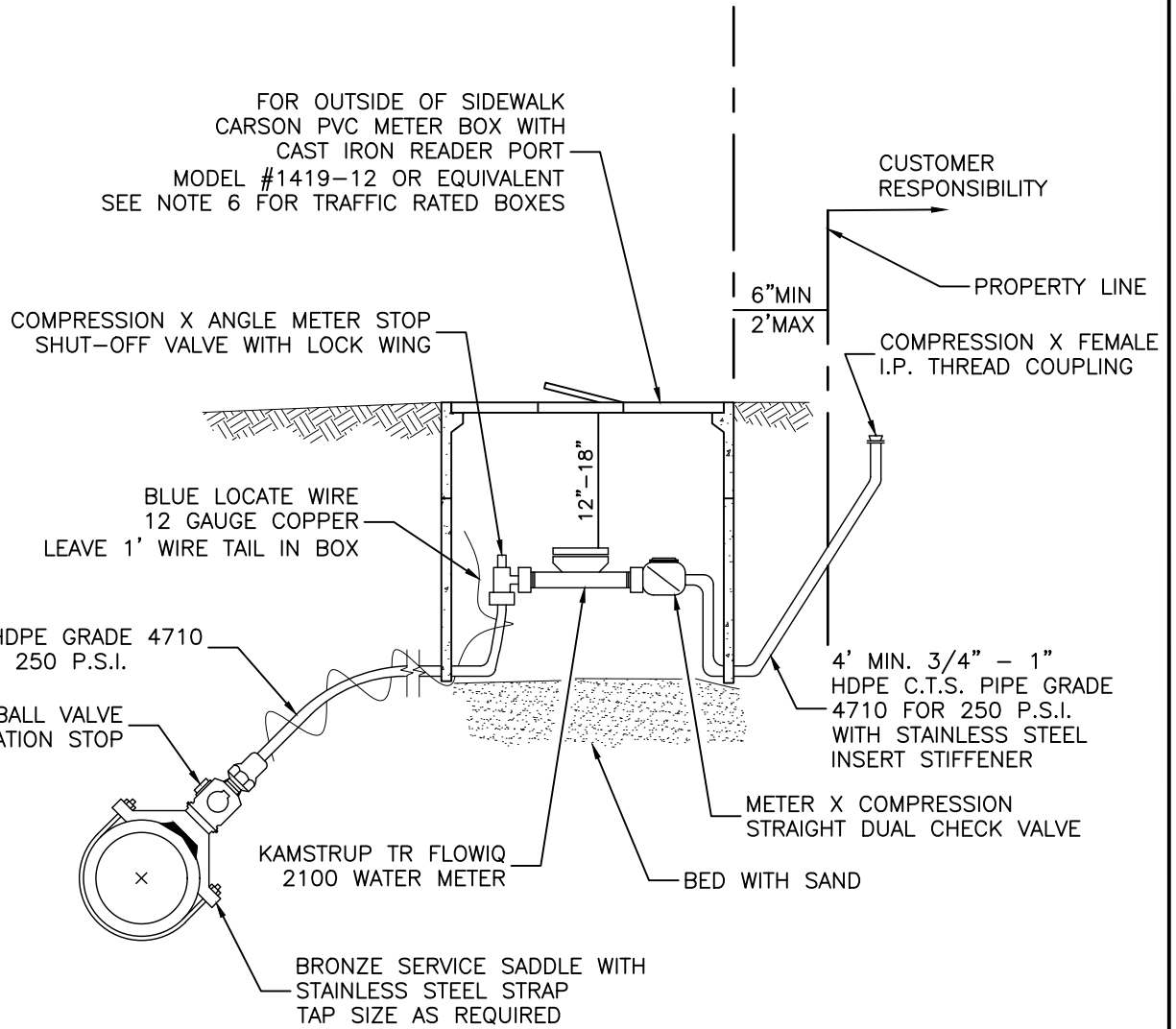


FILE LOCATION: \\citygis\pwwengineering\Design_Standards\02.2 - Drawings - 2021\02 - Water\2021 Updates\Chapter 2 - Master.dwg
 PLOTTED: 2/1/2022 8:22:20 AM

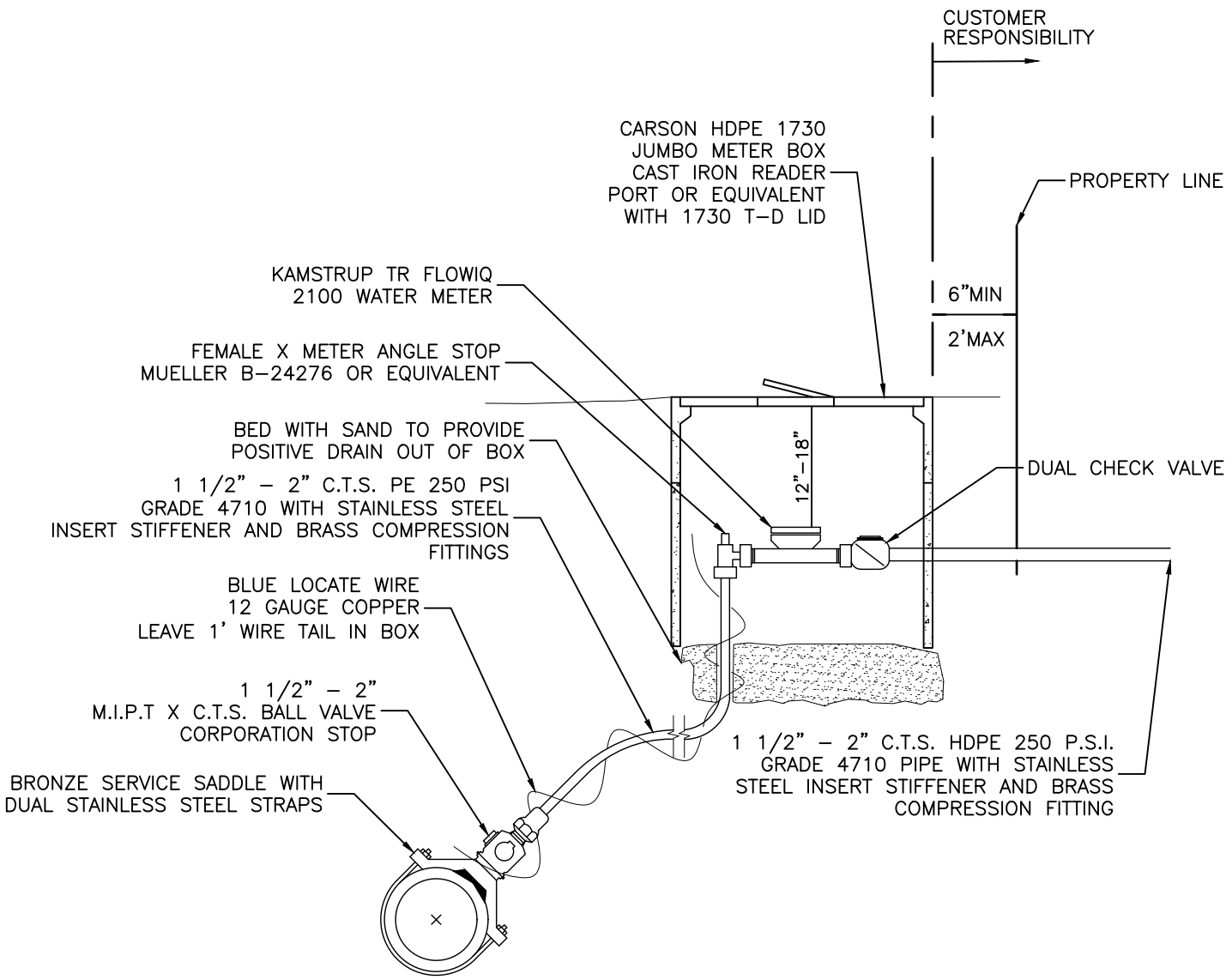


NOTES

1. IT IS THE CUSTOMERS RESPONSIBILITY TO INSTALL A PRESSURE REDUCING VALVE WHERE STATIC PRESSURE IS GREATER THAN 80 PSI.
2. ALL FITTINGS SHALL BE LEAD FREE U.S. BRASS AND SHALL BE FORD, MUELLER, OR EQUIVALENT.
3. STAINLESS STEEL INSERTS REQUIRED FOR ALL PACK JOINTS OR GRIP JOINTS. MUELLER #H-15028 OR EQUIVALENT.
4. ALL SERVICE SADDLES SHALL BE BRONZE AND HAVE A RUBBER GASKET, I.P. THREADS, STAINLESS STEEL STRAP, AND ROMAC #101BS OR EQUIVALENT. TORQUE TO MANUFACTURERS SPECIFICATIONS.
5. SIZE OF FITTINGS AND TAP SIZE SHALL BE AS REQUIRED FOR THE TYPE OF SERVICE.
6. FOR TRAFFIC RATED BOXES USE SIGMA 1324-12 BOX WITH LC1324T-D LID.

APPROVED BY:	REVISED DATE	 City of Port Townsend PUBLIC WORKS	WATER SERVICE CONNECTION SINGLE 1" SERVICE	Std. Dwg. No.
STEVE KING, PE	2/1/2022			2-1
PUBLIC WORKS DIRECTOR				

FILE LOCATION: \\citygis\pwwengineering\Design_Standards\02.2 - Drawings - 2021\02 - Water\2021 Updates\Chapter 2 - Master.dwg
 PLOTTED: 2/1/2022 8:22:21 AM

