

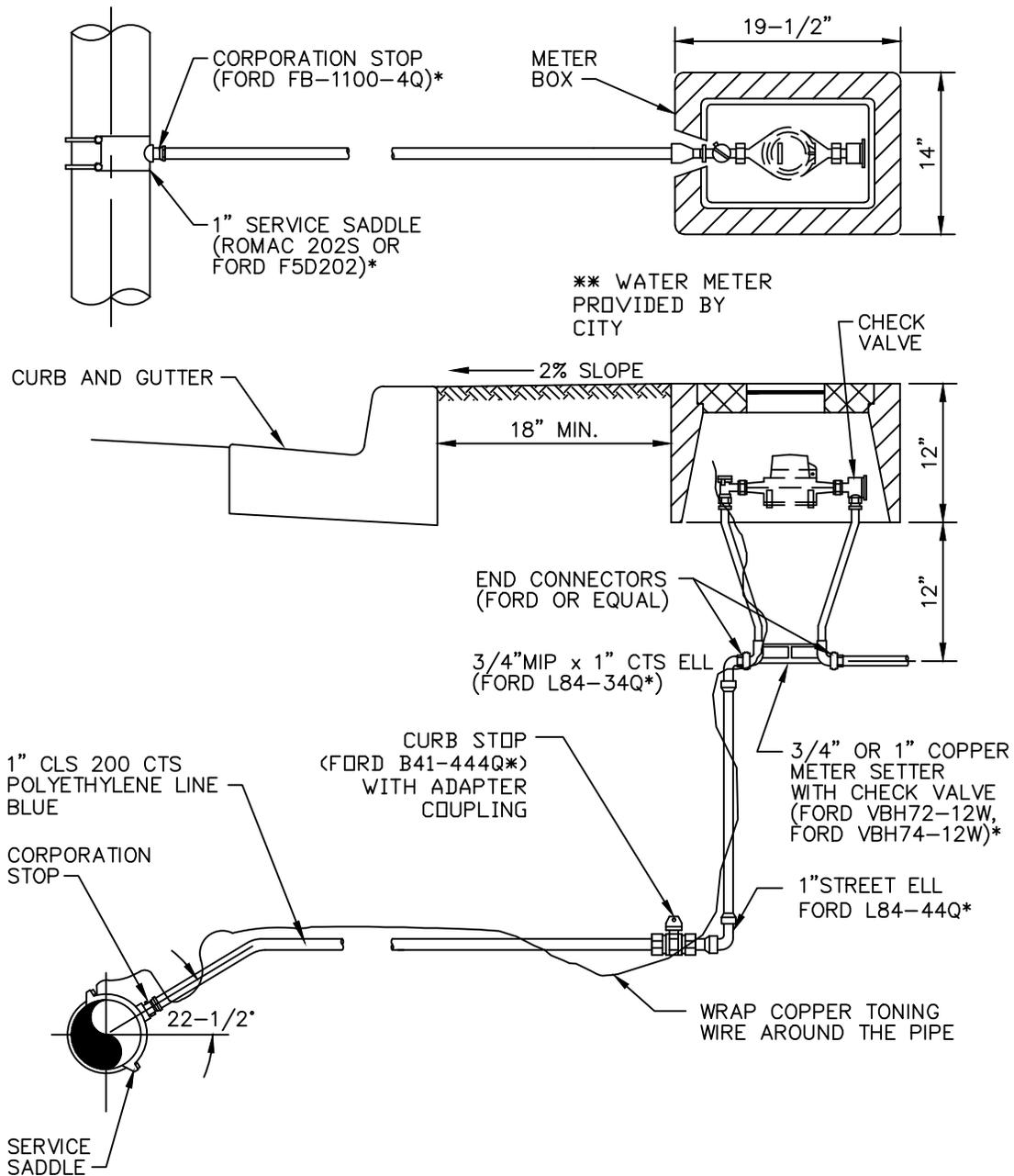
HYDRANT ASSEMBLY

* (OR APPROVED EQUAL)

NOTES:

1. DEAD END MAIN EXTENSIONS OVER 50' SHALL BE 8" MINIMUM.
2. USE PORT 5" STORTZ, MVO 5-1/4", WITH ALL OPERATING NUTS THE SAME SIZE.
3. AN UNOBSTRUCTED THREE FOOT MINIMUM WORKING AREA RADIUS SHALL BE PROVIDED AROUND ALL HYDRANTS.
4. FABRIC TO BE INSTALLED AROUND BASE OF HYDRANT AFTER PLACEMENT OF DRAIN ROCK.

	CITY OF GIG HARBOR ENGINEERING DIVISION	<small>REV. NO.</small>
<h2 style="margin: 0;">HYDRANT ASSEMBLY</h2>		<small>DETAIL NO.</small> <h2 style="margin: 0;">4-01</h2>
<small>APPROVED BY</small> <small>CITY ENGINEER</small>		<small>DATE</small>
		1/1/2014

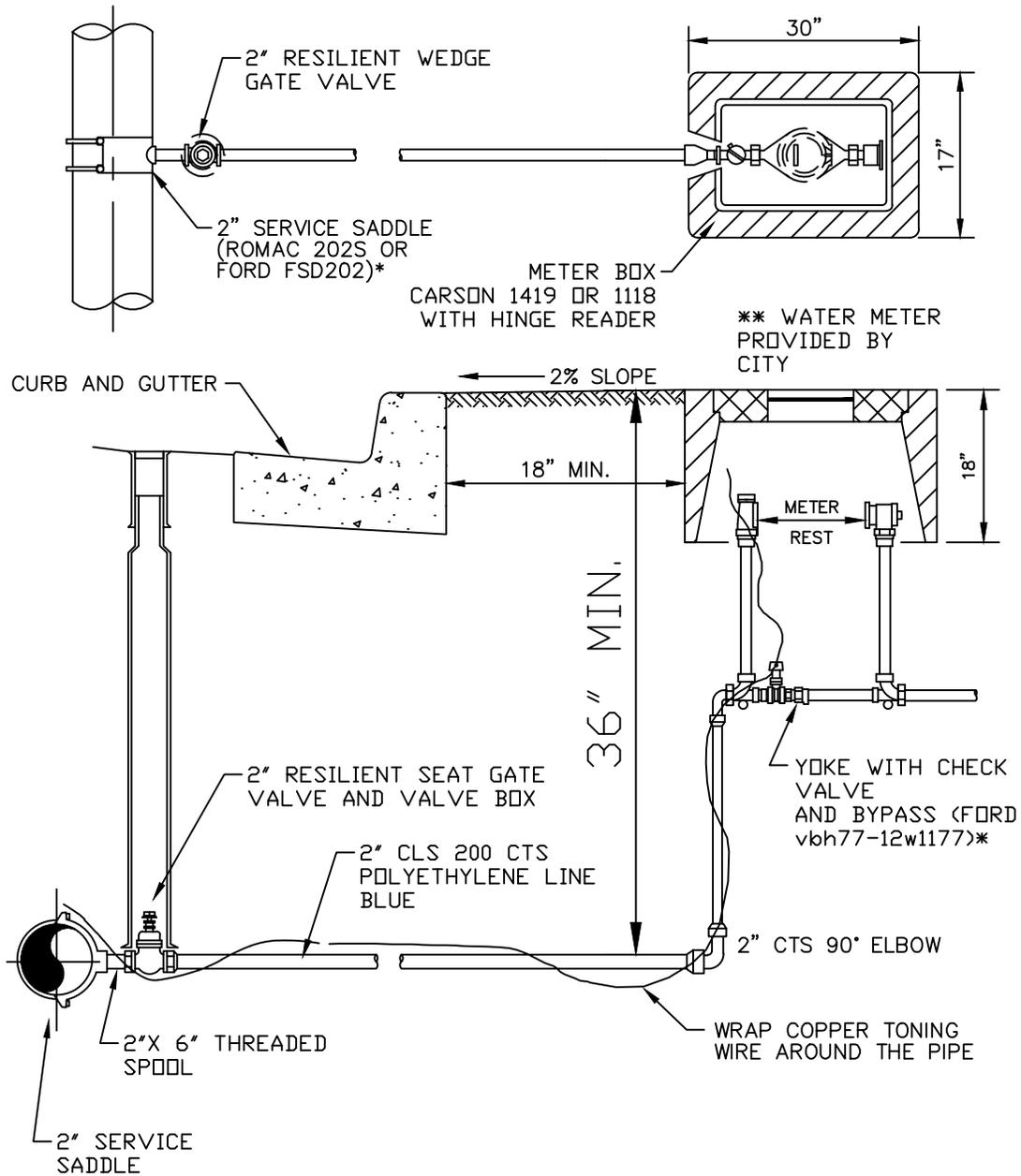


**3/4 INCH OR 1 INCH
SERVICE CONNECTION**

NOTES:

1. STAINLESS STEEL INSERTS REQUIRED FOR ALL COMPRESSION FITTINGS.
2. ALL SERVICE SADDLES SHALL HAVE RUBBER GASKET AND I.P. THREADS.

