CITY OF NEWPORT
WATER SYSTEM

NEWPORT, WASHINGTON

DESIGN STANDARDS

July 2022

Prepared For:

City of Newport
Newport, WA
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GENERAL REQUIREMENTS

I General Requirements

General

These standards are the minimum design standards for the planning and design of water systems at the City of Newport. These standards do not address the design of special facilities such as pump stations and reservoirs. Compliance with these standards does not relieve the designer of the responsibility to apply conservative and sound professional judgment. These are minimum standards and are intended to assist, but not substitute for competent work by design professionals.

The cost of extending water mains into new areas or within plats will be borne by the patron or developer requesting such extension. This includes the cost of storage, fire protection, and pressure reduction or booster pumping if the elevation is such that the City's normal pumping head cannot furnish the required pressure.

All construction on City, County, or State roads or right-of-way shall comply with the standards and requirements of that agency in accordance with the franchise and/or permit requirements. Where conflict exists between these standards and permit requirements, the most stringent permit requirements shall take precedence.

Any extension of the City of Newport distribution system must have plans and specifications prepared by a licensed engineer with the State of Washington and be submitted for approval to the City and the Washington State Department of Health (DOH).

References

References are made to the standards, specifications, or other published data of the various regional or local organizations. Following acronyms or abbreviations shall have the meaning as indicated:

ANSI	American National Standards Institute, Inc.
ASTM	American Society for Testing and Materials
AWWA	American Water Works Association
WSDOT	Washington State Department of Transportation

PLANNING STANDARDS

II Planning Standards

System Plan

A. Each fitting/valve shall have attachment type listed (e.g. FL, MJ, FL x MJ, etc.)

B. List pipe length (from center of fitting to center of fitting), size, and material along side of each pipe e.g. 100 LF 8" D.I. Pipe material can be listed in a general note in lieu of listing along each pipe.

C. Establish water main location by means of baseline, stations, and offsets.

D. Eliminate dead end mains by providing additional looping.

E. Minimum watermain size

6" minimum fire hydrant lateral pipe.

8" minimum main when serving fire hydrants.

8" minimum shall be used to serve domestic services on a dead end with no future extension or fire hydrant connections.

System Parameters

Fire Flow

Fire flow requirements shall be determined by the City of Newport Water Department or Fire District Designated Official.

A. Available fire flow shall be determined by the Water Department or Fire Department fire flow test.

B. Minimum system pressure during fire flow analysis is 20 psi.

System Pressure

Desirable - Minimum 50 psi
Maximum 80 psi

Allowable - Minimum 40 psi
Maximum 100 psi

Minimum 30 psi is allowable for existing systems

Individual pressure reducing valves are required on all services when water pressure exceeds 80 psi.

Water velocity in the main shall not exceed 10' per second during the highest demand fire flow.

System Demand

Unit Demand

Single family	140 Gallons per Capital per Day (GPCD)
Multi-family	100 GPCD
Commercial	20 Gallons per Day per Square Feet of Floor Area
Hotel/Motel	50 GPCD

Population Densities

3.08 people per single family unit

1.53 people per multi-family unit

1.9 people per hotel/motel room

Peaking Factors

Maximum Day Demand (MDD) = Average Day Demand (ADD) x 2.6

Peak Hour Demand (PHD) = Maximum Day Demand (MDD) x 1.7

Valves

A. Valves shall be spaced and system pipelines looped so that no more than one (1) block is deprived of service in the event of shutdown of any pipeline segment to which customers are directly connected. The maximum valve spacing shall be 500' in school, commercial, or multifamily areas, and 800' in residential areas where customers are served.

B. At watermain intersections the valve shall be placed on 3 out of 4 legs at each cross and 2 out of 3 legs at each tee (unless tapping an existing watermain).

C. Air/vacuum relief valves shall be installed at local points in watermain.

Fire Hydrants

Following are the guidelines regarding the fire hydrants to be used in the design. The final number and location of fire hydrants shall be approved by the City of Newport Water Department.

A. Fire/hydrant lateral run over 50' in length must be 8" (terminate with tee, plug, and hydrant assembly).

B. Fire hydrant location:

Urban residential: Less ¼ acre lot	Spacing shall not exceed 330'
Suburban/rural residential: ¼ acre and above	Spacing shall not exceed 600'
Multi-family/Commercial:	As determined by the fire district.
Exception:	On street without development (on conveyance mains) the maximum hydrant spacing shall be 1000'.

C. Provide minimum 3' clearance around hydrants for operation.

D. Guard posts shall be provided for the protection of the hydrants.

Clearance, Cover, & Setback

The clearances shall be from outside to outside of pipes.

A. Provide a minimum cover of 5' from the top of the pipe to the approved finished grade.

B. Water services and sewer stubs shall have minimum 10' horizontal separation.

C. Minimum crossing angle for between utilities should be 45 degrees.

D. Minimum clearance from buried utilities and structures shall be 5'. Clearance between the concrete blocking and other buried utilities or structures shall be sufficient to prevent weakening of the blocking support.

E. Horizontal distances from watermain:

Sanitary	10'
Storm	5'
Gas	5'
Other	5'

F. Vertical distances from watermain:

Sanitary	18"
Storm	12"
Gas	12"
Other	12"

G. Where watermain crosses above or below sanitary sewer, one full length of pipe shall be used with the pipes centered for maximum joint separation.

Easements

Watermain easement of minimum 20' wide shall be provided centered on the watermain on all private property.

Backflow Prevention

A. Refer to Uniform Plumbing Code for interior backflow prevention.

B. All backflow prevention assemblies shall be from the state approved list.

C. All backflow assemblies shall comply with the requirements of WAC 246-290-490 "Cross-Connection Control Regulations in Washington State" **Appendix C** and City of Newport Cross-Connection Control Ordinance & Program **Appendix D.**

D. Maintenance of the fire services down stream of the gate valve at its connection to the watermain is the responsibility of the property owner. The backflow prevention assembly on fire services shall be located as close to the serving watermain as possible.

MATERIAL STANDARDS

III Material Standards

General

All materials shall be new and undamaged. The same manufacturer of each item shall be used throughout the work.

All materials not specifically referenced shall comply with applicable sections of ANSI, ASTM, AWWA or the APWA/WSDOT Standard Specifications and with NSF Standard 61.

Approved manufacturers and model numbers of various materials are listed in the Appendix of these standards. No substitutions will be allowed without prior approval. Other materials that are like or better may be considered.

Pipe & Fittings

Water pipe 3" and larger shall be DR-18 PVC pipe, conforming to AWWA C900-16 or ductile iron pipe, minimum 350 PSI Pressure Class, cement mortar lined conforming to ANSI/AWWA C151/A21.51, unless otherwise specified.

All water main fittings shall be ductile iron, short body, cement mortar lined, and for pressure rating of 350 psi for mechanical joint fittings and 250 psi for flange joint fittings, unless otherwise noted. Metal thickness and manufacturing process shall conform to applicable portions of ANSI/AWWA C 110/A 21.10. Mechanical joint, ductile iron, compact fittings 24" and less shall be in accordance with ANSI/AWWA C 153/A 21.53. Flanged fittings, cast or ductile iron, shall conform to ANSI B 16.1, class 125 drilling pattern.

Rubber gasket pipe joints to be push-on-joint (Tyton for ductile iron) or mechanical joint (M.J.) in accordance with ASTM 3139 or ANSI/AWWA C 111/A 21.11, unless otherwise specified.

Gasket material for flanges shall be neoprene, Buna N, chlorinated butyl, or cloth-inserted rubber.

Flanged joints shall conform to ANSI B 16.1, class 125 drilling pattern, rated for 250 psi working pressure.

Standard thickness cement lining shall be in accordance with ANSI/AWWA C 104/A 21.4.

Bolts shall be malleable iron, Cor-ten, or stainless steel.

Bolts and nuts for flanged pipe and fittings shall conform in size and length with ANSI/AWWA C 115/A 21.15. T-bolts shall be malleable iron or Cor-ten in accordance with ANSI/AWWA C 111/A 21.11. Stainless steel bolts shall meet the requirements of ASTM A-307, Grade A. Shackle rods, nuts and washers shall be hot-dipped galvanized in accordance with AASHTO M 232 and coated thoroughly with asphaltic material.

Stainless steel nuts, bolts and washers shall be Type 304.

Restrained mechanical joint glands shall be Megalug by EBAA Iron, or RomaGrip by Romac Industries.

Encasement

Polyethylene encasement shall be eight mil tube or sheet or shall be furnished with all ductile iron pipe unless otherwise specified. Materials shall comply with ANSI/AWWA C105/A21.5.

Valves

Gate Valves

The minimum requirements for all gate valves, 2" to 12" shall, in design, material and workmanship, conform to the Standards of AWWA C 509.

Buried gate valves shall be iron body, bronze mounted, resilient seat, non-rising stem, suitable for installation with the type and class of pipe being installed. Ends to be as specified. Operating stems shall be equipped with standard 2" operation nut, and O-ring stem seals. Valves not buried shall be as specified.

Valve Box

Valve Box shall be cast iron two-piece 8" or 18" slip type top section with flange located within 3" of top, with 24" bottom section (and extension, if required). Valve box lid shall be cast iron, 3 ½" deep, with recessed lifting handle, and the word "WATER" or "WW" cast into it.

Valve box paving risers shall be cast iron suitable for H-20 traffic loading. The riser shall have four lugs or a flange around the perimeter.

Valve box adjusting sleeves (for use in unimproved areas) shall be cast iron, 12" long.

All castings shall be coated with asphaltic varnish.

Valve Nut Extension

Use where valves are installed more than 3' below finished grade. Extensions are to be a minimum of 1' with only one extension per valve. All extensions shall be coated with asphaltic varnish.

Check Valve

Check valves shall be for 150 psi working pressure, unless otherwise specified. Valve shall be a high flow, center guided poppet type (silent check valve) or slanting disc type to provide non-slamming action under all conditions unless otherwise specified.

Air and Vacuum Release Valve

Combination Air Valves shall be of the single housing style that combines the operating features of both an Air/Vacuum and Air Release Valve.

The Air/Vacuum portion shall automatically exhaust large quantities of air during the filling of the pipeline and automatically allows air to re-enter the pipeline when the internal pressure of the pipeline approaches a negative value due to column separation, draining of the pipeline, power outage, pipeline break, etc. The Air Release portion shall automatically release small pockets of air from the pipeline while the pipeline is in operation and under pressure.

Fire Hydrant

Fire Hydrants must be MuellerSuper Centurion, 67" and shall have a minimum valve opening of 5-1/4" "O" ring stem seal, two 2-1/2" N.S.T. (four threads per inch) hose nozzle connections, and one 4-1/2" N.S.T. (four threads per inch) pumper connection. The shoe connection shall be 6" mechanical joint with lugs. The operating nut is 1-1/4" pentagonal. Hydrants shall be as shown in the approved materials list, with no exceptions unless approved by the Engineer. All hydrants shall be of the "Traffic Model" type with approved break-away features and brass to brass sub-seat.

The hydrant shall be fitted with a permanent hydrant adapter, designed with a gasket and metal anchors for permanent mounting. The adapter shall be a 5" Storz x 4-1/2" NH, equipped with cap and connector cable. The permanent hydrant adapter shall be Harrington, Inc. HSFR 50-45 NH or approved equal. Hydrants shall be a standard 5'-0" bury or deeper where conditions or conflicts require. The 6" and 12" vertical adjustment assemblies shall be complete, including the flanged riser, stem and all required components to provide a complete adjustment kit when required.

A minimum 6" diameter lateral pipe and isolation valve is required for connecting hydrants to the main line. Where hydrants are located more than 50' from an 8" or larger main, a minimum 8" diameter lateral pipe and in-ground isolation valve is required.

Hydrant Guard Posts

Hydrant guard posts (if required) shall be 9" diameter reinforced concrete, 6' long, and buried to a depth of 3'. Pipe shall be painted with two (2) coats of Rust-Oleum high gloss traffic yellow paint.

Services

Corporation Stop

Corporation stops shall be brass in accordance with AWWA Standard C800 with AWWA tapered thread (CC) inlet by compression fitting for copper outlet, complete with coupling nut for copper service.

Corporation stops for 1" and 2" tap shall be the ball valve stop.

Meter Locations

Standard installation requires placement of the meter outside the building in a water vault provided by the City.

Water Service Pipe

All service pipe for underground water service 2" or less shall be 200 psi CTS polyethylene tubing conforming to ASTM D2737 or seamless copper conforming to ASTM B88 (ANSI H33.1) Type K annealed tubing with wrought copper fittings. Connections shall be compression (pack joint).

Backflow Preventers

Double Check Valve Assembly

All Double Check Valve Assemblies shall be as listed on the most current copy of "Accepted Cross-Connection Control Assemblies" published by Washington State DOH. The assembly shall include a tightly closing resilient seated shut-off valve on each end of the body and each assembly shall be fitted with four (4) properly located resilient seated test cocks.

All other appurtenances shall be as shown in the Standard Detail.

Double Check Valve Assembly with Detector

This assembly shall include a line sized DOH approved Double Check Valve Assembly with a parallel 3/4" meter and 3/4" DOH approved Double Check Valve Assembly. (See Approved List in the most current copy of "Accepted Cross-Connection Control Assemblies" published by DOH). Each assembly shall include a tightly closing resilient seated shut-off valve on each end of the body and each assembly shall be fitted with four (4) properly located resilient seated test-cocks.

All other appurtenances shall be as shown in the Standard Detail.

Reduced Pressure Backflow Assembly with Detector

This assembly shall include a line sized DOH approved Reduced Pressure Backflow Assembly with a parallel 3/4" meter and 3/4" DOH approved Reduced Pressure Backflow Assembly. (See Approved List in the most current copy of "Accepted Cross-Connection Control Assemblies" published by Washington State DOH). Each assembly shall include a tightly closing resilient seated shut-off valve on each end of the body and each assembly shall be fitted with four (4) properly located resilient seated test cocks.

All other appurtenances shall be as shown in the Standard Detail.

GENERAL NOTES

IV Water General Notes:

The following general notes should be included on the water system improvement plan. Additional notes, if necessary, may be added to these notes for the review by the City of Newport Water Department.

1. All work shall conform to the water system drawings approved by the City of Newport Water Department.

2. All water main pipe shall be C900-16 DR-18 minimum PVC or ductile iron Pressure Class 350 psi minimum with cement mortar lining unless otherwise shown. Water services 2" and smaller shall be 200 CTS psi polyethylene pipe conforming to ASTM D2737 with brass compression fittings.

3. The new watermain shall be connected to the existing system only after new main is pressure tested, flushed, disinfected and dechlorinated and satisfactory bacteriological sample results are obtained. This work shall be in accordance with APWA/WSDOT Standard Specifications for Road, Bridge, and Municipal Construction Sections 7-09.3(24)A-O.

4. Watermain shut-off shall be coordinated with the water operations division and the fire department.

5. The locations of all existing utilities shown hereon have been established by field survey or obtained from available records and should therefore be considered approximate only and not necessarily complete. It is the sole responsibility of the contractor to independently verify the accuracy of all utility locations shown, and to further discover and avoid any other utilities not shown here on which may be affected by the implementation of this plan.

6. Deflect the watermain above or below existing utilities as required to maintain 5' minimum cover and 12" minimum vertical clearance between utilities unless otherwise specified.

7. Wrap all ductile iron pipe and adjacent valves and fittings with 8 mil. Polyethylene conforming to AWWA C105.

8. All fittings shall be blocked per standard detail unless otherwise specified.

9. Call the Underground Utility Location Service 48-hours before construction for utility locations.

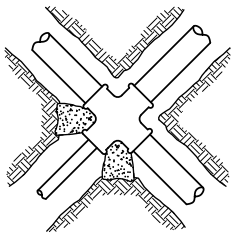
10. Avoid crossing water or sewer mains at highly acute angles. The smallest angle between the crossing utilities shall be 45 degrees.

11. Where watermain crosses above or below sanitary sewer, one full length of water pipe shall be centered for maximum joint separation. Pipe encasement per AWWA Standards may be required based on separation distance.

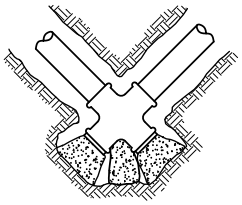
12. At points where existing thrust blocking is found, clearance between the concrete blocking and other buried utilities or structures shall be sufficient to prevent weakening of the blocking support.

STANDARD DETAILS

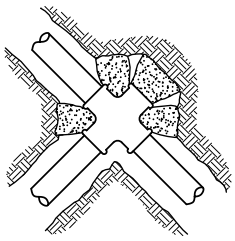
10/06 (DP-A)



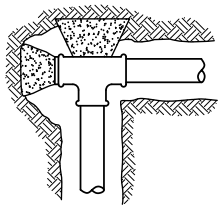
UNBALANCED CROSS
(USE COLUMN A)



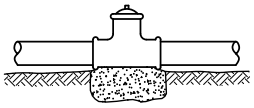
PLUGGED CROSS
(USE COLUMN B)



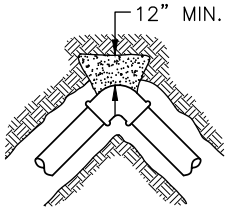
PLUGGED CROSS
(USE COLUMN A)



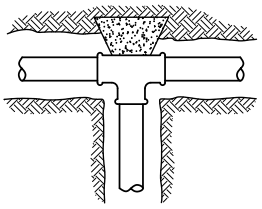
PLUGGED TEE
(USE COLUMN B)



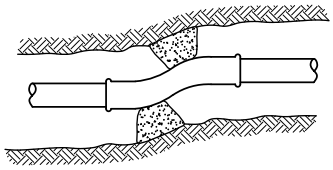
VALVE
(USE COLUMN A)



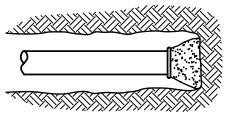
BEND



TEE
(USE COLUMN B)



OFFSET
(USE COLUMN C, D or E)



DEAD END

NOTES:

1. CONTRACTOR TO PROVIDE BLOCKING ADEQUATE TO WITHSTAND FULL TEST PRESSURE.

2. DIVIDE THRUST BY SAFE BEARING LOAD TO DETERMINE REQUIRED AREA (IN SQUARE FEET) OF CONCRETE TO DISTRIBUTE LOAD.

3. AREAS TO BE ADJUSTED FOR OTHER PRESSURE CONDITIONS.

		Bearing Area of Thrust Block (sq. ft.)				
		A	B	C	D	E
SIZE	TEST PRESSURE PSI.	TEST AND DEAD ENDS	90° BEND	45° BEND	22.5° BEND	11.25° BEND
4"	200	2.5	3.6	2.0	1.0	1.0
6"	200	5.7	8.0	4.3	2.2	1.1
8"	200	10.2	14.3	7.8	4.0	2.0
10"	200	15.8	22.4	12.3	6.4	3.2
12"	200	22.8	32.0	17.3	8.8	4.4

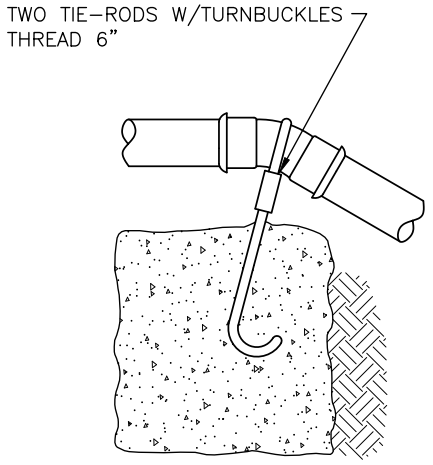
CONCRETE THRUST BLOCKING

SCALE: NTS

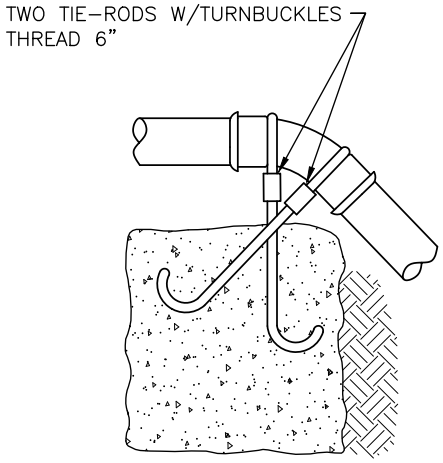
DATE: 7-01-22

CITY OF NEWPORT STANDARD
WATER DETAIL

SHEET NO.
V-1a



BLOCKING FOR 11.25’ OR 22.5’
VERTICAL BENDS



BLOCKING FOR 45’
VERTICAL BENDS

PIPE DIA.	TEST PRESSURE PSI.	DIMENSION TABLE			
		BEND ANGLE	CONCRETE VOLUME CU. YD.	TIE–ROD DIA.	TIE–ROD EMBEDMENT
4”	200	11.25°	0.2	5/8”	30”
		22.5°	0.2		
		45°	0.5		
6”	200	11.25°	0.3	5/8”	30”
		22.5°	0.5		
		45°	1.0		
8”	200	11.25°	0.5	5/8”	30”
		22.5°	1.0		
		45°	1.8		
10”	200	11.25°	0.8	5/8”	30”
		22.5°	1.5		
		45°	2.7	3/4”	
12”	200	11.25°	1.0	5/8”	30”
		22.5°	2.2		
		45°	4.3	7/8”	

CONVEX BLOCKING FOR
CONVEX VERTICAL BENDS

SCALE: NTS

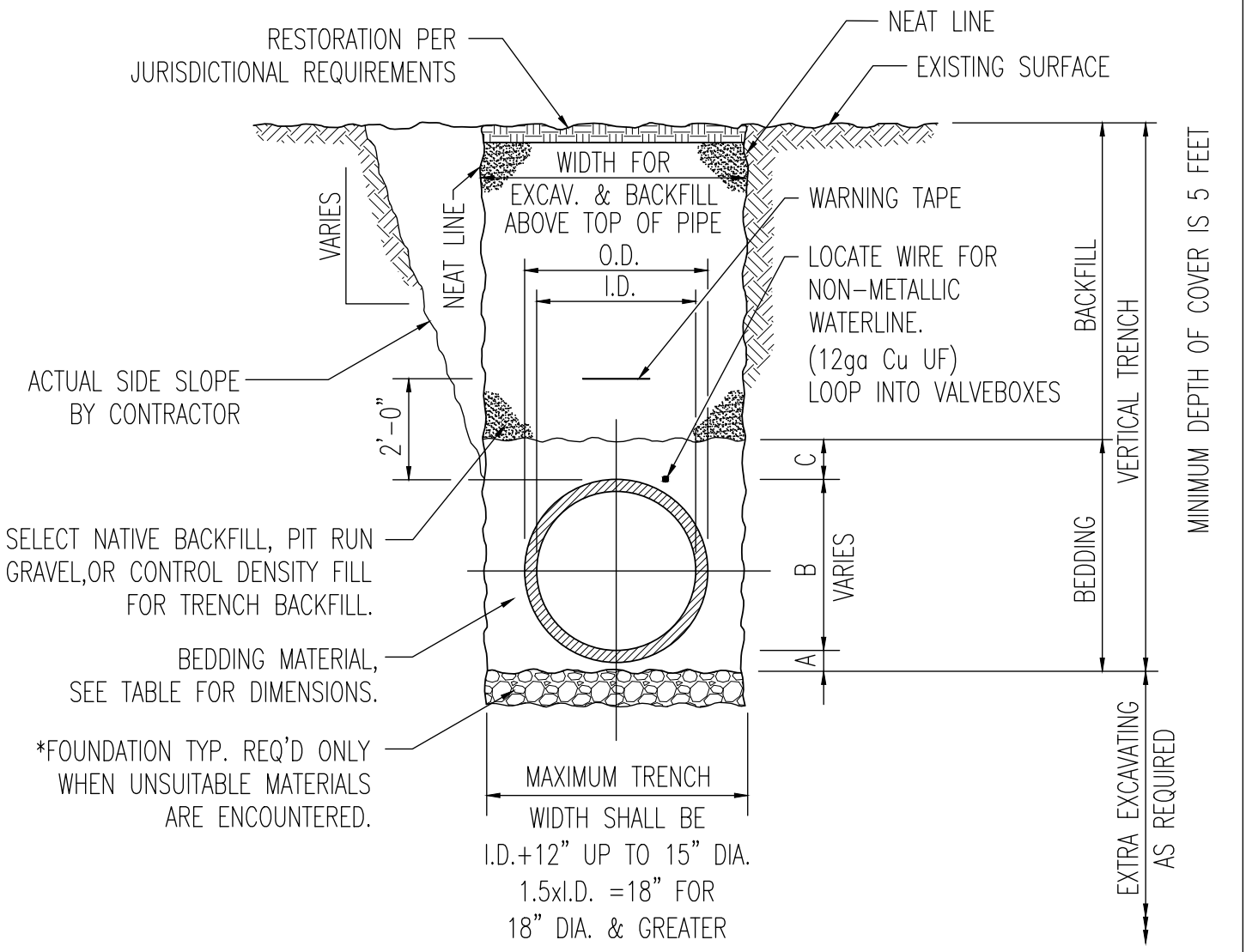
DATE: 7-01-22

CITY OF NEWPORT STANDARD
WATER DETAIL

SHEET NO.
V-1b

10/06 (DP-A)

	PIPE BEDDING DIMENESIONS	
DIMENSIONS	FOR FLEXIBLE PIPE	FOR RIGID PIPE
A	0.34'	0–0.34'
B	O.D.	N/A
C	0.5'	N/A



CONTRACTOR IS RESPONSIBLE FOR ALL SAFETY AND SHORING REQUIREMENTS MEETING OSHA STANDARDS.