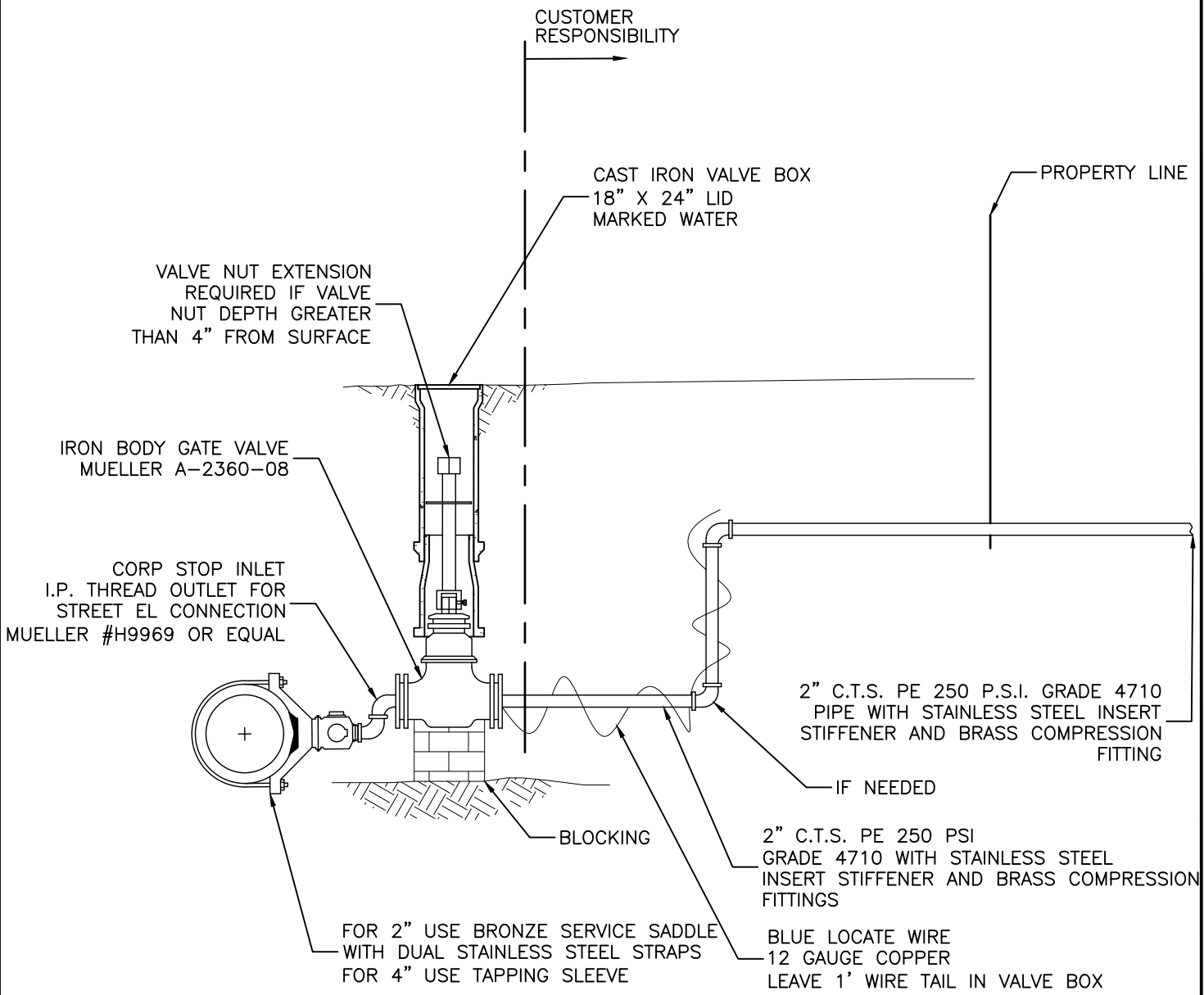


NOTES

1. IT IS THE CUSTOMERS RESPONSIBILITY TO INSTALL A PRESSURE REDUCING VALVE WHERE STATIC PRESSURE IS GREATER THAN 80 PSI.
2. ALL FITTINGS SHALL BE LEAD FREE U.S. BRASS AND SHALL BE FORD, MUELLER, OR EQUIVALENT.
3. STAINLESS STEEL INSERTS REQUIRED FOR ALL PACK JOINTS OR GRIP JOINTS. MUELLER #H-15028 OR EQUIVALENT.
4. ALL SERVICE SADDLES FOR TAP SIZES 1 1/2" AND ABOVE SHALL BE BRONZE AND HAVE A RUBBER GASKET, I.P. THREADS, STAINLESS STEEL DUAL STRAPS, AND ROMAC #202BS OR EQUIVALENT. TORQUE TO MANUFACTURERS SPECIFICATIONS.
5. SIZE OF FITTINGS AND TAP SIZE SHALL BE AS REQUIRED FOR THE TYPE OF SERVICE.

APPROVED BY: STEVE KING, PE	REVISED DATE 2/1/2022		WATER SERVICE CONNECTION SINGLE 1 1/2" AND 2" SERVICE	Std. Dwg. No. 2-2
---------------------------------------	---------------------------------	---	---	-----------------------------

FILE LOCATION: \\citygis\pwwengineering\Design_Standards\02.2 - Drawings - 2021\02 - Water\2021 Updates\Chapter 2 - Master.dwg
 PLOTTED: 2/1/2022 8:22:21 AM



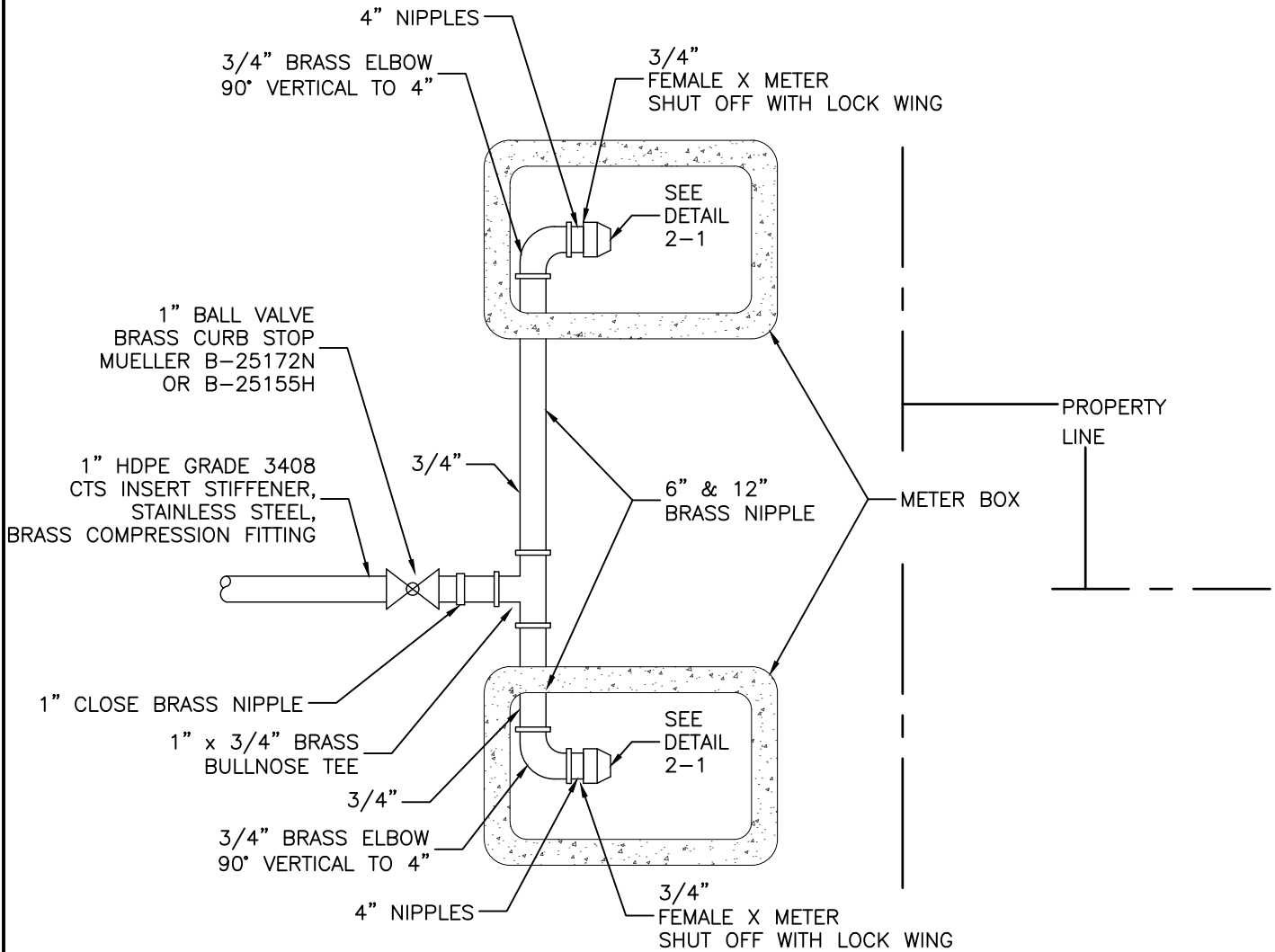
NOTES

1. ALL FITTINGS SHALL BE LEAD FREE U.S. BRASS AND SHALL BE FORD, MUELLER, OR EQUIVALENT.
2. STAINLESS STEEL INSERTS REQUIRED FOR ALL PACK JOINTS OR GRIP JOINTS. MUELLER #H-15028 OR EQUIVALENT.
3. ALL SERVICE SADDLES FOR TAP SIZES 1 1/2" AND ABOVE SHALL BE BRONZE AND HAVE A RUBBER GASKET, I.P. THREADS, STAINLESS STEEL DUAL STRAPS, AND ROMAC #202BS OR EQUIVALENT. TORQUE TO MANUFACTURERS SPECIFICATIONS.
4. SIZE OF FITTINGS AND TAP SIZE SHALL BE AS REQUIRED FOR THE TYPE OF SERVICE.
5. ALL FIRE SERVICE LINES REQUIRE CROSS CONNECTION CONTROL.

APPROVED BY:	REVISED DATE		2" FIRE SERVICE	Std. Dwg. No.
STEVE KING, PE	2/1/2022			2-3
PUBLIC WORKS DIRECTOR				

FILE LOCATION: \\citygis\pwwengineering\Design_Standards\02.2 - Drawings - 2021\02 - Water\2021 Updates\Chapter 2 - Master.dwg

PLOTTED: 2/1/2022 8:22:22 AM

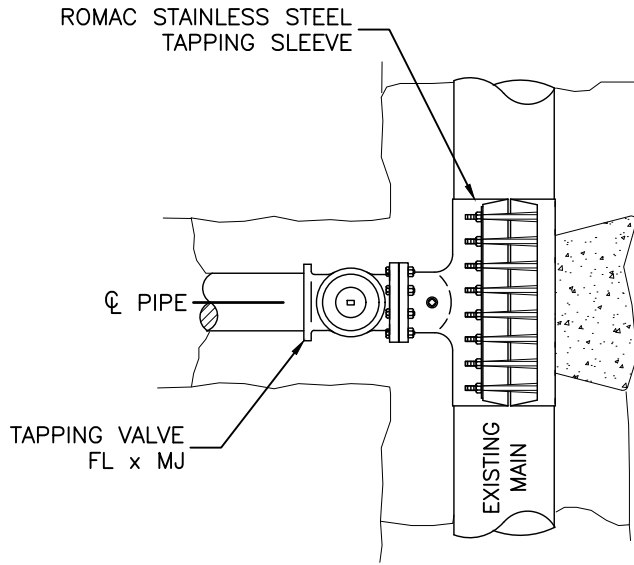


NOTES

1. ALL BRASS FITTINGS AND PIPE SHALL BE LEAD FREE IN COMPLIANCE WITH ANSI/ASTM B584, B62, OR B43.
2. METERS SHALL BE SET BEHIND SIDEWALKS IF POSSIBLE.

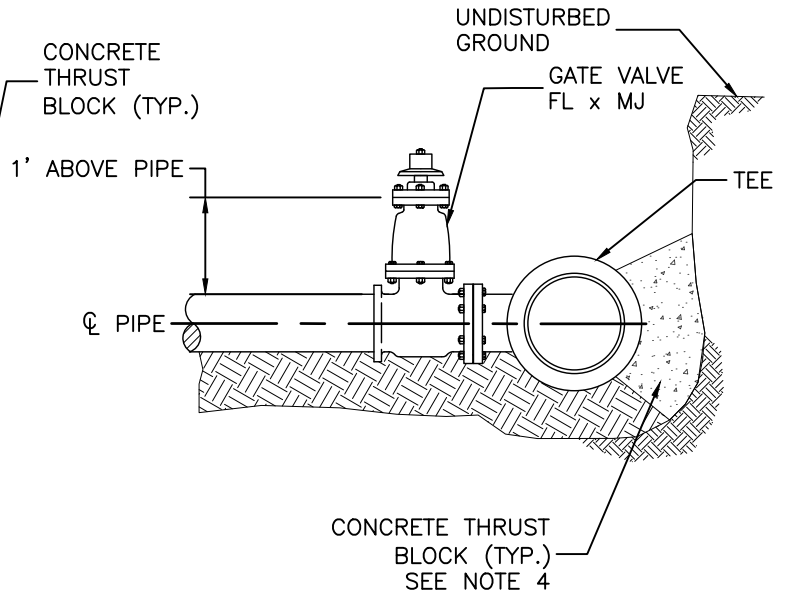
APPROVED BY:	REVISED DATE		DOUBLE SERVICE CONNECTION RESIDENTIAL/IRRIGATION	Std. Dwg. No.
STEVE KING, PE	2/1/2022			2-4
PUBLIC WORKS DIRECTOR				

