

NOTES:

1. ALL BLOWOFF ASSEMBLIES SHALL BE TYPE K COPPER OR APPROVED EQUIVALENT.
2. SEE THRUST BLOCKING DETAIL FOR THRUST BLOCKING REQUIREMENTS.
3. KUFERLE FOUNDRY COMPANY MODEL #77 OR #78 MAINGUARD HYDRANT INSTALLED PER MANUFACTURER DETAIL MAY BE USED IN LIEU OF THE ASSEMBLY SHOWN HERE.
4. ALL BRASS AND BRONZE WATER SYSTEM COMPONENTS USED IN POTABLE WATER SUPPLY SYSTEMS, EXCEPT FOR SERVICE SADDLES, FIRE HYDRANTS, AND DISTRIBUTION MAIN GATE VALVES 2" IN DIAMETER OR LARGER, SHALL BE DEMONSTRATED TO HAVE BEEN TESTED AND CERTIFIED AS "LEAD-FREE" IN COMPLIANCE WITH THE REDUCTION OF LEAD IN DRINKING WATER ACT.

APPROVED
City of Oak Harbor
Engineering Dept.

Signature

6/30/2020

Date



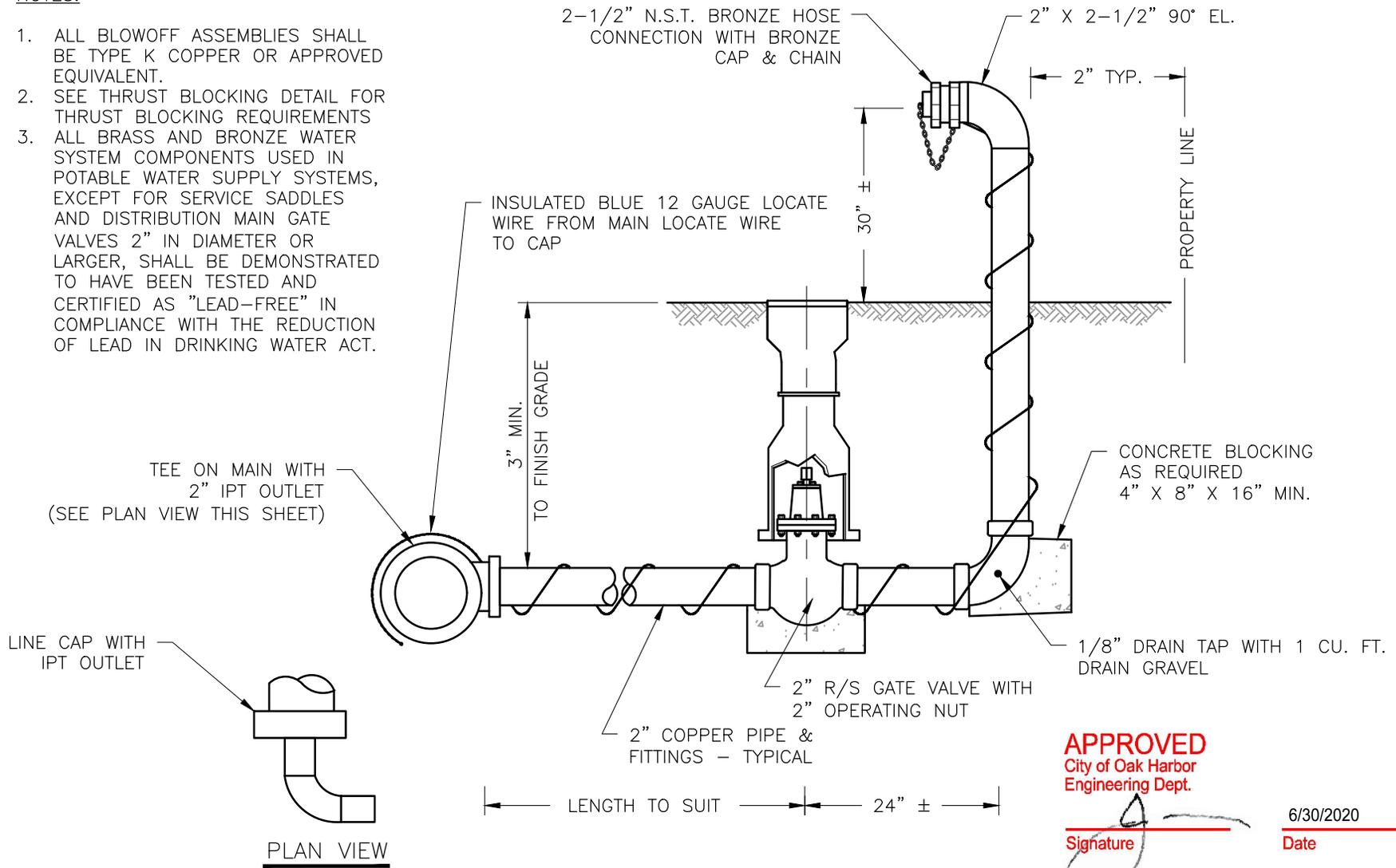
**City of
Oak Harbor**

ENGINEERING DEPARTMENT
865 SE Barrington Drive
Oak Harbor, WA 98277

**BLOWOFF ASSEMBLY
(PERMANENT)**

NOTES:

1. ALL BLOWOFF ASSEMBLIES SHALL BE TYPE K COPPER OR APPROVED EQUIVALENT.
2. SEE THRUST BLOCKING DETAIL FOR THRUST BLOCKING REQUIREMENTS
3. ALL BRASS AND BRONZE WATER SYSTEM COMPONENTS USED IN POTABLE WATER SUPPLY SYSTEMS, EXCEPT FOR SERVICE SADDLES AND DISTRIBUTION MAIN GATE VALVES 2" IN DIAMETER OR LARGER, SHALL BE DEMONSTRATED TO HAVE BEEN TESTED AND CERTIFIED AS "LEAD-FREE" IN COMPLIANCE WITH THE REDUCTION OF LEAD IN DRINKING WATER ACT.



APPROVED
City of Oak Harbor
Engineering Dept.

Signature

6/30/2020

Date

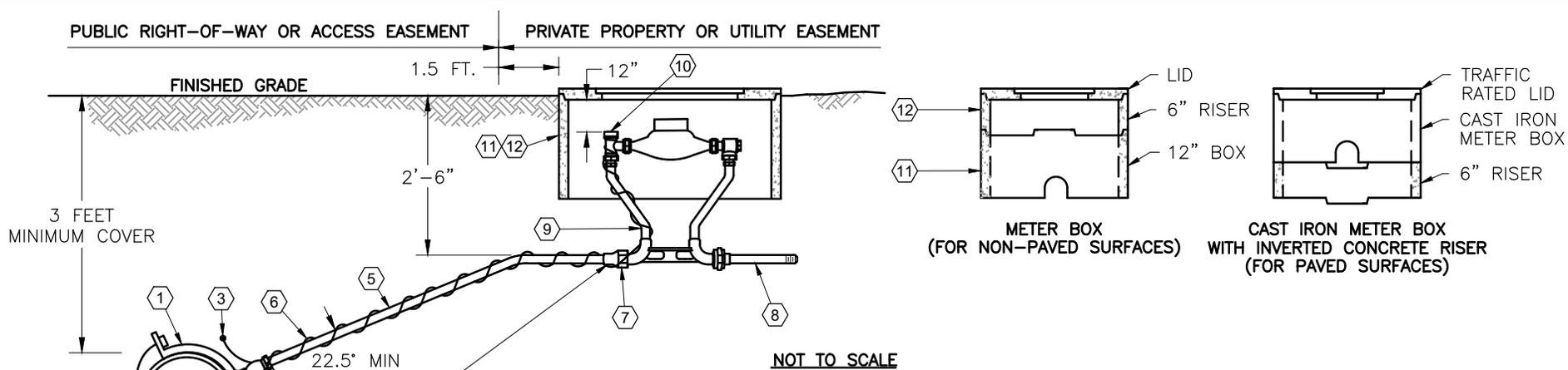


**City of
Oak Harbor**

ENGINEERING DEPARTMENT
865 SE Barrington Drive
Oak Harbor, WA 98277

**BLOWOFF ASSEMBLY
(TEMPORARY)**

ACAD-W-2Blow off Assembly Temp.dwg



NOT TO SCALE

NOTES:

1. CONTRACTORS SHALL USE THE MATERIAL LIST SHOWN. SUBSTITUTION REQUESTS WILL BE CONSIDERED BUT MUST BE APPROVED BY THE CITY PRIOR TO INSTALLATION.
- *2. AN OLYMPIC FOUNDRY SM-29 TRAFFIC BOX SHALL BE USED FOR METERS SET IN PAVED AREAS, DRIVEWAYS, SIDEWALKS, ETC.
3. ALL SETTERS SHALL BE SET FLUSH, PLUMB, AND CENTERED IN THE METER BOX.
4. INSTALL WATER SERVICE LINE PERPENDICULAR TO MAIN.
5. CORPORATION STOP TO BE IN FULL ON POSITION PRIOR TO PLACEMENT OF BACKFILL.
6. SERVICE LINE AND SETTER SHALL BE FLUSHED FOR 1-MINUTES. MUD, FOREIGN MATERIALS OR CONTAMINANTS SHALL NOT BE PERMITTED TO ENTER ANY TUBING OR FITTINGS.
7. A TIGHT FITTING CAP SHALL BE INSTALLED OVER OPEN END OF FITTING (MAKE WATER TIGHT) IF SERVICE CONNECTION IS NOT COMPLETE TO BUILDING.
8. WATER SERVICE FROM THE METER TO THE BUILDING SHALL BE INSTALLED IN ACCORDANCE WITH THE UNIFORM PLUMBING CODE (UPC).
9. BACK FLOW PREVENTION DEVICES SHALL BE INSTALLED FOR ALL IRRIGATION SERVICES AND WHERE NECESSARY TO PREVENT BACK FLOW CONTAMINATION OF THE CITY WATER SUPPLY.
10. METER BOXES SHALL BE SET ON A SAND BASE THAT IS PLACED TO WITHIN 18" OF FINISH GRADE.
11. SERVICE LINE SHALL HAVE A MINIMUM OF 4" DEPTH OF SAND BEDDING ABOVE AND BELOW THE PIPE.
12. TOP OF LID SHALL BE 2" ABOVE FINISHED GRADE EXCEPT WHEN IN HARD SURFACE.

SINGLE 5/8" X 3/4" METERED SERVICE

NO.	ITEM	DESCRIPTION	QUANTITY	PART NUMBER	BRAND
①	SADDLE	ALL BRASS BY 1" IPT TAP	1	S91-SERIES / 202B SERIES	FORD
②	CORP STOP	1" IPT (M) X 1" CTS "Q"	1	F-1100-4-Q-NL	FORD
③	WIRE CONNECTOR	3-WAY SEALED/TAPE	1	903 / 6147	IBS
④	STIFFENERS	SS FOR 1" CTS MUNICIPEX	2	# 6133T	
⑤	PIPE	1" CTS PEX PIPE	AS NEEDED	MUNICIPEX	REHAU
⑥	LOCATE WIRE	12 GAUGE COPPER, BLUE	AS NEEDED		
⑦	ADAPTER	3/4" IPT (M) X 1" CTS "Q"	1	C84-34-Q-NL	FORD
⑧	NIPPLE	3/4" X 12" BRASS	1	3007N120	
⑨	METER SETTER	3/4" 18" W/ DBL CHECK	1	VHH72-18W-1133-NL	FORD
⑩	METER LOCK	FIRAMATIC METER LOCK	1		
⑪	METER BOX *	CONC W/ STEEL READER	1	#1 CONCRETE LID W/ STEEL READER	BERG VLT
⑫	METER BOX RISER	6" CONCRETE	1	#1	BERG VLT

NOTE: DETAIL IS SCHEMATIC. ACTUAL ITEM SPECIFIED IN MATERIAL LIST MAY VARY IN STYLE OR APPEARANCE.

APPROVED
City of Oak Harbor
Engineering Dept.

Signature

6/30/2020

Date

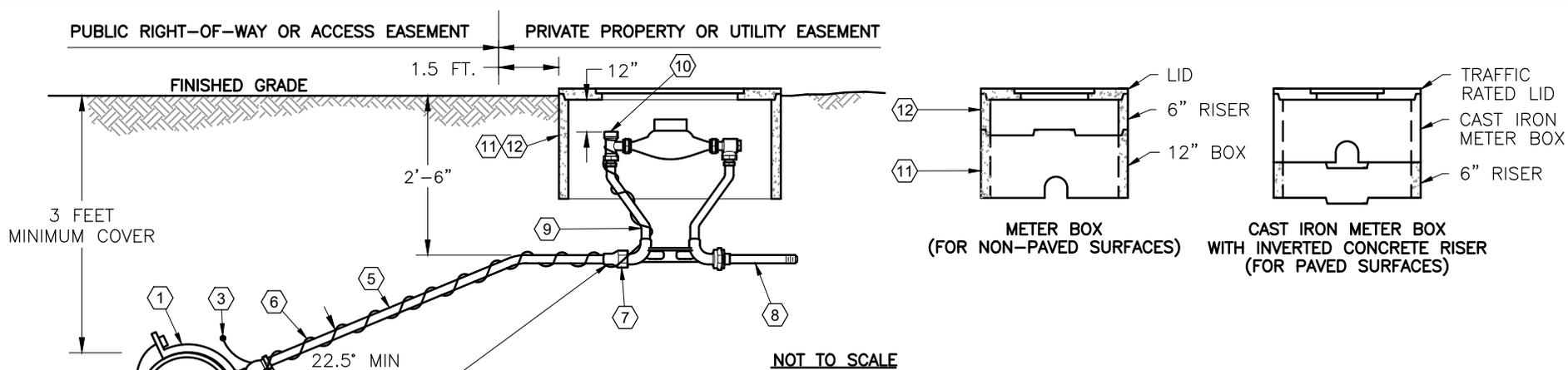


City of
Oak Harbor

ENGINEERING DEPARTMENT
865 SE Barrington Drive
Oak Harbor, WA 98277

SINGLE WATER SERVICE
5/8 X 3/4-INCH METER

ACAD-W-3A 5_8 X 3_4-inch water meter.dwg



NOT TO SCALE

NOTES:

1. CONTRACTORS SHALL USE THE MATERIAL LIST SHOWN. SUBSTITUTION REQUESTS WILL BE CONSIDERED BUT MUST BE APPROVED BY THE CITY PRIOR TO INSTALLATION.
- *2. AN OLYMPIC FOUNDRY SM-29 TRAFFIC BOX SHALL BE USED FOR METERS SET IN PAVED AREAS, DRIVEWAYS, SIDEWALKS, ETC.
3. ALL LINE SETTERS SHALL BE SET FLUSH, PLUMB, AND CENTERED IN THE METER BOX.
4. INSTALL WATER SERVICE LINE PERPENDICULAR TO MAIN.
5. CORPORATION STOP TO BE IN FULL ON POSITION PRIOR TO PLACEMENT OF BACKFILL.
6. SERVICE LINE AND SETTER SHALL BE FLUSHED FOR 1-MINUTE. MUD, FOREIGN MATERIALS OR CONTAMINANTS SHALL NOT BE PERMITTED TO ENTER ANY TUBING OR FITTINGS.
7. A TIGHT FITTING PLUG SHALL BE INSTALLED OVER OPEN END OF FITTING (MAKE WATER TIGHT) IF SERVICE CONNECTION IS NOT COMPLETE TO BUILDING.
8. WATER SERVICE FROM THE METER TO THE BUILDING SHALL BE INSTALLED IN ACCORDANCE WITH THE UNIFORM PLUMBING CODE (UPC).
9. BACK FLOW PREVENTION DEVICES SHALL BE INSTALLED FOR ALL IRRIGATION SERVICES AND WHERE NECESSARY TO PREVENT BACK FLOW CONTAMINATION OF THE CITY WATER SUPPLY.
10. METER BOXES SHALL BE SET ON A SAND BASE THAT IS PLACED TO WITHIN 18" OF FINISH GRADE.
11. SERVICE LINE SHALL HAVE A MINIMUM OF 4" DEPTH OF SAND BEDDING ABOVE AND BELOW THE PIPE.
12. TOP OF LID SHALL BE 2" ABOVE FINISHED GRADE EXCEPT WHEN IN HARD SURFACE.

APPROVED
City of Oak Harbor
Engineering Dept.

Signature

6/30/2020

Date

SINGLE 1" METERED SERVICE					
NO.	ITEM	DESCRIPTION	QUANTITY	PART NUMBER	BRAND
1	SADDLE	ALL BRASS BY 1" IPT TAP	1	S91-SERIES / 202B SERIES	FORD
2	CORP STOP	1" CTS (M) X PEX GJ	1	F-1100-4G-NL	FORD
3	WIRE CONNECTOR	3-WAY SEALED/TAPE	1	903 / 6147	IBS
4	STIFFENERS	1" 6133T CTS INSERT SS	2	# 6133T	
5	PIPE	1" CTS PEX PIPE	AS NEEDED	MUNICPEX	REHAU
6	LOCATE WIRE	12 GAUGE COPPER, BLUE	AS NEEDED		
7	ADAPTER	1"(M) IPT X 1" IPS PEP GJ	1	C86-44-G-NL	FORD
8	NIPPLE	1" IPT X IPT X 12" BRASS	1	3010N120	
9	METER SETTER	1" IPT X IPT X 18" W/ DBL CHECK	1	VHH72-18W-11-44	FORD
10	METER LOCK	FIRAMATIC METER LOCK	1		
11	METER BOX *	CONC W/ STEEL READER	1	#3 CONCRETE LID W/ STEEL READER	BERG VLT
12	METER BOX RISER	6" CONCRETE	1	#3	BERG VLT

NOTE: DETAIL IS SCHEMATIC. ACTUAL ITEM SPECIFIED IN MATERIAL LIST MAY VARY IN STYLE OR APPEARANCE.