TYPICAL TRENCH	SCALE: NTS	DATE: 7-01-22
CITY OF NEWPORT STANDARD WATER DETAIL		SHEET NO. V-2

NOTES:

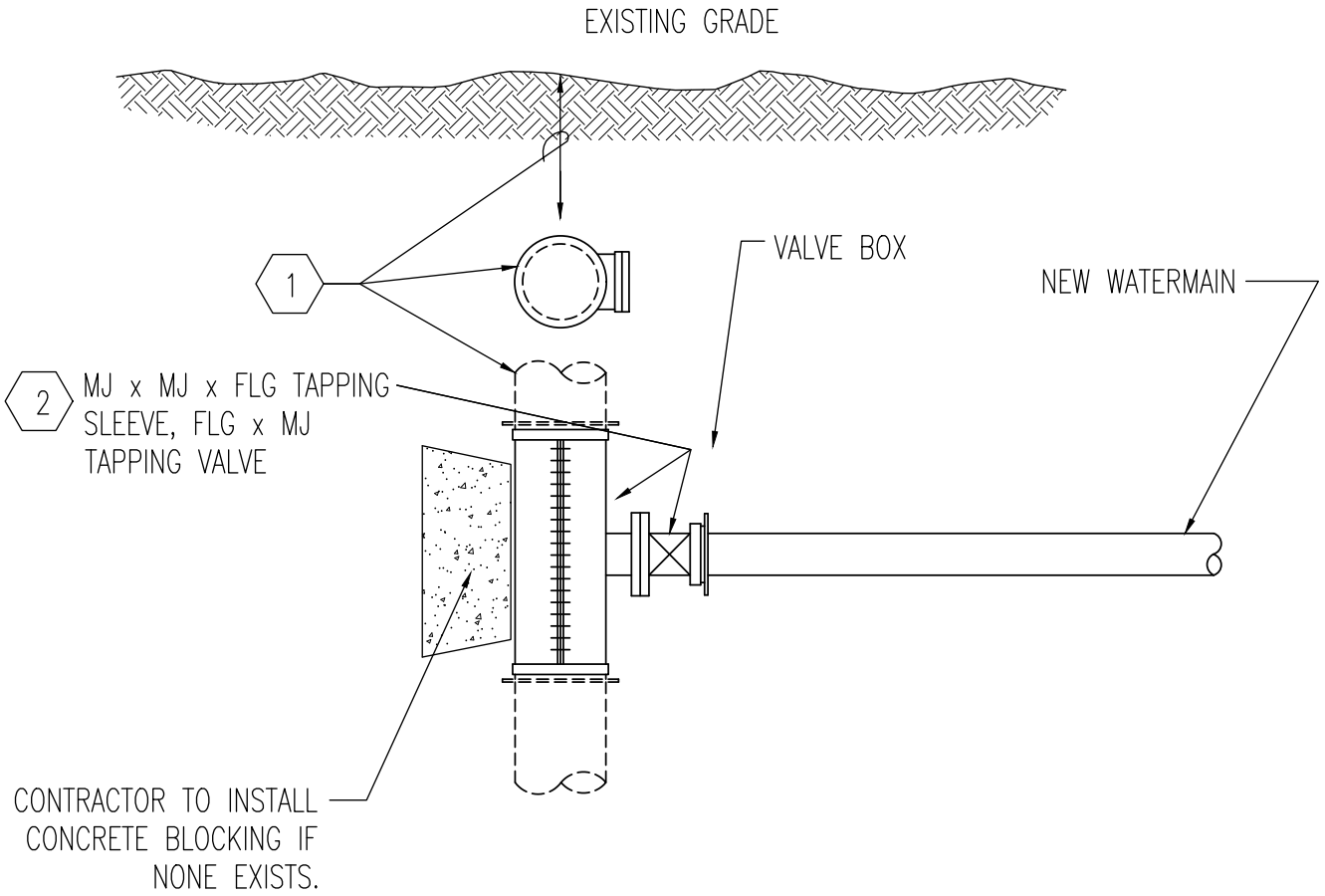
ALL FITTINGS TO BE DUCTILE IRON.

ALL EXCAVATION SHALL PROVIDE A MINIMUM OF 1' CLEAR AROUND PIPE AND FITTINGS.
THIS STANDARD DETAIL APPLIES TO DIP WATERMAIN EXTENSIONS 12 INCH OR SMALLER DIAMETER.
OTHER SIZES, SEE PROJECT SPECIFIC DRAWINGS.

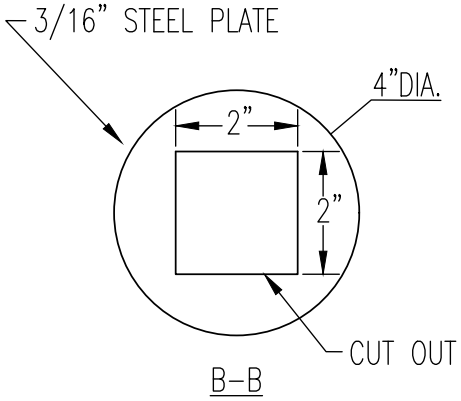
ALL EXCAVATION, PIPE, FITTINGS (EXCEPT AS NOTED BELOW), OTHER MATERIAL, BACKFILL, COMPACTION, & STREET RESTORATION BY CONTRACTOR. ALL MATERIALS TO BE ON JOB SITE PRIOR TO SHUTDOWN OF EXISTING MAIN.

1. CONTRACTOR TO DETERMINE ALIGNMENT & GRADE OF EXISTING FACILITY PRIOR TO INSTALLING NEW WATERMAIN. CITY WATER DEPARTMENT TO DETERMINE OUTSIDE DIAMETER OF EXISTING FACILITY AT THE SAME TIME CONTRACTOR EXCAVATES TO DETERMINE ALIGNMENT & GRADE.

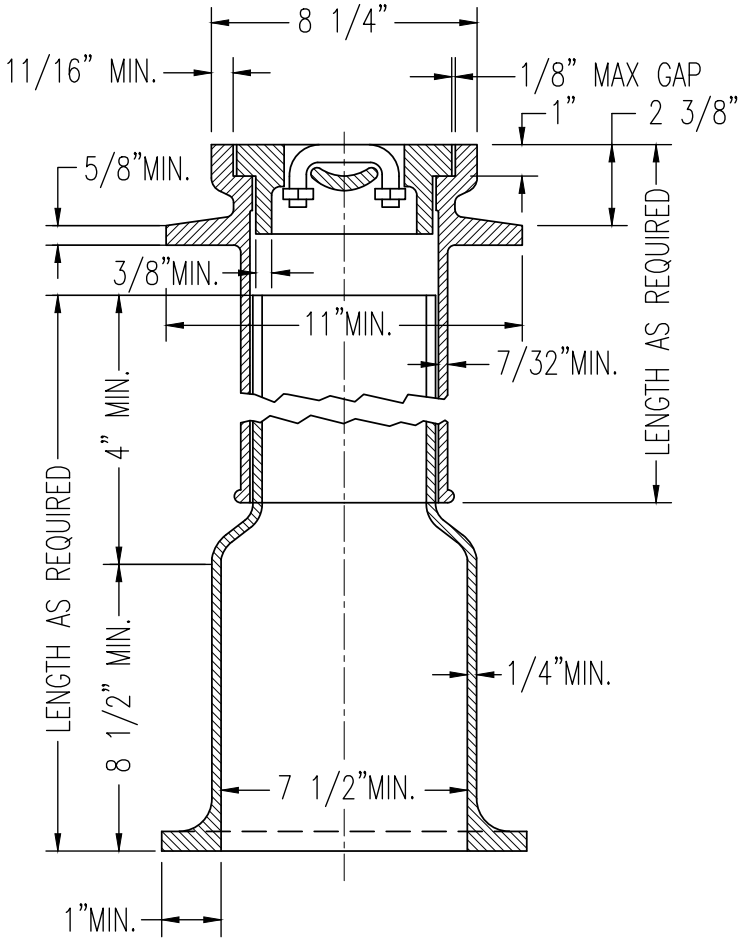
2. TAPPING SLEEVE & TAPPING VALVE FURNISHED AND INSTALLED BY CONTRACTOR IN THE PRESENCE OF CITY WATER DEPARTMENT.



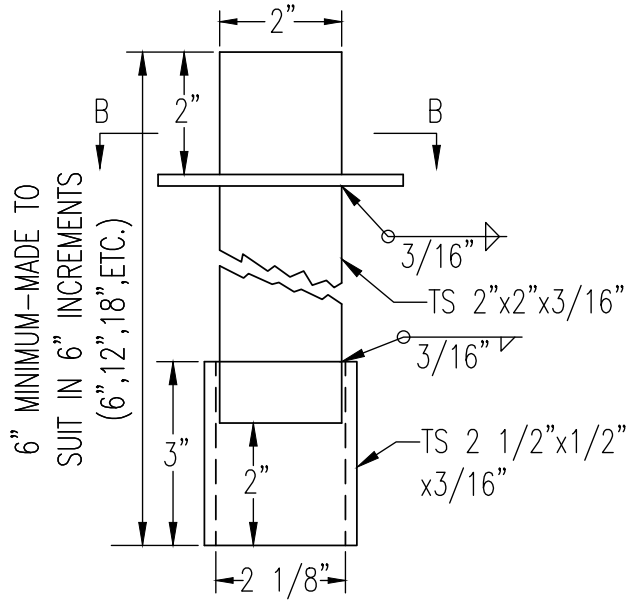
WET TAPPING TEE & TAPPING VALVE	SCALE: NTS	DATE: 7-01-22
CITY OF NEWPORT STANDARD WATER DETAIL		SHEET NO. V-3



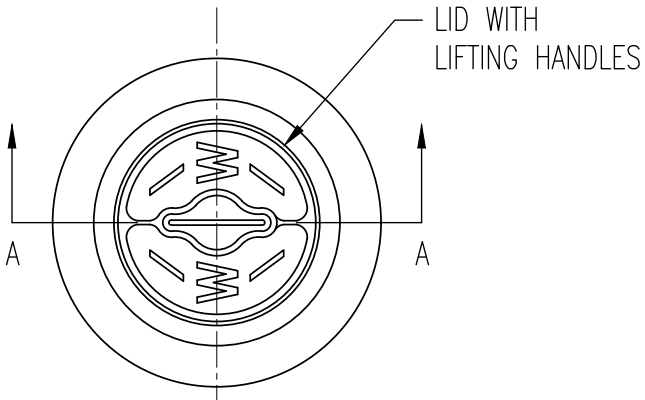
B–B



SECTION A–A

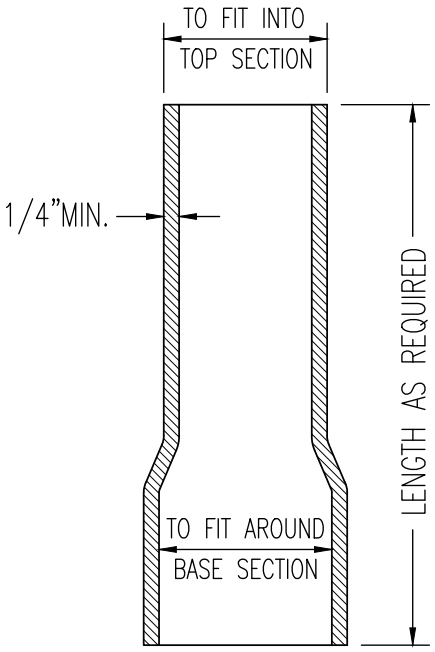


OPERATING NUT EXTENSION DETAILS
NTS

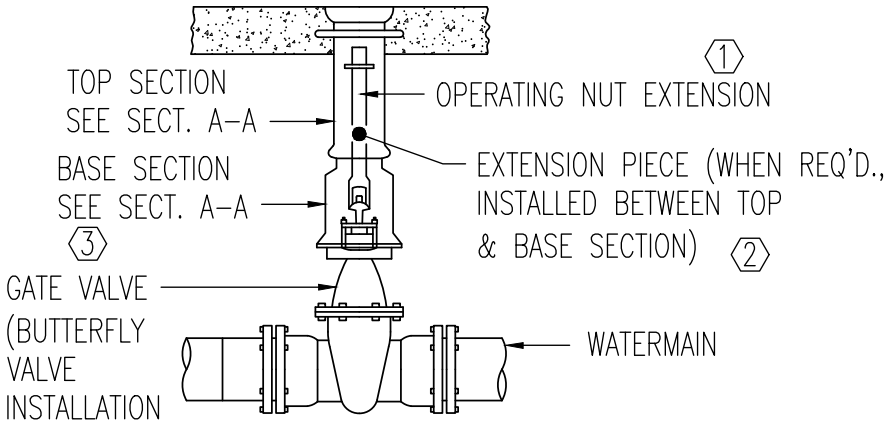


PLAN VIEW

CAST IRON VALVE BOX & OPERATING NUT EXTENSION	SCALE: NTS	DATE: 7-01-22
CITY OF NEWPORT STANDARD WATER DETAIL		SHEET NO. V-4a



EXTENSION PIECE ⟨2⟩
(WHEN REQUIRED)
NTS



VALVE BOX ASSY

TYPICAL SETTING DETAIL
NTS

NOTES:

FRAME & COVER SHALL BE TESTED FOR ACCURACY OF FIT & SHALL BE MARKED IN SETS FOR DELIVERY.

CASTINGS & EXTENSION SHALL BE HOT–DIPPED IN ASPHALTIC VARNISH, ROYSTON ROSKOTE #612XM OR APPROVED EQUAL.

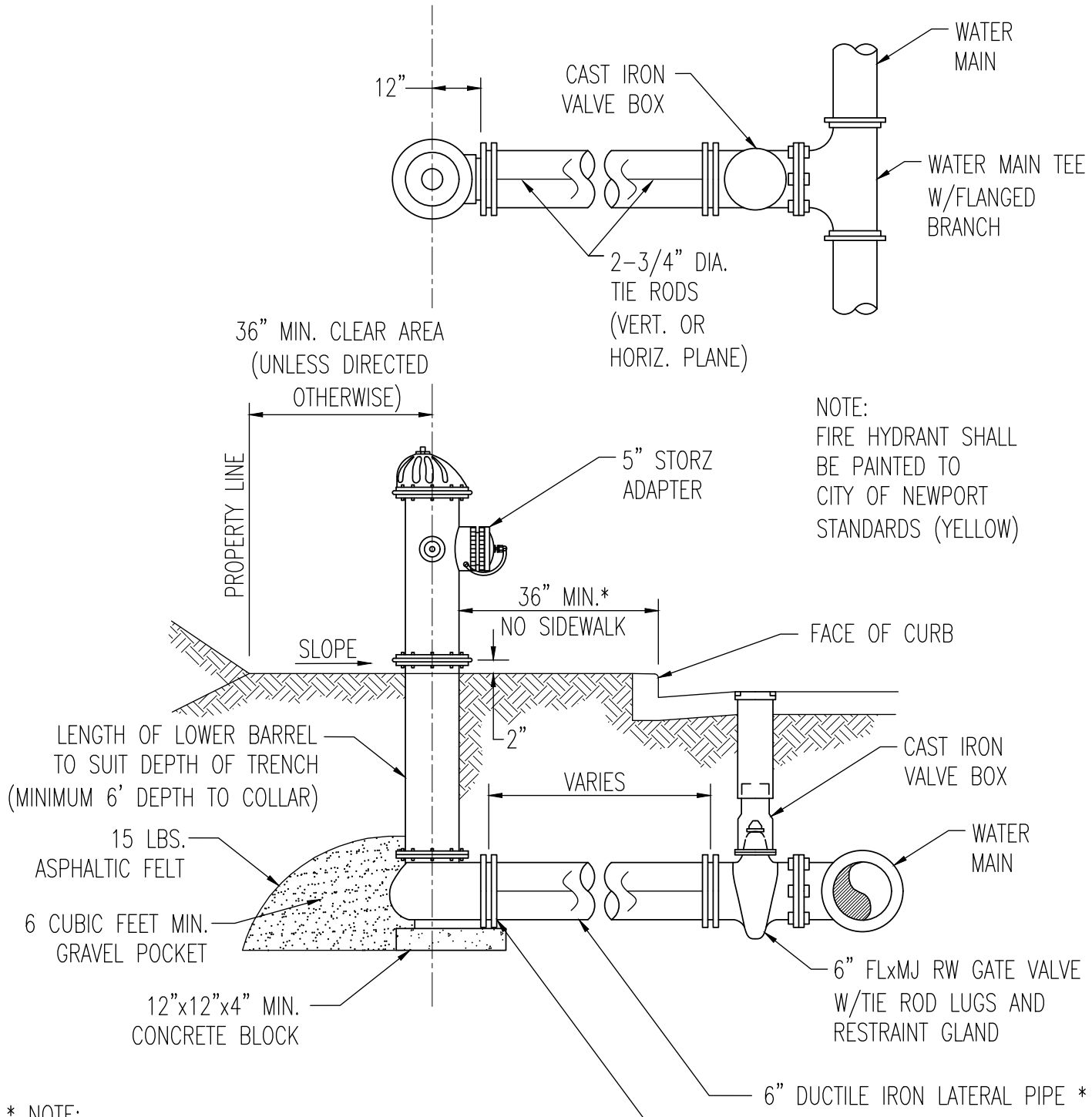
VALVE BOXES SHALL BE RICH #045, TOP SECTION, LID, & BASE; OR OLYMPIC FOUNDRY–LID #1908–33, TOP SECTION #1106–33, BASE SECTION #1301–33; OR APPROVED EQUAL.

⟨1⟩ AN OPERATING NUT EXTENSION SHALL BE INSTALLED WHEN THE GROUND SURFACE IS MORE THAN 3' ABOVE THE VALVE OPERATING NUT. THE OPERATING NUT EXTENSION SHALL EXTEND INTO THE TOP SECTION OF THE STANDARD VALVE BOX AND SHALL CLEAR THE BOTTOM OF THE LID BY A MINIMUM OF 6 INCH.

⟨2⟩ EXTENSION PIECES (WHEN USED) SHALL CONFORM TO MINIMUM THICKNESS REQUIREMENTS AND SHALL FIT INTO THE TOP SECTION AND OVER THE BOTTOM SECTION.

⟨3⟩ WRAP VALVE BOX AND VALVE TOP WITH FILTER FABRIC TO KEEP SAND OUT.

CAST IRON VALVE BOX & OPERATING NUT EXTENSION	SCALE: NTS	DATE: 7-01-22
CITY OF NEWPORT STANDARD WATER DETAIL		SHEET NO. V-4b



* NOTE:

1.) FIRE HYDRANT SHALL BE PLACED AT BACK OF SIDEWALK IF CONSTRUCTED OR PLANNED FOR FUTURE. (24" CENTER OF FIRE HYDRANT TO BACK OF WALK)

2.) 8" WHEN LATERAL RUN LENGTH EXCEEDS 50 FEET.

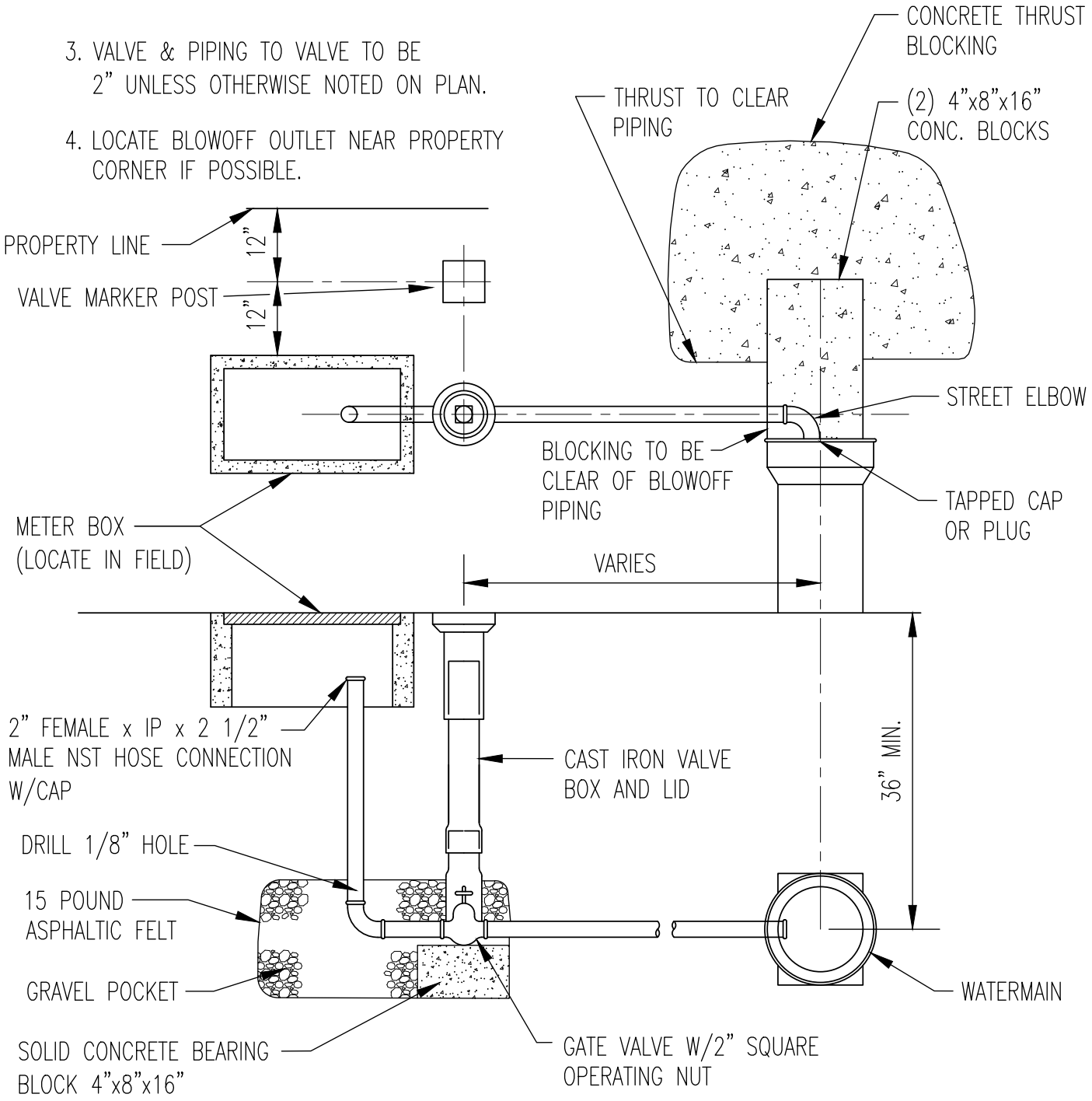
3.) ALL PIPE JOINTS IN LATERAL RUN SHALL BE RESTRAINED WITH LOCKING GASKET OR BELL RESTRAINT HARNESS.

TYPE A FIRE HYDRANT SETTING	SCALE: NTS	DATE: 7-01-22
CITY OF NEWPORT STANDARD WATER DETAIL		SHEET NO. V-5a

10/06 (DP-A)

NOTES:

1. PAINT PIPE THREADS W/ASPHALT PAINT AFTER ASSEMBLY.
2. ALL PIPING TO BE GALVANIZED STEEL.
3. VALVE & PIPING TO VALVE TO BE 2" UNLESS OTHERWISE NOTED ON PLAN.
4. LOCATE BLOWOFF OUTLET NEAR PROPERTY CORNER IF POSSIBLE.

