,000
Sand and gravel cemented with clay	4,000
Hard shale	10,000

*Restrained joints required in all cases.

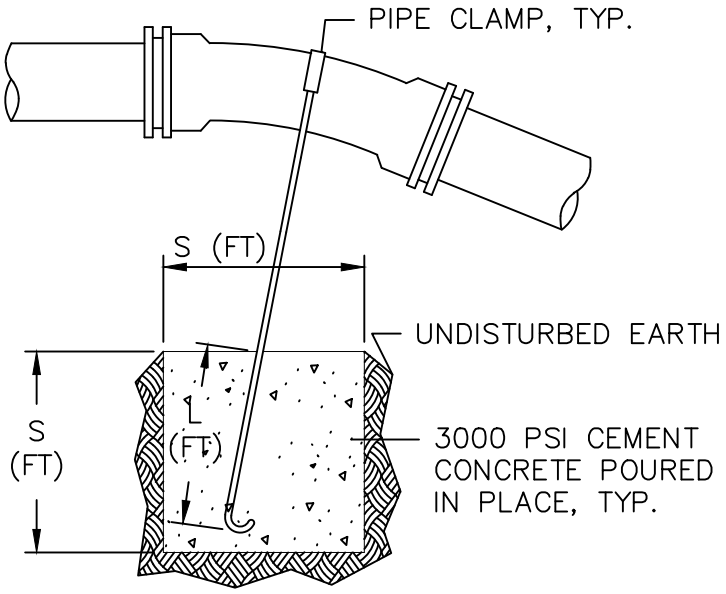
BASED ON WSDOT STANDARD PLAN B-90.40-00 DATED 6/8/06.

LAKE WHATCOM WATER & SEWER DISTRICT

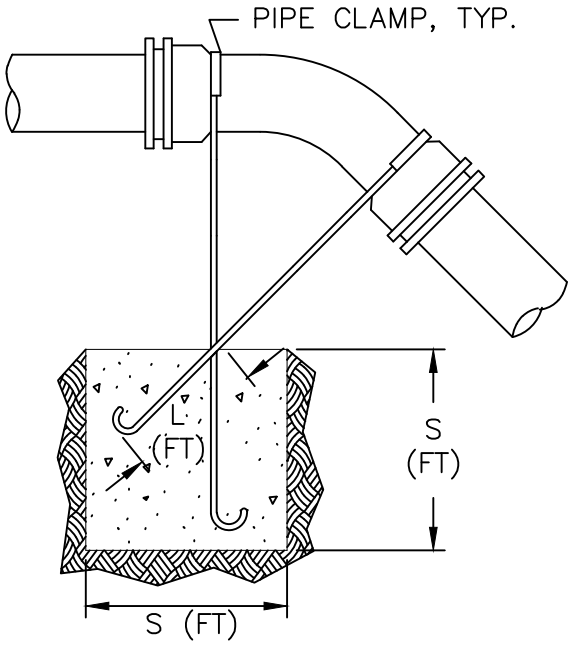
CONCRETE THRUST BLOCK
Sheet 2 of 2

STANDARD DETAIL

W4



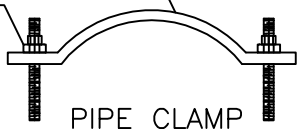
BLOCKING FOR 11.25°, 22.5° OR 33.75°
VERTICAL BENDS



BLOCKING FOR 45°
VERTICAL BENDS

DIMENSION TABLE							
PIPE DIAM.	TEST PRESSURE (PSI)	BEND ANGLE	CONCRETE VOLUME (Cubic–Ft)	CUBE SIZE "S" (FT)	TIE ROD DIAM. (IN)	DEPTH OF RODS IN CONCRETE "L" (IN)	PIPE CLAMP SIZE (DxW)
4"	300	11.25°	8	2.0	5/8"	18"	3/8" X 2"
		22.5°	11	2.2		24"	
		33.75°	17	2.6			
		45°	30	3.1			
6"	300	11.25°	11	2.2	5/8"	24"	1/2" X 2–1/2"
		22.5°	25	2.9			
		33.75°	41	3.5			
		45°	68	4.1			
8"	300	11.25°	16	2.5	5/8"	24"	1/2" X 2–1/2"
		22.5°	47	3.6			
		33.75°	70	4.1	3/4"		
		45°	123	5.0			
12"	250	11.25°	32	3.2	5/8"	24"	3/4" X 3"
		22.5°	88	4.5	7/8"		
		33.75°	132	5.1			
		45°	232	6.1		30"	

GALVANIZED STEEL BAR, PER TABLE
STAINLESS STEEL HARDWARE



PIPE CLAMP

BASED ON ALDERWOOD WATER & WASTEWATER STANDARD WD–12
11–2015

NOTES:

1. Tie rods shall be stainless steel, diameter as specified.
2. Location shall be approved by the District prior to installation.

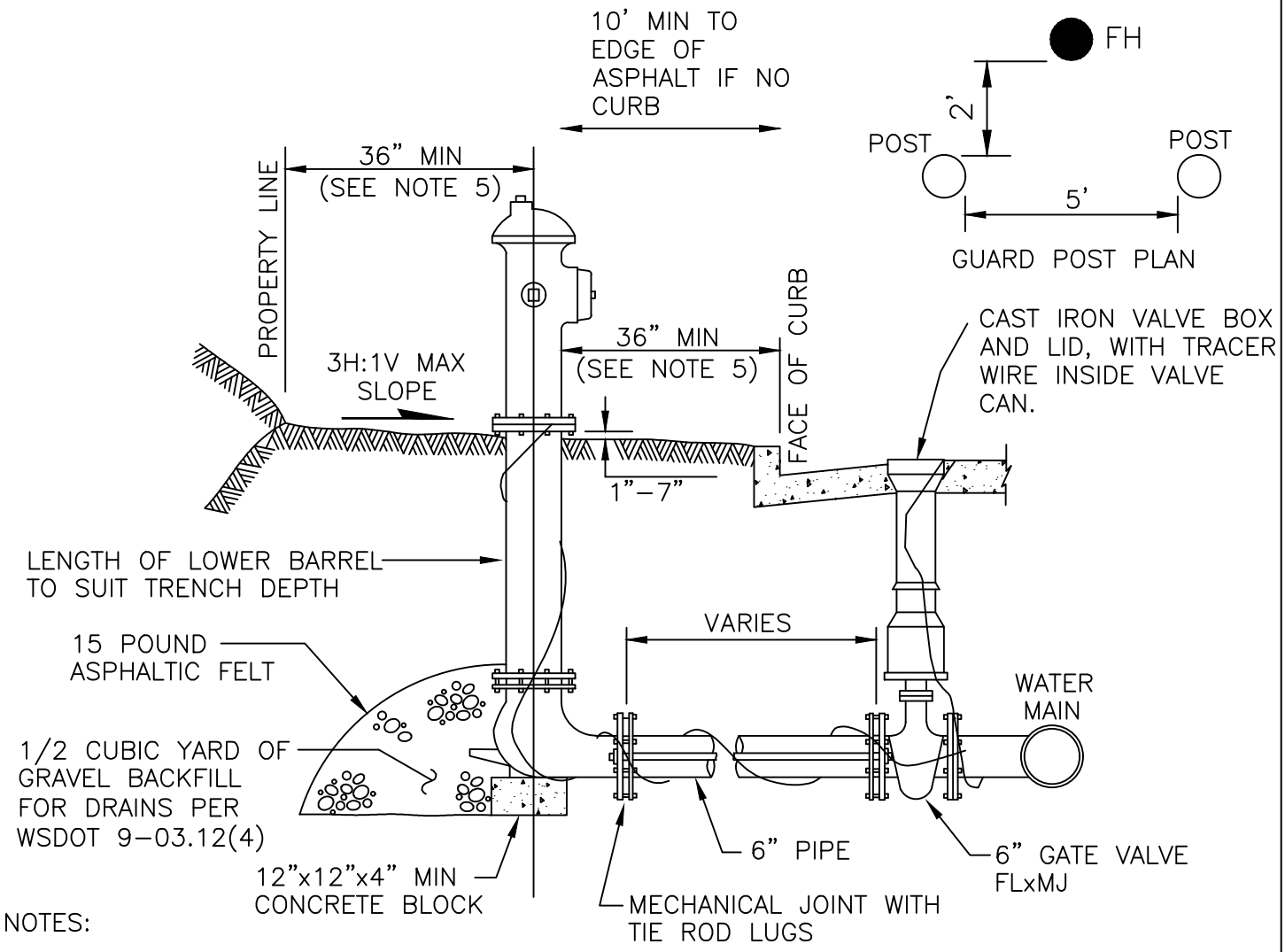
LAKE WHATCOM WATER & SEWER DISTRICT

CONCRETE THRUST BLOCK
FOR CONVEX VERTICAL BENDS

STANDARD DETAIL

W5

1/28/2026



NOTES:

1. Fire hydrants shall be 5–1/4" compression type MJ foot with National Standard Thread on 2–1/2" side ports, and 5" Stortz connection fitting on the steamer port. District standard fire hydrant manufacturers/models are: American Flow Control – Waterous Pacer 250, M&H – Style 929 Reliant, Clow – Medallion, and EJ 5CD250 3 nozzle with standard operating nut. Hydrant caps & bells shall be painted bright industrial yellow in accordance with South Whatcom Fire Authority and Whatcom County Fire District #4 requirements. Hydrant barrel extensions shall be provided and installed as required.

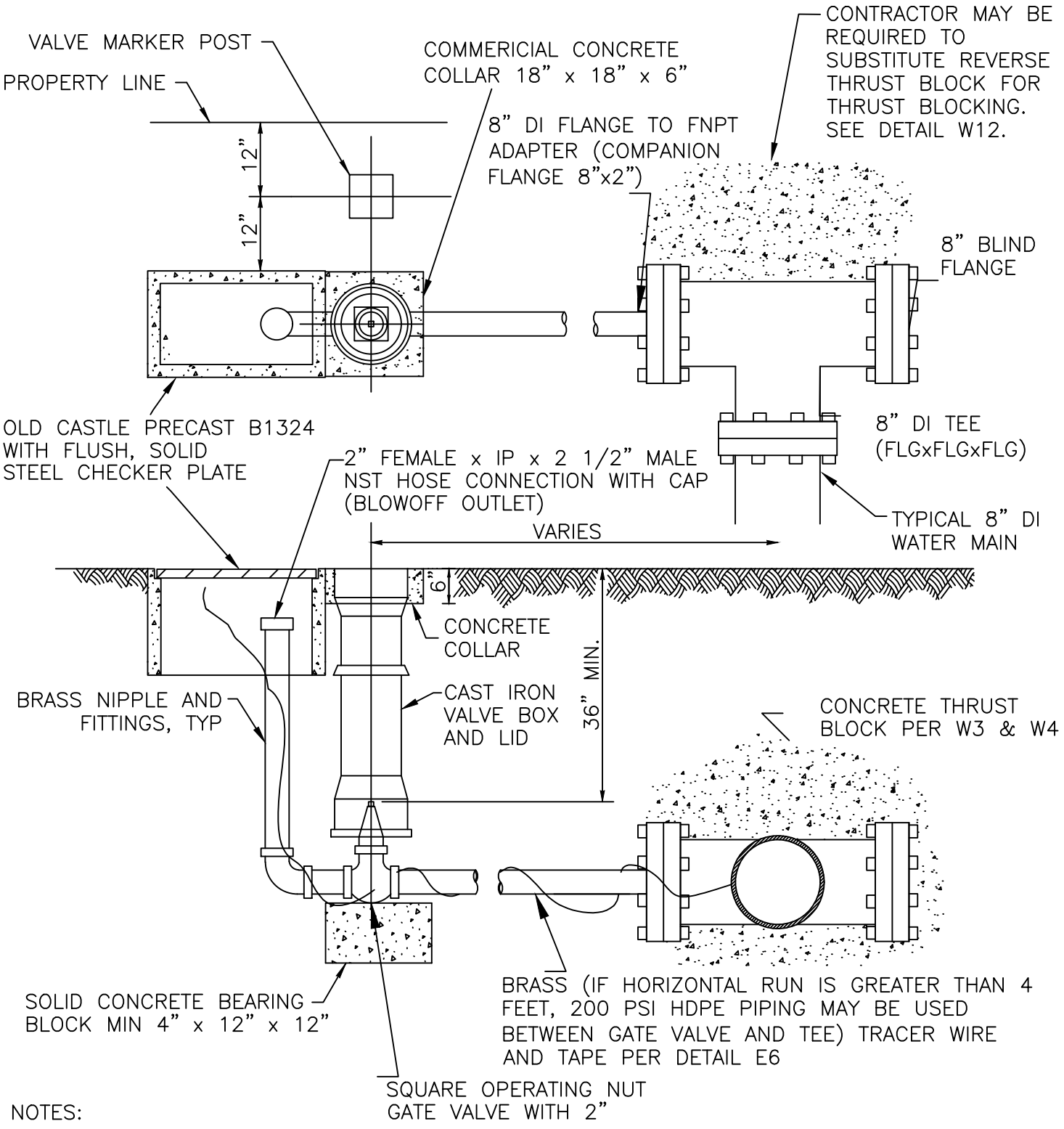
2. Shackle rods shall be installed with Romac ductile lugs. Tie rods shall be ¾" diameter Type 316 stainless steel (for up to 12" diameter main) with Type 316 stainless steel hardware. Restrained joints may be substituted for tie rods with approval of District Engineer.

3. Ground surface within 36" of hydrant shall be smooth and clear of obstructions on all sides.

NOTE ADDED.

4. A minimum of two guard posts shall be provided. Guard posts per Bollard Detail S11). Bollard locations shall be per the District.

5. If required setbacks cannot be achieved, alternate setbacks subject to approval by District Engineer.



NOTES:

1. Valve and piping to valve shall be 2" unless otherwise noted on plans.

3. Locate blowoff outlet near property corner if possible.

4. An 8–inch gate valve (FLxMJ) is required on the tee if future water main extension is possible.

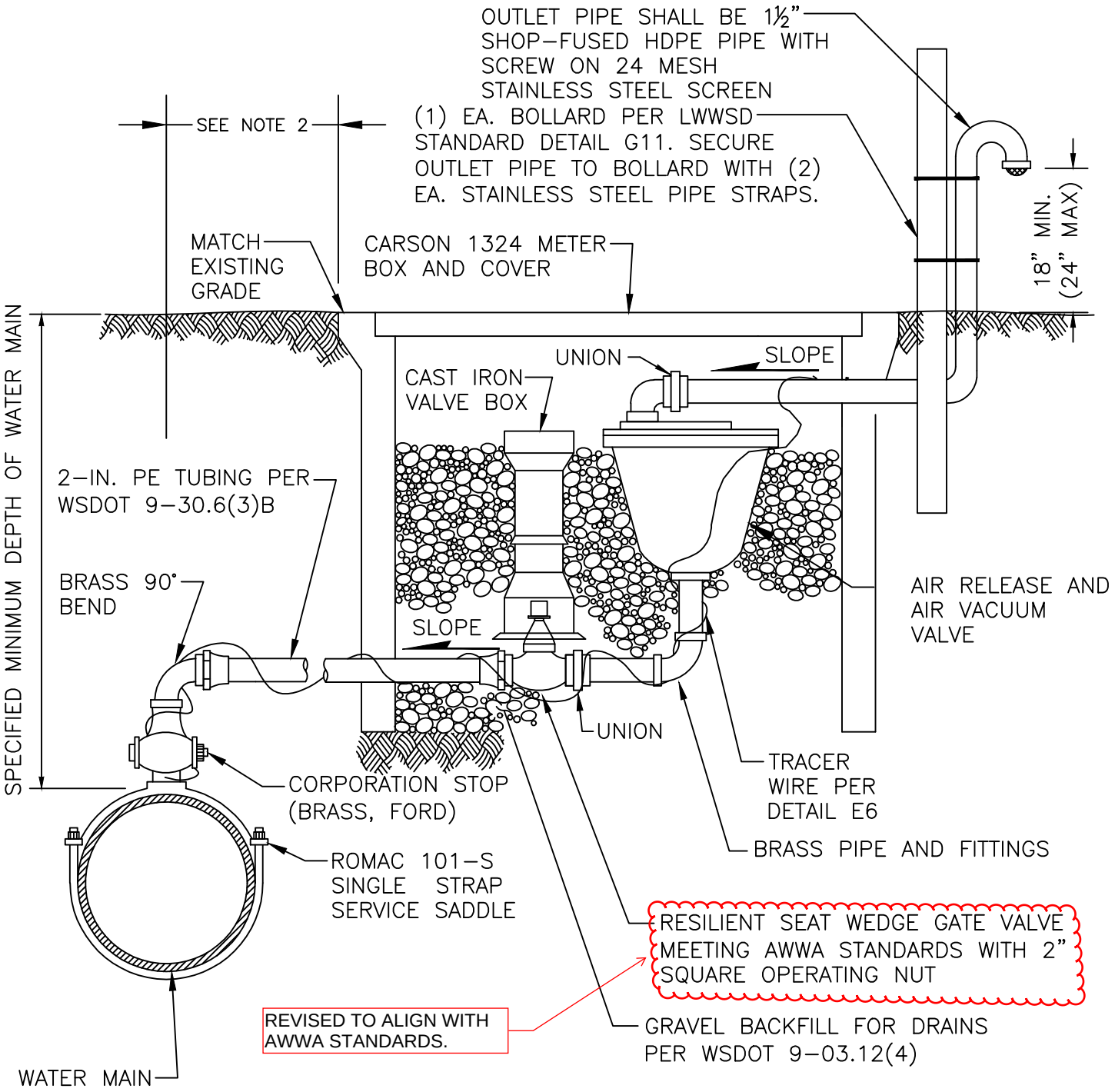
LAKE WHATCOM WATER & SEWER DISTRICT

2 INCH BLOWOFF ASSEMBLY

STANDARD DETAIL

W7

3/11/2020



NOTES:

1. The Air/Vacuum Release Valves shall be 2-inch combination air-release/vacuum relief valve, single body, double orifice, APCO Series 145C or approved alternate. Locate at the high point of the main, tap top of main.

2. Air/Vacuum Release assembly shall be installed along the right-of-way at location staked by engineer.

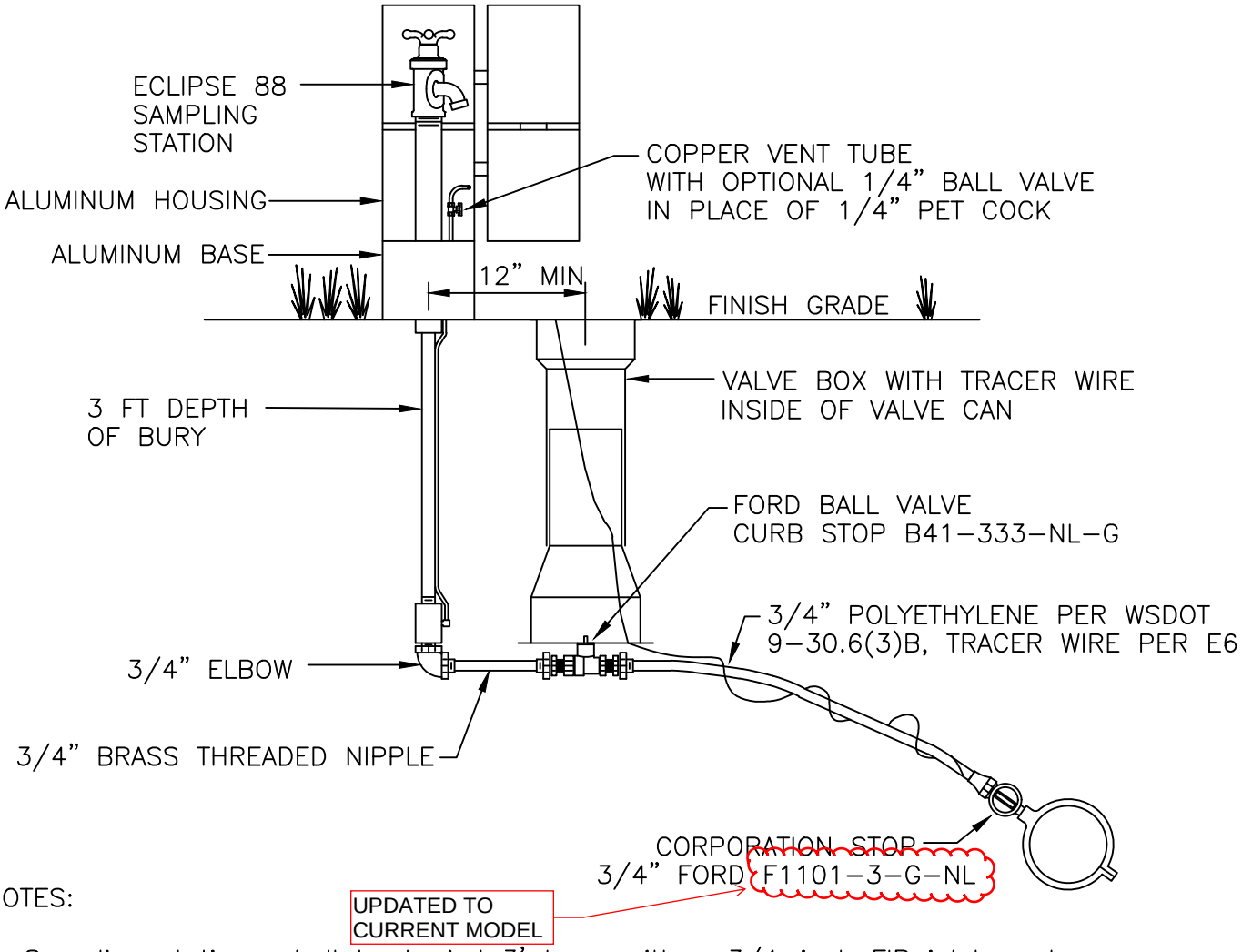
BASED ON WSDOT STANDARD PLAN B-90.30-00 DATED 6/8/06.

LAKE WHATCOM WATER & SEWER DISTRICT

COMBINATION
AIR RELEASE / AIR VACUUM
VALVE ASSEMBLY

STANDARD DETAIL

W8



NOTES:

1. Sampling stations shall be buried 3' bury, with a 3/4-inch FIP inlet, and a (3/4-inch hose or unthreaded) nozzle.

2. All stations shall be in a lockable, nonremovable, aluminum cast housing. Housing shall be painted green.

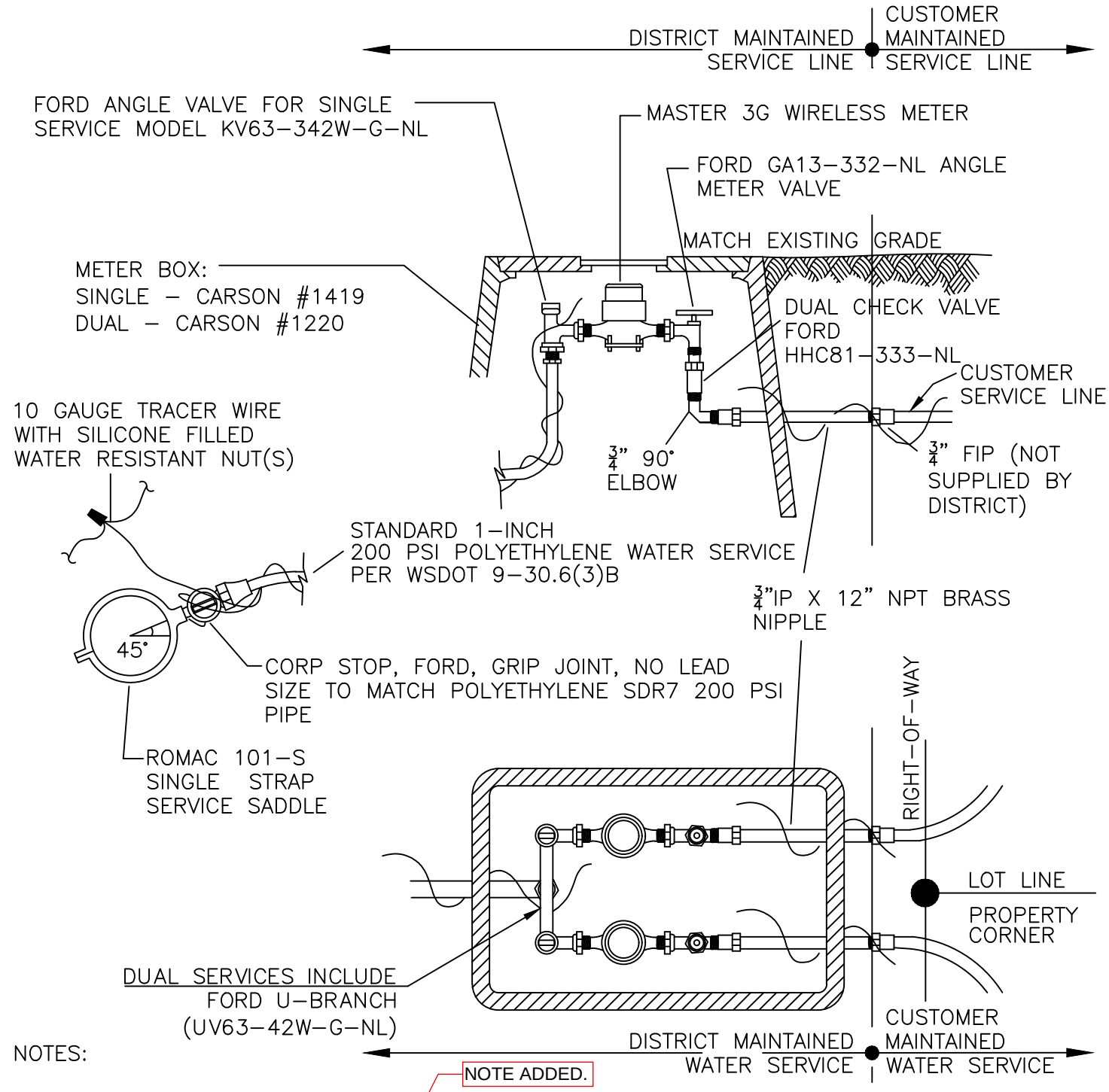
3. When opened, the station shall require no key for operation, and the water will flow in an all brass waterway.