 CITY OF GIG HARBOR ENGINEERING DIVISION	DETAIL NO. 4-02
3/4 INCH OR 1 INCH SERVICE CONNECTION	
APPROVED BY CITY ENGINEER <i>hsl</i>	DATE 1/1/2014



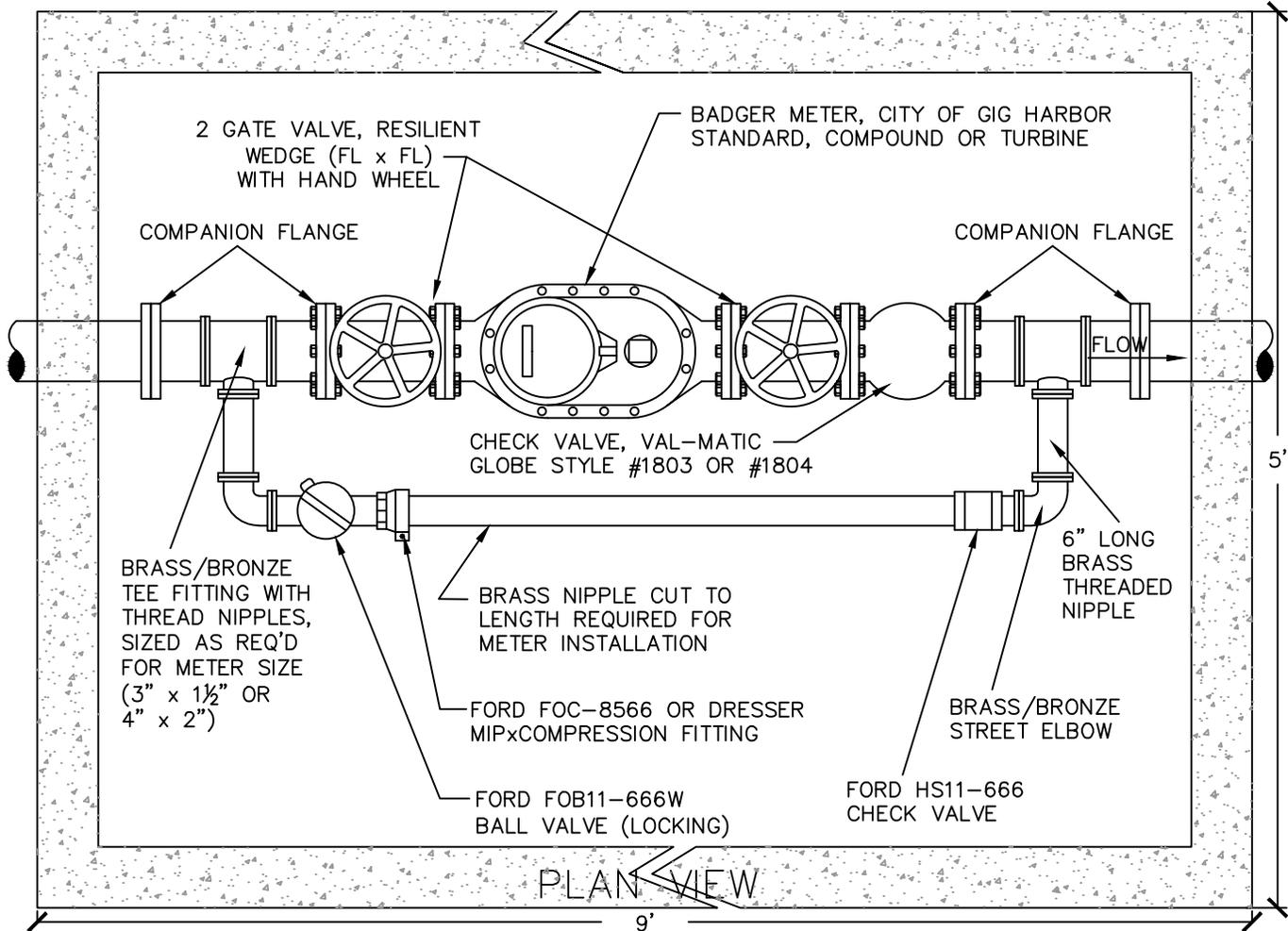
1-1/2" AND 2" WATER SERVICE CONNECTION

* (OR APPROVED EQUAL)

NOTES:

1. STAINLESS STEEL INSERTS REQUIRED FOR ALL COMPRESSION FITTINGS.
2. ALL SERVICE SADDLES SHALL HAVE RUBBER GASKET AND I.P. THREADS.

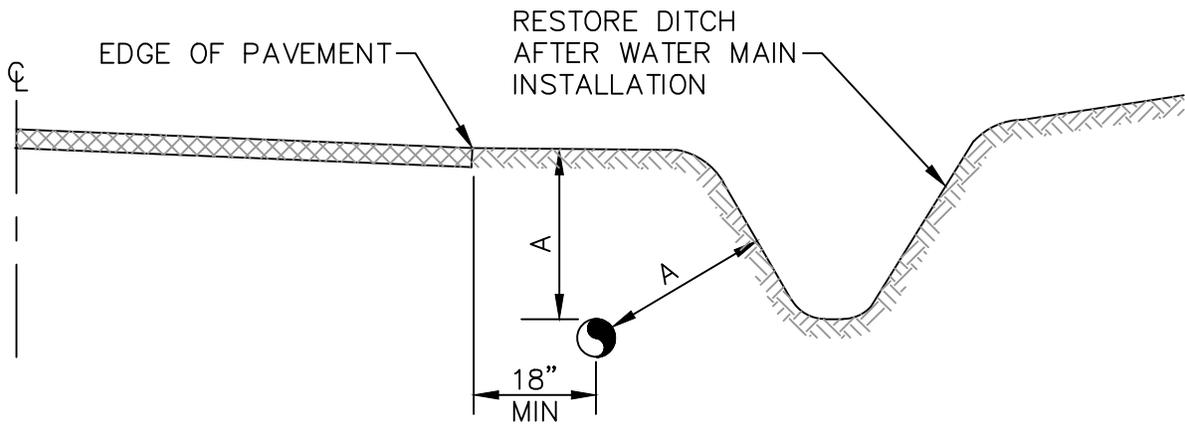
	CITY OF GIG HARBOR ENGINEERING DIVISION
1-1/2" AND 2" WATER SERVICE CONNECTION	DETAIL NO. 4-03
APPROVED BY CITY ENGINEER <i>[Signature]</i>	DATE 1/1/2014



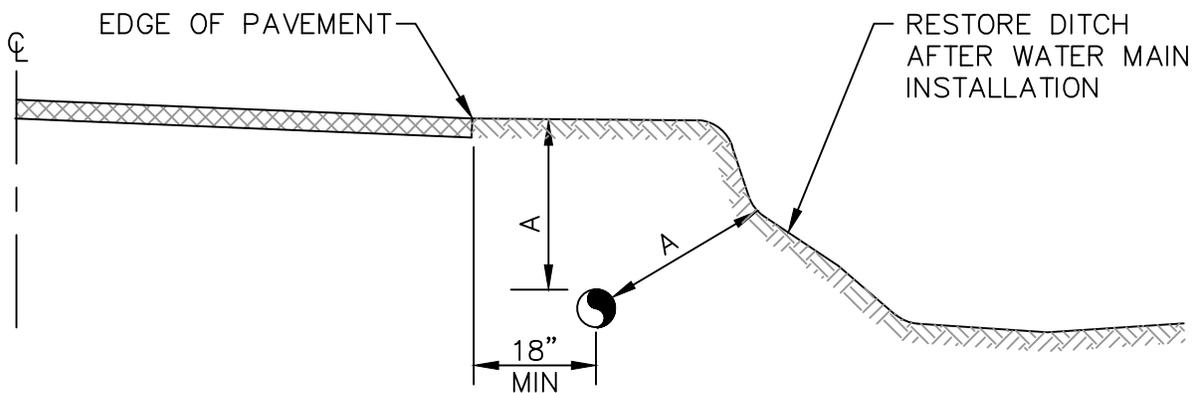
NOTES:

1. 3" METERS SHALL HAVE 3" PLUMBING AND 1 1/2" BYPASS PLUMBING.
2. 4" METERS SHALL HAVE 4" PLUMBING AND 2" BYPASS PLUMBING.
3. A MINIMUM OF 10 PIPE DIAMETERS OF STRAIGHT UNOBSTRUCTED PIPE SHALL BE REQUIRED UPSTREAM OF THE INSTALLED METER.
4. THE METER BOX PIT SHALL BE BEDDED WITH 6" DEPTH OF CRUSHED ROCK.
5. USE CONCRETE UTILITY VAULT SIZED ACCORDINGLY WITH TRAFFIC-RATED HINGED ACCESS HATCHED(S) AND READER LID. VAULT SHALL HAVE CONCRETE BOTTOM WITH DRAIN TO DAYLIGHT/OR PROVIDE MECHANICAL SUMP PUMP. INSIDE DEPTH SHALL NOT EXCEED 4'.
6. BYPASS AND GLOBE STYLE CHECK VALVE NOT REQUIRED FOR IRRIGATION ONLY INSTALLATION.
7. ALL PLUMBING SHALL BE SUPPORTED BY ADJUSTABLE JACK STANDS. THESE STANDS SHALL BE PLACED IN FOUR LOCATIONS TO PROVIDE THE INSTALLATION WITH A FIRM SUPPORT.
8. REMOTE READER ABOVE GROUND BOX SHALL BE INSTALLED. ALLIED MOULDED PRODUCTS #1056 W/ READER WINDOW.
9. REMOTE METER READER BOX SHALL BE MOUNTED A MIN. 3' ABOVE GROUND ON A 1 1/2" GALVANIZED UNI-STRUT POST SET IN CONCRETE.
10. INSTALL 3/4" PVC ELECTRICAL CONDUIT FROM METER VAULT TO REMOTE READER BOX.
11. METER VAULT SHALL HAVE GRAVITY DRAIN INSTALLED.

	<p>CITY OF GIG HARBOR ENGINEERING DIVISION</p>
<p>STANDARD PLUMBING CONFIGURATION FOR 3" AND 4" METERS</p>	
<p>DETAIL NO.</p>	<p>4-04</p>
<p>APPROVED BY <i>hermann</i> DATE 1/1/2014</p>	



DITCH



SLOPE

PIPE SIZE	A
6" - 18"	42"
20" & OVER	48"

 CITY OF GIG HARBOR ENGINEERING DIVISION	
WATER MAIN DEPTH REQUIREMENTS	DETAIL NO. 4-05
APPROVED BY CITY ENGINEER <i>hohmann</i>	DATE 1/1/2014