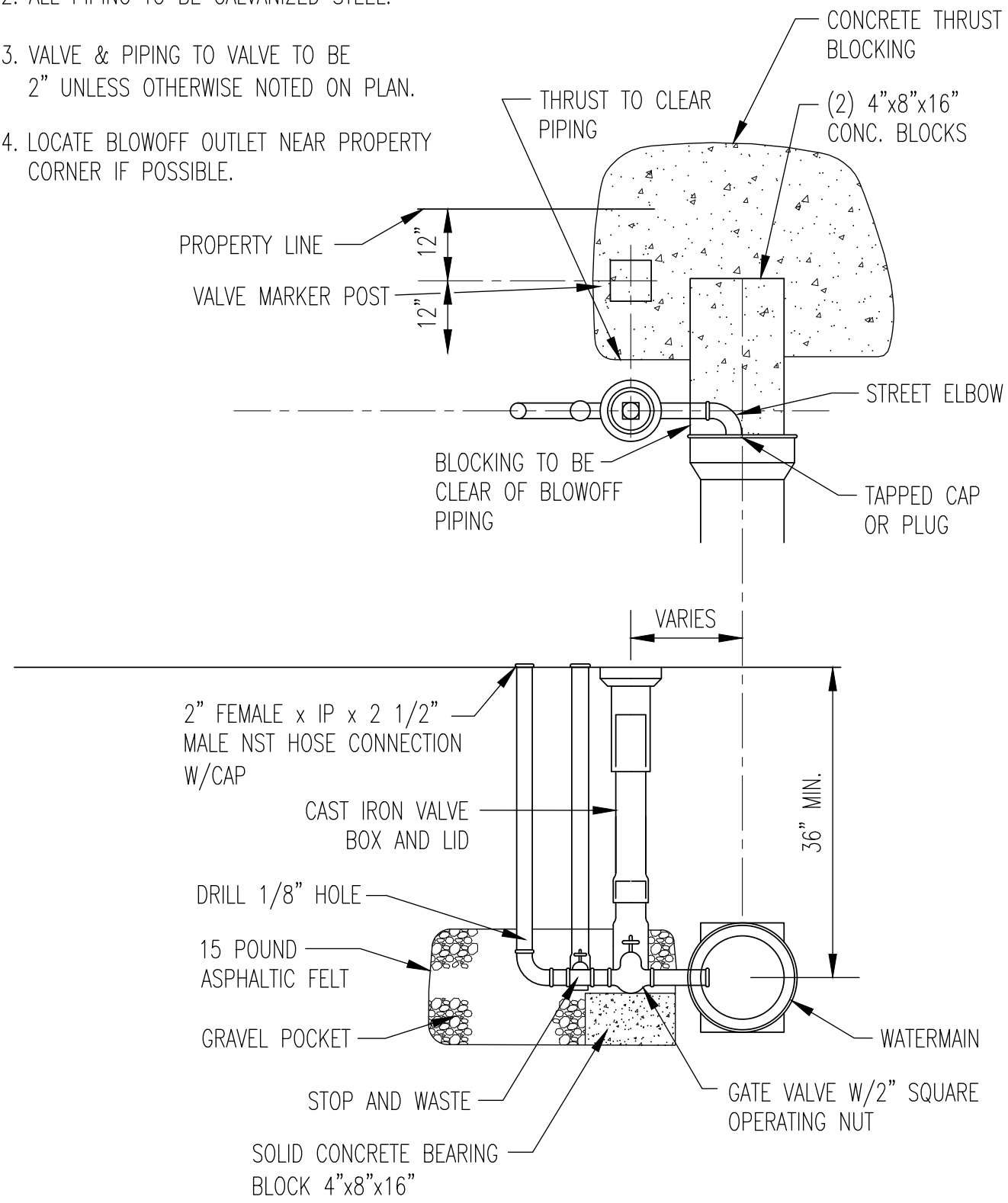


2" BLOW OFF ASSEMBLY - OUTSIDE OF PAVEMENT	SCALE: NTS	DATE: 7-01-22
CITY OF NEWPORT STANDARD WATER DETAIL		SHEET NO. V-6

10/06 (DP-A)

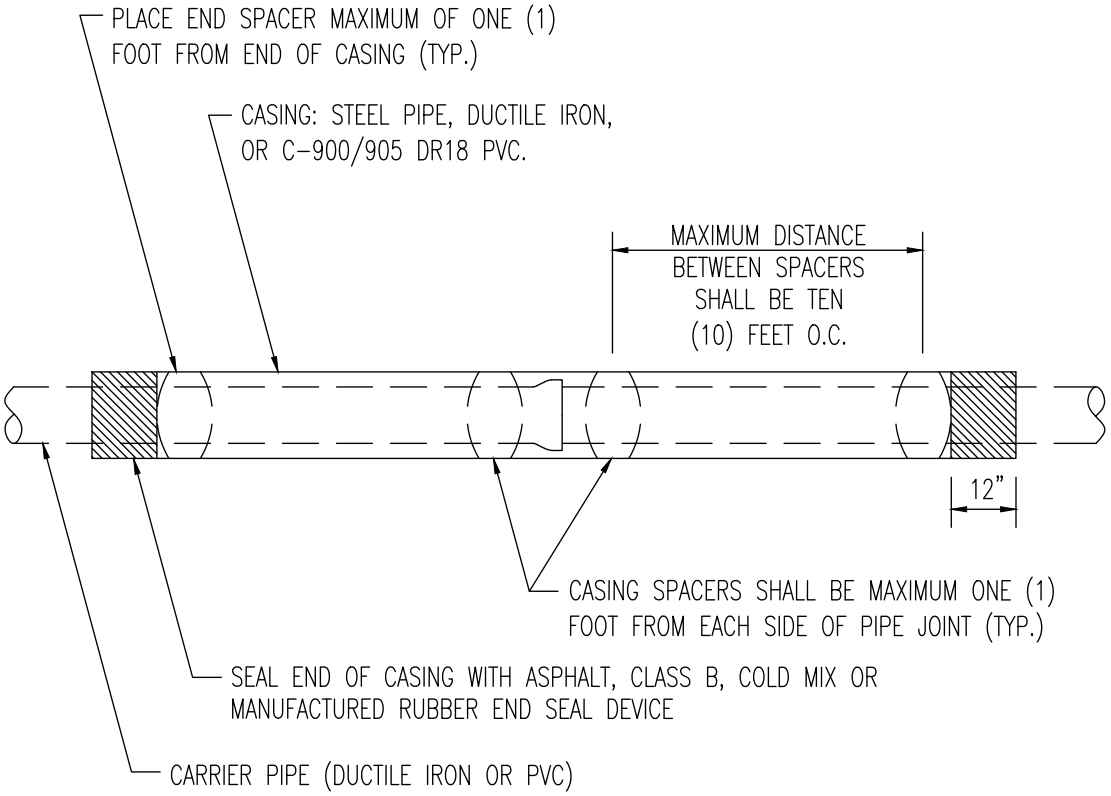
NOTES:

1. PAINT PIPE THREADS W/ASPHALT PAINT AFTER ASSEMBLY.
2. ALL PIPING TO BE GALVANIZED STEEL.
3. VALVE & PIPING TO VALVE TO BE 2" UNLESS OTHERWISE NOTED ON PLAN.
4. LOCATE BLOWOFF OUTLET NEAR PROPERTY CORNER IF POSSIBLE.



2" BLOW OFF ASSEMBLY - END OF PIPE - FUTURE EXTENSION	SCALE: NTS	DATE: 7-01-22
CITY OF NEWPORT STANDARD WATER DETAIL		SHEET NO. V-6.1

10/06 (DP-A)



CASING SPACERS (SEE APPROVED MATERIALS LIST)

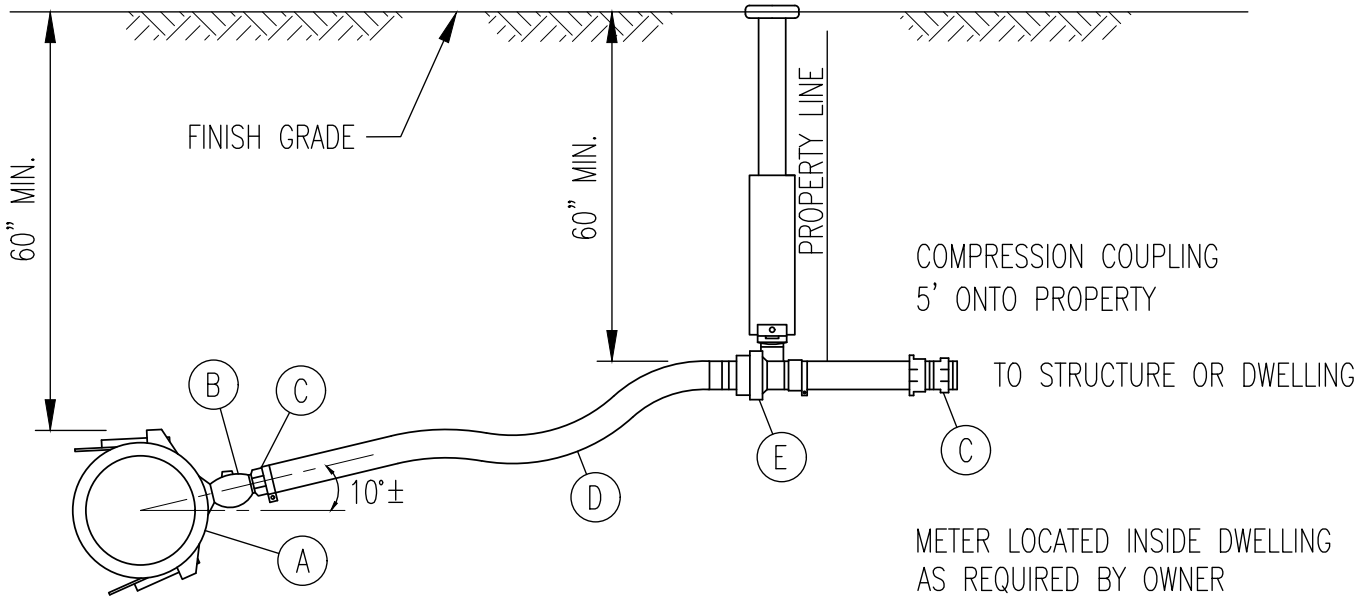
CARRIER PIPE DIAMETER	4"	6"	8"	10"	12"
CASING PIPE DIAMETER (PUSH-ON JOINT CARRIER PIPE)	10"	12"	14"	16"	20"
CASING PIPE DIAMETER (MJ/MEGALUG JOINT CARRIER PIPE)	14"	16"	18"	20"	22"*
STEEL CASING THICKNESS (MIN.)	0.25"	0.25"	0.25"	0.25"	0.25"
SPACER BAND WIDTH	8"	8"	8"	8"	8"

* 24" FOR DUCTILE IRON OR C-905 PVC CASING.
ANTICORROSIVE COATING THICKNESS:
DIP CARRIER – 8 MILLS DFT
DIP OR STEEL CASING – 8 MILLS DFT

NOTES:

1. CASING SPACERS SHALL BE "CENTER POSITIONING" TYPE.
2. MINIMUM RUNNER WIDTH SHALL BE 2 INCHES.
3. RUNNER HEIGHT SHALL BE SIZED TO PROVIDE:
   A. MINIMUM 0.75" BETWEEN CARRIER PIPE BELL AND CASING PIPE WALL AT ALL TIMES.
   B. MINIMUM 1" CLEARANCE BETWEEN RUNNERS AND TOP OF CASING WALL TO PREVENT JAMMING DURING INSTALLATION.
4. STEEL CASING DIAMETERS ARE "OUTSIDE DIAMETER" FOR 16" OR LARGER.
5. SPACER BAND WIDTH SHALL BE 12" FOR CARRIER PIPES THAT ARE 36" DIAMETER OR GREATER.

CASING INSTALLATION	SCALE: NTS	DATE: 7-01-22
CITY OF NEWPORT STANDARD WATER DETAIL		SHEET NO. V-7



(A) PAINTED HIGH TENSILE D.I. SERVICE SADDLE W/DOUBLE STAINLESS STEEL STRAP, 2" AWWA TAPER (CC) TAP, ROMAC 202S, OR EQUAL, SIZE AS REQUIRED.

(B) CORPORATION STOP, 2" AWWA TAPER (CC) INLET BY 2" MALE IRON PIPE THREAD OUTLET. CORP STOP TO BE BALL VALVE TYPE (OR EQUAL LOW-FRICTION VALVE), FORD BALLCORP FB400, MUELLER ORISEAL NO. H-9968, OR EQUAL.

(C) COUPLING, 2" FEMALE IRON PIPE THREAD BY 2" PACK JOINT (COMPRESSION FITTING) FOR COPPER, FORD C14-77, MUELLER NO.H-15451, OR EQUAL.

(D) 200 PSI CTS POLYETHYLENE TUBING

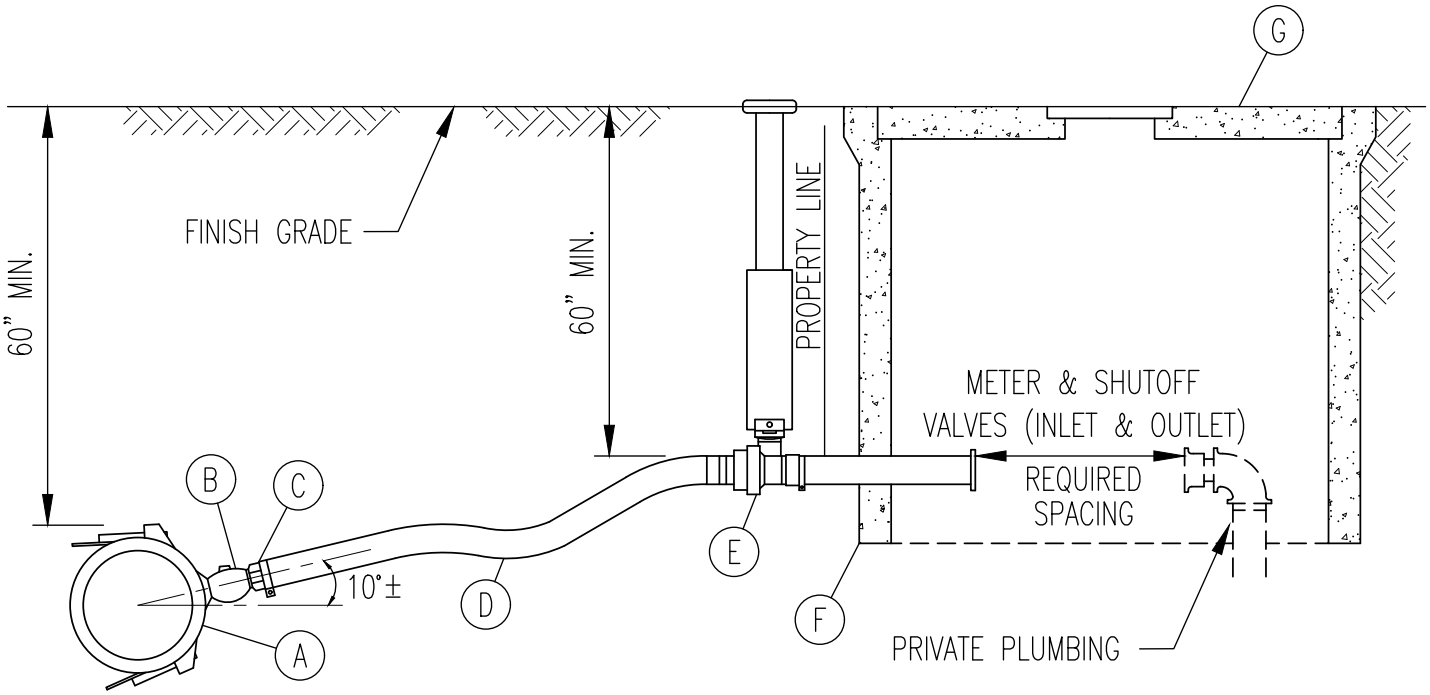
(E) 2" CURB STOP (BALL VALVE TYPE) MEETING CITY STANDARDS.

NOTES:

1. CURB STOP SHALL BE PLACED AT PROPERTY LINE WITH CURB BOX.
2. METER IS LOCATED INSIDE STRUCTURAL CRAWL SPACE OR MECHANICAL ROOM. SHUTOFF SHALL BE PROVIDED ON BOTH SIDES OF METER IN STRUCTURE.
3. 1" AND 1-1/2" SERVICES ARE SIMILIAR. SUBSTITUTE CORRESPONDING SIZE FOR 2".

1", 1-1/2" and 2" DOMESTIC WATER SERVICE ALTERNATE #1 - METER IN DWELLING	SCALE: NTS	DATE: 7-01-22
CITY OF NEWPORT STANDARD WATER DETAIL		SHEET NO. V-8

10/06 (DP-A)



(A) PAINTED HIGH TENSILE D.I. SERVICE SADDLE W/DOUBLE STAINLESS STEEL STRAP, 1 1/2" AWWA TAPER (CC) TAP, ROMAC 202S, OR EQUAL, SIZE AS REQUIRED.

(B) CORPORATION STOP, 1 1/2" AWWA TAPER (CC) INLET BY 1 1/2" MALE IRON PIPE THREAD OUTLET. CORP. STOP TO BE BALL VALVE TYPE (OR EQUAL LOW-FRICTION VALVE), FORD BALLCORP FB400, MUELLER ORISEAL NO. H-9968, OR EQUAL.

(C) COUPLING, 1 1/2" FEMALE IRON PIPE THREAD BY 1 1/2" PACK JOINT (COMPRESSION FITTING) FOR COPPER, FORD C14-66, MUELLER NO.H-15451, OR EQUAL.

(D) 200 PSI CTS POLYETHYLENE TUBING.

(E) 1 1/2" CURB STOP (BALL VALVE TYPE) MEETING CITY STANDARDS.

(F) 48" MIN. ID VAULT. CONCRETE FOR TRAFFIC AREAS AND CMP (ALLOWED) IN NON-TRAFFIC LOCATIONS.

(G) CONCRETE LID, TRAFFIC RATED, ALL LOCATIONS.

NOTES:

1. 1" AND 2" SERVICES ARE SIMILIAR. SUBSTITUTE CORRESPONDING SIZE FOR 1 1/2".

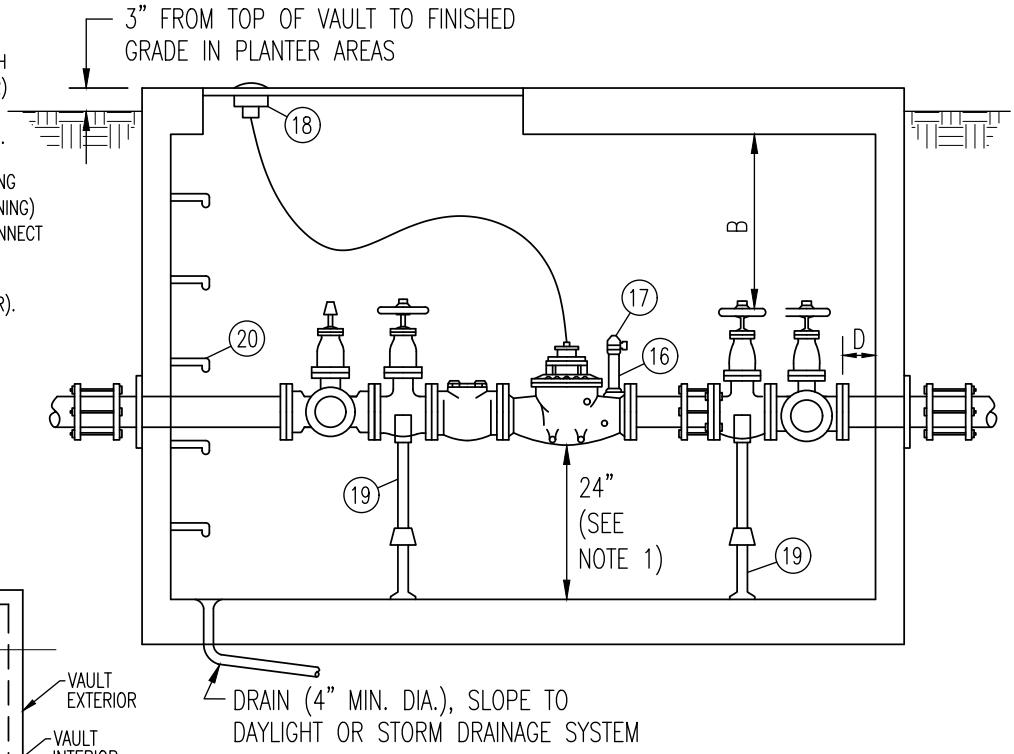
1", 1-1/2" and 2" WATER SERVICE ALTERNATE #2 - METER LOCATED OUTSIDE DWELLING	SCALE: NTS	DATE: 7-01-22
CITY OF NEWPORT STANDARD WATER DETAIL		SHEET NO. V-9

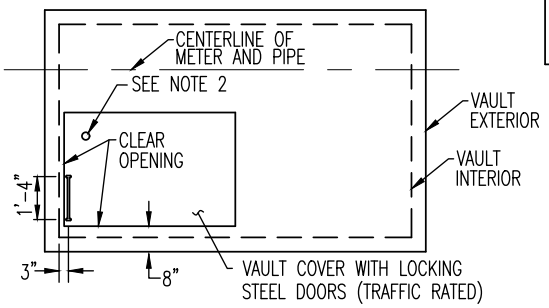
10/06 (DP-A)

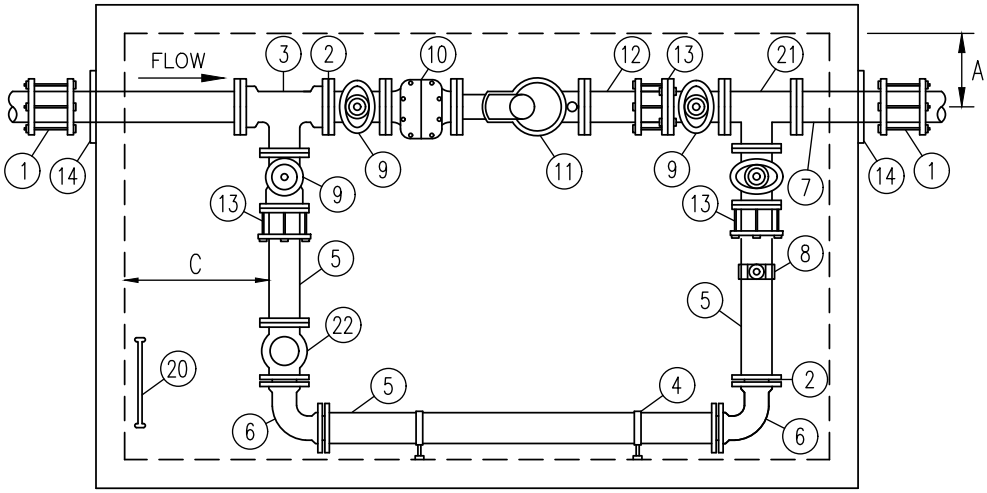
MATERIAL LIST – (ALL SIZES ARE SAME AS METER UNLESS OTHERWISE LISTED)

1. 1–FLEX CPLG. TO FIT, EQUAL TO SMITH–BLAIR 441
2. 1–4"x3" REDUCER, P.E.xM.J. (FOR 3" SERVICE ONLY)
3. 1–TEE, FL.xFL.
4. 2–WALL MOUNT PIPE SUPPORTS
5. 3–D.I. PIPE, P.E., LENGTH AS REQUIRED*
6. 2–90° BEND, FL.xFL.
7. 2–D.I. PIPE, LF.xFL., LENGTH AS REQUIRED.
8. 1–SERVICE SADDLE, ROMAC 202S (101S FOR 3" SERVICE) OR EQUAL
   1–COPRORATE STOP, AWWA TAPER(CC) x M.I.P.T. FORD FB400 OR EQUAL (SEE TABLE FOR SIZE).
9. 4–GATE VALVE, FL.
10. 1–SENSUS STRAINER (SM–951–R1).
11. 1–SENSUS SRH COMPOUND METER, W/ELECTRONIC REGISTER. (SENSUS TR/PL MODEL W/4 WHEEL HIGH RESOLUTION (GALLONS REGISTER.) (BY CONTRACTOR)
12. 1–D.I. ADAPTER FLxP.E., LENGTH TO FIT.
13. 2–FL.xCPLG. ADAPTER, EQUAL TO SMITH–BLAIR 912.
14. WELDED FL. RESTRAINT OR MEGA–LUG WALL RING.
15. PRECAST CONC. VAULT WITH DIAMOND PLATE LOCKING DOOR RATED FOR H–20 LOADING. (3'x3' MIN. OPENING)
16. 1–2" BRASS NIPPLE, M.I.P.T.xM.I.P.T., 6" LONG, CONNECT TO TEST PORT OF COMPOUND METER.
17. 1–2" BALL VALVE, F.I.P.T.xM.I.P.T., FORD B81–777.
18. TR/PL SENSOR (TO MOUNT IN VALVE ACCESS DOOR).
19. 2–ADJUSTABLE STANCHION BOLTED TO FLOOR.
20. 1–GALVANIZED STEEL LADDER TO BE ATTACHED TO VAULT.
21. 1–TEE, FL.
22. 1–SENSUS COMPOUND METER W/MANUAL READ REGISTER. (GALLONS)

METER SIZE	MAIN–LINE	BYPASS	CORP STOP FOR FLUSH PORT–SIZE	MIN. CLEARANCES			
				A	B	C	D
3"	3" D.I.*	3" D.I.*	1"	10"	6"	2'–8"	6"
4"	4" D.I.	4" D.I.	2"	12"	6"	2'–8"	6"
6"	6" D.I.	6" D.I.	2"	12"	6"	3'–2"	6"







NOTE:

1. PROVIDE 24" CLEARANCE BETWEEN VAULT FLOOR & BOTTOM OF COMPOUND METER. WHERE ELEVATION OF VAULT FLOOR IS TOO LOW TO DRAIN TOO DAYLIGHT OR STORM SYSTEM (APPROVED BY THE CITY ON A CASE BY CASE BASIS ONLY).
2. PROVIDE 2 1/4" DIA. OPENING IN STEEL DOOR FOR TR/PL SENSOR.
3. LADDER TO BE BOLTED TO VAULT FLOOR AND TO VAULT WALL AT TWO LOCATIONS. RUNGS SHALL BE SPACED AT 12" ON CENTER.
4. BYPASS IS OPTIONAL. INSTALL IN CRITICAL WATER SERVICE INSTALLATIONS ONLY.