4. All working parts will be of brass or stainless steel and be removable from above ground with no digging.

5. Exterior piping shall be brass pipe.

6. A vent tube will enable each station to be pumped free of standing water to prevent freezing and to minimize bacteria growth.

7. Sampling station shall be Eclipse No. 88, manufactured by Kupferle Foundry, St. Louis, MO 63102.



NOTES:

NOTE ADDED.

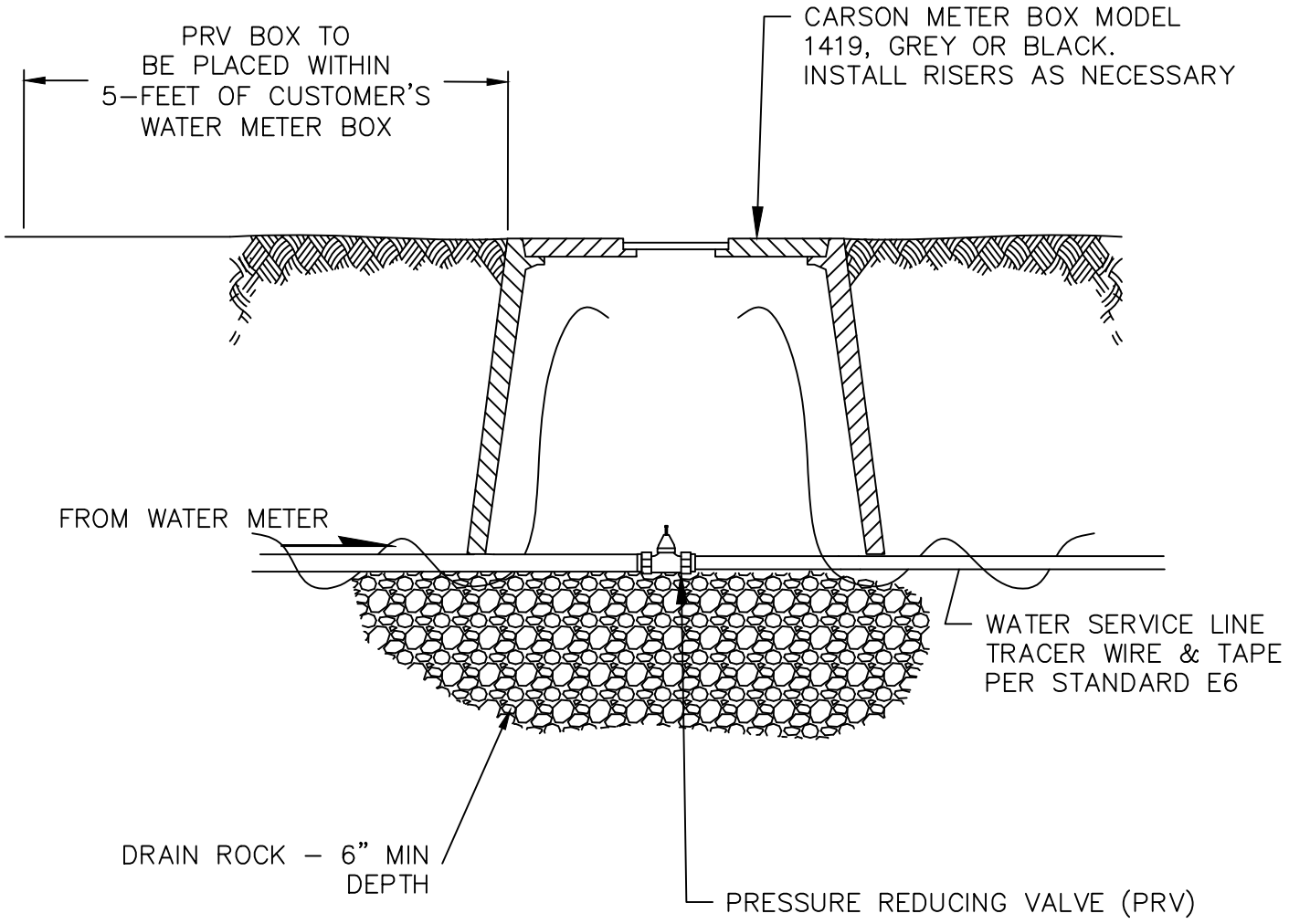
1. Private water service fittings shall be in accordance with WSDOT 9-30.6 except that PEX-a-tubing is not allowed and only compression (grip joint) fittings on private water services are allowed. All fittings shall be brass.
2. The water service pipe shall have a minimum of 30 inches depth and a maximum of 36 inches depth, including under ditch sections.
3. Meter boxes in traffic areas shall be rated for H-20 loading with a reader lid.
4. Standard water service connection for a single family residence is 1-inch. It is the customer's responsibility to determine if a larger diameter service is required for any reason, including but not limited to satisfying local agency fire flow requirements and pipe sizing in accordance with the UPC.

LAKE WHATCOM WATER & SEWER DISTRICT

WATER METER ASSEMBLY

STANDARD DETAIL

W10



NOTES:

1. The pressure reducing valve assembly shall be located on the customer's property downstream of the water meter box assembly.
2. A pressure reducing valve is required for all private water services.
3. All fittings shall be brass.
4. Installation, maintenance and operation of the pressure reducing valve is the responsibility of the property owner.

LAKE WHATCOM WATER & SEWER DISTRICT

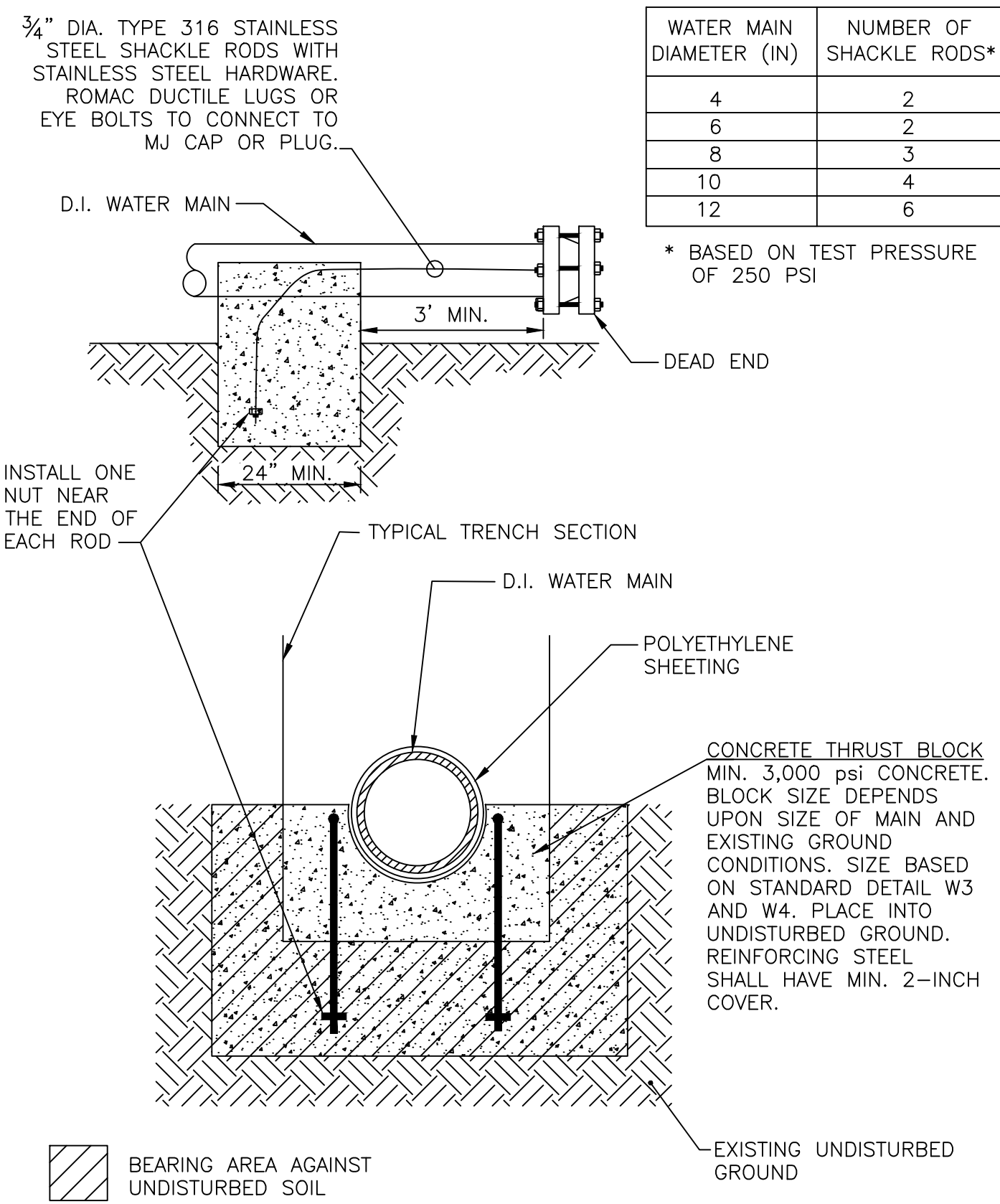
PRIVATE SERVICE PRESSURE REDUCING VALVE

STANDARD DETAIL

W11

WATER MAIN DIAMETER (IN)	NUMBER OF SHACKLE RODS*
4	2
6	2
8	3
10	4
12	6

* BASED ON TEST PRESSURE OF 250 PSI



LAKE WHATCOM WATER & SEWER DISTRICT

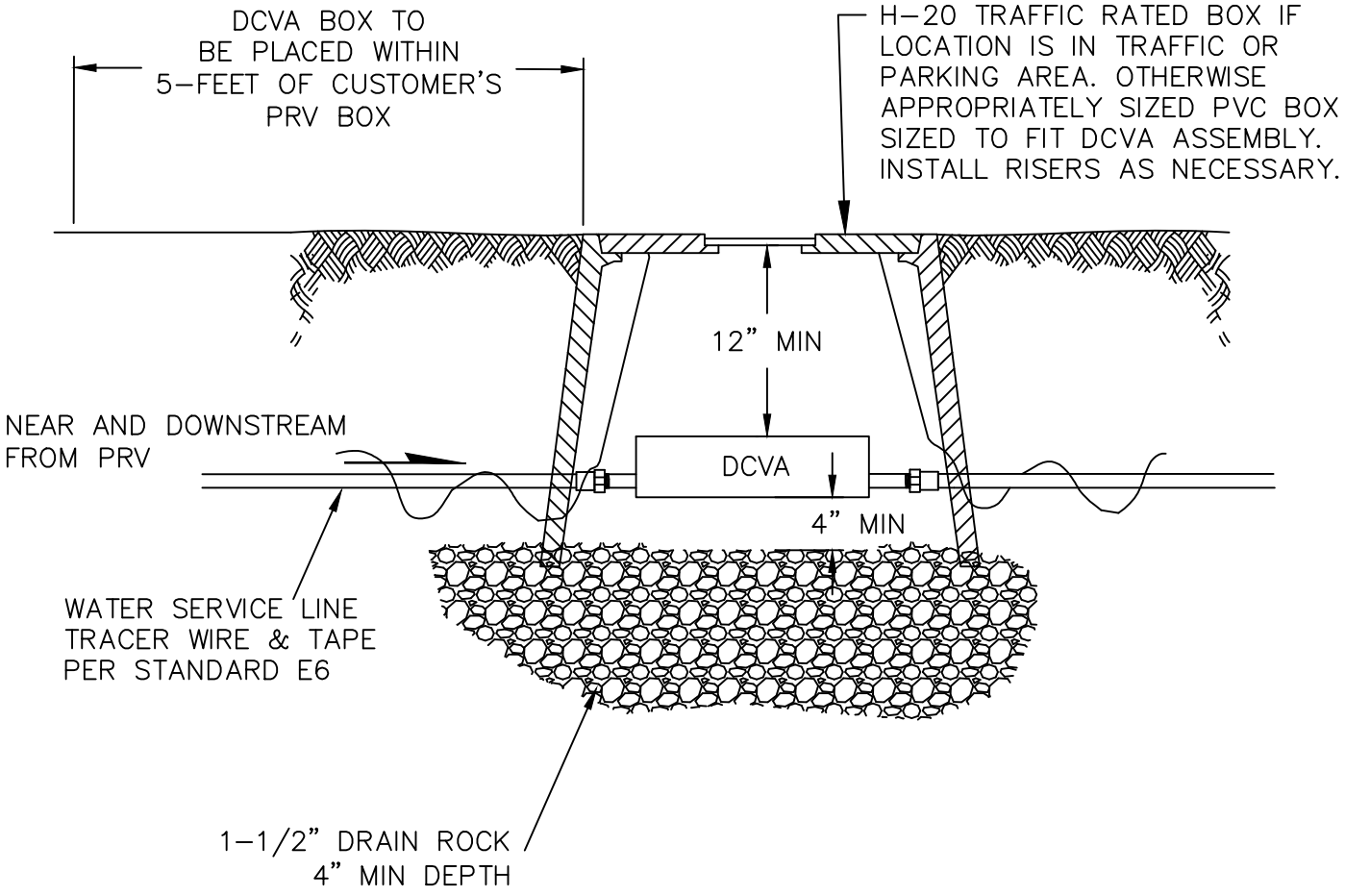
REVERSE THRUST BLOCK

NOT TO SCALE

STANDARD DETAIL

W12

3/11/2020



DOUBLE CHECK VALVE ASSEMBLY REQUIREMENTS:

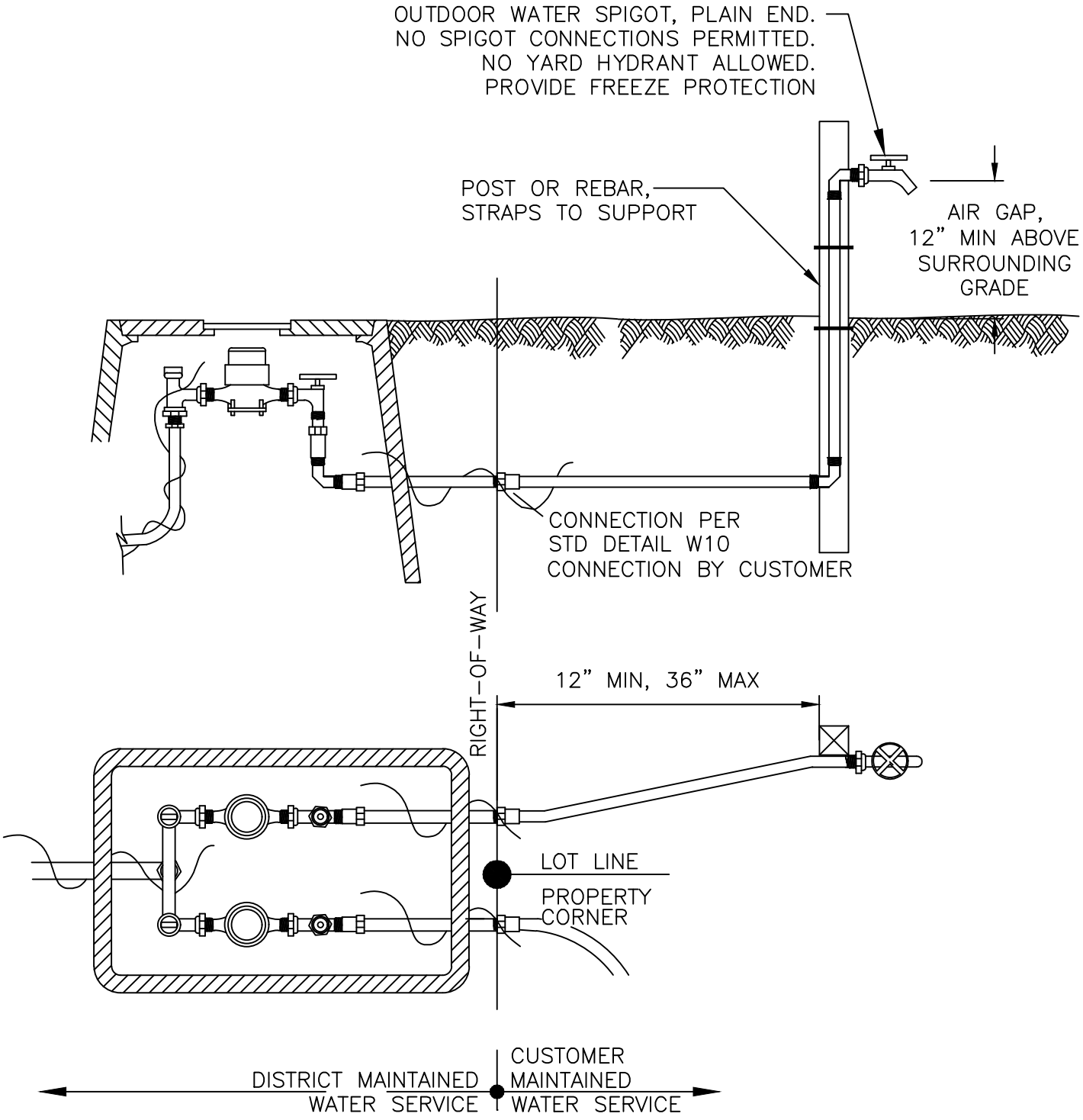
1. In accordance with the District's Cross Connection Control Program, a double check valve assembly shall be installed by the property owner in accordance with this standard detail when plumbing or activity present on the property requires a double check valve assembly.
2. A Washington State Department of Health approved double check valve assembly (DCVA) shall be installed a minimum of 12-inches below grade in a box near the property line just beyond the private pressure reducing valve (PRV).
3. After installation, installed DCVA shall be tested by a certified backflow assembly tester and the test report submitted to the District's Cross Connection Control Program Manager (crossconnection@lwwsd.org).
4. Ongoing testing and reporting is required in accordance with the District's Cross Connection Control Program.

LAKE WHATCOM WATER & SEWER DISTRICT

SINGLE FAMILY RESIDENCE
PRIVATE DOUBLE CHECK VALVE ASSEMBLY

STANDARD DETAIL

W13



TEMPORARY CONSTRUCTION WATER – CONDITIONS TO TURN ON METER

1. Plain end outdoor spigot must be installed as detailed above before the District will turn on water for construction. No spigot connections are permitted.
2. Billing for both water and sewer begins when temporary construction water has been turned on by the District.
3. Remove temporary construction water assembly to install PRV and to complete private water service before occupancy.

LAKE WHATCOM WATER & SEWER DISTRICT

TEMPORARY CONSTRUCTION WATER
OUTDOOR SPIGOT - NO SPIGOT CONNECTIONS PERMITTED

STANDARD DETAIL

W14

SEWER SYSTEM NOTES:

Added for clarity and connection to other District guidance documents.

These Standard Details, together with the most current versions of the District's full Design and Construction Standards (DCS) and the District Administrative Code, incorporated herein by reference, shall govern all District design and construction activities.

1. Sewer system materials, trenching, bedding, installation, backfilling, and testing shall meet the requirements of WSDOT 7-05 and WSDOT 7-17 and District standards detailed herein.

NOTE ADDED TO CLARIFY THAT GRINDERS ARE AN EXCEPTION REQUIRING SPECIAL CIRCUMSTANCES FOR APPROVAL.

2. Gravity sewer pipe shall be ASTM D3034-SDR 35 PVC per WSDOT 9-05.12(1). In certain applications, the District may require class 52 ductile iron pipe, per WSDOT 9-30.1(1), encased in polyethylene encasement per WSDOT 9-30.1(2).

3. Gravity sewer service connections are required. Grinder pump systems shall only be installed in such special circumstances where installation is approved by the District Engineer (DCS 5.2.2). A submittal of a compliant grinder pump system is required before scheduling a pre-construction meeting.

4. Pressure sewer pipe shall be class 52 ductile iron pipe per WSDOT 9-30.1(1) encased in polyethylene encasement per WSDOT 9-30.1(2) or PVC C900 class 150 per WSDOT 9-30.1(5). HDPE may be substituted with the approval of the District Engineer (pipe rating, resins, physical properties, dimensions and tolerances must be as specified in the American Water Works Associations (AWWA) Manual C901 for the specific design conditions).

5. Sewer service connections (comprised of the service lateral and side sewer) from the public sewer main to the cleanout adjacent to the building must be installed, modified or repaired by a contractor on the District's current Bonded Side Sewer Contractor list.

6. All sewer system installations, modifications, or repairs shall be inspected prior to backfill.

7. All gate valves for sewer force mains shall have a cast iron valve box with a commercial concrete collar (18" x 18" x 6") with each valve. Valves not in pavement shall have a 24" x 24" x 6" concrete collar cast around the valve box.

8. Service laterals, from main or manhole to private property line, shall meet the requirements of WSDOT 7-18. Service laterals shall have a minimum slope of 2%. Service laterals shall maintain a minimum cover of 36-inches and 30 inches under ditches. Service laterals and cleanout/test tee at property line shall be minimum 6-inches in diameter.

9. Side sewers within private property shall meet the requirements of the District Standards detailed herein. Gravity side sewers shall have a minimum slope of 2%. Minimum size for gravity side sewer pipes shall be 4-inches for a single family residence and 6-inches for a multi-family residence up to a 4-plex. See Standard Detail S10 for requirements regarding layout (bends) and cleanouts. Sewer cleanouts shall be installed per WSDOT 7-19.

10. Grout for manholes shall be a polyurethane chemical grout or non–shrinking cementitious grout, containing no gypsum or calcium sulfate Di–hydrate (CaSO42H2O), conforming to WSDOT 9–20.3(2), such as Blueline, Rapid Set Cement All or approved equivalent. Grout shall be installed according to manufacturer's instructions.

11. All sewer pipe and appurtenances shall be flushed and cleaned prior to being put into service. Debris shall not be allowed into the existing sewer system.

12. The District Engineer shall witness testing. Contractor shall provide the District Engineer 48–hours notice prior to conducting tests or sampling.

13. Sewer mains shall be tested after backfill by the low–pressure air test method per WSDOT 7–17.3(2)F. PVC pipe shall have a mandrel passed through it to check for any deflections in the pipe per WSDOT 7–17.3(2)G. All sewers shall be television inspected and video delivered to the District, with all costs borne by Contractor, before acceptance. Connection to the existing system is not permitted until final acceptance.

NOTE REVISED TO MAKE AIR TESTING THE PRIMARY TESTING PROCEDURE.

14. Side sewers on private property shall be cleaned and tested by either a low pressure air test or exfiltration water test at the option of the Contractor, as per WSDOT 7–17.3(2)A. An air test is acceptable when air is slowly supplied to the plugged pipe section until the internal air pressure reaches 4 psi and maintains for 5 minutes with no pressure loss.

Water testing may be done in lieu of an air test and shall follow WSDOT 7–17.3(2)B. As stated therein, leakage shall be no more than 0.28 gph per inch diameter per 100 feet of sewer, with a hydrostatic head of 6 feet above the crown at the upper end of the test section, or above the natural ground water table at the time of test, whichever is higher. The length of pipe tested shall be limited so that the pressure at the lower end of the Section tested does not exceed 16 feet of head above the invert.

Where the test head is other than 6 feet, the maximum leakage shall not exceed the amount determined from the following equation:

Maximum leakage (in gallons per hour) = $0.28 \times (\sqrt{H}/\sqrt{6}) \times D \times (L/100)$

Where:

D = diameter (in.)

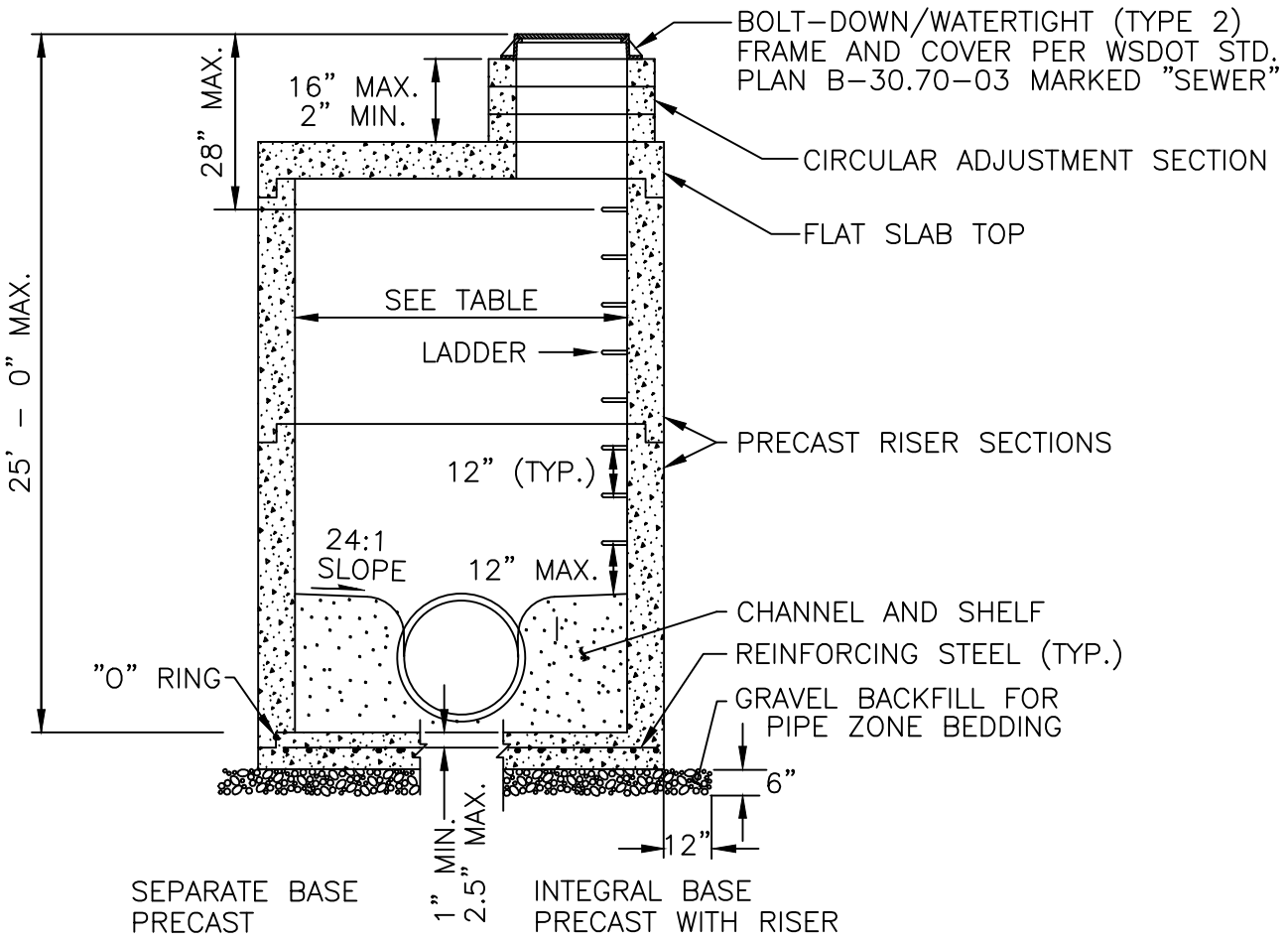
L = length of pipe (ft.)

