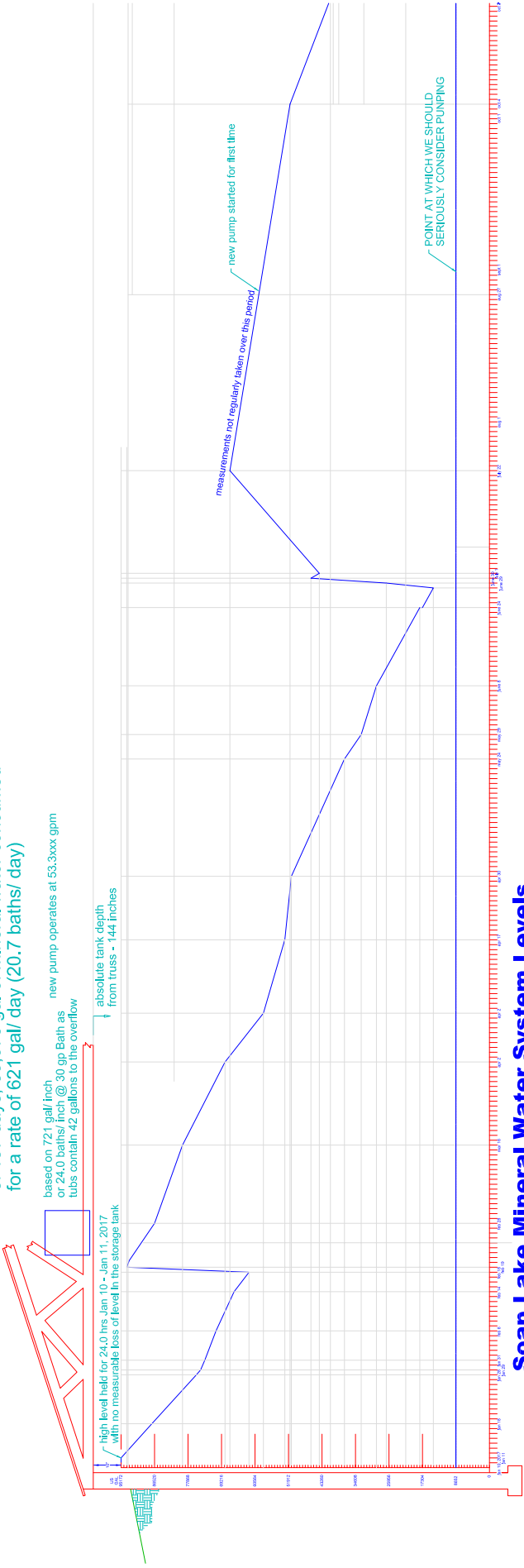


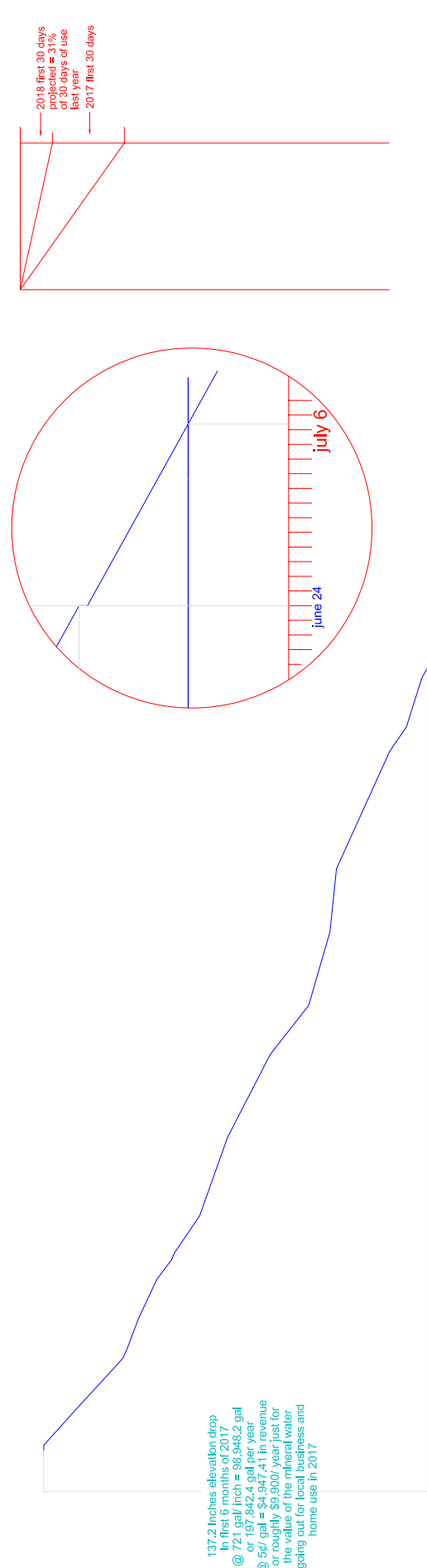
APPENDIX C
RESERVOIR LEVELS

NOTE:
 between Feb 19, 2017 and July 6, 2017 a span
 of 137 days, 85,078 gal of mineral water consumed
 for a rate of 621 gal/ day (20.7 baths/ day)

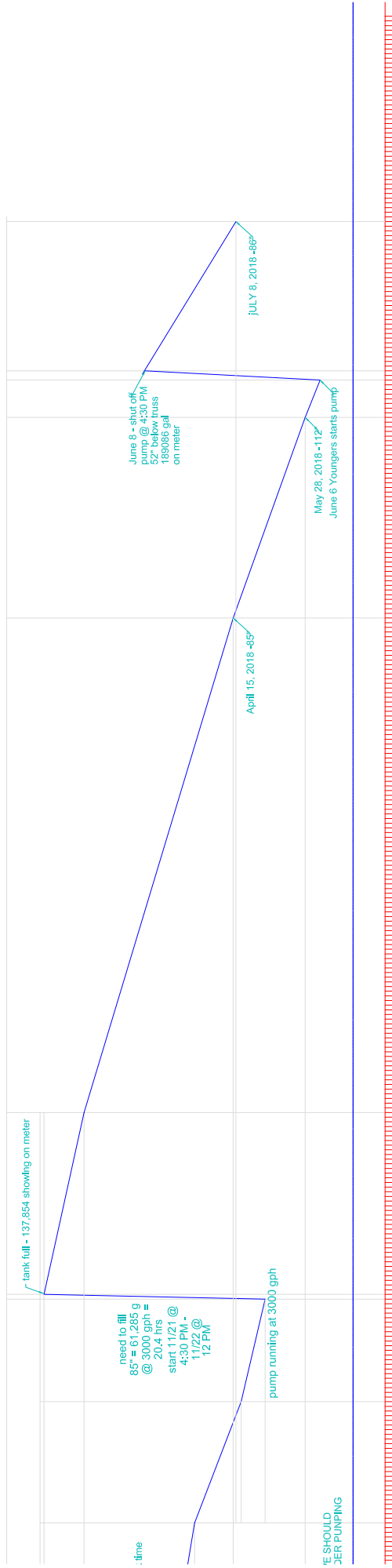
based on 721 gal/ inch
 or 24.0 baths/ inch @ .30 gp. Bath as
 tubs contain 42 gallons to the overflow



Soap Lake Mineral Water System Levels



137.2 inches elevation drop
 137.2 inches elevation drop
 @ 721 gal/ inch = 98,943.2 gal
 or 197,842.4 gal per year
 @ 5¢/ gal = \$4,947.41 in revenue
 or roughly \$9,900/ year just for
 the value of the mineral water
 going out for local business and
 home use in 2017



— 2018 first 30 days projected = 31% of 30 days of use last year
 — 2017 first 30 days



APPENDIX D

MUNICIPAL CODE FOR MINERAL WATER SYSTEM

Chapter 13.28 MINERAL WATER SERVICE SYSTEM

Sections:

- [13.28.010](#) Application for service.
- [13.28.020](#) Mineral water rates.
- [13.28.030](#) Mineral water service connection charges.
- [13.28.040](#) Turn-on charges.
- [13.28.050](#) Service and billing requirements.
- [13.28.060](#) Delinquent accounts.
- [13.28.070](#) Joint charging.
- [13.28.080](#) Permission required for service to additional premises.
- [13.28.090](#) Double charge for unauthorized service.
- [13.28.100](#) Service connection removal.
- [13.28.110](#) Service reinstallation after discontinuance.
- [13.28.120](#) Shut-off by city.
- [13.28.130](#) Termination or refusal of service for utilities.
- [13.28.140](#) Repair of service equipment.
- [13.28.150](#) Connection compliance with this title required – Recovery of costs of illegal or unsafe connection.
- [13.28.160](#) Entry for inspection and testing.
- [13.28.170](#) Unlawful acts.
- [13.28.180](#) Dispute resolution.
- [13.28.190](#) Severability.
- [13.28.200](#) Mineral water rates.

13.28.010 Application for service.

A. It is the intent of the city that all utility deliveries, whether mineral water, water, sewer, garbage or some combination thereof, shall be deliveries of services and/or utilities to the property served. All such delivery of utilities and/or services shall be a claim against the property and a claim against the owner of that property served or furnished utilities and/or services. It shall be the responsibility of each property owner served by city utilities to determine the extent of utility services and deliveries being made and/or furnished to the owner's property. It shall be the responsibility of the property owner to pay all claims, charges, penalties and/or costs imposed by the city for the furnishing and/or delivery of utilities and/or services to the owner's property. The property owner's responsibility shall exist independent of any claim of lien the city may have or make pursuant to any statute, rule or regulation. The fact the owner has directed or allowed the billings for utilities furnished and/or services delivered to the owner's property to be delivered to a tenant or other third person does not in any way reduce or extinguish the property owner's responsibility for water, sewer and/or garbage billings, charges, costs or penalties imposed by the city. All delinquent charges for water, sewer, garbage, or some combination thereof, shall bear interest at the maximum rate allowed by law.

B. All applications for residential water service shall be made by the property owner of the property to be delivered water service, and responsibility for billing payment shall be borne by the property owner except as to tenant accounts as provided in this chapter. All charges for water service will be sent directly to the property mailing address unless the property owner directs otherwise. No charge will be made for meter reading for closing accounts, except as provided in this chapter.

C. Applications for industrial and commercial water service may be by the property owner, lessee or other consumer. However, a deposit, as determined by the city clerk, will be required of such account in lieu of the deposit required under SLMC [13.28.050](#).

D. Upon a failure to pay the charges for water service, the amount thereof shall become a lien against the real property furnished the service as provided by law.

E. The city of Soap Lake is a combined utility system. All billings to a property for utility services are combined utility billings. To the fullest extent permitted by law, all payments received from a customer for utility services shall be credited first to charges for account charges, next to interest charges, if any, next to sewer charges, if any, and last to water charges, if any. Penalties are deemed charges of the appropriate utility. Payments are credited first to the oldest charge or penalty appearing on the billing. A delinquency in payment for any utility service to a subject property may result in the termination of any other utility service to the subject property. (Ord. 1029 § 1, 2005).

13.28.020 Mineral water rates.

A. Inside City Limits. There exists a city mineral water system which delivers water drawn from Soap Lake to service locations within the city limits. To be eligible for mineral water service, a property must be connected to the city's potable water system and remain so during the period of mineral water service. This is a delivery of nonpotable water for therapeutic, relaxation or other nonpotable uses. The monthly rate charges for mineral water from the city mineral water system for all residential and commercial users serviced by the mineral water system shall be as set forth in SLMC [13.28.200](#).

B. Outside City Limits. Because of the higher costs associated with the delivery of mineral water to users outside the city limits, there shall be no delivery from the city mineral water system to service locations located outside the city limits. (Ord. 1029 § 1, 2005).

13.28.030 Mineral water service connection charges.

A. All mineral water service connections shall be approved by the city and all separate buildings or separately owned businesses carried on within a single building with a divided ownership shall be separately connected to the city mineral water system, except that separate buildings which are an integral part of a single business or industry may be served by a master connection serving the property if the city consents. Such service to separate buildings shall be terminated and separate services installed upon the separate sale or segregation of that business or industry so served. Such new service to the parts of the separated industry or business shall be deemed new services for the purposes of this chapter.

B. The city shall make all connections to the water system for service to properties within the city except as otherwise provided herein. Charges shall be made by the city for making water service connections. Such charges shall be paid in full before the connection is made by the city to the city mineral water system for the property to be served. Those charges are set forth in SLMC [13.28.200](#).

C. A property owner may, with the permission of the city's public works director, after establishing that installation of the service by the property owner is cheaper than installation by the city, upon such reasonable conditions as the public works director shall determine, make service connections from a city mineral water main to the property to be served. In such case, the property owner shall be responsible to pay all costs of such connection, including repair of any pavement, curbs, gutters, driveways or streets disturbed or damaged. In addition, the property owner shall pay the cost of the city's inspection of the installation as set forth in SLMC [13.28.200](#). The installer shall be required to guarantee such a connection, including repaired pavement, curbs, gutters, driveways or streets, for one year after

installation against defects in such installation. Upon proper installation of such lateral and its acceptance by the city, it shall become the city's responsibility to maintain and repair such lateral including enforcement of the one year guarantee against the installer.

D. The installation of mineral water service laterals from mains to the property line of the service location shall be required with the installation of infrastructure related to the platting of property, water mains, streets, curbs, gutters, sidewalks and the like. This is done to avoid later damage to streets, curbs, gutters and driveways. The process described in subsection C of this section shall be followed in these situations where the platting party makes mineral water service lateral installations. Upon payment of the connection fees to the city, the city shall make those mineral water connections.

E. Once a mineral water service lateral running from a mineral water main to a service location is installed and/or accepted by the city, ownership and responsibility for maintenance of that lateral from the property line to the main shall be the city's. (Ord. 1029 § 1, 2005).

13.28.040 Turn-on charges.

In addition to the charges for services provided for in this chapter, there shall be a charge to any account for turning on mineral water service. Those charges are set forth in SLMC [13.28.200](#). (Ord. 1029 § 1, 2005).

13.28.050 Service and billing requirements.

A. All billings for mineral water service provided by the city shall be sent to the owner of the property served at the property owner's mailing address, unless the owner shall designate in writing a different address to receive the utility bill for the property, and such owner will be fully responsible for all charges due the city for providing mineral water and all other utility service to the property, except as to tenant accounts as provided in this chapter.

B. Mineral water service will be delivered only upon request of the property owner of the property to be served, except as to tenant accounts as provided in this chapter.

C. An additional charge as set forth in SLMC [13.28.200](#) shall be paid to the water/sewer operating fund as a charge for turning on the mineral water service.

D. Tenant Accounts. Mineral water service will be delivered to a single-family residential rental property at the request of the tenant if the tenant claims an owner/tenant dispute exists and the owner has allowed the mineral water service account to become delinquent. If such a situation exists, a secondary tenant account may be established for water/sewer/garbage utility/mineral water service of the property to be served. Upon making any such request, a deposit shall be made by the tenant in an amount determined by the city clerk based on past use. That deposit will be held in the utility deposit fund to secure the payment of mineral water service charges as provided in this chapter. The process outlined above will be used to establish a temporary tenant account for residential tenants of any dwelling to which the utility service has been discontinued for failure to pay the utility billings as required herein. (Ord. 1029 § 1, 2005).

13.28.060 Delinquent accounts.

A. Payment for mineral water service for any property shall become due and payable on the fifth day of the month following the month within which the service was rendered. If any amount remains unpaid after the twenty-eighth of the month being first billed, a late penalty in an amount of \$25.00 shall be added to the utility account on the date stated on the billing. The city clerk shall give notice in writing to the owner or owner's agent as officially listed in the city records, or the best address available to the clerk, of such

delinquency, advising that the mineral water service shall be discontinued at the expiration of 10 days thereafter unless the account is paid in full. Such notice shall indicate that the delinquent user may contact the city clerk at City Hall during business hours to make arrangements to bring the account current.