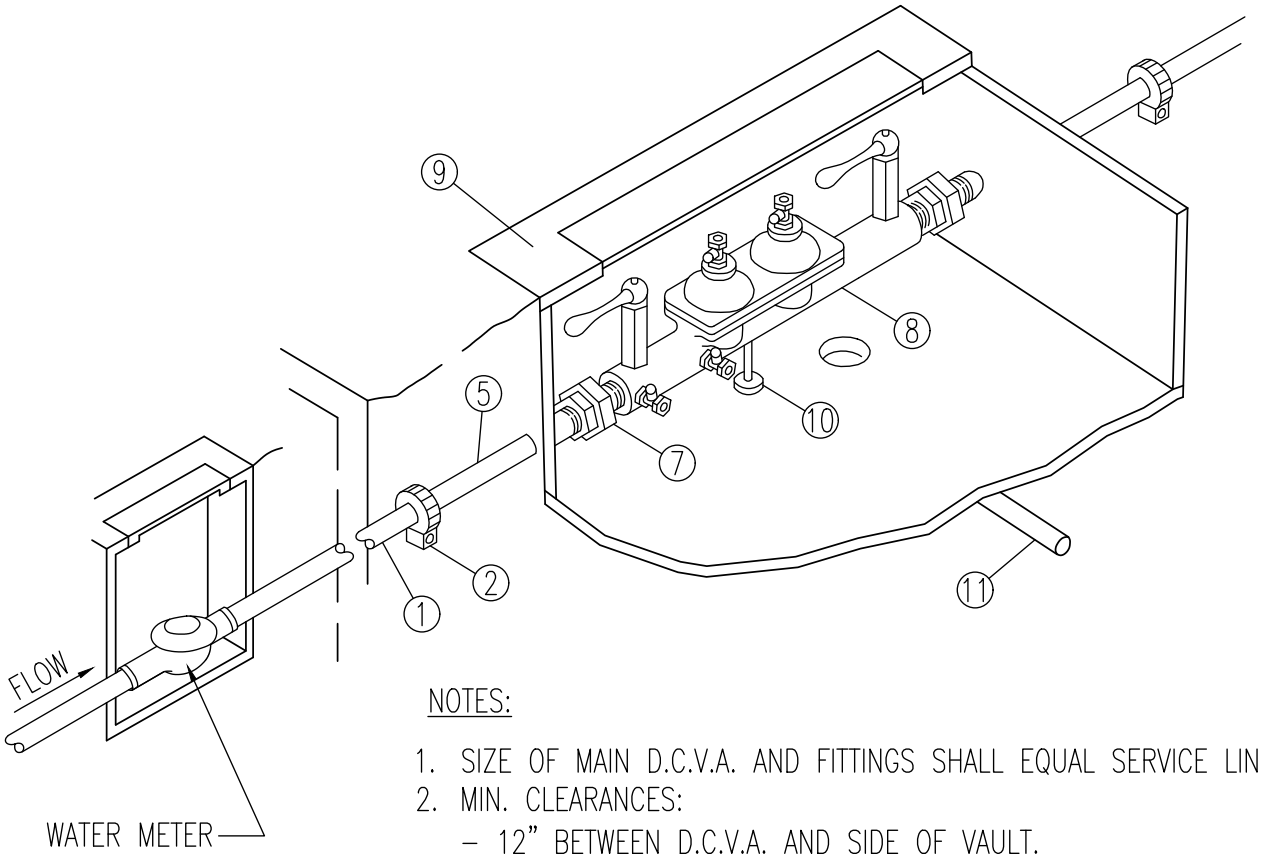
3" TO 6" DOMESTIC METER INSTALLATION

SCALE: NTS | DATE: 7-01-22

CITY OF NEWPORT STANDARD WATER DETAIL

SHEET NO. V-10

10/06 (DP-A)



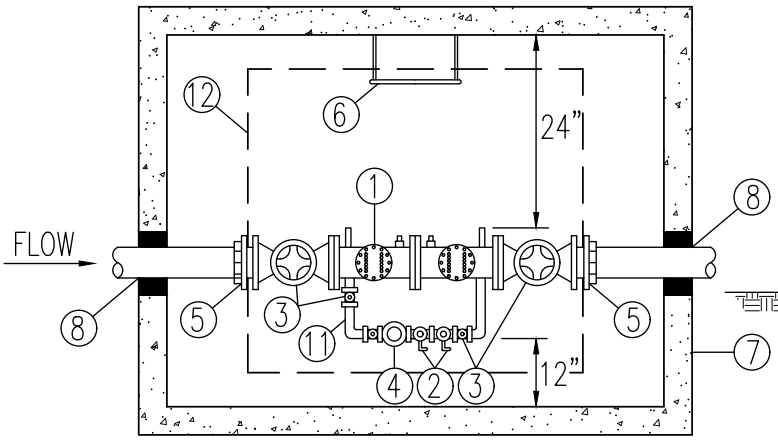
NOTES:

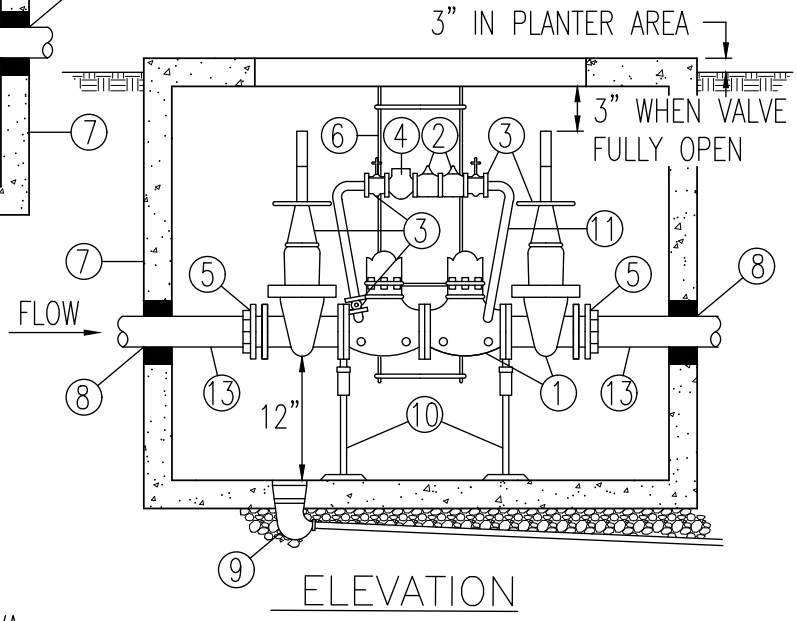
1. SIZE OF MAIN D.C.V.A. AND FITTINGS SHALL EQUAL SERVICE LINE SIZE
2. MIN. CLEARANCES:
   - 12" BETWEEN D.C.V.A. AND SIDE OF VAULT.
   - 12" BETWEEN D.C.V.A. AND VAULT FLOOR.
   - 24" SOIL COVER OVER SERVICE LINE.
3. INSTALL PLUGS IN ALL TEST COCKS.
4. CITY OF NEWPORT WATER QUALITY DIVISION MUST TEST AND CERTIFY DEVICES BEFORE USE.
5. D.C.V.A. SHALL BE CENTERED IN VAULT.
6. WHERE ACCESS OPENING DOES NOT EXPOSE SHUT OFF VALVES MIN. 18" CLEARANCE SHALL BE REQUIRED BETWEEN TOP OF VALVE AND UNDERSIDE OF VAULT COVER.

① 200 PSI CST POLYETHYLENE TUBING.*
② COUPLING, MALE IRON PIPE THREAD BY PACK JOINT (COMPRESSION FITTING) FOR COPPER, MUELLER NO. H-15428 OR EQUAL.*
⑤ BRASS NIPPLE, MAIN LINE SIZE, LENGTH TO FIT MALE IRON PIPE THREAD.
⑦ BRASS UNION, MALE, FEMALE IRON PIPE THREAD.*
⑧ STATE APPROVED INTERNALLY LOADED DOUBLE CHECK VALVE ASSEMBLY, COMPLETE WITH (2) FULL FLOW RESILIENT SEATED SHUT-OFF VALVES AND TEST COCKS.
⑨ CONCRETE VAULT WITH AT LEAST ONE (1) 3'x3' DIAMOND PLATE DOOR (H20 LOADED, LOCKING LID) COVER TO READ "WATER". SIZE VAULT TO PROVIDE MINIMUM CLEARANCES LISTED IN NOTE 2.
⑩ ADJUSTABLE PIPE STANCHION, BOLTED TO FLOOR
⑪ DRAIN, SLOPE TO DAYLIGHT WHERE APPLICABLE (DO NOT CONNECT TO SANITARY SEWER).
* TYPICAL EACH SIDE OF D.C.V.A.

1", 1 1/2", 2" AND 2 1/2" DOUBLE CHECK VALVE ASSEMBLY (OUTSIDE INSTALLATION)	SCALE: NTS	DATE: 7-01-22
CITY OF NEWPORT STANDARD WATER DETAIL		SHEET NO. V-11

10/06 (DP-A)





NOTES:

1. ASSEMBLY TO BE MAINTAINED BY OWNER AND ANNUAL CERTIFICATION REQUIRED.
2. FIRELINE SHALL NOT BE PUT INTO SERVICE UNTIL THE BACKFLOW PREVENTION ASSEMBLY IS APPROVED BY CITY WATER DEPARTMENT.
3. VAULT ASSEMBLY TO BE CENTERED IN VAULT.
4. TEE & GATE VALVE REQUIRED ON MAIN.
5. ALL CLEARANCES SHOWN ARE MINIMUMS.
6. FDC & PIV TO BE LOCATED DOWNSTREM OF DCVA.

① STATE APPROVED DOUBLE CHECK VALVE ASSEMBLY WITH (2) RESILIENT SEATED O.S.&Y. VALVES AND (4) RESILIENT SEATED TEST COCKS, AND BRASS OR COPPER DETECTOR BY-PASS.

② STATE APPROVED 3/4" DOUBLE CHECK VALVE ASSEMBLY WITH (2) RESILIENT SEATED BALL VALVES AND (4) RESILIENT SEATED TEST COCKS.

③ EACH VALVE SHALL BE MARKED WITH MODEL NUMBER WITH DESIGNATION OF RESILIENT SEAT: SUCH AS "RS" OR "R", WHICH MUST BE CAST, MOLDED OR AFFIXED ONTO THE BODY OR BONNET OF THE VALVE. ALL FERROUS BODIED VALVES SHALL BE COATED WITH A MINIMUM OF 4MLS. OF EPOXY OR EQUIVALENT POLYMERIZED COATING.

④ 3/4" METER (GALLONS READING)

⑤ UNI-FLANGE WITH SETSCREWS.

⑥ ONE GALVANIZED STEEL LADDER TO BE SECURED TO VAULT.

⑦ CONCRETE VAULT WITH A MINIMUM OF (2) 3'x3' DIAMOND PLATED DOORS RATED FOR H20 LOADING, MARKED "WATER". VAULT SHALL BE EQUAL TO UTILITY VAULT CO. MODEL LISTED IN TABLE BELOW.

⑧ WATER TIGHT GROUT, RESTRAIN INLET/OUTLET PIPE WITH WELDED FLANGE OR ANCHOR BLOCKS.

⑨ DRAIN, SLOPE TO DAYLIGHT WHERE APPLICABLE.

⑩ TWO ADJUSTABLE PIPE STANCHIONS, BOLTED TO FLOOR.

⑪ ALL PLUMBING FOR BY-PASS TO BE COPPER OR BRASS.

⑫ ACCESS TO BE CENTERED OVER METER.

⑬ CL. 52 D.L., M.J. WITH RESTRAINER GLANDS.

⑭ INSTALL WIRE MESH RODENT SCREEN OVER DRAIN OUTLET.

SIZE	MIN. VAULT SIZE (INSIDE) W	L	H	UTILITY VAULT CO. MODEL	UTILITY VAULT CO. COVER
3"	4'-2"	4'-8"	3'-3"	675-WA	675-2-332P
4"	4'-6"	5'-3"	3'-8"	675-WA	675-2-332P
6"	4'-8"	6'-6"	4'-5"	675-WA	675-2-332P
8"	5'-0"	7'-8"	5'-3"	687-LA	687-TL-2-332
10"	5'-2"	8'-8"	6'-1"	5106-LA	5106-TL3-332

3" TO 10" DOUBLE CHECK VALVE ASSEMBLY WITH DETECTOR FOR FIRE SPRINKLER SYSTEMS (OUTSIDE INSTALLATION)

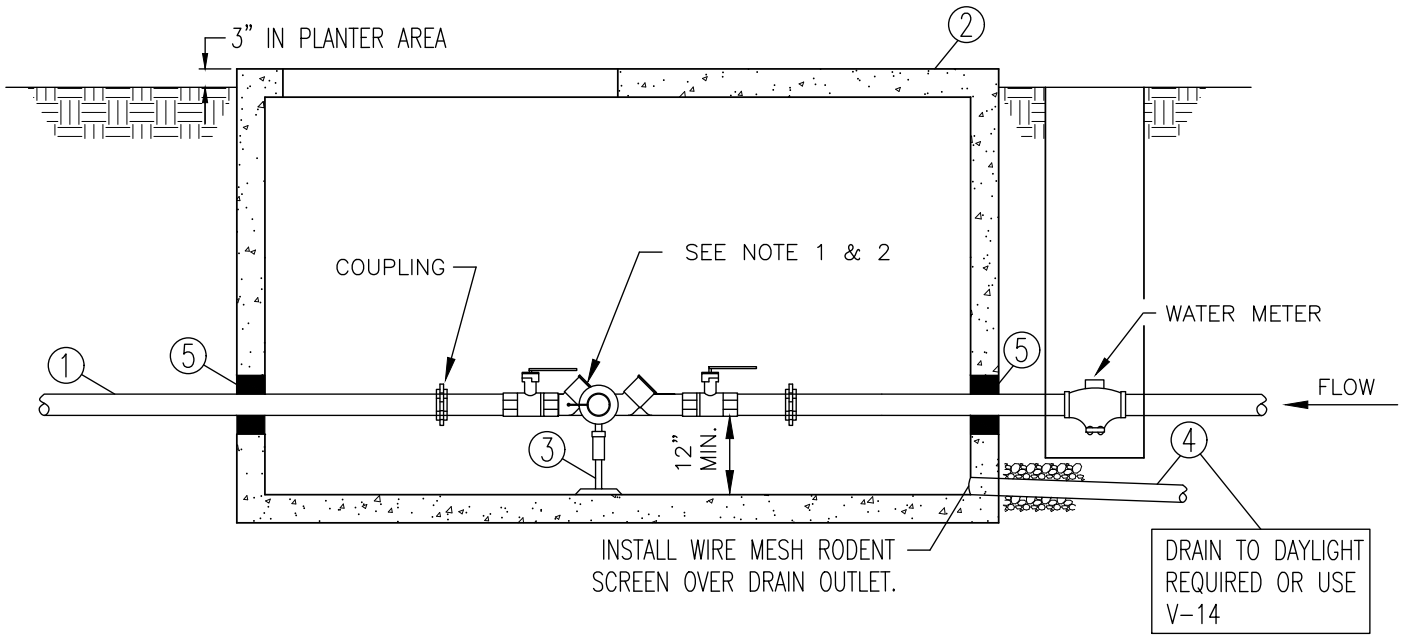
SCALE: NTS

DATE: 7-01-22

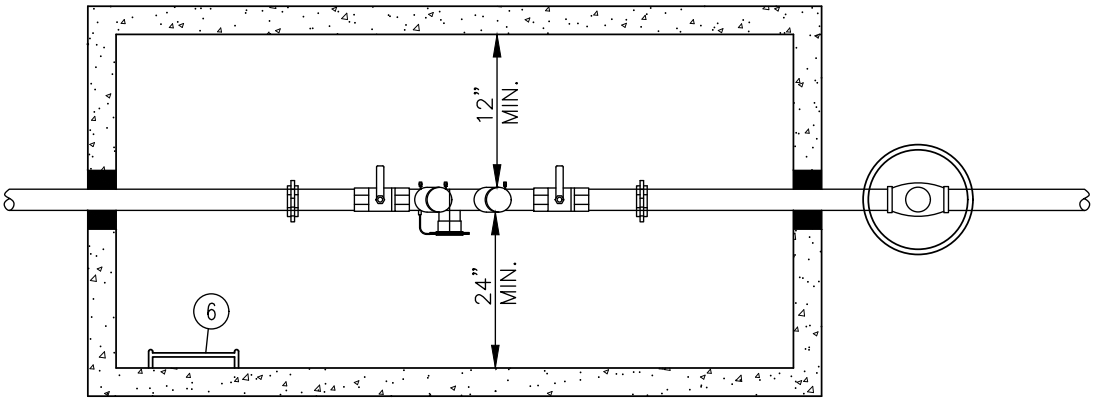
CITY OF NEWPORT STANDARD
WATER DETAIL

SHEET NO.
V-12

10/06 (DP-A)



1. 200 PSI CST POLYETHYLENE TUBING.
2. CONCRETE VAULT WITH AT LEAST ONE (1) 2'x2' DIAMOND PLATE DOOR (H20 LOADED, LOCKING LID) COVER TO READ "WATER". SIZE VAULT TO PROVIDE MINIMUM CLEARANCES LISTED IN NOTE 2.
3. ADJUSTABLE PIPE STANCHION, BOLTED TO FLOOR.
4. DRAIN, SLOPE TO DAYLIGHT WHERE APPLICABLE (DO NOT CONNECT TO SANITARY SEWER).
5. WATER TIGHT GROUT.
6. GALV. STEEL LADDER ATTACHED TO THE VAULT.

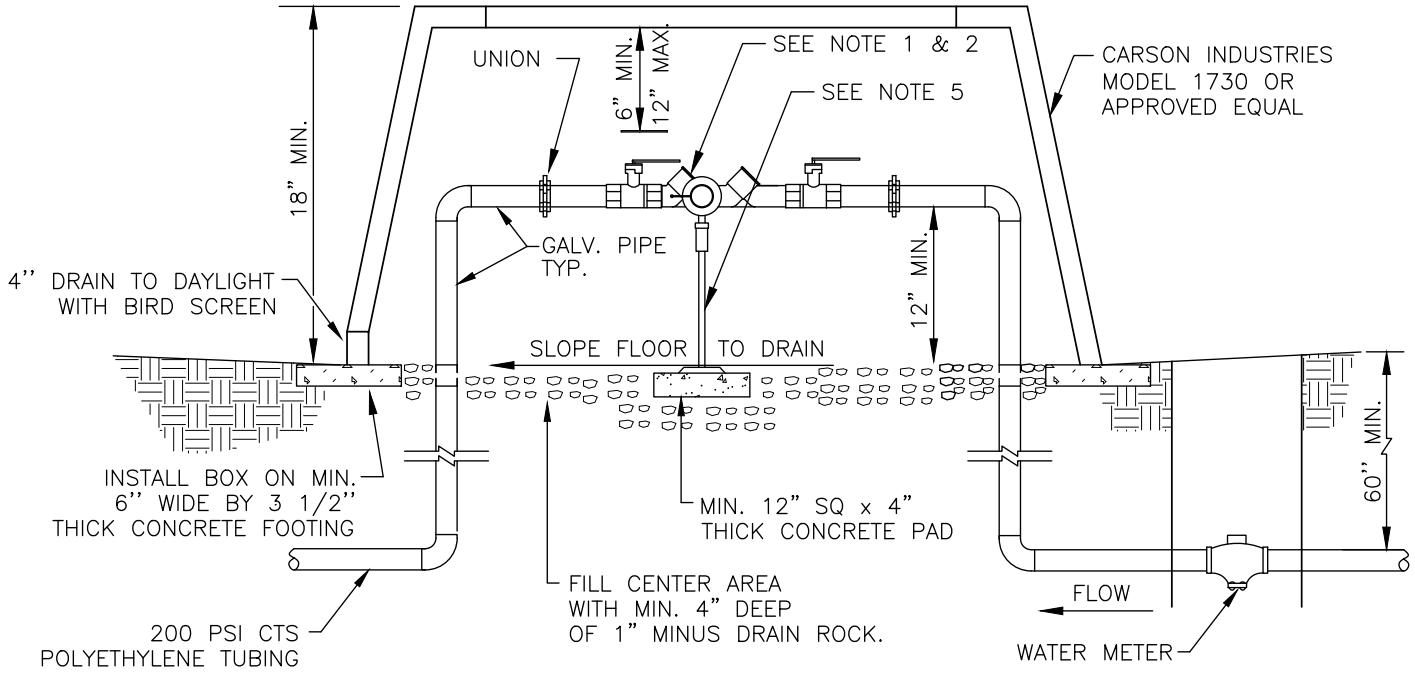


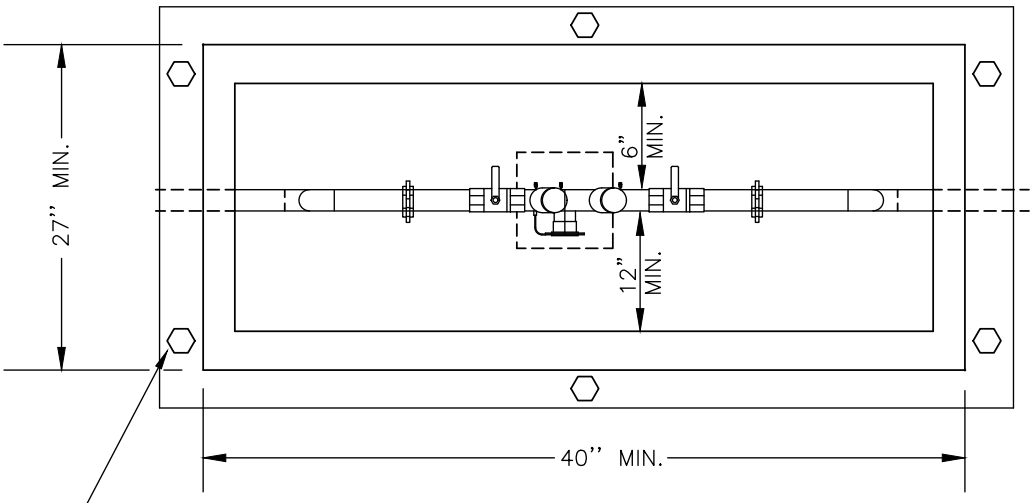
NOTES:

1) MUST BE ON THE LATEST DEPT. OF HEALTH APPROVED LIST OF BACKFLOW PREVENTION ASSEMBLIES.
2) MINIMUM CLEARANCES:
   - 12" BETWEEN RPBA AND SIDE OF VAULT.
   - 12" BETWEEN RPBA AND VAULT FLOOR.
   - 60" SOIL COVER OVER SERVICE LINE.

2 1/2" AND SMALLER REDUCED PRESSURE PRINCIPLE BACKFLOW ASSEMBLY (OUTSIDE INSTALLATION - BELOW GROUND)	SCALE: NTS	DATE: 7-01-22
CITY OF NEWPORT STANDARD WATER DETAIL		SHEET NO. V-13

10/06 (DP-A)



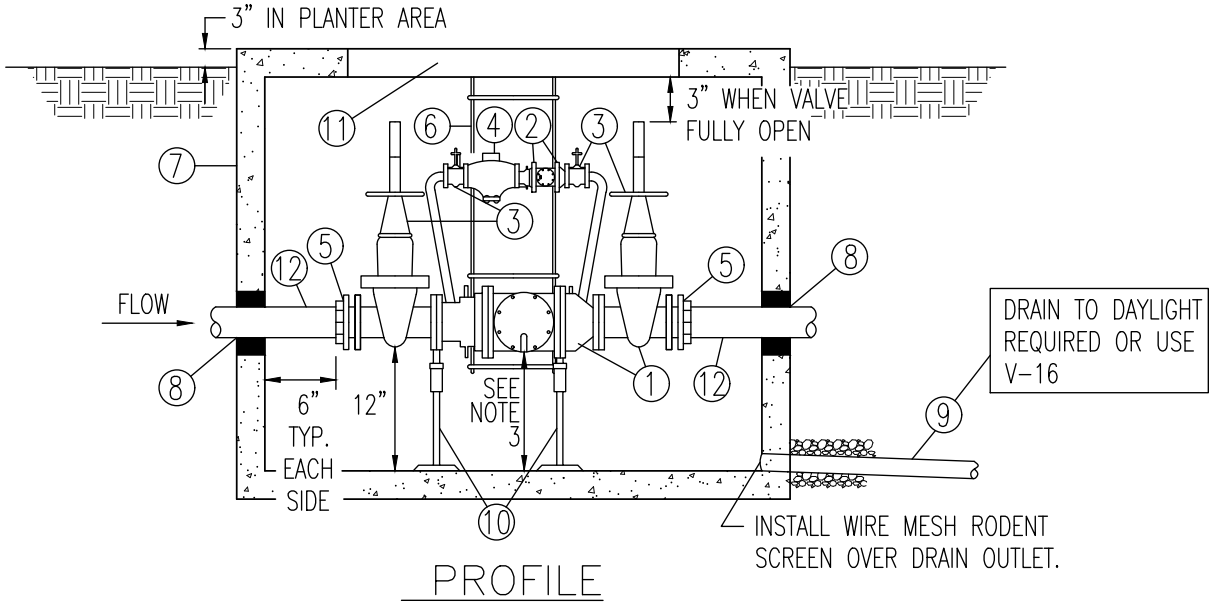


NOTES:

1) MUST BE ON THE LATEST DEPT. OF HEALTH APPROVED LIST OF BACKFLOW PREVENTION ASSEMBLIES.
2) MUST BE INSTALLED ABOVE GROUND MIN. 12 INCHES.
3) WHEN INSTALLED INSIDE A BUILDING, A FLOOR DRAIN SIZED TO ACCEPT MAXIMUM DISCHARGE FROM THE RELIEF ASSEMBLY IS REQUIRED.
4) FREEZE PROTECTION IS THE RESPONSIBILITY OF THE OWNER.
5) ADJUSTABLE PIPE STANCHION, BOLTED TO PAD.

2 1/2" AND SMALLER REDUCED PRESSURE PRINCIPLE BACKFLOW ASSEMBLY (OUTSIDE INSTALLATION - ABOVE GROUND)	SCALE: NTS	DATE: 7-01-22
CITY OF NEWPORT STANDARD WATER DETAIL		SHEET NO. V-14

10/06 (DP-A)



PROFILE

① STATE APPROVED REDUCED PRESSURE BACKFLOW ASSEMBLY, COMPLETE WITH (2) RESILIENT SEATED O.S.&Y. VALVES AND (4) RESILIENT SEATED TEST COCKS, AND BRASS OR COPPER DETECTOR BY-PASS. CENTERED IN VAULT.

② STATE APPROVED 3/4" REDUCED PRESSURE BACKFLOW ASSEMBLY ON BY-PASS, COMPLETE WITH (2) RESILIENT SEATED BALL VALVES AND (4) RESILIENT SEATED TEST COCKS.

③ EACH VALVE SHALL BE MARKED WITH MODEL NUMBER WITH DESIGNATION OF RESILIENT SEAT: SUCH AS "RS" OR "R", WHICH MUST BE CAST, MOLDED OR AFFIXED ONTO THE BODY OR BONNET OF THE VALVE. ALL FERROUS BODIED VALVES SHALL BE COATED WITH A MINIMUM OF 4MLS. OF EPOXY OR EQUIVALENT POLYMERIZED COATING.

④ 3/4" METER (GALLONS READING) AS REQUIRED

⑤ UNI-FLANGE WITH SETSCREWS.

⑥ ONE GALVANIZED STEEL LADDER TO BE SECURED TO VAULT.