LIVE TAP – PLAN VIEW

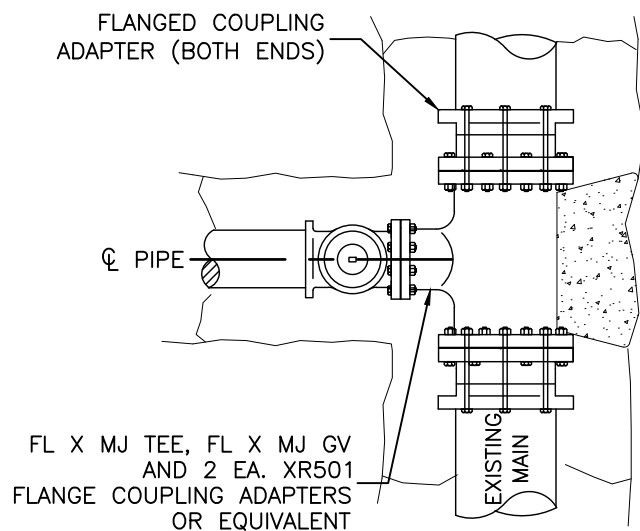
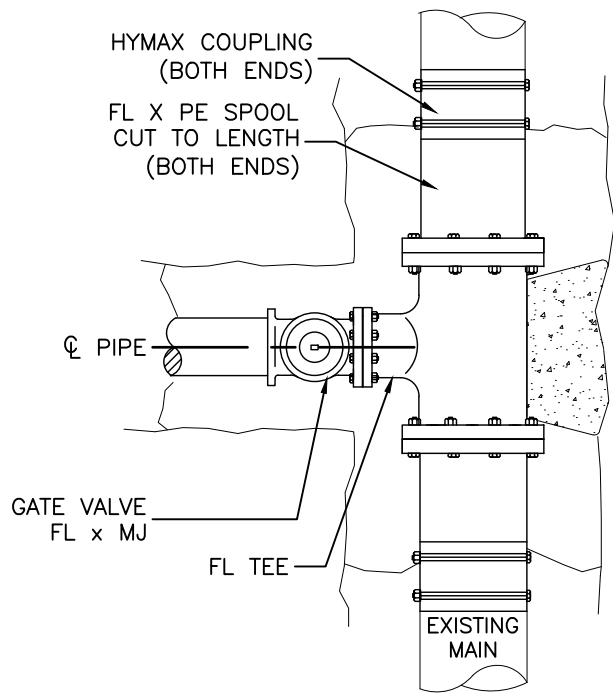


CUT-IN-TEE

LIVE TAP – SECTION VIEW



CUT-IN-TEE



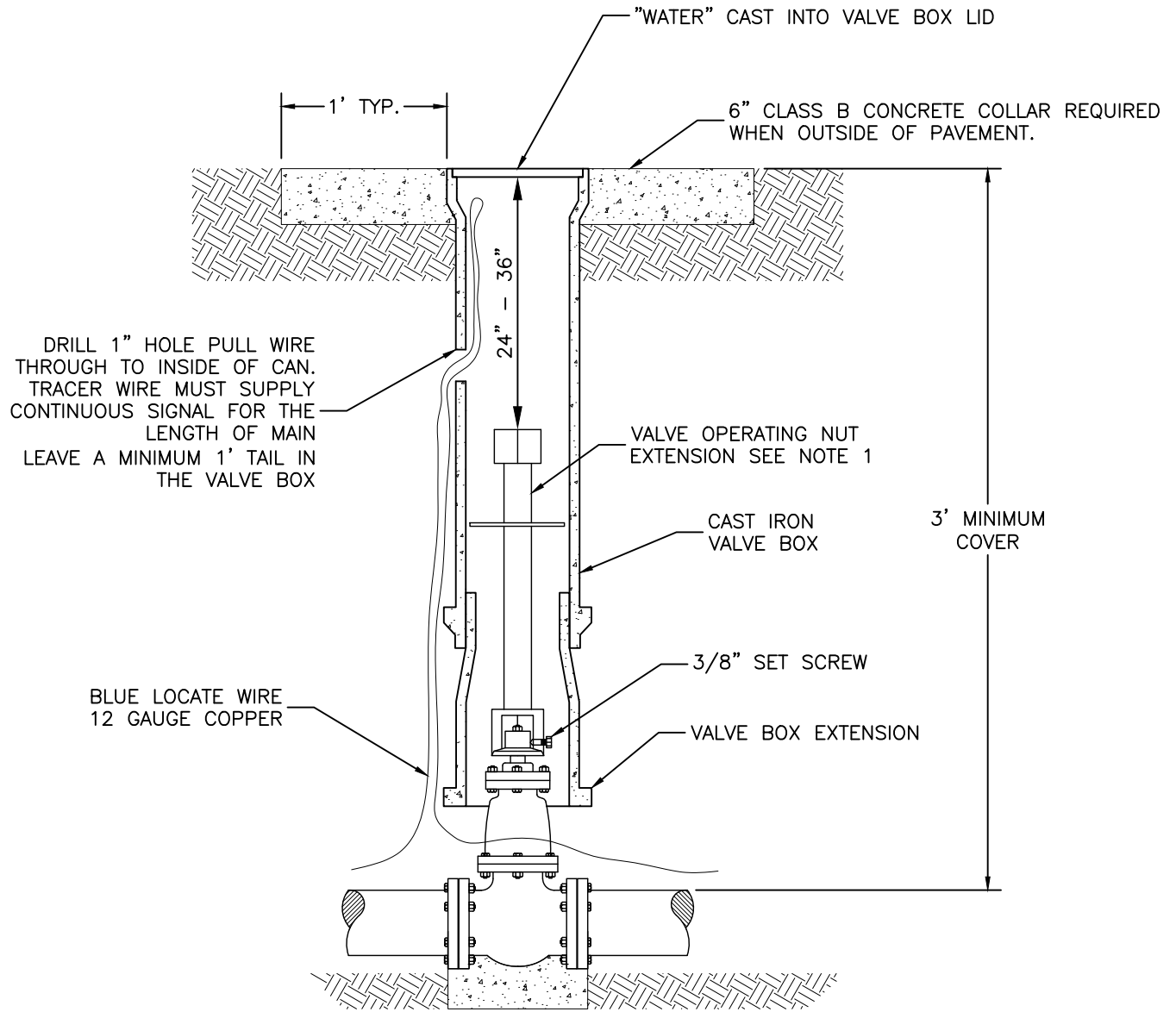
NOTES

1. 11 MIL PLASTIC OR CONSTRUCTION FABRIC SHALL BE WRAPPED AROUND PIPE AND FITTINGS BEFORE THE THRUST BLOCK IS POURED.
2. SUPPORT VALVE AND SLEEVE CONTINUOUSLY THROUGH INSTALLATION.
3. ALL THRUST BLOCKS TO BE PLACED AGAINST UNDISTURBED GROUND
4. VALVE AND SLEEVE SHALL BE SUPPORTED AND BACKFILLED WITH COMPACTED PIPE ZONE BEDDING.
5. 4" AC WATER MAINS SHALL BE CUT IN TEE ONLY.

FILE LOCATION: \\citygis\pwwengineering\Design_Standards\02.2 - Drawings - 2021\02 - Water\2021 Updates\Chapter 2 - Master.dwg
 PLOTTED: 2/1/2022 8:22:23 AM

APPROVED BY:	REVISED DATE		CONNECTION TO EXISTING MAIN	Std. Dwg. No.
STEVE KING, PE	2/1/2022			2-5
PUBLIC WORKS DIRECTOR				

FILE LOCATION: \\citygis\pwwengineering\Design_Standards\02.2 - Drawings - 2021\02 - Water\2021 Updates\Chapter 2 - Master.dwg
 PLOTTED: 2/1/2022 8:22:23 AM



DRILL 1" HOLE PULL WIRE THROUGH TO INSIDE OF CAN. TRACER WIRE MUST SUPPLY CONTINUOUS SIGNAL FOR THE LENGTH OF MAIN LEAVE A MINIMUM 1' TAIL IN THE VALVE BOX

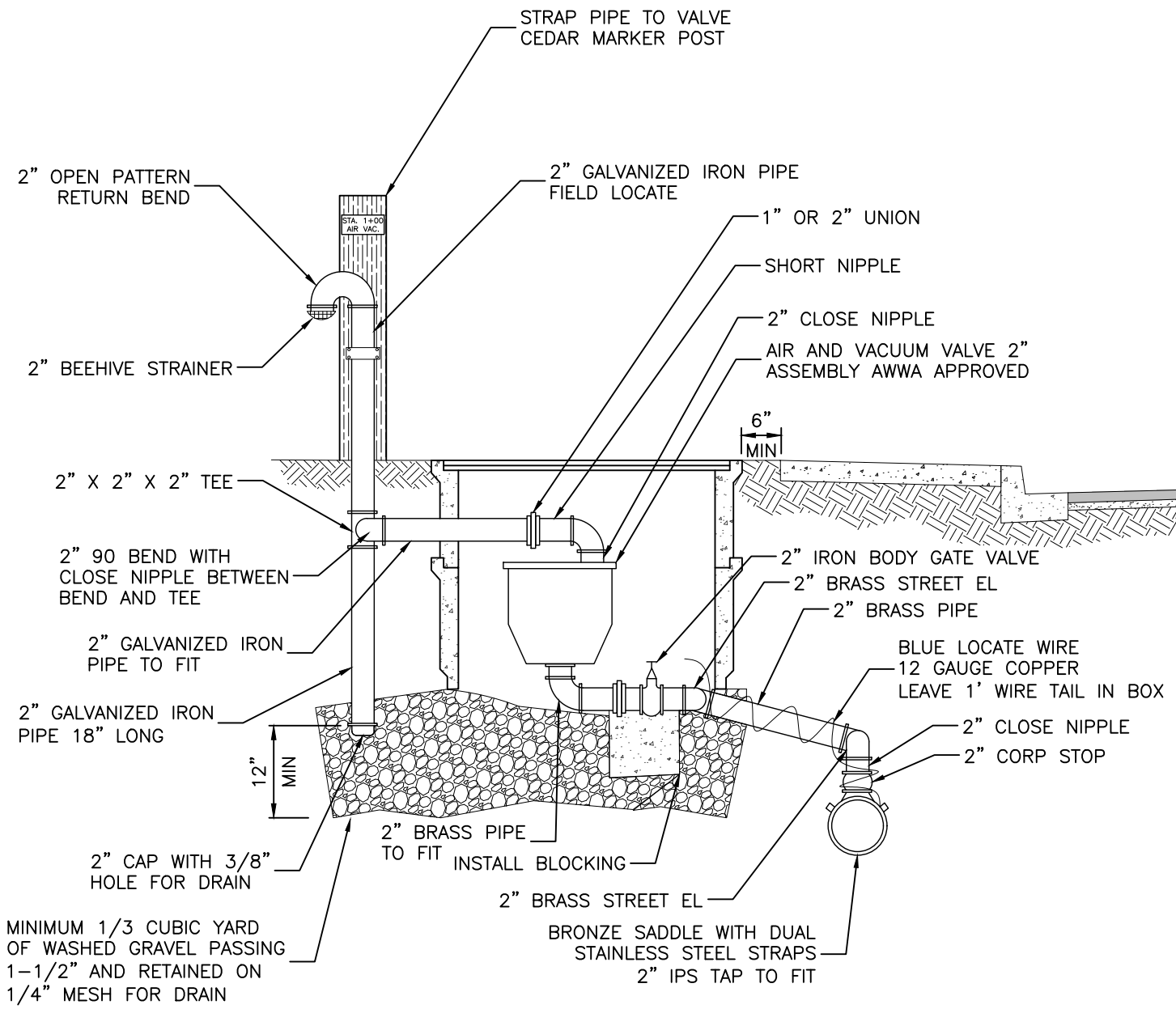
BLUE LOCATE WIRE 12 GAUGE COPPER

NOTES

1. VALVE OPERATION NUT EXTENSIONS ARE REQUIRED WHEN THE VALVE NUT IS MORE THAN THREE (3) FEET BELOW FINISHED GRADE. EXTENSIONS ARE TO BE A MINIMUM OF ONE (1) FOOT LONG. ONLY ONE EXTENSION WILL BE ALLOWED PER VALVE.