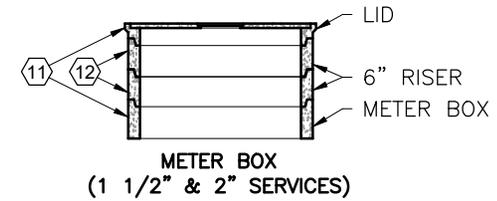
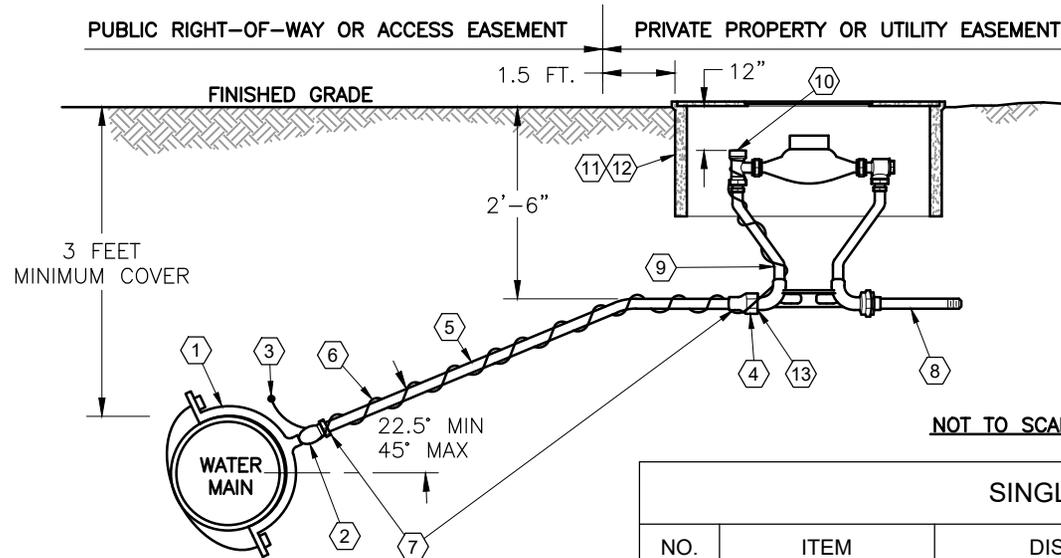


**City of
Oak Harbor**

ENGINEERING DEPARTMENT
865 SE Barrington Drive
Oak Harbor, WA 98277

**SINGLE WATER SERVICE
1-INCH METER**

ACAD-W-3B 1-inch water meter.dwg



NOT TO SCALE

SINGLE 1 1/2" METERED SERVICE

NO.	ITEM	DISCRIPTION	QUANTITY	PART NUMBER	BRAND
①	SADDLE	ALL BRASS BY 2" IPT TAP	1	S91-SERIES / 202B SERIES	FORD
②	CORP STOP	2" IPT (M) X PEP GJ	1	FB-500-7-NL	FORD
③	WIRE CONNECTOR	3-WAY SEALED/TAPE	1	903 / 6147	IBS
④	BUSHING	2" IPT X 1 1/2" IPT BRASS	1		
⑤	PIPE	2" TYPE K COPPER	AS NEEDED	TYPE "K"	
⑥	LOCATE WIRE	12 GAUGE COPPER, BLUE	AS NEEDED		
⑦	ADAPTER	2"(F) IPT X 2" CTS GJ	2	C14-77-G-NL	FORD
⑧	NIPPLE	1 1/2" IPT X IPT X 12" BRASS	1	SCH-40 B-43	
⑨	METER SETTER	1 1/2" IPT X IPT X 12" W/ DBL CHECK AND HIGH BYPASS	1	VBHH76-12HB-11-66-NL	FORD
⑩	METER LOCK	FIRAMATIC METER LOCK	2		
⑪	METER BOX *	CONC W/ STEEL READER	1	#2 CONCRETE LID W/ STEEL READER	BERG VLT
⑫	METER BOX RISER	6" CONCRETE	2	#2	BERG VLT
⑬	NIPPLE	1 1/2" IPT CLOSE NIPPLE	1	3015N120	

NOTE: FOR 1 1/2" IRRIGATION SERVICE, SUBSTITUTE VB76-12-1166 FOR METER SETTER PART NUMBER ABOVE. DETAIL IS SCHEMATIC. ACTUAL ITEM SPECIFIED IN MATERIAL LIST MAY VARY IN STYLE OR APPEARANCE.

NOTES:

- CONTRACTORS SHALL USE THE MATERIAL LIST SHOWN. SUBSTITUTION REQUESTS WILL BE CONSIDERED BUT MUST BE APPROVED BY THE CITY PRIOR TO INSTALLATION.
- *AN OLYMPIC FOUNDRY SM-30 TRAFFIC BOX SHALL BE USED FOR METERS SET IN PAVED AREAS, DRIVEWAY, SIDEWALK, ETC.
- ALL LINE SETTERS SHALL BE SET FLUSH, PLUMB, AND CENTERED IN THE METER BOX.
- INSTALL WATER SERVICE LINE PERPENDICULAR TO MAIN.
- CORPORATION STOP TO BE IN FULL ON POSITION PRIOR TO PLACEMENT OF BACKFILL.
- SERVICE LINE AND SETTER SHALL BE FLUSHED FOR 1-MINUTE. MUD, FOREIGN MATERIALS OR CONTAMINANTS SHALL NOT BE PERMITTED TO ENTER ANY TUBING OR FITTINGS.
- A TIGHT FITTING PLUG SHALL BE INSTALLED OVER OPEN END OF FITTING (MAKE WATER TIGHT) IF SERVICE CONNECTION IS NOT COMPLETE TO BUILDING.
- WATER SERVICE FROM THE METER TO THE BUILDING SHALL BE INSTALLED IN ACCORDANCE WITH THE UNIFORM PLUMBING CODE (UPC).
- BACK FLOW PREVENTION DEVICES SHALL BE INSTALLED FOR ALL IRRIGATION SERVICES AND WHERE NECESSARY TO PREVENT BACK FLOW CONTAMINATION OF THE CITY WATER SUPPLY.
- METER BOXES SHALL BE SET ON A SAND BASE THAT IS PLACED TO WITHIN 18" OF FINISH GRADE.
- SERVICE LINE SHALL HAVE A MINIMUM OF 4" DEPTH OF SAND BEDDING ABOVE AND BELOW THE PIPE.
- TOP OF LID SHALL BE 2" ABOVE FINISHED GRADE EXCEPT WHEN IN HARD SURFACE.

APPROVED
City of Oak Harbor
Engineering Dept.

Signature

6/30/2020

Date

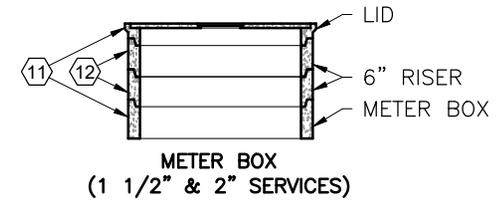
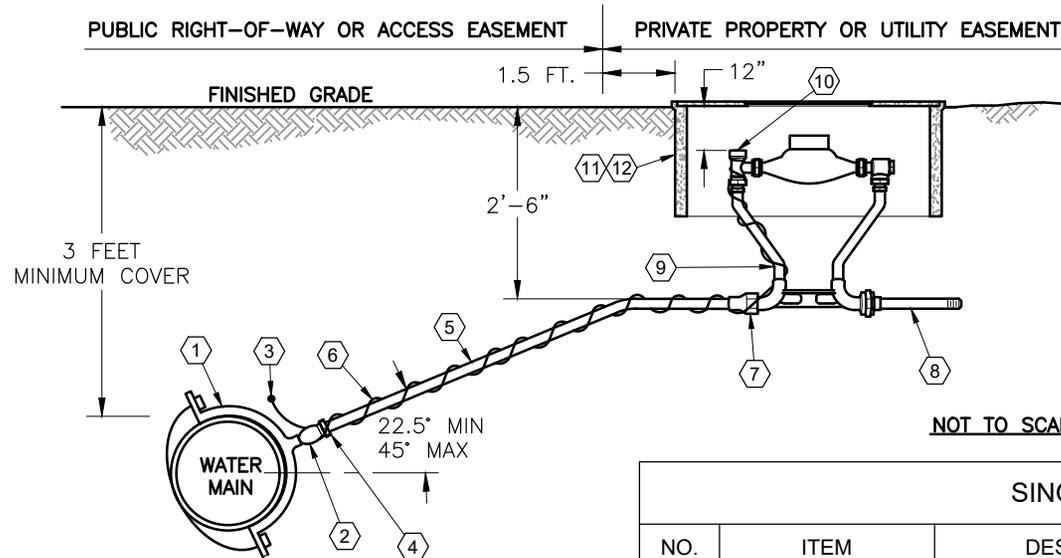


City of
Oak Harbor

ENGINEERING DEPARTMENT
865 SE Barrington Drive
Oak Harbor, WA 98277

SINGLE WATER SERVICE
1.5 INCH METER

ACAD-W-3C 1.5 inch water meter.dwg



NOT TO SCALE

NOTES:

1. CONTRACTORS SHALL USE THE MATERIAL LIST SHOWN. SUBSTITUTION REQUESTS WILL BE CONSIDERED BUT MUST BE APPROVED BY THE CITY PRIOR TO INSTALLATION.
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12. TOP OF LID SHALL BE 2" ABOVE FINISHED GRADE EXCEPT WHEN IN HARD SURFACE.