H = test head (ft.)

All testing shall be witnessed by appropriate District personnel.

15. Downspouts, foundation/crawl space sump pumps, yard drains, or any outside drains shall not be connected to sanitary sewer mains or sewer service connection.

16. Contractor shall prepare Record Drawings of all new sanitary sewer main and service lateral construction in accordance with Lake Whatcom Water and Sewer District Design Standards Section 1.2.1 (Record Drawings) and Standard Detail G6.



MANHOLE DIMENSION TABLE						
DIAM	MIN. WALL THICKNESS	MIN. BASE THICKNESS	MAXIMUM KNOCKOUT SIZE	MINIMUM DISTANCE BETWEEN KNOCKOUTS	PIPE ALLOWANCES PIPE MATERIAL WITH MAX. INSIDE DIAM.	
					ALL METAL	SOLID WALL PVC
48"	4"	6"	36"	8"	30"	30"
54"	4.5"	8"	42"	8"	36"	36"
60"	5"	8"	48"	8"	42"	42"
72"	6"	8"	60"	12"	54"	48"
84"	8"	12"	72"	12"	60"	48"
96"	8"	12"	84"	12"	72"	48"

NOTES:

1. Knockouts shall have a wall thickness of 2" minimum to 2.5" maximum.
2. No steps are required when height is 4' or less.

BASED ON WSDOT STANDARD PLANS B–15.60–02 AND B–10.20–01.

LAKE WHATCOM WATER & SEWER DISTRICT

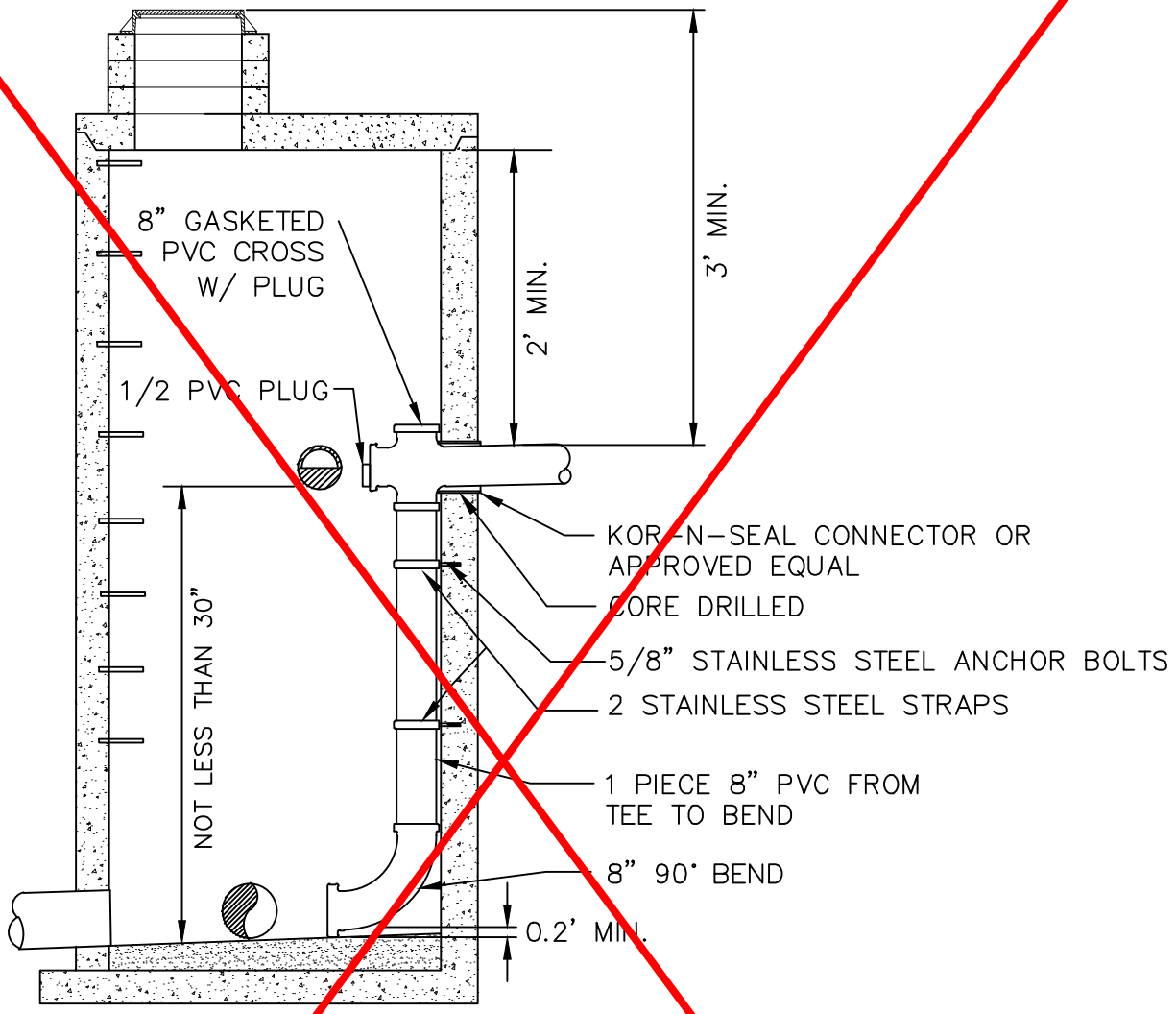
SANITARY SEWER MANHOLE TYPE 3

STANDARD DETAIL

S3

9/20/2017

DETAIL REMOVED. INSIDE DROP MANHOLES NOT PERMITTED EXCEPT WITH SPECIAL APPROVAL FROM DISTRICT ENGINEER.



NOTES:

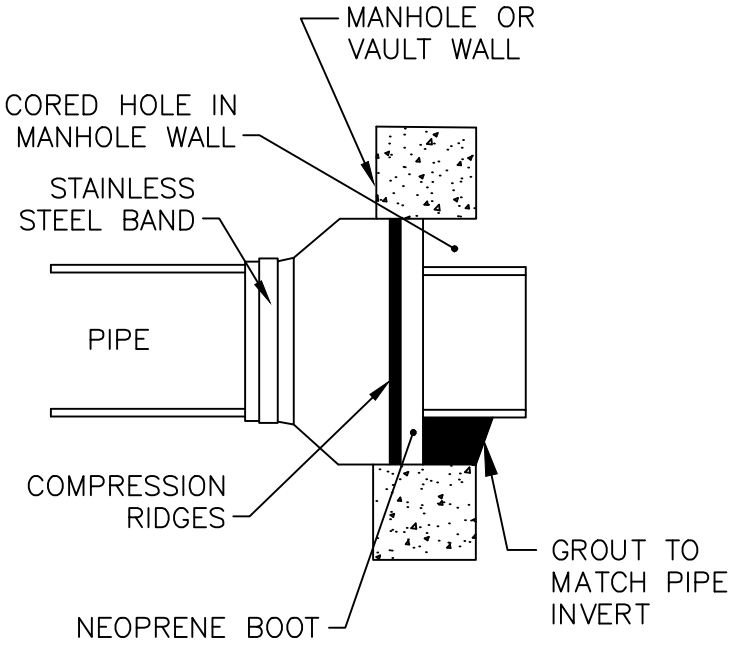
1. Inside drop manhole shall be installed only where approved the District and when manhole width is minimum 60-inches, unless approved by the District.

2. Drop tee to be installed minimum of 2' below ceiling.

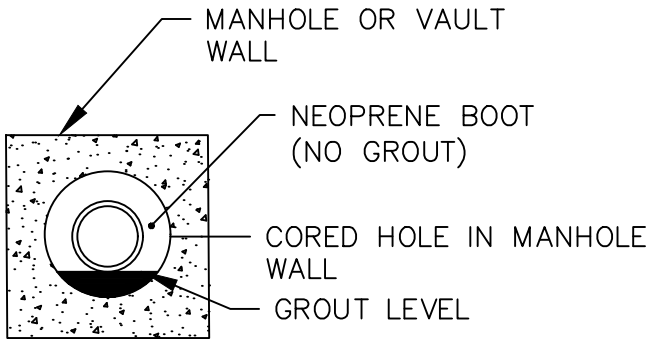
3. Size of manhole will increase with larger diameter pipe and shall be approved by the District Engineer.

4. Channel to outlet.

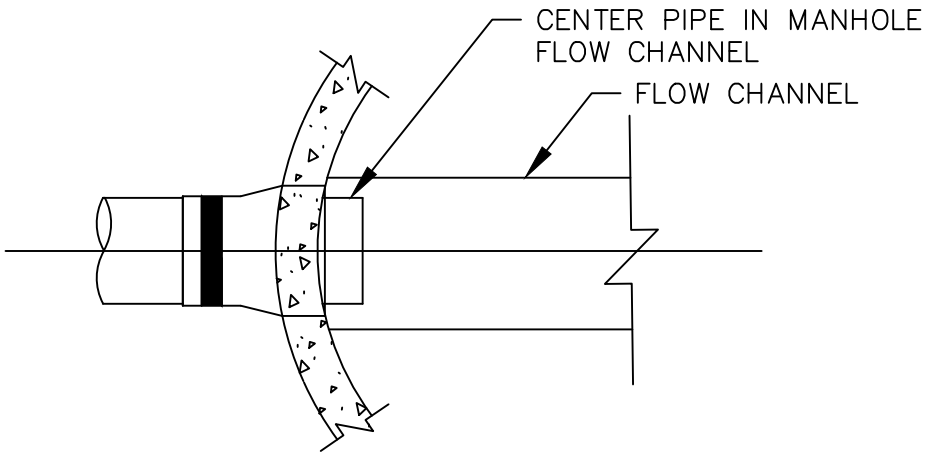
BASED ON CITY OF BELLINGHAM DRAWING SS-715 DATED 11/29/04.



FLEXIBLE SEAL ADAPTER – PROFILE VIEW



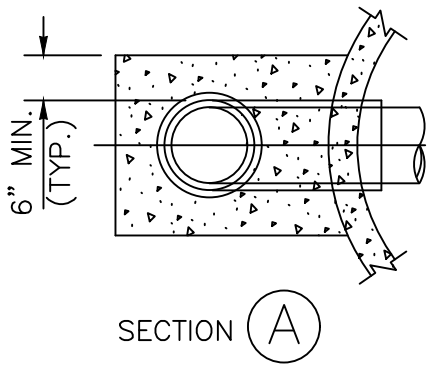
GROUT DETAIL



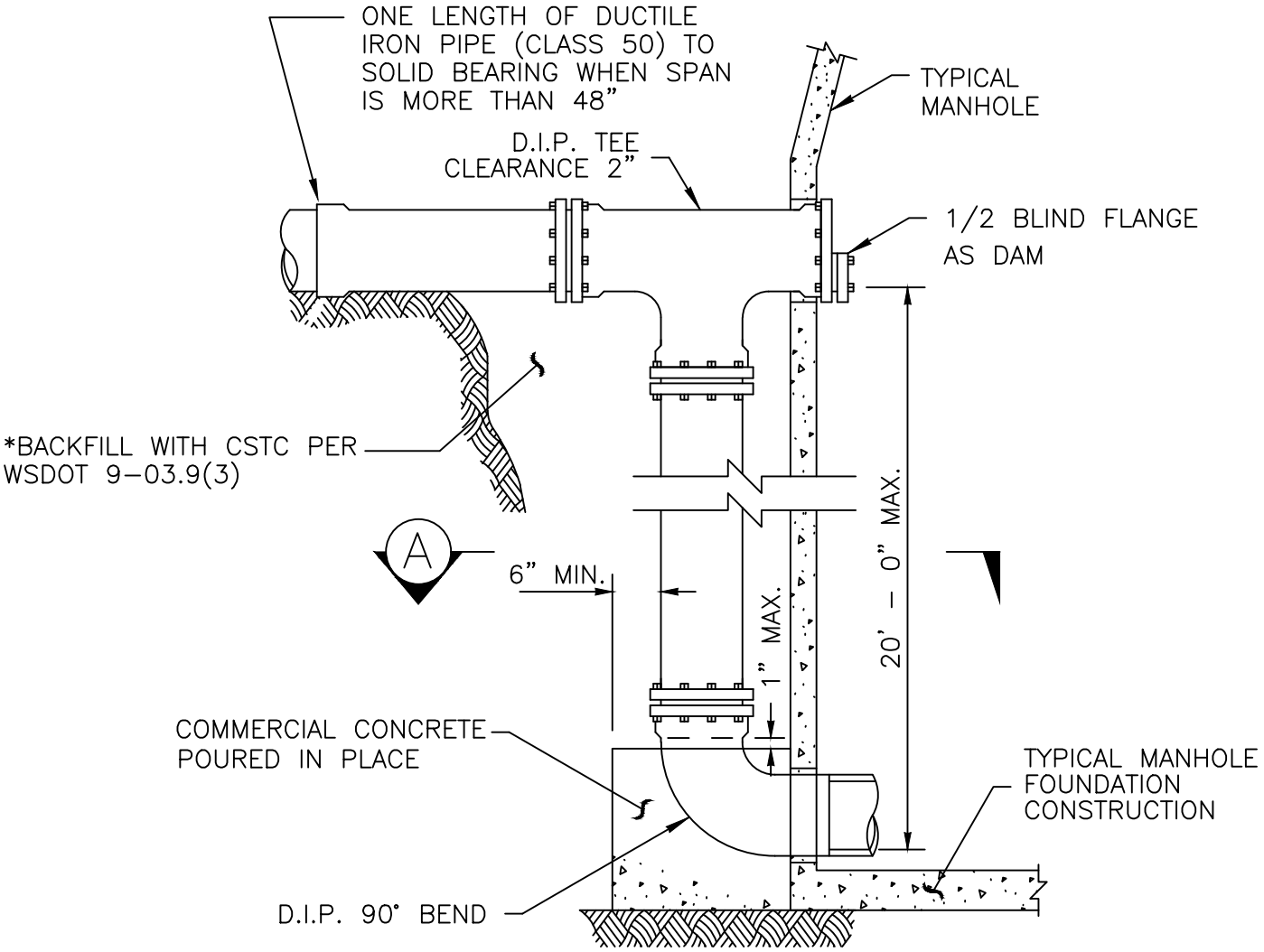
FLEXIBLE SEAL ADAPTER– PLAN VIEW

NOTES:

1. All manhole connections shall be 100% watertight.
2. All pipe shall extend 2" into manhole.
3. Pipe to manhole connection shall use a flexible connector, Kor–N–Seal Series 106, or approved equal. Flexible neoprene boot on the flexible seal adapter shall be a minimum of ⅜" thick per ASTM C–443, and shall be held in place with an internal expanding stainless steel band.
4. Deflection at the adapter must not exceed manufacturer's recommendation. If slope of pipe at penetration exceeds recommended deflection, cast or core hole at an angle such that deflection does not exceed manufacturer's recommendations.



SECTION (A)



NOTES:

1. Outside drop manholes shall be installed only where approved by the District.
2. All pipe shall be minimum Class 52 ductile iron pipe.
3. * Differs from WSDOT Std. Plan B-85.50-01

BASED ON WSDOT STANDARD PLAN B-85.50-01 DATED 6/10/08.

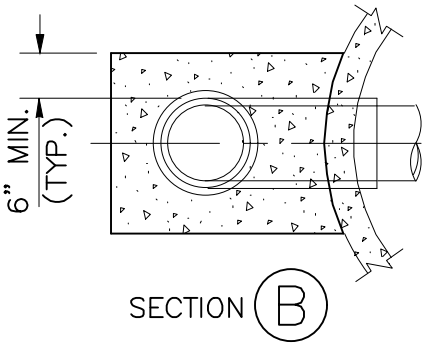
LAKE WHATCOM WATER & SEWER DISTRICT

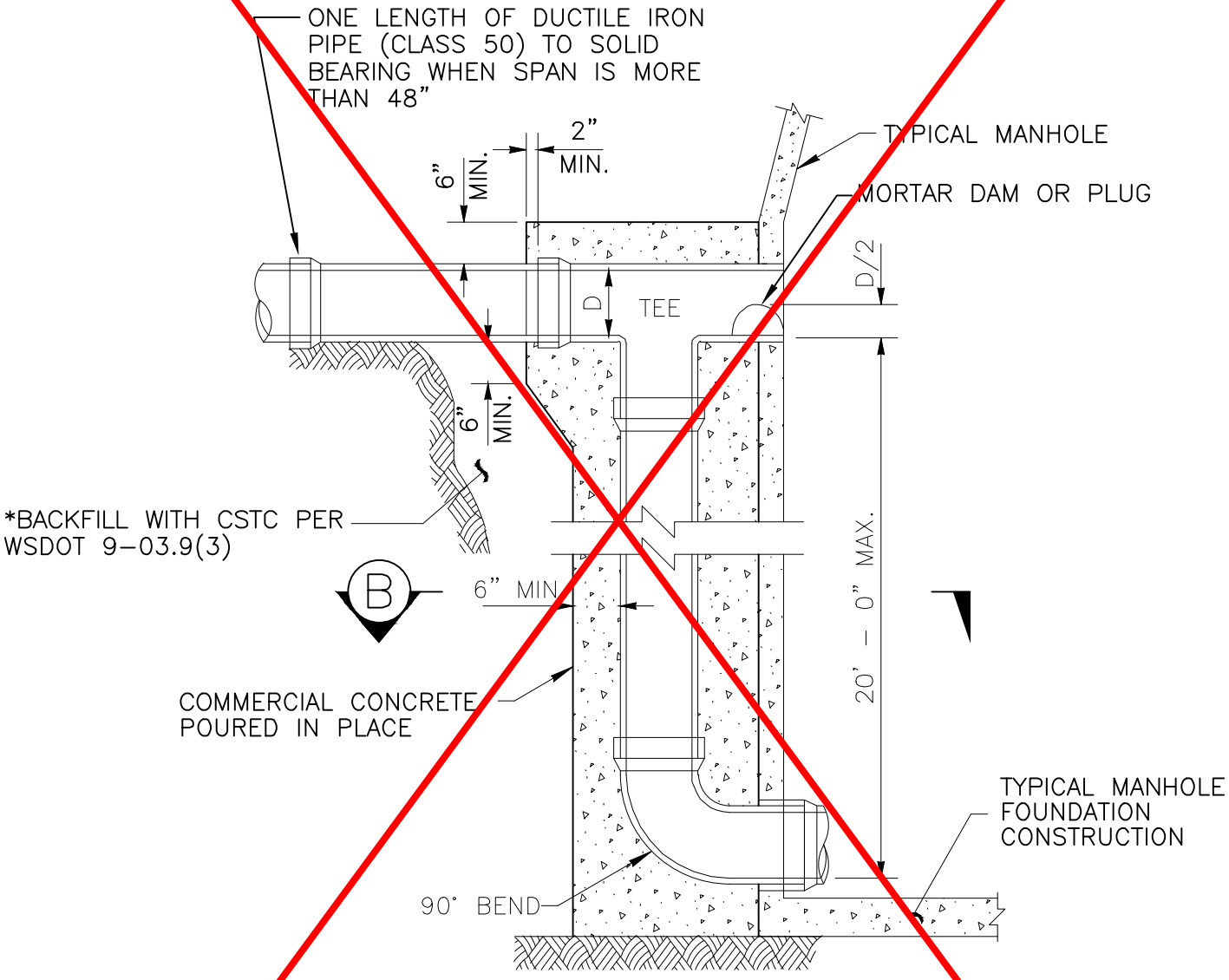
OUTSIDE DROP SEWER MANHOLE CONNECTION

STANDARD DETAIL

S5

DETAIL DELETED.
OBSOLETE.





NOTES:

1. All pipe, except ductile iron pipe, shall be concrete encased.

2. Outside drop manhole shall be installed only where approved by the district.

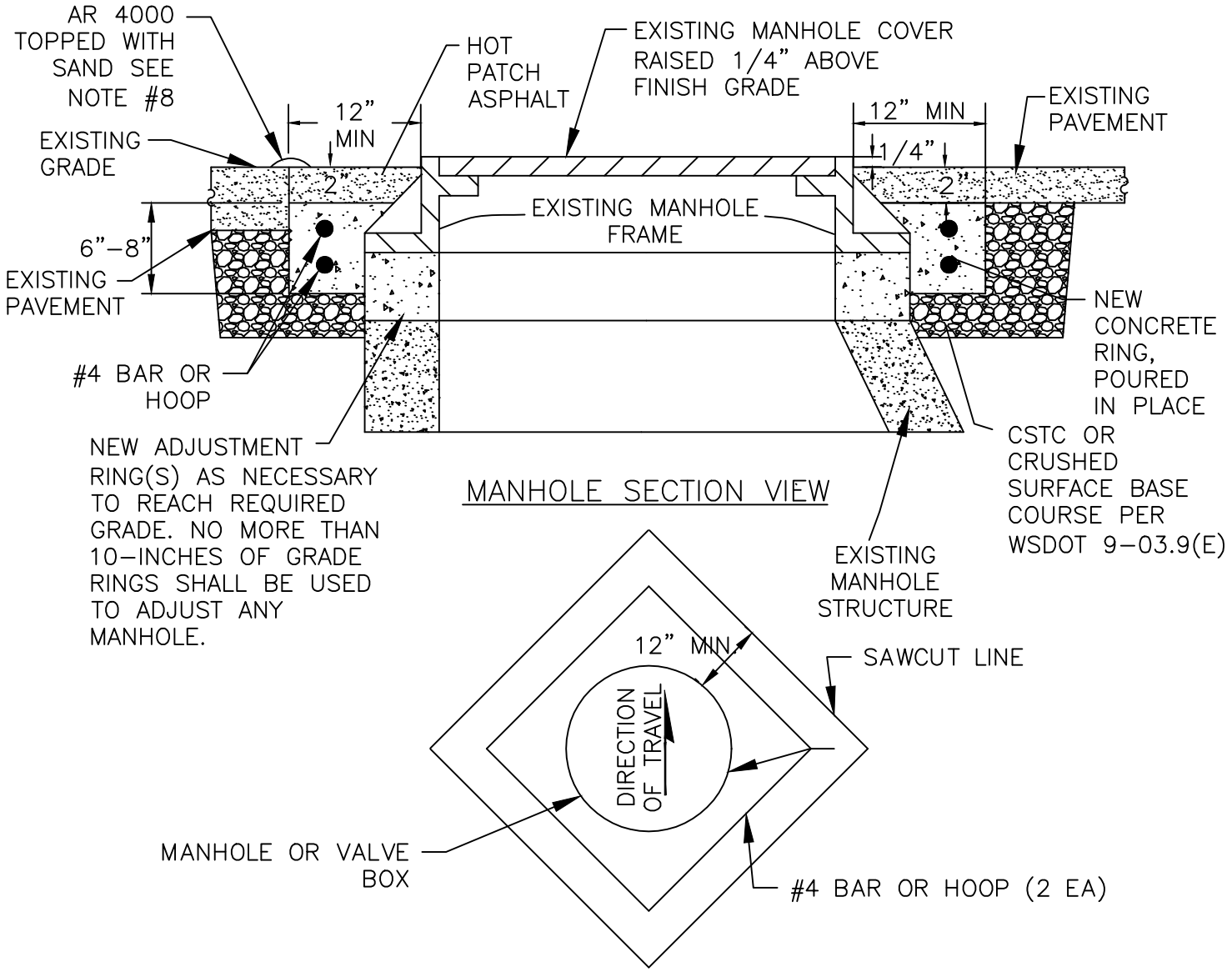
3. * Differs from WSDOT Std. Plan B-85.50-01.

BASED ON WSDOT STANDARD PLAN B-85.50-01 DATED 6/10/08.