⑦ CONCRETE VAULT WITH A MINIMUM OF (2) 3'x3' DIAMOND PLATTED DOORS RATED FOR H20 LOADING, MARKED "WATER". VAULT SHALL BE EQUAL TO UTILITY VAULT CO. MODEL LISTED IN TABLE BELOW.

⑧ WATER TIGHT GROUT, RESTRAIN INLET/OUTLET PIPE WITH WELDED FLANGE OR ANCHOR BLOCKS.

⑨ DRAIN, SLOPE TO DAYLIGHT. TO BE LAID INLINE ON GRADE, DRAIN TO TWICE THE DIAMETER OF THE RP DEVICE MINIMUM.

⑩ TWO ADJUSTABLE PIPE STANCHIONS, BOLTED TO FLOOR.

⑪ ACCESS TO BE CENTERED OVER METER.

⑫ CL. 52 D.L., M.J. WITH RESTRAINER GLANDS.

SIZE	MIN. VAULT SIZE (INSIDE) W	L	H	UTILITY VAULT CO. MODEL	UTILITY VAULT CO. COVER
3"	4'-9"	4'-8"	3'-11"	675-WA	675-2-332P
4"	5'-0"	5'-3"	4'-7"	675-WA	675-2-332P
6"	5'-1"	6'-6"	5'-5"	676-WA	676-2-332P
8"	5'-9"	7'-7"	7'-1"	687-LA	687-TL-2-332
10"	5'-10"	8'-8"	8'-0"	612-2X	612-3-332P

NOTES:

1. DAYLIGHT DRAIN MUST BE ABLE TO LINE SIGHTED, INSTALLED ABOVE MAXIMUM FLOOD LEVEL, AND BE ABLE TO HANDLE THE VOLUME OF WATER THAT CAN BE DISCHARGED FROM THE RELIEF VALVE PORT.
2. WHEN THE REDUCED PRESSURE ASSEMBLY IS LOCATED INSIDE A BUILDING, A SIZED DRAIN LINE SHALL BE PROVIDED FOR RELIEF PORT. THERE MUST BE AN APPROVED AIR GAP BELOW THE RELIEF PORT AND FLOOR.
3. ALLOW 12"+ NOMINAL DIAMETER OF ASSEMBLY CLEARANCE BELOW RELIEF PORT FOR REPAIR.
4. ASSEMBLY TO BE MAINTAINED BY OWNER AND ANNUAL CERTIFICATION REQUIRED.
5. REDUCED PRESSURE PRINCIPLE BACKFLOW ASSEMBLY WILL BE ALLOWED TO BE INSTALLED IN VAULT ONLY IN CASES WHERE NO OTHER MEANS OF INSTALLATION IS AVAILABLE AND AS APPROVED BY THE CITY OF DEER PARK.
6. FIRE LINE SHALL NOT BE PUT INTO SERVICE UNTIL THE BACKFLOW PREVENTION ASSEMBLY IS APPROVED BY CITY OF DEER PARK. MINIMUM CLEARANCE BETWEEN ASSEMBLY AND WALL ON LADDER SIDE OF VAULT IS 24". MINIMUM CLEARANCE
7. FROM OPPOSITE WALL 12". ALL CLEARANCES SHOWN ARE MINIMUMS.
8. FDC & PIV TO BE LOCATED DOWNSTREAM OF DCVA.

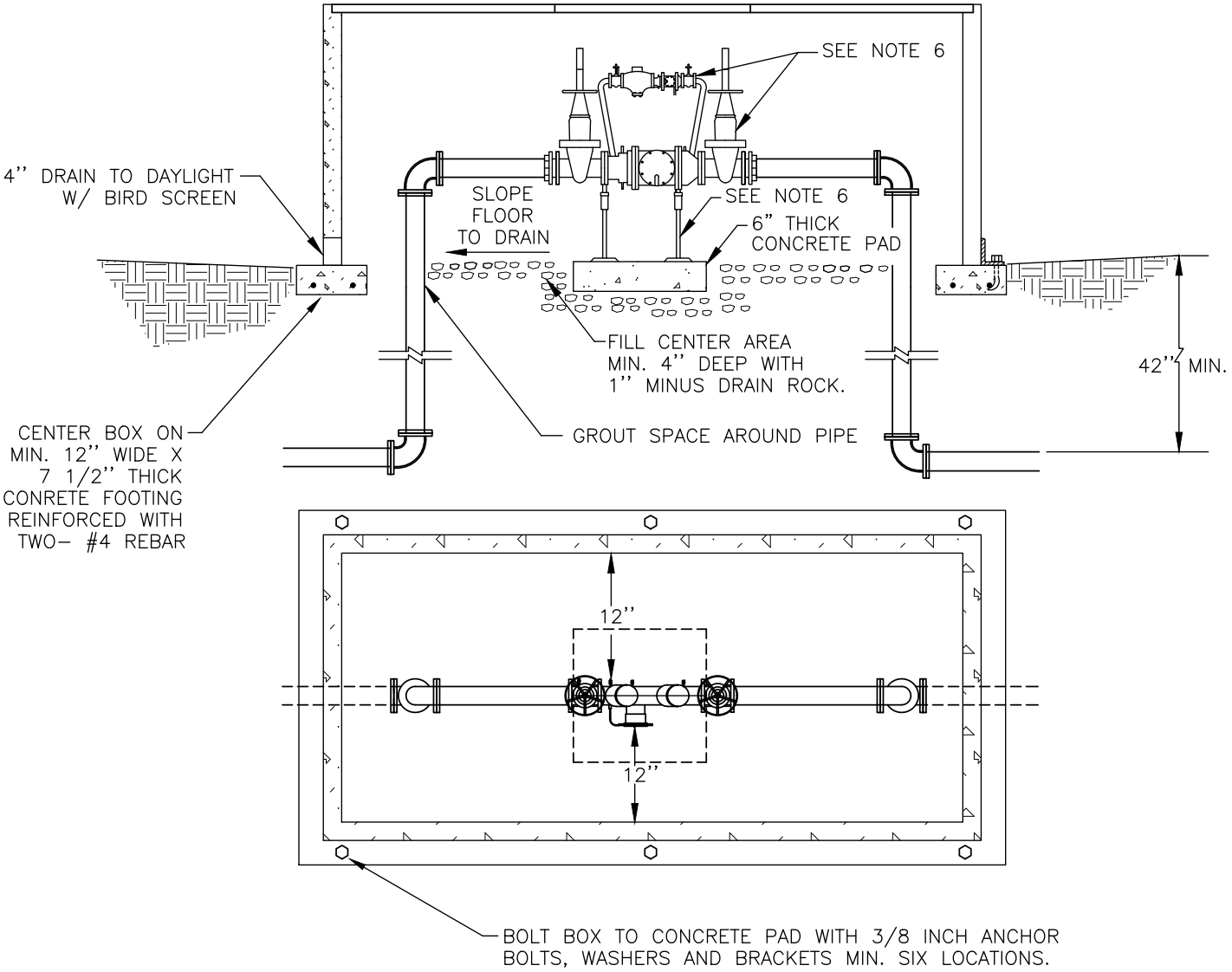
3" TO 10" REDUCED PRESSURE PRINCIPLE BACKFLOW ASSEMBLY W/DETECTOR FOR FIRE SPRINKLER SYSTEMS (OUTSIDE INSTALLATION - BELOW GROUND)

SCALE: NTS | DATE: 7-01-22

CITY OF NEWPORT STANDARD WATER DETAIL

SHEET NO. V-15

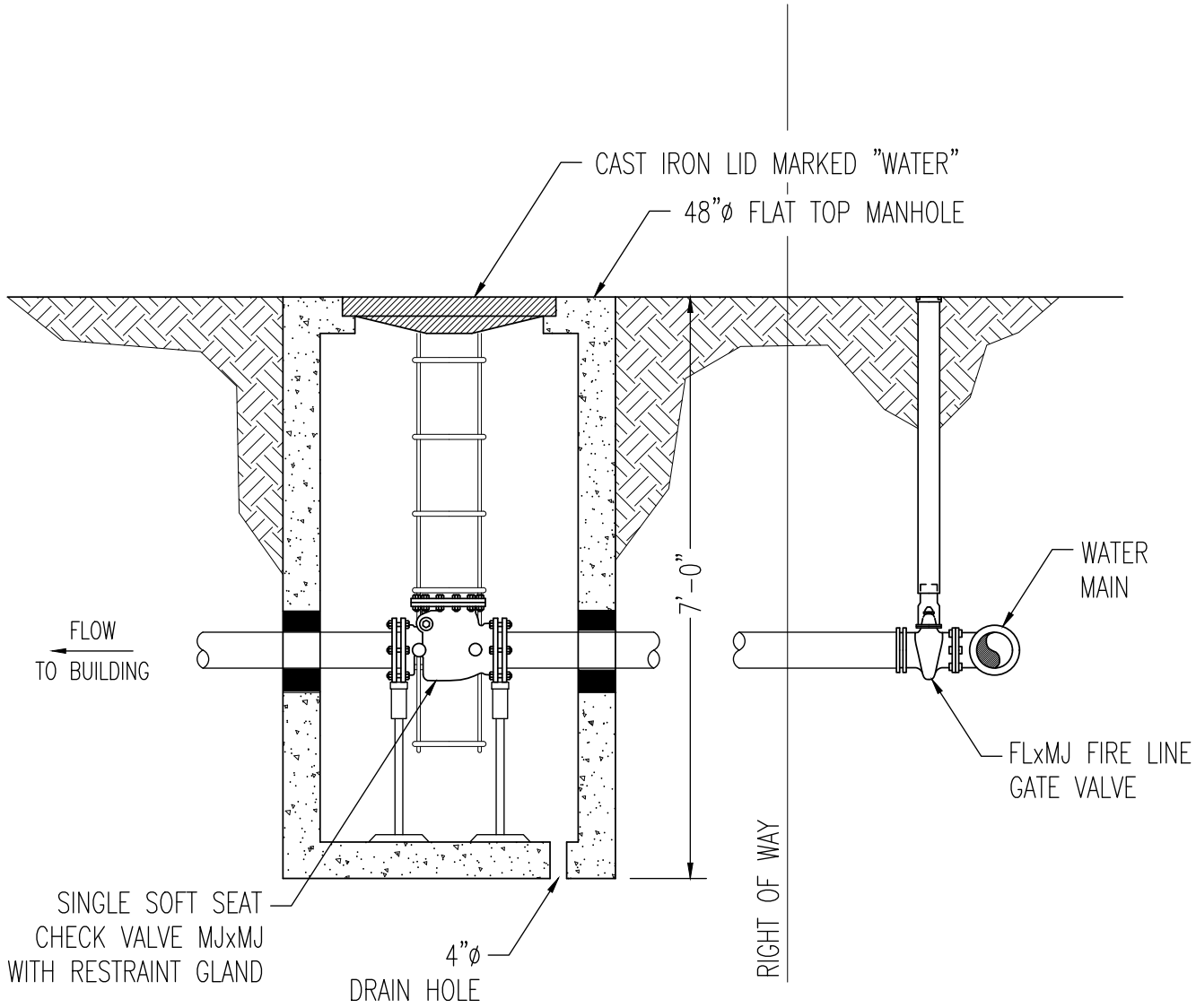
10/06 (DP-A)



NOTES:

1) MUST BE ON THE LATEST DEPT. OF HEALTH APPROVED LIST OF BACKFLOW PREVENTION ASSEMBLIES.
2) MUST BE INSTALLED ABOVE GROUND. MIN. 12'' PLUS PIPE DIAMETER.
3) WHEN INSTALLED INSIDE A BUILDING, A FLOOR DRAIN SIZED TO ACCEPT MAXIMUM DISCHARGE FROM THE RELIEF ASSEMBLY IS REQUIRED.
4) FREEZE PROTECTION IS THE RESPONSIBILITY OF THE OWNER.
5) TWO PIPE SUPPORTS REQUIRED. SET SUPPORTS ON CONCRETE BLOCKS.
6) ALL BACKFLOW DEVICE, DETECTOR METER, PIPING AND SUPPORT REQUIREMENTS SHALL BE IN ACCORDANCE WITH STANDARD DETAIL V–15.

3" TO 10" REDUCED PRESSURE PRINCIPLE BACKFLOW ASSEMBLY W/DETECTOR FOR FIRE SPRINKLER SYSTEM (OUTSIDE INSTALLATION-ABOVE GRADE)	SCALE: NTS	DATE: 7-01-22
CITY OF NEWPORT STANDARD WATER DETAIL		SHEET NO. V-16



PROFILE

NOTES:

1. SINGLE SOFT SEAT CHECK VALVE REQUIRED WHEN THE DISTANCE (LENGTH) FROM THE MAIN TO THE FLANGE ABOVE THE BUILDING FLOOR IS GREATER THAN 50 FT.

FIRE LINE CHECK VALVE	SCALE: NTS	DATE: 7-01-22
CITY OF NEWPORT STANDARD WATER DETAIL		SHEET NO. V-17

Appendix A
Approved Material List

Water Approved Materials List

The following manufacturers have been approved for use for water works construction. Where specific manufacturers are listed no other manufacturer may be used without prior approval by the Utility.

Joint Restraint Systems

EBAA Iron (MEGALUG Series 1100)
Griffin Pipe Products Company (Snap-Lok, Bolt-Lok)
Romac (Grip Ring)
Star National Products (Shackle Products)
US Pipe (TR FLEX)
Uni-Flange Corporation (Series 1300 and 1390)

Couplings

Romac, Smith-Blair (Rockwell), Mueller MaxiFit, Mueller MaxiStep

Service Saddles

1" & 2" tap:	Romac 202S Ford FS202 Smith-Blair 317

Corporation Stops

1" size:	Ford Ballcorp FB400 Mueller Ball Type No. 300
2" size:	Ford Ballcorp FB400 Mueller ORISEAL No. H-9968

Valve Boxes

Olympic Foundry Inc.:	#VBO45 Lid, Top and Base Section
Inland Foundry Co., Inc.:	Valve Box Paving Riser #2052-3, #2052-4, #2052-5
	12" Adjusting Sleeve #044A

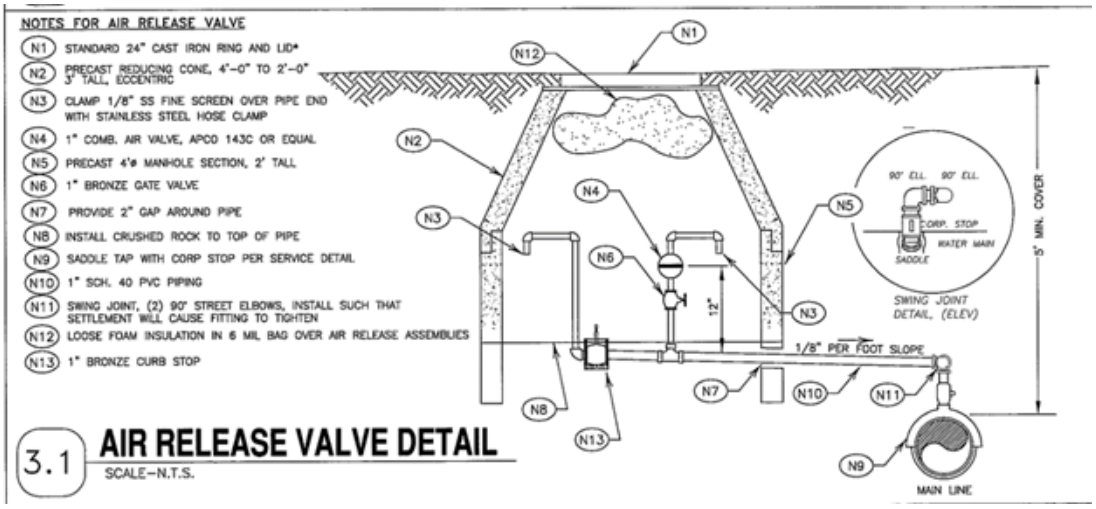
Air and Vacuum Release Valves

APDCO NO. 143-C, Val-matic NO. 201C, Crispin ULIO

Fire Hydrants

Mueller Super Centurion

M & H 129T or 929



Appendix B
WAC 246-290-010
Cross-Connection
Rules&Definitions

March 2011
DOH 331-355
Revised

Cross-connection control rules and definitions

Extracts from Group A Public Water Supplies, chapter 246-290 WAC
The full rule is online at http://www.doh.wa.gov/ehp/dw/publications/331-010.pdf

WAC 246-290-010 Definitions.

"Approved air gap" means a physical separation between the free-flowing end of a potable water supply pipeline and the overflow rim of an open or non-pressurized receiving vessel. To be an air gap approved by the department, the separation must be at least:

- Twice the diameter of the supply piping measured vertically from the overflow rim of the receiving vessel, and in no case be less than one inch, when unaffected by vertical surfaces (sidewalls); and:
- Three times the diameter of the supply piping, if the horizontal distance between the supply pipe and a vertical surface (sidewall) is less than or equal to three times the diameter of the supply pipe, or if the horizontal distance between the supply pipe and intersecting vertical surfaces (sidewalls) is less than or equal to four times the diameter of the supply pipe and in no case less than one and one-half inches.

Acronyms

AG	air gap
AVB	atmospheric vacuum breaker
AWWA	American Water Works Association
BAT	backflow assembly tester
CCS	cross-connection control specialist
DCDA	double check detector assembly
DCVA	double check valve assembly
EPA	U.S. Environmental Protection Agency
IAPMO	International Association of Plumbing and Mechanical Officials
PVBA	pressure vacuum breaker assembly
RPBA	reduced pressure backflow assembly
RPDA	reduced pressure detector assembly
SVBA	spill resistant vacuum breaker assembly
UPC	Uniform Plumbing Code
WAC	Washington Administrative Code

"Approved atmospheric vacuum breaker (AVB)" means an AVB of make, model, and size that is approved by the department. AVBs that appear on the current approved backflow prevention assemblies list developed by the University of Southern California Foundation for Cross-Connection Control and Hydraulic Research or that are listed or approved by other nationally recognized testing agencies (such as IAPMO, ANSI, or UL) acceptable to the authority having jurisdiction are considered approved by the department.

"Approved backflow preventer" means an approved air gap, an approved backflow prevention assembly, or an approved AVB. The terms "approved backflow preventer," "approved air gap," or "approved backflow prevention assembly" refer only to those approved backflow preventers relied upon by the purveyor for the protection of the public water system. The requirements of WAC 246-290-490 do not apply to backflow preventers installed for other purposes.

Washington State Department of Health
Division of Environmental Health
Office of Drinking Water
HELPING TO ENSURE SAFE AND RELIABLE DRINKING WATER

"Approved backflow prevention assembly" means an RPBA, RPDA, DCVA, DCDA, PVBA, or SVBA of make, model, and size that is approved by the department. Assemblies that appear on the current approved backflow prevention assemblies list developed by the University of Southern California Foundation for Cross-Connection Control and Hydraulic Research or other entity acceptable to the department are considered approved by the department.

"Authority having jurisdiction" (formerly known as local administrative authority) means the local official, board, department, or agency authorized to administer and enforce the provisions of the Uniform Plumbing Code as adopted under chapter 19.27 RCW.

"Backflow" means the undesirable reversal of flow of water or other substances through a cross-connection into the public water system or consumer's potable water system.

"Backflow assembly tester" means a person holding a valid BAT certificate issued under chapter 246-292 WAC.

"Backpressure" means a pressure (caused by a pump, elevated tank or piping, boiler, or other means) on the consumer's side of the service connection that is greater than the pressure provided by the public water system and which may cause backflow.

"Backsiphonage" means backflow due to a reduction in system pressure in the purveyor's distribution system and/or consumer's water system.

"Combination fire protection system" means a fire sprinkler system that:

- Is supplied only by the purveyor's water;
- Does not have a fire department pumper connection; and
- Is constructed of approved potable water piping and materials that serve both the fire sprinkler system and the consumer's potable water system.

"Consumer" means any person receiving water from a public water system from either the meter, or the point where the service line connects with the distribution system if no meter is present. For purposes of cross-connection control, "consumer" means the owner or operator of a water system connected to a public water system through a service connection.

"Consumer's water system" as used in WAC 246-290-490, means any potable or industrial water system that begins at the point of delivery from the public water system and is located on the consumer's premises. The consumer's water system includes all auxiliary sources of supply, storage, treatment, and distribution facilities, piping, plumbing, and fixtures under the control of the consumer.

"Contaminant" means a substance present in drinking water that may adversely affect the health of the consumer or the aesthetic qualities of the water.

"Council" means the Washington state building code council under WAC 51-04-015(2).

"Cross-connection" means any actual or potential physical connection between a public water system or the consumer's water system and any source of nonpotable liquid, solid, or gas that could contaminate the potable water supply by backflow.

"Cross-connection control program" means the administrative and technical procedures the purveyor implements to protect the public water system from contamination via cross-connections as required in WAC 246-290-490.

"Cross-connection control specialist" means a person holding a valid CCS certificate issued under chapter 246-292 WAC.

"Cross-connection control summary report" means the annual report that describes the status of the purveyor's cross-connection control program.

"Department" means the Washington state department of health or health officer as identified in a joint plan of operation under WAC 246-290-030(1).

"Distribution system" means all piping components of a public water system that serve to convey water from transmission mains linked to source, storage and treatment facilities to the consumer excluding individual services.

"Emergency" means an unforeseen event that causes damage or disrupts normal operations and requires immediate action to protect public health and safety.

"Flow-through fire protection system" means a fire sprinkler system that:

- Is supplied only by the purveyor's water;
- Does not have a fire department pumper connection;
- Is constructed of approved potable water piping and materials to which sprinkler heads are attached; and
- Terminates at a connection to a toilet or other plumbing fixture to prevent stagnant water.

"High health cross-connection hazard" means a cross-connection involving any substance that could impair the quality of potable water and create an actual public health hazard through injury, poisoning, or spread of disease.

"In-premises protection" means a method of protecting the health of consumers served by the consumer's potable water system, located within the property lines of the consumer's premises by the installation of an approved air gap or backflow prevention assembly at the point of hazard, which is generally a plumbing fixture.

"Low cross-connection hazard" means a cross-connection that could impair the quality of potable water to a degree that does not create a hazard to the public health, but does adversely and unreasonably affect the aesthetic qualities of potable waters for domestic use.

"Potable" means water suitable for drinking by the public.

"Premises isolation" means a method of protecting a public water system by installation of approved air gaps or approved backflow prevention assemblies at or near the service connection or alternative location acceptable to the purveyor to isolate the consumer's water system from the purveyor's distribution system.

"Public water system" is defined and referenced under WAC 246-290-020.

"Purveyor" means an agency, subdivision of the state, municipal corporation, firm, company, mutual or cooperative association, institution, partnership, or person or other entity owning or operating a public water system. Purveyor also means the authorized agents of these entities.

"Reclaimed water" means effluent derived in any part from sewage from a wastewater treatment system that has been adequately and reliably treated, so that as a result of that treatment, it is suitable for beneficial use or a controlled use that would not otherwise occur, and it is no longer considered wastewater.

"Severe health cross-connection hazard" means a cross-connection which could impair the quality of potable water and create an immediate, severe public health hazard through poisoning or spread of disease by contaminants from radioactive material processing plants, nuclear reactors, or wastewater treatment plants.

"State building code" means the codes adopted by and referenced in chapter 19.27 RCW; the state energy code; and any other codes so designated by the Washington state legislature as adopted and amended by the council.

"Unapproved auxiliary water supply" means a water supply (other than the purveyor's water supply) on or available to the consumer's premises that is either not approved for human consumption by the health agency having jurisdiction or is not otherwise acceptable to the purveyor.

"Uniform Plumbing Code (UPC)" means the code adopted under RCW 19.27.031(4) and implemented under chapter 51-56 WAC. This code establishes statewide minimum plumbing standards applicable within the property lines of the consumer's premises.

"Used water" means water which has left the control of the purveyor.

WAC 246-290-490 Cross-connection control.

(1) Applicability, purpose, and responsibility.

(a) All community water systems shall comply with the cross-connection control requirements specified in this section.

(b) All non-community water systems shall apply the principles and provisions of this section, including subsection (4)(b) of this section, as applicable to protect the public water system from contamination via cross-connections. Noncommunity systems that comply with subsection (4)(b) of this section and the provisions of WAC 51-56-0600 of the UPC (which addresses the installation of backflow preventers at points of water use within the potable water system) shall be considered in compliance with the requirements of this section.

(c) The purpose of the purveyor's cross-connection control program shall be to protect the public water system, as defined in WAC 246-290-010, from contamination via cross-connections.

(d) The purveyor's responsibility for cross-connection control shall begin at the water supply source, include all the public water treatment, storage, and distribution facilities, and end at the point of delivery to the consumer's water system, which begins at the downstream end of the service connection or water meter located on the public right of way or utility-held easement.

(e) Under this section, purveyors are not responsible for eliminating or controlling cross-connections within the consumer's water system. Under chapter 19.27 RCW, the responsibility for cross-connection control within the consumer's water system, i.e., within the property lines of the consumer's premises, lies with the authority having jurisdiction.

(2) General program requirements.

(a) The purveyor shall develop and implement a cross-connection control program that meets the requirements of this section, but may establish a more stringent program through local ordinances, resolutions, codes, bylaws, or operating rules.

(b) Purveyors shall ensure that good engineering and public health protection practices are used in the development and implementation of cross-connection control programs. Department publications and the most recently published editions of references, such as, but not limited to, those listed below, may be used as guidance for cross-connection program development and implementation:

(i) *Manual of Cross-Connection Control* published by the Foundation for Cross-Connection Control and Hydraulic Research, University of Southern California (USC Manual);

(ii) *Cross-Connection Control Manual, Accepted Procedure and Practice* published by the Pacific Northwest Section of the American Water Works Association (PNWS-AWWA Manual); or

(iii) Guidance document: *Cross-Connection Control for Small Water Systems* published by the department.