APPROVED BY:	REVISED DATE		Std. Dwg. No.
STEVE KING, PE	2/1/2022		VALVE BOX EXTENSION
PUBLIC WORKS DIRECTOR			2-6

FILE LOCATION: \\citygis\pwwengineering\Design_Standards\02.2 - Drawings - 2021\02 - Water\2021 Updates\Chapter 2 - Master.dwg
 PLOTTED: 2/1/2022 8:22:24 AM

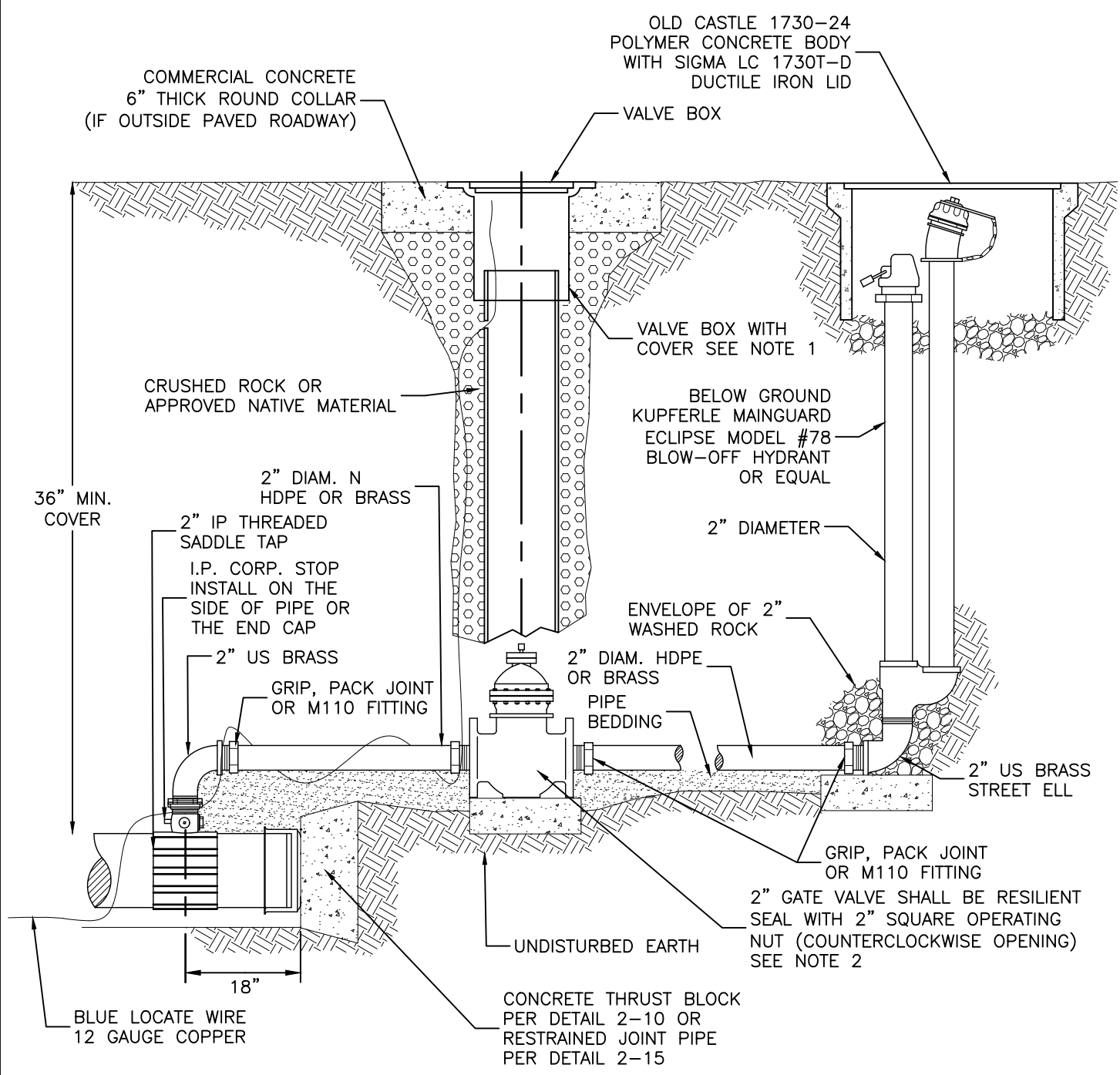


- NOTES**
- AIR AND VACUUM RELEASE VALVE ASSEMBLY SHALL BE INSTALLED AT THE HIGHEST POINT OF THE LINE. IF THE HIGH POINT FALLS IN A LOCATION WHERE THE ASSEMBLY CANNOT BE INSTALLED, PROVIDE ADDITIONAL LINE DEPTH TO CREATE A HIGH POINT AT A LOCATION WHERE THE ASSEMBLY CAN BE INSTALLED.
 - ALL BRASS FITTINGS AND PIPE SHALL BE LEAD FREE IN COMPLIANCE WITH ANSI/ASTM B584, B62, OR B43
 - BLOWOFF SIZES SHALL BE 1" FOR A 6" WATER MAIN, AND 2" FOR AN 8" WATER MAIN.

APPROVED BY:	REVISED DATE	 City of Port Townsend PUBLIC WORKS	COMBINATION AIR RELEASE & AIR VACUUM VALVE ASSEMBLY	Std. Dwg. No.
STEVE KING, PE	2/1/2022			2-7
PUBLIC WORKS DIRECTOR				

FILE LOCATION: \\citygis\pwwengineering\Design_Standards\02.2 - Drawings - 2021\02 - Water\2021 Updates\Chapter 2 - Master.dwg

PLOTTED: 2/1/2022 8:22:25 AM

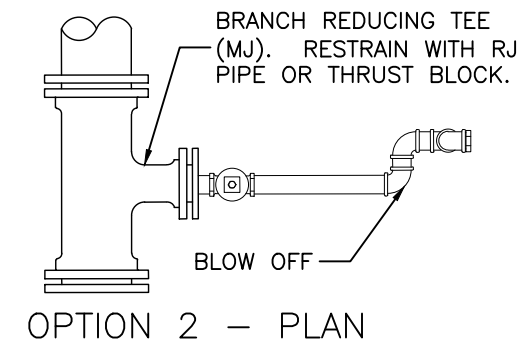
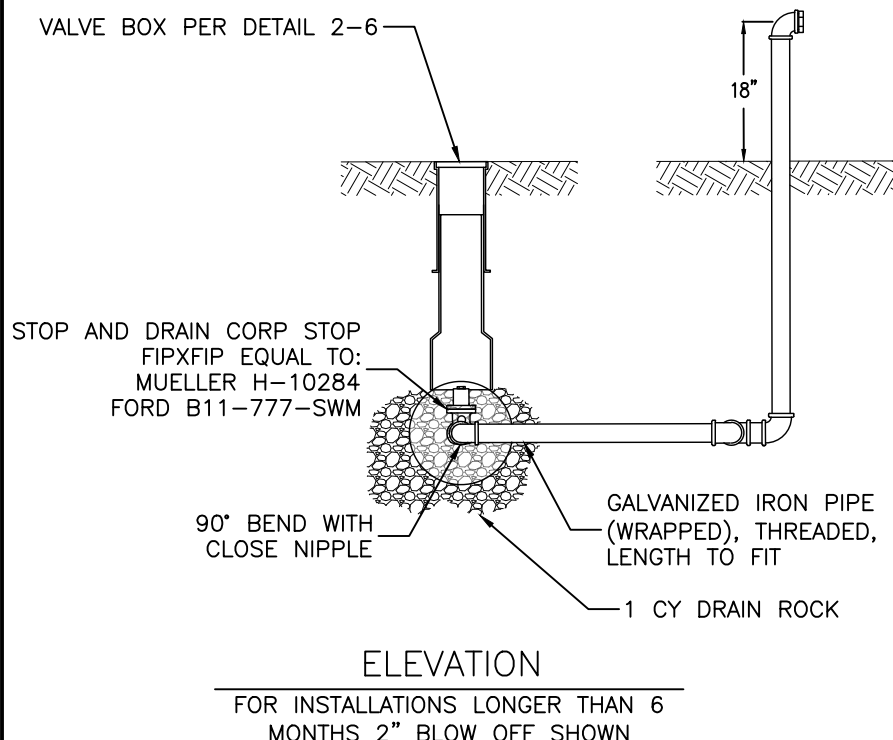
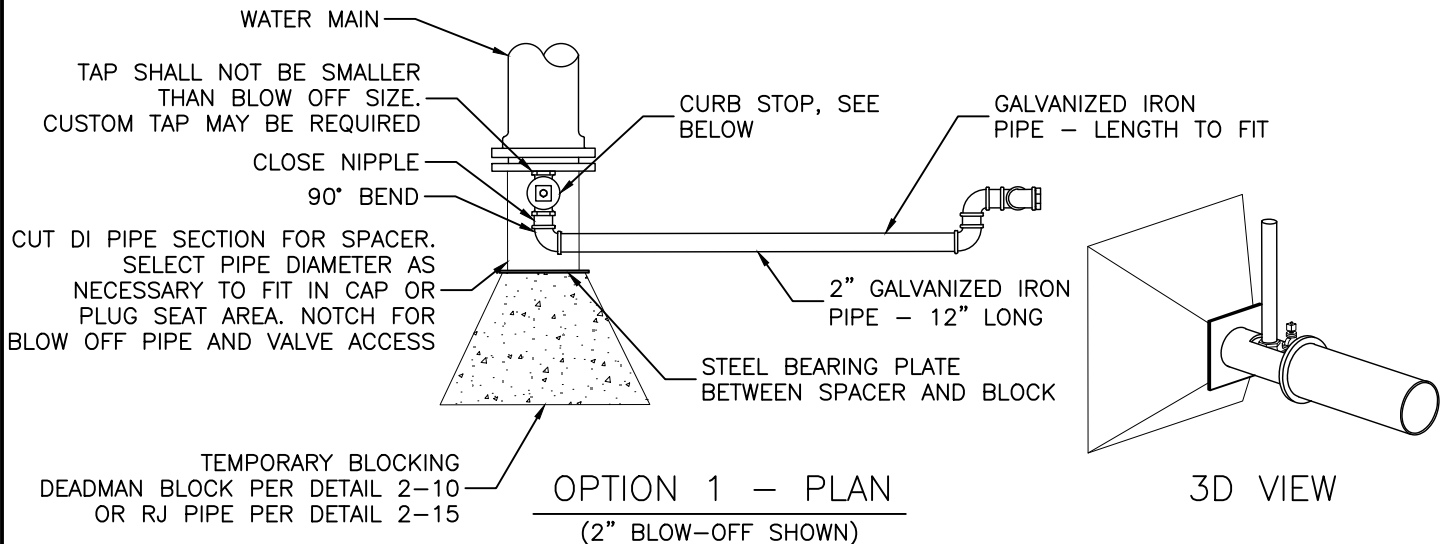


NOTES

1. VALVE BOX AND COVER SHALL BE PER VALVE BOX STANDARD DRAWING 2-6.
2. LOCATE BLOW-OFF HYDRANT OUTSIDE ROADWAY.
3. ALL BRASS FITTINGS AND PIPE SHALL BE LEAD FREE IN COMPLIANCE WITH ANSI/ASTM B584, B62, OR B43.