OUTSIDE DROP SEWER MANHOLE CONNECTION
Sheet 2 of 2

STANDARD DETAIL

S6



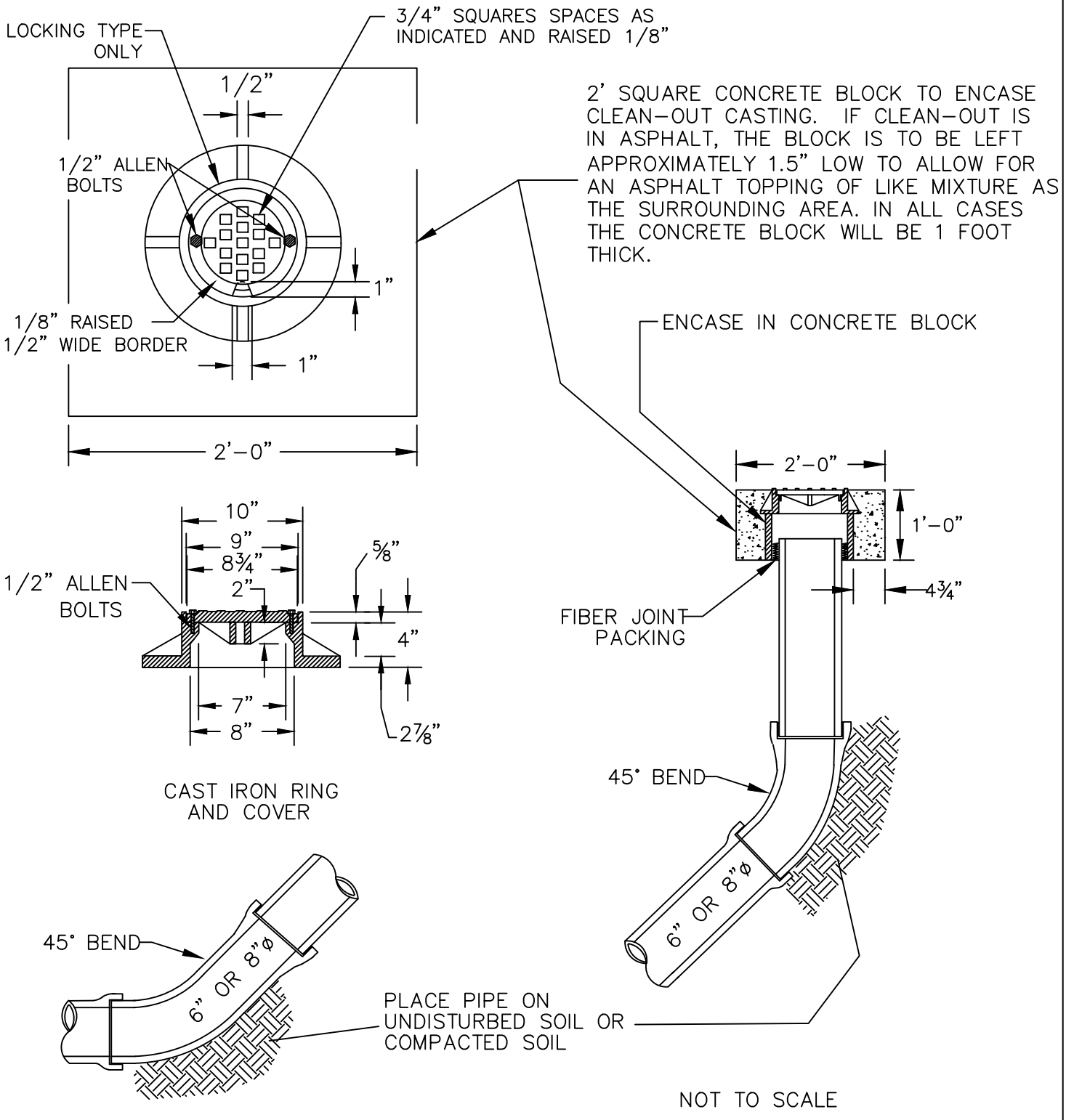
MANHOLE SECTION VIEW

PLAN VIEW

NOTES REVISED FOR ADDITIONAL CLARITY.

NOTES:

1. All manhole frames and covers shall be removed, cleaned and raised to finished grade.
2. Locations within a paved travel lane shall receive a concrete collar as detailed herein:
   - 2.1. Remove the fill material within the cut pavement to 8–inches below finish grade, or to expose adjustment ring.
   - 2.2. Casting shall be placed so that the smooth edge diamond pattern is oriented with the flow of traffic.
   - 2.3. All joints shall be grouted with material conforming to WSDOT 9–20.3(2).



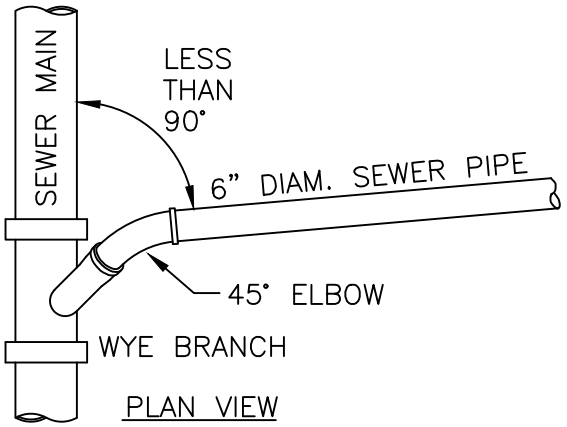
LAKE WHATCOM WATER & SEWER DISTRICT

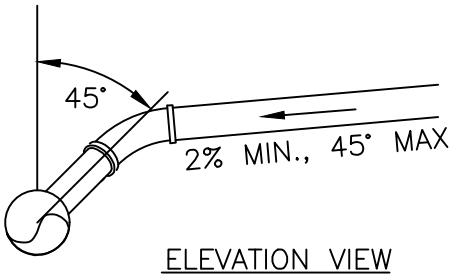
SEWER MAIN CLEANOUT

STANDARD DETAIL

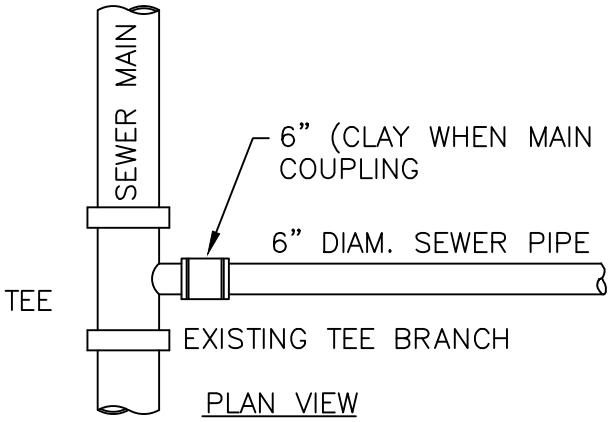
S7

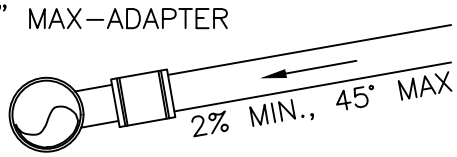
1/28/2026



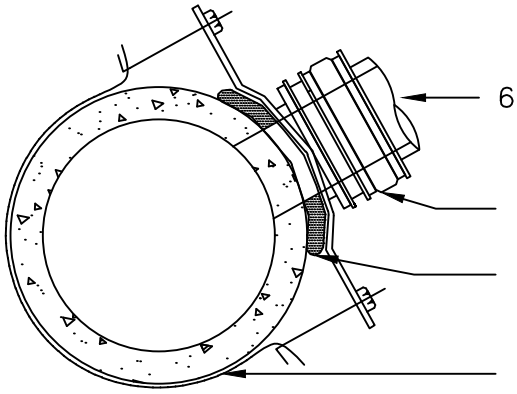


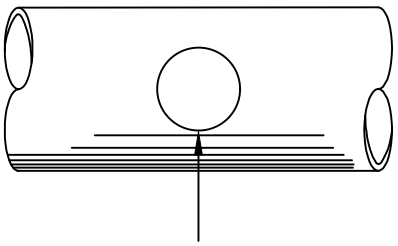
SERVICE LATERAL INSTALLED WITH NEW MAINS





CONNECTION TO EXISTING TEE

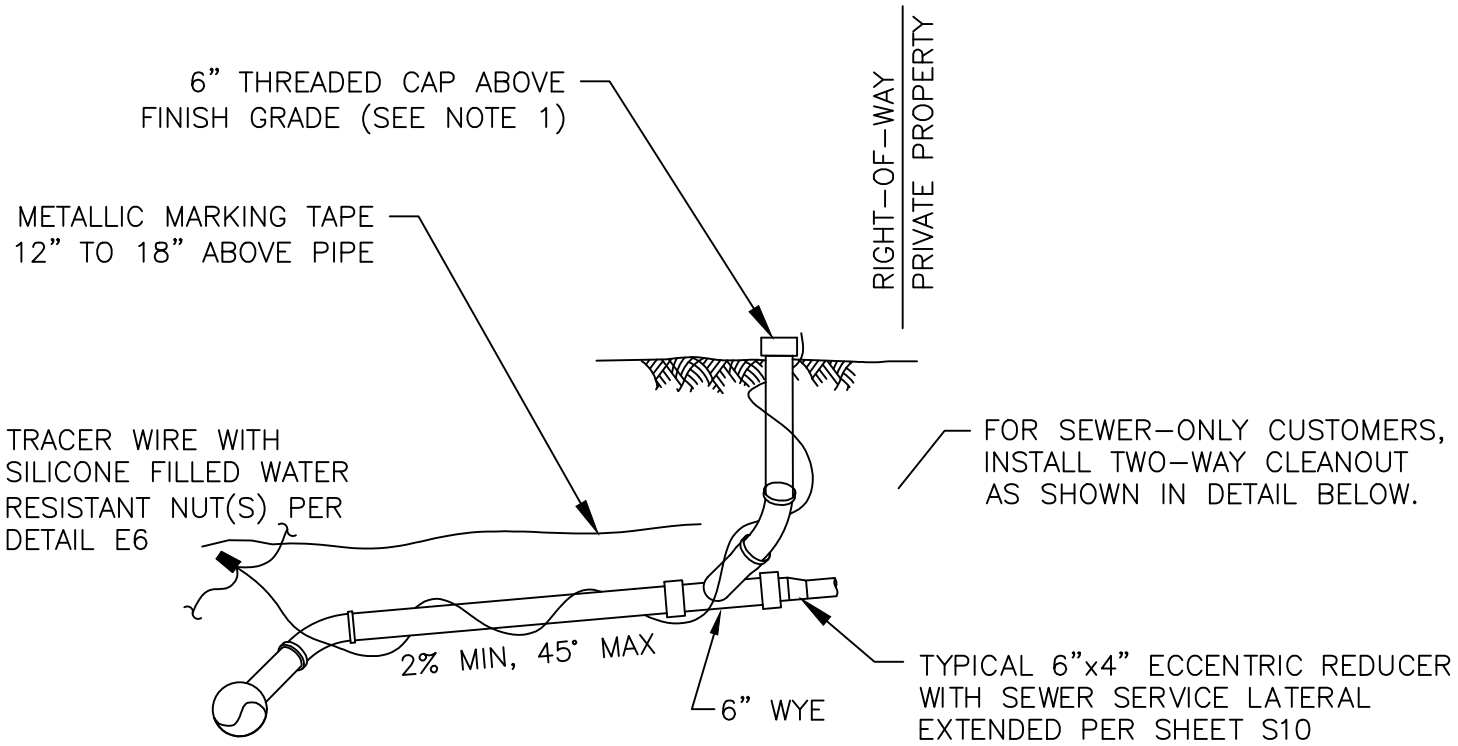




NOTES;

1. Install wye fitting with gaskets for new sewer installations
2. Pipe bedding shall Gravel Backfill for Pipe Zone Bedding per WSDOT 9–03.12(3).
3. Minimum cover to finish grade is 36".
4. Core drill hole then remove coupon. Do not drop coupon into pipe.

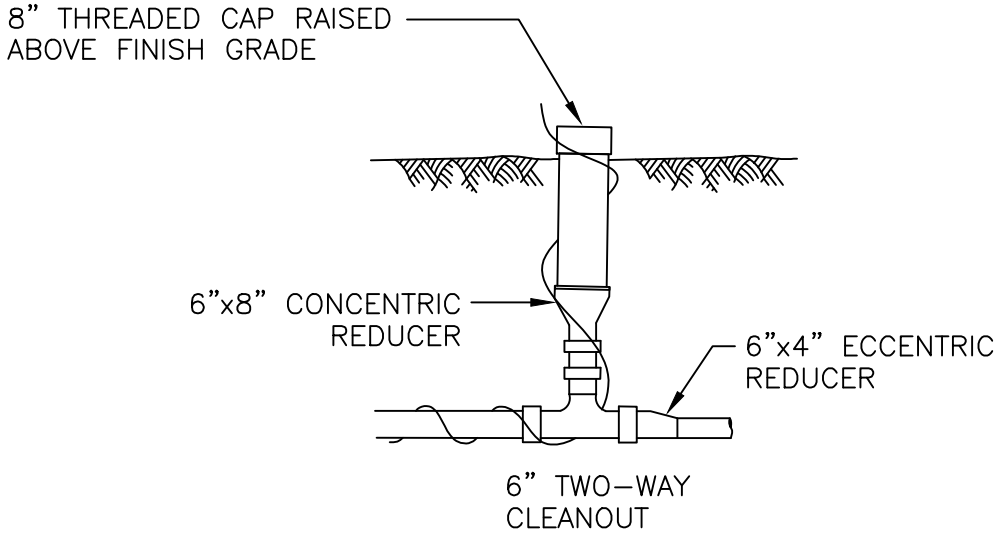
CONNECTION TO EXISTING SEWER (TAP)



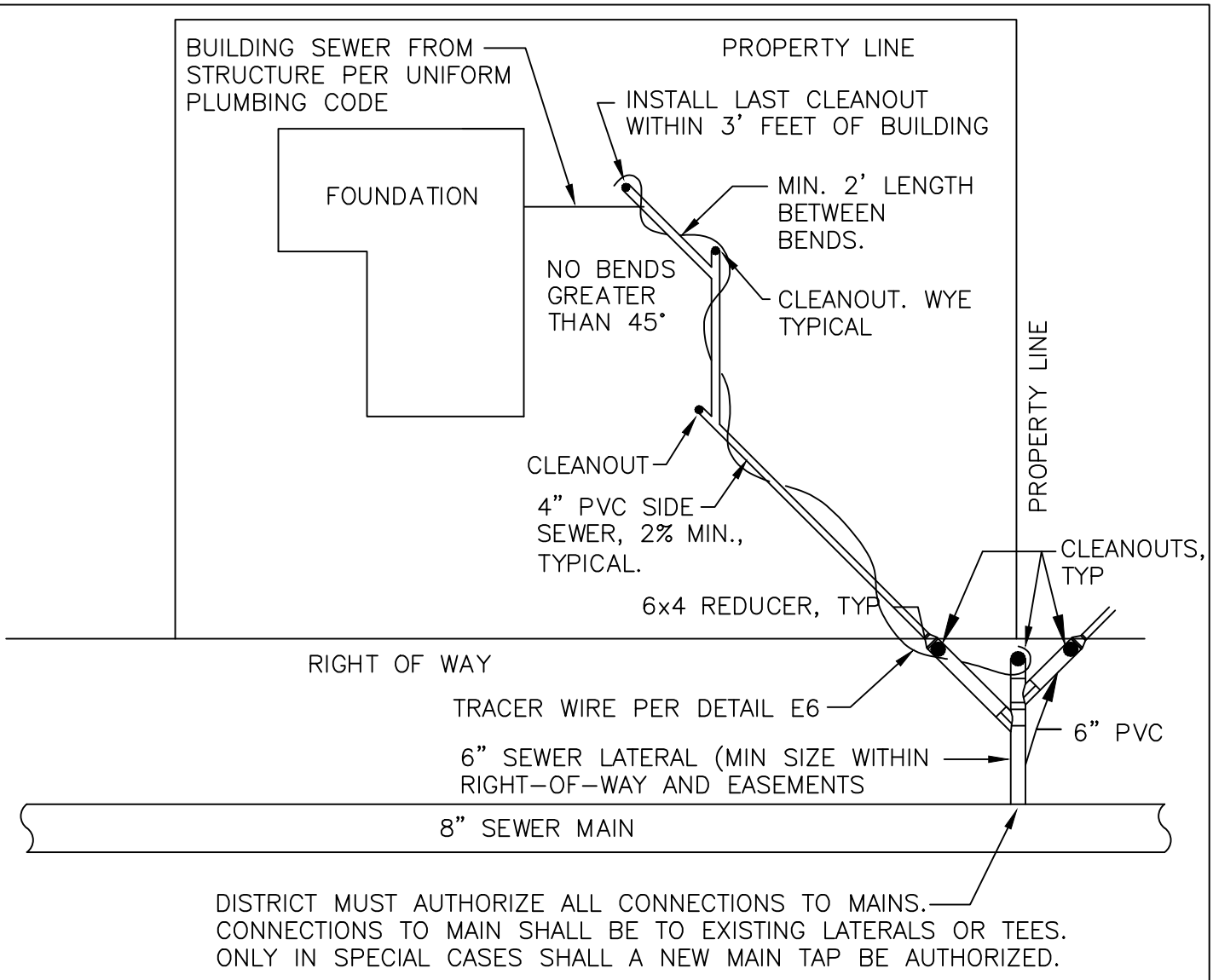
TYPICAL SINGLE SEWER SERVICE LATERAL & CLEANOUT

NOTES:

1. For future sewer service lateral connections install a 6-inch plug immediately upstream of cleanout and stake location with a 2"x4"x8" treated marker post, embedded 4-ft below grade, painted green, and marked with depth to pipe. Wrap cleanout with tracer wire.



CLEANOUT FOR SEWER-ONLY CUSTOMERS.



NOTES:

NOTES REVISED TO REMOVE REDUNDANCY WITH DRAWING.

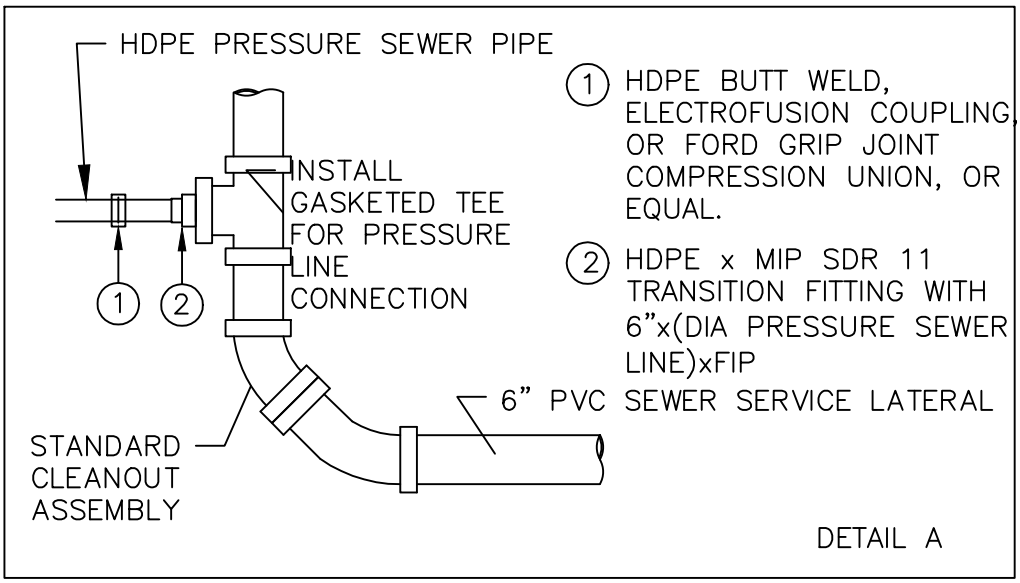
1. All pipe from main to cleanout at foundation shall be PVC ASTM D3034 SDR 35, joints shall conform to ASTM D3212 using elastomeric gaskets conforming to ASTM F477. Fittings shall be injection molded, factory welded, or factory solvent cemented.
2. Minimum 18" of cover from property line to building.
3. Down spouts, sump pumps, outside drains and storm drainage shall not be connected to sewer pipes.
4. Minimum size for side sewer pipe is 4" for single family residence and 6" for multi-family residence up to a 4 plex.
5. Cleanouts on side sewer pipe shall be installed at every change in horizontal alignment in excess of 22 1/2 degrees.
6. Cleanouts shall be installed at intervals not to exceed 100 feet.
7. Cleanouts shall be installed for each aggregate horizontal change in direction exceeding 135 degrees.
8. Transitions of different pipe material type shall be with a MAXADAPTER coupling.
9. Side sewers or service laterals passing under existing or future retaining walls must be installed within a District approved casing pipe per DCS.

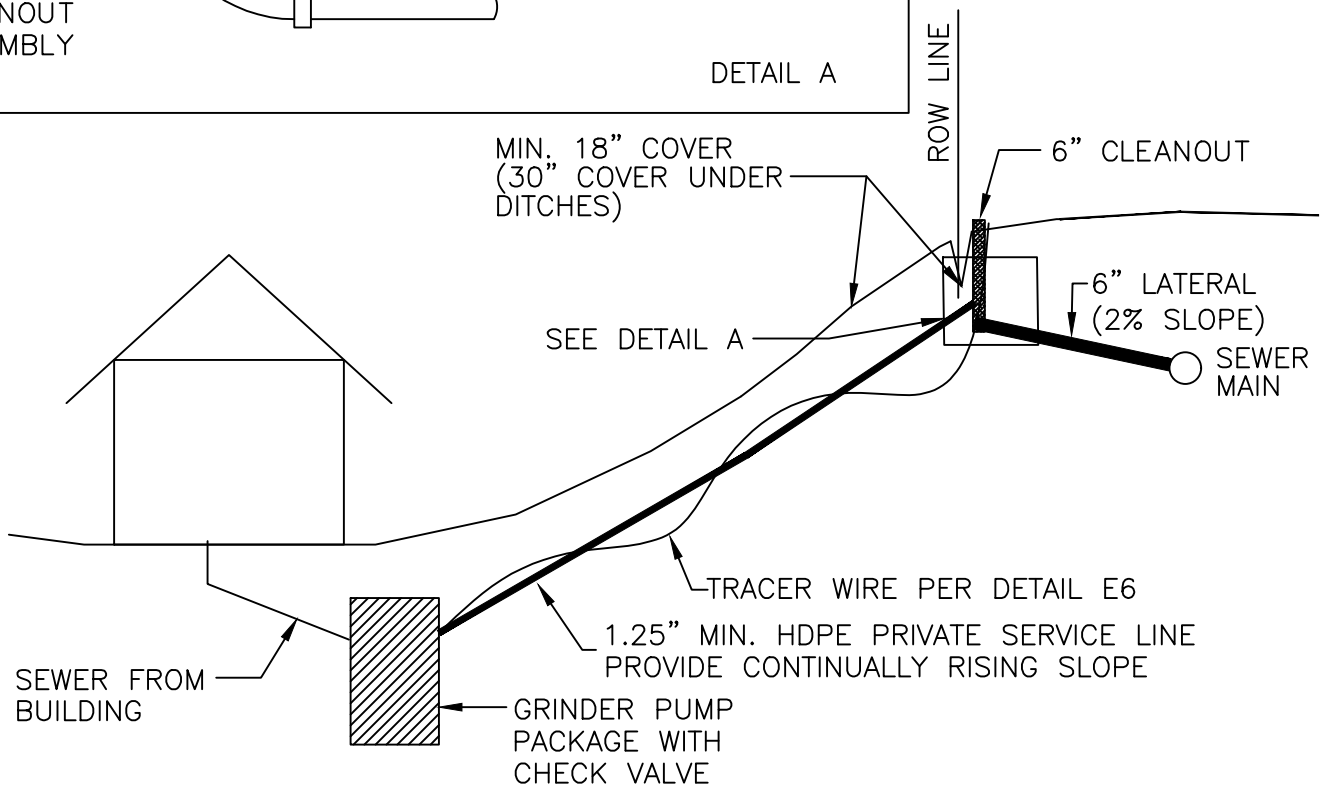
LAKE WHATCOM WATER & SEWER DISTRICT

GRAVITY SIDE SEWER INSTALLATION

STANDARD DETAIL

S10





NOTES:

1. Pressure sewer service pipe shall be PE 3408 HDPE conforming to the requirements of ASTM D–3350. Piping shall be SDR11, IPS (OD), pressure rated at 160 PSI, conforming to the requirements of AWWA C901 and ASTM F714. Fittings shall be electro–fusion welded socket joints. or Ford Grip Joints or equal.

2. See Dept. of Ecology (DOE) Criteria for Sewage Works Design, Sections C1–10.1 and C1–10.2 and DCS 5.2.2 for required grinder pump package components.