B. In the event the mineral water supply is turned off, the same shall not be turned back on until all delinquent utility charges have been paid in full. The account shall be charged the mineral water turn-on charge as set forth in SLMC [13.28.200](#). (Ord. 1168 § 1, 2013; Ord. 1029 § 1, 2005).

13.28.070 Joint charging.

All charges for water, mineral water, sewer, garbage, penalty and interest payments due the city of Soap Lake shall be billed jointly on one statement. All payments received from a user shall be credited first to charges for account charges, second to charges for interest, third to charges for penalty, fourth to charges for garbage service, fifth to charges for sewer service, sixth to charges for mineral water service, and seventh to charges for water service. (Ord. 1029 § 1, 2005).

13.28.080 Permission required for service to additional premises.

It is unlawful for any person whose premises are supplied with mineral water to furnish mineral water to additional premises unless such person first makes application in writing to do so and permission is granted by the city council. (Ord. 1029 § 1, 2005).

13.28.090 Double charge for unauthorized service.

When additional premises are connected or furnished with mineral water without the application prescribed in SLMC [13.28.080](#), the property owner served with the unauthorized service shall pay to the city two times the rate for the service provided as calculated by the city in its sole discretion. (Ord. 1029 § 1, 2005).

13.28.100 Service connection removal.

When it is desired by the property owner to change the location of the old service connection, a new service shall be placed only upon the owner making application and paying for a new tap at the actual cost involved. (Ord. 1029 § 1, 2005).

13.28.110 Service reinstatement after discontinuance.

When service has been discontinued from any premises, upon the application of the owner thereof, or for nonpayment of mineral water charges, or for any other causes, it is unlawful for any person to again connect the premises with mineral water until all arrearage for the premises have been paid, and application made for reinstatement of service, and other cause or causes corrected to the satisfaction of the city. (Ord. 1029 § 1, 2005).

13.28.120 Shut-off by city.

The city reserves the right at any time, without notice, to shut off the mineral water supply for repairs, extensions, emergencies or any other reason, and the city shall not be responsible for any damage, such as lost profits, the breaking of any pipes or fixtures, stoppages or interruption of mineral water supply or any other damage, resulting from the shutting off of the mineral water. The city will attempt to notify the users in nonemergency situations when the mineral water supply is shut off. (Ord. 1029 § 1, 2005).

13.28.130 Termination or refusal of service for utilities.

The city shall have the right and power to deny connection to city mineral water, water and/or sewer utilities or to terminate a connection to city water and sewer utilities upon a determination by the mayor that any of the violations contained in Chapter [13.22](#) SLMC have occurred. (Ord. 1029 § 1, 2005).

13.28.140 Repair of service equipment.

The mineral water pipes, connections and other apparatus within the premises to be delivered mineral water service must be kept in good repair and protected from freezing at the expense of the owner, who will be responsible for all damages resulting from leaks or breaks. No person shall be allowed to dig into any street or sidewalk for the purpose of laying, moving or repairing any service unless they have a permit issued by the city. (Ord. 1029 § 1, 2005).

13.28.150 Connection compliance with this title required – Recovery of costs of illegal or unsafe connection.

A. The public works director shall specify how connections shall be made until all rules contained in this chapter for the same shall have been complied with.

B. All connections to the mineral water system shall comply with the state building code, particularly UPC Section 601.2.2, as now enacted or hereafter amended, in that all piping for this utility shall inside all buildings be color coded with yellow background with black lettering with the words "Caution: Nonpotable water, do not drink." All faucets and outlets which dispense mineral water shall be clearly marked with a warning that the faucet dispenses nonpotable water and such water is not safe to drink. In service locations existing on the date of the adoption of this chapter, the property owner shall have 60 days to install warning signs on all faucets and dispensing points for the system with all buildings serviced with mineral water.

C. Any person making a connection not permitted by this chapter shall be responsible for all costs incurred by the city in causing such connection to be removed from the city's mineral water system. Such costs shall include all wages, benefits and other compensation paid to city employees to cause such connection to be removed and/or all charges incurred by the city in employing contractors, including a 16 percent overhead fee for city administration of such contracted work, to accomplish such disconnection. Such charge shall become a mineral water utility charge against the premises where the connection was improperly made and shall be recoverable by all means used to collect mineral water utility account payments. Such charge shall be billed in the ordinary course of billing mineral water utility charges except that if such charge shall be more than twice the ordinary utility charge for that account location, the billing shall be sent as soon as it has been calculated.

D. Any person making a connection not permitted by this title, especially a cross-connection to the city's potable water system, shall be responsible for all costs incurred by the city in causing such connection to be removed from the city's potable water system and all costs of restoring the city's potable water system to a safe condition after such illegal connection. In the case of a cross-connection in violation of Chapter [13.22](#) SLMC, such costs shall include all costs of employee wages and benefits, consultants, contractors, laboratory fees including sample transportation costs, expert inspection fees, and all materials or chemicals consumed to effect the restoration of the potable water system. A 16 percent overhead fee for city administration shall be added to all costs of consultants, contractors or experts. Such charge shall become a water utility charge against the premises where the cross-connection was improperly made and shall be recoverable by all means used to collect water utility account payments. Such charge shall be billed in the ordinary course of billing water utility charges except that if such charge shall be more than twice the ordinary utility charge for that account location, the billing shall be sent as soon as it has been calculated. (Ord. 1029 § 1, 2005).

13.28.160 Entry for inspection and testing.

The duly authorized employees of the city are permitted to enter all properties at a time agreed to between the city employee and the property occupant or owner, for the purpose of inspecting,

observation, measurement testing and testing in accordance with the provisions of this chapter. (Ord. 1029 § 1, 2005).

13.28.170 Unlawful acts.

A. It is unlawful for any person to make connection with any fixture or connect any pipe with any mineral water main or mineral water pipe belonging to the city mineral water supply, without first obtaining the permission to do so from the city. Any person violating this section shall be subject to a C-6 penalty.

B. It is unlawful for any person other than an employee of the city authorized to do so to either turn on or off mineral water service to any property. Any person determined to have committed the civil infraction of violation of this subsection shall be subject to a C-10 penalty. (Ord. 1029 § 1, 2005).

13.28.180 Dispute resolution.

A. The city clerk shall inform all customers of the water/sewer/garbage/mineral water utility of the city of the availability of a dispute resolution system in the event of a disputed water/sewer/garbage/mineral water utility billing. Such notification shall occur via a notice on each billing that the customer may dispute the correctness of that billing by contacting the city clerk's office.

B. Customer Dispute.

1. At any time before the date of termination of water service for nonpayment of the amount shown on a water/sewer/mineral water/utility bill, or a notice of termination, a customer may dispute the correctness of all or part of the amount shown in accordance with the provisions of this section. A customer shall not be entitled to dispute the correctness of all or part of the amount if all or part of the amount was the subject of a previous dispute under this section.

2. The procedure for customer disputes shall be as follows:

a. Before the date of termination, the customer shall notify the clerk's office in writing, that the customer disputes all or part of the amount shown on a water/sewer/mineral water utility bill or a notice of termination, stating as completely as possible the basis for the dispute.

b. If the city clerk, or the clerk's designee, determines that the present dispute is untimely or that the customer previously disputed the correctness of all or part of the amount shown, the clerk's office shall mail to the customer a notice stating that the present dispute is untimely or invalid. The city shall then proceed as if the customer had not notified the city of the present dispute.

c. If the city clerk determines that the present dispute is not untimely or invalid under this section, the city, within three days after receipt of the customer's notice, shall arrange an informal meeting between the customer and the clerk.

d. Based on the city's records, the customer's allegations and all other relevant materials available to the clerk, the clerk shall resolve the dispute, attempting to do so in a manner satisfactory to both the city and the customer.

e. Within five days of completion of the meeting, the clerk shall mail to the customer a copy of its decision resolving the dispute.

f. That decision shall be final and binding on the customer.

3. Utilization of this dispute procedure shall not relieve a customer of his obligation to timely and completely pay all other undisputed charges and/or installments and surcharges, and the undisputed portion of the amount which is the subject of the present dispute.

Notwithstanding this section, failure to timely and completely pay all such undisputed amounts shall subject the customer to termination of water service in accordance with the provisions of this chapter.

4. Until the date of the decision of the city clerk, the city shall not terminate the water service of this customer and shall not issue a notice of termination to this customer solely for nonpayment of the disputed amount. If it is determined that the customer must pay some or all of the disputed amount, the city shall promptly mail to, or personally serve upon the customer, a notice of termination, following the procedure set forth in SLMC [13.28.060](#). (Ord. 1029 § 1, 2005).

13.28.190 Severability.

The invalidity of any part of this chapter shall not affect the validity of any other part of this chapter which can be given its full force and effect without the invalid portion or portions. (Ord. 1029 § 1, 2005).

13.28.200 Mineral water rates.

A. Turn-On Charge. The turn-on charge for turning on a mineral water service within the city is \$20.00.

B. Connection charge for a single mineral water connection to the city's main is \$250.00 together with the costs of materials and repairs to infrastructure.

C. Inspection charge to inspect repairs or installations not performed by the city public works department is \$50.00 per hour measured in quarter-hour increments with a one-hour minimum.

D. Monthly Service Fee.

1. Residential connection serving one point of use in a single-family residence: \$30.00 for the May-October billings, and \$15.00 for the November-April billings.

2. Commercial connection for each point of use shall be \$30.00 for the May-October billings, and \$15.00 for the November-April billings.

E. The definitions found in SLMC [13.18.290](#) apply to the mineral water utility.

F. Standby fee for availability of mineral water service at a property without any active service: \$8.16 per month. (Ord. 1170 § 1, 2013; Ord. 1168 § 1, 2013; Ord. 1036 § 1, 2006; Ord. 1029 § 1, 2005).

APPENDIX E
SURVEY RESULTS

Soap Lake Mineral Water System Questionnaire

The City of Soap Lake is currently preparing a Mineral Water Utility System Comprehensive Plan. The objectives of the Plan are to evaluate the existing mineral water utility, and to identify future system improvements. Your consideration and completion of the questionnaire is greatly appreciated. Please mail to the return address or drop off at the location below. If you have any questions please contact Anita Richardson.

Return Address:

Drop-off Location:

Questions:

PO Box 1270
Soap Lake, WA 98851

Drop Box in front of City Hall,
239 2nd Ave S.E.
Soap Lake, WA 98851

Anita Richardson
Deputy Clerk
(509) 246-1211

1. Do you have a mineral water service in your home or business?

YES NO

2. If you do not have a mineral water service, would you like to have mineral water service?

YES NO

3. If you would like a mineral water service, how much would you be willing to pay per month for it?

\$20/month \$30/month \$40/month Other \$ _____

4. If you have a mineral water service, how do you use it? (e.g. soaking bathtubs or for making Soap Lake products)

Explain:

5. Do you use mineral water service throughout the year or only seasonally?

Explain:

6. How often do you use your mineral water service? (e.g. 3 times per week, 10 times per month)

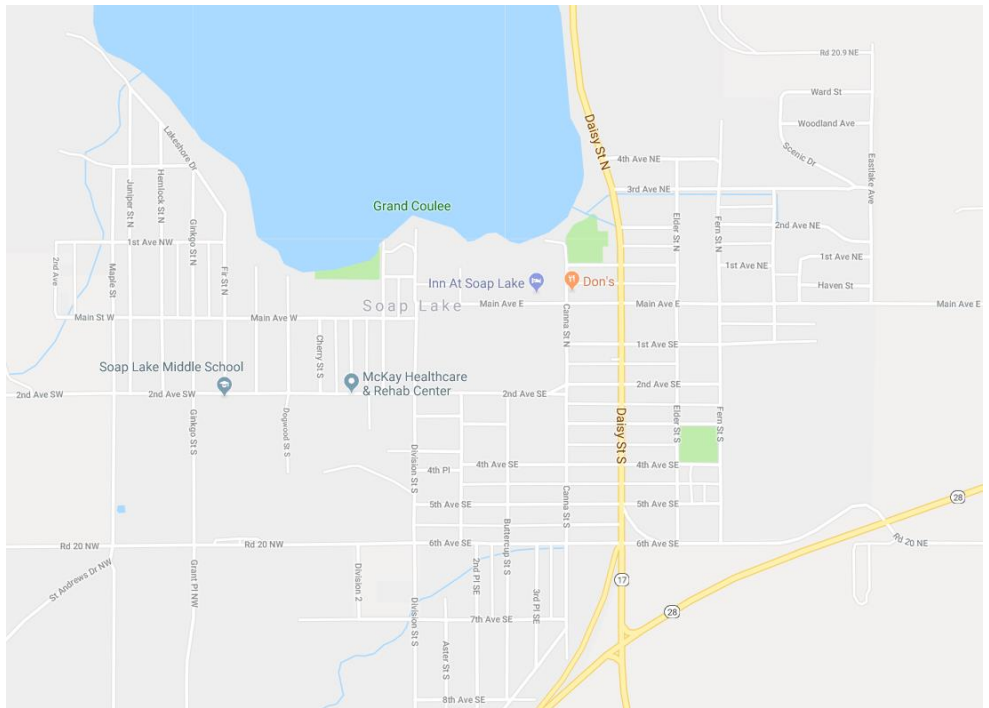
Explain:

7. If you have problems with your mineral water service, what are they? (e.g. my mineral water connection is unreliable or lacks pressure)

Explain:

(Optional) Please provide the following or place an “X” on the map for your location within Soap Lake:

- Name
- Address
- Email
- Phone Number



City of Soap Lake
 Mineral Water System Plan, GO# 17059
 City Wide Survey -- Positive Responses

ID	Q1 Have MW Service?	Q2 Want MW Service?	Q3 Willing to pay?	Q4 Used how?	Q5 Used when?	Q6 How often used?	Q7 Problems?	Note
1	YES	YES	20	Bathroom		5 week		
2	NO	MAYBE	40					
3	NO	MAYBE	0			10 month	Capped on inside	edited Q1 response
4	YES	YES	20	Tub				Not sure if currently gets MW Service
5	NO	YES	50	Tub				edited Q1
6	NO	YES	Rate Fee	Tub	Seasonally		Leaking Line to Water Tank	edited Q1
7	NO	YES	20	Tub	All Year	8 week		edited Q1
8	NO	YES	30	Tub	All Year	2 week		edited Q1
9	NO	YES	20	All of the Above	All Year	1 day		edited Q1
10	NO	YES	20	Tub	All Year		Hard on Water Tanks	edited Q1
11	NO	YES	20	Tub	All Year		Not sure How Works	edited Q1
12	NO	YES	20	Tub	Seasonally	1 day		edited Q1
13	NO	YES	20					edited Q1
14	NO	NO						edited Q1
15	NO	YES						
16	NO	YES	40	Tub				
17	NO	MAYBE	20	Tub				
18	NO	NO	20	Tub				
19	NO	YES	20		All Year			
20	NO	YES	Rate Fee					
21	NO	YES	40					
22	NO	YES	40	Tub				
23	NO	YES	30		All Year			
24	NO	YES	20					
25	NO	YES	100	Tub				
26	NO	YES	20	Tub				
27	NO	YES	20	Tub				
28	NO	YES	50	Tub	All Year	10 month		
29	NO	YES	40	Tub	All Year	1 day		
30	NO	YES	20	Tub				
31	NO	MAYBE	30					
32	NO	YES	40	Tub				
33	NO	YES	30					
34	NO	YES	30	Tub	Seasonally			
35	NO	YES	10	Tub	All Year			
36	NO	YES	20	Tub	All Year			
37	NO	YES	15	Tub	All Year			
38	NO	YES	20	Tub	Seasonally			
39	NO	YES						
40	NO	YES						
41	NO	MAYBE	40	Tub	All Year	2 week		edited Q1