APPROVED
City of Oak Harbor
Engineering Dept.

Signature

6/30/2020

Date

SINGLE 2" METERED SERVICE					
NO.	ITEM	DESCRIPTION	QUANTITY	PART NUMBER	BRAND
1	SADDLE	ALL BRASS BY 2" IPT TAP	1	S91-SERIES / 202B SERIES	FORD
2	CORP STOP	2" IPT (M) X IPT (M)	1	FB-500-7-NL	FORD
3	WIRE CONNECTOR	3-WAY SEALED/TAPE	1	903 / 6147	IBS
4	ADAPTER	2" IPT (F) X 2" COPPER GJ	1	C14-77-G-NL	FORD
5	PIPE	2" TYPE K COPPER	AS NEEDED	TYPE "K"	
6	LOCATE WIRE	12 GAUGE COPPER, BLUE	AS NEEDED		
7	ADAPTER	2" IPT M X 2" COPPER GJ	1	C84-77-G-NL	FORD
8	NIPPLE	2" IPT X IPT X 12" BRASS	1	SCH-40 B-43	
9	METER SETTER	2" IPT X IPT X 12" W/ DBL CHECK AND HIGH BYPASS	1	VBHH77-12HB-11-77-NL	FORD
10	METER LOCK	FIRAMATIC METER LOCK	2		
11	METER BOX *	CONC W/ STEEL READER	1	#2 CONCRETE LID W/ STEEL READER	BERG VLT
12	METER BOX RISER	6" CONCRETE	2	#2	BERG VLT

NOTE: FOR 2" IRRIGATION SERVICE, SUBSTITUTE VB77-12-1177 FOR METER SETTER PART NUMBER ABOVE. DETAIL IS SCHEMATIC. ACTUAL ITEM SPECIFIED IN MATERIAL LIST MAY VARY IN STYLE OR APPEARANCE.

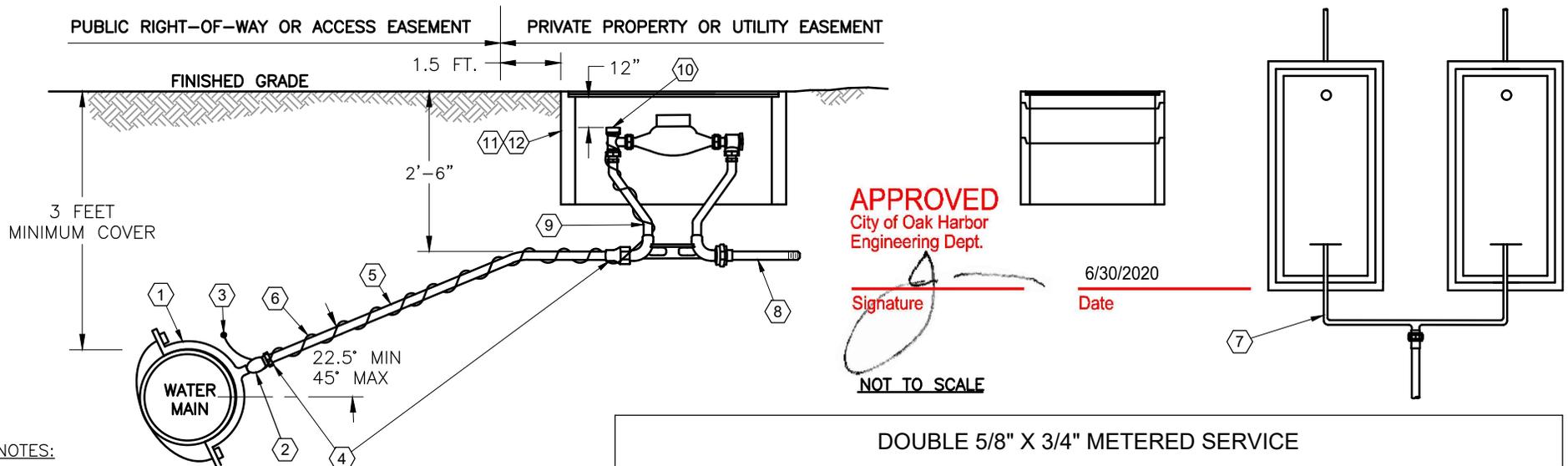


City of
Oak Harbor

ENGINEERING DEPARTMENT
865 SE Barrington Drive
Oak Harbor, WA 98277

SINGLE WATER SERVICE
2-INCH METER

ACAD-W-3D 2-inch water meter.dwg



APPROVED
City of Oak Harbor
Engineering Dept.

Signature _____
Date 6/30/2020

NOT TO SCALE

NOTES:

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- *2. AN OLYMPIC FOUNDRY SM-29 TRAFFIC BOX SHALL BE USED FOR METERS SET IN PAVED AREAS, DRIVEWAYS, SIDEWALKS, ETC.
3. ALL LINE SETTERS SHALL BE SET FLUSH, PLUMB, AND CENTERED IN THE METER BOXES.
4. INSTALL WATER SERVICE LINE PERPENDICULAR TO MAIN.
5. CORPORATION STOP TO BE IN FULL ON POSITION PRIOR TO PLACEMENT OF BACKFILL.
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7. A TIGHT FITTING PLUG SHALL BE INSTALLED OVER OPEN END OF FITTING (MAKE WATER TIGHT) IF SERVICE CONNECTIONS ARE NOT COMPLETE TO BUILDING.
8. WATER SERVICES FROM THE METERS TO THE BUILDING SHALL BE INSTALLED IN ACCORDANCE WITH THE UNIFORM PLUMBING CODE (UPC).
9. ALL MANIFOLD METERS SHALL BE APPROVED BY THE CITY ENGINEER PRIOR TO INSTALLATION.
10. BACK FLOW PREVENTION DEVICES SHALL BE INSTALLED FOR ALL IRRIGATION SERVICES AND WHERE NECESSARY TO PREVENT BACK FLOW CONTAMINATION OF THE CITY WATER SUPPLY.
11. METER BOXES SHALL BE SET ON A SAND BASE THAT IS PLACED TO WITHIN 18" OF FINISH GRADE.
12. SERVICE LINE SHALL HAVE A MINIMUM OF 4" DEPTH OF SAND BEDDING ABOVE AND BELOW THE PIPE.

DOUBLE 5/8" X 3/4" METERED SERVICE					
NO.	ITEM	DESCRIPTION	QUANTITY	PART NUMBER	BRAND
①	SADDLE	ALL BRASS BY 1" IPT TAP	1	S91-SERIES / 202B SERIES	FORD
②	CORP STOP	1" IPT (M) X PEP GJ	1	F-1101-4G-NL	FORD
③	WIRE CONNECTOR	3-WAY SEALED/TAPE	1	903 / 6147	IBS
④	STIFFENERS	SS INSERT FOR 1" PEP IPS PIPE	2	# 72	
⑤	PIPE	1" IRON PIPE SIZE PEP 200PSI	AS NEEDED	PE3408	
⑥	LOCATE WIRE	12 GAUGE COPPER, BLUE	AS NEEDED		
⑦	U BRANCH	1" IPS PEP GJ X (2)IPT M X 14"	1	U68-43-14-NL	FORD
⑧	NIPPLE	3/4" IPT X IPT X 12" BRASS	2	3007N120	
⑨	METER SETTER	3/4" IPT X IPT X 18" W/ DBL CHECK	2	VHH72-18W-11-33-NL	FORD
⑩	METER LOCK	FIRAMATIC METER LOCK	2		
⑪	METER BOX *	CONC W/ STEEL READER	2	#1 W/ STL RDR, CONC LID	BERG VLT
⑫	METER BOX RISER	6" CONCRETE	2	#1	BERG VLT

NOTE: DETAIL IS SCHEMATIC. ACTUAL ITEM SPECIFIED IN MATERIAL LIST MAY VARY IN STYLE OR APPEARANCE.