APPROVED BY:	REVISED DATE		Std. Dwg. No.
STEVE KING, PE	2/1/2022		PERMANENT 2" BLOW-OFF ASSEMBLY
PUBLIC WORKS DIRECTOR			2-8

FILE LOCATION: \\citygis\pwwengineering\Design_Standards\02.2 - Drawings - 2021\02 - Water\2021 Updates\Chapter 2 - Master.dwg
 PLOTTED: 2/1/2022 8:22:25 AM

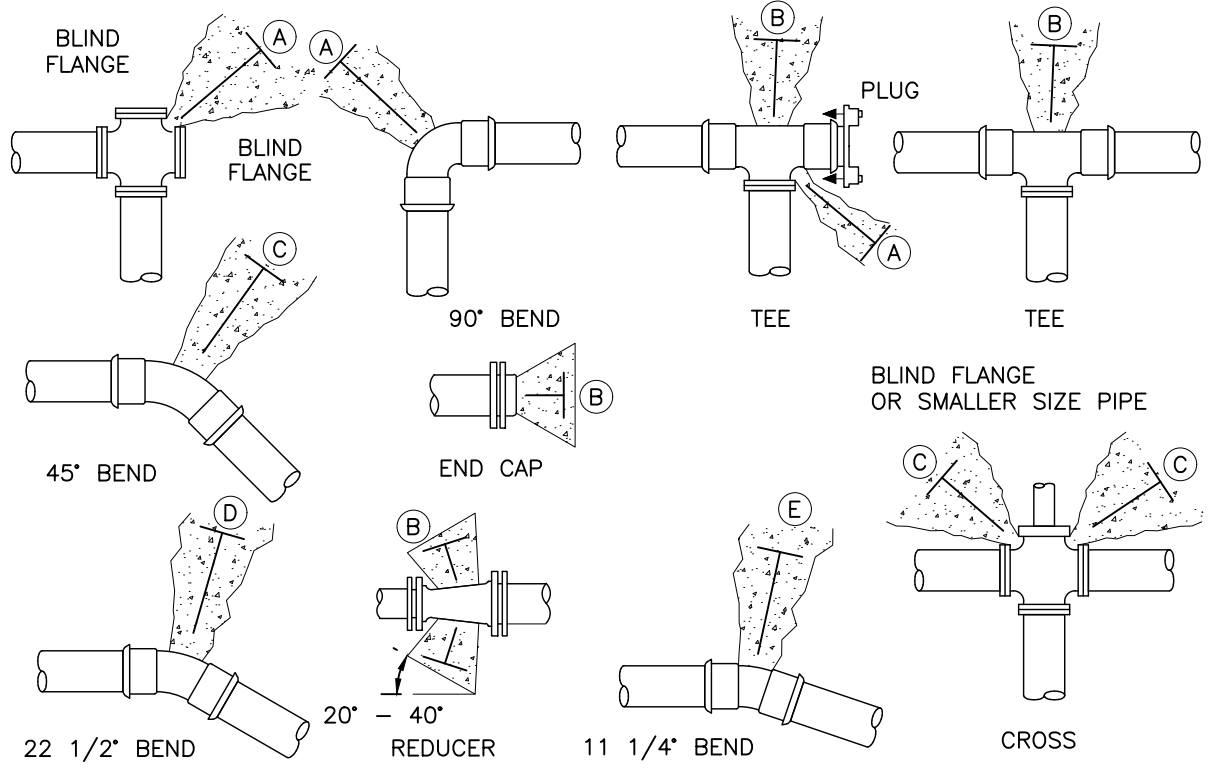


NOTES

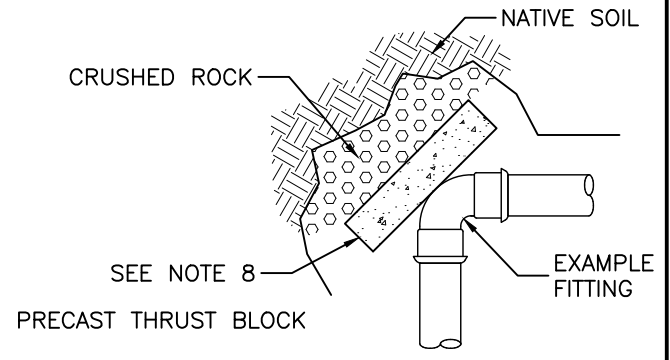
1. THIS DETAIL IS NOT TO BE USED WHERE THE BLOW-OFF MAY STAY IN THE GROUND FOR A PERIOD OF MORE THAN ONE YEAR.
2. MINIMUM BLOW-OFF SIZE SHALL BE 2" FOR 8" AND SMALLER MAINS. 3" BLOW-OFF FOR 10" AND 12" MAINS. 4" BLOW-OFF ON 14" AND LARGER MAINS. LARGER BLOW OFFS MAY BE REQUIRED DEPENDING ON AVAILABLE SYSTEM PRESSURE.

APPROVED BY:	REVISED DATE		CONSTRUCTION/TEMPORARY BLOW-OFF ASSEMBLY	Std. Dwg. No.
STEVE KING, PE	2/1/2022			2-9
PUBLIC WORKS DIRECTOR				

FILE LOCATION: \\citygis\pwwengineering\Design_Standards\02.2 - Drawings - 2021\02 - Water\2021 Updates\Chapter 2 - Master.dwg
 PLOTTED: 2/1/2022 8:22:26 AM



THRUST BLOCK - TABLE						
MIN. BEARING AREA AGAINST UNDISTURBED SOIL						
SQUARE FEET						
PIPE SIZE	(A) FT ²	(B) FT ²	(C) FT ²	(D) FT ²	(E) FT ²	(X) FT ²
4"	3	1	1	1	1	NONE
6"	4	4	2	1	1	NONE
8"	7	6	4	2	1	4
10"	11	10	6	3	2	6
12"	16	14	9	5	3	9
14"	22	19	12	6	3	12
16"	29	25	16	8	4	16
18"	36	31	20	10	5	20
20"	45	39	24	13	6	24
22"	54	47	29	15	8	29
24"	64	56	35	18	9	35
28"	87	76	38	24	12	48
30"	101	87	55	28	14	55
36"	175	125	78	40	20	78
42"	197	171	107	55	27	107
48"	257	224	140	71	36	140

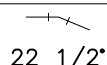
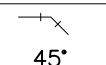
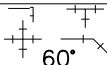
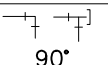


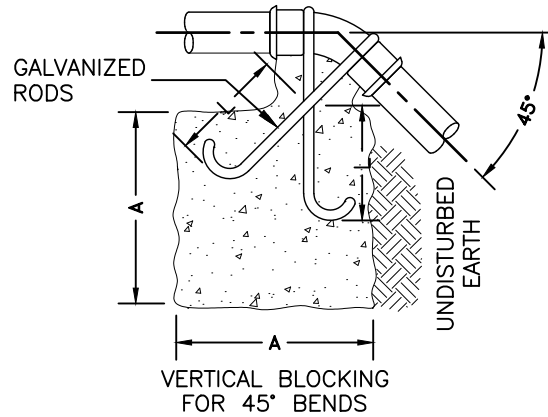
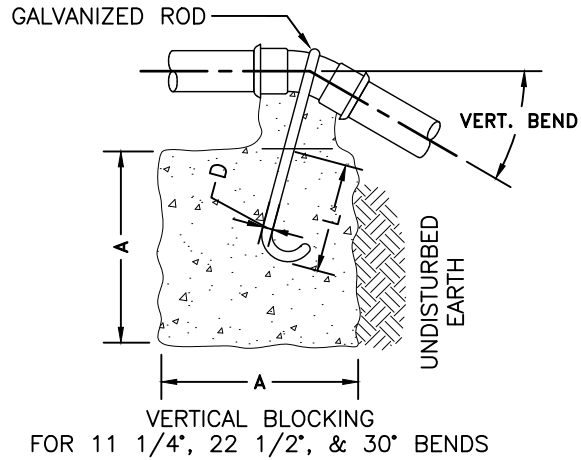
- NOTES:
1. BEARING AREA OF CONCRETE THRUST-BLOCK BASED ON 200 PSI PRESSURE AND SAFE SOIL-BEARING LOAD OF 2,000 POUNDS PER SQUARE FOOT.
 2. AREAS MUST BE ADJUSTED FOR OTHER PIPE SIZES, PRESSURES, AND SOIL CONDITIONS.
 3. CONCRETE BLOCKING SHALL BE CLASS B POURED AGAINST UNDISTURBED EARTH.
 4. ISOLATE FITTING WITH PLASTIC.
 5. BLOCK SHALL BEAR AGAINST FITTINGS ONLY AND SHALL BE CLEAR OF JOINTS TO PERMIT TAKING UP OR DISMANTLING OF JOINT.
 6. CONTRACTOR SHALL INSTALL BLOCKING ADEQUATE TO WITHSTAND FULL TEST PRESSURE UNDER ALL CONDITIONS OF SERVICE.
 7. MINIMUM ROD DIAMETER SHALL BE 3/4" ASTM A-307 WITH 36KSI YIELD STRENGTH.
 8. PRECAST THRUST BLOCK OR APPROVED EQUAL. BEARING AREA EQUAL OR GREATER THAN FOR POURED THRUST BLOCK. CENTER PRECAST BLOCK ON FITTING.

APPROVED BY:	REVISED DATE		HORIZONTAL THRUST BLOCKS	Std. Dwg. No.
STEVE KING, PE	2/1/2022			2-10
PUBLIC WORKS DIRECTOR				

FILE LOCATION: \\citygis\pwwengineering\Design_Standards\02.2 - Drawings - 2021\02 - Water\2021 Updates\Chapter 2 - Master.dwg
 PLOTTED: 2/1/2022 8:22:26 AM

VERTICAL BLOCKING							
PIPE SIZE	VB	CU.FT.	A	D	L		
4"	11 1/4"	8	2.0'	3/4"	1.5'		
	22 1/2"	11	2.2'		2.0'		
	30"	17	2.6'				
6"	11 1/4"	11	2.2'	3/4"	2.0'		
	22 1/2"	25	2.9'				
	30"	41	3.5'				
12"	11 1/4"	16	2.5'	3/4"	2.0'		
	22 1/2"	47	3.6'				
	30"	70	4.1'		2.5'		
16"	11 1/4"	32	3.2'	3/4"	2.0'		
	22 1/2"	88	4.5'			7/8"	3.0'
	30"	132	5.1'				
16"	11 1/4"	70	4.1'	7/8"	3.0"		
	22 1/2"	184	5.7'			1 1/8"	4.0"
	30"	275	6.5'				
20"	11 1/4"	91	4.5'	7/8"	3.0"		
	22 1/2"	225	6.1'			1 1/4"	4.0"
	30"	330	6.9'	1 3/8"	4.5"		
24"	11 1/4"	128	5.0'				
	22 1/2"	320	6.8'			1 3/8"	4.5"
	30"	480	7.9'	1 5/8"	5.5"		
VERTICAL BLOCKING FOR 45° BENDS'							
4"	45°	30	3.1'	3/4"	2.0'		
6"		68	4.1'				
8"		123	5.0'				
12"		232	6.1'	3/4"	2.5'		
16"		478	7.8'	1 1/8"	4.0'		
20"		560	8.2'	1 1/4"			
24"		820	9.4'	1 3/8"	4.5'		