SUMMARY

Currently Using Service	2
YES Want Service	34
MAYBE Want Service	4
Have Mineral Water Connection	18
No Connection but Want Service	0

Respects Rate Fee	2
WILLING TO PAY	
Median	20
Average	29.51612903
Mode	20

Question
 Total Respondents 1.20 0.487179487
 Do you have a mineral water connection?
 Do you want Mineral Water Service
 Water are you willing to pay for Mineral Water Service
 How do (or would) you use your Mineral Water Service
 How often would you use your Mineral Water service

Statistics
 49% responded YES
 33% responded YES
 The median amount was \$20
 Most respondents said bathing times per year or 17 times per month

98% of mineral water connections cannot receive service

APPENDIX F
SPA CALCULATIONS

City of Soap Lake
Mineral Water System Plan
Spa Evaporation Calculations

	wind speed	temp		vapor pressure
date	mph	f	c	
Jan	2	32	0	4.54
Feb	3	36	2	5.34
Mar	3	45	7	7.58
Apr	5	52	11	9.87
May	5	63	17	14.68
Jun	5	70	21	18.71
Jul	5	75	24	22.16
Aug	3	73	23	20.72
Sep	3	63	17	14.68
Oct	3	52	11	9.87
Nov	3	37	3	5.55
Dec	3	30	-1	4.19
year	3	54	12	10.62

sq ft
Surface Area 707

EPA	Stiver Mackay
Monthly Evaporation	
gpd	gpd
44	13
71	23
99	32
189	68
275	99
346	125
406	146
256	82
185	60
127	41
74	24
56	18
136	44

Averages

gpd	177	61
gpm	0.1231	0.0423
gpy	64,687	22,241

APPENDIX G
MODEL RESULTS

City of Soap Lake
 Mineral Water System Plan, GO# 17059
 Model Results

PHD 42.00
 #noded 67.00
 even 0.63
 5 gpm 8.40

EVEN DISTRIBUTION OF DEMAND

ID (Char)	Demand 1 (gpm)
J1	0.63
J3	0.63
J5	0.63
J7	0.63
J9	0.63
J11	0.63
J13	0.63
J15	0.63
J17	0.63
J19	0.63
J21	0.63
J23	0.63
J25	0.63
J27	0.63
J29	0.63
J31	0.63
J33	0.63
J35	0.63
J37	0.63
J39	0.63
J41	0.63
J43	0.63
J45	0.63
J47	0.63
J49	0.63
J51	0.63
J53	0.63
J55	0.63
J57	0.63
J59	0.63
J61	0.63
J63	0.63
J65	0.63
J67	0.63
J69	0.63
J71	0.63
J73	0.63
J75	0.63
J77	0.63
J89	0.63
J91	0.63
J93	0.63

JUNCTION RESULTS

ID	Demand (g)	Elevation (ft)	Head (ft)	Pressure (psi)
D1	0.63	1,095.00	1,200.33	45.64
D2	0.63	1,110.00	1,202.68	40.16
D3	0.63	1,082.00	1,203.07	52.46
J1	0.63	1,119.00	1,205.91	37.66
J105	0.63	1,125.00	1,202.11	33.41
J107	0.63	1,125.00	1,202.00	33.37
J109	0.63	1,130.00	1,201.82	31.12
J11	0.63	1,106.00	1,204.08	42.5
J111	0.63	1,135.00	1,201.69	28.9
J113	0.63	1,140.00	1,201.66	26.72
J115	0.63	1,145.00	1,201.64	24.54
J117	0.63	1,150.00	1,201.64	22.37
J119	0.63	1,135.00	1,201.64	28.88
J121	0.63	1,100.00	1,201.35	43.91
J123	0.63	1,100.00	1,201.59	44.02
J125	0.63	1,100.00	1,200.59	43.58
J127	0.63	1,100.00	1,200.55	43.57
J129	0.63	1,100.00	1,200.44	43.52
J13	0.63	1,093.00	1,203.91	48.06
J131	0.63	1,100.00	1,200.36	43.48
J133	0.63	1,100.00	1,201.63	44.04
J135	0.63	1,100.00	1,200.54	43.57
J137	0.63	1,100.00	1,200.56	43.57
J139	0.63	1,100.00	1,203.71	44.94
J141	0.63	1,100.00	1,202.35	44.35
J143	0.63	1,092.00	1,203.07	48.13
J15	0.63	1,089.00	1,203.72	49.71
J17	0.63	1,109.00	1,203.26	40.84
J19	0.63	1,105.00	1,203.08	42.5
J21	0.63	1,107.00	1,203.02	41.6
J23	0.63	1,103.00	1,202.81	43.25
J25	0.63	1,098.00	1,202.63	45.34
J27	0.63	1,099.00	1,202.11	44.68
J29	0.63	1,100.00	1,202.01	44.2
J3	0.63	1,115.00	1,205.69	39.29
J31	0.63	1,106.00	1,201.82	41.52
J33	0.63	1,119.00	1,201.69	35.83
J35	0.63	1,135.00	1,201.66	28.88
J37	0.63	1,137.00	1,201.64	28.01
J39	0.63	1,140.00	1,201.64	26.71
J41	0.63	1,100.00	1,204.93	45.46
J43	0.63	1,100.00	1,204.93	45.46

City of Soap Lake
 Mineral Water System Plan, GO# 17059
 Model Results

EVEN DISTRIBUTION OF DEMAND			JUNCTION RESULTS			
ID (Char)	Demand 1 (gpm)	ID	Demand (g)	Elevation (ft)	Head (ft)	Pressure (psi)
J95	0.63	J45	0.63	1,100.00	1,204.93	45.47
J97	0.63	J47	0.63	1,100.00	1,205.36	45.65
J105	0.63	J49	0.63	1,100.00	1,203.95	45.04
J107	0.63	J5	0.63	1,113.00	1,205.36	40.02
J109	0.63	J51	0.63	1,100.00	1,203.93	45.03
J111	0.63	J53	0.63	1,100.00	1,204.07	45.1
J113	0.63	J55	0.63	1,100.00	1,204.07	45.09
J115	0.63	J57	0.63	1,100.00	1,204.07	45.09
J117	0.63	J59	0.63	1,100.00	1,204.05	45.09
J119	0.63	J61	0.63	1,100.00	1,202.68	44.49
J121	0.63	J63	0.63	1,100.00	1,203.80	44.98
J123	0.63	J65	0.63	1,100.00	1,203.77	44.96
J125	0.63	J67	0.63	1,100.00	1,203.73	44.95
J127	0.63	J69	0.63	1,100.00	1,203.73	44.94
J129	0.63	J7	0.63	1,097.00	1,204.93	46.77
J131	0.63	J71	0.63	1,100.00	1,203.75	44.96
J133	0.63	J73	0.63	1,100.00	1,203.74	44.95
J135	0.63	J75	0.63	1,100.00	1,203.75	44.96
J137	0.63	J77	0.63	1,100.00	1,203.71	44.94
J139	0.63	J89	0.63	1,100.00	1,202.71	44.51
J141	0.63	J9	0.63	1,100.00	1,204.23	45.16
D1	0.63	J91	0.63	1,100.00	1,202.71	44.51
D2	0.63	J93	0.63	1,100.00	1,202.68	44.49
D3	0.63	J95	0.63	1,110.00	1,202.68	40.16
J143	0.63	J97	0.63	1,120.00	1,202.35	35.68

City of Soap Lake
 Mineral Water System Plan, GO# 17059
 Model Results

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REALISTIC DISTRIBUTION				JUNCTION RESULTS				PIPE RESULTS								
ID (Char)	gpm	Demand (g Elevation)	(ft) Head (ft)	Pressure (psi)	ID	From NodeTo Node	Length (ft)	Diameter	(Roughness Flow (gpm)\Velocity (ft Headloss (ft HL)/1000 (ft Status							
J1	5	0	1,095.00	45.27	D1	P101	167	165	479.36	3	150	-0.61	0.03	0	0	Open
J3		0	1,110.00	40.1	D2	P103	J71	J73	452.86	2	100	0	0	0	0	Open
J5		0	1,082.00	52.37	D3	P105	J75	J77	576.53	2	60	0	0	0	0	Open
J7		5	1,119.00	37.65	J1	P111	J23	J91	636	4	80	5.96	0.15	0.06	0.1	Open
J9		0	1,125.00	33.23	J105	P113	J25	J93	637.2	3	130	-5.96	0.27	0.1	0.16	Open
J11		0	1,125.00	33.15	J107	P115	J98	J95	175.52	4	80	0	0	0	0	Open
J13		0	1,130.00	30.81	J109	P117	J93	J91	271.9	4	80	-5.96	0.15	0.03	0.1	Open
J15		0	1,106.00	42.44	J11	P119	J91	J89	134	4	80	0	0	0	0	Open
J17		5	1,135.00	28.46	J111	P131	J141	J97	567.13	3	130	0	0	0	0	Open
J19		0	1,140.00	26.32	J113	P133	J27	J105	577.75	3	130	0	0	0	0	Open
J21	5	0	1,145.00	24.14	J115	P135	J29	J107	604.29	3	130	0	0	0	0	Open
J23		5	1,150.00	21.93	J117	P137	J31	J109	575.18	3	130	0	0	0	0	Open
J25		0	1,135.00	28.47	J119	P139	J33	J111	606.64	3	130	5	0.23	0.07	0.12	Open
J27		0	1,100.00	43.52	J121	P141	J35	J113	604.57	3	130	0	0	0	0	Open
J29		0	1,100.00	43.62	J123	P143	J37	J115	604.56	3	130	0	0	0	0	Open
J31		0	1,100.00	43.11	J125	P145	J39	J117	604.56	3	130	5	0.23	0.07	0.12	Open
J33		0	1,100.00	43.11	J127	P147	J39	J133	1,245.70	3	130	0	0	0	0	Open
J35	5	0	1,100.00	43.11	J129	P149	J37	J119	412.11	4	80	0	0	0	0	Open
J37		0	1,093.00	48	J13	P151	J33	J123	670.93	3	130	5	0.23	0.08	0.12	Open
J39		0	1,100.00	43.11	J131	P153	J123	J121	278.2	2	130	5	0.51	0.24	0.86	Open
J41		0	1,100.00	43.62	J133	P155	J121	J125	454.85	2	80	5	0.51	0.96	2.11	Open
J43		0	1,100.00	43.11	J135	P157	J125	J137	615.16	2	80	5	0.51	1.3	2.11	Open
J45		5	1,100.00	42.55	J137	P159	J125	J127	276.39	2	130	0.02	0	0	0	Open
J47		0	1,100.00	44.98	J139	P161	J127	J129	376.43	1	130	0.02	0.01	0	0	Open
J49		0	1,100.00	44.23	J141	P163	J125	J129	480.37	1.5	140	-0.02	0	0	0	Open
J51		0	1,092.00	48.04	J143	P165	J129	J131	365.21	1.5	140	0	0	0	0	Open
J53		0	1,089.00	49.63	J15	P167	J127	J135	507.7	2	130	0	0	0	0	Open
J55		0	1,109.00	40.76	J17	P169	J141	J27	278.21	3	140	20	0.91	0.38	1.35	Open
J57		5	1,105.00	42.41	J19	P171	J131	D1	471.77	1.5	140	0	0	0	0	Open
J59		0	1,107.00	41.52	J21	P173	J93	D2	205.24	4	120	0	0	0	0	Open
J61		0	1,103.00	43.17	J23	P175	J19	J143	235.36	4	140	0	0	0	0	Open
J63		0	1,098.00	45.25	J25	P177	J143	D3	356.14	4	140	0	0	0	0	Open
J65	5	0	1,099.00	44.5	J27	P23	T5002	J1	510.86	6	140	45	0.51	0.11	0.21	Open

City of Soap Lake
 Mineral Water System Plan, GO# 17059
 Model Results

REALISTIC DISTRIBUTION		JUNCTION RESULTS		PIPE RESULTS									
ID (Char)	Demand (g Elevation)	(ft) Head (ft)	Pressure (psi)	From Node	To Node	Length (ft)	Diameter (ft)	Roughness	Flow (gpm)	Velocity (ft)	Headloss (ft)	HL/1000 (ft)	Status
J67	0	1,100.00	43.98	J25	J1	170.69	4	140	40	1.02	0.2	0.2	1.2 Open
J69	0	1,115.00	39.3	P27	J3	256.53	4	140	40	1.02	0.31	0.31	1.2 Open
J71	0	1,106.00	41.21	P29	J5	367.9	4	140	40	1.02	0.44	0.44	1.2 Open
J73	5	1,119.00	35.43	P31	J7	668.37	4	140	40	1.02	0.8	0.8	1.2 Open
J75	5	1,135.00	28.48	P33	J9	340.52	4	140	26.23	0.67	0.19	0.19	0.55 Open
J77	0	1,137.00	27.6	P35	J11	469.57	4	140	21.23	0.54	0.17	0.17	0.37 Open
J89	0	1,140.00	26.29	P37	J13	479.61	4	140	24.4	0.62	0.23	0.23	0.48 Open
J91	0	1,100.00	45.47	P39	J15	934.63	4	140	25	0.64	0.47	0.47	0.5 Open
J93	0	1,100.00	45.47	P41	J17	407.31	4	140	25	0.64	0.2	0.2	0.5 Open
J95	0	1,100.00	45.47	P43	J19	145	4	140	20	0.51	0.05	0.05	0.33 Open
J97	0	1,100.00	45.66	P45	J21	137	3	140	20	0.91	0.19	0.19	1.35 Open
J105	0	1,100.00	44.99	P47	J23	278.26	3	140	14.04	0.64	0.2	0.2	0.7 Open
J109	0	1,113.00	40.03	P49	J25	278.21	3	140	20	0.91	0.38	0.38	1.35 Open
J111	5	1,100.00	44.98	P51	J27	139	3	140	20	0.91	0.19	0.19	1.35 Open
J113	5	1,100.00	45.04	P53	J29	287.83	3	140	20	0.91	0.39	0.39	1.35 Open
J115	5	1,100.00	45.04	P55	J31	261.59	3	140	20	0.91	0.35	0.35	1.35 Open
J117	5	1,100.00	45.04	P57	J33	278.26	3	140	5	0.23	0.03	0.03	0.1 Open
J119	5	1,100.00	44.9	P59	J35	267.86	3	140	5	0.23	0.03	0.03	0.1 Open
J121	0	1,100.00	44.9	P61	J37	276.78	3	140	5	0.23	0.03	0.03	0.1 Open
J123	5	1,100.00	44.87	P63	J7	233.1	3	150	0	0	0	0	0 Open
J125	0	1,100.00	44.87	P65	J41	307.5	3	150	0	0	0	0	0 Open
J127	0	1,100.00	44.87	P67	J7	250.92	3	150	0	0	0	0	0 Open
J129	0	1,097.00	46.77	P69	J5	607.75	4	140	0	0	0	0	0 Open
J131	0	1,100.00	44.85	P71	J9	451.19	3	140	13.77	0.63	0.31	0.31	0.68 Open
J133	0	1,100.00	44.85	P73	J11	529.94	4	150	5	0.13	0.01	0.01	0.02 Open
J135	5	1,100.00	44.84	P75	J49	157.96	4	140	13.77	0.35	0.03	0.03	0.17 Open
J137	5	1,100.00	44.84	P77	J51	178.56	4	140	13.77	0.35	0.03	0.03	0.17 Open
J139	0	1,100.00	44.45	P79	J11	349	3	140	0	0	0	0	0 Open
J141	0	1,100.00	45.12	P81	J13	341.39	3	130	10.61	0.48	0.16	0.16	0.48 Open
D1	0	1,100.00	44.45	P83	J63	121.63	0.75	60	0	0	0	0	0 Open
D2	0	1,100.00	44.43	P85	J57	201.82	2	60	0	0	0	0	0 Open
D3	0	1,110.00	40.1	P87	J57	132.48	3	140	0	0	0	0	0 Open
J143	0	1,120.00	35.56	P89	J51	463.38	1	140	0	0	0	0	0 Open
				P91	J63	342.25	4	100	10.61	0.27	0.07	0.07	0.19 Open
				P93	J65	374.31	3	130	5	0.23	0.04	0.04	0.12 Open
				P95	J71	304.63	4	130	5	0.13	0.01	0.01	0.03 Open
				P97	J15	361.85	4	100	-0.61	0.02	0	0	0 Open
				P99	J69	347.24	4	100	-0.61	0.02	0	0	0 Open