(c) The purveyor may implement the cross-connection control program, or any portion thereof, directly or by means of a contract with another agency or party acceptable to the department.

(d) The purveyor shall coordinate with the authority having jurisdiction in all matters concerning cross-connection control. The purveyor shall document and describe the coordination, including delineation of responsibilities, in the written cross-connection control program required in (e) of this subsection.

(e) The purveyor shall include a written description of the cross-connection control program in the water system plan required under WAC 246-290-100 or the small water system management program required under WAC 246-290-105. The cross-connection control program shall include the minimum program elements described in subsection (3) of this section.

(f) The purveyor shall ensure that cross-connections between the distribution system and a consumer's water system are eliminated or controlled by the installation of an approved backflow preventer commensurate with the degree of hazard. This can be accomplished by implementation of a cross-connection program that relies on:

(i) Premises isolation as defined in WAC 246-290-010; or

(ii) Premises isolation and in-premises protection as defined in WAC 246-290-010.

(g) Purveyors with cross-connection control programs that rely both on premises isolation and in-premises protection:

(i) Shall comply with the premises isolation requirements specified in subsection (4)(b) of this section; and

(ii) May reduce premises isolation requirements and rely on in-premises protection for premises other than the type addressed in subsection (4)(b) of this section, only if the following conditions are met:

(A) The in-premises backflow preventers provide a level of protection commensurate with the purveyor's assessed degree of hazard;

(B) Backflow preventers which provide the in-premises backflow protection meet the definition of approved backflow preventers as described in WAC 246-290-010;

(C) The approved backflow preventers are installed, inspected, tested (if applicable), maintained, and repaired in accordance with subsections (6) and (7) of this section;

(D) Records of the backflow preventers are maintained in accordance with subsections (3)(j) and (8) of this section; and

(E) The purveyor has reasonable access to the consumer's premises to conduct an initial hazard evaluation and periodic reevaluations to determine whether the in-premises protection is adequate to protect the purveyor's distribution system.

(h) The purveyor shall take appropriate corrective action as authorized by the legal instrument required by subsection (3)(b) of this section, when:

(i) A cross-connection exists that is not controlled commensurate to the degree of hazard assessed by the purveyor; or

(ii) A consumer fails to comply with the purveyor's requirements regarding the installation, inspection, testing, maintenance or repair of approved backflow preventers required by this chapter.

(i) The purveyor's corrective action may include, but is not limited to:

(i) Denying or discontinuing water service to a consumer's premises until the cross-connection hazard is eliminated or controlled to the satisfaction of the purveyor;

(ii) Requiring the consumer to install an approved backflow preventer for premises isolation commensurate with the degree of hazard; or

(iii) The purveyor installing an approved backflow preventer for premises isolation commensurate with the degree of hazard.

(j) Except in the event of an emergency, purveyors shall notify the authority having jurisdiction prior to denying or discontinuing water service to a consumer's premises for one or more of the reasons listed in (h) of this subsection.

(k) The purveyor shall prohibit the intentional return of used water to the purveyor's distribution system. Used water includes, but is not limited to, water used for heating, cooling, or other purposes within the consumer's water system.

(3) Minimum elements of a cross-connection control program.

(a) To be acceptable to the department, the purveyor's cross-connection control program shall include the minimum elements identified in this subsection.

(b) **Element 1:** The purveyor shall adopt a local ordinance, resolution, code, bylaw, or other written legal instrument that:

(i) Establishes the purveyor's legal authority to implement a cross-connection control program;

(ii) Describes the operating policies and technical provisions of the purveyor's cross-connection control program; and

(iii) Describes the corrective actions used to ensure that consumers comply with the purveyor's cross-connection control requirements.

(c) **Element 2:** The purveyor shall develop and implement procedures and schedules for evaluating new and existing service connections to assess the degree of hazard posed by the consumer's premises to the purveyor's distribution system and notifying the consumer within a reasonable time frame of the hazard evaluation results. At a minimum, the program shall meet the following:

(i) For connections made on or after April 9, 1999, procedures shall ensure that an initial evaluation is conducted before water service is provided;

(ii) For all other connections, procedures shall ensure that an initial evaluation is conducted in accordance with a schedule acceptable to the department; and

(iii) For all service connections, once an initial evaluation has been conducted, procedures shall ensure that periodic reevaluations are conducted in accordance with a schedule acceptable to the department and whenever there is a change in the use of the premises.

(d) **Element 3:** The purveyor shall develop and implement procedures and schedules for ensuring that:

(i) Cross-connections are eliminated whenever possible;

(ii) When cross-connections cannot be eliminated, they are controlled by installation of approved backflow preventers commensurate with the degree of hazard; and

(iii) Approved backflow preventers are installed in accordance with the requirements of subsection (6) of this section.

(e) **Element 4:** The purveyor shall ensure that personnel, including at least one person certified as a CCS, are provided to develop and implement the cross-connection control program.

(f) **Element 5:** The purveyor shall develop and implement procedures to ensure that approved backflow preventers relied upon to protect the public water system are inspected and/or tested (as applicable) under subsection (7) of this section.

(g) **Element 6:** The purveyor shall develop and implement a backflow prevention assembly testing quality control assurance program, including, but not limited to, documentation of BAT certification and test kit calibration, test report contents, and time frames for submitting completed test reports.

(h) **Element 7:** The purveyor shall develop and implement (when appropriate) procedures for responding to backflow incidents.

(i) **Element 8:** The purveyor shall include information on cross-connection control in the purveyor's existing program for educating consumers about water system operation. The public education program may include periodic bill inserts, public service announcements, pamphlet distribution, notification of new consumers and consumer confidence reports.

(j) **Element 9:** The purveyor shall develop and maintain cross-connection control records including, but not limited to, the following:

(i) A master list of service connections and/or consumer's premises where the purveyor relies upon approved backflow preventers to protect the public water system from contamination, the assessed hazard level of each, and the required backflow preventer(s);

(ii) Inventory information on backflow preventers that protect the public water system including:

(A) Approved air gaps installed in lieu of approved assemblies including exact air gap location, assessed degree of hazard, installation date, history of inspections, inspection results, and person conducting inspections;

(B) Approved backflow assemblies including exact assembly location, assembly description (type, manufacturer, model, size, and serial number), assessed degree of hazard, installation date, history of inspections, tests and repairs, test results, and person performing tests; and

(C) Approved AVBs used for irrigation system applications including location, description (manufacturer, model and size), installation date, history of inspection(s), and person performing inspection(s).

(iii) Cross-connection program summary reports and backflow incident reports required under subsection (8) of this section.

(k) Element 10: Purveyors who distribute and/or have facilities that receive reclaimed water within their water service area shall meet any additional cross-connection control requirements imposed by the department in a permit issued under chapter 90.46 RCW.

(4) Approved backflow preventer selection.

(a) The purveyor shall ensure that a CCS:

(i) Assesses the degree of hazard posed by the consumer's water system upon the purveyor's distribution system; and

(ii) Determines the appropriate method of backflow protection for premises isolation as described in Table 8.

TABLE 8

APPROPRIATE METHODS OF BACKFLOW PROTECTION FOR PREMISES ISOLATION

Degree of Hazard	Application Condition	Appropriate Approved Backflow Preventer
High health cross-connection hazard	Backsiphonage or backpressure backflow	AG, RPBA, or RPDA
Low cross-connection hazard	Backsiphonage or backpressure backflow	AG, RPBA, RPDA, DCVA, or DCDA

(b) Premises isolation requirements.

(i) The purveyor shall ensure that an approved air gap, RPBA, or RPDA is installed for premises isolation for service connections to premises posing a high health cross-connection hazard including, but not limited to, those premises listed in Table 9, except those premises identified as severe in (b)(ii) of this subsection.

(ii) For service connections to premises posing a severe health cross-connection hazard including wastewater treatment plants, radioactive material processing plants, and nuclear reactors, the purveyor shall ensure that either an:

(A) Approved air gap is installed for premises isolation; or

(B) Approved RPBA or RPDA is installed for premises isolation in combination with an in-plant approved air gap.

(iii) If the purveyor's CCS determines that no hazard exists for a connection serving premises of the type listed in Table 9, the purveyor may grant an exception to the premises isolation requirements of (b)(i) of this subsection.

(iv) The purveyor shall document, on a case-by-case basis, the reasons for granting an exception under (b)(i) of this subsection and include the documentation in the cross-connection control program annual summary report required in subsection (8) of this section.

TABLE 9

SEVERE* AND HIGH HEALTH CROSS-CONNECTION HAZARD PREMISES REQUIRING PREMISES ISOLATION BY AG OR RPBA

Agricultural (farms and dairies)

Beverage bottling plants

Car washes

Chemical plants

Commercial laundries and dry cleaners

Premises where both reclaimed water and potable water are provided

Film processing facilities

Food processing plants

Hospitals, medical centers, nursing homes, veterinary, medical and dental clinics, and blood plasma centers

Premises with separate irrigation systems using the purveyor's water supply and with chemical addition[+]

Laboratories

Metal plating industries

Mortuaries

Petroleum processing or storage plants

Piers and docks

Radioactive material processing plants or nuclear reactors[*]

Survey access denied or restricted

Wastewater lift stations and pumping stations

Wastewater treatment plants[*]

Premises with an unapproved auxiliary water supply interconnected with the potable water supply

[+] For example, parks, playgrounds, golf courses, cemeteries, estates, etc.

[*] RPBAs for connections serving these premises are acceptable only when used in combination with an in-plant approved air gap; otherwise, the purveyor shall require an approved air gap at the service connection.

(c) Backflow protection for single-family residences.

(i) For single-family residential service connections, the purveyor shall comply with the premises isolation requirements of (b) of this subsection when applicable.

(ii) If the requirements of (b) of this subsection do not apply and the requirements specified in subsection (2) (g)(ii) of this section are met, the purveyor may rely on backflow protection provided at the point of hazard in accordance with WAC 51-56-0600 of the UPC for hazards such as, but not limited to:

(A) Irrigation systems;

(B) Swimming pools or spas;

(C) Ponds; and

(D) Boilers.

For example, the purveyor may accept an approved AVB on a residential irrigation system, if the AVB is properly installed under the UPC.

(d) Backflow protection for fire protection systems.

(i) Backflow protection is not required for residential flow-through or combination fire protection systems constructed of potable water piping and materials.

(ii) For service connections with fire protection systems other than flow-through or combination systems, the purveyor shall ensure that backflow protection consistent with WAC 51-56-0600 of the UPC is installed. The UPC requires minimum protection as follows:

(A) An RPBA or RPDA for fire protection systems with chemical addition or using unapproved auxiliary water supply; and

(B) A DCVA or DCDA for all other fire protection systems.

(iii) For connections made on or after April 9, 1999, the purveyor shall ensure that backflow protection is installed before water service is provided.

(iv) For existing fire protection systems:

(A) With chemical addition or using unapproved auxiliary supplies, the purveyor shall ensure that backflow protection is installed within ninety days of the purveyor notifying the consumer of the high health cross-connection hazard or in accordance with an alternate schedule acceptable to the purveyor.

(B) Without chemical addition, without on-site storage, and using only the purveyor's water (i.e., no unapproved auxiliary supplies on or available to the premises), the purveyor shall ensure that backflow protection is installed in accordance with a schedule acceptable to the purveyor or at an earlier date if required by the code official administering the State Building Code as defined in chapter 51-04 WAC.

(C) When establishing backflow protection retrofitting schedules for fire protection systems that have the characteristics listed in (d)(iv)(B) of this subsection, the purveyor may consider factors such as, but not limited to, impacts of assembly installation on sprinkler performance, costs of retrofitting, and difficulty of assembly installation.

(e) Purveyors may require approved backflow preventers commensurate with the degree of hazard as determined by the purveyor to be installed for premises isolation for connections serving premises that have characteristics such as, but not limited to, the following:

(i) Complex plumbing arrangements or plumbing potentially subject to frequent changes that make it impracticable to assess whether cross-connection hazards exist;

(ii) A repeated history of cross-connections being established or reestablished; or

(iii) Cross-connection hazards are unavoidable or not correctable, such as, but not limited to, tall buildings.

(5) Approved backflow preventers.

(a) The purveyor shall ensure that all backflow prevention assemblies relied upon by the purveyor are models included on the current list of backflow prevention assemblies approved for use in Washington state. The current approved assemblies list is available from the department upon request.

(b) The purveyor may rely on testable backflow prevention assemblies that are not currently approved by the department, if the assemblies:

(i) Were included on the department and/or USC list of approved backflow prevention assemblies at the time of installation;

(ii) Have been properly maintained;

(iii) Are commensurate with the purveyor's assessed degree of hazard; and

(iv) Have been inspected and tested at least annually and have successfully passed the annual tests.

(c) The purveyor shall ensure that an unlisted backflow prevention assembly is replaced by an approved assembly commensurate with the degree of hazard, when the unlisted assembly:

(i) Does not meet the conditions specified in (b)(i) through (iv) of this subsection;

(ii) Is moved; or

(iii) Cannot be repaired using spare parts from the original manufacturer.

(d) The purveyor shall ensure that AVBs meet the definition of approved atmospheric vacuum breakers as described in WAC 246-290-010.

(6) Approved backflow preventer installation.

(a) The purveyor shall ensure that approved backflow preventers are installed in the orientation for which they are approved (if applicable).

(b) The purveyor shall ensure that approved backflow preventers are installed in a manner that:

(i) Facilitates their proper operation, maintenance, inspection, in-line testing (as applicable), and repair using standard installation procedures acceptable to the department such as those in the USC Manual or PNWS-AWWA Manual;

(ii) Ensures that the assembly will not become submerged due to weather-related conditions such as flooding; and

(iii) Ensures compliance with all applicable safety regulations.

(c) The purveyor shall ensure that approved backflow assemblies for premises isolation are installed at a location adjacent to the meter or property line or an alternate location acceptable to the purveyor.

(d) When premises isolation assemblies are installed at an alternate location acceptable to the purveyor, the purveyor shall ensure that there are no connections between the point of delivery from the public water system and the approved backflow assembly, unless the installation of the connection meets the purveyor's cross-connection control requirements and is specifically approved by the purveyor.

(e) The purveyor shall ensure that approved backflow preventers are installed in accordance with the following time frames:

(i) For connections made on or after April 9, 1999, the following conditions shall be met before service is provided:

(A) The provisions of subsection (3)(d)(ii) of this section; and

(B) Satisfactory completion of the requirements of subsection (7) of this section.

(ii) For existing connections where the purveyor identifies a high health cross-connection hazard, the provisions of (3)(d)(ii) of this section shall be met:

(A) Within ninety days of the purveyor notifying the consumer of the high health cross-connection hazard; or

(B) In accordance with an alternate schedule acceptable to the purveyor.

(iii) For existing connections where the purveyor identifies a low cross-connection hazard, the provisions of subsection (3)(d)(ii) of this section shall be met in accordance with a schedule acceptable to the purveyor.

(f) The purveyor shall ensure that bypass piping installed around any approved backflow preventer is equipped with an approved backflow preventer that:

(i) Affords at least the same level of protection as the approved backflow preventer that is being bypassed; and

(ii) Complies with all applicable requirements of this section.

(7) Approved backflow preventer inspection and testing.

(a) For backflow preventers that protect the public water system, the purveyor shall ensure that:

(i) A CCS inspects backflow preventer installations to ensure that protection is provided commensurate with the assessed degree of hazard;

(ii) Either a BAT or CCS inspects:

(A) Air gaps installed in lieu of approved backflow prevention assemblies for compliance with the approved air gap definition; and

(B) Backflow prevention assemblies for correct installation and approval status.

(iii) A BAT tests approved backflow prevention assemblies for proper operation.

(b) The purveyor shall ensure that inspections and/or tests of approved air gaps and approved backflow assemblies that protect the public water system are conducted:

(i) When any of the following occur:

(A) Upon installation, repair, reinstallation, or relocation of an assembly;

(B) Upon installation or replumbing of an air gap;

(C) After a backflow incident involving the assembly or air gap; and

(ii) Annually thereafter, unless the purveyor requires more frequent testing for high hazard premises or for assemblies that repeatedly fail.

(c) The purveyor shall ensure that inspections of AVBs installed on irrigation systems are conducted:

(i) At the time of installation;

(ii) After a backflow incident; and

(iii) After repair, reinstallation, or relocation.

(d) The purveyor shall ensure that approved backflow prevention assemblies are tested using procedures acceptable to the department, such as those specified in the most recently published edition of the USC Manual. When circumstances, such as, but not limited to, configuration or location of the assembly, preclude the use of USC test procedures, the purveyor may allow, on a case-by-case basis, the use of alternate (non-USC) test procedures acceptable to the department.

(e) The purveyor shall ensure that results of backflow prevention assembly inspections and tests are documented and reported in a manner acceptable to the purveyor.

(f) The purveyor shall ensure that an approved backflow prevention assembly or AVB, whenever found to be improperly installed, defective, not commensurate with the degree of hazard, or failing a test (if applicable) is properly reinstalled, repaired, overhauled, or replaced.

(g) The purveyor shall ensure that an approved air gap, whenever found to be altered or improperly installed, is properly replumbed or, if commensurate with the degree of hazard, is replaced by an approved RPBA.

(8) Recordkeeping and reporting.

(a) Purveyors shall keep cross-connection control records for the following time frames:

(i) Records pertaining to the master list of service connections and/or consumer's premises required in subsection (3)(j)(i) of this section shall be kept as long as the premises pose a cross-connection hazard to the purveyor's distribution system;

(ii) Records regarding inventory information required in subsection (3)(j)(ii) of this section shall be kept for five years or for the life of the approved backflow preventer whichever is shorter; and

(iii) Records regarding backflow incidents and annual summary reports required in subsection (3)(j)(iii) of this section shall be kept for five years.

(b) Purveyors may maintain cross-connection control records in original form or transfer data to tabular summaries.

(c) Purveyors may maintain records or data in any media, such as paper, film, or electronic format.

(d) The purveyor shall complete the cross-connection control program summary report annually. Report forms and guidance on completing the report are available from the department.

(e) The purveyor shall make all records and reports required in subsection (3)(j) of this section available to the department or its representative upon request.

(f) The purveyor shall notify the department, authority having jurisdiction, and local health jurisdiction as soon as possible, but no later than the end of the next business day, when a backflow incident is known by the purveyor to have:

(i) Contaminated the public water system; or

(ii) Occurred within the premises of a consumer served by the purveyor.

(g) The purveyor shall:

(i) Document details of backflow incidents contaminating the public water system on a backflow incident report form available from the department; and

(ii) Include all backflow incident report(s) in the annual cross-connection program summary report referenced in (d) of this subsection, unless otherwise requested by the department.

For more information

Our publications are online at https://fortress.wa.gov/doh/eh/dw/publications/publications.cfm

Call the Office of Drinking Water Cross-Connection Control Program staff at (360) 236-3133 or toll-free (800) 521-0323.

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Appendix C
WAC 246-290-490

WAC 246-290-490 Cross-connection control. (1) Applicability, purpose, and responsibility.

(a) All community water systems shall comply with the cross-connection control requirements specified in this section.

(b) All noncommunity water systems shall apply the principles and provisions of this section, including subsection (4)(b) of this section, as applicable to protect the public water system from contamination via cross-connections. Noncommunity systems that comply with subsection (4)(b) of this section and the provisions of WAC 51-56-0600 of the UPC (which addresses the installation of backflow preventers at points of water use within the potable water system) shall be considered in compliance with the requirements of this section.

(c) The purpose of the purveyor's cross-connection control program shall be to protect the public water system, as defined in WAC 246-290-010, from contamination via cross-connections.

(d) The purveyor's responsibility for cross-connection control shall begin at the water supply source, include all the public water treatment, storage, and distribution facilities, and end at the point of delivery to the consumer's water system, which begins at the downstream end of the service connection or water meter located on the public right of way or utility-held easement.

(e) Under this section, purveyors are not responsible for eliminating or controlling cross-connections within the consumer's water system. Under chapter 19.27 RCW, the responsibility for cross-connection control within the consumer's water system, i.e., within the property lines of the consumer's premises, lies with the authority having jurisdiction.

(2) General program requirements.

(a) The purveyor shall develop and implement a cross-connection control program that meets the requirements of this section, but may establish a more stringent program through local ordinances, resolutions, codes, bylaws, or operating rules.

(b) Purveyors shall ensure that good engineering and public health protection practices are used in the development and implementation of cross-connection control programs. Department publications and the most recently published editions of references, such as, but not limited to, those listed below, may be used as guidance for cross-connection program development and implementation:

(i) *Manual of Cross-Connection Control* published by the Foundation for Cross-Connection Control and Hydraulic Research, University of Southern California (USC Manual);

(ii) *Cross-Connection Control Manual, Accepted Procedure and Practice* published by the Pacific Northwest Section of the American Water Works Association (PNWS-AWWA Manual); or

(iii) Guidance document: *Cross-Connection Control for Small Water Systems* published by the department.

(c) The purveyor may implement the cross-connection control program, or any portion thereof, directly or by means of a contract with another agency or party acceptable to the department.

(d) The purveyor shall coordinate with the authority having jurisdiction in all matters concerning cross-connection control. The purveyor shall document and describe the coordination, including delineation of responsibilities, in the written cross-connection control program required in (e) of this subsection.

(e) The purveyor shall include a written description of the cross-connection control program in the water system plan required under WAC 246-290-100 or the small water system management program re-

quired under WAC 246-290-105. The cross-connection control program must include the minimum program elements described in subsection (3) of this section.

(f) The purveyor shall ensure that cross-connections between the distribution system and a consumer's water system are eliminated or controlled by the installation of an approved backflow preventer commensurate with the degree of hazard. This can be accomplished by implementation of a cross-connection program that relies on:

(i) Premises isolation as defined in WAC 246-290-010; or

(ii) Premises isolation and in-premises protection as defined in WAC 246-290-010.

(g) Purveyors with cross-connection control programs that rely both on premises isolation and in-premises protection:

(i) Shall comply with the premises isolation requirements specified in subsection (4)(b) of this section; and

(ii) May reduce premises isolation requirements and rely on in-premises protection for premises other than the type addressed in subsection (4)(b) of this section, only if the following conditions are met:

(A) The in-premises backflow preventers provide a level of protection commensurate with the purveyor's assessed degree of hazard;

(B) Backflow preventers which provide the in-premises backflow protection meet the definition of approved backflow preventers as described in WAC 246-290-010;

(C) The approved backflow preventers are installed, inspected, tested (if applicable), maintained, and repaired in accordance with subsections (6) and (7) of this section;

(D) Records of the backflow preventers are maintained in accordance with subsections (3)(j) and (8) of this section; and

(E) The purveyor has reasonable access to the consumer's premises to conduct an initial hazard evaluation and periodic reevaluations to determine whether the in-premises protection is adequate to protect the purveyor's distribution system.

(h) The purveyor shall take appropriate corrective action as authorized by the legal instrument required by subsection (3)(b) of this section, when:

(i) A cross-connection exists that is not controlled commensurate to the degree of hazard assessed by the purveyor; or

(ii) A consumer fails to comply with the purveyor's requirements regarding the installation, inspection, testing, maintenance or repair of approved backflow preventers required by this chapter.

(i) The purveyor's corrective action may include, but is not limited to:

(i) Denying or discontinuing water service to a consumer's premises until the cross-connection hazard is eliminated or controlled to the satisfaction of the purveyor;

(ii) Requiring the consumer to install an approved backflow preventer for premises isolation commensurate with the degree of hazard; or

(iii) The purveyor installing an approved backflow preventer for premises isolation commensurate with the degree of hazard.

(j) Except in the event of an emergency, purveyors shall notify the authority having jurisdiction prior to denying or discontinuing water service to a consumer's premises for one or more of the reasons listed in (h) of this subsection.

(k) The purveyor shall prohibit the intentional return of used water to the purveyor's distribution system. Used water includes, but

is not limited to, water used for heating, cooling, or other purposes within the consumer's water system.

(3) Minimum elements of a cross-connection control program.

(a) To be acceptable to the department, the purveyor's cross-connection control program must include the minimum elements identified in this subsection.

(b) Element 1: The purveyor shall adopt a local ordinance, resolution, code, bylaw, or other written legal instrument that:

(i) Establishes the purveyor's legal authority to implement a cross-connection control program;

(ii) Describes the operating policies and technical provisions of the purveyor's cross-connection control program; and

(iii) Describes the corrective actions required of consumers to comply with the purveyor's cross-connection control requirements.

(c) Element 2: The purveyor shall develop and implement procedures and schedules for evaluating new and existing service connections to assess the degree of hazard posed by the consumer's premises to the purveyor's distribution system and notifying the consumer within a reasonable time frame of the hazard evaluation results. At a minimum, the program shall meet the following:

(i) For connections made on or after April 9, 1999, procedures shall ensure that an initial evaluation is conducted before water service is provided;

(ii) For all other connections, procedures shall ensure that an initial evaluation is conducted in accordance with a schedule acceptable to the department; and

(iii) For all service connections, once an initial evaluation has been conducted, procedures shall ensure that periodic reevaluations are conducted in accordance with a schedule acceptable to the department and whenever there is a change in the use of the premises.

(d) Element 3: The purveyor shall develop and implement procedures and schedules for ensuring that:

(i) Cross-connections are eliminated whenever possible;

(ii) When cross-connections cannot be eliminated, they are controlled by installation of approved backflow preventers commensurate with the degree of hazard; and

(iii) Approved backflow preventers are installed in accordance with the requirements of subsection (6) of this section.

(e) Element 4: The purveyor shall ensure that personnel, including at least one person certified as a CCS, are provided to develop and implement the cross-connection control program.

(f) Element 5: The purveyor shall develop and implement procedures to ensure that approved backflow preventers relied upon to protect the public water system are inspected and/or tested (as applicable) under subsection (7) of this section.