DEAD WEIGHT BLOCKING					
PIPE SIZE IN.	PIPE AREA IN ²	TYPE OF FITTING			
					
		22 1/2°	45°	60°	90°
SIZE OF DEAD WEIGHT BLOCK C.Y. CONCRETE					
4	12.5	0.3	0.6	0.7	1.1
6	28.3	0.5	1.1	1.4	2.1
8	50.3	0.9	1.9	2.5	2.8
12	113	2.1	4.2	5.6	8.4
16	201	3.7	7.5	9.9	15
18	254	4.9	10	13	20
20	314	6.0	12	16	24
24	432	7.9	16	21	32



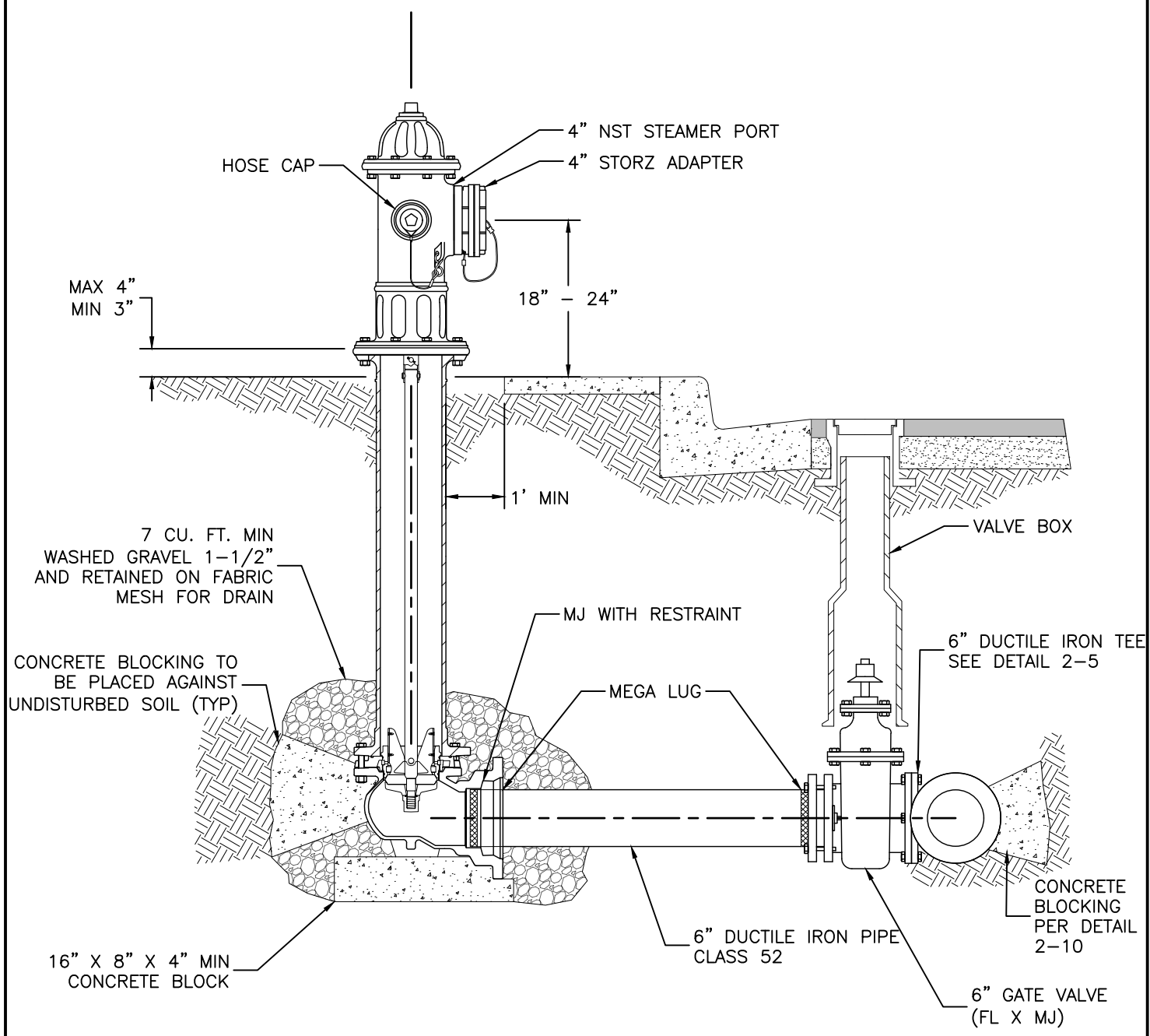
NOTES

1. CONCRETE BLOCKING BASED ON 200 P.S.I PRESSURE & CLASS 3000 CONCRETE

APPROVED BY:	REVISED DATE		Std. Dwg. No.	
STEVE KING, PE	2/1/2022		VERTICAL CONCRETE BLOCKING	2-11
PUBLIC WORKS DIRECTOR				

FILE LOCATION: \\citygis\engineering\Design_Standards\02.2 - Drawings - 2021\02 - Water\2021 Updates\Chapter 2 - Master.dwg

PLOTTED: 2/1/2022 8:22:27 AM



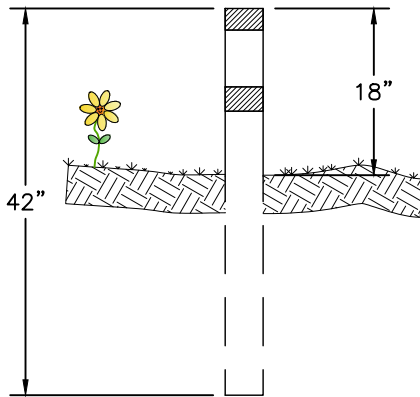
NOTES

1. HYDRANTS SHALL BE LOCATED WITH MINIMUM 5-FOOT CLEARANCE ON ALL SIDES AND SHALL NOT BE LOCATED WITHIN A SIDEWALK.
2. HYDRANT SHALL BE LOCATED A MINIMUM OF 3 FEET FROM FACE OF CURB AND A MINIMUM OF 1 FOOT FROM BACK OF SIDEWALK.
3. HYDRANT SHALL BE MUELLER SUPER CENTURION OR M&H STYLE 129S.

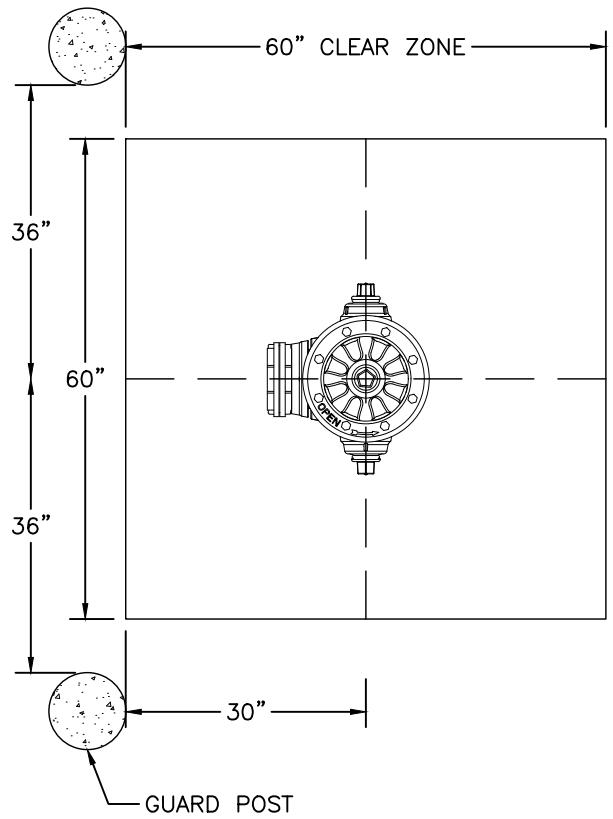
APPROVED BY:	REVISED DATE		FIRE HYDRANT ASSEMBLY	Std. Dwg. No.
STEVE KING, PE	2/1/2022			2-12
PUBLIC WORKS DIRECTOR				

FILE LOCATION: \\citygis\pwwengineering\Design_Standards\02.2 - Drawings - 2021\02 - Water\2021 Updates\Chapter 2 - Master.dwg

PLOTTED: 2/1/2022 8:22:28 AM



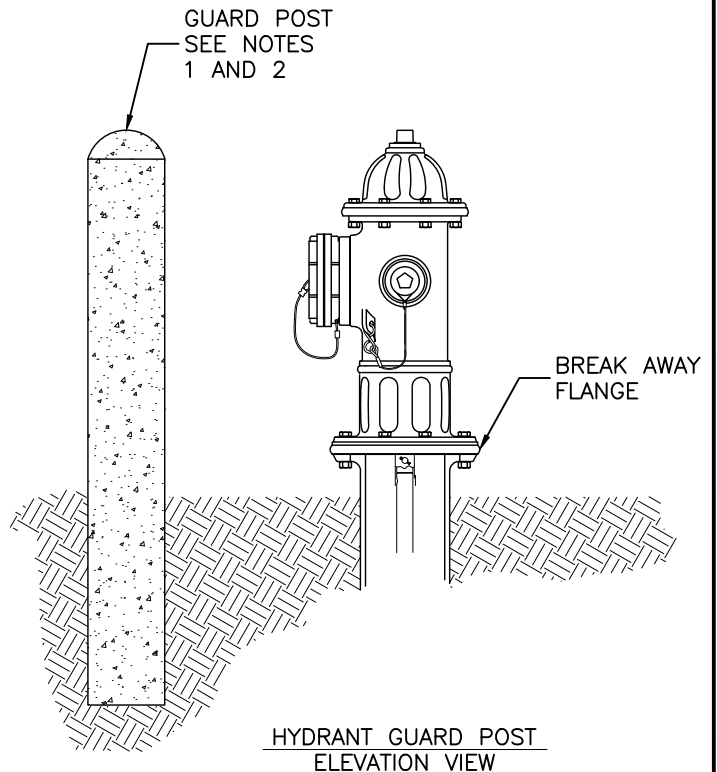
VALVE MARKER POST
(SEE NOTES 3, 4, AND 5)



HYDRANT GUARD POST
PLAN VIEW

NOTES

1. GUARD POSTS SHALL BE 6' LONG, 8" IN DIAMETER PRECAST CONCRETE. PAINTED WITH TWO COATS OF X-O RUST OIL BASE DTM ENAMEL, GLOSS FINISH, SAFETY YELLOW - 802041, OR EQUIVALENT.
2. TOP OF GUARD POST SHALL BE LEVEL WITH THE TOP OF FIRE HYDRANT OR 3' IF NOT ON LEVEL GROUND.
3. VALVE MARKER POST SHALL BE 42" PORTABLE TRAFFIC DELINEATOR POST WITH TWO REFLECTOR STRIPS. THEY SHALL BE FURNISHED NEW AND UNUSED AN BURIED 24" DEEP, TO LEAVE 18" EXPOSED AS A MARKER POST THE LETTER "V" AND THE DISTANCE TO THE VALVE SHALL BE STENCILED ON THE POST WITH 2" HIGH NUMERALS, WITH BLACK ENAMEL PAINT.
4. FIRE HYDRANT GUARD POSTS AND VALVE MARKER POSTS SHALL BE INSTALLED FOR ALL VALVES LOCATED IN UNIMPROVED OR UNPAVED AREAS. VALVE MARKER POSTS SHALL BE SET IN A SAFE AND REASONABLY CONSPICUOUS LOCATION.
5. VALVE MARKER POSTS ARE NOT REQUIRED FOR AUXILIARY HYDRANT VALVES.
6. GUARD POSTS ARE REQUIRED AT ALL LOCATIONS WHERE A HYDRANT MAY BE HIT BY CARS.