FINISHED GRADE

COMPACTED BACKFILL
CONSISTING OF EXCAVATED
MATERIAL OR GRAVEL
BASE AS DIRECTED
BY THE CITY

LOCATE TAPE 12"-16" BELOW
FINISHED GRADE

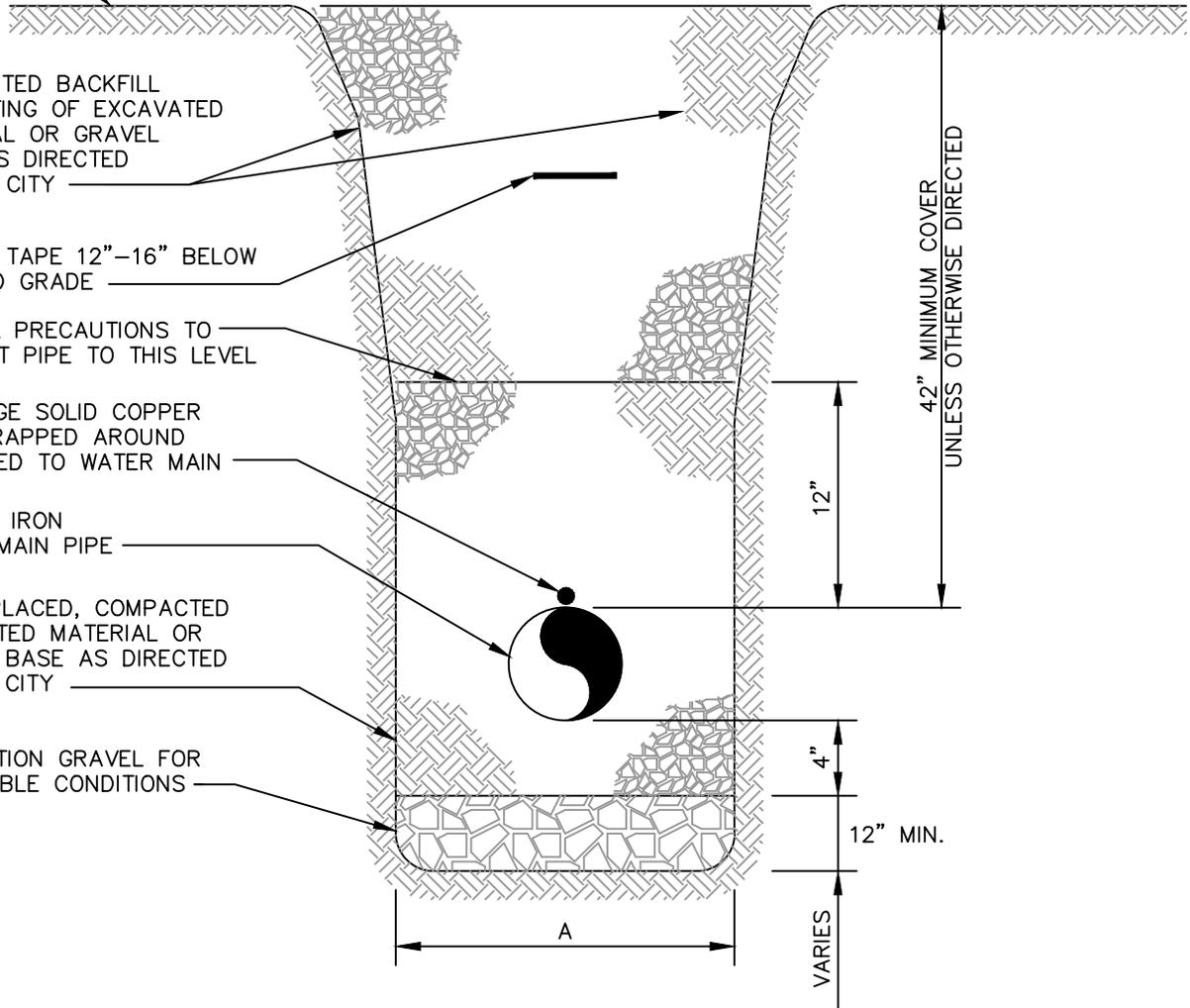
SPECIAL PRECAUTIONS TO
PROTECT PIPE TO THIS LEVEL

14 GAUGE SOLID COPPER
WIRE WRAPPED AROUND
OR TAPED TO WATER MAIN

DUCTILE IRON
WATER MAIN PIPE

HAND-PLACED, COMPACTED
EXCAVATED MATERIAL OR
GRAVEL BASE AS DIRECTED
BY THE CITY

FOUNDATION GRAVEL FOR
UNSUITABLE CONDITIONS



DUCTILE IRON WATER MAIN TRENCH SECTION

PIPE SIZE	A
6"	24"
8"	30"
10" & 12"	36"
16" AND 18"	42"



CITY OF GIG HARBOR
ENGINEERING DIVISION

DUCTILE IRON WATER MAIN TRENCH SECTION

DETAIL NO.

4-06

APPROVED BY
CITY ENGINEER

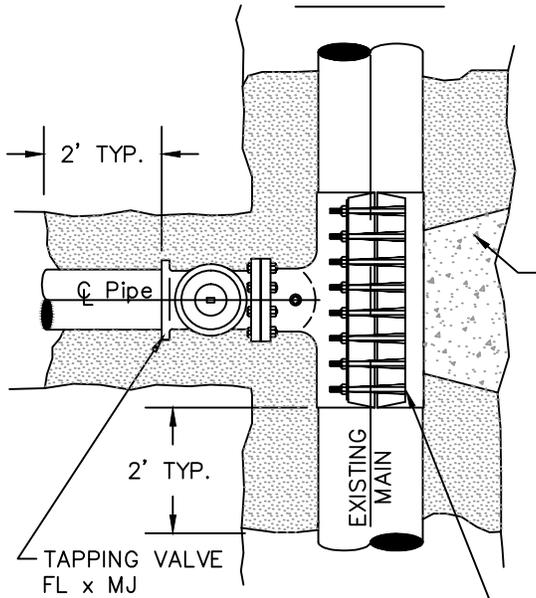
Handwritten signature

DATE 1/1/2014

CUT-IN-TEE

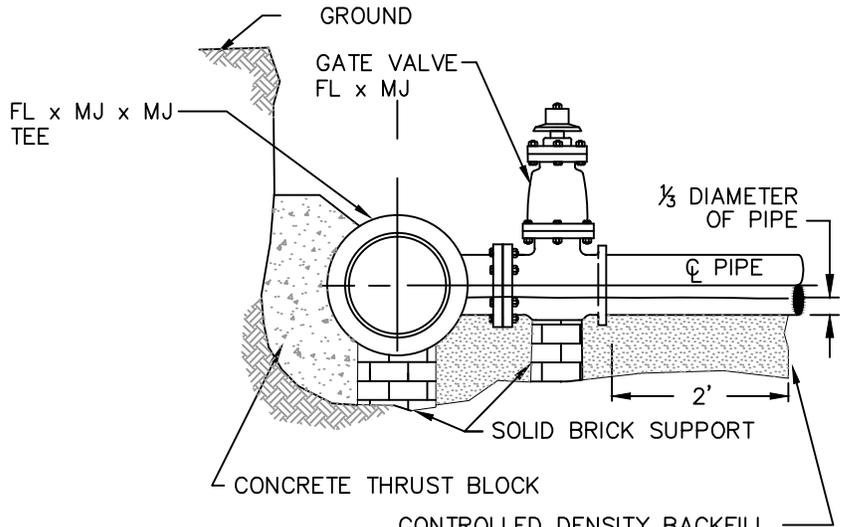
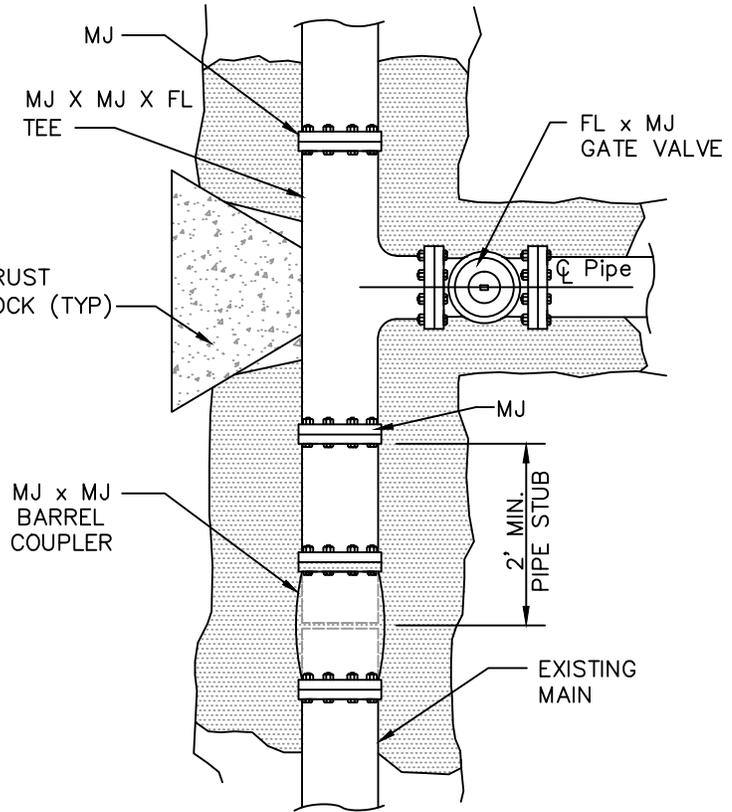
(ONLY BY APPROVAL OF CITY ENGINEER)

LIVE TAP



VALVE AND SLEEVE SHALL BE SUPPORTED AND BACKFILLED AS SHOWN BELOW—RIGHT.

ASTM APPROVED TAPPING SLEEVE (12" DIAMETER AND UNDER SHALL BE STAINLESS STEEL).



CONTROLLED DENSITY BACKFILL
POURED WIDTH OF TRENCH, TWO FEET PAST VALVE FLANGE UP TO 1/3 DIAMETER OF PIPE

NOTES:

- 11 MIL. PLASTIC OR CONSTRUCTION FABRIC SHALL BE WRAPPED AROUND PIPE AND FITTINGS BEFORE THRUST BLOCK AND BACKFILL ARE POURED.
- CONTROLLED DENSITY BACKFILL IS A PLANT MIX CONSISTING OF: 3100# SAND, 450# WATER, AND ONE SACK (94#) OF CEMENT.
- SUPPORT VALVE AND SLEEVE CONTINUOUSLY THROUGH INSTALLATION.
- MEGA LUG RESTRAINT JOINT REQUIRED ON ALL MECHANICAL JOINT FOLLOWERS.