APPENDIX H
CONSTRUCTION STANDARDS

CITY OF SOAP LAKE



CONSTRUCTION STANDARDS

2018

G&O JOB No. 18026



Gray & Osborne, Inc.
CONSULTING ENGINEERS

CHAPTER 1
GENERAL REQUIREMENTS

REQUIREMENTS FOR DEVELOPER CONSTRUCTED IMPROVEMENTS

Section A: General Provisions

1. The specifications and standard details provided herein shall be used to implement design and construction requirements of the City of Soap Lake development ordinances, codes, or titles. The use of product manufacturer names or trademarks is intended to provide examples of acceptable quality standards. Parts or products specified by name may be interchangeable with like and equal products only upon prior City approval.
2. Definitions for terms described herein shall be those provided pursuant to Title 13 of the Soap Lake Municipal Code. The definition of any word or phrase which may not be identified pursuant to Title 13 shall be defined from either one of the following sources:
 - A. Revised Code of Washington.
 - B. Washington Administrative Code.
 - C. Commonly used dictionary such as Merriam-Webster's.
3. Within this document are numerous references to "the City". All communication with the City shall be first directed to the City of Soap Lake's Public Works Supervisor. The Public Works Supervisor may designate an alternate contact for specific items, however only the Public Works Supervisor shall have the authority to provide approval for variations from this document.
4. The standards, procedures, and requirements of these Design and Construction Standards are the minimum necessary to promote the health, safety, and welfare of the residents of the City of Soap Lake. The City may adopt more rigorous or different standards, procedures, and requirements whenever necessary. If the provisions of these Design and Construction Standards conflict with one another, or if a provision of these Design and Construction Standards conflicts with the provision of the City Code or another Ordinance of the City, the most restrictive provision or the provision imposing the highest standard shall prevail.

Section B: General Requirements of the Developer

1. The Developer shall retain the services of an engineer registered with the state of Washington to provide necessary construction design services.
2. Complete plans and specifications of any proposed improvement shall be submitted to the City for approval. Upon City review and approval, the

Developer may submit all water and sewer plans and specifications to the Departments of Health and Ecology as required.

3. Unless otherwise approved by the City, plan and design drawings shall have a minimum scale of 1 inch equal to 50 feet or 1 inch equal to 40 feet if water, sewer, and street improvements are drawn on the same sheets.
4. All utilities, whether City-owned or provided by an outside purveyor, shall be placed within the City's required right-of-way.
5. Water and sewer certification shall be on standard State forms. Copies of testing data including, but not limited to, compaction and pressure testing, shall be provided to the City. Street certification shall consist of a letter, test data, weight tickets, and other associated or City required information.
6. The Developer shall provide a performance bond or similar security instrument to ensure workmanship and materials over the full time period between project beginning and end.
7. The Developer shall require the Contractor to provide insurance which insures all contracted work and which holds the City and its agents harmless from any and all damage claims which may result due to the performance of any contracted work. The Contractor shall provide the City proof of insurance which shall be approved by the City prior to commencing contracted work.
8. The Developer shall provide the City with 2 full size paper copies and a .pdf copy of construction record drawings illustrating all revisions made during construction. At minimum, the record drawings shall show the following:
 - A. The existence of all underground utilities encountered (station and depth).
 - B. Precise distance to fittings, valves, services, etc, length of all spools, etc.
 - C. Type of all fitting ends (MJ, FL, etc.).
 - D. Type of restraint used.
 - E. Location of sewer wyes.
 - F. Elevation of each manhole, pipe invert (in and out) and sewer slope.
9. Where specific manufacturers are required for facilities and materials, installation of those facilities and materials shall be completed to the manufacturer's specifications, unless otherwise approved by the City.

10. No excavation work shall be done between November 15 and February 15 without permission from the City.
11. Water system improvements shall meet the requirements of the Washington State Department of Health Water System Design Manual, current edition, and the specifications as described herein.
12. Sewer system improvements shall meet the requirements of the Washington State Department of Ecology Criteria for Sewerage Works Design, current edition, and the specifications as described herein.
13. To maintain the best travel surface feasible, there shall be no excavation on newly paved or substantially repaired streets for a period of five (5) years.
14. Plan review and inspection fees are hereby established to defray the administrative expense of plan review and inspection costs incurred by the City of Soap Lake.

The plan review and inspection fee shall be the total actual costs incurred by the City of Soap Lake, its agents, employees, and elected or appointed officials, for review and approval of the plans and specifications and for inspection of construction of the public works improvements. The fee shall include, but not be limited to, initial plan review, subsequent meetings with the Developer, explanations to the Developer's engineering consultant, reviews of revised plans, construction inspection, re-inspections, and a final inspection prior to the expiration of the maintenance period.

The plan review fee shall be tabulated and sent to the Developer and paid by the Developer in full prior to the City releasing the approved original plans and specifications for construction or the issuance of a Building Permit.

The construction inspection fee shall be tabulated and sent to the Developer and paid by the Developer in full prior to the City issuing a Certificate of Occupancy or final acceptance of the public works improvements.

END CHAPTER 1

CHAPTER 2

WATER

W-1 DESIGN REQUIREMENTS

1. Water system improvements shall be designed and constructed in accordance with the current editions of the Washington State Department of Health Water System Design Manual, the City's Water System Plan, and applicable AWWA standards.
2. Non-residential and irrigation water services may be required to install backflow prevention devices as determined by the City. If this is the case, backflow prevention device installations, including but not limited to, valves, piping, vaults, and drain lines shall be coordinated with City staff.
3. All water piping, valves, fittings, and appurtenances shall be certified under NSF 61 and NSF 372 for potable water use.
4. The City's plan review for water system improvements may, as determined by the City, include updating the City's water system model to include the proposed improvements and to assess the affect that the improvements will have on the existing water system.

W-2 WATER MAIN PIPE

Water mains to be installed shall be polyvinyl chloride (PVC) for all sizes, unless specifically noted otherwise.

The PVC pipe shall conform to AWWA C900 Standards. The PVC pipe shall have the same outside dimensions as ductile iron pipe.

The pipe manufacturer shall certify in writing that the inspection and all tests of the specified standards for both pipe and gaskets being supplied for this project have been made and that the results thereof comply with the requirements of the AWWA standard.

Joints shall be "made-up" in accordance with the manufacturer's recommendations. Standard joint material, including rubber ring gaskets shall be furnished with the pipe. Materials shall be suitable for the specified pipe sizes and pressures.

Except where necessary, in making connections with other lines and unless authorized by the City, pipes shall be laid with bells facing in the direction of laying and for lines on an appreciable slope, the bells shall face upwards.

All pipe shall be delivered to the job site with water tight wrapping or pipe plugs. All pipe shall be carefully checked on delivery as well as before placing in the trench. Pipe shall be carefully bedded, joined, and protected. It shall be laid to the line and grade established and at all times the interior kept free from dirt,

gravel, and all other foreign matter. The open ends shall be wrapped or plugged and secured at any time pipe laying is not in progress.

Water mains shall be laid on a uniform grade and the Developer shall anticipate those places where additional depth is required to avoid certain utilities, and adjust the pipeline profile accordingly to maintain uniform grade.

Water main shall be installed with suitable separation and protection from any other type of nonpotable underground piping. Separation and protection requirements as defined in *Pipeline Separation Design and Installation Reference Guide* by the Washington State Department of Ecology and the Department of Health shall apply to all water main installations.

Prior to making permanent connections to the existing system, the new water main including service lines shall have passed a pressure test, been adequately flushed, and finally passed the required bacteriological test.

Dirt or other foreign material shall be prevented from entering the pipe or pipe joint during handling or laying operations, and any pipe or fitting that has been installed with dirt or foreign material in it shall be removed, cleaned, and relayed. A clean whiskbroom shall be used for this purpose and for brushing to remove foreign matter prior to joining of pipe ends. At times when pipe laying is not in progress, the open ends of the pipe shall be closed by a watertight plug or by other means approved by the City to ensure cleanliness inside the pipe.

Bedding and backfill materials shall comply with the most current version of the Washington State Department of Transportation (WSDOT) Standard Specifications for Road, Bridge, and Municipal Construction.

Pipe shall be stacked in such a manner as to prevent damage to the pipe, to prevent dirt and debris from entering the pipe, and to prevent any movement of the pipe. The bottom tiers of the stack shall be kept off the ground on timbers, rails or other similar supports. Pipe on succeeding tiers shall be alternated by bell and plain end. Timbers 4-inches by 4-inches in size shall be placed between tiers and chocks shall be placed at each end to prevent movement. For safety each size of pipe shall be stacked separately.

W-3 WATER MAIN FITTINGS

All fittings shall be short-bodied, ductile iron complying with applicable AWWA C110 or C153 Standards. All fittings shall be cement-lined and either mechanical joint or flanged, as indicated on the Plans. Use of a comparable "equal" product requires approval of the City.

Fittings in sections shown on the Plans requiring restrained joints shall be mechanical joint fittings with a mechanical joint restraint device. The mechanical joint restraint device shall have a working pressure of at least 250 psi with a minimum safety factor of 2:1 and shall be EBAA Iron, Inc. MEGALUG, Romac Industries, Inc., Grip Ring Pipe Restrainer or approved equal. Stargrip Series 3000 mechanical joint restraint devices are not accepted or approved as equal.

Fittings shall be adequately "blocked" with poured-in-place concrete, within wooden forms shaped to establish a firm minimum bearing area, against an undisturbed earth wall as shown on the Standard Details. Four-inch by four-inch minimum size timber blocking may be permitted as temporary blocking, when utilized as forms outside the poured-in-place concrete when fittings are to be pressurized prior to the 24 hour minimum "set" time. The concrete thrust blocks must be in place at least 24 hours before beginning the pressure test, to allow the concrete to "set." The strength of the concrete shall be 2,000 psi minimum.

All valves and all fittings requiring a concrete block shall first be covered with visqueen, before concrete is poured. The concrete shall not cover joints, bolt heads or nuts.

All bolts shall be coated with Armite Anti-Seize Compound No. 609, or equal, prior to installation.

Before cutting existing pipes, the Developer shall measure the pipe outside diameter to determine if pipe was manufactured to a diameter which is different than presently specified in AWWA Standards, and if required, the Developer shall furnish alternate or additional fittings more compatible with the pipe outside diameter.

All connections to other pipe shall be with Romac, Smith-Blair, Dresser, or Ford flexible couplings. The couplings shall have long middle rings and shall have a fusion-bonded epoxy coating. The bolts and nuts shall be high strength, low alloy steel or electro-galvanized mild steel.

All joints in the pipe, fittings, valves, flexible couplings, and sleeves, shall be fully seated with small clearances allowed for pipe expansion. Where flexible couplings and sleeves are called for, the space between pipe ends shall not exceed 1/4 inch.

When the space between pipe ends is excessive, a short section of pipe may be inserted as a spacer ring to limit such pipe movement within the coupling or sleeve, to obtain the 1/4-inch limitation stipulated herein.

W-4 VALVES

All valves 8-inch and smaller shall be resilient seated ductile iron gate valves except where shown on the Plans. All valves 10-inch and larger shall be ductile iron butterfly valves.

Valves shall be installed at a minimum of every 800 lineal feet of pipe installed in residential areas and a minimum of every 500 lineal feet in commercial/industrial areas.

The valve manufacturer shall certify in writing that the inspection and all tests of the specified standards for the valves being supplied for this project have been made and that the results thereof comply with the requirements of the Standard.

A. Resilient-Seated Gate Valves

The gate valves shall be resilient seated ductile iron body valves with non-rising stems (NRS) opening counterclockwise and equipped with a 2-inch square operating nut. Valves shall meet the full requirements of the AWWA C509 or C515 Standards. The valves shall have double "O" ring stem seals which shall withstand the test pressure without leakage. Valves shall be rated at 250 pounds per square inch (psi), minimum working pressure and furnished with either flanged and/or mechanical joints as shown on the Plans. All surfaces, interior and exterior, shall be epoxy-coated, acceptable for potable water.

Valves shall be Mueller, M&H, Clow, American Flow Control Series 2500, U.S. Pipe or approved equal.

B. Butterfly Valves

The butterfly valves shall be either mechanical joint or flanged ductile iron body valves equipped with a 2-inch square operating nut and shall be of the tight closing, rubber seat type. Valves shall meet the full requirements of AWWA C504-87 Standards, Class 150-B except the valve shall be able to withstand 200 psi differential pressure without leakage.

Butterfly valves shall be Mueller, M&H, Clow, Henry Pratt Company "Groundhog," or approved equal.

C. Appurtenances

All valves shall be set with the operating stems vertical. The axis of the valve box shall be common with the projected axis of the valve operating stem. The

tops of the adjustable valve boxes shall be set to the existing or established grade, whichever is applicable.

Valves shall include operator extension stems to bring the operating nut from 2'-0" to 1'-0" from finished grade.

The extension stem of the length required to meet field conditions shall be a manufactured unit with a 1-inch-diameter mild steel rod. At the top of the extension stem there shall be a 2-inch standard operating nut complete with a centering flange.

Valve boxes shall be equal to the "Rich 940" Model or Sather Manufacturing. The flared end of the valve box shall be set at the bottom elevation of the 2-inch operating nut to allow space for rocks to be moved laterally from the operation nut. The "ears" on the valve box top shall be aligned parallel to the direction of flow through the valve.

The valve box shall be placed over the valve or valve operator in such a manner that the valve box does not transmit shock or stress loads to the valve. The casting shall not rest directly upon the body of the valve or upon the water main.

Any extension of the valve box shall utilize additional flared end valve box bottom sections or cast iron hub soil pipe. Other materials are not acceptable.

In areas where the valve box is not in concrete or asphalt a 24-inch-diameter by 6-inch cement concrete block shall be installed around the valve box at finished grade. The valve box shall be flush with the top and centered.

A fiberglass valve marker post shall be furnished and installed where directed. Valve marker posts shall be blue in color, 3.75-inches wide (flat), 60-inches long and furnished with a 3-inch- by 3-inch-high density white reflector (250 candle power) and a flexible anchor barb. Valve markers shall be Carsonite Utility Marker CUM 375.

Markers shall be placed at the edge of the right-of-way opposite the valve and set so as to leave 36 inches of the post exposed above grade. The size of the valve and the distance in feet and inches to the valve shall be noted with decals, typically designed for use on fiberglass boats, placed on the face of the post, using letters approximately 2-inches high. Each post shall include the following decal: "Caution Water Valve, Before Digging, Call 811, Utility Underground Location Center."

W-5 TAPPING TEES AND TAPPING VALVES

The tapping sleeves shall be rated for a working pressure of 250 psi minimum and furnished complete with joint accessories. Tapping sleeves shall be constructed in two sections for ease of installation and shall be assembled around the main without interrupting service.

Fabricated steel style sleeves shall be fusion bonded coated, acceptable for potable water, and shall be manufactured by JCM, Romac, or approved equal.

Size on size tapping shall not be permitted.

Tapping valves shall be resilient-seated ductile iron body gate valves provided with a standard mechanical joint outlet for use with ductile iron pipe and shall have oversized seat rings to permit entry of the tapping machine cutters. In all other respects, the tapping valves shall conform to the resilient seat gate valves herein specified with regards to operation and materials.

