

# WATER

<u>NUMBER</u>	<u>TITLE</u>	<u>NUMBER</u>	<u>TITLE</u>
W-01.0	FIRE HYDRANT INSTALLATION - NOTES	W-11.0	CONCRETE THRUST BLOCK
W-01.1	FIRE HYDRANT INSTALLATION	W-12.0	REDUCED PRESSURE PRINCIPLE ASSEMBLY BACKFLOW PREVENTION ASSEMBLY - TYPE 1 - NOTES
W-02.0	SIDEWALK MODIFICATION AT FIRE HYDRANT	W-12.1	REDUCED PRESSURE PRINCIPLE ASSEMBLY BACKFLOW PREVENTION ASSEMBLY - TYPE 1
W-03.0	FIRE HYDRANT GUARD POST	W-13.0	DOUBLE DETECTOR CHECK ASSEMBLY BACKFLOW PREVENTION ASSEMBLY - TYPE 2 - NOTES
W-04.0	VALVE BOX	W-13.1	DOUBLE DETECTOR CHECK ASSEMBLY BACKFLOW PREVENTION ASSEMBLY - TYPE 2
W-05.0	SERVICE CONNECTION - NOTES	W-13.2	DOUBLE DETECTOR CHECK ASSEMBLY - VERTICAL INSTALLATION
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W-05.2	2-INCH SERVICE CONNECTION MANIFOLD	W-15.0	RECLAIMED WATER FILL STATION
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### GENERAL LEGEND:

C.I.P. = CAST IRON PIPE  
 D.I.P. = DUCTILE IRON PIPE  
 C.R. = CURB RETURN  
 F.L.G. = FLANGE JOINT  
 M.J. = MECHANICAL JOINT  
 L.R.G. = LOCKING RETAINER GLAND  
 P.E. = PLAIN END



# WATER

## TABLE OF CONTENTS

STREETS:	REV. DATE: 8/17	DETAIL: W-00.0
TRANS OPS:	APPROVED:	
FACILITIES:	CITY ENGINEER	
WATER RESOURCES:	PUBLIC WORKS DIRECTOR	

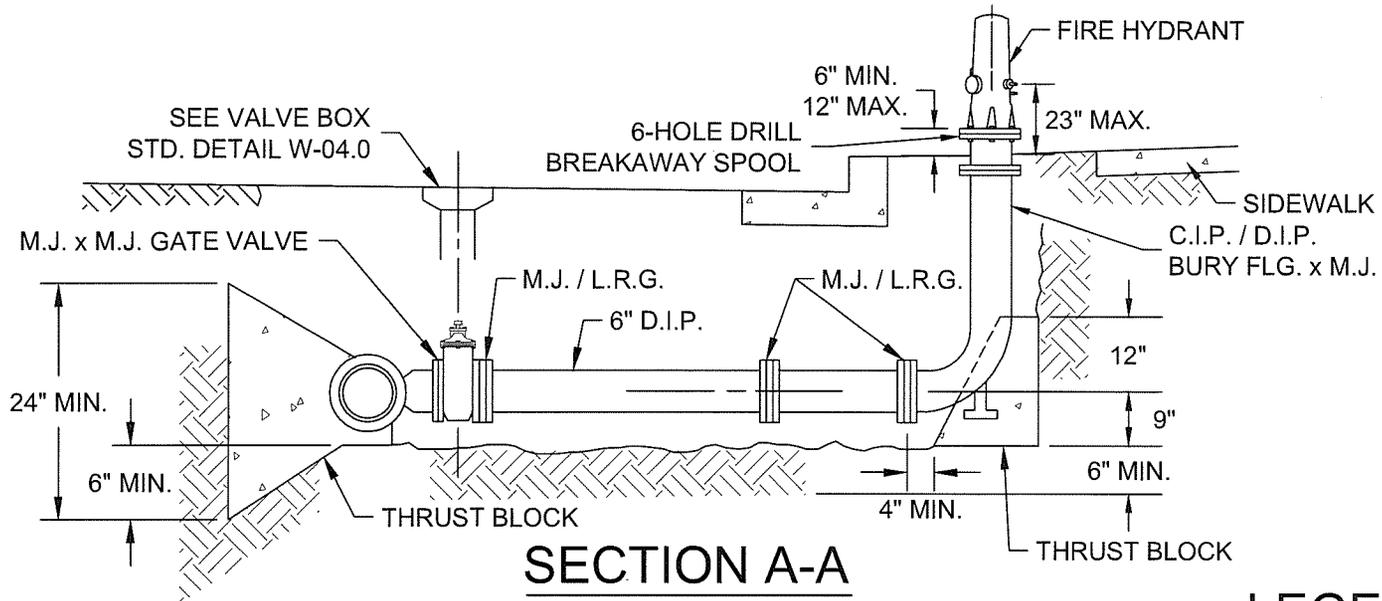
# FIRE HYDRANT INSTALLATION NOTES:

1. Fire hydrant for residential installation shall be J. Jones No. 3700 with plastic hose cap J-669.
2. Fire hydrant for commercial installation shall be J. Jones No. J-3765 with 6 hole pattern. Use commercial installation at apartments and condominiums, motels, commercial and manufacturing developed or zoned areas.
3. Fire hydrant assembly breakaway spool shall be used to adjust lower fire hydrant stem within required distance from finish grade. Cadmium plated breakaway bolts shall be installed on fire hydrant and extension. Bolts to be installed heads up. Only one gasketed flange shall be allowed below the surface. Bury, control valve, tee and breakaway spool shall be lined with epoxy, Scotchkote 206N or 134.
4. Fire hydrants shall not be epoxy lined. Before installation, Bronze fire hydrant exterior shall be washed thoroughly with XIM cleaner, and painted with one coat of white XIM primer-sealer 400 and two coats of AERO-PLATE #462 gloss bright yellow (safety yellow). Fire hydrants to be purchased with factory paint.
5. Outlets shall be positioned perpendicular to curb line or center line of roadway, facing into the roadway.
6. All buried bolts shall be coated with an approved corrosion control coating and wrapped with a 8 mil. thick polyethylene sheet and taped, as specified in A.W.W.A. C-105/A21.5-99-PRINTED.
7. Concrete thrust blocks shall be constructed in conformance with Standard Detail W-012.0.
8. The installation of fire hydrants in concrete sidewalk area shall be per Standard Detail W-02.0.
9. Fire hydrant valve shall be Pratt Groundhog butterfly valve or approved resilient wedge gate valve (preferred) except the butterfly valve shall not be used where the operating water pressure exceeds 200 psi. The gate valve shall be installed so that the bonnet and operating nut do not encroach into any part of the street structural section.
10. All pipe shall be ductile iron with mechanical joints and Megalug retainer glands or approved equal.
11. Fire hydrant spacing shall be according to Fire Department requirements.
12. All ductile iron pipe, including valves and fittings shall be encased with an 8 mil. thick black polyethylene sheet and taped as specified in A.W.W.A. C-105/A21.5-99-PRINTED.
13. Any deviation from this Standard Detail shall be approved by the Water Resources Division of Public Works Department.
14. Hot tapping saddle installation shall be pre-approved by the Water Resources Division of Public Works Department.

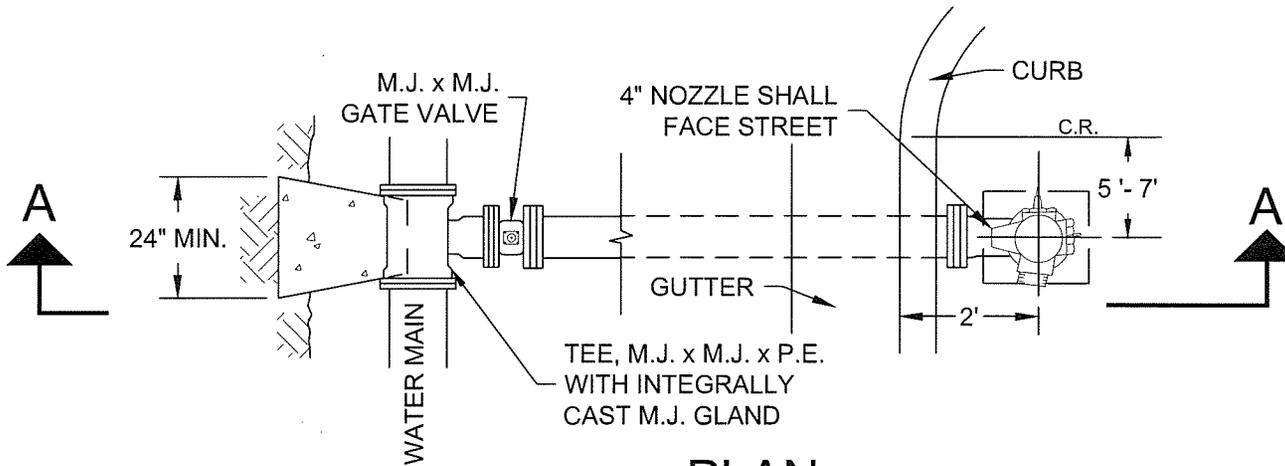


## FIRE HYDRANT INSTALLATION NOTES

STREETS:	REV. DATE: 11/12	DETAIL: W-01.0
TRANS OPS:	APPROVED: <i>Pat Kelly</i>	
FACILITIES:	CITY ENGINEER	
WATER RESOURCES:	<i>Christine Rudersen</i> PUBLIC WORKS DIRECTOR	