CITY OF GIG HARBOR
ENGINEERING DIVISION

CONNECTION TO EXISTING MAIN

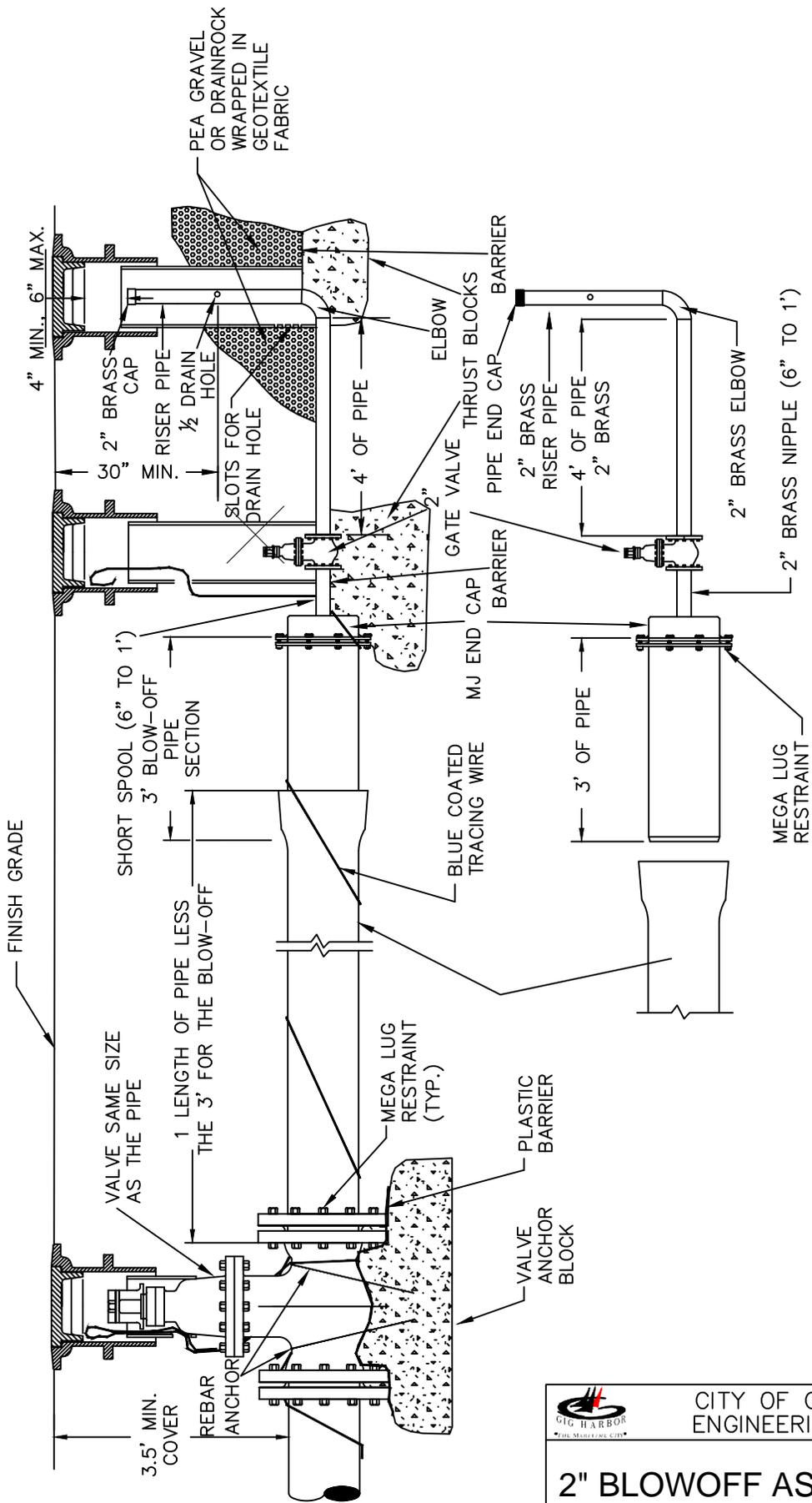
DETAIL NO.

4-07

APPROVED BY
CITY ENGINEER

Handwritten signature

DATE 1/1/2014

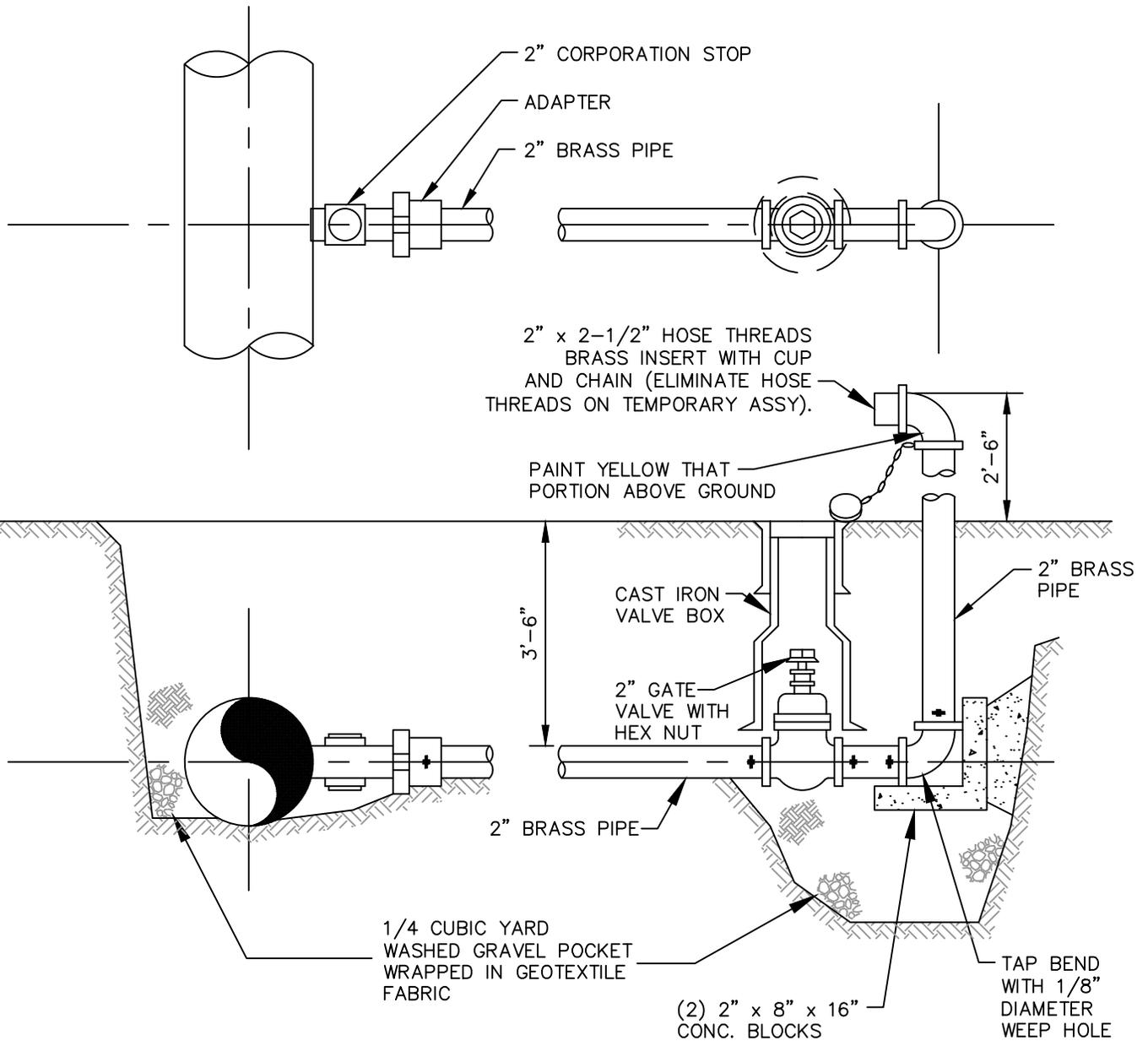


NOTES:

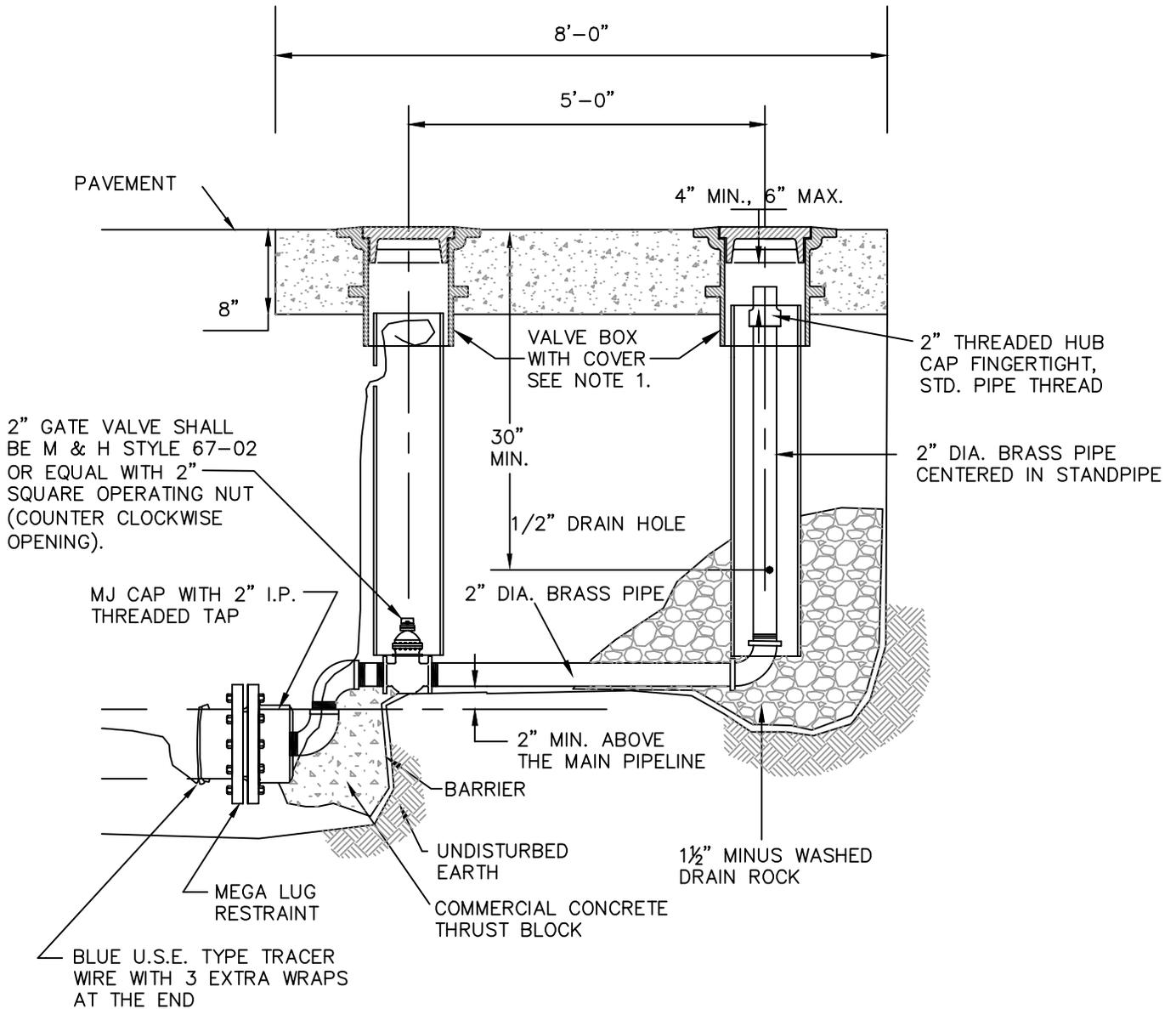
1. FOR VALVE BOX REQUIREMENTS SEE DETAIL 4-09.
2. FILL THE AREA OUTSIDE OF THE BLOW-OFF RISER STAND PIPE WITH PEA GRAVEL.
3. FOR PIPING REQUIREMENTS SEE GENERAL NOTE #5.
4. ALL FITTINGS AND PIPING SHALL BE BRASS.