The tapping sleeve and valve shall be pressure tested to 200 psi (water) prior to tapping the main.

The installation of the tapping sleeves and valves and the tapping of the main shall be performed by Speer Taps or an equal approved by the City.

W-6 AIR RELIEF VALVES

Air and vacuum release assemblies shall be installed at high points on the water system as shown on the Plans or designated in the field by the City.

The air relief assemblies shall be a combination air and vacuum valve APCO 143C or equal complete as shown on the Standard Detail.

W-7 BLOWOFF ASSEMBLIES

The blowoff assemblies shall be furnished and installed as shown on the Standard Detail.

Temporary blowoffs utilized by the Contractor for flushing the water main shall be sufficient size to obtain 2.5 feet per second velocity in the main.

Hydrant assemblies shall be installed within 4 feet of new dead-end water mains before being placed in service. Blow-off assemblies may be approved by the City in lieu of hydrant assemblies for temporary dead-end water mains that are to be placed in service. Blow-off assemblies are not approved for installation on dead-end water mains within permanent cul-de-sacs.

W-8 FIRE HYDRANTS

The fire hydrants shall be the break-away compression type, meeting AWWA C502-85 Standards, in which the valve will remain closed if the barrel is broken. The hydrant's main valve opening shall be not less than 5-1/4 inches in diameter. The fire hydrants shall be equipped with two, 2-1/2-inch National Standard Thread (NST) hose nozzles and one, 4-1/2-inch NST pumper port. A permanent anodized 5-inch Storz hydrant adapter and anodized Storz blind flange shall be installed on the 4-1/2-inch pumper port. Branch connection shall be for 6-inch pipe, as noted on the Standard Details, and shall be mechanical joint.

Fire hydrants shall be M&H Valve (MH-129), or approved equal.

Fire hydrant spacing shall not exceed 400 feet. Additional hydrants may be required to provide adequate fire protection as noted in Section C103 of the *International Fire Code*.

The Contractor shall furnish fire hydrants with the correct bury depth (trench depth), in accordance with the specified pipe depth and special conditions of the Project. The fire hydrants shall be installed to provide the mounting height above finished grade as shown on the Standard Detail. The hydrant shall be installed plumb on the vertical axis.

The hydrants shall be wire brushed, primed with one coat of Preservative All Metal Guard II and painted with two coats of Yellow to match the City's existing hydrants.

Between the time when the hydrant is installed and the completed facility is placed in operation, the hydrant shall at all times be wrapped in burlap, bagged, or covered in some other suitable manner as approved by the City, to clearly indicate that the hydrant is not in service.

The resilient seated ductile iron body gate valve shall have a flange by mechanical joint body, and be bolted to the main line tee.

The connecting pipe between the fire hydrant and gate valve shall be 6-inch CL53 DI pipe and shall not exceed 50 feet in length. The fire hydrant and gate valve shall be restrained with a mechanical joint restraint device as indicated in Water Main Fittings. In addition to this, the hydrant and tee shall be fully blocked with concrete.

W-9 SERVICE CONNECTIONS

Individual services to each structure and/or property shall be installed and connected to the new water mains.

Upon completion of the installation of the water main (before testing and disinfection) services shall be installed by connecting to the water main and extending the service line to the property line as shown on the Standard Details or approved equal. Service lines for residential property shall be 1-inch HDPE with a minimum pressure rating of 200 psi. All HDPE shall be butt welded PE 3408 or 4710 HDPE pipe conforming to ASTM D3350. Pipe dimensions and workmanship shall conform to ASTM F714. Larger service lines shall be of the type and style as designated in the Standard Details and shown on the Plans.

Two inch and smaller meters are supplied by the City. Three inch and larger meters fall into a different design criteria and shall be specifically coordinated with the City.

Corporation stops and the single meter shut-off valves shall be "Mueller" of the type and style noted on the Standard Details or approved equal. Included as a part of the service connection shall be the furnishing and installation of the meter box complete with a cast iron traffic lid, set flush with the proposed finished grade of the lot in the designated location near the property line, all as shown on the Standard Details.

Service lines between the main and the property line shall be placed at a trench depth sufficient to maintain cover over the top of the service line per the standard detail for its full length, taking into consideration the final finished grade of the proposed street and the final finished grade of any storm ditches.

W-10 LARGE METER AND TESTS

If extensions require water meters 3 inches or larger, then such entire meter installations, including but not limited to, valves, piping, vaults, drain lines and meters shall be coordinated with City staff.

W-11 HYDROSTATIC PRESSURE TEST

The water mains shall be hydrostatically tested before being placed in service. Water for testing must be obtained by the Developer by arrangement with the City. A positive displacement type pump shall be furnished by the Developer for the testing. Feed for the pump shall be from a disinfected clean container, wherein the actual amount of "makeup" water can be measured.

Upon completion of sections of the pipe installation, the water main shall be pressure tested in segments of 1,000 lineal feet or less. The test pressure shall

be either 200 pounds per square inch, or twice the system pressure, using the greater value, and shall maintain the test for a period of not less than 2 hours.

Pressure testing against existing valves shall not be permitted unless authorized by the City.

The Developer shall provide temporary plugs, caps, and blocking as required to pressure test and disinfect the new water main prior to making connections to the existing system.

Concrete thrust blocking for fittings shall be in place and the concrete "set" sufficiently to withstand the test pressure before starting the test.

All pressure tests shall be made with the hydrant auxiliary gate valves open and pressure against the hydrant valve. After this basic pipe line test has been completed, each valve shall be tested including the hydrant auxiliary valve by closing each in turn and relieving the pressure beyond. This test of the valves will be acceptable if there is no immediate loss of pressure on the gauge when the pressure comes against the valve being checked. The Developer shall verify and ensure that the pressure differential across the valve does not exceed the rated working pressure of the valve.

Prior to calling for the City to witness the pressure test, the Developer shall first perform a satisfactory pressure test. The allowable leakage rate per thousand feet of each size pipeline is as follows:

Allowable Leakage	
<u>Pipe Size</u>	<u>Gallon per hour per 1,000 Ft. @ 200 psi</u>
6"	0.64
8"	0.85
10"	1.06
12"	1.28
16"	1.70

Any leakage caused by defective workmanship or materials shall be repaired, and the line shall again be tested to full compliance.

All visible leaks in pipelines or fittings shall be repaired even if the test results fall within the allowable leakage.

W-12 DISINFECTION OF WATER MAINS

Water mains and appurtenances shall be disinfected in accordance with AWWA C651 before being placed in service. Water for disinfection must be obtained by the Developer by arrangement with the City.

The method of placing calcium hypochlorite granules in the water main as it is being installed is acceptable if the pipe and appurtenances are kept clean and dry during construction.

The calcium hypochlorite granules contain approximately 65 percent available chlorine by weight. The minimum amount of calcium hypochlorite granules placed at the beginning and in each 500 feet of pipe is as follows:

Pipe Size Calcium Hypochlorite Granules

6"	1.0 oz.
8"	2.0 oz.
12"	4.0 oz.
16" and larger	8.0 oz.

When the line is completed and ready to disinfect, water shall be allowed to flow in slowly, until it appears at the far end of the line so as not to displace the disinfecting agent. The system shall then be allowed to stand for at least 24 hours. The line shall then be flushed through the fire hydrants until a test shows the chlorine residual no longer exceeds distribution system residual.

In all instances, the Developer shall utilize a state approved double check valve type backflow prevention device to protect the potable water supply while filling, flushing, and disinfecting the particular water main.

In the process of chlorinating newly laid water pipe, all valves, fire hydrants, and other appurtenances shall be operated while the pipeline is filled with the chlorinating agent.

Other means of disinfecting will be reviewed by the Public Works Supervisor on a case by case basis.

The Developer is herein advised that prior to making any restoration or permanent connections to the existing water mains the Developer shall first demonstrate to the City that the new water main has adequately passed a pressure test, been adequately flushed, and finally passed the required bacteriological test.

In all disinfection processes, the Developer shall take particular care in flushing and wasting the chlorinated water from the mains to assure that the flushed and chlorinated water does no physical or environmental damage to property,

streams, storm sewers, or any waterways. Flushing water must be disposed of in accordance with Washington State Department of Ecology Standards. Flushing water shall require dechlorination or disposal to sewer system to prevent damage to the affected environment, particularly aquatic and fish life of receiving streams.

Before placing the lines in service, a satisfactory bacteriological report or approval shall be received from a State-approved laboratory on samples collected from representative points in the new system. The City shall collect all samples for the bacteriological tests. However, the Developer shall notify the City requesting collection of samples 2 working days in advance, and schedule on days wherein samples can be conveniently processed by a State Department of Health approved laboratory. If any of the pipeline materials are replaced thereafter, then that section shall again be disinfected, pressure tested, and tested for bacteriological count.

If disinfection of mains by the above methods prove unsatisfactory and the lab report indicates any type of bacteria count, then the Developer shall re-chlorinate using other methods in accordance with AWWA C691, and as approved by the City.

W-13 CONNECTIONS TO EXISTING SYSTEMS

All cut-in connections to the existing system shall be made after a successful pressure test of the new main has been witnessed by the City and after a purity test has been satisfactorily evidenced.

Size on size taps shall not be permitted.

Where it is necessary to shut-off the existing (or new) mains to make a connection, the Developer shall notify the City 72 hours or 3 working days in advance of such shut-off, and the City will notify customers of the shut-off, provide temporary services to critical customers and shut-off the mains. Connections shall be performed between the hours of 9:00 a.m. and 4:30 p.m. only. No cut-in connections or connections of new piping to the existing piping shall be scheduled for Fridays or Mondays. Once the water has been shut-off, the Developer shall diligently pursue the connection to completion, so that the time required for the shut-off may be held to a minimum. The City will notify customers in the area of the scheduled shut-off.

The required connections shall not be started until all of the materials, equipment and labor necessary to properly complete the work are assembled on the site. All connections shall be completed the same day they are started. The

Developer shall time its operations so that water will not be shutoff overnight or over weekends or holidays.

It shall be the responsibility of the Developer to determine the exact horizontal and vertical location of connections, ascertain the type and size of existing facilities and determine potential conflicts prior to starting work on any connection. Alternatives shall be provided as required to complete the connection detail.

Connections to existing facilities shall be made with the use of fittings, valves, flexible couplings, solid sleeves, shackling and other miscellaneous fittings, including thrust blocks as shown on the Plans and with additional pipe or fittings as approved by the City.

Where connections are made to existing facilities and it is impractical to use the methods described herein to disinfect the section between the existing water main and the point of installation of the new water main (valve or temporarily plugged line) the Developer shall clean and swab the pipe, fittings and valves with a minimum 5 percent chlorinated solution immediately before making said connection and thereby disinfect the necessary connection.

All pipe and fittings used for the connection shall be clean and disinfected. The Developer shall take extra precautions to ensure the tightness of the connections, nuts and bolts. The existing water main shall be placed back into service by the City and the connection observed for leakage by the City prior to backfilling the pipe.

END CHAPTER 2

INDEX OF STANDARD DETAILS	
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W-6	VALVE MARKER
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ST-12	MONUMENT CASE AND COVER
ST-13	ORNAMENTAL LIGHTING
ST-14	ORNAMENTAL SIDEWALK
ST-15	ORNAMENTAL DISTRICT

WATER DETAILS

SURFACE REPAIR REQUIREMENTS SHALL BE DETERMINED BY CITY

FINISHED GRADE

6" WIDE DETECTABLE MARKING TAPE

COMPACTED BACKFILL CONSISTING OF SUTABLE EXCAVATED MATERIAL OR BANK RUN GRAVEL FOR TRENCH BACKFILL AS AGREED TO BY THE CITY, OBTAIN COMPACTION REQUIREMENTS.

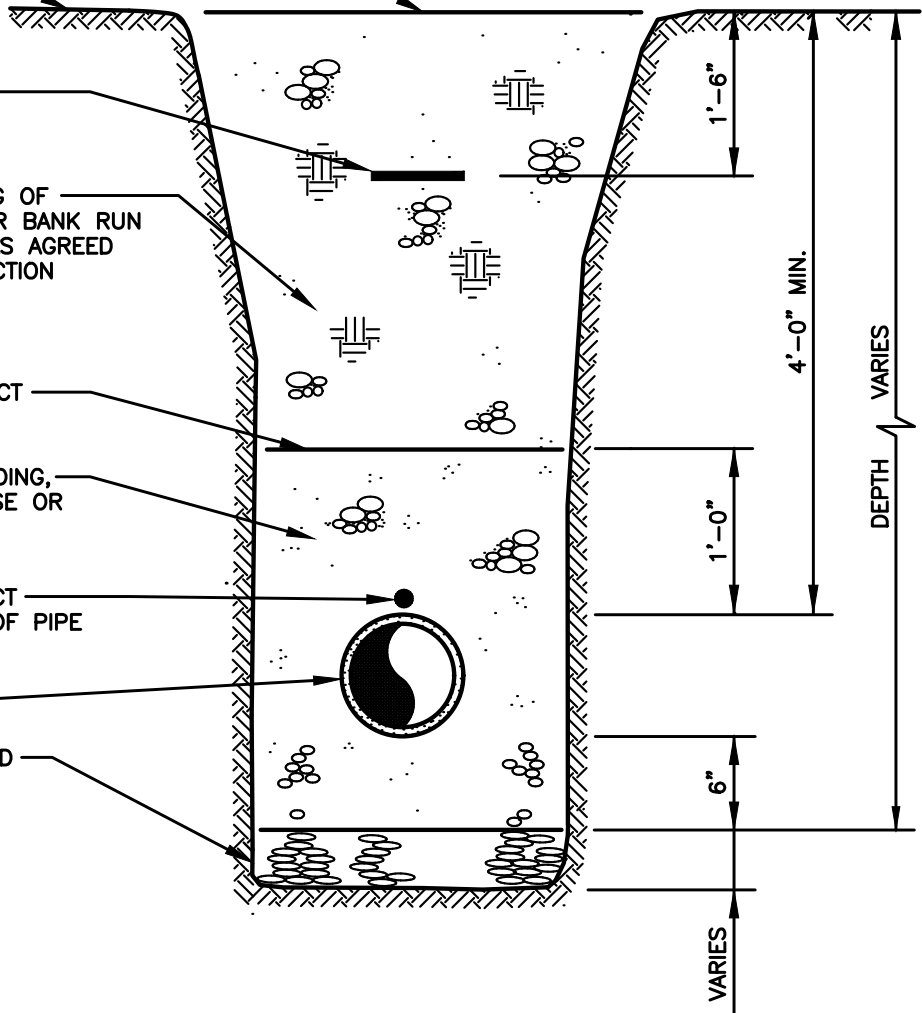
SPECIAL PRECAUTIONS TO PROTECT PIPE TO THIS LEVEL

GRAVEL BACKFILL FOR PIPE BEDDING, CRUSHED SURFACING TOP COURSE OR APPROVED BEDDING MATERIAL

14 GAUGE TRACER WIRE, CONNECT BETWEEN VALVES TAPE TO TOP OF PIPE

PVC WATER PIPE

FOUNDATION GRAVEL AS REQUIRED



	MINIMUM PIPE COVER "L"	MINIMUM PIPE DIAMETER "D"
WATER MAINS	48 INCHES	8 INCH
WATER SERVICES	30 INCHES	1 INCH

NOTES:

1. MINIMUM TRENCH WIDTH FOR MAINS IS PIPE SIZE PLUS 18 INCHES. ALL TRENCHES SHALL MEET WAC CHAPTER 298-155 FOR CONSTRUCTION WORK.
2. AGGREGATES SHALL BE AS SPECIFIED IN SECTION 7-08 OF THE WSDOT STANDARD SPECIFICATIONS FOR ROAD, BRIDGE, AND MUNICIPAL CONSTRUCTION - LATEST EDITION.