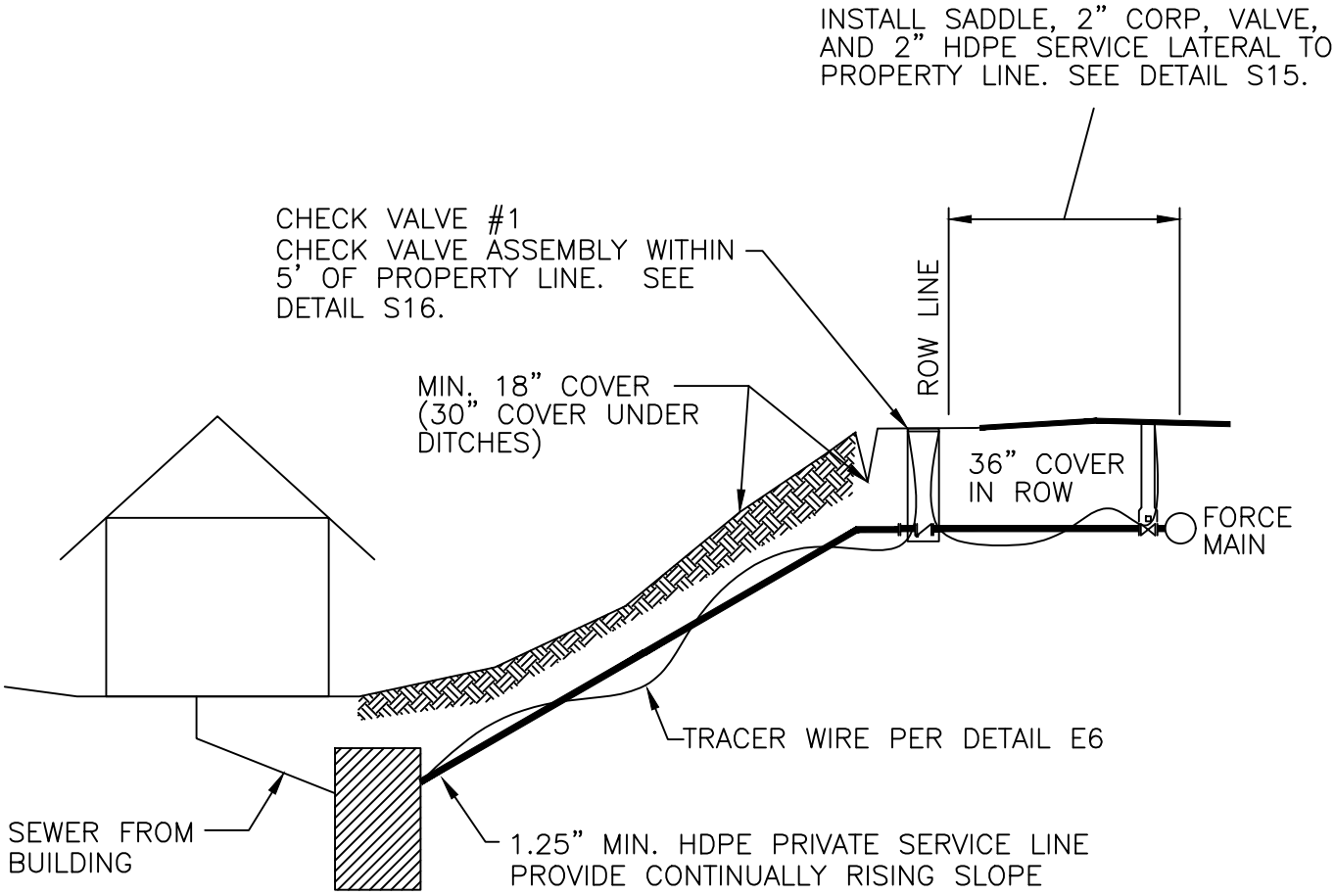
NOTE REVISED TO REFERENCE ECOLOGY MANUAL FOR GRINDER PUMP COMPONENTS.

LAKE WHATCOM WATER & SEWER DISTRICT

GRINDER PUMP SERVICE TO GRAVITY MAIN INSTALLATION

STANDARD DETAIL

S11



GRINDER PUMP (CHECK VALVE #2 AT GRINDER PUMP)

NOTES:

1. Pressure sewer service pipe shall be PE 3408 HDPE conforming to the requirements of ASTM D–3350. Piping shall be SDR11, IPS (OD), pressure rated at 160 PSI, conforming to the requirements of AWWA C901 and ASTM F714. Fittings shall be electro–fusion welded socket joints, or Ford Grip Joints or equal.

2. Two check valves are required between the pump station and the force main. One check valve shall be installed within 5' of the right–of–way in the check valve vault. The second valve shall be installed at the grinder pump.

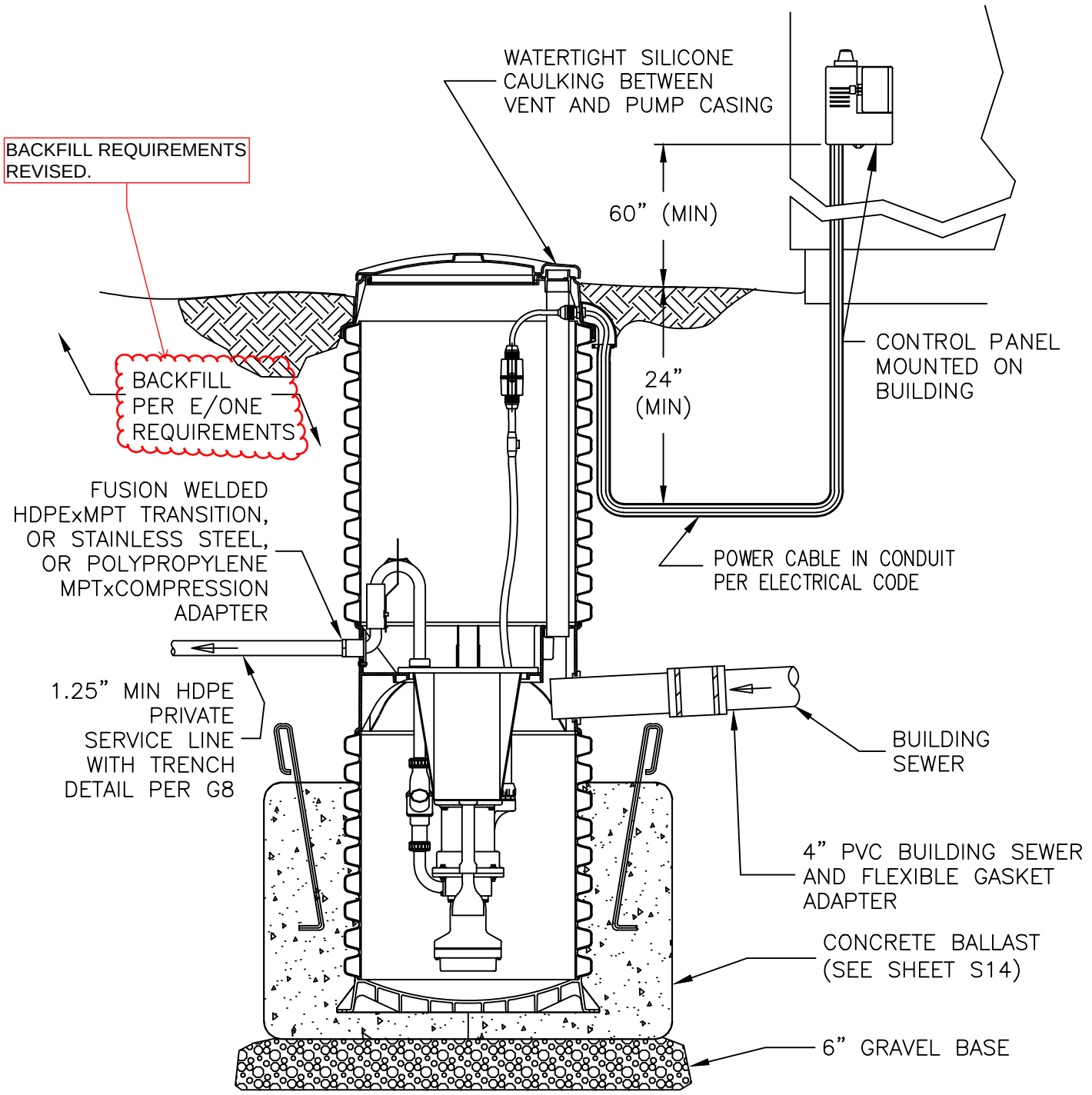
2. See Dept. of Ecology (DOE) Criteria for Sewage Works Design, Sections C1–10.1 and C1–10.2 and DCS 5.2.2 for required grinder pump package components.
3.

LAKE WHATCOM WATER & SEWER DISTRICT

GRINDER PUMP SERVICE TO FORCE MAIN INSTALLATION

STANDARD DETAIL

S12



NOTES:

1. Install E/One tank assembly and panel per manufacturer's installation manual and follow requirements for manufacturer's warranty.
2. All fittings shall be brass or Type 316 stainless steel compression fittings, unless specifically noted otherwise.
3. Alarm panel and electrical inspected by others.

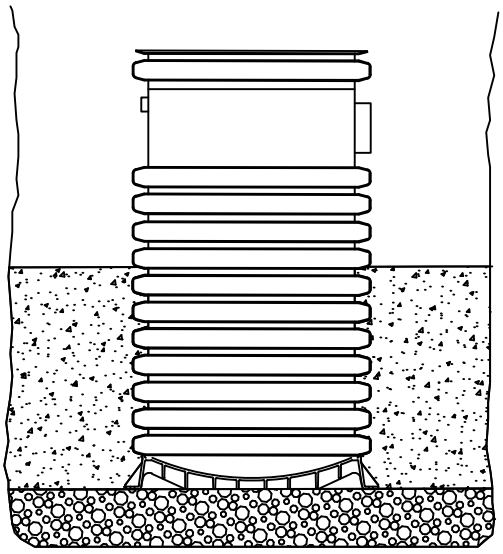
LAKE WHATCOM WATER & SEWER DISTRICT

TYPICAL E/ONE GRINDER PUMP INSTALLATION

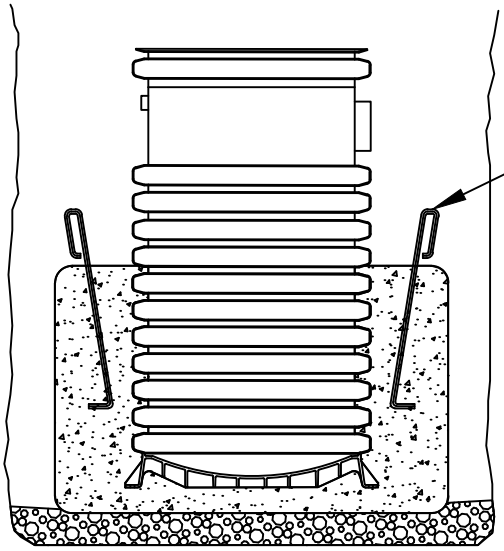
STANDARD DETAIL

S13

1/28/2026



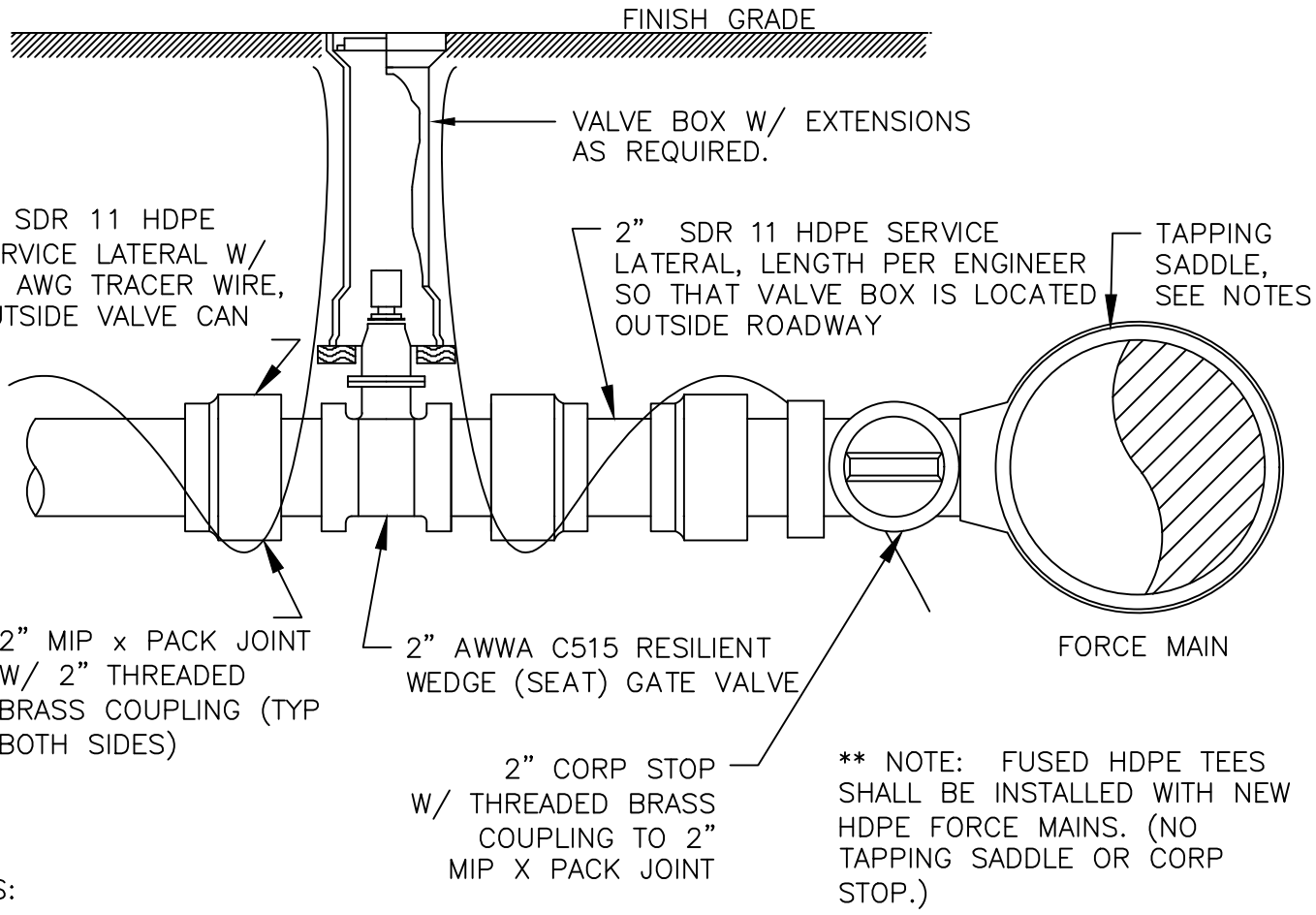
POURED IN PLACE



PRECAST

NOTES:

1. Calculate ballast quantities per manufacturer's recommendations.



NOTES:

1. HDPE Service Saddles. Saddles for use on SDR 17 HDPE mains shall be epoxy or nylon coated ductile iron tapping saddles with a double stainless steel strapping mechanism specifically recommended by the manufacturer for use on HDPE piping. Saddles shall be Romac style 202N–H or approved equal.

2. PVC Service Saddles. Saddles for use on AWWA C900 PVC mains shall have epoxy or nylon coated ductile iron tapping saddles with a double strap stainless steel strapping mechanism. Service saddles shall be Romac style 202N or approved equal.

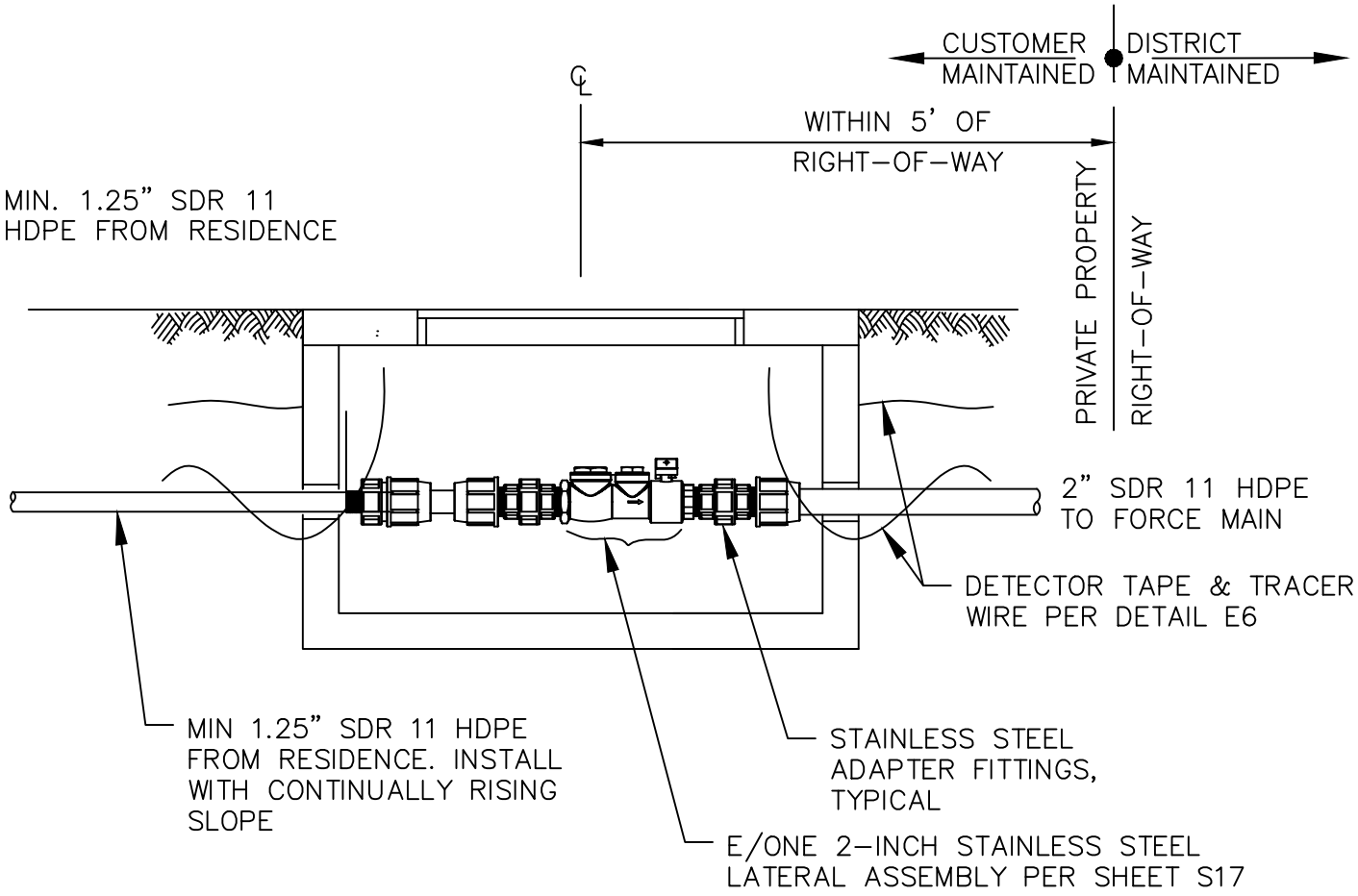
3. Ductile Iron Service Saddles. Saddles for use on ductile iron mains shall have epoxy or nylon coated ductile iron tapping saddles with stainless steel tapping mechanism. Service saddles shall be Romac style 101NS or approved equal.

4. Customer Service Shutoff Valves. Shutoff gate valves shall be M&H AWWA C515 resilient wedge type gate valves, or approved equal, in conformance with AWWA C515 and AWWA C550. Bolts, nuts and washers shall be ASTM Type 304 stainless–steel. Gate valve placement shall be outside of travel lanes to a location directed by the Engineer.

5. Valve boxes shall have the word "SEWER" cast into the cover.

6. Fittings. All fittings shall be brass or Type 316 stainless steel.

REVISED TO REMOVE REDUNDANCY.



NOTES:

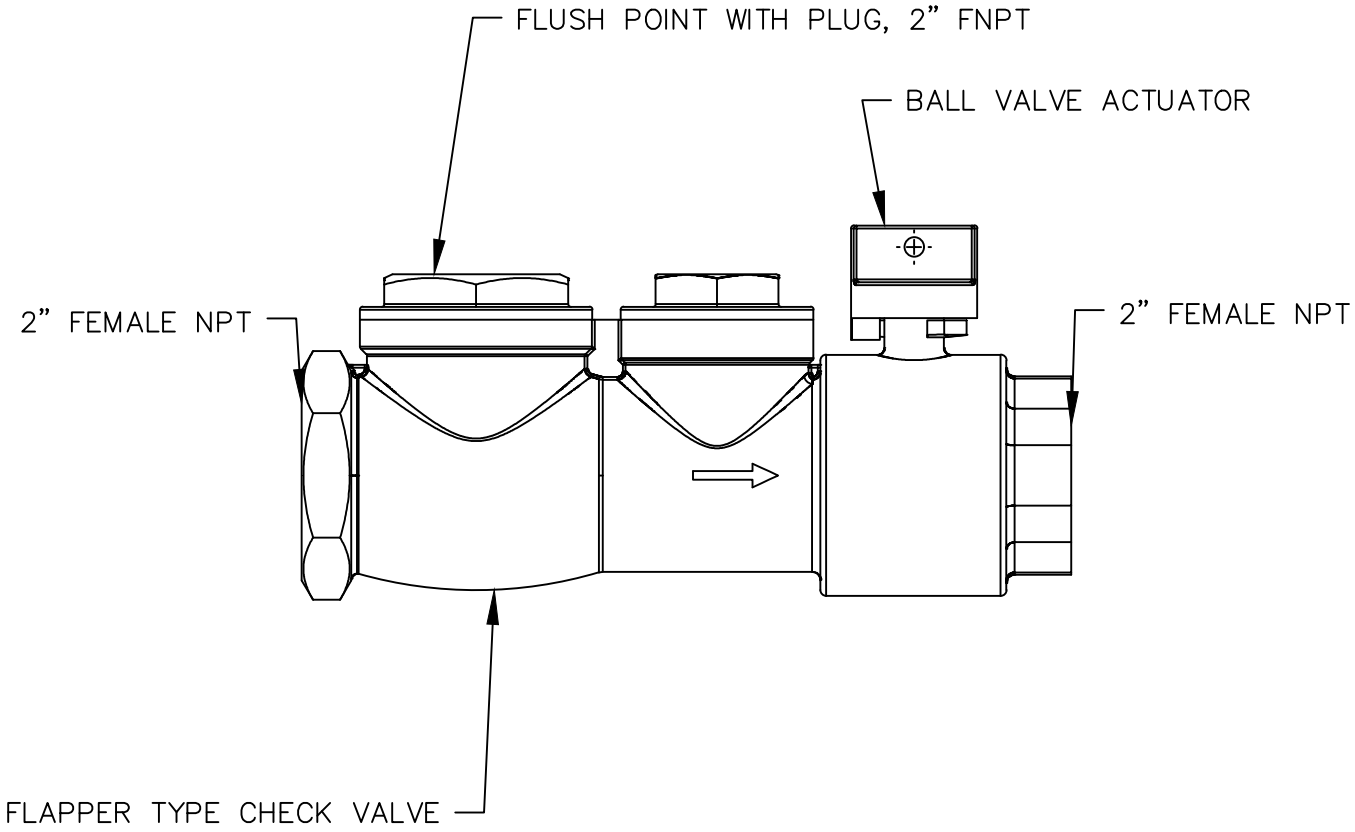
1. Vault. Vault shall be a pre–cast concrete hand hole with a minimum 2'–0" by 3'–0" inside diameter and a maximum 4'–0" inside depth. Hand hole and access hatch shall be traffic rated. Access hatch shall be galvanized steel checker plate with pick holes and bolt down holes in plate and shall be designed for H–20 loading when within or adjacent to roadway or driveways. Lid shall be marked "SEWER" with 2" raised letters. Check valve vaults shall be Utility Vault Model 2436 hand hole or approved equal.

2. Air/Vacuum Valve. Where required, in cases where continually rising slope cannot be obtained, an air relief and combination air relief/ vacuum relief valves shall be installed. Air/Vacuum valve shall be as manufactured by Orenco, Apco, Crispin, ARI, or equivalent for sewer service. All valves shall be on private property and be fully accessible to enable customer's operation, maintenance and repair.

3. Fittings and Adapters. Adapter fittings shall be Type 316 stainless steel or polypropylene. Install with appropriate adapters/union fittings for future maintenance and quick disassembly. All fittings, adapters and pipe shall be rated for minimum 235 psi.

4. Install all fittings and adapters per manufacturer's recommendations.

5. Assembly and pipe shall be pressure tested.



NOTES:

1. Assembly shall be brass or Type 316 stainless steel with min 235 psi pressure rating.

2. Assembly is a ball valve curb stop with female pipe threads, valve position stops (open/closed), with flush point and integral check valve. Assembly shall be E/One 2" Lateral Assembly NC0443P01 or approved equal.

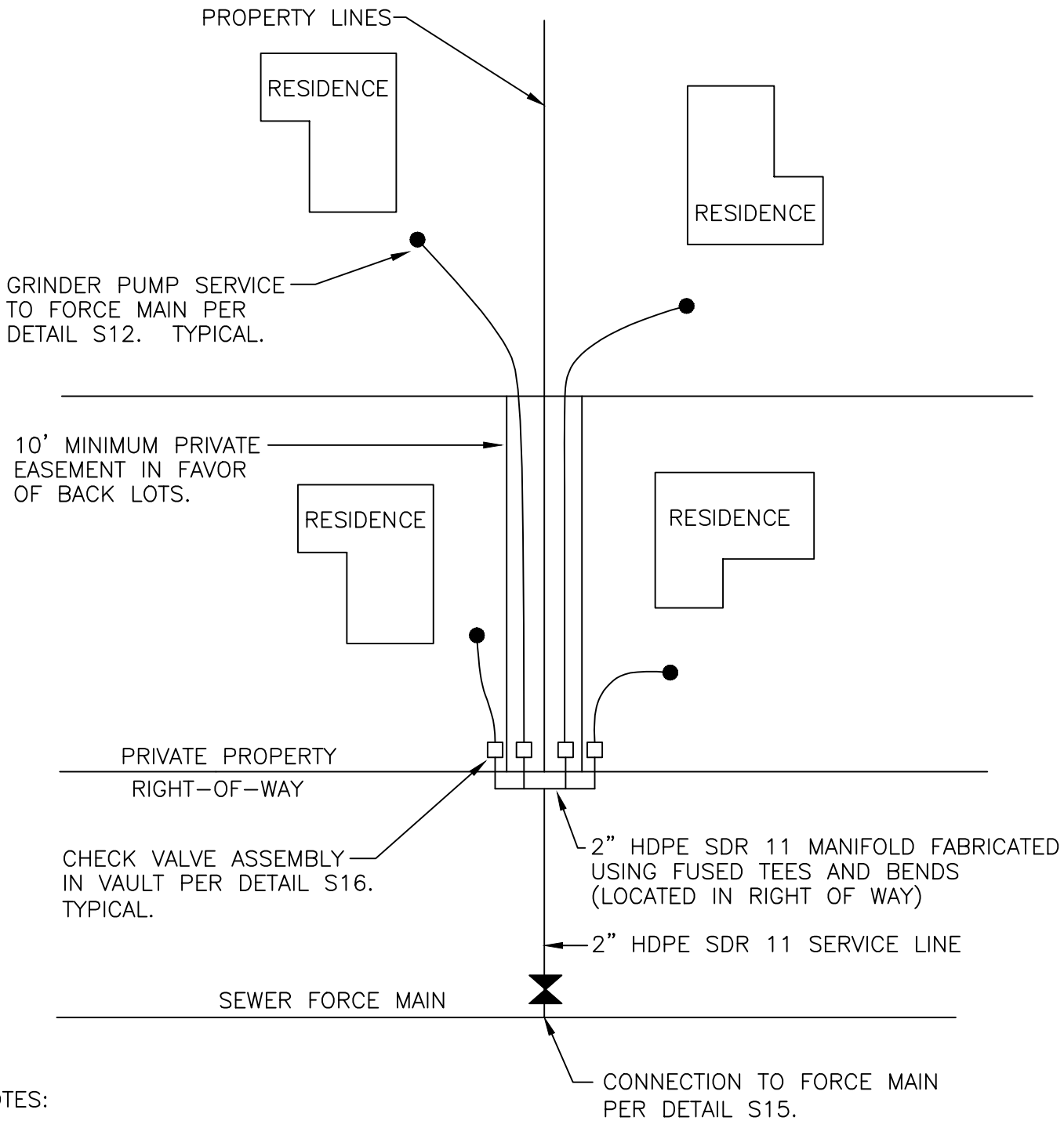
LAKE WHATCOM WATER & SEWER DISTRICT

E/ONE 2" LATERAL ASSEMBLY

STANDARD DETAIL

S17

1/28/2026



NOTES:

1. If approved by the District Engineer, a single 2" service tap may be shared with multiple residences. District will review requests for shared taps on a case by case basis. Property owners desiring to install a shared tap, shall individually but at the same time, submit a sewer permit application with the grinder pump check list for review by the District.
2. Manifold must be fabricated using fused HDPE tees and bends by a contractor certified by a HDPE pipe or fusion machine manufacturer.
3. Install a gate valve and blind flange on all unused connections on the manifold.