(g) Element 6: The purveyor shall develop and implement a backflow prevention assembly testing quality control assurance program including, but not limited to, documentation of BAT certification and test kit calibration, test report contents, and time frames for submitting completed test reports.

(h) Element 7: The purveyor shall develop and implement (when appropriate) procedures for responding to backflow incidents.

(i) Element 8: The purveyor shall include information on cross-connection control in the purveyor's existing program for educating consumers about water system operation. The public education program may include periodic bill inserts, public service announcements, pam-

phlet distribution, notification of new consumers and consumer confidence reports.

(j) Element 9: The purveyor shall develop and maintain cross-connection control records including, but not limited to, the following:

(i) A master list of service connections and/or consumer's premises where the purveyor relies upon approved backflow preventers to protect the public water system from contamination, the assessed hazard level of each, and the required backflow preventer(s);

(ii) Inventory information on backflow preventers that protect the public water system including:

(A) Approved air gaps installed in lieu of approved assemblies including exact air gap location, assessed degree of hazard, installation date, history of inspections, inspection results, and person conducting inspections;

(B) Approved backflow assemblies including exact assembly location, assembly description (type, manufacturer, model, size, and serial number), assessed degree of hazard, installation date, history of inspections, tests and repairs, test results, and person performing tests; and

(C) Approved AVBs used for irrigation system applications including location, description (manufacturer, model, and size), installation date, history of inspection(s), and person performing inspection(s).

(iii) Cross-connection program summary reports and backflow incident reports required under subsection (8) of this section.

(k) Element 10: Purveyors who distribute and/or have facilities that receive reclaimed water within their water service area shall meet any additional cross-connection control requirements imposed by the department in a permit issued under chapter 90.46 RCW.

(4) Approved backflow preventer selection.

(a) The purveyor shall ensure that a CCS:

(i) Assesses the degree of hazard posed by the consumer's water system upon the purveyor's distribution system; and

(ii) Determines the appropriate method of backflow protection for premises isolation as described in Table 12 of this section.

TABLE 12
APPROPRIATE METHODS OF BACKFLOW PROTECTION FOR PREMISES ISOLATION

Degree of Hazard	Application Condition	Appropriate Approved Backflow Preventer
High health cross-connection hazard	Backsiphonage or backpressure backflow	AG, RPBA, or RPDA
Low cross-connection hazard	Backsiphonage or backpressure backflow	AG, RPBA, RPDA, DCVA, or DCDA

(b) Premises isolation requirements.

(i) The purveyor shall ensure that an approved air gap, RPBA, or RPDA is installed for premises isolation for service connections to premises posing a high health cross-connection hazard including, but not limited to, those premises listed in Table 13 of this section, except those premises identified as severe in (b)(ii) of this subsection.

(ii) For service connections to premises posing a severe health cross-connection hazard including wastewater treatment plants, radio-

active material processing plants, and nuclear reactors, the purveyor shall ensure that either an:

(A) Approved air gap is installed for premises isolation; or

(B) Approved RPBA or RPDA is installed for premises isolation in combination with an in-plant approved air gap.

(iii) If the purveyor's CCS determines that no hazard exists for a connection serving premises of the type listed in Table 13 of this section, the purveyor may grant an exception to the premises isolation requirements of (b)(i) of this subsection.

(iv) The purveyor shall document, on a case-by-case basis, the reasons for granting an exception under (b)(i) of this subsection and include the documentation in the cross-connection control program annual summary report required in subsection (8) of this section.

TABLE 13 (formerly codified as TABLE 9)
SEVERE* AND HIGH HEALTH CROSS-CONNECTION HAZARD PREMISES REQUIRING PREMISES ISOLATION BY AG OR RPBA

Agricultural (farms and dairies)
Beverage bottling plants
Car washes
Chemical plants
Commercial laundries and dry cleaners
Premises where both reclaimed water and potable water are provided
Film processing facilities
Food processing plants
Hospitals, medical centers, nursing homes, veterinary, medical and dental clinics, and blood plasma centers
Premises with separate irrigation systems using the purveyor's water supply and with chemical addition+
Laboratories
Metal plating industries
Mortuaries
Petroleum processing or storage plants
Piers and docks
Radioactive material processing plants or nuclear reactors*
Survey access denied or restricted
Wastewater lift stations and pumping stations
Wastewater treatment plants*
Premises with an unapproved auxiliary water supply interconnected with the potable water supply

\+ For example, parks, playgrounds, golf courses, cemeteries, estates, etc.

* RPBAs for connections serving these premises are acceptable only when used in combination with an in-plant approved air gap; otherwise, the purveyor shall require an approved air gap at the service connection.

(c) Backflow protection for single-family residences.

(i) For single-family residential service connections, the purveyor shall comply with the premises isolation requirements of (b) of this subsection when applicable.

(ii) If the requirements of (b) of this subsection do not apply and the requirements specified in subsection (2)(g)(ii) of this section are met, the purveyor may rely on backflow protection provided at the point of hazard in accordance with WAC 51-56-0600 of the UPC for hazards such as, but not limited to:

(A) Irrigation systems;
(B) Swimming pools or spas;
(C) Ponds; and
(D) Boilers.

For example, the purveyor may accept an approved AVB on a residential irrigation system, if the AVB is properly installed under the UPC.

(d) Backflow protection for fire protection systems.

(i) Backflow protection is not required for residential flow-through or combination fire protection systems constructed of potable water piping and materials.

(ii) For service connections with fire protection systems other than flow-through or combination systems, the purveyor shall ensure that backflow protection consistent with WAC 51-56-0600 of the UPC is installed. The UPC requires minimum protection as follows:

(A) An RPBA or RPDA for fire protection systems with chemical addition or using unapproved auxiliary water supply; and

(B) A DCVA or DCDA for all other fire protection systems.

(iii) For connections made on or after April 9, 1999, the purveyor shall ensure that backflow protection is installed before water service is provided.

(iv) For existing fire protection systems:

(A) With chemical addition or using unapproved auxiliary supplies, the purveyor shall ensure that backflow protection is installed within ninety days of the purveyor notifying the consumer of the high health cross-connection hazard or in accordance with an alternate schedule acceptable to the purveyor.

(B) Without chemical addition, without on-site storage, and using only the purveyor's water (i.e., no unapproved auxiliary supplies on or available to the premises), the purveyor shall ensure that backflow protection is installed in accordance with a schedule acceptable to the purveyor or at an earlier date if required by the code official administering the State Building Code as defined in chapter 51-04 WAC.

(C) When establishing backflow protection retrofitting schedules for fire protection systems that have the characteristics listed in (d)(iv)(B) of this subsection, the purveyor may consider factors such as, but not limited to, impacts of assembly installation on sprinkler performance, costs of retrofitting, and difficulty of assembly installation.

(e) Purveyors may require approved backflow preventers commensurate with the degree of hazard as determined by the purveyor to be installed for premises isolation for connections serving premises that have characteristics such as, but not limited to, the following:

(i) Complex plumbing arrangements or plumbing potentially subject to frequent changes that make it impracticable to assess whether cross-connection hazards exist;

(ii) A repeated history of cross-connections being established or reestablished; or

(iii) Cross-connection hazards are unavoidable or not correctable, such as, but not limited to, tall buildings.

(5) Approved backflow preventers.

(a) The purveyor shall ensure that all backflow prevention assemblies relied upon by the purveyor are models included on the current list of backflow prevention assemblies approved for use in Washington state. The current approved assemblies list is available from the department upon request.

(b) The purveyor may rely on testable backflow prevention assemblies that are not currently approved by the department, if the assemblies:

(i) Were included on the department or USC list of approved backflow prevention assemblies at the time of installation;

(ii) Have been properly maintained;

(iii) Are commensurate with the purveyor's assessed degree of hazard; and

(iv) Have been inspected and tested at least annually and have successfully passed the annual tests.

(c) The purveyor shall ensure that an unlisted backflow prevention assembly is replaced by an approved assembly commensurate with the degree of hazard, when the unlisted assembly:

(i) Does not meet the conditions specified in (b)(i) through (iv) of this subsection;

(ii) Is moved; or

(iii) Cannot be repaired using spare parts from the original manufacturer.

(d) The purveyor shall ensure that AVBs meet the definition of approved atmospheric vacuum breakers as described in WAC 246-290-010.

(6) Approved backflow preventer installation.

(a) The purveyor shall ensure that approved backflow preventers are installed in the orientation for which they are approved (if applicable).

(b) The purveyor shall ensure that approved backflow preventers are installed in a manner that:

(i) Facilitates their proper operation, maintenance, inspection, in-line testing (as applicable), and repair using standard installation procedures acceptable to the department such as those in the USC Manual or PNWS-AWWA Manual;

(ii) Ensures that the assembly will not become submerged due to weather-related conditions such as flooding; and

(iii) Ensures compliance with all applicable safety regulations.

(c) The purveyor shall ensure that approved backflow assemblies for premises isolation are installed at a location adjacent to the meter or property line or an alternate location acceptable to the purveyor.

(d) When premises isolation assemblies are installed at an alternate location acceptable to the purveyor, the purveyor shall ensure that there are no connections between the point of delivery from the public water system and the approved backflow assembly, unless the installation of the connection meets the purveyor's cross-connection control requirements and is specifically approved by the purveyor.

(e) The purveyor shall ensure that approved backflow preventers are installed in accordance with the following time frames:

(i) For connections made on or after April 9, 1999, the following conditions shall be met before service is provided:

(A) The provisions of subsection (3)(d)(ii) of this section; and

(B) Satisfactory completion of the requirements of subsection (7) of this section.

(ii) For existing connections where the purveyor identifies a high health cross-connection hazard, the provisions of (3)(d)(ii) of this section shall be met:

(A) Within ninety days of the purveyor notifying the consumer of the high health cross-connection hazard; or

(B) In accordance with an alternate schedule acceptable to the purveyor.

(iii) For existing connections where the purveyor identifies a low cross-connection hazard, the provisions of subsection (3)(d)(ii) of this section shall be met in accordance with a schedule acceptable to the purveyor.

(f) The purveyor shall ensure that bypass piping installed around any approved backflow preventer is equipped with an approved backflow preventer that:

(i) Affords at least the same level of protection as the approved backflow preventer that is being bypassed; and

(ii) Complies with all applicable requirements of this section.

(7) Approved backflow preventer inspection and testing.

(a) For backflow preventers that protect the public water system, the purveyor shall ensure that:

(i) A CCS inspects backflow preventer installations so that protection is provided commensurate with the assessed degree of hazard;

(ii) Either a BAT or CCS inspects:

(A) Air gaps installed in lieu of approved backflow prevention assemblies for compliance with the approved air gap definition; and

(B) Backflow prevention assemblies for correct installation and approval status.

(iii) A BAT tests approved backflow prevention assemblies for proper operation.

(b) The purveyor shall ensure that inspections and/or tests of approved air gaps and approved backflow assemblies that protect the public water system are conducted:

(i) When any of the following occur:

(A) Upon installation, repair, reinstallation, or relocation of an assembly;

(B) Upon installation or replumbing of an air gap;

(C) After a backflow incident involving the assembly or air gap; and

(ii) Annually thereafter, unless the purveyor requires more frequent testing for high hazard premises or for assemblies that repeatedly fail.

(c) The purveyor shall ensure that inspections of AVBs installed on irrigation systems are conducted:

(i) At the time of installation;

(ii) After a backflow incident; and

(iii) After repair, reinstallation, or relocation.

(d) The purveyor shall ensure that approved backflow prevention assemblies are tested using procedures acceptable to the department, such as those specified in the most recently published edition of the USC Manual. When circumstances, such as, but not limited to, configuration or location of the assembly, preclude the use of USC test procedures, the purveyor may allow, on a case-by-case basis, the use of alternate (non-USC) test procedures acceptable to the department.

(e) The purveyor shall ensure that results of backflow prevention assembly inspections and tests are documented and reported in a manner acceptable to the purveyor.

(f) The purveyor shall ensure that an approved backflow prevention assembly or AVB, whenever found to be improperly installed, defective, not commensurate with the degree of hazard, or failing a test (if applicable) is properly reinstalled, repaired, overhauled, or replaced.

(g) The purveyor shall ensure that an approved air gap, whenever found to be altered or improperly installed, is properly replumbed or,

if commensurate with the degree of hazard, is replaced by an approved RPBA.

(8) Recordkeeping and reporting.

(a) Purveyors shall keep cross-connection control records for the following time frames:

(i) Records pertaining to the master list of service connections or consumer's premises required in subsection (3)(j)(i) of this section shall be kept as long as the premises pose a cross-connection hazard to the purveyor's distribution system;

(ii) Records regarding inventory information required in subsection (3)(j)(ii) of this section shall be kept for five years or for the life of the approved backflow preventer whichever is shorter; and

(iii) Records regarding backflow incidents and annual summary reports required in subsection (3)(j)(iii) of this section shall be kept for five years.

(b) Purveyors may maintain cross-connection control records in original form or transfer data to tabular summaries.

(c) Purveyors may maintain records or data in any media, such as paper, film, or electronic format.

(d) The purveyor shall complete the cross-connection control program summary report annually. Report forms and guidance on completing the report are available from the department.

(e) The purveyor shall make all records and reports required in subsection (3)(j) of this section available to the department or its representative upon request.

(f) The purveyor shall notify the department, authority having jurisdiction, and local health jurisdiction as soon as possible, but no later than the end of the next business day, when a backflow incident is known by the purveyor to have:

(i) Contaminated the public water system; or

(ii) Occurred within the premises of a consumer served by the purveyor.

(g) The purveyor shall:

(i) Document details of backflow incidents contaminating the public water system on a backflow incident report form available from the department; and

(ii) Include all backflow incident report(s) in the annual cross-connection program summary report referenced in (d) of this subsection, unless otherwise requested by the department.

[Statutory Authority: RCW 43.20.050, 70A.125.080, and 70A.130.010. WSR 21-23-097, § 246-290-490, filed 11/17/21, effective 1/1/22. Statutory Authority: RCW 70.119A.180 and 43.20.050. WSR 08-03-061, § 246-290-490, filed 1/14/08, effective 2/14/08. Statutory Authority: RCW 43.20.050 (2) and (3) and 70.119A.080. WSR 03-08-037, § 246-290-490, filed 3/27/03, effective 4/27/03. Statutory Authority: RCW 43.02.050 [43.20.050]. WSR 99-07-021, § 246-290-490, filed 3/9/99, effective 4/9/99. Statutory Authority: RCW 43.20.050. WSR 91-02-051 (Order 124B), recodified as § 246-290-490, filed 12/27/90, effective 1/31/91. Statutory Authority: P.L. 99-339. WSR 89-21-020 (Order 336), § 248-54-285, filed 10/10/89, effective 11/10/89. Statutory Authority: RCW 34.04.045. WSR 88-05-057 (Order 307), § 248-54-285, filed 2/17/88. Statutory Authority: RCW 43.20.050. WSR 83-19-002 (Order 266), § 248-54-285, filed 9/8/83.]

Appendix D
Cross-Connection Control Ordinance & Program

City of Newport

WATER SYSTEM

NEWPORT, WASHINGTON

CROSS-CONNECTION CONTROL PROGRAM

Protecting the Water Distribution System
from Cross-Connection Contamination

Meeting requirements of WAC 246-290-490

July 2022

Prepared For:
Abby Gribi
City Administrator
For the City of Newport, Washington

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LEGAL AUTHORITY

I Legal Authority

City of Newport's Public Works Department (PWD) legal authority to implement a cross-connection control program is provided by the Newport City Council Ordinance 847, Chapter 13.10, adopted by the City Council for the City of Newport on March 1, 1994. The ordinance requires PWD to implement a cross-connection control program in accordance with WAC 246-290-490 or subsequent revisions of the WAC as adopted by the Washington State Department of Health. (DOH)

PURPOSE, RESPONSIBILITY AND GENERAL REQUIREMENTS OF PROGRAM

II Purpose, Responsibility and General Requirements of Program

A. Purpose and Responsibility

1. The purpose of PWD's cross-connection control program shall be to protect the health of the water consumer and the potability of the water in the distribution system as defined in WAC 246-290-490, from contamination via cross-connections.

2. PWD's responsibility for cross-connection control shall begin at the water supply source, include all the public water treatment, storage, and distribution facilities, and end at the point of delivery to the consumer's water system, which begins at the consumer's water service at a point near the property line or utility held easement.

B. General Program Requirements

1. PWD shall develop and implement a cross-connection control program that meets the requirements of WAC 246-290-490, but may establish a more stringent program through PWD's ordinance or operating policies.

2. PWD shall ensure that good engineering and public health protection practices are used in the development and implementation of the cross-connection control program. Washington State Department of Health (DOH), Division of Drinking Water publications and the most recently published editions of references such as, but not limited to those listed below, are used as guidance for the cross-connection program development and implementation.

    a. Accepted Procedure and Practice Cross-Connection Control Manual published by the Pacific Northwest Section of the American Water Work Association (PNWS-AWWA Manual).
    b. Manual of Cross-Connection Control published by the Foundation for Cross-Connection Control and Hydraulic Research, University of Southern California (USC Manual).

3. PWD may implement their cross-connection control program, or any portion thereof, directly or by means of a contract with another agency or party acceptable to the State Department of Health

4. PWD shall coordinate with the administrative authority in all matters concerning cross-connection control.

5. PWD shall ensure that cross-connections between the distribution system and the consumer's water system are eliminated or controlled by the installation of an approved backflow preventer commensurate with the degree of hazard. This will be accomplished by implementation of a cross-connection program and policy that relies on:

    a. Premise isolation as defined in WAC 246-290-490
    b. In-premise protection as defined in WAC 246-290-490
    c. Combination of both.

6. When PWD's cross-connection program relies both on premise isolation and/or in premise protection:

    a. The program shall comply with the premise isolation requirements specified in subsection (4)(b) of WAC 246-290-490; and
    b. May reduce premise isolation requirements that rely on in premise protection for premise other than the type addressed in subsection (4)(b) of-WAC 246-290-490 if the conditions of (h) of that subsection are met.

7. PWD may rely on in premise protection only when the following conditions are met:

    a. The in-premise backflow preventers provide a level of protection commensurate with the purveyor's assessed degree of hazard;
    b. Backflow preventers which provide the in-premise backflow protection must meet the definition of approved backflow preventers as described in WAC 246-290-490;
    c. The approved backflow preventers are installed, inspected, tested, maintained, and repaired in accordance with subsections (6) and (7) of WAC 246-290-490;
    d. Records of such backflow preventers are maintained in accordance with subsections (3)(j) and (8) of WAC 246-290-490; and
    e. PWD has reasonable access to the consumer's premise to conduct an initial hazard evaluation and periodic reevaluations to determine whether the in-premise protection is adequate to protect PWD's distribution System.

8. PWD shall take appropriate corrective action within its authority if;

    a. A cross-connection exists that is not controlled commensurate to the degree of hazard assessed by PWD.
    b. A consumer fails to comply with PWD's requirements regarding the installation, inspection, testing, maintenance or repair of approved backflow preventers required by WAC 246-290-490.

9. PWD's corrective action may include, but is not limited to:

    a. Denying or discontinuing water service to a consumer's premises until the cross-connection hazard is eliminated or controlled to the satisfaction of the purveyor;
    b. Requiring the consumer to install an approved backflow preventer for premise

isolation commensurate with the degree of hazard; or

c. PWD installing an approved backflow preventer for premise isolation commensurate with the degree of hazard at the consumer's expense.

10. PWD denying or discontinuing water service to a consumer's premises for one ormore of the reasons listed in subsection 2(i) of WAC 246-290-490 shall notify the administrative authority prior to taking such action except in the event of an emergency.

11. PWD shall prohibit the intentional return of used water to the purveyor's distribution system. Such water would include, but is not limited to, water used for heating, cooling, or other purposes within the consumer's water system.

APPROVED BACKFLOW PREVENTER SELECTION

III Approved Backflow Preventer Selection

A. PWD Cross-Connection Control Specialist (CCS)

1. Assesses the degree of hazard posed by the consumer's water system upon PWD's distribution system; and

2. Determines the appropriate method of backflow protection for premise isolation in accordance with **Table 12,** listed in WAC 246-290-490, and shown in **Section B**, below; and

3. Determines premise isolation requirements:

   a. For service connections with premises posing a high health cross-connection hazard including, but not limited to, those premises listed in **Table 13**, listed in WAC 246-290-490, and shown in **Section C** below, the purveyor shall ensure that an approved air gap or RPBA is installed for premise isolation.

   b. IF PWD's CCS determines that no hazard exists for a connection serving a premise of the type listed in **Table13**, the requirements of 3(a) of this section do not apply.

   c. PWD will document, on a case-by-case basis, reasons for not applying the requirements of 3(a), of this section to a connection serving premises of the type listed in **Table 13** and include such documentation in the cross-connection control program summary report as required by WAC 246-290-490.

Table 13

Appropriate Methods of Backflow Protection for Premises Isolation

Degree of Hazard	Application Condition	Appropriate Approved Backflow Preventer
High Health Cross-Connection Hazard	Backsiphonage or backpressure backflow	AG, RPBA, or RPDA
Low Cross-Connection Hazard	Backsiphonage or backpressure backflow	AG, RPBA, RPDA, DCVA or DCDA

Table 13

High Health Cross-Connection Hazard Premises

Requiring Premises Isolation by AG or RPBA as identified by WAC 246-290-490.

1. Agricultural (farms, dairies, <City Wastewater Spray Field and Lagoon>),
2. Beverage bottling plant,
3. Car Washes,
4. Chemical plants

5. Commercial laundries and dry cleaners,
6. Premises where both reclaimed water and potable water are provided,
7. Film processing facilities,
8. Food processing plants,
9. Hospitals, medical centers, nursing homes, veterinary, medical/dental clinic and blood plasma centers,
10. Premises with separate irrigation systems using the purveyor's water supply and with chemical addition, *
10. Laboratories,
11. Metal plating industries,
12. Mortuaries,
13. Petroleum processing or storage plants,
14. Piers and docks,
15. Radioactive material processing plants or nuclear reactors, **
16. Survey access denied or restricted,
17. Wastewater lift stations and pumping stations,
18. Wastewater treatment plants,
19. Premises with an unapproved auxiliary water supply interconnected or the potential to interconnect with the potable water supply.

* For example: parks, playgrounds, golf courses, cemeteries, estates, etc.

** RPBA's for connections serving these premises are acceptable only when used in combination with an in-plant approved air gap; otherwise, PWD shall require an approved air gap at the service connection.

B. Backflow Protection for Residential

(One, Two, or Three family residences)

1. For one, two or three family residential service connections, PWD shall comply with the requirements of paragraph A(3) of this section when applicable.

2. If the requirements of paragraph A(3), of this section do not apply and the requirements specified in subsection (2)(h) of WAC 246-290-490 are met, PWD will rely on backflow protection provided at the point of hazard in accordance withWAC 51-56-0600 of the Uniform Plumbing Code and Newport Municipal Code Section 13.10.040 for hazards such as, but not limited to:

    a. Irrigation systems,
    b. Swimming pools or spas;
    c. Ponds;
    d. Boilers.

For example, PWD may accept an approved AVB on a residential irrigation system, if the AVB is properly installed in accordance with the Uniform Plumbing Code.

C. Backflow Protection for Fire Protection Systems

1. Backflow protection is not required for residential flow-through or combination fire protection systems constructed to potable water piping and materials.

2. For service connections with fire protection systems other than flow-through or combination systems, PWD shall ensure that backflow protection is consistent with WAC 51-56-0600 of the Uniform Plumbing Code (UPC). The UPC requires minimum protection as follows.

   a. An RPBA or RPDA for fire protection systems with chemical addition or using unapproved auxiliary water supply; and
   b. A DCVA or DCDA for all other fire protection systems.

3. For new connections made on or after the effective date of ordinance 847, Chapter 13.10, PWD shall ensure backflow protection is installed before water service is provided.

4. For existing fire protection systems:

   a. With chemical addition or using unapproved auxiliary supplies, PWD shall ensure that backflow protection is installed within ninety (90) days of the purveyor notifying the consumer of the high health cross-connection hazard or in accordance with an alternate schedule acceptable to the purveyor.
   b. Without chemical addition, without on-site storage, and using only PWD's water (i.e., no unapproved auxiliary supplies on or available to the premises), the purveyor shall ensure that backflow protection is installed in accordance with a schedule acceptable to PWD or at an earlier date if required by the administrative authority administering the Uniform Building Code as adopted under chapter 19.27 RCW.
   c. When establishing backflow protection retrofitting schedules for fire protection systems that have been assessed as a low hazard, PWD will consider factors such as, but not limited to, impacts of assembly installation on sprinkler performance, costs of retrofitting, and difficulty of assembly installation.

D. Additional Backflow Preventer Installation

1. PWD may require backflow preventers commensurate with the degree of hazard determined by the purveyor to be installed for premises isolation for connections serving premises that have characteristics such as, but not limited to, the following:

a. Complex plumbing arrangements or plumbing potentially subject to frequent changes that make it impractical to assess whether cross-connections hazards exist; or
b. A repeated history of cross-connections being established or reestablished; or
c. Cross-connection hazards are unavoidable or not correctable, such as, but not limited to tall buildings.

APPROVED BACKFLOW PREVENTERS

IV Approved Backflow Preventers

A. New Assemblies

1. PWD shall unsure that all new backflow prevention assemblies relied upon are models included on the current list of Backflow Prevention Assemblies Approved for Installation in Washington State, as publishing in DOH Publication #331-137, dated February 2002, or as later amended. The current approved assemblies list is available from the State of Washington, Department of Health, Division of Drinking Water, and is included as **Appendix B**.

B. Existing Assemblies

1. PWD may rely on testable backflow prevention assemblies that are not currently approved by the department, if the assemblies:
   a. Were included on the department and/or USC list of approved backflow prevention assemblies at the time of installation;
   b. Have been properly maintained;
   c. Are commensurate with PWD's assessed degree of hazard; and
   d. Have been inspected and tested at least annually and have successfully passed the annual test.