DETAIL W-1
WATER MAIN TRENCH SECTION



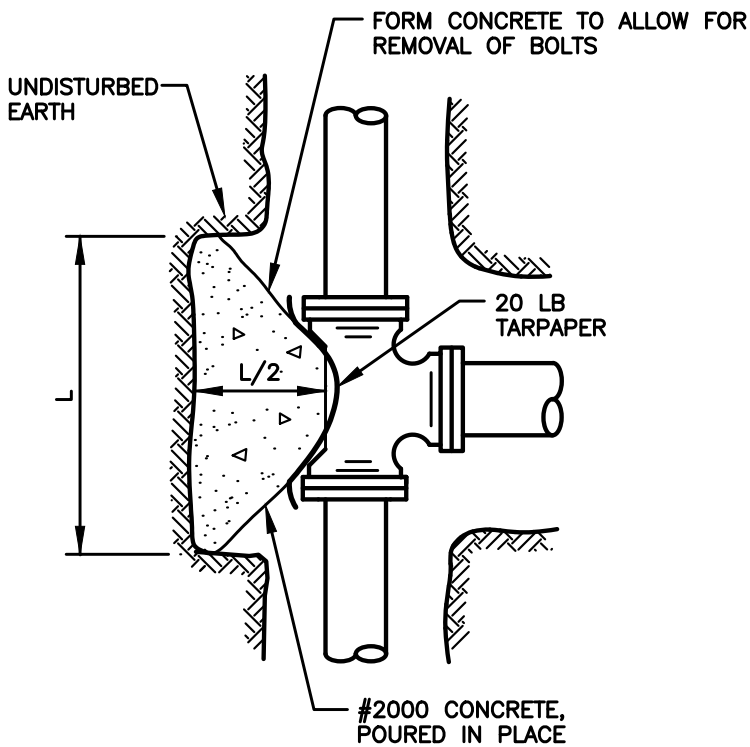
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MINIMUM BEARING AREA TABLE					
FITTING D	TEE	90°	45°	22 1/2°	11 1/4°
6"	4 SQ FT	6 SQ FT	3 SQ FT	2 SQ FT	2 SQ FT
8"	7 SQ FT	10 SQ FT	6 SQ FT	3 SQ FT	2 SQ FT
10"	10 SQ FT	15 SQ FT	9 SQ FT	5 SQ FT	3 SQ FT
12"	14 SQ FT	22 SQ FT	12 SQ FT	6 SQ FT	4 SQ FT
16"	25 SQ FT	38 SQ FT	21 SQ FT	11 SQ FT	7 SQ FT
18"	32 SQ FT	48 SQ FT	27 SQ FT	14 SQ FT	8 SQ FT

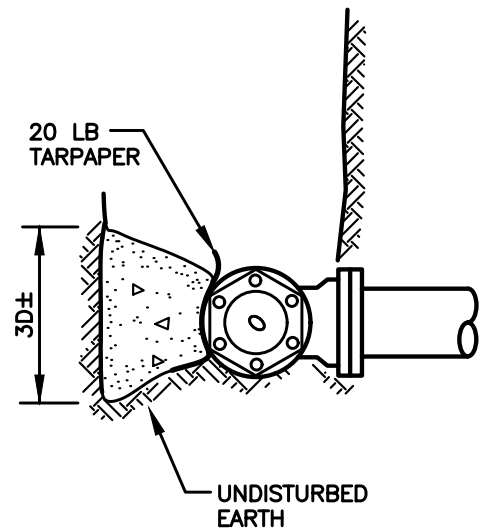
TYPICAL FOR SANDY SOIL WITH 2,000 PSF BEARING STRENGTH & 100 PSI WORKING PRESSURE. ADJUST BEARING AREA BY PRESSURE & SOIL BEARING CAPACITY. USE TEE FOR DEAD ENDS.

NOTES

1. BLOCKING SHALL BE TO SOLID BEARING SURFACE.
2. FITTING SHALL BE PROTECTED WITH VISQUEEN.
3. BEARING AREA SHALL BE PROPORTIONALLY INCREASED WITH PRESSURES IN EXCESS OF 100 PSI OR IN SOIL CONDITIONS WITH LESS THAN 2,000 PSF BEARING STRENGTH.
4. ALL BLOCKS ON TEES SHALL BE SEPARATED FOR DIRECTION OF THRUST.



PLAN



M:\SOAP LAKE\18028 DEVELOPER STANDARDS\FIGURES\CAD\W-2 THRUST BLOCKS FOR WATERMANS



**DETAIL W-2
THRUST BLOCKS**



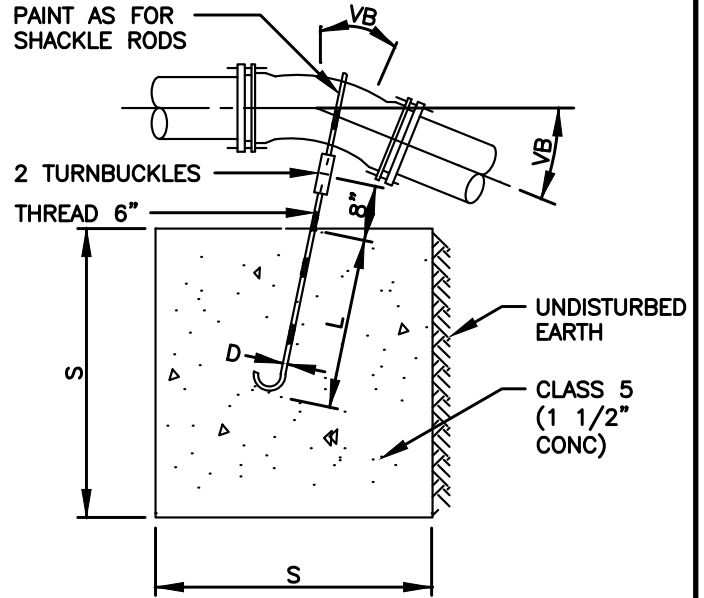
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TYPE "A" BLOCKING
FOR 11 1/4° - 22 1/2° - 30° VERTICAL BENDS

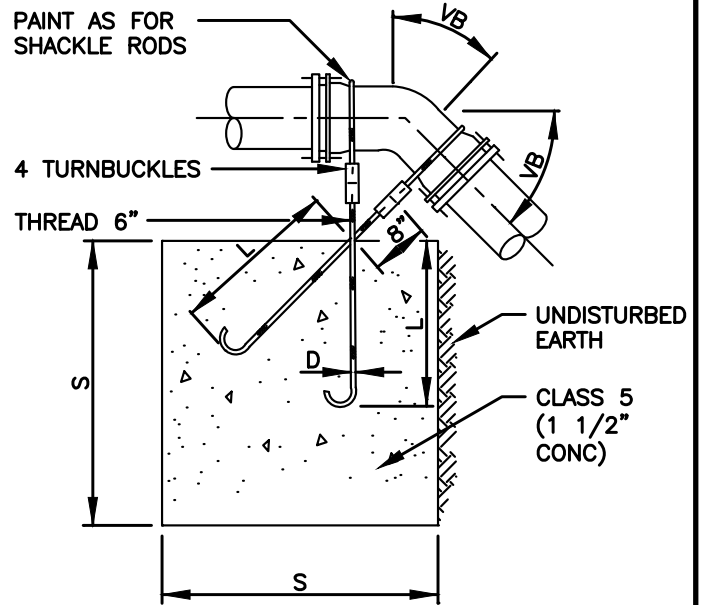
PIPE SIZE NOMINAL DIAMETER— INCHES	TEST PRESSURE PSI	VB VERTICAL BEND DEGREES	No. OF CUBIC FT OF CONC BLOCKING	S SIDE OF CUBE LINEAR FT	D DIA OF SHACKLE RODS (2) INCHES	L DEPTH OF RODS IN CONCRETE LINEAR FT
4"	300	11 1/4	8	2	5/8"	1.5
		22 1/2	11	2.2		
		30	17	2.6		
6"	300	11 1/4	11	2.2	5/8"	2.0
		22 1/2	25	2.9		
		30	41	3.5		
8"	300	11 1/4	16	2.5	5/8"	2.0
		22 1/2	47	3.6		
		30	70	4.1	3/4"	2.5
12"	250	11 1/4	32	3.2	5/8"	2.0
		22 1/2	88	4.5		
		30	132	5.1	7/8"	3.0
16"	225	11 1/4	70	4.1	7/8"	3.0
		22 1/2	184	5.7		
		30	275	6.5	1 1/4"	4.0
20"	200	11 1/4	91	4.5	7/8"	3.0
		22 1/2	225	6.1		
		30	330	6.9	1 3/8"	4.5
24"	200	11 1/4	128	5.0	1"	3.5
		22 1/2	320	6.8		
		30	480	7.9	1 7/8"	5.5

TYPE "B" BLOCKING
FOR 45° VERTICAL BENDS

PIPE SIZE	TEST PRESSURE	VB	S	D	L
4"	300	45	30	5/8"	2.0
6"			68		
8"			123		
12"	250	232	6.1	3/4"	2.5
16"	225	478	7.8	1 1/8"	4.0
20"	200	560	8.2	1 1/4"	4.5
24"		820	9.4	1 3/8"	



TYPE "A" BLOCKING

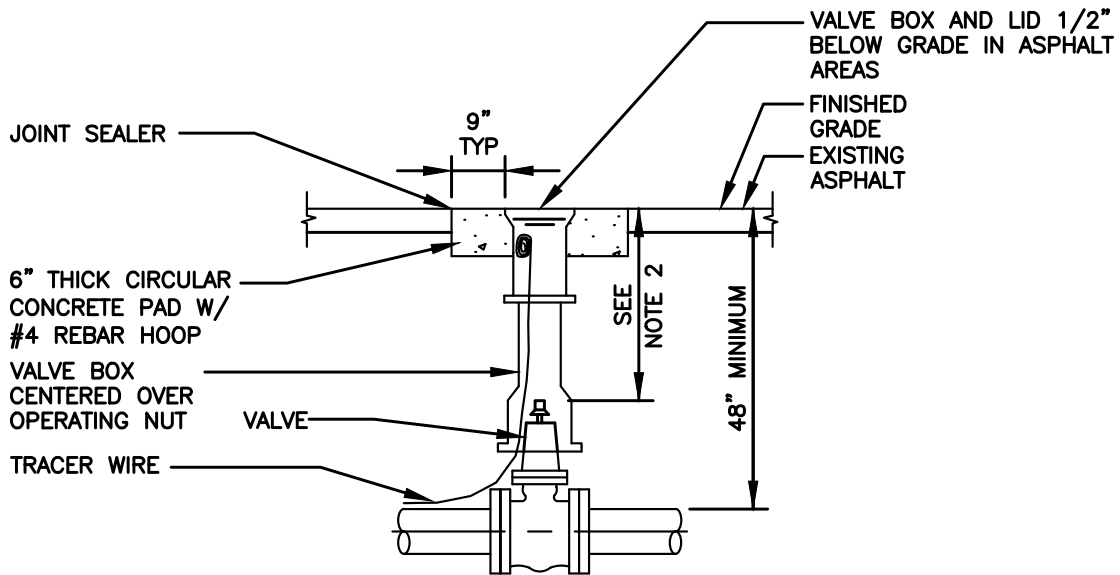


TYPE "B" BLOCKING

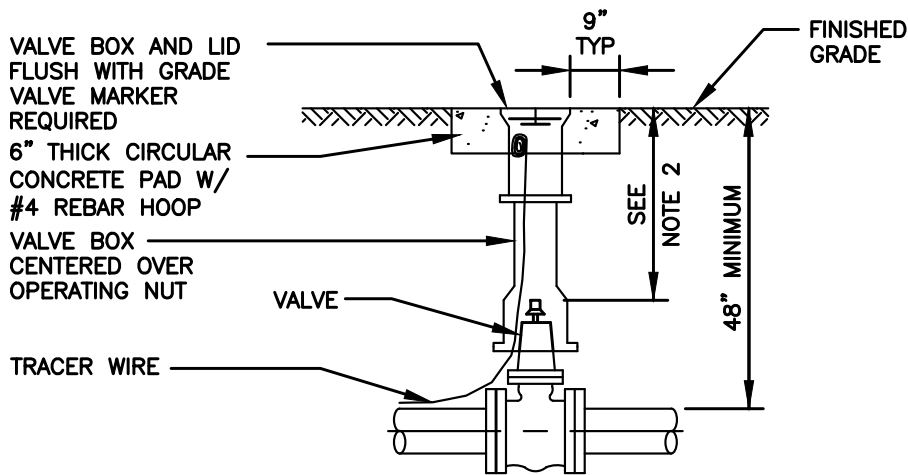


DETAIL W-3
VERTICAL ANCHOR BLOCK





VALVE BOX IN ASPHALT AREA



**VALVE BOX IN UNIMPROVED AREA
(VALVE MARKER REQUIRED)**

NOTES

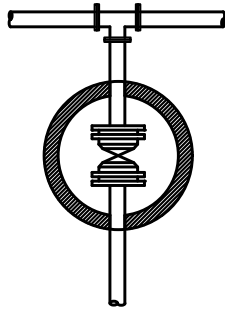
1. EACH VALVE SHALL BE PROVIDED WITH AN ADJUSTABLE CAST IRON VALVE BOX OF 5 INCHES (5") INSIDE DIAMETER. VALVE BOXES SHALL HAVE A TOP SECTION WITH AN EIGHTEEN INCH (18") MIN. LENGTH. THE VALVE BOX SHALL BE RICH No. 940 OR SATHER MANUFACTURING. VALVE BOX EARS SHALL BE PLACED IN LINE WITH PIPE IT SERVES.
2. 18" MINIMUM, 24" MAXIMUM FOR OPERATOR NUT IF EXTENSION IS REQUIRED.



**DETAIL W-4
TYPICAL VALVE INSTALLATION**

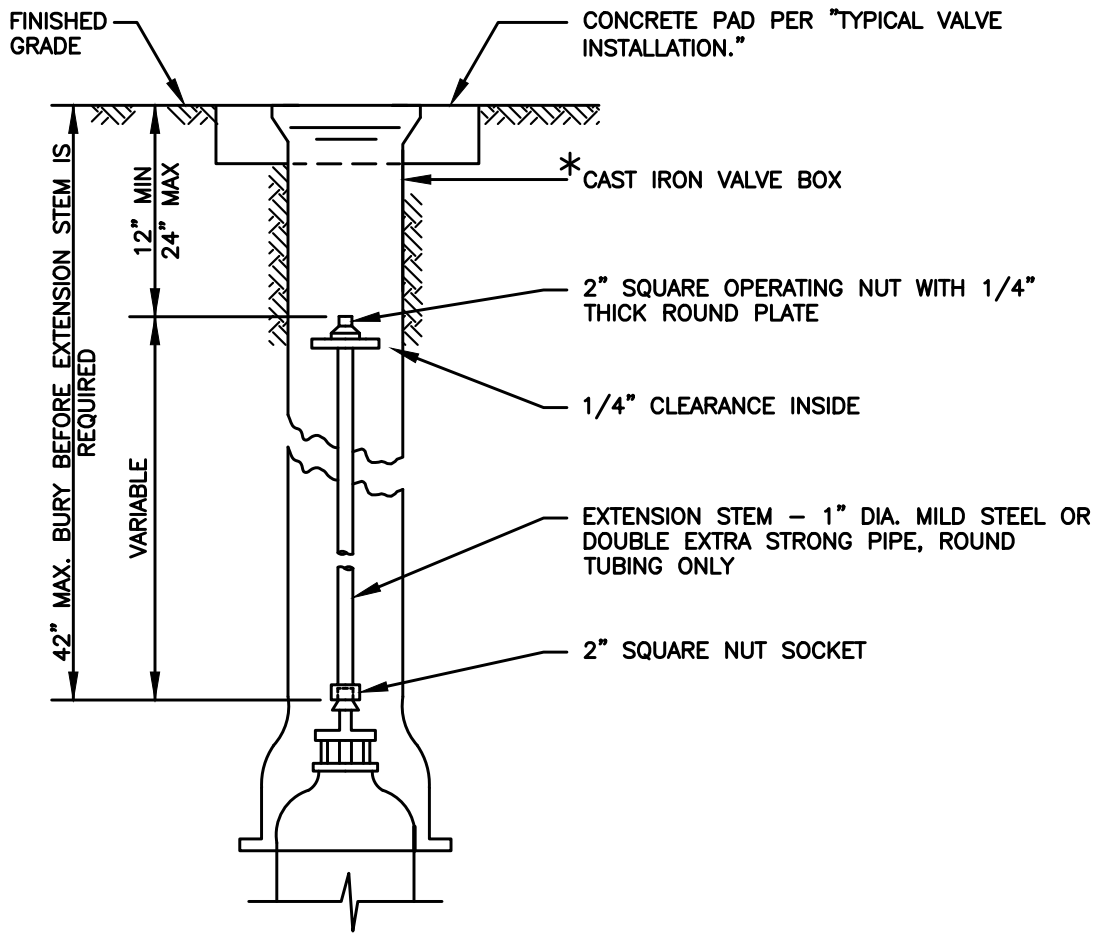


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ALIGN "EARS" ON VALVE BOX TOP WITH DIRECTION OF FLOW THROUGH THE VALVE.