Added for clarity and connection to other District guidance documents.

ELECTRICAL, TELECOMMUNICATION AND AUTOMATIC CONTROL NOTES

These Standard Details, together with the most current versions of the District's full Design and Construction Standards (DCS) and the District Administrative Code, incorporated herein by reference, shall govern all District design and construction activities.

1. Provide all electrical work and appurtenances in accordance with the latest edition of the National Electric Code (NEC), National Electric Safety Code, Washington State Electrical Code, and local regulations and ordinances.

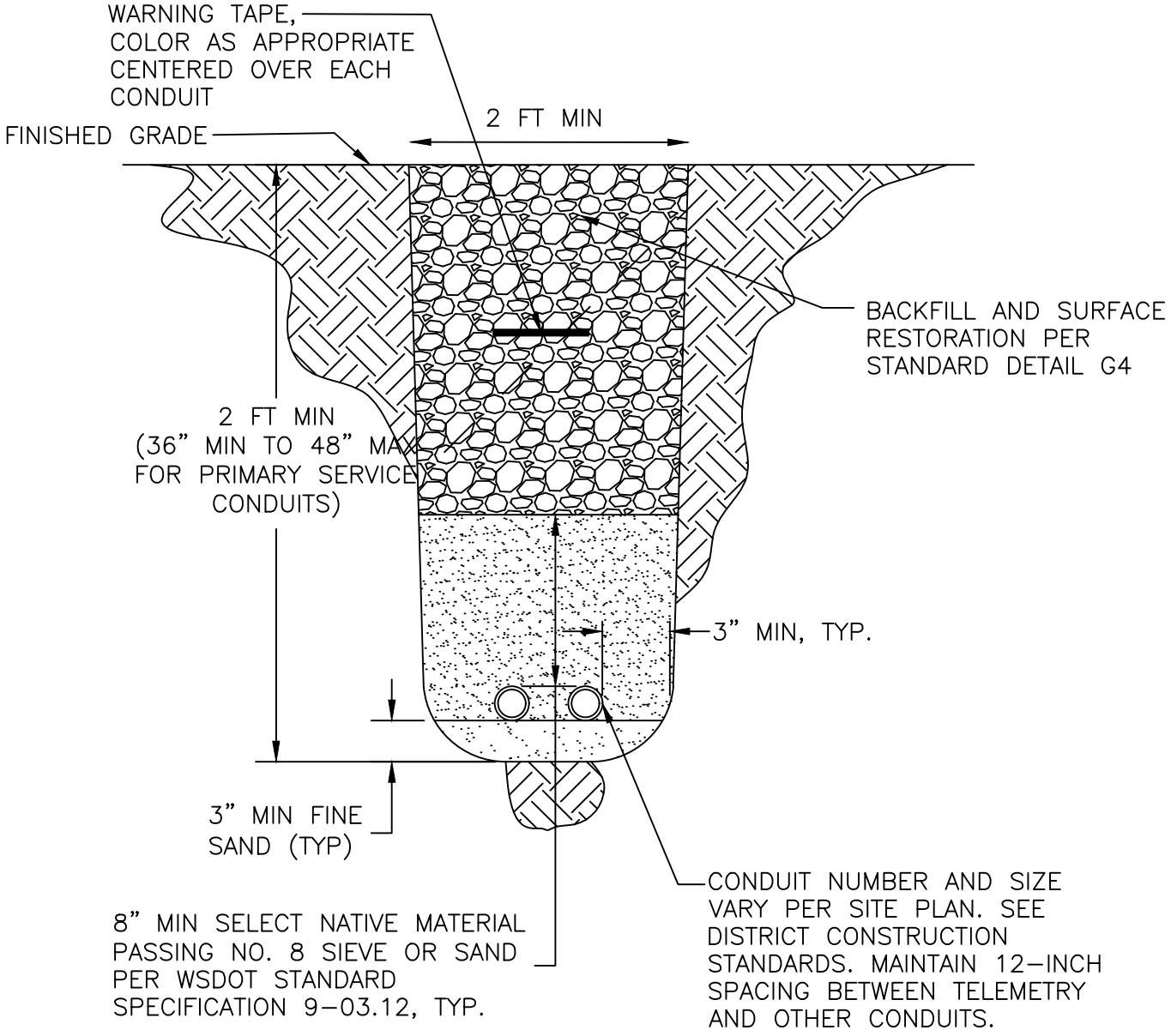
2. All electrical products shall bear a label from a certified testing laboratory recognized by the State of Washington. Recognized labels in the State of Washington are UL, ETL and CSA–US.

3. The contractor shall coordinate and provide all permits, licenses, approvals and inspections by the authority having jurisdiction, and other arrangements for the work on the project. All fees shall be paid by the Contractor.

4. Test reports shall be submitted to the Engineer prior to acceptance.

5. Test all circuits for continuity, freedom from ground and proper operation during progress of work.

6. Conduct final testing in the presence of the District Engineer.



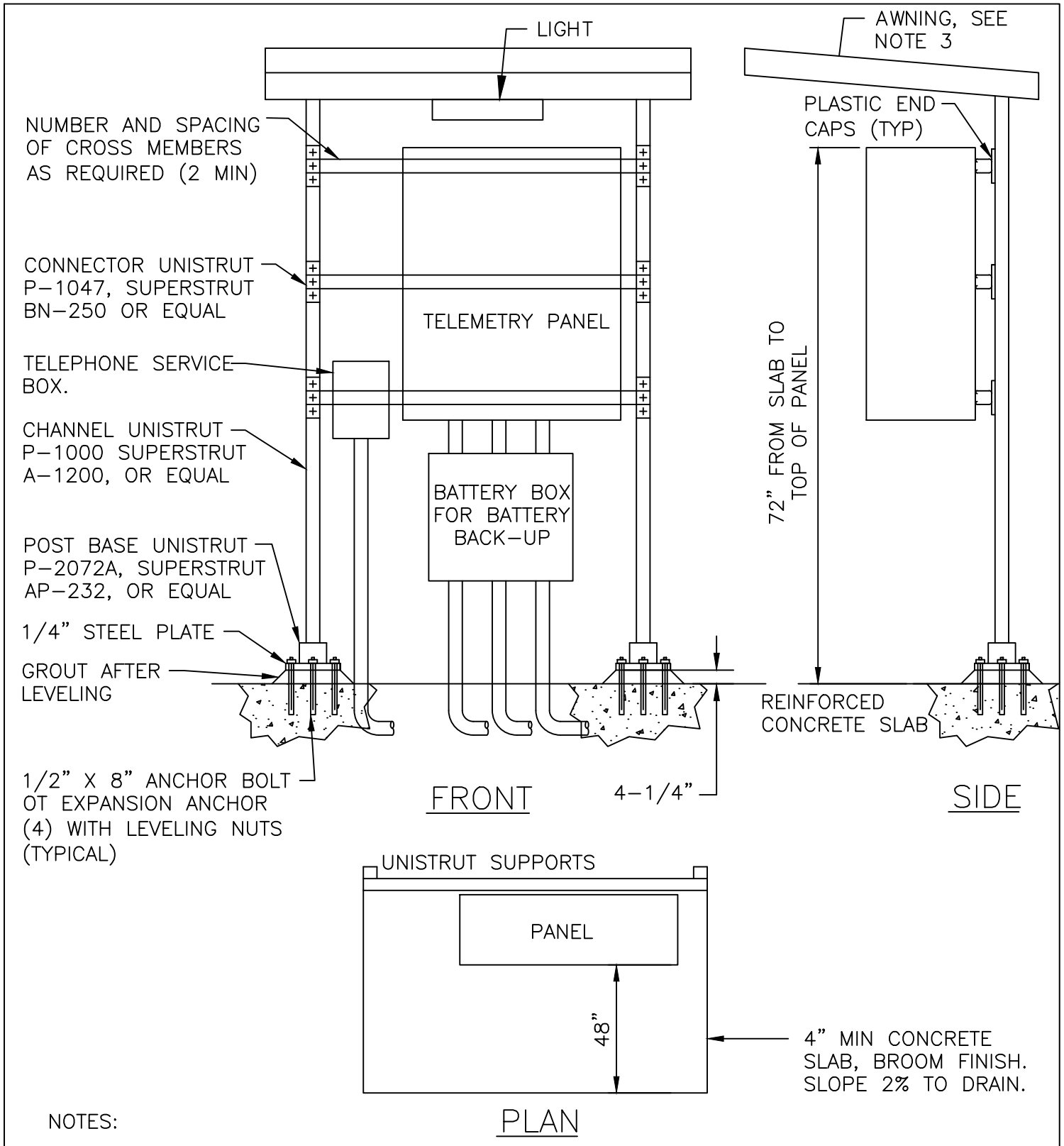
LAKE WHATCOM WATER & SEWER DISTRICT

TYPICAL ELECTRICAL / TELECOMMUNICATION / AUTOMATIC CONTROL TRENCH

STANDARD DETAIL

E2

3/11/2020



NOTES:

1. Rack channels and fittings shall be hot dipped galvanized steel.
2. Telephone service lines shall be installed in conduit, both above and underground.
3. Provide weatherproof awning with standing seam metal roofing, facia, gutters and downspout routed away from shelter. Roof pitch shall be 3/12 pitch.
4. Bollards required, not shown.

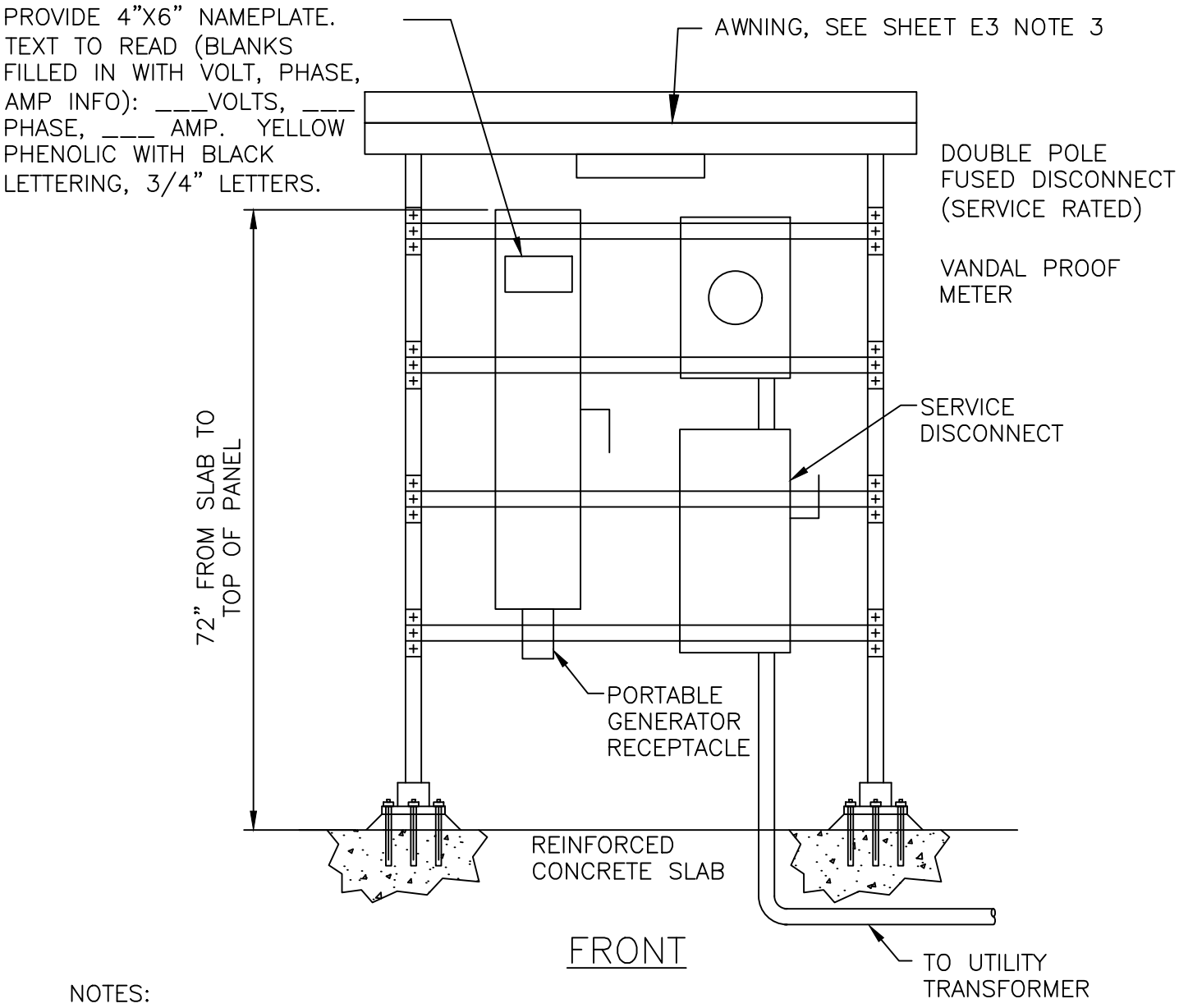
LAKE WHATCOM WATER & SEWER DISTRICT

TELEMETRY PANEL

STANDARD DETAIL

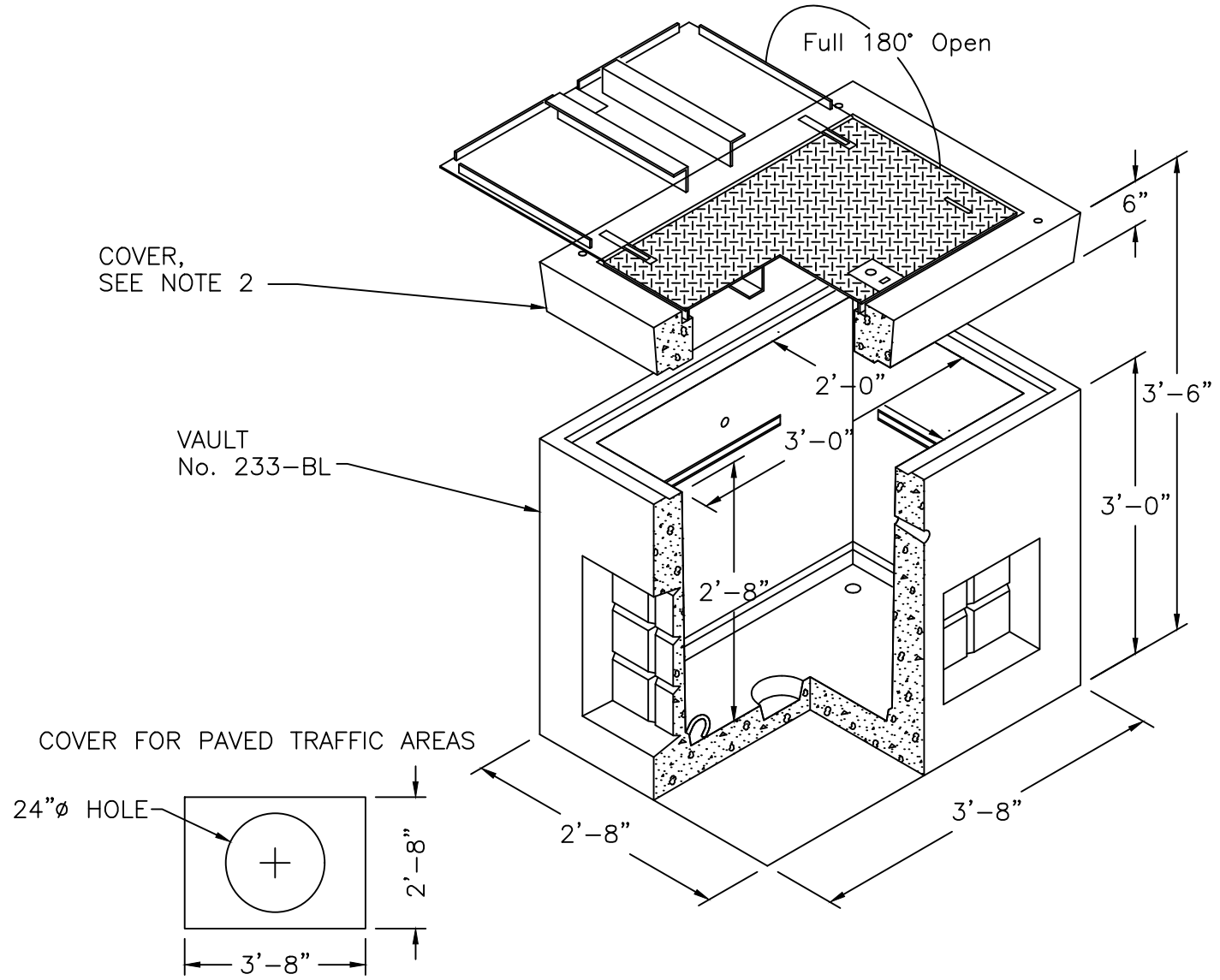
E3

3/11/2020



NOTES:

1. See LWWSD Standard Detail E3 – Telemetry Control Panel for unistrut system and concrete slab requirements. Concrete slab shall extend out 48" from face of panels.
2. Utility equipment may be mounted on back of telemetry panel rack.
3. Portable generator receptacle shall be 480 volt, 3–phase, 4 wire service, 100 amp with reversed contacts (female). Receptacle shall be provided complete with cast back box, angle adapter, gaskets, and a gasketed screw–type, weathertight cap with chain fastener. Receptacle shall be Crouse–Hinds "Arktite", Appleton "Powertite", or approved equal.
4. Manual transfer switch shall be a heavy duty (not general or light duty) double–throw MTS, fused as required to comply with NEC as manufactured by ABB, Cutler Hammer, Square D, Westinghouse, or equal.
5. All equipment shall be fitted with locking mechanisms, keyed to match District locks, that can be locked in both "ON" and "OFF" positions.
5. Bollards required, not shown.



No. 23–24C WITH 4220 DUCTILE IRON COVER AND FRAME.

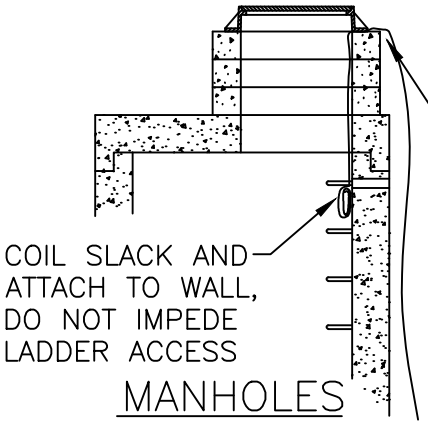
NOTES:

1. Utility Vault base No. 233–LA or approved equal. Dimensions shown as minimum.

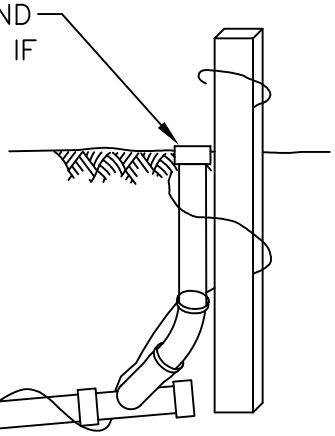
2. Covers shall be rated for H–20 traffic loads. In non–traffic and gravel shoulder areas install hatch cover No. 23–2436P. In paved traffic areas install 4220 Ductile Iron Cover and Frame.

3. Sump knockout in floor, to drain to daylight.

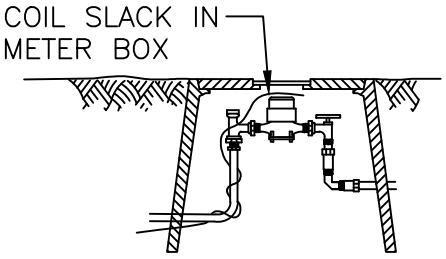
4. Handholes shall be spaced every 500 to 1000 feet and installed at changes in conduit direction.



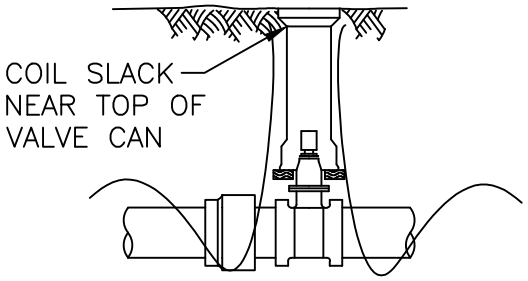
MANHOLES



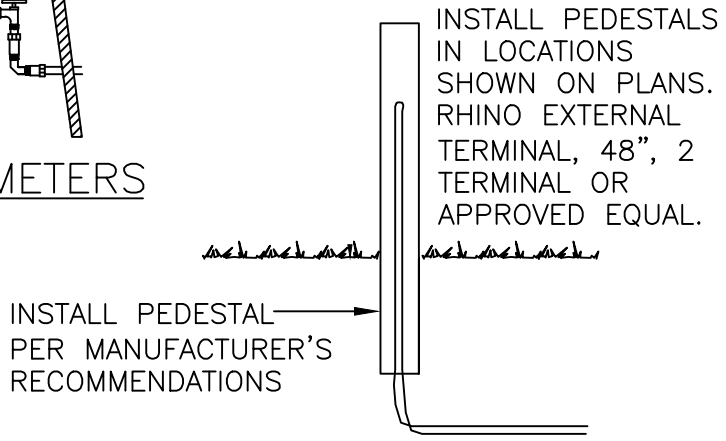
SEWER CLEANOUTS



WATER METERS



VALVE CANS



TRACER WIRE PEDESTAL

NOTES:

1. Tracer wire installation is required on all District owned pipe and communication lines. Tracer wire is also required on sewer service connections and water service connections and private water services.

2. Tracer wire shall be 10 AWG insulated copper wire rated for direct burial in wet locations. Use green insulation for sewer, blue insulation for water, and orange insulation for fiber/communication related utilities.

3. Install tracer wire in continuous lengths (no splices) between surface access points. Any direct bury splices shall be approved and inspected by the District Engineer prior to cover. Splices shall be made with silicone filled wire nuts rated for direct burial in wet locations such as "Ideal Underground Wire Connectors", "Ideal Mudbug Connectors," "Copperhead Snakebite Connectors," or "3M DBR Direct Bury Splice Kit."

4. Tape tracer wire to pipe at 10–foot intervals.

5. Provide at least 2–feet of coiled tracer wire slack at surface access points.

AGENDA BILL Item 8.A	**General Manager's Report**			
DATE SUBMITTED:	January 22, 2026	MEETING DATE:	January 28, 2026	
TO: BOARD OF COMMISSIONERS		FROM: Justin Clary, General Manager		
GENERAL MANAGER APPROVAL				
ATTACHED DOCUMENTS		1. General Manager's Report 2. Goal Performance Status Report		
TYPE OF ACTION REQUESTED		RESOLUTION ☐	FORMAL ACTION/ MOTION ☐	INFORMATIONAL /OTHER ☒

BACKGROUND / EXPLANATION OF IMPACT
Updated information from the General Manager in advance of the Board meeting.

FISCAL IMPACT
None.

RECOMMENDED BOARD ACTION
None required.

PROPOSED MOTION
None.

LAKE WHATCOM WATER AND SEWER DISTRICT

General Manager's Report

Upcoming Dates & Announcements

Regular Meeting – Wednesday, January 28, 2026 – 8:00 a.m.