 CITY OF GIG HARBOR ENGINEERING DIVISION <small>REV. NO.</small>	DETAIL NO.
	4-09
APPROVED BY CITY ENGINEER <i>John Munn</i>	DATE 1/1/2014

2" BLOWOFF ASSEMBLY



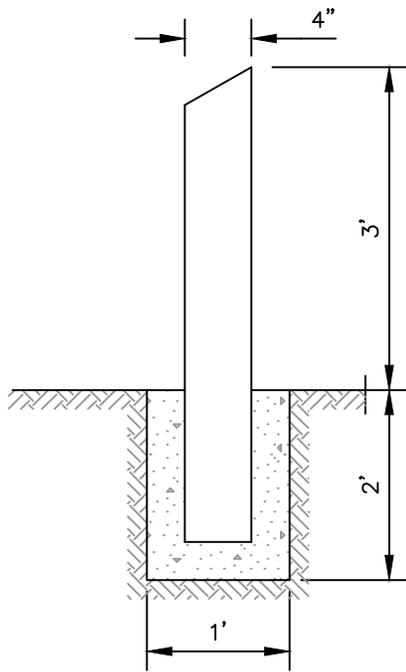
 CITY OF GIG HARBOR ENGINEERING DIVISION	
IN-LINE BLOWOFF ASSEMBLY	DETAIL NO. 4-10
APPROVED BY CITY ENGINEER <i>[Signature]</i>	DATE 1/1/2014



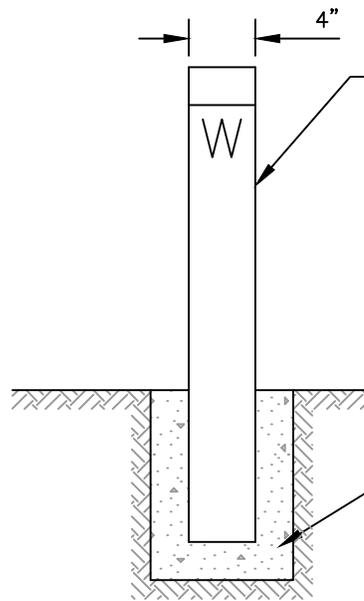
NOTES:

1. VALVE BOX, COVER AND PAD SHALL BE PER CITY OF GIG HARBOR VALVE BOX DETAIL 4-09.
2. ALL FITTING AND PIPING SHALL BE BRASS.

	CITY OF GIG HARBOR ENGINEERING DIVISION
2" BLOWOFF ASSEMBLY FOR DEAD END LINE	DETAIL NO. 4-11
APPROVED BY CITY ENGINEER <i>hshomard</i>	DATE 1/1/2014



SIDE

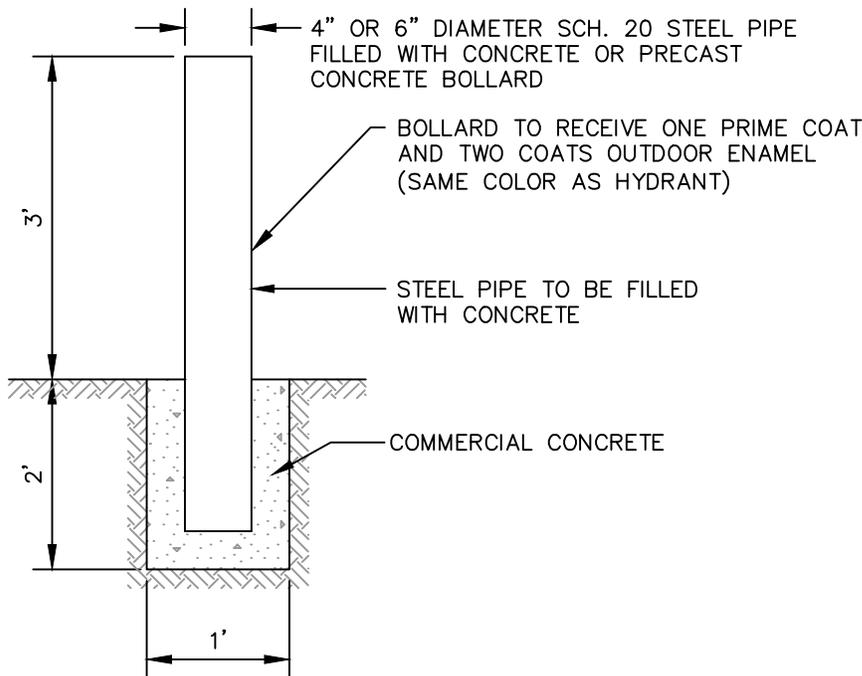


REINFORCED CONCRETE MARKER POST STAMPED WITH "W" AND DISTANCE TO VALVE. POST TO RECEIVE ONE PRIME COAT AND TWO COATS OUTDOOR ENAMEL (WHITE).

COMMERCIAL CONCRETE

FRONT

VALVE MARKER POST

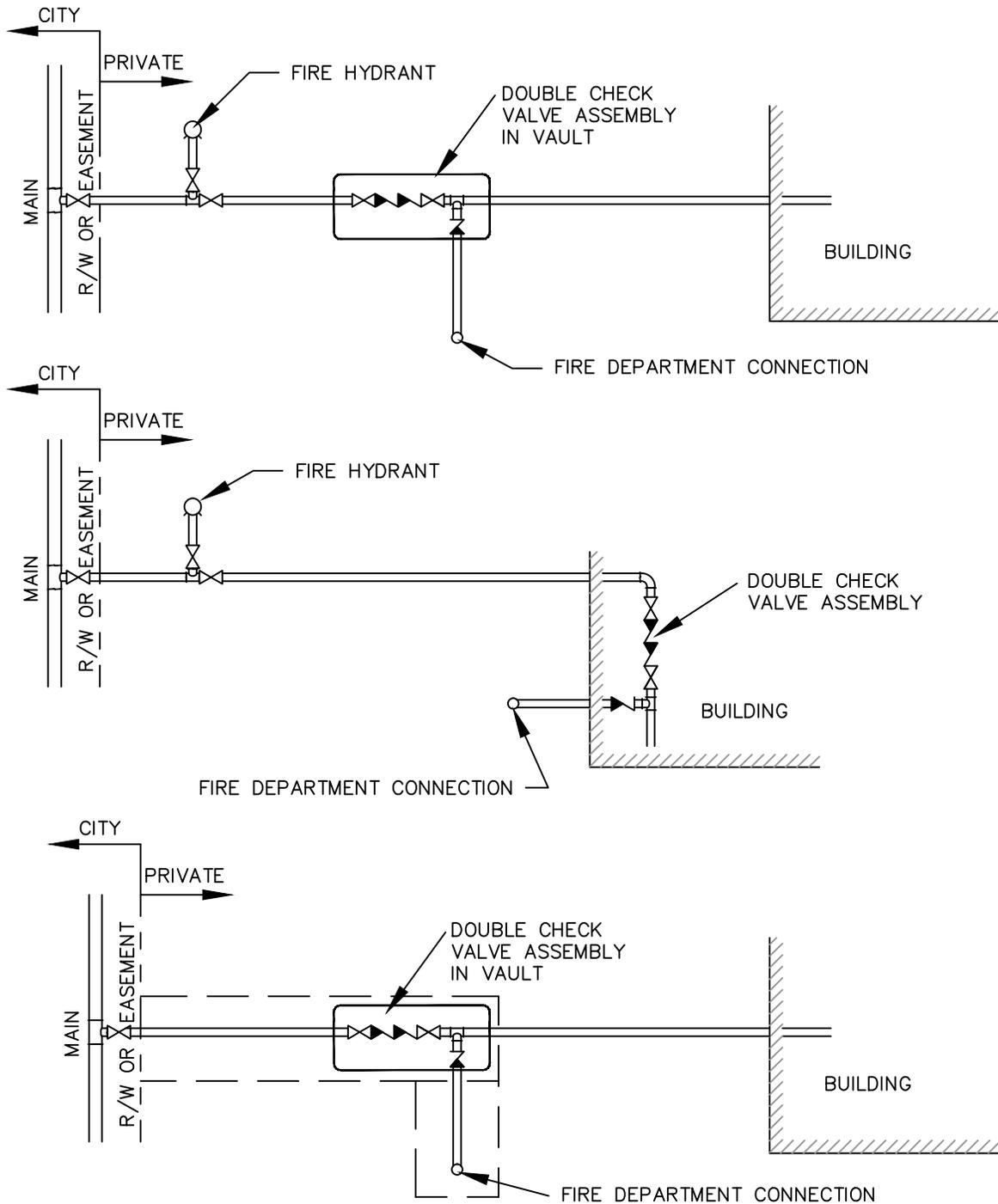


HYDRANT BOLLARD

NOTE:

1. LOCATE BOLLARDS 3' FROM HYDRANT DO NOT BLOCK HYDRANT PORTS.

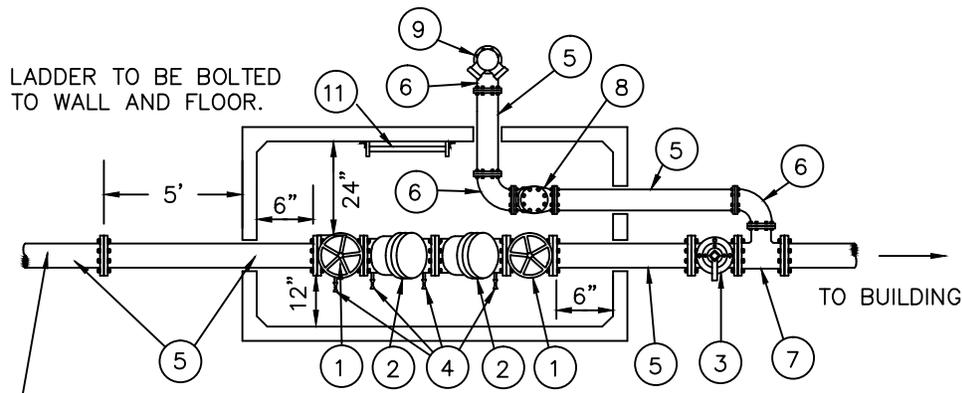
 CITY OF GIG HARBOR ENGINEERING DIVISION	
VALVE MARKER POST AND HYDRANT BOLLARD	DETAIL NO. 4-12
APPROVED BY CITY ENGINEER <i>handwritten signature</i>	DATE 1/1/2014