PLAN VIEW



PROFILE VIEW

* CAST IRON VALVE BOX EXTENSION SHALL UTILIZE 5" CAST IRON "SOIL PIPE." BELL END TO BE PLACED OVER TOP OF VALVE BOX BOTTOM.

M:\SOAP LAKE\18026 DEVELOPER STANDARDS\FIGURES\CAD\W-5 VALVE STEM EXTENSION



**DETAIL W-5
VALVE STEM EXTENSION**

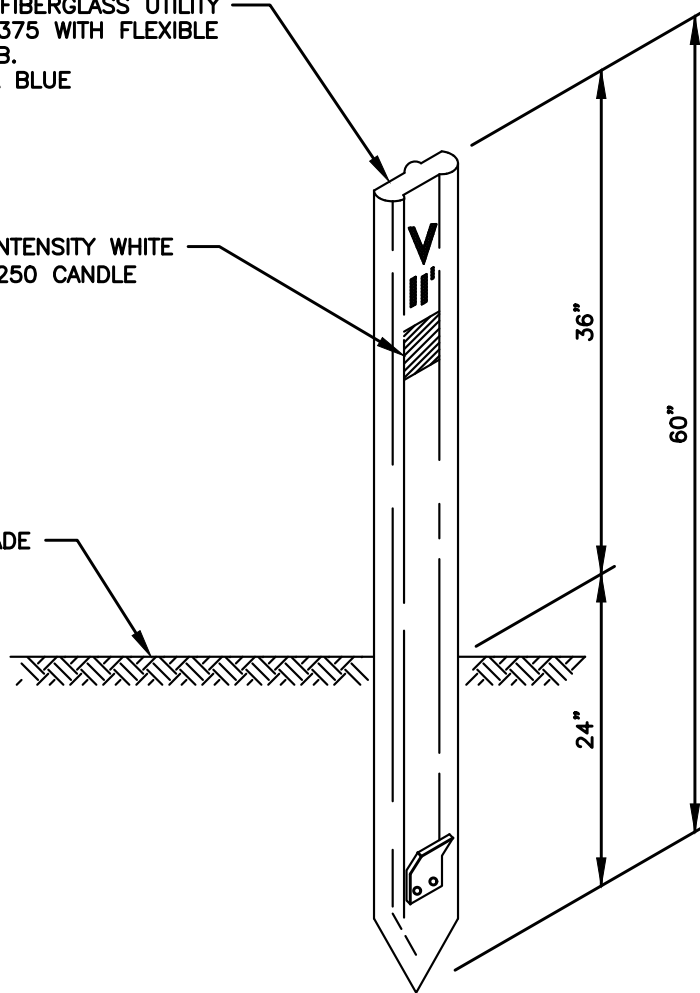


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"CARSONITE" FIBERGLASS UTILITY MARKER CUM375 WITH FLEXIBLE ANCHOR BARB.
COLOR: APWA BLUE

3"x3" HIGH INTENSITY WHITE REFLECTOR (250 CANDLE POWER)

FINISHED GRADE



NOTES

1. THE LETTER "V" AND THE DISTANCE IN FEET TO THE VALVE SHALL BE ON THE POST WITH 2" HIGH DECALS DESIGNED FOR USE ON FIBERGLASS BOATS.
2. EACH POST SHALL INCLUDE THE FOLLOWING DECAL: "CAUTION WATER VALVE, BEFORE DIGGING, CALL 811, UTILITY UNDERGROUND LOCATION CENTER."



COMPRESSION STYLE
FIRE HYDRANT, M&H
STYLE 129S

2 1/2" HOSE NOZZLE WITH
NATIONAL STANDARD THREADS

4 1/2" PUMPER PORT WITH NATIONAL
STANDARD THREADS W/ 4" STORZ
ADAPTER (SHORT PROFILE STYLE)

EXTENSION SECTIONS AS
REQUIRED OR HYDRANT
ADJUSTER IN GROUND

FINISHED
GRADE

WRAP NON-WOVEN
GEOTEXTILE AROUND
DRAIN GRAVEL

6" RESILIENT SEAT
GATE VALVE, (FLxMJ)

STANDARD 2-PIECE
CAST IRON VALVE
BOX

1/2 CU YD OF 1/2"
WASHED DRAIN
GRAVEL

GRIP RINGS

CONCRETE THRUST
BLOCK

6" DI CL 53

TEE SIZED PER
MAINLINE PIPE
SIZE W/ 6"
BRANCH (MJ X
MJ X FL)

CONCRETE BEARING BLOCK

4'-6" MIN

4'-0" MIN. COVER ON
WATER MAIN

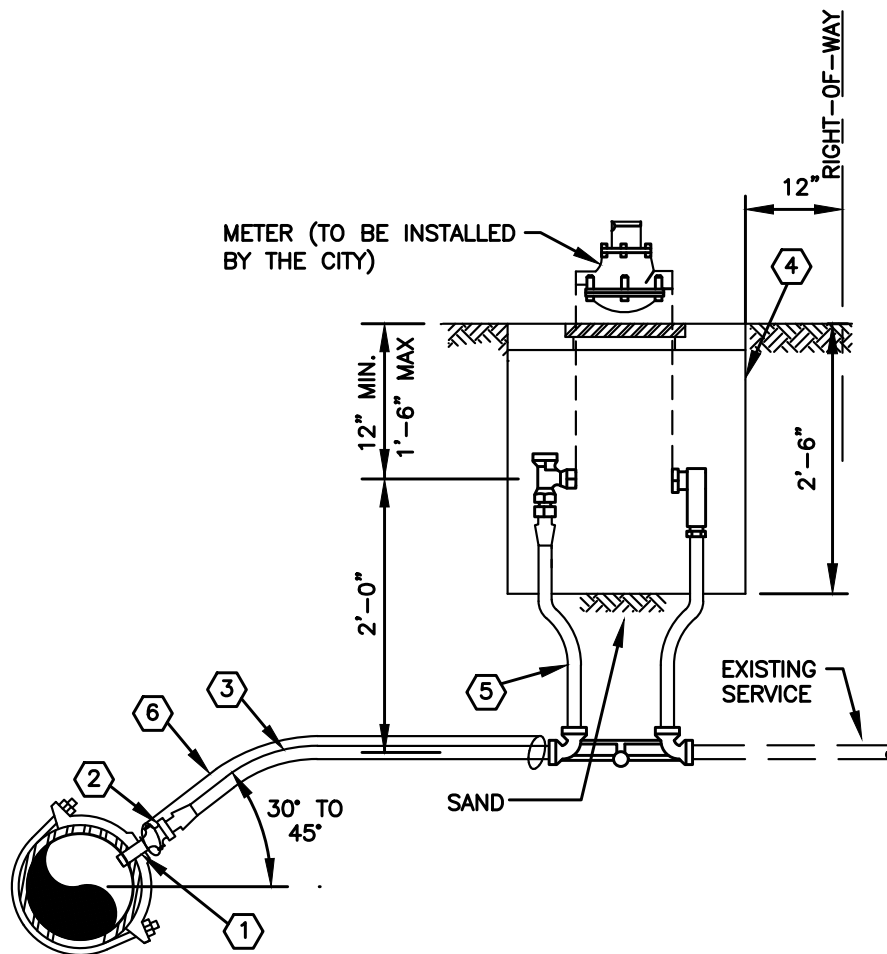
NOTES

1. PROVIDE MIN. 3'-0" CLEARANCE AND LEVEL AREA AROUND HYDRANT.
2. PAINT FIRE HYDRANT WITH TWO COATS OF YELLOW RUST-RESISTANT PAINT TO MATCH CITY'S EXISTING HYDRANTS.
3. ACCEPTABLE HYDRANTS: M&H VALVE M&H-129S
4. HYDRANT TEES SHALL BE MINIMUM OF 10 FEET FROM THE NEAREST TAP IN THE WATER MAIN.



DETAIL W-7
FIRE HYDRANT ASSEMBLY

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- ① FORD DOUBLE STRAP SERVICE SADDLE.
- ② CORPORATION STOP MUELLER H-15008.
- ③ 1" HDPE SERVICE PIPE - LENGTH AS REQUIRED (CTS 250 PSI)
- ④ BROOKS 12" X 20" METER BOX WITH H-20 RATED CAST IRON COVER.
- ⑤ FORD 70 SERIES COPPERSETTER, WITH ANGLE BALL AND SINGLE CHECK VALVE OR APPROVED EQUAL.
- ⑥ 14 GAUGE TRACER WIRE.

NOTES

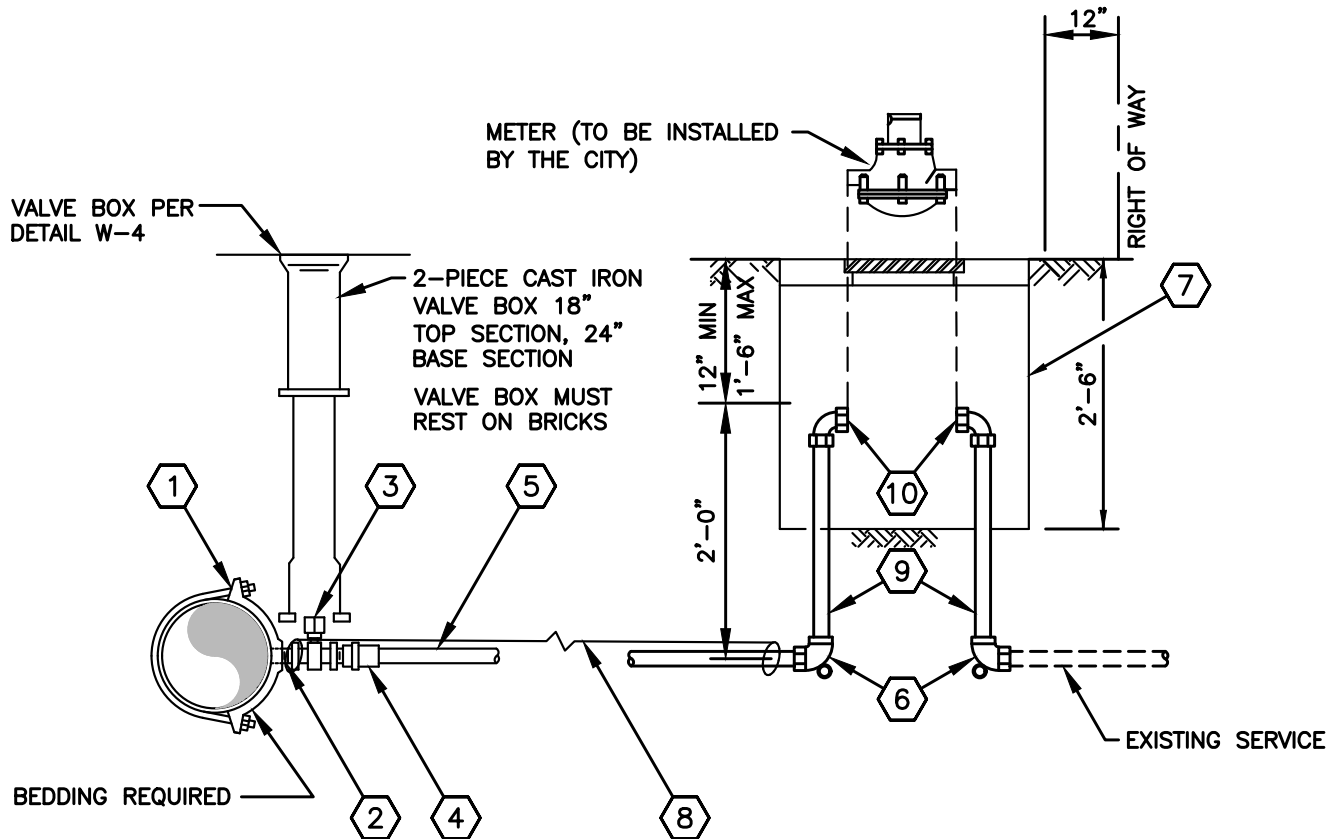
1. SERVICE FROM METER BOX TO HOUSE BY PROPERTY OWNER.
2. INDIVIDUAL SERVICES REQUIRED FOR EACH LOT.
3. METER TO BE INSTALLED BY THE CITY AT OWNER'S EXPENSE.
4. COMPARABLE "FORD" FITTINGS MAY BE USED IN LIEU OF "MUELLER."