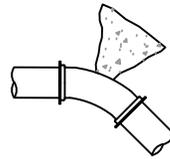


City of Oak Harbor
ENGINEERING DEPARTMENT
865 SE Barrington Drive
Oak Harbor, WA 98277

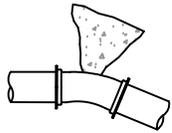
**MANIFOLD WATER SERVICE
5/8" METER**



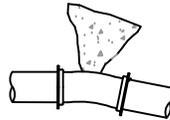
90° BEND



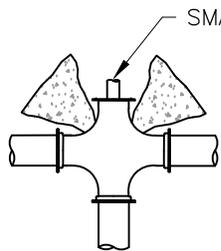
45° BEND



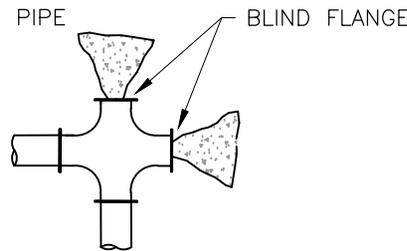
22 1/2° BEND



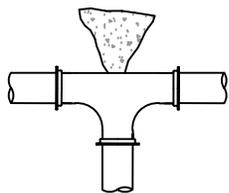
11 1/4° BEND



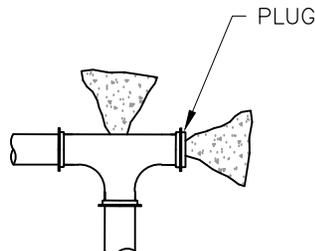
CROSS



CAPPED CROSS



TEE



TEE

BEARING AREA OF BLOCK IN SQUARE FEET

FITTING SIZE (INCHES)	TEES & PIPE ENDS	90 BEND	45 BEND	22-1/2 BEND	11-1/4 BEND
100 PSF SOIL BEARING CAPACITY					
3	1.8	2.5	1.4	1.0	1.0
4	3.2	4.5	2.4	1.3	1.0
6	7.1	10.0	5.5	2.8	1.4
8	12.6	17.8	9.7	4.9	2.5
10	19.7	27.8*	15.1	7.7	3.9
12	28.3*	40.0*	21.7	11.1	5.6
14	38.5*	54.5*	29.5*	15.1	7.6
16	50.3*	71.1*	38.5*	19.7	9.9
2500 PSF SOIL BEARING CAPACITY					
3	1.0	1.0	1.0	1.0	1.0
4	1.3	1.8	1.0	1.0	1.0
6	2.9	4.0	2.2	1.1	1.0
8	5.1	7.2	3.9	2.0	1.0
10	7.9	11.2	6.1	3.1	1.6
12	11.4	16.0	8.7	4.5	2.3
14	15.4	21.8	11.8	6.1	3.1
16	20.2	28.5*	15.4	7.9	4.0

* MAXIMUM BEARING AREA ALLOWED IS 25 SQ.FT. BEARING AREA MAY BE REDUCED BY USING RESTRAINED JOINT PIPE OR BY CONDUCTING SOILS TESTS.

NOTES:

1. BLOCK HEIGHT SHALL BE EQUAL OR LESS THAN ONE HALF OF THE TOTAL DEPTH FROM GROUND SURFACE TO BLOCK BASE.
2. BLOCK SIZE BASED ON 250 PSI WATER PRESSURE AND 2500 PSI CONCRETE.
3. CONTRACTOR SHALL USE PLASTIC SHEETING TO PREVENT CONTACT BETWEEN PIPE FITTINGS, BOLTS AND CONCRETE BLOCKING.
4. NO BLOCKING MAY BE COVERED WITHOUT PERMISSION OF THE ENGINEER.
5. PIPE JOINT RESTRAINING SYSTEMS MUST BE APPROVED BY THE CITY ENGINEER PRIOR TO INSTALLATION.

APPROVED
City of Oak Harbor
Engineering Dept.

Signature

6/30/2020

Date

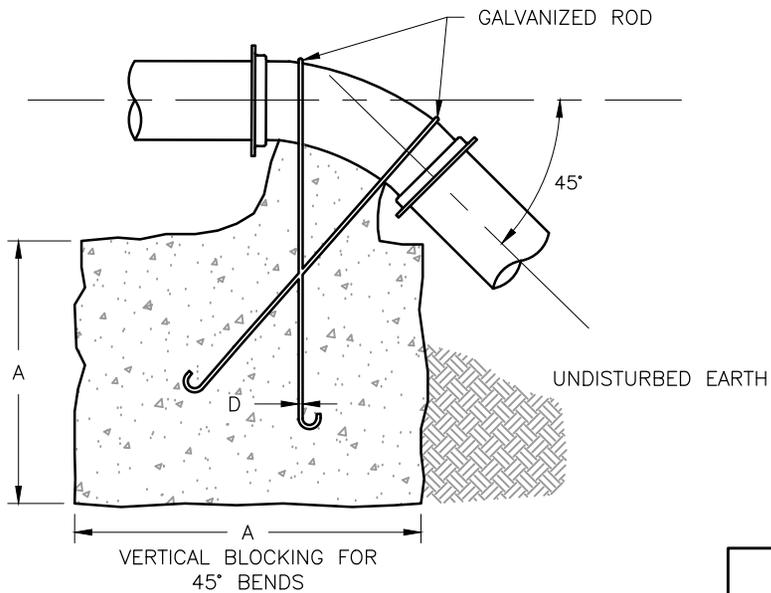
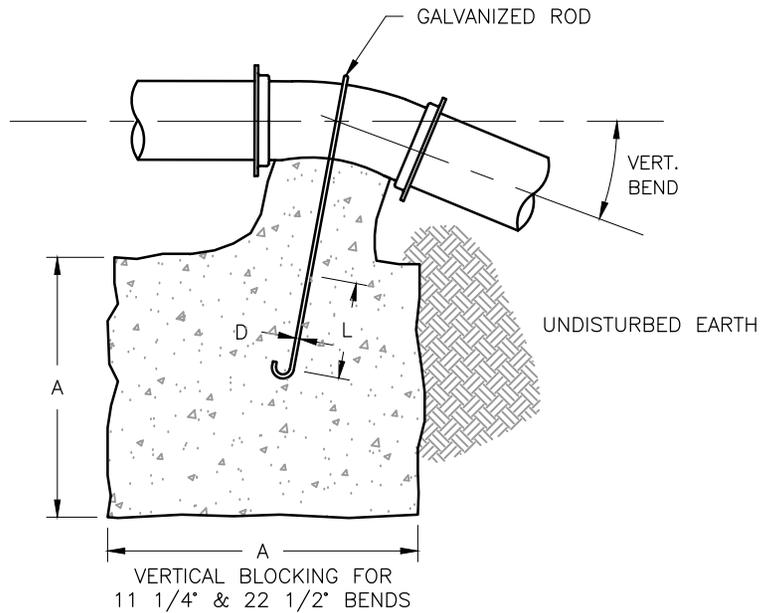


City of Oak Harbor

ENGINEERING DEPARTMENT
865 SE Barrington Drive
Oak Harbor, WA 98277

**THRUST BLOCKING
(HORIZONTAL)**

ACAD-W-4Horizontal Thrust Blocking.dwg



VERTICAL BLOCKING FOR 11-1/4° & 22-1/2° BENDS

FITTING SIZE	BENDS	VOL. (CU. FT.)	A	D	L
4	11-1/4°	8	2.0'	3/4"	1.5'
	22-1/2°	11	2.2'	3/4"	2.0'
6	11-1/4°	11	2.2'	3/4"	2.0'
	22-1/2°	25	2.9'	3/4"	2.0'
8	11-1/4°	16	2.5'	3/4"	2.0'
	22-1/2°	47	3.6'	3/4"	2.0'
12	11-1/4°	32	3.2'	3/4"	2.0'
	22-1/2°	88	4.5'	7/8"	3.0'
16	11-1/4°	70	4.1'	7/8"	3.0'
	22-1/2°	184	5.7'	1-1/8"	4.0'
20	11-1/4°	91	4.5'	7/8"	3.0'
	22-1/2°	225	6.1'	1-1/4"	4.0'
24	11-1/4°	128	5.0'	1"	3.5'
	22-1/2°	320	6.8'	1-3/8"	4.5'

VERTICAL BLOCKING FOR 45° BENDS

FITTING SIZE	BENDS	VOL. (CU. FT.)	A	D	L
4	45°	30	3.1'	3/4"	2.0
6	45°	68	4.1'	3/4"	2.0
8	45°	123	5.0'	3/4"	2.0
12	45°	232	6.1'	3/4"	2.5
16	45°	478	7.8'	1-1/8"	4.0
20	45°	560	8.2'	1-1/4"	4.0
24	45°	820	9.4'	1-3/8"	4.5

NOTES:

1. BLOCK HEIGHT SHALL BE EQUAL OR LESS THAN ONE HALF OF THE TOTAL DEPTH FROM GROUND SURFACE TO BLOCK BASE.
2. BLOCK SIZE BASED ON 250 PSI WATER PRESSURE AND 2500 PSI CONCRETE.
3. CONTRACTOR SHALL USE PLASTIC SHEETING TO PREVENT CONTACT BETWEEN PIPE FITTINGS, BOLTS AND CONCRETE BLOCKING.
4. NO BLOCKING MAY BE COVERED WITHOUT PERMISSION OF THE ENGINEER.
5. PIPE JOINT RESTRAINING SYSTEMS MUST BE APPROVED BY THE CITY ENGINEER PRIOR TO INSTALLATION.