C. Unlisted Assemblies

1. PWD shall ensure that an unlisted backflow prevention assembly is replaced by an approved assembly commensurate with the degree of hazard, when the unlisted assembly:

   a. Does not meet the conditions specified in B, of this subsection;
   b. Is moved; or
   c. Cannot be repaired using spare parts from the original manufacturer.

D. Residential AVB's

1. PWD shall ensure that AVB's meet the definition of approved atmospheric vacuum breakers as described in WAC 246-290-490.

APPROVED BACKFLOW PREVENTER INSTALLATION

V Approved Backflow Preventer Installation

A. Installation Guidelines

1. PWD shall ensure that approved backflow preventers are installed in the orientation for which they were originally approved by the certifying laboratory.

2. PWD shall ensure that approved backflow preventers are installed in a manner that:

   a. Facilitates their proper operation, maintenance, inspection, and/or in-line testing (as applicable) using standard installation procedures acceptable to the department such as those in the USC Manual or PNWS-AWWA Manual;
   b. Ensures that the assembly will not become submerged due to weather-related conditions such as flooding; and
   c. Ensures compliance with all applicable: safety regulations.

3. PWD shall ensure that approved backflow assemblies for premises isolation are installed at a location adjacent to the meter or property line or an alternate location acceptable to the purveyor.

4. When premise isolation assemblies are installed at an alternate location acceptable to PWD, PWD shall ensure that there are no connections between the point of delivery from the public water system and the approved backflow assembly, unless the installation of such a connection meets PWD's cross-connection control requirements and is specifically approved by PWD.

5. PWD shall ensure that approved backflow preventers are installed in accordance with the following time frames;

   a. For new connections made on or after the effective date of Ordinance 847, Chapter 13.10, the following conditions listed in Section VII A through B shall be met before service is provided.
   b. For existing connections where the purveyor identifies a high health cross-connection hazard, the provisions listed in Section VII C.6.a shall be met.
   c. For existing connections where the purveyor identifies a low health cross connection hazard, the provisions listed in Section VII C.6.b shall be met in accordance with a schedule acceptable to the purveyor.

6. PWD shall ensure that bypass piping installed around any approved backflow preventer is equipped with an approved backflow preventer that:

   a. Affords at least the same level of protection as the approved backflow preventer that is being bypassed; and
   b. Complies with all applicable requirements of this section.

APPROVED BACKFLOW PREVENTER INSPECTION AND TESTING

VI Approved Backflow Preventer Inspection/Testing

A. PWD Staff Responsibilities

1. PWD shall ensure that:

    a. A PWD CCS inspects backflow preventer installations to ensure that protection is provided commensurate with the assessed degree of hazard.
    b. Either a Backflow Assembly Tester (BAT) or CCS inspects:
        i. Backflow prevention assemblies for correct installation and approval status.
        ii. Air gaps installed in lieu of approved backflow prevention assemblies for compliance with the approved air gap definition.
    c. A BAT tests the approved backflow prevention assemblies upon installation for proper operation.

2. PWD shall ensure inspections and/or tests of approved air gaps and approved backflow assemblies are conducted:

    a. At the time of installation;
    b. Annually, after installation, or more frequently if required by PWD for connection serving premises or systems that pose a high health cross-connection hazard of for assemblies that repeatedly fail;
    c. After a backflow incident;
    d. After an assembly is repaired, reinstalled, or relocated or an air gap is replumbed.

3. PWD shall ensure that inspections of AVB's installed on irrigation systems are conducted:

    a. At the time of installation;
    b. After a backflow incident; and
    c. After repair, reinstallation, or relocation.

4. PWD shall ensure that approved backflow prevention assemblies are tested using procedures acceptable to the department, such as those specified in the most recently published editions of the USC Manual. When circumstances, such as, but not limited to, configuration or location of the assembly, preclude the use of the USC test procedures, PWD may allow, on a case by case basis, the use of alternate (non-USC) test procedures acceptable to the department.

5. PWD shall ensure that the results of backflow prevention assembly inspections and tests are documented and reported in a manner acceptable to PWD.

6. PWD shall ensure that an approved backflow prevention assembly or AVB, whenever found to be improperly installed, defective, not commensurate with the degree of hazard, or failing a test (if applicable) is properly reinstalled, repaired, overhauled, or replaced.

7. PWD shall ensure that an approved air gap, whenever found to be altered, or improperly installed, is properly replumbed or, if commensurate with the degree of hazard, is replaced by an approved RPBA.

EVALUATION OF PROTECTION REQUIRED

VII Evaluation of Protection Required

A. New Water Services - Commercial

1. Prior to providing water service, the following procedures shall be followed:

    a. A service application shall be properly filled out by the owner of the project or his/her designated agent.
    b. A copy of the site plan is provided.
    c. If premise is listed as a high hazard per **Table13**, WAC 246-290-490, PWD will initially classify it as the same.
    d. If the premise is not listed under **Table13**, WAC 246-290-490 or there is question as to whether it is a high hazard, the following steps are followed:
        i. A copy of the mechanical (plumbing) and plumbing fixture schedule is requested.
        ii. The plans are reviewed for actual and potential cross-connections.
        iii. Each fixture and/or cross-connection is assessed for degree of hazard and backflow protection required for each according to plans.
        iv. Based on this information, the degree of hazard the premises poses to PWD public water system is assessed and backflow protection shall be required in accordance with the assessed degree of hazard.
        v. Backflow protection will be required at the property line or where water service enters the premise prior to the first branch tee.
        vi. A letter is sent to the owner, general contractor, and plumbing contractor (if known) including the following information:

            (1) Basic definitions associated with cross-connection control; reasons for controlling cross-connections; type of protection required; annual testing; detailed installation instructions, etc. Information also included stipulates *"that in accordance with State Regulations, the water purveyor shall deny water service to anyone who does not cooperate in the installation, testing, and repair of required backflow protection".*
            (2) PWD also informs the owner of their financial and legal responsibilities in protecting the quality of their drinking water within their premise. PWD stated that additional backflow protection will be required by the administrative authority. These devices are required to protect the quality of the drinking water within the owner's premise in accordance with the Plumbing Code enforced within the city. The Plumbing Code requires all testable backflow preventers to be tested annually by a certified backflow assembly tester (BAT). Documentation of this testing and any repairs shall be maintained by the owner.
            (3) PWD offers to answer any questions and provide assistance to the owner.

(4) When construction begins, PWD monitors progress. When backflow prevention assemblies PWD has required are installed, one of PWD's CCS will inspect to assure proper type of assembly has correctly been installed.

(5) When installation is approved, PWD gathers the required information for each assembly, records the information in the PWD database, and the assembly is then tested by a certified BAT.

B. New Water Services - Residential

1. At the time of building permit issuance, the Administrative Authority will notify the new applicant or contractor of the requirements for cross connection control.

2. At the time of service connection, PWD personnel will assess the degree of hazard posed by the residential premises to PWD's distribution system.

3. Based on this information, the degree of hazard the premise may pose to PWD's distribution system is assessed and backflow protection shall be required in accordance with the assessed degree of hazard and installed prior to occupancy or issuance of "Certificates of Occupancy" by the Administrative Authority.

C. Existing Water Services

1. Under WAC 246-290-490, PWD will begin a program to evaluate all commercial accounts to assess the degree of hazard the use of the premise poses on the distribution system of the city. Also, PWD will identify commercial premises that:

   a. Have devices installed, without current test data and that are not on the current list of approved assemblies within Washington State.
   b. Have devices installed commensurate with the degree of hazard.
   c. Have no devices installed.

2. A priority list will be made with the premises PWD determine pose the highest hazards to PWD's potable water supply. The list will rank the hazards in order of threat. The greatest threats will be listed at the top and the least potential at the bottom. **Table 13** in the State Regulations on page 7 in this program, and section 13.10.040, of the City Code regulating cross-connections will be used as a guideline for establishing this list.

3. The priority list will be used for re-evaluating the degree of hazard starting with the highest threat and working down the list.

4. A letter will be sent to the owners of each facility listed on the priority list. This letter will review cross-connection control basics, with the addition of the reasons for water use evaluations and a prospective date for a meeting and/or water use survey.

5. Degree of Hazard will be determined during the survey of the premises, by use of **Table 13** of WAC 246-290-490 and the current PNWS AWWA Cross-Connection Control Manual.

6. Backflow protection shall be required based upon the above findings in accordance with **Table 12** of WAC 246-290-490, and as shown on page 6 of this regulation.

    a. If it is determined the premise poses a high hazard to PWD's public water system, a RPBA will be required on the water service to the facility within 90 days or in accordance with an alternate schedule acceptable to the purveyor.
    b. If it is determined the premises poses a low hazard toe PWD's public water supply, either:

        i. A DCVA will be required on the water service to the facility within 90 days or in accordance with an alternate schedule acceptable to the purveyor; or
        ii. In premises backflow protection shall be provided as described in VII.D.

7. Existing fire suppression systems not presently controlled by State approved backflow prevention assemblies will be required to comply as described in III.C.4.

8. Existing irrigation systems that are capable of polluting or contamination PWD's public water supply and controlled by State approved backflow protection, shall comply as described in Section III.A.3. a.

9. Backflow protection assemblies shall be installed:
    a. On the service line to premises requiring premise isolation at or near property line or inside of the facility prior to the first branch or tee; or
    b. At the point of supply to fire suppression and/or irrigation systems.

10. When backflow prevention assemblies are installed, PWD follows the procedures listed in Section V.

D. In-Premise Backflow Protection

1. When PWD is relying on in-premise backflow protection for the potable water supply, PWD shall require owners to follow the below identified provisions which includes but is not limited to:
    a. A water use survey of premises entire plumbing system by a PWD Cross-connection Control Specialist (CCS), will be required.
    b. The CCS Inspector shall prepare a cross-connection control inspection report which:

        i. Identifies all cross connections including degree of hazard and if properly controlled in accordance with III.A.3.a.

ii. Inspect all backflow protection assemblies for correct installation and State of Washington approval.
i. Notify owner of tests required, and receive reports for all testable devices.

ii. Records receipt of all inspection reports, test report(s) and documentation of air gaps or atmospheric vacuum breaker inspections, prior to annual compliance date.

iii. Notifies owner if above items are not complied with, PWD will proceed with procedures for discontinuing water service at the customer curb stop.

E. Periodic Re-evaluation

1. All premises without an approved APBA installed on a water service are subject to periodic reevaluation.

   a. All changes in occupancy of commercial and industrial facilities will be monitored through PWD's backflow assembly computer database and business office utility billing system computer.

   b. In the type of occupancy changes which may increase the degree of hazard, a water use reevaluation will be conducted within 90 days. The procedures followed are:

      i. A letter will be sent to the owner of each premises to be reevaluated. This letter will review cross-connection control basics as described in A.1.d.vi of this section with the reasons for the reevaluation and a prospective date for a meeting and/or water use survey.

      ii. Based upon the water use survey, backflow protection will be required commensurate with the degree of hazard as described in Section III.

F. Construction and/or Temporary Water Meter Connection

1. PWD will not supply water through temporary connections, such as those used for construction projects or water main chlorination, except through a backflow assembly/water meter device supplied and approved by the purveyor.

2. An applicant request use of such water, shall complete forms for use of the device as determined by PWD.

3. PWD will complete and maintain accurate records of yearly testing of their backflow assemblies.

G. Tank Truck Connections

1. PWD may allow tank trucks or well drilling trucks to obtain water from the water system under the following conditions:

   a. The tank truck is equipped with an approved AG or an approved RPBA, with a current satisfactory inspection or test report.

b. The tank trucks shall obtain water from PWD's designated water points only. These water points are equipped with purveyor installed and tested backflow devices.

PWD
CROSS-CONNECTION
PERSONNEL

VIII PWD Cross-Connection Control Personnel

A. Staffing/Responsibilities

1. PWD currently has the following employees within the utility operations section and involved in maintenance functions:

    a. David North, Water Distribution Manager 2, Cross-Connection Specialist, Water Treatment 1, Wastewater Operator, Backflow Assembly Tester
    b. Shea Courtney, Water Distribution Manager 1, Cross-Connection Specialist, Backflow Assembly Tester
    c. Josh Howard, Water Distribution Manager 2, Water Treatment 2, Wastewater Operator 2.

2. David North, Distribution Manager oversees PWD's Cross-Connection Control Program and is assisted by Shea Courtney and Josh Howard, Operators, all under the oversight of the Mayor of the City.

ANNUAL TESTING PROGRAM

XI Annual Testing Program

A. Backflow Prevention Assembly Testing Assurance Program

1. PWD has developed and implemented a backflow prevention assembly testing quality assurance program. This includes:

   a. Documentation of tester certification by requiring proof of current certification of all testers.

   b. Documentation of brand, model, serial number, and date of last verification of accuracy is required on all test kits used to test backflow preventers in PWD's jurisdiction.
      i. Verification of accuracy of test kits is required annually.

   c. A test report **(Appendix A)** for each backflow prevention assembly required to be tested is sent to the owner of the backflow preventer.
      i. Test report lists the following information:
         - Owner's name, address, service account and phone number.
         - Name of business, if applicable, and contact person.
         - Cross-connection controlled.
         - Location of backflow assembly.
         - Make of assembly, model number and serial number.

      ii. The tester is required to correctly fill out the test report, including:
         - System water pressure at time of test.
         - Pressure differentials, buffer, etc. for assembly being tested.
         - Note if assembly passed or failed test.
         - Note if assembly is installed correctly.
         - Note if any unauthorized connections or modifications to assembly have been made.
         - Test kit brand, model, serial number and date of last verification of accuracy.
         - Print full name and telephone number.
         - Signature and certification number of assembly tester, BAT.
         - Date of initial test.
         - If assembly failed:
           (1) List repairs made.
           (2) Person making repairs.
           (3) Results of final test.
           (4) Signature and certification number of tester.
           (5) Date of final test.

iii. A letter accompanies the test report that contains basics of cross-connection control as described in Section VII.A.1.d.vi. with the addition of testing requirements and compliance date for returning test report.

- Test report and letter is sent to owner and lessee, if applicable.
- A list of area commercial testers is included.

iv. Compliance date for returning completed test report form is included in the letter.

- Report form is sent out 30 to 40 days prior to the compliance date for the device.
- If completed test report is not returned by compliance date, a "Notification of Non-Compliance" (second notice) is sent.
  (1) This letter is sent by certified mail to the owner.
  (2) The letter indicates that this is a "Notification of Non-Compliance"
  (3) Return date for completed test report (15-days minimum) is established.
  (4) Owner is reminded if test report is not returned by due date, PWD will discontinue water service without further notification.

APPENDIX A

Appendix A
Backflow Prevention Assembly Test Report

Account#_____

Name of Premises_____Commercial ___ Residential ___

Service Address_____City/State_____Zip_____

Contact Person_____ Phone _____ Fax _____

Location of Assembly_____

DownStream Process _____DCVA ___ RPBA ___ PVBA ___ Other _____

New Install____ Existing ____ Replacement ____ Old Serial # _____ Proper Installation? Yes ___ No ___

Make of Assembly _____Model_____Serial #_____Size_____

INITIAL TEST PASSED ☐ FAILED ☐	**DCVA/RPBA CHECK VALVE NO. 1** LEAKED ☐ CLOSED TIGHT ☐ _____**PSID**	**DCVA/RPBA CHECK VALVE NO. 2** LEAKED ☐ CLOSED TIGHT ☐ _____**PSID**	**RPBA** OPENED AT _____PSID #1 CHECK _____PSID AIR GAP OK? _____	**PVBA** OPENED AT _____PSID DID NOT OPEN ☐
NEW PARTS AND REPAIRS	CLEAN REPLACE PART ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐	CLEAN REPLACE PART ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐	CLEAN REPLACE PART ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐	**CHECK VALVE** HELD AT _____PSID LEAKED ☐ CLEANED ☐ REPAIRED ☐
TEST AFTER REPAIRS PASSED ☐ FAILED ☐	CLOSED TIGHT ☐ _____**PSID**	CLOSED TIGHT ☐ _____**PSID**	OPENED AT _____**PSID** #1 CHECK _____**PSID**	AIR INLET _____**PSID** CHECK VALVE _____**PSID**

AIR GAP INSPECTION: required minimum air gap separation provided? Yes ___ No ___ Detector Meter Reading _____

REMARKS:_____LINE PRESSURE _____PSI

_____CONFINED SPACE?_____

TESTERS SIGNATURE _____CERT. NO. _____DATE: _____

REPAIRED BY _____DATE:_____

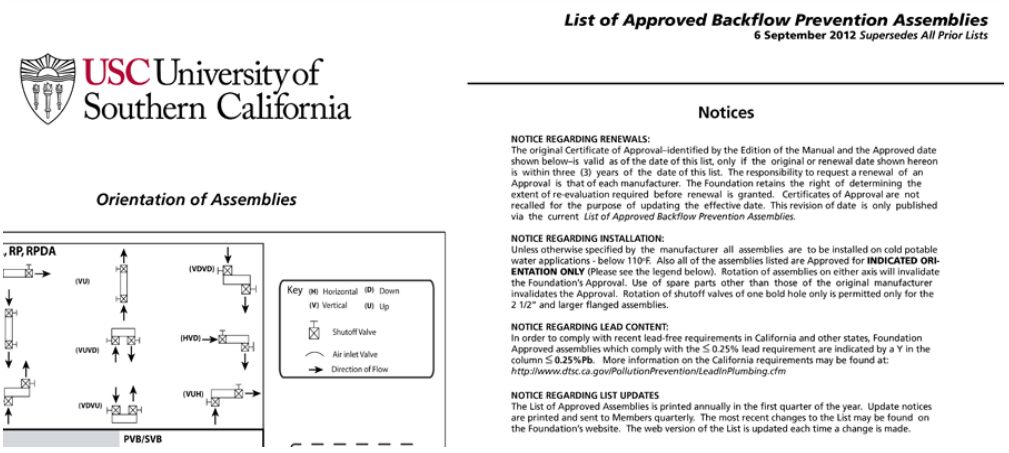
FINAL TEST BY _____CERT. NO. _____DATE: _____

GAUGE CALIBRATION DATE _____GAUGE #_____MODEL _____SERVICE RESTORED YES ___ NO ___

APPENDIX B

List of Approved Backflow Prevention Assemblies

The List of Approved Backflow Prevention Assemblies continues to be a valuable source of information for anyone involved in cross-connection control. Keeping up to date with the most current List is crucial. The best way to stay current is downloading the List from the USC Foundation's website since it is updated as changes are made to the List.



USC University of Southern California

Orientation of Assemblies

RP, RPDA

(VUI) (VDVD) (VUVD) (HVD) (VDVU) (VUH) PVB/SVB

Key (H) Horizontal (D) Down (V) Vertical (U) Up

Shutoff Valve

Air inlet Valve

Direction of Flow

List of Approved Backflow Prevention Assemblies

6 September 2012 *Supersedes All Prior Lists*

Notices

NOTICE REGARDING RENEWALS:
The original Certificate of Approval–identified by the Edition of the Manual and the Approved date shown below–is valid as of the date of this list, only if the original or renewal date shown hereon is within three (3) years of the date of this list. The responsibility to request a renewal of an Approval is that of each manufacturer. The Foundation retains the right of determining the extent of re-evaluation required before renewal is granted. Certificates of Approval are not recalled for the purpose of updating the effective date. This revision of date is only published via the current *List of Approved Backflow Prevention Assemblies.*

NOTICE REGARDING INSTALLATION:
Unless otherwise specified by the manufacturer all assemblies are to be installed on cold potable water applications - below 110°F. Also all of the assemblies listed are Approved for **INDICATED ORIENTATION ONLY** (Please see the legend below). Rotation of assemblies on either axis will invalidate the Foundation's Approval. Use of spare parts other than those of the original manufacturer invalidates the Approval. Rotation of shutoff valves of one bold hole only is permitted only for the 2 1/2" and larger flanged assemblies.

NOTICE REGARDING LEAD CONTENT:
In order to comply with recent lead-free requirements in California and other states, Foundation Approved assemblies which comply with the ≤ 0.25% lead requirement are indicated by a Y in the column **≤ 0.25%Pb.** More information on the California requirements may be found at: *http://www.dtsc.ca.gov/PollutionPrevention/LeadInPlumbing.cfm*

NOTICE REGARDING LIST UPDATES
The List of Approved Assemblies is printed annually in the first quarter of the year. Update notices are printed and sent to Members quarterly. The most recent changes to the List may be found on the Foundation's website. The web version of the List is updated each time a change is made.

The List is comprised of backflow prevention assemblies, which have successfully completed the laboratory and field evaluation phases of the Foundation's Approval Program. The backflow prevention assemblies are approved for a period of three years and this approval is subject to renewal.

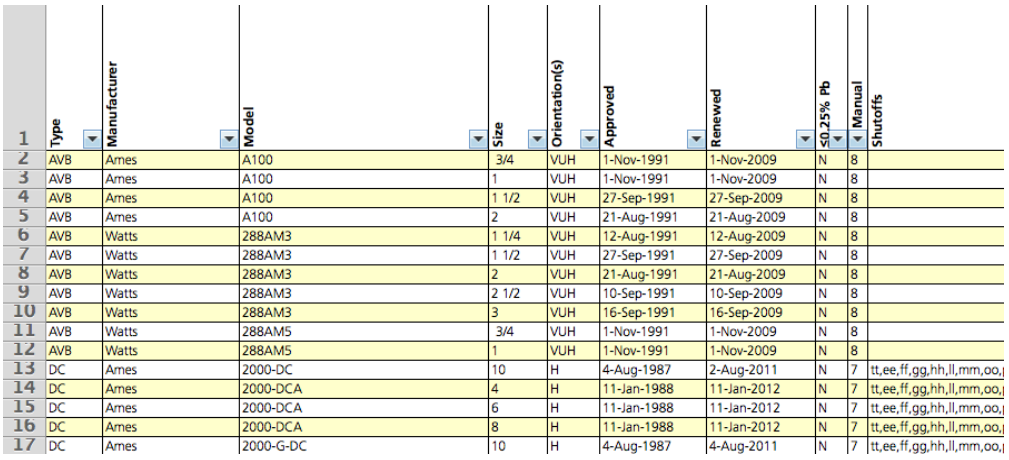
Each approved backflow prevention assembly is listed by the type of assembly, manufacturer's name, model, size, edition of the manual under which the assembly was approved, approval date, and the latest renewal date. The List also reflects assemblies no longer in production but for which spare parts are still available from the manufacturer.

All of the acceptable shutoff valves, which may be used as replacement shutoff valves, are listed with each approved assembly. The use of shutoff valves other than those listed invalidates the Foundation's approval. The listing of shutoff valves allows those in the field to replace one or both shutoff valves of a backflow preventer with any of the listed valves.

https://fccchr.usc.edu/list.html

The USC List is made available digitally in three formats; a sortable Excel format, PDF format and as a web app. The web app is designed for mobile devices and may not display properly on your desktop computer.

The USC List is also made available in printed format but does not include any additions after January 15, 2021. The 2021 USC List Book is available to anyone and is a great tool to have when access to the USC List online is not available.



	Type	Manufacturer	Model	Size	Orientation(s)	Approved	Renewed	≤0.25% Pb	Manual	Shutoffs
2	AVB	Ames	A100	3/4	VUH	1-Nov-1991	1-Nov-2009	N	8	
3	AVB	Ames	A100	1	VUH	1-Nov-1991	1-Nov-2009	N	8	
4	AVB	Ames	A100	1 1/2	VUH	27-Sep-1991	27-Sep-2009	N	8	
5	AVB	Ames	A100	2	VUH	21-Aug-1991	21-Aug-2009	N	8	
6	AVB	Watts	288AM3	1 1/4	VUH	12-Aug-1991	12-Aug-2009	N	8	
7	AVB	Watts	288AM3	1 1/2	VUH	27-Sep-1991	27-Sep-2009	N	8	
8	AVB	Watts	288AM3	2	VUH	21-Aug-1991	21-Aug-2009	N	8	
9	AVB	Watts	288AM3	2 1/2	VUH	10-Sep-1991	10-Sep-2009	N	8	
10	AVB	Watts	288AM3	3	VUH	16-Sep-1991	16-Sep-2009	N	8	
11	AVB	Watts	288AM5	3/4	VUH	1-Nov-1991	1-Nov-2009	N	8	
12	AVB	Watts	288AM5	1	VUH	1-Nov-1991	1-Nov-2009	N	8	
13	DC	Ames	2000-DC	10	H	4-Aug-1987	2-Aug-2011	N	7	tt,ee,ff,gg,hh,ll,mm,oo,
14	DC	Ames	2000-DCA	4	H	11-Jan-1988	11-Jan-2012	N	7	tt,ee,ff,gg,hh,ll,mm,oo,
15	DC	Ames	2000-DCA	6	H	11-Jan-1988	11-Jan-2012	N	7	tt,ee,ff,gg,hh,ll,mm,oo,
16	DC	Ames	2000-DCA	8	H	11-Jan-1988	11-Jan-2012	N	7	tt,ee,ff,gg,hh,ll,mm,oo,
17	DC	Ames	2000-G-DC	10	H	4-Aug-1987	4-Aug-2011	N	7	tt,ee,ff,gg,hh,ll,mm,oo,

The top of each column in the Excel version of the List can act as filters to filter the exact information needed. One can choose which type of assembly (DC, RP, DCDA, DCDA-II, RPDA-II, RPDA, AVB, PVB, or SVB) at the top of the column. Then only those particular assemblies show on the List. This can be printed and handed out to the customer. With the Excel version of the List, it is much easier to provide the end user with a narrowed down list of what is needed in any specific situation. For example, one could select the following: RP, Lead Free, 2", Vertical up inlet and vertical down outlet. This would generate a list of five acceptable assemblies. and distribute it to their end user.