FIGURE W-8
3/4" OR 1" WATER SERVICE



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- ① FORD DOUBLE STRAP SERVICE SADDLE
- ② BRASS NIPPLE (3" MIN/6" MAX)
- ③ MUELLER B-20283 BALL VALVE WITH FORD OPERATING NUT ADAPTER QT-67
- ④ STRAIGHT COUPLING MUELLER H-15428 COMPRESSION x MIP
- ⑤ 1-½" OR 2" HDPE SERVICE PIPE – LENGTH AS REQUIRED (CTS 250 PSI)
- ⑥ 90° GALVANIZED BEND WITH HDPE COUPLING
- ⑦ BROOKS 17"x30" METER BOX WITH H-20 RATED CAST IRON COVER
- ⑧ 14 GAUGE TRACER WIRE
- ⑨ GALVANIZED PIPE
- ⑩ 90° GALVANIZED BEND WITH ADAPTER FOR 2-BOLT FLANGE METER

NOTES:

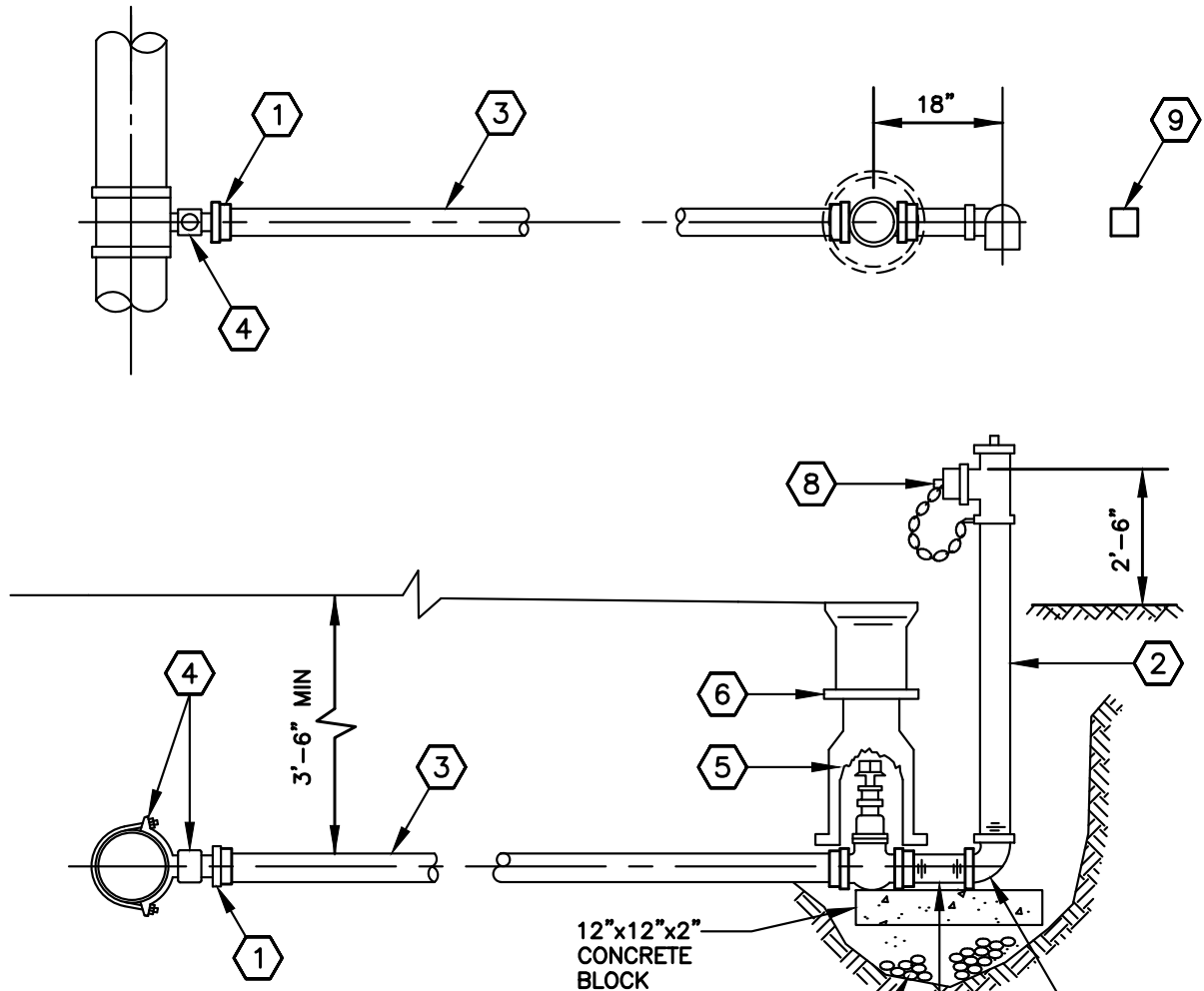
1. SERVICE FROM METER BOX TO HOUSE BY PROPERTY OWNER INDIVIDUAL SERVICES REQUIRED FOR EACH PROPERTY.
2. METER TO BE INSTALLED BY THE CITY AT THE OWNER'S EXPENSE.
3. COMPARABLE "FORD" FITTINGS MAY BE USED IN LIEU OF "MUELLER."



FIGURE W-9
1-1/2" OR 2" WATER SERVICE



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- ① STRAIGHT COUPLING, MUELLER No. H15428 COMPRESSION X MIP OR EQUAL
- ② GALVANIZED PIPE
- ③ PVC PIPE
- ④ DOUBLE STRAP SADDLE TO FIT
- ⑤ AWWA RESILIENT SEAT GATE VALVE THD x THD, WITH OPERATING NUT.
- ⑥ CAST IRON VALVE BOX
- ⑦ 1/4 CUBIC YARD WASHED GRAVEL POCKET WRAPPED IN NON-WOVEN GEOTEXTILE
- ⑧ FREEZE RESISTANT HYDRANT TRUFLO#TF200, OR EQUAL WITH 2-1/2" HOSE THREADS
- ⑨ VALVE MARKER POST

NOTES

1. TURN NOZZLE TOWARDS ROADSIDE DITCH WHEN POSSIBLE.
2. INSTALL DIELECTRIC COUPLINGS AT DISSIMILAR METALS.
3. BLOWOFFS SHALL BE SIZED TO PROVIDE 3.0 fps VELOCITY IN MAIN LINE (2" MIN).



**FIGURE W-10
BLOW OFF ASSEMBLY**



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M:\SOAP LAKE\18028 DEVELOPER STANDARDS\FIGURES\CAD\W-10 BLOW OFF ASSEMBLY

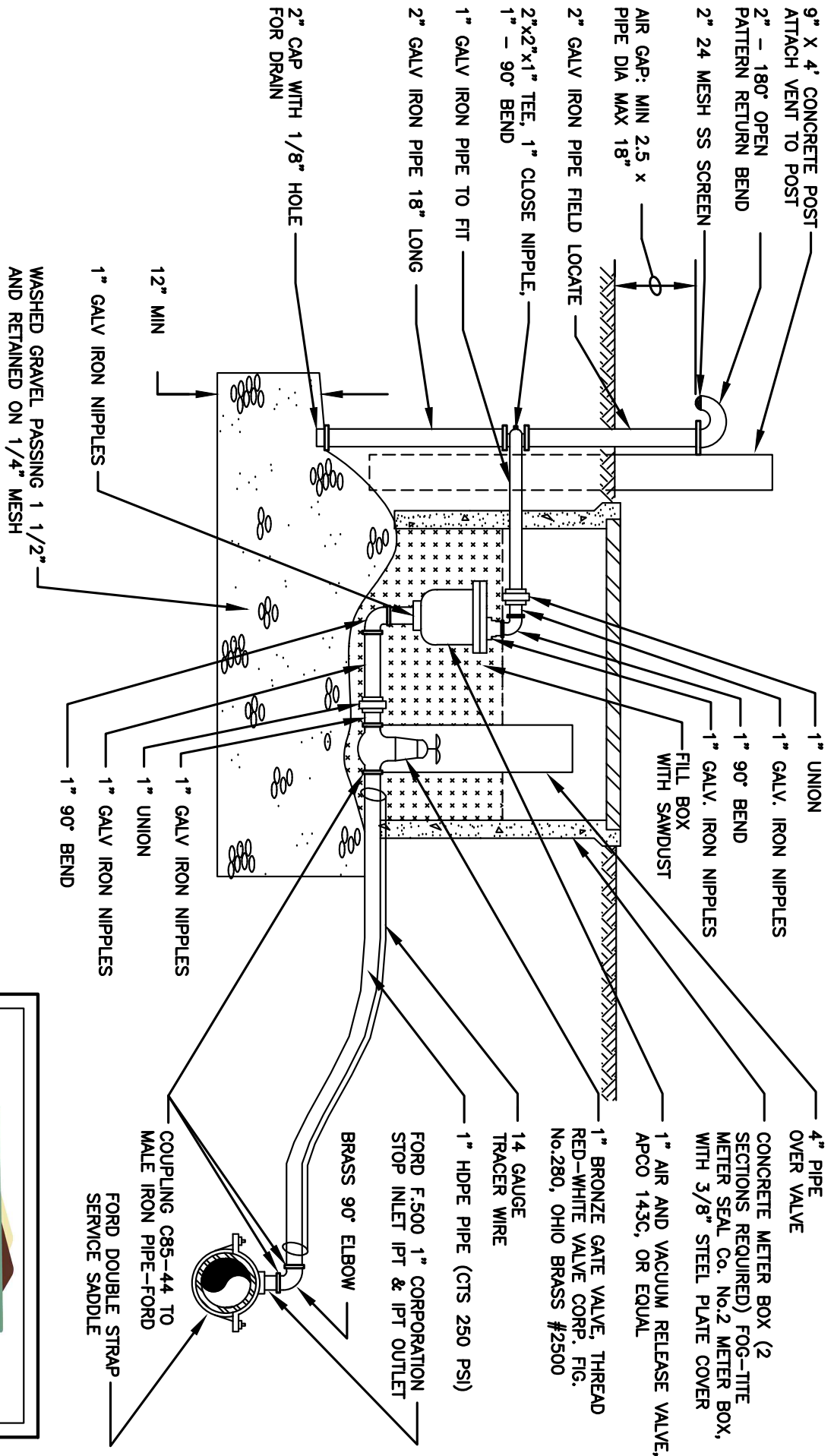
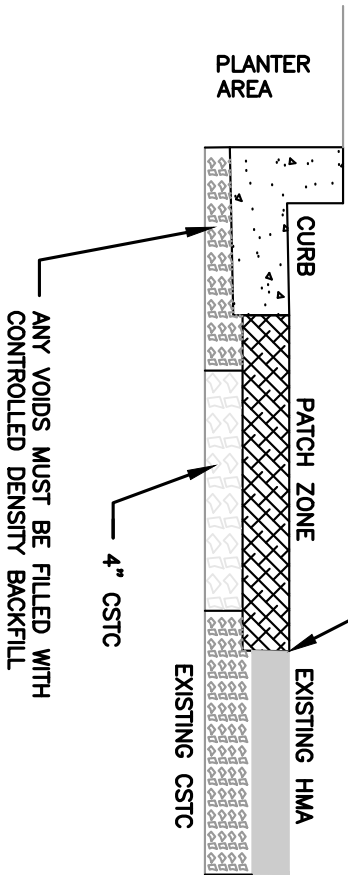


FIGURE W-11
1" AIR AND VACUUM RELEASE ASSEMBLY



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CUT EXISTING ASPHALT CONCRETE PAVEMENT LEAVING A VERTICAL FACE. TACK COAT THE FACES OF ALL CUTS PRIOR TO PATCHING/PLACING HMA



NOTES:

1. HMA IN THE PATCH ZONE SHALL BE A MINIMUM OF 3" THICK, OR MATCH EXISTING, WHICHEVER IS GREATER. HOWEVER, THE MAXIMUM THICKNESS IS NOT REQUIRED TO BE GREATER THAN 6". ALL PATCHES SHALL BE PLACED IN A MINIMUM OF 2 LIFTS. MAXIMUM DEPTH OF LIFTS SHALL BE 2" (COMPACTED).
2. PATCH WIDTH MUST ACCOMMODATE PROPER COMPACTION METHODS AS APPROVED BY THE CITY.
3. ALL CONSTRUCTION AND MATERIALS SHALL MEET THE WSDOT SPECIFICATIONS AND BE APPROVED BY THE CITY.

FIGURE W-12
TRENCH PATCH

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NOTES:

1. MUNICIPAL UTILITIES SHALL BE INSTALLED WITHIN DEDICATED RIGHT-OF-WAY UNLESS A DEVIATION IS APPROVED.
2. MUNICIPAL UTILITIES THAT ARE APPROVED TO BE INSTALLED OUTSIDE OF THE RIGHT-OF-WAY SHALL BE INSTALLED WITHIN A MUNICIPAL EASEMENT AND ACCESS ROADWAY PER THIS DETAIL. THE DEVELOPER MAY SUBMIT AN ALTERNATE PLAN FOR APPROVAL. THE CITY MAY WAIVE THE REQUIREMENT FOR AN ACCESS ROAD IF ALL UTILITY STRUCTURES CAN BE SERVICED BY AN APPROVED ROADWAY.
3. ACCESS ROADWAY SHALL BE CSBC OR CSTC, MINIMUM 3" DEPTH, AND DESIGNED FOR 50,000 lb MAINTENANCE VEHICLES.
4. UTILITY STRUCTURES SHALL BE CENTERED WHERE POSSIBLE AND AT LEAST 1' FROM THE OUTER EDGE OF RIGHT-OF-WAY OR MUNICIPAL EASEMENT.
5. UTILITY STRUCTURES THAT ARE MORE THAN 10' DEEP SHALL REQUIRE ADDITIONAL RIGHT-OF-WAY OR MUNICIPAL EASEMENT WIDTHS.
6. 6'x6'x6" CONCRETE PADS ARE REQUIRED AROUND ALL UTILITY STRUCTURES THAT ARE INSTALLED IN NON-ASPHALT AREAS.
7. ACCESS ROADWAY SHALL DRAIN AWAY FROM UTILITY STRUCTURE.
8. ALL CONSTRUCTION AND MATERIALS SHALL MEET THE WSDOT SPECIFICATIONS AND BE APPROVED BY THE CITY.

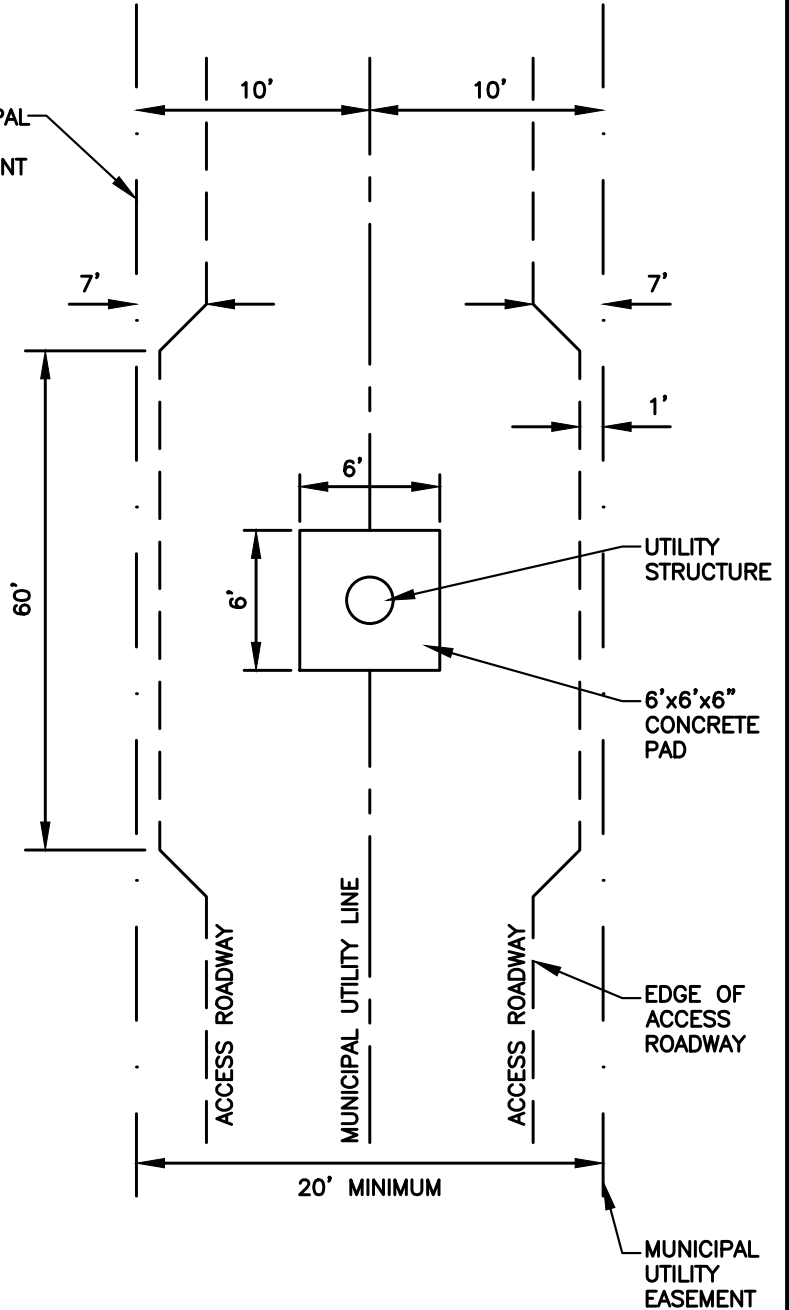




FIGURE W-13
ACCESS EASEMENT AND ROADWAY FOR MUNICIPAL UTILITIES



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