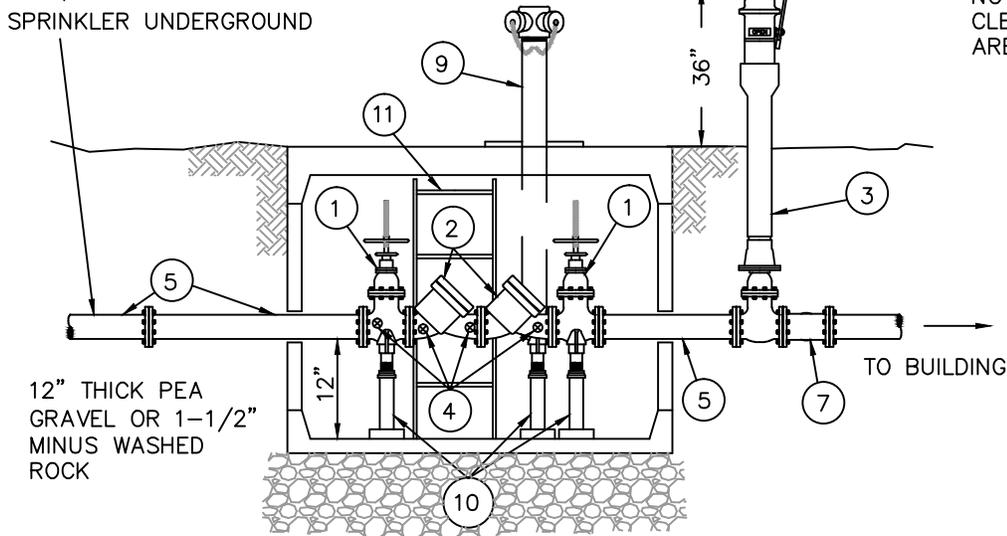
NOTES:

1. ALL PIPE EASEMENTS ARE TO BE 15 FEET WIDE WITH PIPE CENTERED IN EASEMENT.
2. WHEN THE DCVA IS IN A VAULT, OUTSIDE THE BUILDING, THE CITY EASEMENT SHALL END AT THE CITY VALVE.
3. WHEN THE DCVA IS LOCATED WITHIN THE BUILDING, THE CITY EASEMENT SHALL END AT THE CITY VALVE.

 CITY OF GIG HARBOR ENGINEERING DIVISION	
FIRE SPRINKLER UNDERGROUND EASEMENT LIMITS	
DETAIL NO. 4-13	
APPROVED BY <i>hald</i> CITY ENGINEER DATE 1/1/2014	



PLAN



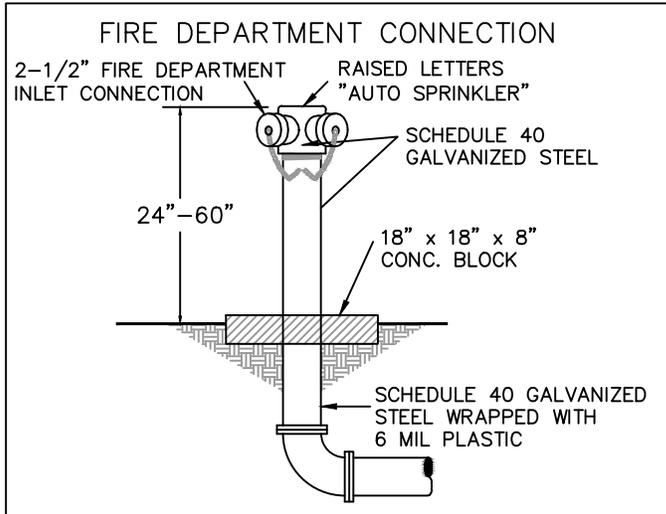
NOTE:
CLEARANCE DIMENSIONS
ARE MINIMUMS.

MATERIAL LIST:

1. OS & Y GATE VALVE W/HANDWHEEL FL x FL
2. D.S.H.S. APPROVED CHECK VALVE FL x FL
3. POST INDICATOR VALVE
4. TEST COCK - 4 REQUIRED
5. CLASS 52 DI WALL PIPE FL x FL
6. CLASS 52 DI 90° BEND FL x FL
7. CLASS 52 DI TEE FL x FL
8. SWING CHECK VALVE W/BALL DRIP ASSEMBLY
9. FIRE DEPARTMENT CONNECTION
10. VALVE STANDS
11. LADDER

GENERAL NOTES:

1. THOROUGHLY FLUSH LINES PRIOR TO INSTALLING BACK FLOW ASSEMBLY.
2. PIPE FROM VAULT TO BUILDING SHALL BE CLASS 52 DI.
3. TAMPER SWITCHES SHALL BE INSTALLED ON 1 AND 3 CONNECTED TO BUILDING FIRE ALARM SYSTEM.
4. WHERE PIPING PASSES THROUGH CONCRETE WALL PROVIDE 2" CLEARANCE W/WATERPROOF MASTIC OR FLEXIBLE SEALANT.
5. DIAMETER OF PIPE AND FITTINGS TO BE DETERMINED BY CERTIFIED SPRINKLER DESIGNER.
6. ALL PIPING SHALL BE A MINIMUM OF 4" DIA. AS PER NFPA13.
7. ALL VAULTS SHALL BE EQUIPPED WITH A DRAIN TO DAYLIGHT OR BE INSTALLED ABOVE GROUND.
8. ALL FIRE SPRINKLER LINES UP TO THE FIRST VALVE ON THE DCVA SHALL BE DISINFECTED, PRESSURE TESTED, FLUSHED AND TESTED FOR PURITY PER THE CITY OF GIG HARBOR STANDARDS.

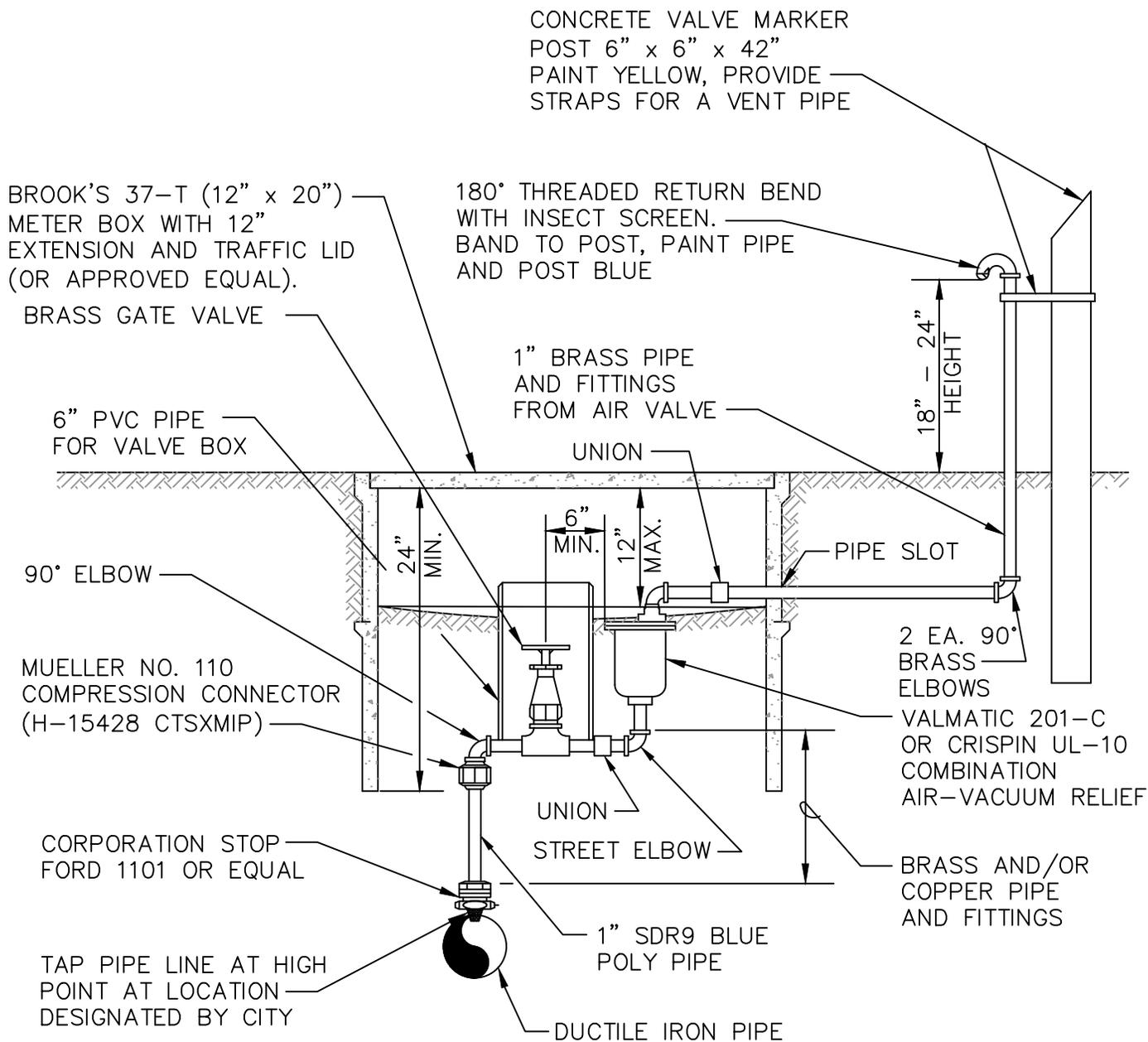


CITY OF GIG HARBOR
ENGINEERING DIVISION

**SINGLE SERVICE
DOUBLE CHECK VALVE
ASSEMBLY WITH FDC**

DETAIL NO.
4-14

APPROVED BY *[Signature]* DATE **1/1/2014**



NOTES:

AIR VAC TO BE LOCATED OUTSIDE OF ROADWAY TRAVEL LANES

 CITY OF GIG HARBOR ENGINEERING DIVISION	
1" AIR AND VACUUM RELEASE ASSEMBLY	DETAIL NO. 4-15
APPROVED BY CITY ENGINEER <i>h.d. [signature]</i>	DATE 1/1/2014

17" x 28" CONC. METER BOX
WITH 3/8" STEEL DIAMOND
PLATE COVER, FOG-TITE
METER SEAL CO. NO. 2

4" x 4" CONC. MARKER POST PAINTED
YELLOW WITH BLACK STENCILED
DISTANCE AND DIRECTION TO VALVE

PAINT BLUE THAT
PORTION ABOVE GROUND

2" BEEHIVE STRAINER
2" OPEN PATTERN
RETURN BEND

2' AIR AND VACUUM RELEASE
VALVE, "APCO" OR "CRISPIN"
MODELS ONLY

FINISHED GRADE

EDGE OF
ASPHALT

2'-0"

CAST IRON VALVE BOX

UNION

2" GATE VALVE AWWA
WITH OPERATING NUT
2" BRASS PIPE

2, 2" x 90°
BRASS ELBOW
WITH WEEP
HOLE IN ONE

2" x 90° ELBOW
BRASS

2" SDR9
BLUE POLY PIPE

2" BRASS
NIPPLE

2" BRASS
ELBOW

12"
8" x 8" x 6"
CONCRETE BLOCK
SUPPORT

FOUNDATION
ROCK

DUCTILE IRON
WATER MAIN
DOUBLE STRAP
SERVICE CLAMP

2" CORP. STOP

NOTES:

AIR VAC TO BE LOCATED OUTSIDE OF
ROADWAY TRAVEL LANES

 CITY OF GIG HARBOR ENGINEERING DIVISION	
2" AIR AND VACUUM RELEASE ASSEMBLY	
DETAIL NO. 4-16	
APPROVED BY CITY ENGINEER <i>[Signature]</i>	DATE 1/1/2014

THRUST LOADS

THRUST AT FITTINGS IN POUNDS AT 200 POUNDS PER SQUARE INCH OF WATER PRESSURE

PIPE DIAMETER	90° BEND	45° BEND	22.5° BEND	11.25° BEND	DEAD END OR TEE
4"	3600	2000	1000	500	2600
6"	8000	4400	2300	1200	5700
8"	14300	7700	4000	2000	10100
10"	22300	12100	6200	3100	15800
12"	32000	17400	8900	4500	22700
14"	43600	23600	12100	6100	30800
16"	57000	30800	15700	7900	40300

NOTES:

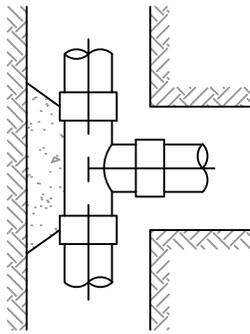
- BLOCKING SHALL BE COMMERCIAL CONCRETE POURED IN PLACE AGAINST UNDISTURBED EARTH. FITTING SHALL BE ISOLATED FROM CONCRETE THRUST BLOCK WITH PLASTIC OR SIMILAR MATERIAL.
- TO DETERMINE THE BEARING AREA OF THE THRUST BLOCK IN SQUARE FEET (SF):
EXAMPLE: 12" – 90° BEND IN SAND AND GRAVEL
 $32000 \text{ LBS} / 3000 \text{ LB/SF} = 10.7 \text{ SF OF AREA}$
- AREAS MUST BE ADJUSTED FOR OTHER PIPE SIZE, PRESSURES, AND SOIL CONDITIONS.
- BLOCKING SHALL BE ADEQUATE TO WITHSTAND FULL TEST PRESSURE AS WELL AS TO CONTINUOUSLY WITHSTAND FULL TEST PRESSURE AS WELL AS TO CONTINUOUSLY WITHSTAND OPERATING PRESSURE UNDER ALL CONDITIONS OF SERVICE.

SAFE SOIL BEARING LOADS

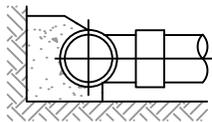
FOR HORIZONTAL THRUSTS WHEN THE DEPTH OF COVER OVER THE PIPE EXCEEDS 2 FEET

SOIL	POUNDS PER SQUARE FOOT
MUCK, PEAT	0
SOFT CLAY	1,000
SAND	2,000
SAND AND GRAVEL	3,000
SAND AND GRAVEL CEMENTED WITH CLAY	4,000
HARD SHALE	10,000

 CITY OF GIG HARBOR ENGINEERING DIVISION	REV. NO.
	DETAIL NO.
THRUST LOADS	4-17
APPROVED BY CITY ENGINEER <i>[Signature]</i>	DATE 1/1/2014

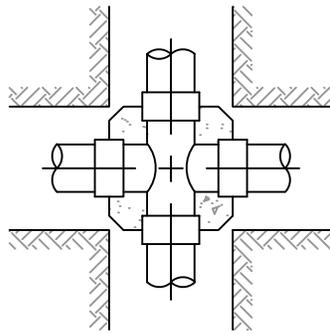


TOP VIEW

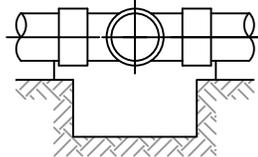


SIDE VIEW

TEE

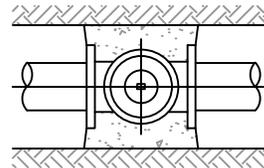


TOP VIEW

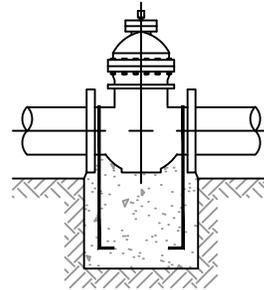


SIDE VIEW

CROSS

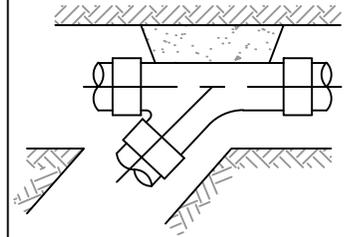


TOP VIEW

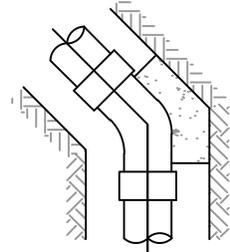


SIDE VIEW

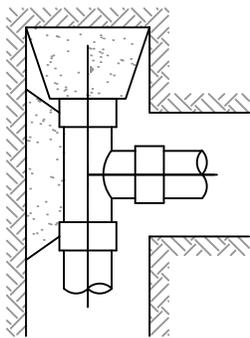
GATE VALVE



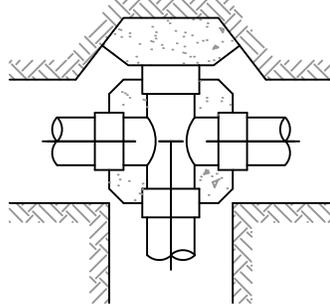
WYE



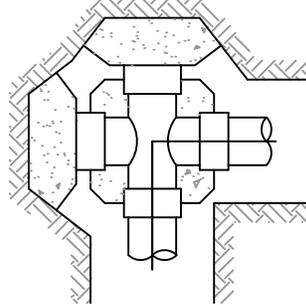
HORIZ. BEND



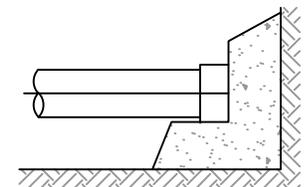
TEE WITH PLUG



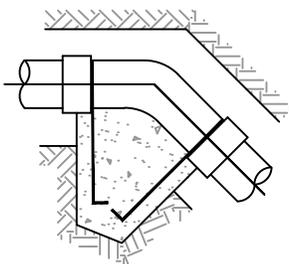
CROSS WITH PLUG



CROSS WITH PLUGS



PLUG OR CAP

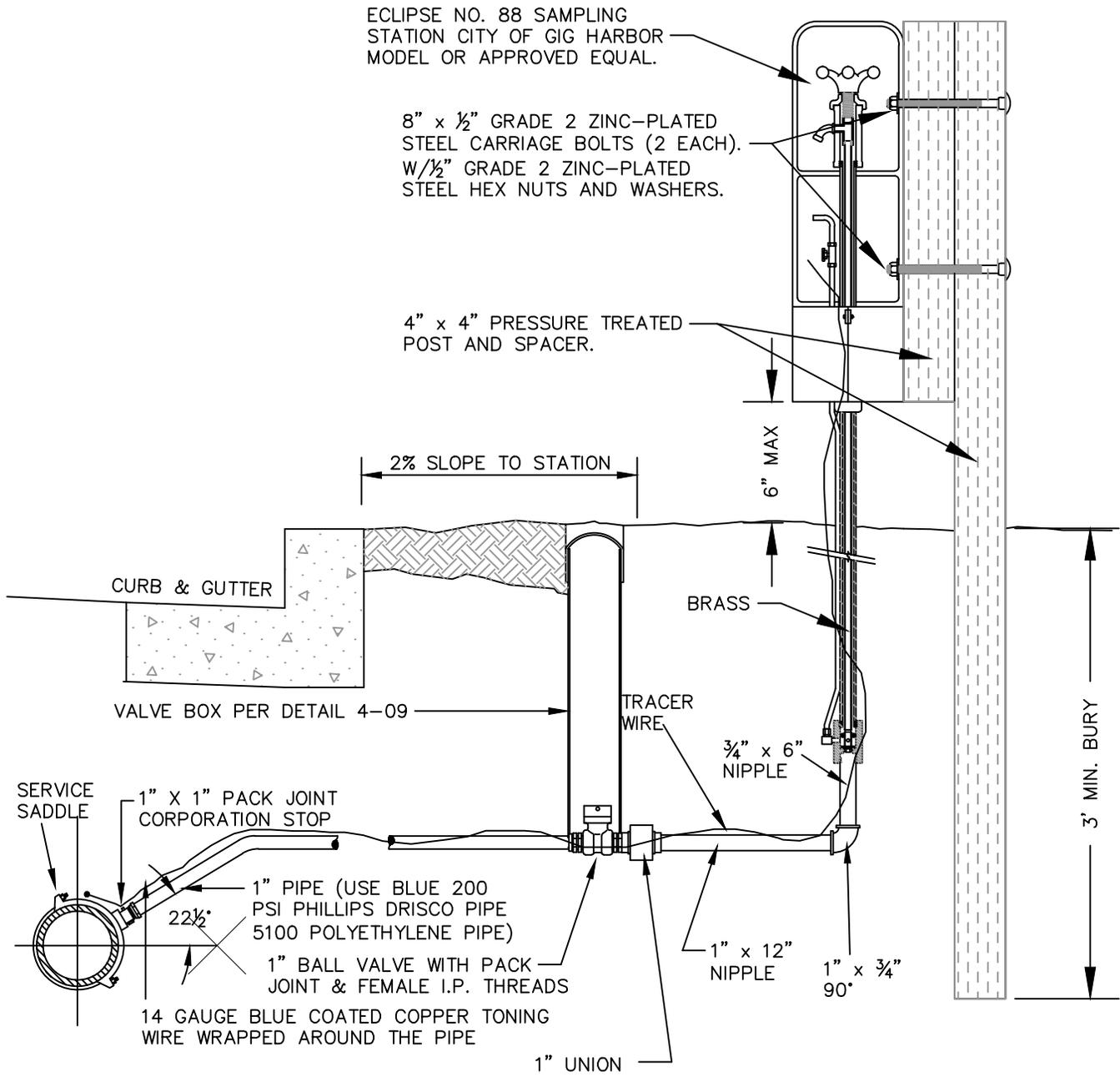


45° - 90°
VERTICAL BEND

NOTES:

1. CONCRETE THRUST BLOCKING TO BE POURED AGAINST UNDISTURBED EARTH.
2. PLASTIC BARRIER SHALL BE PLACED BETWEEN ALL THRUST BLOCKS AND FITTINGS.
3. ANCHOR REBAR SHALL BE 5/8" MINIMUM DIAMETER.

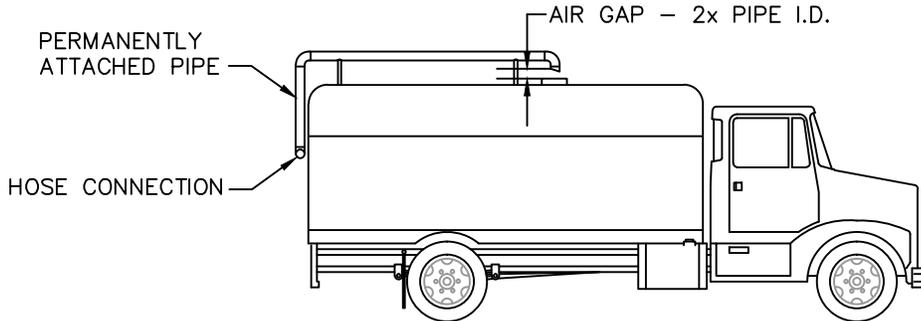
	CITY OF GIG HARBOR ENGINEERING DIVISION	
	STANDARD BLOCKING DETAILS	DETAIL NO. 4-18
APPROVED BY <i>h.s. [signature]</i> CITY ENGINEER		DATE 1/1/2014



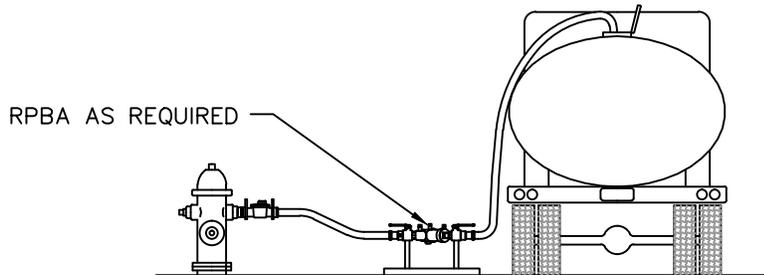
NOTES:

1. STAINLESS STEEL INSERTS REQUIRED FOR ALL PACK JOINTS.
2. ALL SERVICE SADDLES SHALL HAVE RUBBER GASKET AND I.P. THREADS.
3. THE WATERLINE FOR THE SAMPLING STATION SHALL BE INSULATED FROM 1' BELOW GROUND LEVEL TO THE SAMPLING SPIGOT WITH 1" THICK FOAM PLUMBING INSULATION AND SECURED WITH NYLON TIES.
4. PAINT SAMPLE STATION WITH 2 COATS GREEN HI-GRADE EPOXY ENAMEL PAINT.
5. ALL PIPING AND FITTINGS SHALL BE BRASS.

 <small>GIG HARBOR</small> <small>THE MARSHALLS CITY</small>	CITY OF GIG HARBOR ENGINEERING DIVISION <small>REV. NO.</small>	
	SAMPLING STATION	DETAIL NO. 4-19
APPROVED BY <i>John Marshall</i> CITY ENGINEER		DATE 1/1/2014

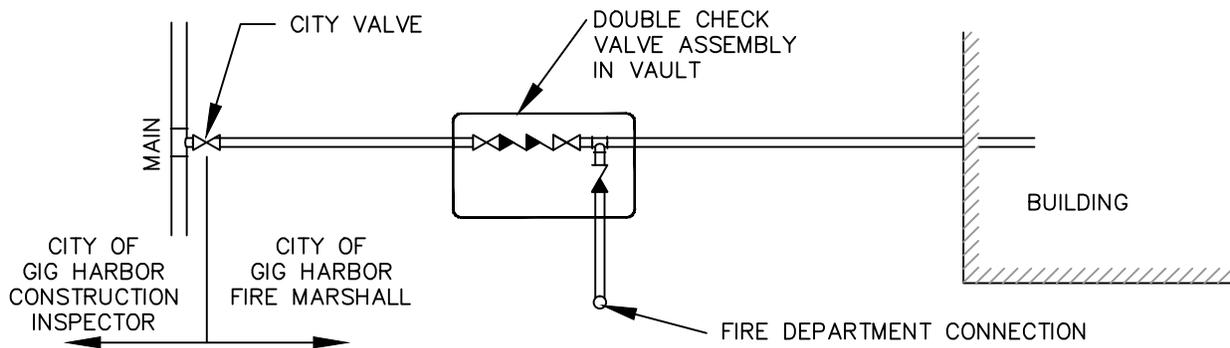
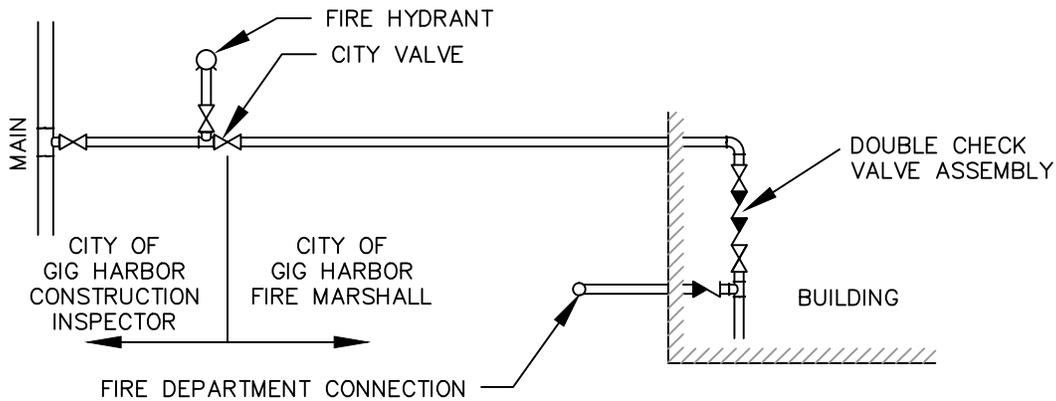
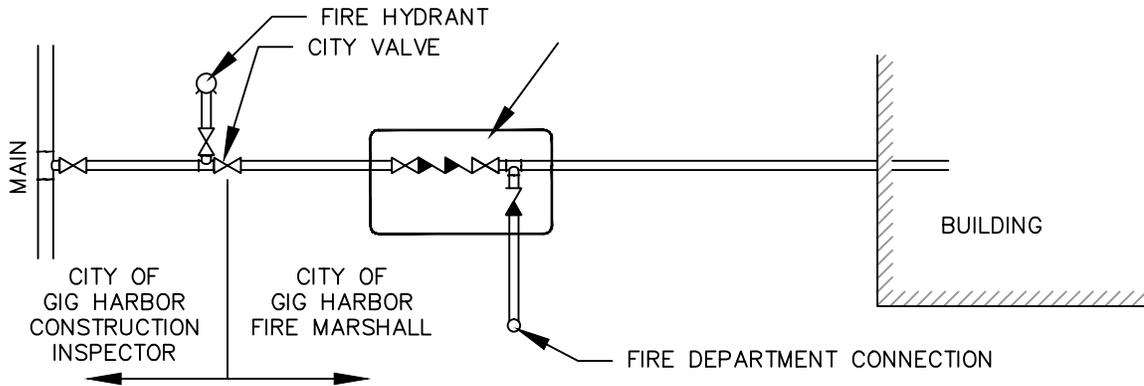


APPROVED AIR GAP



FOR NON-APPROVED AIR GAP
IS EQUIPPED WITH METER AND (RPBA)
REDUCED PRESSURE BACKFLOW ASSEMBLY

	CITY OF GIG HARBOR ENGINEERING DIVISION	
	BACKFLOW PREVENTION FOR VEHICLE FILLING	DETAIL NO. 4-20
APPROVED BY CITY ENGINEER <i>Bob Marshall</i>	DATE 1/1/2014	



NOTES:

1. THE CITY WILL INSPECT AND TEST ALL MAINS AND HYDRANTS UP TO THE CITY VALVE.
2. ALL PIPE PAST CITY VALVE SHALL BE CLASS 52 D.I.
3. SEE PUBLIC WORKS STANDARDS SECTION 4.11 FOR MORE INFORMATION ON BACKFLOW PREVENTION.

	CITY OF GIG HARBOR ENGINEERING DIVISION		
FIRE SPRINKLER UNDERGROUND TESTING LIMITS			
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="font-size: small;">DETAIL NO.</td> <td style="text-align: center; font-size: large;">4-21</td> </tr> </table>	DETAIL NO.	4-21
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<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%; border-bottom: 1px solid black;"> APPROVED BY CITY ENGINEER <i>halderson</i> </td> <td style="width: 40%; border-bottom: 1px solid black;"> DATE 1/1/2014 </td> </tr> </table>		APPROVED BY CITY ENGINEER <i>halderson</i>	DATE 1/1/2014
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