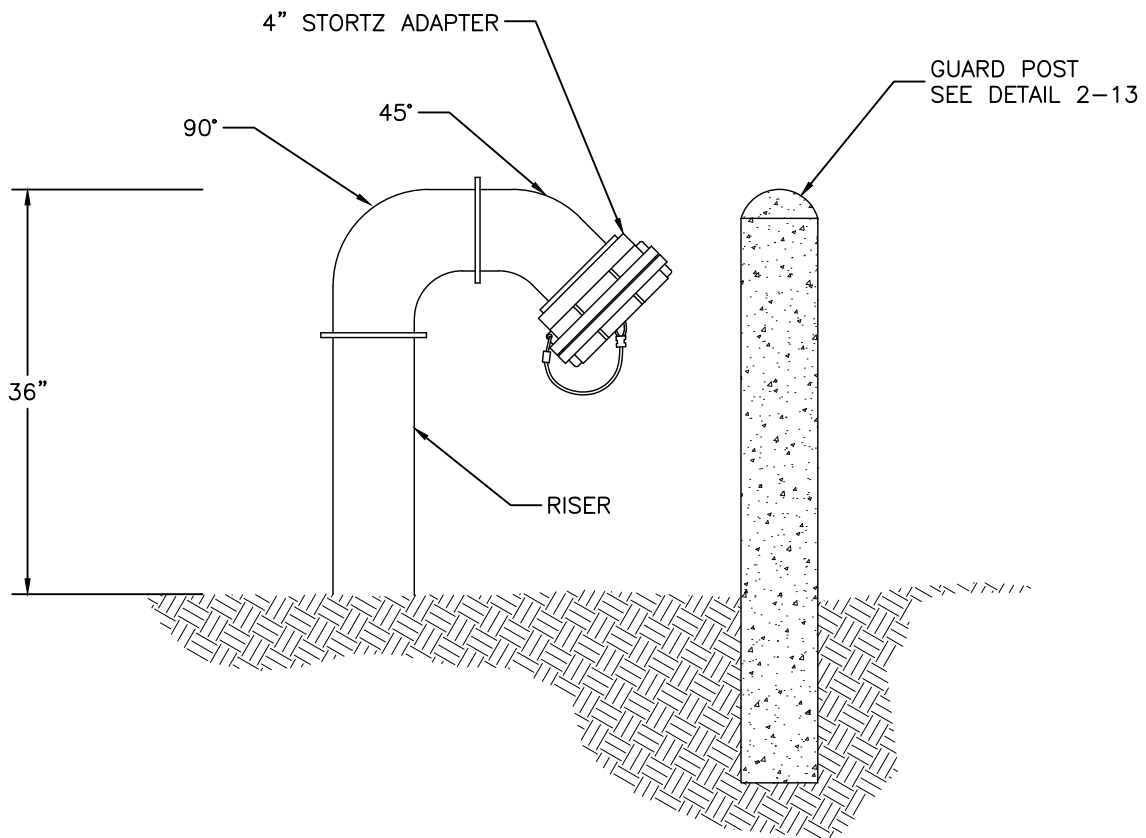
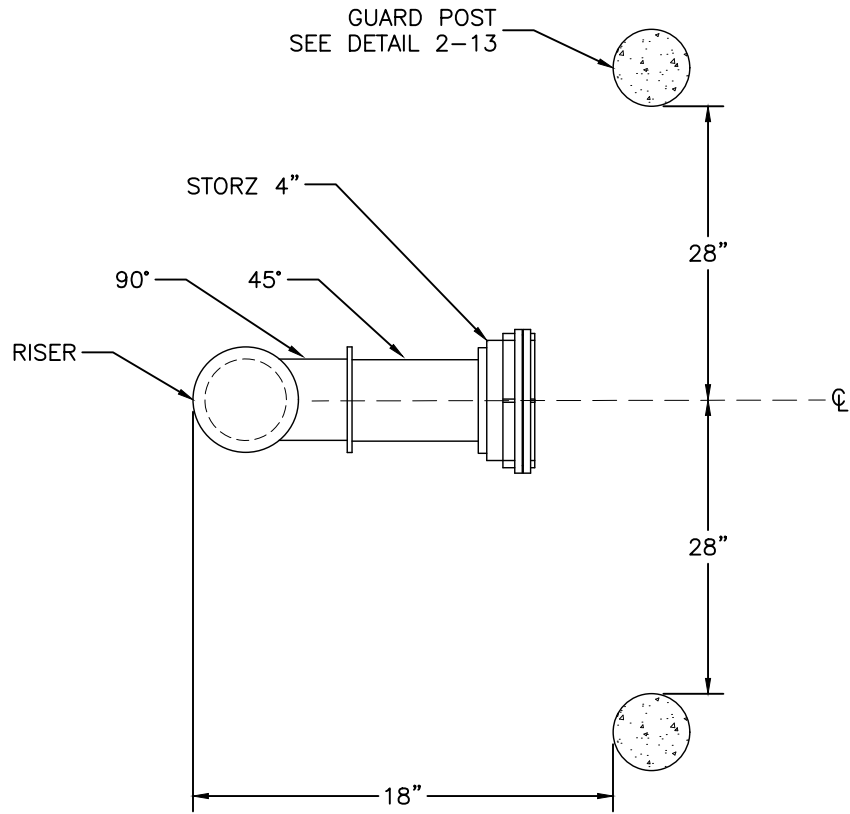


HYDRANT GUARD POST
ELEVATION VIEW

APPROVED BY:	REVISED DATE		FIRE HYDRANT GUARD POST & VALVE MARKER POST	Std. Dwg. No.
STEVE KING, PE	2/1/2022			2-13
PUBLIC WORKS DIRECTOR				

FILE LOCATION: \\citygis\pwwengineering\Design_Standards\02.2 - Drawings - 2021\02 - Water\2021 Updates\Chapter 2 - Master.dwg

PLOTTED: 2/1/2022 8:22:28 AM



APPROVED BY:	REVISED DATE		FIRE DEPARTMENT CONNECTION	Std. Dwg. No.
STEVE KING, PE	2/1/2022			2-14
PUBLIC WORKS DIRECTOR				

NOTES

1. RESTRAINED JOINTS ARE ACCEPTABLE INSTEAD OF THRUST BLOCKS, WHERE APPROPRIATE. THE CITY OF PORT TOWNSEND WILL BE THE SOLE ARBITER OF WHEN THE APPLICATION IS APPROPRIATE. THE FOLLOWING APPLICATIONS MUST USE RESTRAINED JOINTS UNLESS IMPRACTICAL.
 - 1.1. DEAD END MAINS THAT MAY BE EXTENDED IN THE FUTURE
 - 1.2. SOFT OR SATURATED SOILS, FITTINGS NEAR TOP OF SLOPE, OR BEARING AGAINST AN ADJACENT UTILITY.
 - 1.3. VERTICAL BENDS WITH FORCE DIRECTION UPWARDS ARE NOT COVERED HERE. MUST BE DESIGNED BY ENGINEER FOR EACH CASE
2. MECHANICAL JOINT RESTRAINTS SHALL BE COATED WITH FUSION BONDED POLYESTER, OR ZINC AND EPOXY COATING. EBAA MEGABOND, ROMAC ROMABOND, FORD ARMORGUARD E=COAT, OR APPROVED EQUAL.
3. TYLER TUFGRIP RESTRAINTS ARE NOT ALLOWED. SET-SCREW STYLE RESTRAINTS ARE NOT ALLOWED.
4. THE FOLLOWING TABLES ARE BASED ON EQUATIONS FROM THE DUCTILE IRON PIPE RESEARCH ASSOCIATIONS 2016 THRUST RESTRAINT FOR DUCTILE IRON PIPE. THE FOLLOWING CONDITIONS MUST BE MET FOR THESE RESULTS TO BE VALID. IF ANY OF THESE CONDITIONS CANNOT BE MET, PROJECT SPECIFIC CALCULATIONS MUST BE PROVIDED.
 - 4.1. THESE TABLES ARE ONLY FOR BARE (UNWRAPPED) DUCTILE IRON PIPE. RESTRAINED JOINTS SHALL ONLY BE ALLOWED FOR DUCTILE IRON PIPE.
 - 4.2. PIPE LAYING CONDITION TYPE 4 OR 5, DEFINED AS
 - 4.2.1. SELECT GRANULAR BEDDING MATERIAL BELOW PIPE
 - 4.2.2. PIPE ZONE BEDDING EXTENDING TO TOP OF PIPE MECHANICALLY COMPACTED IN LIFTS.
 - 4.3. PIPE RESTING DIRECTLY ON NATIVE TRENCH BOTTOM IS NOT ACCEPTABLE
 - 4.4. SANDY SILT BEDDING, FOR IMPORT CLEAN SAND OR 5/8" TOP COURSE, LENGTHS MAY BE REDUCED BY 25%.
 - 4.5. DEPTH OF COVER IS 3 FEET MINIMUM AT THE TIME OF PRESSURE TESTING.
 - 4.6. 250 PSI TEST PRESSURE MAXIMUM. FOR HIGHER TEST PRESSURE. MULTIPLY "L" BY THE PROPORTIONAL DIFFERENCE.
 - 4.6.1. EXAMPLE: FOR 300 PSI, 300/250 = 1.2 THEREFORE, LENGTHS MUST BE MULTIPLIED BY 120%

THE LENGTH "L" GIVEN BELOW IS THE DISTANCE THAT PIPE MUST BE RESTRAINED PAST THE FITTING JOINT. ALL JOINTS WITHIN THIS DISTANCE MUST BE RESTRAINED, INCLUDING THE FITTING.

DIA.	11¼° BEND	22½° BEND	33¾° BEND	45° BEND	67½° BEND	90° BEND	DEAD END	REDUCER *
4"	3'	5'	8'	10'	17'	25'	61'	20'
6"	4'	7'	11'	14'	23'	34'	86'	58'
8"	5'	9'	14'	19'	30'	44'	112'	81'
10"	6'	11'	16'	22'	36'	53'	135'	83'
12"	7'	13'	19'	26'	41'	62'	158'	84'
16"	8'	16'	24'	33'	53'	78'	203'	86'
18"	9'	18'	27'	36'	58'	86'	224'	121'
PVC**	1.2x	1.2x	1.2x	1.2x	1.2x	1.2x	1.4x	1.4x

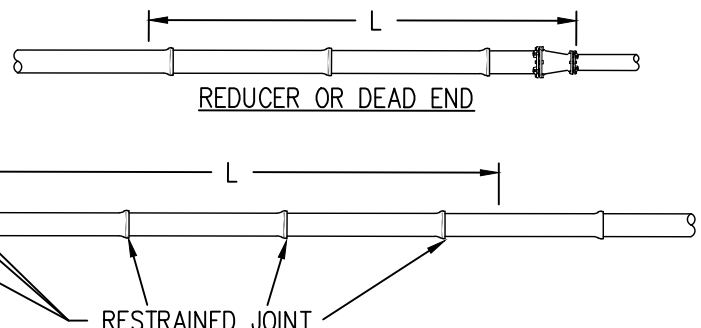
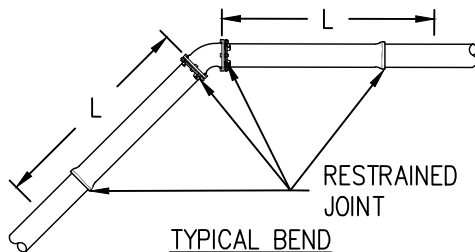
* ASSUMES REDUCER DOWN 2 SIZES. (EXAMPLE 12" X 8"). LARGER REDUCTIONS SHALL BE TREATED AS A TEE.