Important Upcoming Dates

Lake Whatcom Water & Sewer District			
Regular Board Meeting	Wed Feb 11, 2026	6:30 p.m.	Board Room/Hybrid
Employee Staff Meeting	Thu Feb 12, 2026	8:00 a.m.	Board Room/Hybrid Commissioner Carter to attend
Investment Comm. Meeting	Wed Jan 28, 2026	10:00 a.m.	Board Room/Hybrid
Safety Committee Meeting	Thu Jan 22, 2026	8:00 a.m.	Board Room
Lake Whatcom Management Program			
Policy Group Meeting	Wed Feb 4, 2026	3:00 p.m.	City of Bellingham Pacific St Ops Center, 2221 Pacific Street
Joint Councils Meeting	Wed Apr 1, 2026	6:30 p.m.	Bellingham City Hall 210 Lottie Street
Other Meetings			
WASWD Section III Meeting	Tue Feb 10, 2026	6:00 p.m.	Bob's Burgers 8822 Quil Ceda Pkwy, Tulalip, WA
Whatcom County Council of Governments Board Meeting	Wed May 13, 2026	3:00 p.m.	Council of Governments Offices 314 E Champion Street/Hybrid

Committee Meeting Reports

Safety Committee:

- The committee met on January 22; discussion included the status of review of safety programs, the District's pursuit of START program certification through the Department of Labor & Industries, and status of installation of spill mitigation measures on the sodium hypochlorite tank at the Agate Heights water treatment plant.

Investment Committee:

- No committee meeting has been held since the last board meeting.

Upcoming Board Meeting Topics

- Personnel Policies Manual update
- City of Bellingham Scenic Avenue water intertie temporary use interlocal agreement
- City of Bellingham wastewater treatment plant capital projects presentation
- 2025-26 Budget amendment
- Private lending approval (Geneva Reservoir Improvements)

2026 Initiatives Status

Administration and Operations

Water Right Adjudication

- Represent the District in the Water Resource Inventory Area (WRIA) 1 water right adjudication to ensure that its certificated and permitted rights are protected.
  The District received the adjudication documents in March 2025. District staff and counsel are now finalizing claim forms specific to each water right for submittal to Whatcom County Superior Court by the May 1, 2026 deadline, as well as evaluating the potential impact to the District of motions filed by other parties in December 2025.

Water and Sewer Rates Analysis

- With the current multi-year rate structure adopted through 2026, lead the District through a comprehensive review of water and sewer rates with the goal of adopting a new 5-year rate structure prior to development of the 2027-28 biennial budget.
  The rate analysis is scheduled to begin Spring 2026.

2027-28 Biennial Budget

- Develop a balanced budget for the 2027-28 biennium.
  Budget development is scheduled to begin in Summer 2026 following adoption of a new multi-year rate structure.

Succession Plan

- With several staff retirements anticipated over the next five years, update the District's succession plan.
  An update to the succession plan was completed in December 2025.

EUM Assessment/Strategic Plan

- Facilitate the AWWA Effective Utility Management assessment with board and staff and perform an update of the District's 6-year strategic business plan based upon the outcome of the EUM assessment.
  The EUM assessment is scheduled for Spring 2026.

APWA Accreditation

- Continue work towards multi-year effort to gain American Public Works Association accreditation.
  The accreditation team is reviewing/completing the 273 accreditation practices applicable to the District (100 practices have been completed to-date).

Emergency Response/System Security/Safety

Emergency Readiness

- Continue use of Whatcom County Department of Emergency Management services to hold tabletop and/or field emergency response exercises.
  2026 emergency response exercises will be scheduled for Summer/Fall 2026.

AWIA Compliance

- Complete an update to the District's facility risk assessment in compliance with the American Water Infrastructure Act of 2018 (AWIA) deadline of June 30, 2026.
  District staff have initiated review of the assessment.

- Complete an update to the District's emergency response plan in compliance with the AWIA deadline of December 31, 2026.
  Update of the District's ERP will be initiated following completion of the facility risk assessment update.

Safety Program Update

- Continue systematic review and revision of District's safety programs by updating nine programs in 2026.
  Staff are reviewing the hearing conservation and personal protective equipment programs.

L&I START Program

- Initiate a multi-year effort to obtain District certification through the Washington State Department of Labor & Industries Safety Through Achieving Recognition Together (START) program.
  A District commitment letter associated with program participation was sent to L&I on January 12.

Community/Public Relations

General

- Website
  The District's web content is reviewed and updated on a regular basis.
- Social Media
  Posts are made to District Facebook, LinkedIn, and Nextdoor pages regularly; Nextdoor is also regularly monitored for District-related posts.
- Press Releases
  No press releases have been issued year-to-date.

Intergovernmental Relations

- *J Clary attended a Whatcom Water Alliance coordination meeting on January 14 and chaired the quarterly meeting on January 20*.
- *J Clary met with The Firs executive director on January 16 to coordinate relinquishment of an easement associated with the former Division 7 reservoir on Camp Firwood property*.
- *J Clary met with several legislators during Public Works Board Day on the Hill on January 22*.
- *J Clary and R Munson are scheduled to attend a kick-off meeting on January 28 associated with update of the Whatcom County Natural Hazards Mitigation Plan*.

Lake Whatcom Water Quality

Lake Whatcom Management Program

- Participate in meetings of Lake Whatcom Management Program partners.
  J Clary attended the interjurisdictional coordinating team meeting on January 15.

2025-2030 Strategic Business Plan Implementation Status
Lake Whatcom Water and Sewer District

	Executive Department Goals	2025	2026 YTD	2027	2028	2029	2030
1.	**Facilitate achievement of annually established Board inititatives**						
	Workload Indicators						
	- Meetings with management team to attain Board initiatives	47					
	- Reporting on the status of completion of Board initiatives	22					
	- Annual number of Board initiatives	8					
	- Annual number of Board meetings/work sessions held	22					
	Performance Measures						
	- Completion of initiatives within Board/staff agreed timelines	complete					
2.	**Biennial EUM self-assessment and update to strategic plan**						
	Workload Indicators						
	- Draft departmental strategic plans by June 30 of even-numbered years						
	- Financial forecast updated biennially (even-numbered years)						
	- Balanced budget presented to the Board biennially						
	Performance Measures						
	- Complete strategic plan and financial forecast by Sep 1 (even-numbered years)						
3.	**Maintain intergovernmental relations program**						
	Workload Indicators						
	- Participation in LWMP data group, ICT, policy group, and joint councils meetings	yes					
	- Participation in WWA, WUCC, COG, and Whatcom Water Districts meetings	yes					
	- Participation in WASWD and WSRMP meetings	yes					
	- Meet with City, County, SVCA, and SWFA staff	no					
	- Attendance of WASWD and IACC conferences	no					
	- Presentation at SVCA board meetings	no					
	Performance Measures						
	- Annual budgetary allocation supporting organization memberships	complete					
	- Number of LWMP meetings attended	41					
	- Number of WWA, WUCC, COG, and Whatcom Water Districts meetings attended	23					
	- Number of meetings with City, County, SVCA, and SWFA staff	11					
	- Number of conferences attended	3					

2025-2030 Strategic Business Plan Implementation Status
Lake Whatcom Water and Sewer District

	Executive Department Goals	2025	2026 YTD	2027	2028	2029	2030
	- Number of presentations to SVCA board	0					
4.	**Enhance public relations program**						
	Workload Indicators						
	- Update of District website	no					
	- Issuance of press releases and Facebook posts on a regular basis	yes					
	- Active participation in community events	yes					
	Performance Measures						
	- Completion of website udpate by December 31, 2025 (postponed to rebranding)						
	- Completion of District rebranding by December 31, 2028						
	- Number of Facebook followers	223					
	- Number of press releases issued	4					
	- Number of Facebook posts	39					
	- Number of community events participated in	1					
5.	**Maintain safety program**						
	Workload Indicators						
	- Staff review of District safety programs	complete					
	- Staff completion of online safety trainings	complete					
	- Staff attendance of required certification courses	complete					
	Performance Measures						
	- Annual review of a minimum of 9 safety programs	11					
	- Monthly meeting of the safety committee	12					
	- Annual number of safety inspections by management	6					
	- Annual number of lost time injuries and near misses	0					
6.	**Water rights adjudication participation**						
	Workload Indicators						
	- Attendance of adjudication-related presentations/meetings	yes					
	Performance Measures						
	- Claims filed for each District water right	0					
	- Documentation supporting claims filed with court						

2025-2030 Strategic Business Plan Implementation Status
Lake Whatcom Water and Sewer District

Executive Department Goals		2025	2026 YTD	2027	2028	2029	2030
7.	**American Public Works Association accreditation**						
	Workload Indicators						
	- Accreditation team status meetings	yes					
	- Consistent completion of accreditation-required metrics (Practice sub-goals)	yes					
	Performance Measures						
	- Number of Accreditation Team meetings held annually	1					
	- Number of Practice sub-goals completed annually	98					
	- Formal registration in 2026						
	- APWA accreditation in 2029						

2025-2030 Strategic Business Plan Implementation Status
Lake Whatcom Water and Sewer District

	Finance Department Goals	2025	2026 YTD	2027	2028	2029	2030
1.	**Improve performance standards and enhance professional growth**						
	Workload Indicators						
	- Regular review of job descripions and cross-train as duties allow	complete					
	- Identify applicable trainings and encourage accounting principles understanding	ongoing					
	- Issue weekly updates to staff	ongoing					
	- Increase training centered on accounting standards and best practices	ongoing					
	- Develop a comprehensive financial procedure manual	ongoing					
	Performance Measures						
	- Number of trainings and webinars attended	27					
	- Implement employee cross-training and development tracking system	ongoing					
	- Number of weekly updates from the Finance Manager	43					
	- Number of staff meetings and engagement activities	27					
	- Implement comprehensive financial procedures manual	ongoing					
2.	**Improve financial sustainability and forecasting**						
	Workload Indicators						
	- Development and routine evaluation of long-term forecasting model	ongoing					
	- Provide instructions/schedule for budget preparation						
	- Routine evaluation of biennial budget	ongoing					
	- Routine evaluation of financial policies	ongoing					
	- Routine evaluation of investments	ongoing					
	Performance Measures						
	- Alignment of overhead/personnel costs with rate revenue	ongoing					
	- Regular use and update to the forecasting model	ongoing					
	- Number of management team meetings to review cost alignment with budget	ongoing					
	- Financial policies are maintained to align with industry best practices/standards	yes					
	- Investment revenue increases while maintaining safety and liquidity requirements	yes					
	- Financials and financial policies comply with State Auditor's Office	yes					

2025-2030 Strategic Business Plan Implementation Status
Lake Whatcom Water and Sewer District

	Finance Department Goals	2025	2026 YTD	2027	2028	2029	2030
3.	**Maximize and utilize technology to improve workflow**						
	Workload Indicators						
	- Meet with banking representatives to improve daily deposit process	no					
	- Utilize records retention software to maintain payroll and benefites lifetime records	ongoing					
	- Convert accounts payable process to paperless	no					
	- Research implementation of Springbrook Cloud	in process					
	- Increase staff and management trainings on new technology and processes	ongoing					
	Performance Measures						
	- Implementation of remote deposit capture or electronic processing of checks	no					
	- Implementation of document management software for payroll and benefits records	in process					
	- Implementation of paperless accounts payable process	no					
	- Utilization of internal server drive for accounts payable records	no					
	- Number of meetings with Springbrook representatives re: Springbrook Cloud	2					
	- Number of trainings on recent technology and processes	6					

2025-2030 Strategic Business Plan Implementation Status
Lake Whatcom Water and Sewer District

	Engineering Department Goals	2025	2026 YTD	2027	2028	2029	2030
1.	**Identify, design and construct capital improvement projects**						
	Workload Indicators						
	- Number of capital projects completed during the current biennium	13					
	- Hours of on-site inspection provided by District staff	1011					
	- Hours of design and construction admin provided by consulting engineers	1400					
	Performance Measures						
	- Biennial update to the 6- and 20-year capital improvement plans	underway					
	- Board adoption of biennieal capital reinvestment budget	complete					
	- Completion of planned capital projects on schedule and within budget	underway					
2.	**Further develop the asset management system to ensure timely maintenance and plan for asset reinvestment**						
	Workload Indicators						
	- Number of asset decay curves	1					
	- Number of Overall Condition Index scores added or updated	523					
	- Number of asset replacement plans developed for linear assets	1					
	- Number of Asset Committee meetings held	7					
	Performance Measures						
	- Life extension of assets beyond the typical expected useful life	underway					
	- Development of written strategic asset management plan	complete					
	- Creation of an asset management committee	complete					
3.	**Strategically optimize the use and further development of the District's GIS to support operations**						
	Workload Indicators						
	- Completion of GIS management and development plan	underway					
	- Number of assets field located by GPS and updated in GIS	426					
	Performance Measures						
	- Completion of internal GIS utilization and improvement plan	planning					
	- Hire temporary GIS/engineering intern to assist with field inspection/GPS	Complete					
	- Complete updated GIS database with sufficient accuracy for use by staff	complete					

2025-2030 Strategic Business Plan Implementation Status
Lake Whatcom Water and Sewer District

	Engineering Department Goals	2025	2026 YTD	2027	2028	2029	2030
4.	**Support the development of the document management program to ensure maintenance and access to Engineering documents**						
	Workload Indicators						
	- Number of records inventoried	491					
	- Number of records filed	491					
	Performance Measures						
	- Complete inventory and prioritization of all needed engineering records	ongoing					
	- Revise administrative staff job descriptions	draft					
	- Inventory/filing of 25% of records (2025), 50% (2026), 75% (2027), 100% (2028)	50%					

2025-2030 Strategic Business Plan Implementation Status
Lake Whatcom Water and Sewer District

	Operations Department Goals	2025	2026 YTD	2027	2028	2029	2030
1.	**Ensure continuity of potable water production that meets or exceeds regulatory requirements**						
	Workload Indicators						
	- Number of routine water system reports submitted to agencies	72					
	- Number of routine water treatment plant samples collected/analyzed	2,328					
	- Number of water distribution system samples collected/analyzed	1,429					
	- Number of hours performing equipment calibration and maintenance	882					
	- Number of hours inventorying and preparing treatment chemicals	112					
	Performance Measures						
	- Meet all Department of Health water quality requirements without violation	yes					
	- Labor hours used to perform preventitive maintenance tasks at treatment plants	177.5					
	- Percentage of samples analyzed by laboratory that are satisfactory	100					
	- Number of annual water quality customer complaints received	1					
	- Number of tasks related to preventative maintenance completed at plants	30					
	- Number of tasks unrelated to preventative maintenance completed at plants	6					
2.	**Enhance system resiliency through proactive maintenance of electrical systems, instrumentation, controls, and communications**						
	Workload Indicators						
	- Scheduled inspections of electrical cabinets, components and assoc. equipment	54					
	- Repair of electrical cabinents, components and assoc. equipment by staff	19					
	- SCADA hardware/software installation and maintenance using contract services	12					
	- On-call services provided by external contractors	2					
	Performance Measures						
	- Number of inspections per year	54					
	- Number of repairs per year	19					
	- Total cost of SCADA services, including District labor and resources	$35,452					
	- Total cost of electrical, instrumentation, and controls services, including District labor and resources	$25,166					
	- Total communications network downtime (in hours) due to external failures	75					
	- Total communications network downtime (in hours) due to internal failures	7					

2025-2030 Strategic Business Plan Implementation Status
Lake Whatcom Water and Sewer District

	Operations Department Goals	2025	2026 YTD	2027	2028	2029	2030
3.	**Ensure collection and conveyance of sewage out of the watershed through routine inspection and preventitive maintenance**						
	Workload Indicators						
	- Monthly inspections of sewer lift stations	316					
	- Total number of preventative maintenance tasks scheduled	955					
	- Total number of preventative maintenance tasks completed	827					
	- Total number of repairs associated with sewer assets	30					
	- Labor hours expended televising/inspecting sewer mains	174					
	Performance Measures						
	- Number of sewer system overflows per year	3					
	- Labor hours spent performing preventative maintenance tasks for sewer assets	1202					
	- Total cost of repairs associated with sewer assets	$50,089					
	- Miles of sewer main televised/inspected per year	2.26					
	- Annual volume of I&I conveyed to the City of Bellingham	TBD					
	- Annual cost of I&I treatment (by City of Bellingham)	TBD					
4.	**Ensure the realization of the maximum operable life of District water infrastructure**						
	Workload Indicators						
	- Total number of preventative maintenance tasks scheduled	785					
	- Total number of preventative maintenance tasks completed	627					
	- Total number of PRVs rated as *needs replacement*	4					
	Performance Measures						
	- Labor hours performing preventative maintenance tasks on water infrastructure	816					
	- Total cost of replacing PRVs needing replacement	$2,252					
	- Number of customer complaints regarding water pressure per year	7					
	- Number of water leaks repaired	27					

2025-2030 Strategic Business Plan Implementation Status
Lake Whatcom Water and Sewer District

	Operations Department Goals	2025	2026 YTD	2027	2028	2029	2030
5.	**Maintain level-of-service expectations relative to development services**						
	Workload Indicators						
	- Water/sewer connection inquiries processed	58					
	- Water/sewer connection permits issued	21					
	- New water service installations	9					
	Performance Measures						
	- Pre-construction meetings attended (annual)	15					
	- Water/sewer permits issued (annual)	21					
	- Inspector labor hours for new development inspections (annual)	29					
	- Maintenance staff labor hours for new development installations (annual)	212					

AGENDA BILL Item 8.B	**Engineering Department Report**			
DATE SUBMITTED:	January 22, 2026	MEETING DATE:	January 28, 2026	
TO: BOARD OF COMMISSIONERS		FROM: Greg Nicoll, Engineering Manager/District Engineer		
GENERAL MANAGER APPROVAL				
ATTACHED DOCUMENTS		1. Summary of Capital Improvement Projects		
TYPE OF ACTION REQUESTED		RESOLUTION ☐	FORMAL ACTION/ MOTION ☐	INFORMATIONAL /OTHER ☒

BACKGROUND / EXPLANATION OF IMPACT

Updated information regarding District projects and current priorities in advance of the Board meeting.

FISCAL IMPACT

None.

RECOMMENDED BOARD ACTION

None required.

PROPOSED MOTION

None.

SUMMARY OF CAPITAL IMPROVEMENT PROJECTS

Updated: 1/21/2026
Prepared by: G. Nicoll

LEGEND:
WATER | SEWER | SHARED

MAJOR PROJECTS IN CONSTRUCTION:

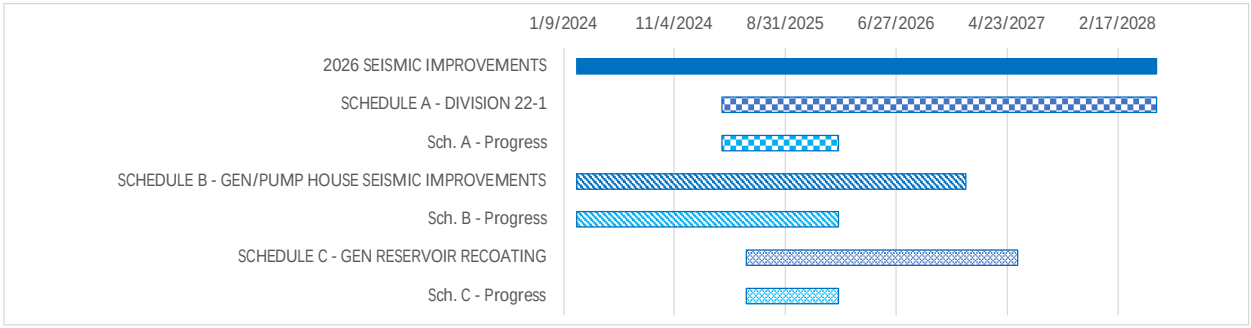
No Capital Projects Currently in Construction

MAJOR PROJECTS IN DESIGN:

2026 WATER SYSTEM SEISMIC IMPROVEMENTS PROJECT

The 2026 Water System Seismic Improvements Project is a composite project of three separately budgeted and separately funded projects that will be bid and constructed under a single construction contract. The project will consist of three schedules of work as summarized below. Bid documents will be prepared to maintain completely separate cost accounting for each of the three projects to ensure compliance with grant funding requirements. Sequencing of the project will be at the discretion of the contractor.

PROJECT SCHEDULE

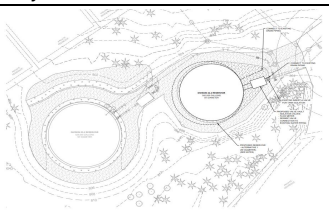


SCHEDULE A: C2517 - DIVISION 22-1 RESERVOIR REPLACEMENT

Project Summary:	Construct a new reservoir to replace the existing Division 22-1 Reservoir to improve seismic resiliancy of critical infrastructure (FEMA Hazard Mitigation Grant 5456-10).
Project Status:	Permit applications for a conditional use permit and building permit have been submitted to Whatcom County and staff is awaiting County review. Gray & Osborne is finalizing the 90% design documents and expects to provide documents to the District for review in January.

Budget Summary	
Budget:	$ 2,870,000.00
Spent to Date:	$ 96,505.33
Balance:	$ 2,773,494.67
Budget Year:	2025-2027

87.5% grant funded



SCHEDULE B: C2402 - SVWTP PUMPHOUSE AND GENEVA RESERVOIR SEISMIC UPGRADES

Project Summary:	Construct improvements at the SV WTP Finished Water Pump Building and the Geneva Reservoir to improve seismic resiliancy of critical infrastructure (FEMA Hazard Mitigation Grant 5395-10R). Reservoir recoating, which will be District funded, will be completed concurrently.
Project Status:	Wilson Engineering has submitted the 90% design documents to the District and District staff have completed review and returned comments to Wilson. Staff is currently awaiting County scheduling of the Pre-Application meeting to confirm permit requirements for the project.

Budget Summary	
Budget:	$ 1,428,895.00
Spent to Date:	$ 235,461.79
Balance:	$ 1,193,433.21
Budget Year:	2024-2026

95% grant funded

SCHEDULE C: C2518 - GENEVA RESERVOIR RECOATING

Project Summary:	Recoat the existing Geneva reservoir including complete removal of the existing coating and recoating the reservoir with a primer and top coat. The reservoir hasn't been recoated since original construction in 1979.
Project Status:	The District has contracted with Evergreen Coating Engineers to prepare design and bidding documents for the project. Recoating will be completed concurrently with the seismic improvement project to maximize cost effectiveness and minimize impact to the system. Evergreen has provided 90% specifications to Wilson Engineering for inclusion with in the bid package for the combined project.

Budget Summary	
Budget:	$ -
Spent to Date:	$ 4,647.50
Balance:	$ (4,647.50)
Budget Year:	2027 (to be moved to 2026)

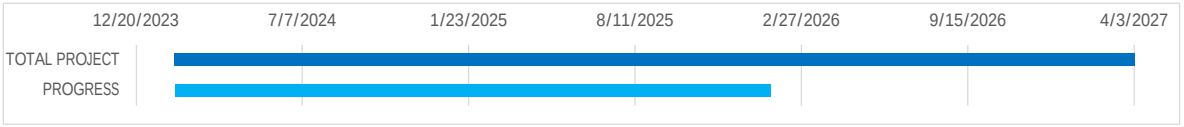
Design costs funded by internal cost saviings


Geneva Reservoir

C2316 - SUDDEN VALLEY WTP CHLORINE CONTACT BASIN REPLACEMENT

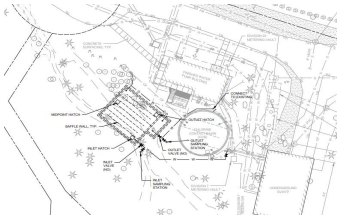
Project Summary:	Replace existing chlorine contact basin with a new basin that will include seismic restraints and will be sized for sufficient contact time at buildout flows. (FEMA Hazard Mitigation Grant 5395-10R).
Project Status:	Gray & Osborne is working on the 90% design documents. Permit applications for a conditional use permit and building permit have been submitted to Whatcom County and staff is awaiting County review. The District has submitted an application for a DWSRF Loan to fund the current budget shortfall. This project is currently scheduled to be advertised for bids in early 2027.

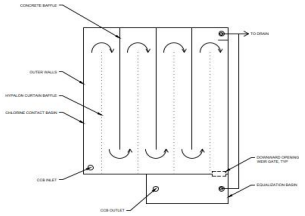
PROJECT SCHEDULE



Budget Summary	
Budget:	$ 1,963,000.00
Spent to Date:	$ 164,332.59
Balance:	$ 1,798,667.41
Budget Year:	2024-2026

87.5% grant funded

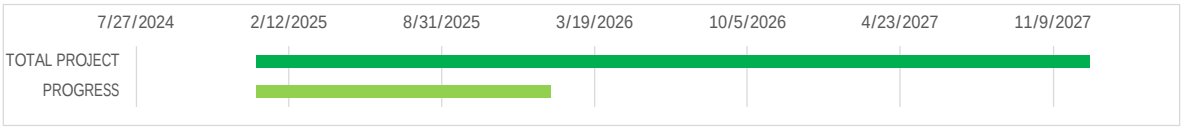




C2510 - AGATE BAY SEWER LIFT STATION REHABILITATION

Project Summary:	Agate Bay Lift Station is one of the last remaining original sewer lift stations that has not been rehabilitated and this project will renovate this station, which could include reconfiguration to a submersible station.
Project Status:	District Engineering staff is completing all civil and mechanical design in-house and has completed the draft Pre-Design Report. Gray & Osborne has completed a technical review of the Pre-Design Report and provided comments that will be incorporated into the final report. Following completion of the Pre-Design Report, staff will proceed with design and preparation of contract documents.