APPROVED
City of Oak Harbor
Engineering Dept.

Signature _____

Date 6/30/2020

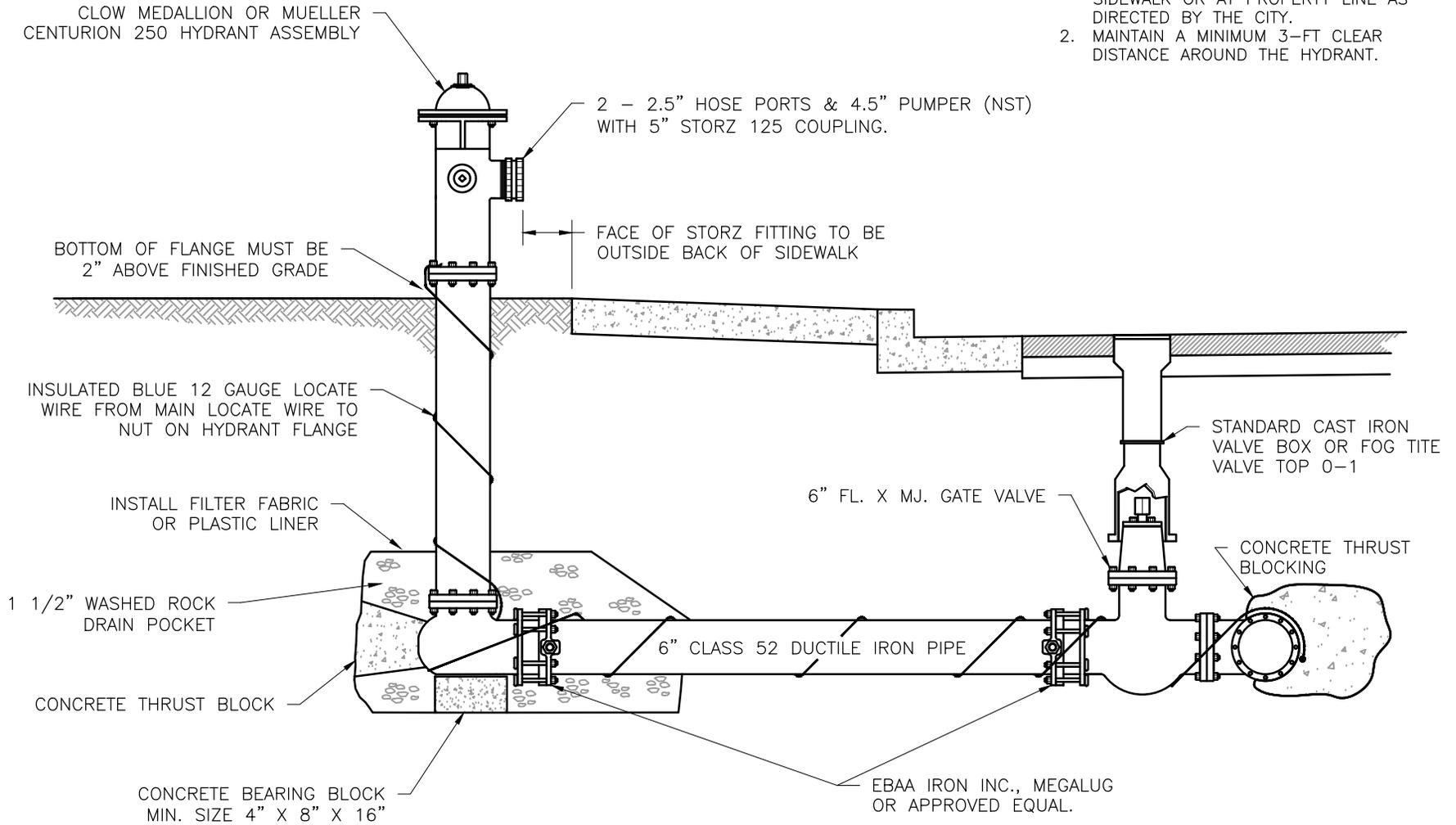


**City of
Oak Harbor**
ENGINEERING DEPARTMENT
865 SE Barrington Drive
Oak Harbor, WA 98277

**THRUST BLOCKING
(VERTICAL)**

NOTES:

1. HYDRANT TO BE LOCATED BEHIND SIDEWALK OR AT PROPERTY LINE AS DIRECTED BY THE CITY.
2. MAINTAIN A MINIMUM 3-FT CLEAR DISTANCE AROUND THE HYDRANT.



APPROVED
 City of Oak Harbor
 Engineering Dept.

 Signature

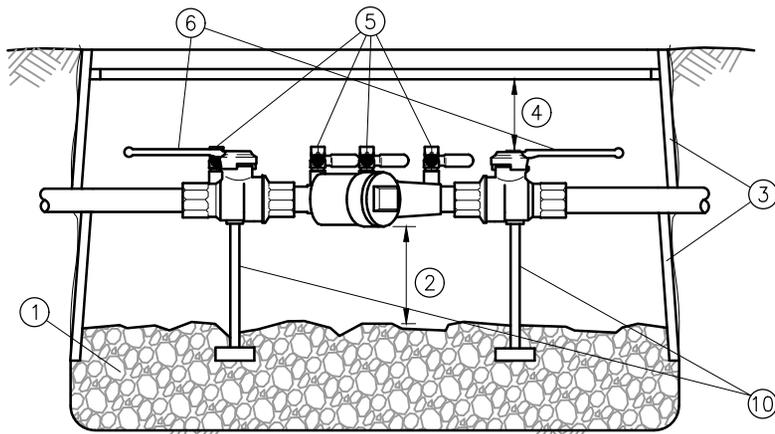
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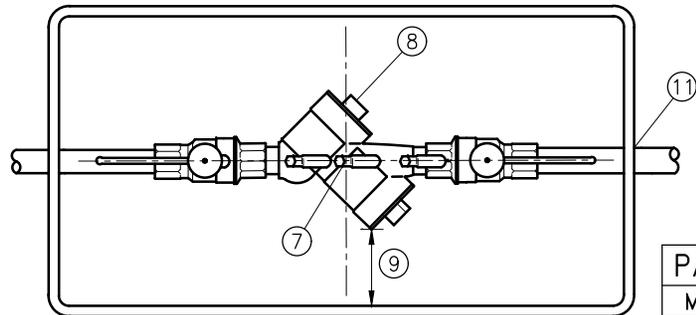


**City of
 Oak Harbor**
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 865 SE Barrington Drive
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**FIRE HYDRANT
 ASSEMBLY**



SECTION



NOTES:

- ① IF DAYLIGHT DRAIN SYSTEM CANNOT BE PROVIDED THEN INSTALL A 6" MINIMUM LAYER OF 1" ROUND WASHED GRAVEL AT THE BOTTOM OF THE BOX.
- ② MINIMUM OF 6" BETWEEN LOWEST POINT OF DEVICE AND DRAIN ROCK.
- ③ TWO NO. 2 METER BOXES STACKED ON TOP OF EACH OTHER OR APPROVED EQUAL. MINIMUM 14" X 20" LID OPENING.
- ④ MINIMUM OF 6" AND A MAXIMUM OF 12" DISTANCE BETWEEN UNDERSIDE OF LID AND HIGHEST POINT OF THE DEVICE.
- ⑤ THE DEVICE MUST BE EQUIPPED WITH FOUR RESILIENT SEATED TEST COCKS WITH PLUGS INSTALLED. THE ASSEMBLY MUST ALSO BE INSTALLED WITH THE TEST COCKS FACING UP OR TO ONE SIDE. PLUGS SHALL BE THREADED BRASS.
- ⑥ THE DEVICE MUST ALSO BE EQUIPPED WITH TWO RESILIENT SEATED SHUT OFF VALVES.
- ⑦ CENTER DEVICE IN BOX.
- ⑧ Y-PATTERN D.C.V.A. SHOULD BE INSTALLED ON SIDE WITH TESTCOCKS FACING UPWARDS.
- ⑨ A MINIMUM DISTANCE OF 6" IS REQUIRED BETWEEN THE SIDE OF THE BOX AND THE TEST COCKS WHEN THEY ARE INSTALLED SIDE WAYS.
- ⑩ SUPPORTS WILL BE REQUIRED ON 2" AND LARGER DEVICES AS SHOWN.
- ⑪ SEAL PIPE CUTOUTS AND UNDERLAY DRAIN ROCK WITH WEED CONTROL FABRIC OR POLYETHYLENE TO PREVENT SOIL INTRUSION.