** FOR PVC OR POLY-BAGGED PIPE, MULTIPLY THE LENGTHS BY THE VALUE SHOWN IN THE PVC ROW.

BRANCH REDUCING TEE TABLE (1.4x for PVC)							
BRANCH DIAMETER	RUN DIAMETER						
	4"	6"	8"	10"	12"	16"	18"
4"	46'	39'	31'	23'	15'	1'	1'
6"	-	70'	65'	60'	55'	43'	37'
8"	-	-	97'	93'	89'	80'	75'
10"	-	-	-	119'	116'	109'	105'
12"	-	-	-	-	143'	137'	133'
16"	-	-	-	-	-	187'	184'
18"	-	-	-	-	-	-	207'

RESTRAIN TEE/CROSS RUN LEGS WITH A MINIMUM 5' STICK OF PIPE IN EACH LEG.

BRANCH INCREASING OR "BULLHEAD" TEES RESTRAINED AS A DEAD-END, LENGTH BASED ON LARGEST SIZE.



FILE LOCATION: \\citygis\pwwengineering\Design_Standards\02.2 - Drawings - 2021\02 - Water\2021 Updates\Chapter 2 - Master.dwg
PLOTTED: 2/1/2022 8:22:29 AM

APPROVED BY:	REVISED DATE		RESTRAINED JOINT PIPE	Std. Dwg. No.
STEVE KING, PE	2/1/2022			2-15
PUBLIC WORKS DIRECTOR				

CONSTRUCTION NOTES:

1. A PRE-CONSTRUCTION MEETING IS REQUIRED PRIOR TO CONSTRUCTION AND NO LESS THAN 5 BUSINESS DAYS ADVANCE NOTIFICATION OF THE CITY OF PORT TOWNSEND, AND ALL AFFECTED UTILITY COMPANIES PRIOR TO THE ACTUAL START OF WORK.
2. ONLY LEAD FREE FORD & MUELLER PRODUCTS ARE APPROVED FOR SERVICE BRASS, UNLESS OTHERWISE NOTED IN THESE DETAILS.
3. LOCATIONS OF EXISTING UTILITIES SHOWN ON THE PLANS ARE ESTIMATED UNLESS STATED OTHERWISE. THE CONTRACTOR SHALL VERIFY, LOCATE AND PROTECT ALL UTILITIES WITHIN THE PROJECT AREA. THE CONTRACTOR SHALL REPLACE OR REPAIR ANY UTILITIES DAMAGED DURING CONSTRUCTION. SHOW ALL ENCOUNTERED UTILITIES ON THE AS-BUILTS. CALL 811 FOR UTILITY LOCATES.
4. THE CONTRACTOR SHALL COMPLY WITH THE PROVISIONS OF THE RIGHT-OF-WAY/STREET CONSTRUCTION PERMIT AS ISSUED BY THE CITY OF PORT TOWNSEND, JEFFERSON COUNTY, OR WASHINGTON STATE DOT FOR THIS PROJECT. TRAFFIC CONTROL SHALL FOLLOW THE ROAD AGENCY'S CODES AND STANDARDS.
5. ALL WATER MAIN APPURTENANCES, AND THRUST BLOCKS SHALL BE INSPECTED BY THE CITY OF PORT TOWNSEND BEFORE BURY.
6. WATER MAIN TRENCH SECTION AND ALL EXCAVATED AREAS SHALL BE BACKFILLED AND COMPACTED IN ACCORDANCE WITH THE STANDARD DETAILS. COMPACTION TESTING IS REQUIRED DURING BACKFILLING OPERATIONS AT THE DISCRETION OF THE CITY OF PORT TOWNSEND. IF TRENCH BACKFILL DOES NOT MEET COMPACTION REQUIREMENTS, CONTRACTOR SHALL EXCAVATE, RE-COMPACT AND RE-TEST MATERIAL AT CONTRACTOR'S EXPENSE.
7. RESTORATION OF DAMAGED ROAD SURFACING SHALL BE IN ACCORDANCE WITH CITY OF PORT TOWNSEND REQUIREMENTS, ALL OTHER AREAS SHALL BE RESTORED TO ORIGINAL CONDITION OR AS DIRECTED BY THE CITY OF PORT TOWNSEND. THIS INCLUDES SHOULDERS, LANDSCAPING, WALLS, FENCES AND OTHER IMPROVEMENTS.
8. PROVIDE A SANITARY GAP BETWEEN THE EXISTING AND NEW WATER SYSTEMS. THE CITY OF PORT TOWNSEND WILL TAKE A WATER SAMPLE FROM THE MAIN AFTER DISINFECTION. CONNECTION TO THE EXISTING WATER SYSTEM SHALL BE PERFORMED BY THE CONTRACTOR ONLY AFTER COMPLETING AN ACCEPTABLE HYDROSTATIC PRESSURE TEST AND THE PIPELINE IS DISINFECTED, FLUSHED, AND RECEIPT OF APPROVAL OF WATER QUALITY TEST RESULTS FROM THE LAB.
10. A RUBBER PIPE PLUG SHALL BE USED ANY TIME THE PIPE TRENCH IS LEFT UNATTENDED TO PROTECT AGAINST SOIL INTRUSION AND FLOODING OF THE PIPE. OPEN ENDS OF VALVES SHALL BE PLUGGED OR BAGGED UNTIL EXTENDED WITH PIPE.
11. NO OTHER PARALLEL UTILITIES SHALL BE INSTALLED WITHIN 36" HORIZONTALLY OF ANY ACTIVE WATER LINE UNLESS OTHERWISE APPROVED BY THE CITY.
12. CONTRACTOR SHALL POTHOLE A SUFFICIENT DISTANCE AHEAD OF PIPELAYING TO VERIFY DEPTH OF EXISTING WATER MAINS AND CROSSING UTILITIES AND TO ANTICIPATE ANY NECESSARY CHANGES IN FITTINGS OR ALIGNMENT.
13. ALL EASEMENTS SHALL BE RECORDED, AND AN AS-BUILT RECORD MUST BE SUBMITTED TO THE CITY OF PORT TOWNSEND BEFORE WATER SERVICE WILL BE PROVIDED.
14. DEFLECTION AT PIPE AND FITTING JOINTS WILL BE ALLOWED UP TO 5.0" PER JOINT OR AS RECOMMENDED BY MANUFACTURER, WHICHEVER IS LESS.
15. ALL WATER PIPE SHALL BE CLASS 52 DUCTILE IRON.
16. ALL CONTRACTORS WORKING WITHIN THE RIGHT-OF-WAY OR ON EXISTING CITY OF PORT TOWNSEND INFRASTRUCTURE SHALL BE LICENSED, BONDED AND HAVE EXPERIENCE INSTALLING PUBLIC DOMESTIC WATER SYSTEMS AND BE PREPARED TO PRESENT EXAMPLES OF 5 SUCH PROJECTS UPON REQUEST BY THE CITY OF PORT TOWNSEND.

CONTINUED ON NEXT PAGE.....

FILE LOCATION: \\citygis\pwwengineering\Design_Standards\02.2 - Drawings - 2021\02 - Water\2021 Updates\Chapter 2 - Master.dwg PLOTTED: 2/1/2022 8:22:29 AM

APPROVED BY:	REVISED DATE		CONSTRUCTION NOTES 1	Std. Dwg. No.
STEVE KING, PE	2/1/2022			2-16
PUBLIC WORKS DIRECTOR				

CONSTRUCTION NOTES:

- 17. CONTRACTOR TO PROVIDE NO LESS THAN 5 BUSINESS DAYS NOTICE TO THE CITY OF PORT TOWNSEND PRIOR TO ANY REQUESTED SHUT DOWN. THE CITY OF PORT TOWNSEND WILL PROVIDE NOTICE TO CUSTOMERS 48 HOURS IN ADVANCE OF OUTAGE.
- 18. RESTRAINTS, GASKETS, OR RESTRAINED PIPES (PORTIONS GOUGED BY RESTRAINTS) MAY NOT BE REUSED ONCE ASSEMBLED.

PRESSURE TESTING

- 1. WATER MAIN APPURTENANCES AND SERVICE CONNECTIONS TO THE METER SHALL BE TESTED IN SECTIONS OF UP TO 500 FEET IN LENGTH UNDER A HYDROSTATIC PRESSURE OF 225 PSI. PUMPS, GAUGES, PLUGS, SADDLES, CORPORATION STOPS, MISCELLANEOUS HOSE AND PIPING, AND MEASURING EQUIPMENT NECESSARY FOR PERFORMING THE TEST SHALL BE FURNISHED AND OPERATED BY THE CONTRACTOR.
- 2. THE MAINS SHALL BE FILLED WITH WATER AND ALLOWED TO STAND UNDER PRESSURE A SUFFICIENT LENGTH OF TIME TO ALLOW THE ESCAPE OF AIR AND ALLOW THE LINING OF THE PIPE TO ABSORB WATER.
- 3. THE TEST SHALL BE ACCOMPLISHED BY PUMPING THE MAIN UP TO THE REQUIRED PRESSURE, STOPPING THE PUMP FOR 15 MINUTES, AND THEN PUMPING THE MAIN UP TO THE TEST PRESSURE AGAIN. DURING THE TEST, THE SECTION BEING TESTED SHALL BE OBSERVED TO DETECT ANY VISIBLE LEAKAGE. THE TEST WILL BE COMPLETE WHEN THERE IS NO APPRECIABLE LOSS IN PRESSURE DURING THE 15 MINUTE TEST PERIOD.
- 4. ANY VISIBLE LEAKAGE DETECTED SHALL BE CORRECTED BY THE CONTRACTOR REGARDLESS OF THE ALLOWABLE LEAKAGE. SHOULD THE TESTED SECTION FAIL TO MEET THE PRESSURE TEST SUCCESSFULLY AS SPECIFIED, THE CONTRACTOR SHALL, AT NO ADDITIONAL EXPENSE TO THE CONTRACTING AGENCY, LOCATE AND REPAIR THE DEFECTS AND THEN RETEST THE PIPELINE.
- 5. THE PRESSURE TEST WILL BE WITNESSED BY THE CITY AND SCHEDULED NO LESS THAN 48 HOURS IN ADVANCE. PRIOR TO CALLING OUT THE CITY, THE CONTRACTOR SHALL HAVE ALL EQUIPMENT SET UP COMPLETELY READY FOR OPERATION AND SHALL HAVE SUCCESSFULLY PERFORMED THE TEST TO ENSURE THE PIPE IS IN SATISFACTORY CONDITION.
- 6. FOR PIPE LENGTHS LONGER THAN 500 FEET, THE QUANTITY OF WATER REQUIRED TO RESTORE THE PRESSURE SHALL BE ACCURATELY DETERMINED BY PUMPING THROUGH A POSITIVE DISPLACEMENT WATER METER. THE METER SHALL BE APPROVED BY THE CITY. THE QUANTITY OF WATER LOST FROM THE MAIN SHALL NOT EXCEED THE NUMBER OF GALLONS PER HOUR AS DETERMINED BY THE FORMULA IN THE WSDOT STANDARD SPECIFICATIONS SECTION 7.09.3(23).

FILE LOCATION: \\citygis\pwwengineering\Design_Standards\02.2 - Drawings - 2021\02 - Water\2021 Updates\Chapter 2 - Master.dwg PLOTTED: 2/1/2022 8:22:30 AM

APPROVED BY:	REVISED DATE		CONSTRUCTION NOTES 2 PRESSURE TESTING NOTES	Std. Dwg. No.
STEVE KING, PE	2/1/2022			2-17
PUBLIC WORKS DIRECTOR				