PROJECT SCHEDULE



Budget Summary	
Budget:	$ 146,000.00
Spent to Date:	$ 10,559.43
Balance:	$ 135,440.57
Budget Year:	2025-2027

Pre-design only

PROJECTS COMPLETED IN PAST 12 MONTHS

Project #	Project Name	Budget	Spent	Balance
C 2111	Division 7 Reservoir Replacement	$ 3,301,000.00	$ 3,146,082.24	$ 154,917.76
C 2113	Flat Car LS Reverse Flow to Sudden Valley LS	$ 280,000.00	$ 262,339.19	$ 17,660.81
C 2506	Physical Security Improvements	$ 37,000.00	$ 34,703.53	$ 2,296.47
C 2516	Sudden Valley WTP Pump House Skylight Replacement	O&M	$ 17,408.00	N/A
C 2511	Lake Whatcom Boulevard Interceptor Cured In Place Pipe	$ 195,000.00	$ 192,271.36	$ 2,728.64
C 2505	Scenic Intertie Rehabilitation	$ 78,000.00	$ 64,030.29	$ 13,969.71
C 2509	Eagleridge Booster Station Building Roof	$ 21,000.00	$ 15,669.84	$ 5,330.16
C 2513	Administration Building HVAC Improvements	O&M	$ 20,282.37	N/A
C 2112	Rocky Ridge and Lakewood Lift Stations Rehabilitation	$ 2,116,353.00	$ 1,791,512.87	$ 324,840.13
C 2303	SVWTP Alum System Replacement	$ 88,000.00	$ 74,405.95	$ 13,594.05
C 2304	Eagleridge Diesel Fuel Tank Replacement	$ 25,000.00	$ 12,222.48	$ 12,777.52
M 2410	Midnight Court Sewer Repair	O&M	$ 41,001.00	N/A

AGENDA BILL Item 8.C		**Finance Department Report**		
DATE SUBMITTED:	January 14, 2026	MEETING DATE:	January 28, 2026	
TO: BOARD OF COMMISSIONERS		FROM: Jennifer Signs, Finance Manager		
GENERAL MANAGER APPROVAL				
ATTACHED DOCUMENTS		1. Fourth Quarter 2025 Financial Report 2. December Utility Account Adjustments		
TYPE OF ACTION REQUESTED		RESOLUTION ☐	FORMAL ACTION/ MOTION ☐	INFORMATIONAL /OTHER ☒

BACKGROUND / EXPLANATION OF IMPACT

Updated information regarding District finances in advance of the Board meeting.

FISCAL IMPACT

None

APPLICABLE EFFECTIVE UTILITY MANAGEMENT ATTRIBUTE(S)

Financial Viability

RECOMMENDED BOARD ACTION

None required.

PROPOSED MOTION

None

Quarterly Financial Report
Fourth Quarter 2025

Lake Whatcom Water and Sewer District
Bellingham, Washington

Summary

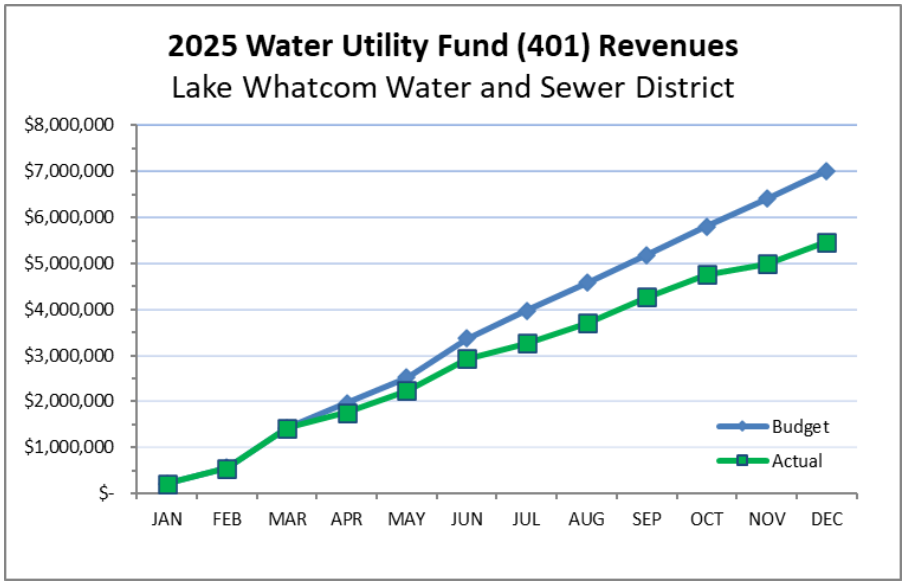
Closing out the fiscal year of 2025, Lake Whatcom Water and Sewer District (District) sustained its strong financial position through its continued commitment to conservative financial management. Notable fourth quarter financial activities included the receipt of approximately $99,000 from the District's final draw on its Public Works Board loan for the Division 7 Reservoir Replacement Project and approximately $89,000 in FEMA Hazard Mitigation Grant funds for the Sudden Valley Water Treatment Plant (SVWTP) Chlorine Contact Basin Replacement Project. Revenues in the Water Utility Fund closed the year below budgeted projections due to grant reimbursements that have not yet been received or requested. The District has three active Hazard Mitigation Grants with FEMA supporting the replacement of the Division 22-1 Reservoir, replacement of the aforementioned chlorine contact basin, and seismic upgrades of the Geneva Reservoir and SVWTP booster building. Collectively, these grants total approximately $4.8 million for pre-design, design, and construction activities over the next few years. The District also received approval in the fourth quarter from the Public Works Board for a $365,000 loan supporting the Division 22-1 Reservoir Replacement project.

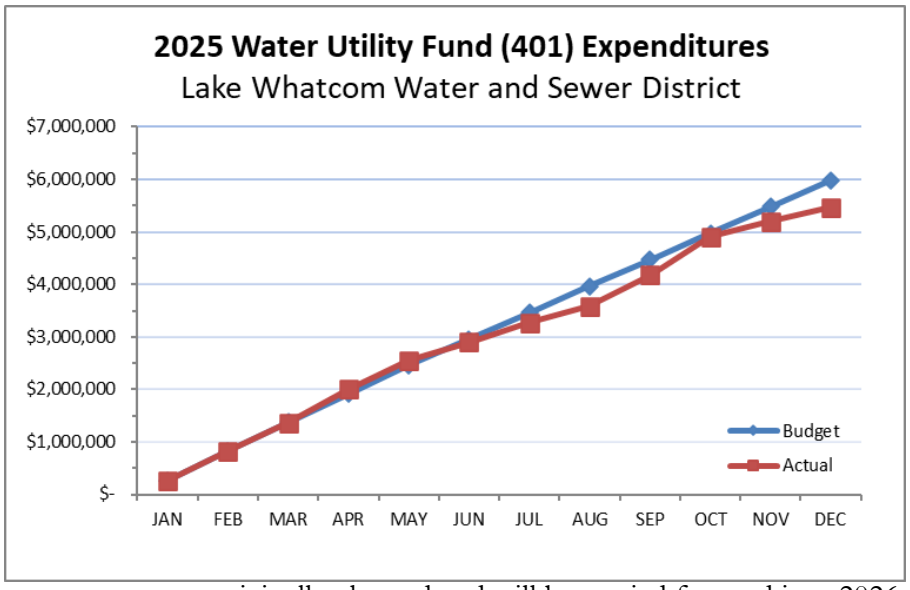
The District's investment portfolio earned approximately $123,500 in interest during the fourth quarter of 2025, reflecting an increase from the prior quarter ($92,000). This increase was primarily due to the maturity of a long-term bond purchased at discount. With further interest rate cuts anticipated in the coming year, the District continues to closely monitor the actions of the Federal Open Market Committee (FOMC). To strengthen its long-term investment position, the District anticipates further shifts from short-term to long-term investing in 2026 to maximize returns through the anticipated rate cuts.

Overall, the District remains in a strong financial position as it prepares to enter the new year. Conservative fiscal management, steady investment performance, and continued progress on capital projects reflect the District's commitment to long-term financial sustainability. While the timing of FEMA grant reimbursements and capital project completion will shift certain revenues and expenditures into 2026, these adjustments are consistent with the District's multi-year planning approach. The District will continue to monitor economic and market conditions closely, particularly with respect to interest rate changes and inflation to ensure the prudent management of both operating and capital resources.

Water Utility Fund (Fund 401)

2025 revenues in the Water Utility Fund totaled $5,463,000, which was below the budgeted projection of $7,013,500. As discussed in the summary, this was due to budgeted grant funding not yet received. Service revenue finished the year in line with projections ($3,225,281 actual vs. $3,239,670 budgeted). The District also closed the year with higher than anticipated revenues associated with General Facilities Charges (GFC). The District takes a conservative approach in budgeting for these revenues at an equivalancy of ten GFC's per year totaling $105,485. In 2025, the District earned $177,156 in water GFC revenue equating to 16 connections. Further, the District's investment portfolio performed well throughout 2025, closing the year with higher investment earnings than anticipated ($182,466 actual vs. $118,000 budgeted).

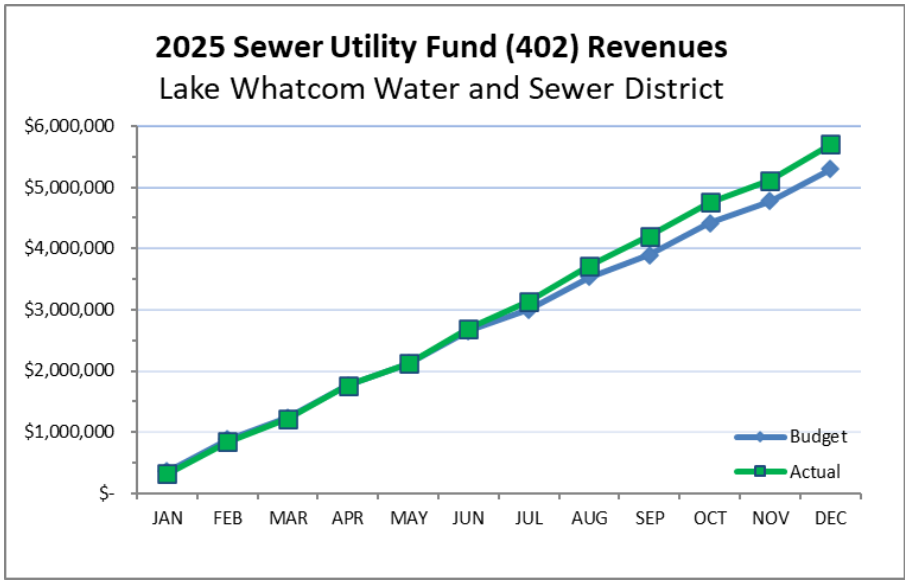




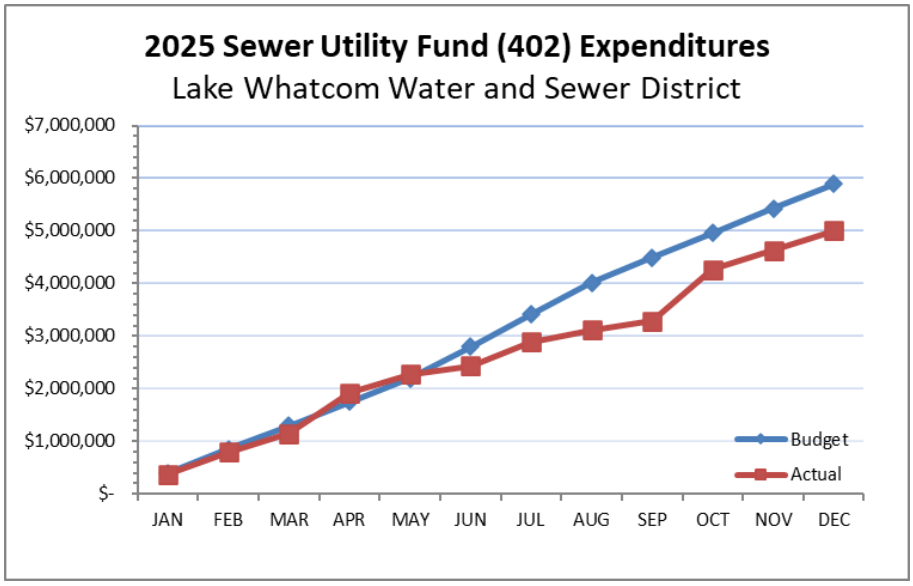
Total expenses for fiscal year 2025 were $5,468,550, which was below the budgeted amount of $5,987,671 and reflects careful financial management throughout the year. The most significant variance between budgeted and actual expenditures occurred within the capital budget, where approximately $343,000 was not spent as originally planned and will be carried forward into 2026 to allow for the completion of ongoing and scheduled projects. Overall, the District's continued commitment to fiscal discipline allowed it to remain within budget parameters while maintaining progress toward operational and capital goals.

Sewer Utility Fund (Fund 402)

2025 revenues in the Sewer Utility Fund slightly exceeded projections ($10,540,554 actual vs. $9,787,854 budgeted). Similar to the Water Utility Fund, the Sewer Utility Fund also saw an increase in GFC revenues and operating revenue was also slightly higher than projected. Consistent with the Water Utility Fund, interest earnings in the Sewer Utility Fund also increased in the fourth quarter closing the year out with stronger earnings than anticipated ($182,466 actual vs. $118,000 budgeted).



Sewer Utility Fund expenditures remained below projections through year end, totaling $5,009,159 compared to the budgeted amount of $5,895,589. Similar to the Water Fund, this variance is due to the timing of capital projects in the District's capital improvement plan that have not yet been competed, with actual capital spending of $1,269,487 compared to budgeted $1,857,000. These projects remain in progress and the funds associated with these projects will be carried forward into 2026 to allow for the completion of ongoing and scheduled projects. Operating expenditures also trailed projections by approximately 9 percent, reflecting continued cost control efforts and efficiencies realized throughout the year.



District Fund Balances

The District manages its monies within five funds: Water Utility Fund (401), Sewer Utility Fund (402), Sewer Contingency Reserve Fund (425), Water Contingency Reserve Fund (426), and Bond Reserve Fund (460). Within the Water Utility and Sewer Utility funds are system reinvestment funds (i.e., funds dedicated to capital projects) and debt service funds associated with the respective utility. The following discussion summarizes the activity associated with each fund through of the end of 2025.

Water Utility Fund (Fund 401)

The Water Utility Fund, which serves as the primary operating fund for the District's water utility, derives most of its revenue from rates charged to water customers. Fund expenditures are comprised of general operating expenses (personnel salary and benefits, professional services, utilities, etc.), payments relative to debt service on past capital improvement projects, and expenditures on water system reinvestment-defined equipment and projects. Also managed within the Water Utility Fund are monies allocated towards an operating reserve, which is equal to the cost of operating the water utility for 90 days ($735,519). The fund entered 2025 with a balance of $2,167,817 and closed the year with a balance of $2,163,016.

Sewer Utility Fund (Fund 402)

Like the Water Utility Fund, the Sewer Utility Fund serves as the primary operating fund for the District's sewer utility. Revenues are comprised primarily of rates charged to sewer customers, and expenditures consist of general operating expenses (personnel salary and benefits, professional services, utilities, etc.), payments relative to debt service on past capital improvement projects, and expenditures on sewer system reinvestment-defined equipment and projects. Also managed within the fund are monies allocated towards an operating reserve, which is equal to the cost of operating the sewer utility for 60 days ($562,836). The fund entered 2025 with a balance of $4,835,293 and closed the year with a balance of $5,531,395. It is worth noting that the fund growth in the Sewer Utility Fund is due to the District's proactive approach to prepare for the financial obligations associated with the City of Bellingham's improvements at the Post Point wastewater treatment plant with those costs anticipated over the next two fiscal years.

Sewer Contingency Reserve (Fund 425)

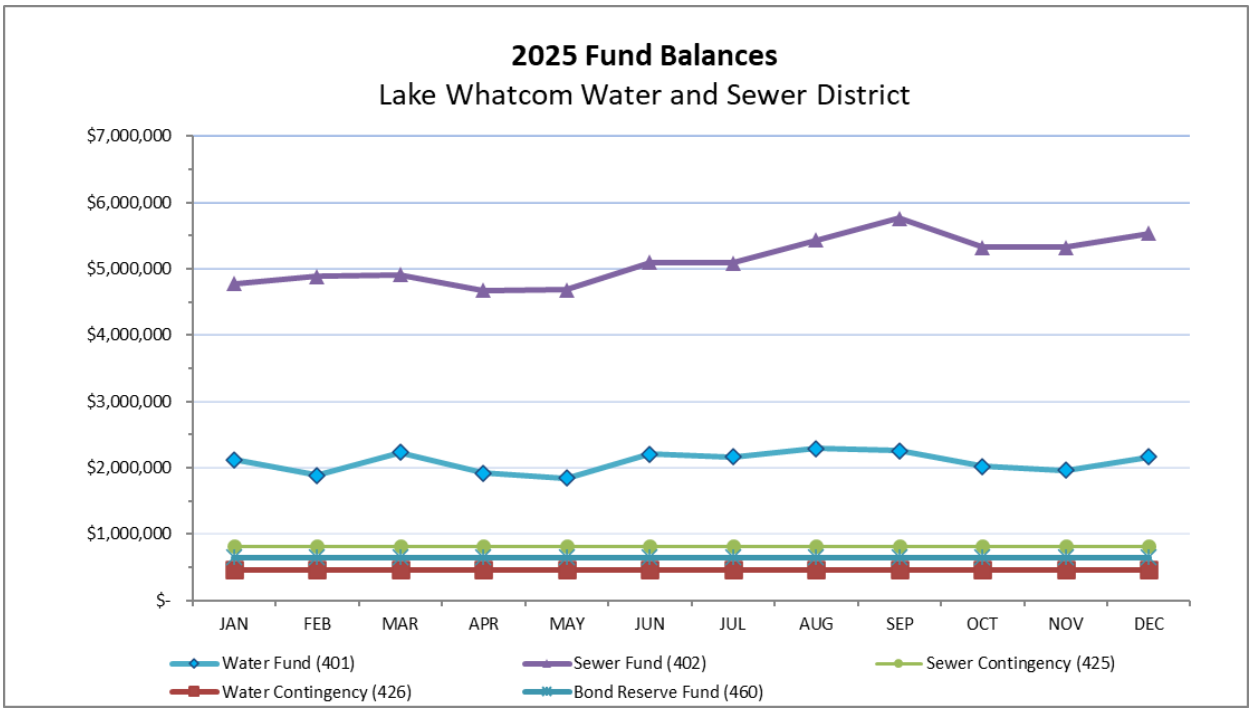
A sewer contingency reserve is maintained in accordance with District financial policies at one percent of the sewer utility infrastructure replacement cost ($815,000). This fund provides for paying for unanticipated costs that may be incurred by the Sewer Utility. The Sewer Contingency Reserve was fully funded through the end of the year.

Water Contingency Reserve (Fund 426)

A water contingency reserve is maintained in accordance with District financial policies at one percent of the water utility infrastructure replacement cost ($460,000). This fund provides for paying for unanticipated costs that may be incurred by the Water Utility. The Water Contingency Reserve was fully funded through the end of the year.

Bond Reserve Fund (Fund 460)

The District's Bond Reserve Fund is a restricted fund associated with covenants of the 2016 bond sale. It was fully funded at $646,125 through the end of the year. As the District moves closer to paying this debt in full, the balance within this fund will be reduced in the coming years to maintain the Maximum Amount Due (MAD).



District Cash and Investments

In accordance with its financial policies, the District invests its funds in a manner that provides the highest return with maximum security while meeting daily cash flow demands. The following is a summary of the District's cash and investments through December 31, 2025.

LAKE WHATCOM WATER AND SEWER

INVESTMENTS/CASH AS OF 12/31/2025

Petty Cash	$	1,600	
Cash	$	1,018,409	
Debt Service Account	$	646,125	
Public Funds Account	$	31,875	2.940%
WA Federal	**$**	**1,698,009**	
Local Gov't Investment Pool	**$**	**3,742,673**	3.880%

		PRINCIPAL COST	MARKET VALUE	MATURITY DATE	YIELD
US Treasury Note	Non-callable	$ 797,274	$ 855,000	Jan-26	3.950%
US Treasury Note	Non-callable	$ 467,667	$ 500,000	Jun-26	4.500%
US Treasury Note	Non-callable	$ 499,508	$ 510,000	Oct-26	3.707%
US Treasury Note	Non-callable	$ 497,683	$ 515,000	Feb-27	3.470%
US Treasury Note	Non-callable	$ 534,034	$ 515,000	Jun-27	3.724%
US Treasury Note	Non-callable	$ 496,879	$ 525,000	Sep-27	3.410%
US Bank Short-Term Money Market	Holding Account	$ 881,809			3.360%
US Bank Trust		**$ 4,174,854**	**$ 3,420,000**		
TOTAL		**$ 9,615,536**			

USE OF FUNDS:		
Bond Reserve - Restricted	$	646,125
Contingency - Assigned	$	1,298,355
Operating Reserves	$	1,185,000
Operating Assigned	$	6,485,856
	$	**9,615,336**

Fund Balance Summary		
Water Utility Fund (401)	$	2,163,016
Sewer Utility Fund (402)	$	5,531,395
Sewer Contingency Fund (425)	$	815,000
Water Contingency Fund (426)	$	460,000
Bond Reserve Fund (460)	$	646,125
	$	**9,615,536**

LAKE WHATCOM WATER AND SEWER DISTRICT
December 2025 Utility Account Adjustments

		Year to Date	Notes
Sudden Valley Adjustments			
Late Fee Credits	$ 852.53	$ 5,275.74	Issue with Xpress Bill Pay
High Use/Leak Credits	$ 3,982.95	$ 12,699.13	Center Condos
North Shore/Geneva			
Late Fee Credits	$ 230.70	$ 2,140.34	
High Use/Leak Credits	$ -	$ 2,368.51	
Total Account Adjustments	$ 5,066.18	$ 22,483.72	

AGENDA BILL Item 8.D	**Operations Department Report**		
DATE SUBMITTED:	January 22, 2026	MEETING DATE:	January 28, 2026
TO: BOARD OF COMMISSIONERS		FROM: Jason Dahlstrom, Operations & Maintenance Manager	
GENERAL MANAGER APPROVAL			
ATTACHED DOCUMENTS		1. Operations Department Report	
		2. Status of District Water & Sewer Systems	
TYPE OF ACTION REQUESTED		RESOLUTION ☐	FORMAL ACTION/ MOTION ☐ / INFORMATIONAL /OTHER ☒

BACKGROUND / EXPLANATION OF IMPACT

Updated information regarding District operations in advance of the Board meeting.

FISCAL IMPACT

None.

RECOMMENDED BOARD ACTION

None required.

PROPOSED MOTION

None.

Lake Whatcom Water & Sewer District
Operations & Maintenance Department Report

Prepared for the January 28, 2026 Board Meeting
Data Compiled 1/20/2026

State Required Report Status													
Monthly Reports													
Name Of Report		**Completed**											
Chlorination Report Agate Heights Prepared by: K Cook	Postmarked by the 10th of month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
		x											
Surface Water Treatment Rule Report (SVWTP) Prepared by: K Cook	Postmarked by the 10th of month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
		x											
Annual Reports													
Name Of Report	**Deadline**	**Completed**											
WA State Cross Connection Report Prepared by: R Munson	May	April 22, 2025											
OSHA 300 Log Prepared by: R Munson	February 1	January 13, 2026											
Water Use Efficiency Performance Report Prepared by: K Cook	July 1	January 22, 2025											
Community Right to Know (Hazardous Materials) Prepared by: R Munson	March 31	January 13, 2026											
Northwest Clean Air Emissions Report	February 1	January 14, 2026											
Consumer Confidence Reports Prepared by: K Cook	June 30	Geneva		SV		EagleR		Agate Ht					
Other Reports													
Name Of Report	**Deadline**	**Last Completed**											
CPR/First Aid Training Coordinated by: R Munson	Due Biennially Next Due 2027	February 27, 2025											
Flagging Card Training Coordinated by: R Munson	Due Triennially Next Due 2025	All complete as of 10/22/25											

Safety Program Summary Completed by Rich Munson	
Summary of Annual Safety Training *2025/26 Testing Period - Dec 2025 to April 4, 2026*	
	% Complete
Engineering - Managers	In progress
Engineering - Staff	100%
Field Crew - Managers	In progress
Field Crew - Staff	In progress
Office - Managers	100%
Office - Staff	100%
Overall	**100%**

Safety meetings for the field crew take place every Thursday at 8 a.m.

Dates of Completed Safety Committee Meetings		
1/23/2026		

Summary of Work-Related Injuries & Illnesses	Current Month	2026	2025	2024	2023	2022
Total Number of Work Related Injuries Defined as a work related injury or illness that results in: Death Medical treatment beyond first aid Loss of consciousness Significant injury or illness diagnosed by a licensed health care professional Days away from work (off work) Restricted work or job transfer	0	0	0	0	0	0
Total Number of Days of Job Transfer or Restriction (light duty or other medical restriction)	0	0	0	0	0	0
Total Number of Days Away from Work (at home, in hospital, not at work)	0	0	0	0	0	0
Near Misses	0	0	0	0	0	0

Safety Coordinator Update

Status of District Water and Sewer Systems
Prepared by Jason Dahlstrom - Operations and Maintenance Manager
1/28/2026 Board Meeting

Safety Activities

1. No time-loss injuries or near misses.
2. Daily safety reminders directly relevant to the day's tasks. Weekly safety trainings based on District specific safety programs.
3. Jobsite tailgate meetings by project lead.

Water Utility Activities

Water Treatment Plants

1. Sudden Valley
    a. Plant is operating well, averaging 0.5 million gallons per day (MGD) at 700 GPM.
    b. Water use is consistent with typical seasonal usage.
    c. Static mixer replacement project complete (M2507)
    d. Annual maintenance ongoing
2. Agate Heights
    a. Plant is operating well.
    b. Water use is consistent with typical seasonal usage.

Distribution System

1. 1 water leak repaired this month

Sewer Utility Activities

Lift Stations

1. Annual building inspections ongoing
2. Annual battery backup inspections ongoing

Collection System

1. Sewer camera inspections focused on infiltration have identified many repairs needed

Fleet

Vehicles

1. VEH54 recently had the transmission replaced

Equipment

1. All equipment is functional

Facilities

1. Nothing new to report

Training

1. Nothing new to report

Development

1. There are 14 permits currently in stages of development