GENERAL REQUIREMENTS:

1. THE D.C.V.A CHOSEN MUST BE ON THE MOST RECENT WASHINGTON STATE APPROVAL LISTING.
2. THE D.C.V.A. MUST BE TESTED BY A WASHINGTON STATE CERTIFIED BACKFLOW ASSEMBLY TESTER AT THE TIME OF INSTALLATION, ANNUALLY, AND WHEN MOVED OR REPAIRED.
3. ALL INSTALLATION MUST MEET MANUFACTURES SPECIFICATIONS AND THE MINIMUM STANDARDS OF THE U.P.C.
4. INSTALLATION INSPECTION BY CITY OF OAK HARBOR IS REQUIRED BEFORE WATER SERVICE IS ACTIVATED.
5. ALL BRASS AND BRONZE WATER SYSTEM COMPONENTS USED IN POTABLE WATER SUPPLY SYSTEMS, EXCEPT FOR SERVICE SADDLES, FIRE HYDRANTS, AND DISTRIBUTION MAIN GATE VALVES 2" IN DIAMETER OR LARGER, SHALL BE DEMONSTRATED TO HAVE BEEN TESTED AND CERTIFIED AS "LEAD-FREE" IN COMPLIANCE WITH THE REDUCTION OF LEAD IN DRINKING WATER ACT.

PARTIAL LISTING OF STATE APPROVED DOUBLE CHECK VALVE ASSEMBLIES

MAKE	MODEL	SIZES	SHUTOFFS
WATTS	U007M1QT	3/4" OR 1"	- WATTS FIGURE FBV (FBV-E)-QT OR WATTS SERIES 6080 (& 6080-E)-QT
WATTS	950XL	3/4"	- FORTUNE FIGURE 620-QT (FORMERLY FIGURE 601 PRIVATE LABELED AS: AMES, BUCKNER, FEBCO, FLOMATIC, HERSEY AND WILKINS) - NIGBO BALL VALVES (FEBCO SERIES 622-QT & WILKINS SERIES 855-QT)
WILKINS	975XL	3/4", 1", 1 1/2", OR 2"	- FORTUNE FIGURE 620-QT (FORMERLY FIGURE 601 PRIVATE LABELED AS: AMES, BUCKNER, FEBCO, FLOMATIC, HERSEY AND WILKINS) - NIGBO BALL VALVES (FEBCO SERIES 622-QT & WILKINS SERIES 855-QT)
WILKINS	975XL	1 1/4"	- FORTUNE FIGURE 620-QT (FORMERLY FIGURE 601 PRIVATE LABELED AS: AMES, BUCKNER, FEBCO, FLOMATIC, HERSEY AND WILKINS) - FORTUNE FIGURE 620U-QT
WATTS	995QT	3/4", 1", 1 1/4", OR 1 1/2"	- SHUTOFF VALVE IS INTEGRAL PART OF ASSEMBLY



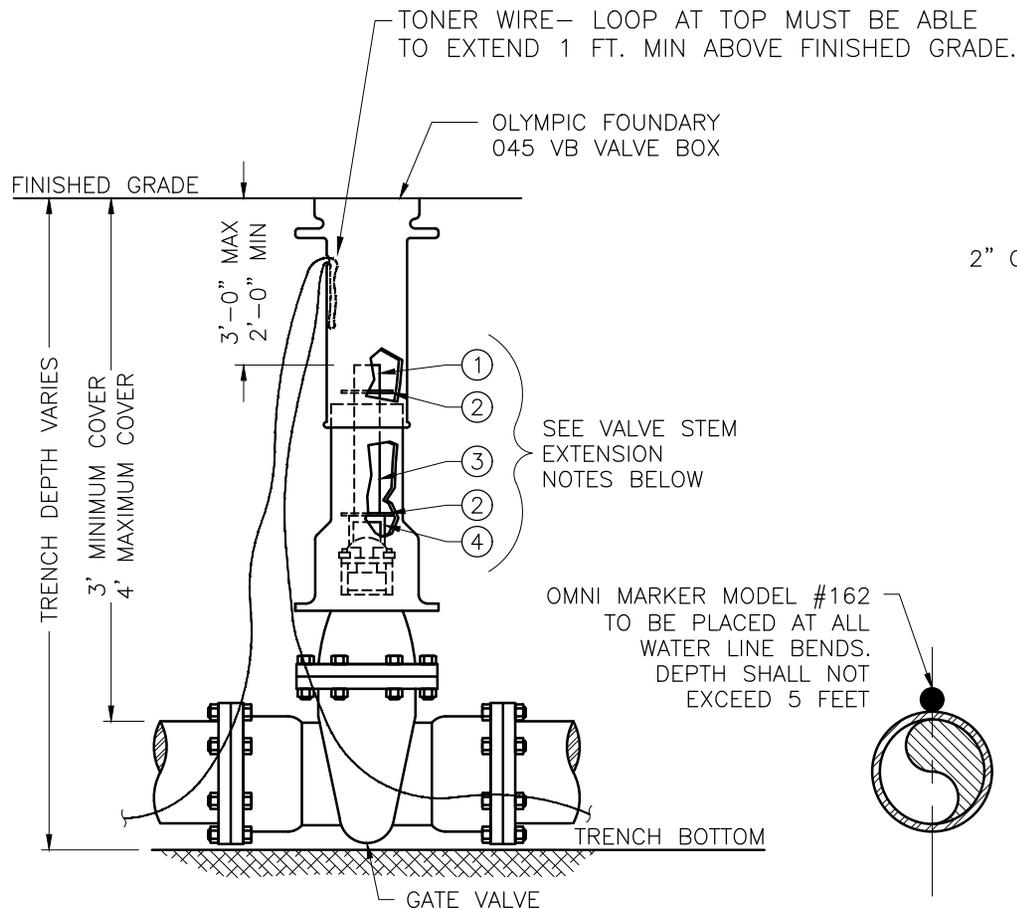
City of
Oak Harbor

ENGINEERING DEPARTMENT
865 SE Barrington Drive
Oak Harbor, WA 98277

DOUBLE CHECK VALVE
ASSEMBLY - 0.75-2.5"

ACAD-W-11Double Check Valve .75 to 2.5 inch.dwg

REVISED 6-30-20



WATER VALVE DETAIL

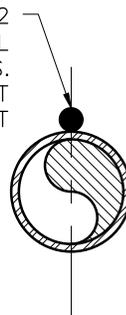
VALVE STEM EXTENSION NOTES:

(VALVE STEM EXTENSION IS REQUIRED WHEN VALVE NUT IS MORE THAN 3' BELOW GRADE. ALL PARTS TO BE WELDED AND PAINTED WITH TWO COATS OF METAL PAINT.)

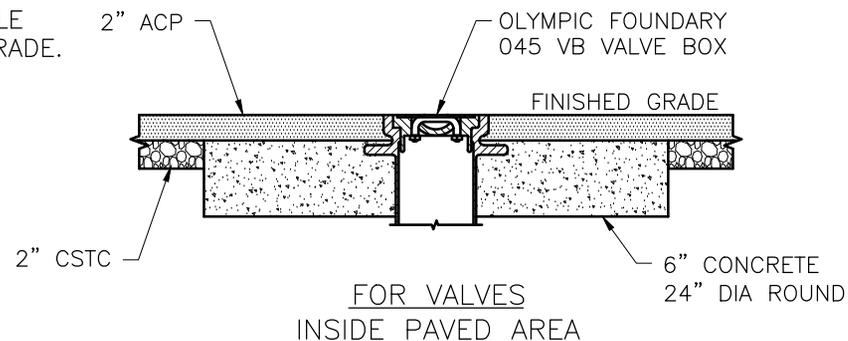
- ① VALVE OPERATING NUT OR 2" SQUARE X 2" HIGH GRADE STEEL WELDED TO GUIDE PLATE.
- ② TWO 3/16" THICK X 5 1/5" DIA STEEL GUIDE PLATE WELDED TO RISER SHAFT.
- ③ 1 1/4" STEEL STOCK RISER SHAFT. SIZE AS REQUIRED TO EXTEND OPERATING NUT WITHIN 2' MINIMUM AND 3' MAXIMUM FROM TOP OF VALVE BOX.
- ④ SQUARE SOCKET 2 1/4" INSIDE X 2 1/4" DEPTH (1/8" MIN WALL THICKNESS) WELDED TO GUIDE PLATE.

SEE VALVE STEM EXTENSION NOTES BELOW

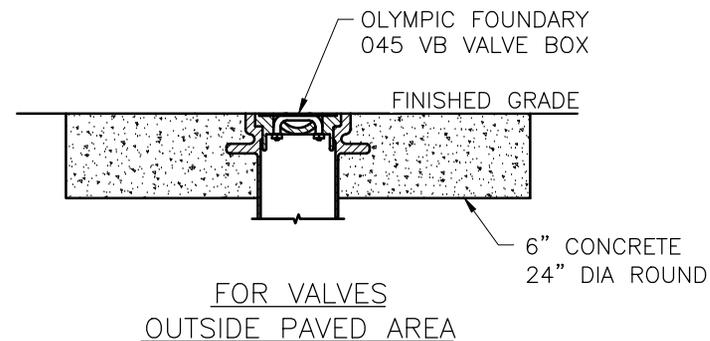
OMNI MARKER MODEL #162 TO BE PLACED AT ALL WATER LINE BENDS. DEPTH SHALL NOT EXCEED 5 FEET



WATER LINE MARKER



FOR VALVES INSIDE PAVED AREA



FOR VALVES OUTSIDE PAVED AREA

GENERAL NOTES:

1. ALL VALVES MUST HAVE 12 GAUGE BLUE COATED COPPER TRACER WIRE TIED OFF AT VALVE BODY, EXTENDED OUTSIDE PVC RISER PIPE THEN EXTENDED ONE FOOT TOP OF VALVE BOX.

APPROVED
City of Oak Harbor
Engineering Dept.

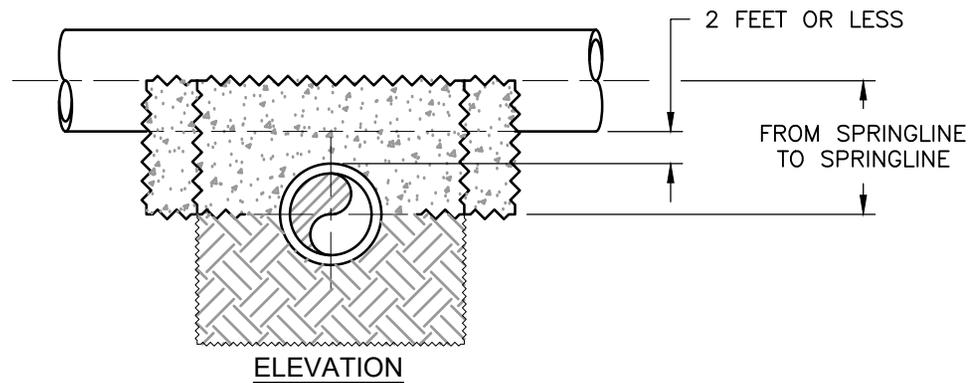
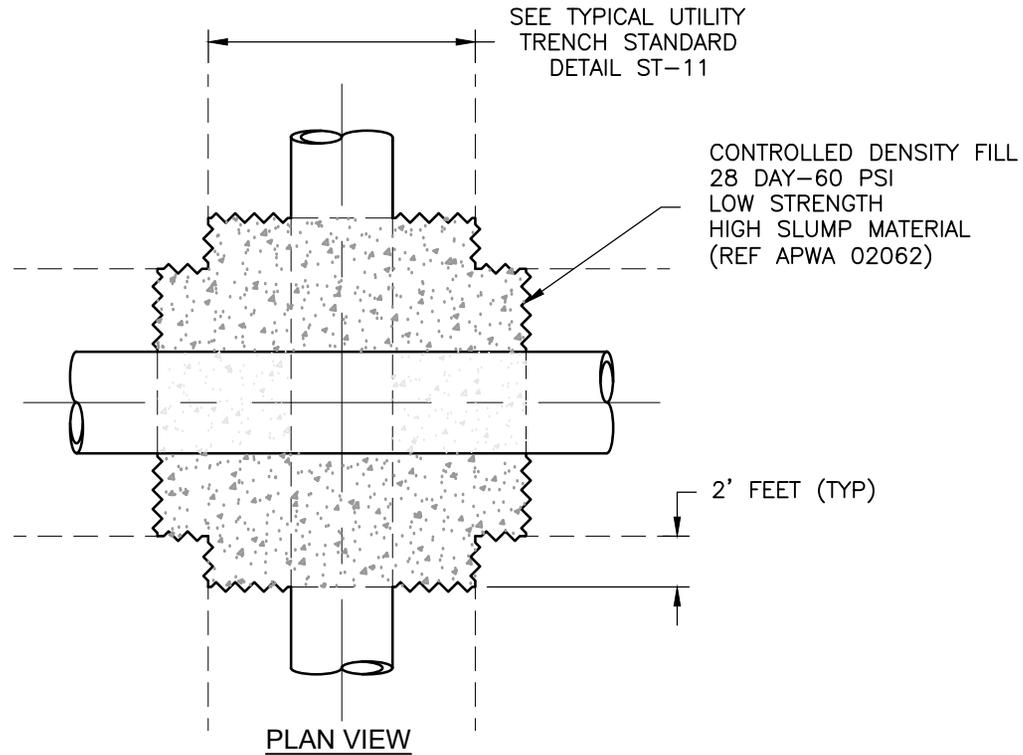
Signature

6/30/2020
Date



City of Oak Harbor
ENGINEERING DEPARTMENT
865 SE Barrington Drive
Oak Harbor, WA 98277

WATER LINE VALVE BOX AND MARKER



APPROVED
City of Oak Harbor
Engineering Dept.

Signature

6/30/2020

Date

NOT TO SCALE



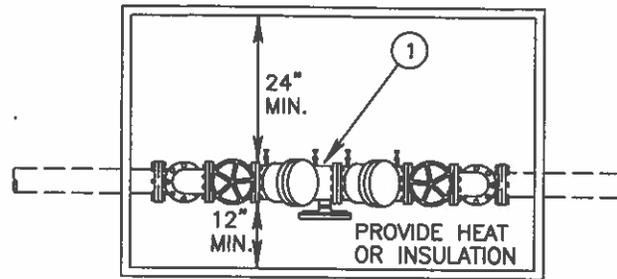
*City of
Oak Harbor*
ENGINEERING DEPARTMENT
865 SE Barrington Drive
Oak Harbor, WA 98277

**PIPE CROSSING WITH 2' OR
LESS VERTICAL CLEARANCE**

PIPE CROSSING DETAIL.dwg

APPROVED on 06/27/2025 at 8:14:13 AM by:

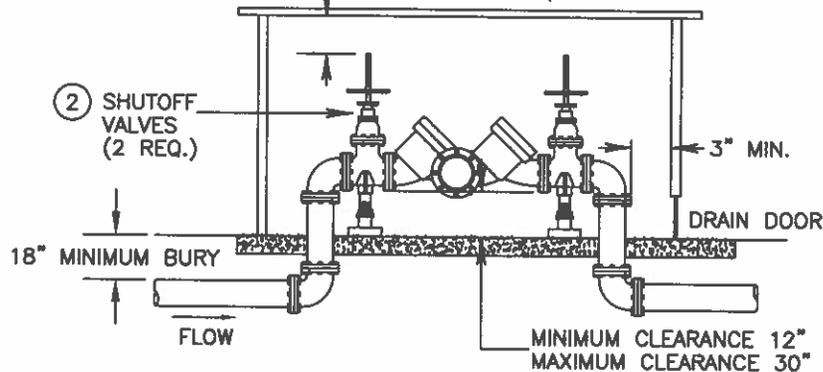
City Engineer Alexander K. Warner, PE
City of Oak Harbor, Washington



PLAN

INSULATED OR HEATED ENCLOSURE
OR APPROVED EQUAL

3" MIN. WHEN VALVE
IS FULLY OPEN



ELEVATION

LEGEND

- ① WA STATE DEPT. OF HEALTH APPROVED REDUCED PRESSURE BACK FLOW ASSY.
- ② ALL SHUTOFF VALVES SHALL BE OF THE RESILIENT SEAL TYPE.

NOTES :

- PIPE TO BE DUCTILE IRON, C900 OR C909 PVC OR APPROVED MATERIAL
- BASE PENETRATIONS TO BE SEALED WITH A WATER TIGHT GROUT, WATER PROOF MASTIC, OR FLEXIBLE SEALANT.
- ACCESS TO BE CENTERED OVER ASSEMBLY.
- EACH ASSEMBLY SHALL BE EQUIPPED WITH (4) RESILIENT SEATED TEST COCKS WITH PLUGS INSTALLED, (FINGER TIGHT).
- ENCLOSED R.P.B.A.'S ARE REQUIRED TO MEET SPECIFIC CRITERIA AND SHALL BE REVIEWED ON A CASE BY CASE BASIS.
- PRESSURE RELIEF PORTS MUST BE KEPT CLEAN AND IN GOOD WORKING ORDER AND BE ABLE TO FREELY DISCHARGE TO THE ATMOSPHERE.
- A MINIMUM OF A 12" CLEARANCE IS REQUIRED BETWEEN THE LOWEST POINT OF THE ASSEMBLY AND THE BOTTOM OF THE ENCLOSURE.
- TEE AND A GATE VALVE REQUIRED ON CONNECTION TO MAINLINE.
- THE R.P.B.A MUST BE APPROVED FOR USE BY THE WA STATE DEPT. OF HEALTH
- THE R.P.B.A. MUST BE TESTED BY A WA STATE CERTIFIED BACK FLOW ASSEMBLY TESTER AT THE TIME OF INSTALLATION, ANNUALLY, AND WHEN MOVED OR REPAIRED.
- ALL INSTALLATIONS MUST MEET MANUFACTURERS SPECIFICATIONS AND MEET THE MINIMUM THE UNIFORM PLUMBING CODE AND MUST CONFORM STANDARDS OF TO THE REQUIREMENTS AND GUIDELINES OUTLINED BY THE NATIONAL FIRE PROTECTION ASSOCIATION.

NOT TO SCALE



City of **Reduced Pressure Backflow Assembly**
Oak Harbor
ENGINEERING DEPARTMENT
865 SE Barrington Drive
Oak Harbor, WA 98277

DETAIL