**SECTION A-A**



**PLAN**

**LEGEND**

- C.I.P. = CAST IRON PIPE
- D.I.P. = DUCTILE IRON PIPE
- C.R. = CURB RETURN
- F.L.G. = FLANGE JOINT
- M.J. = MECHANICAL JOINT
- L.R.G. = LOCKING RETAINER GLAND
- P.E. = PLAIN END



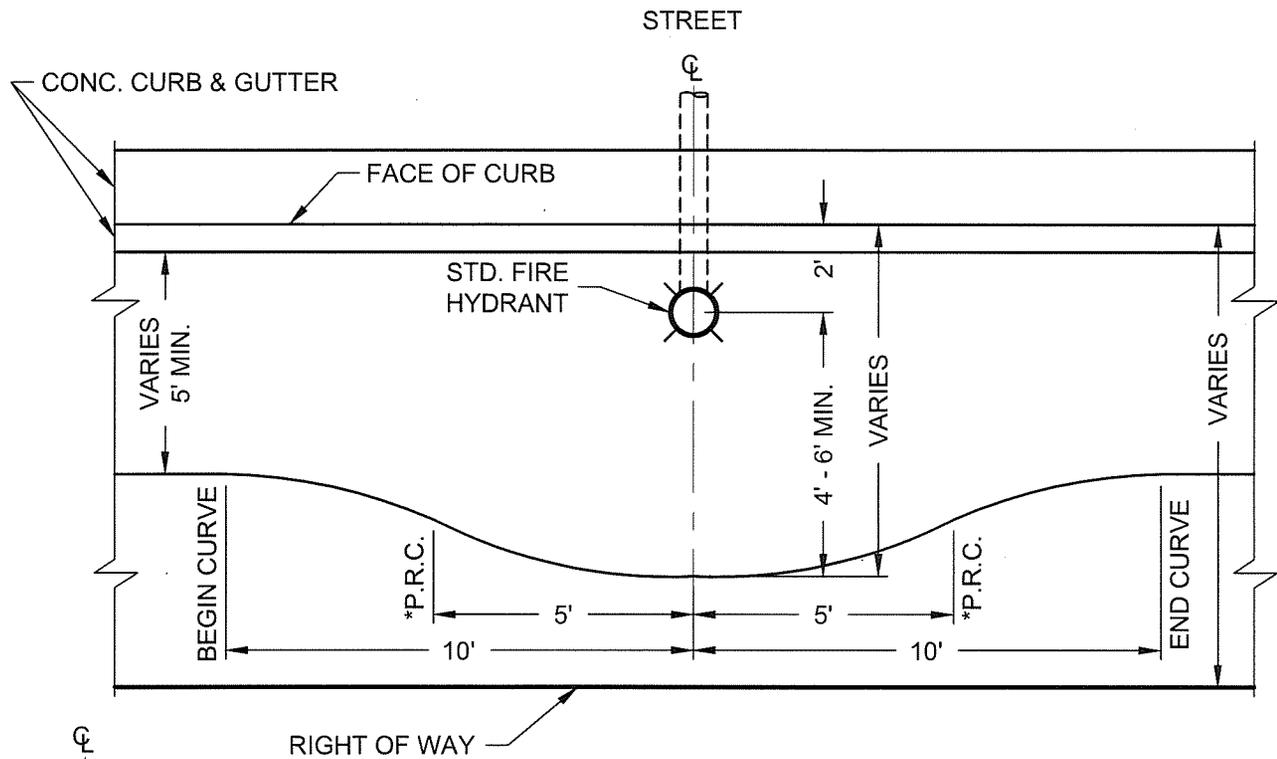
**FIRE HYDRANT INSTALLATION**

STREETS:	REV. DATE: 11/12	DETAIL: W-01.1
TRANS OPS:	APPROVED: <i>Pat Kelly</i>	
FACILITIES:	CITY ENGINEER	
WATER RESOURCES:	PUBLIC WORKS DIRECTOR	

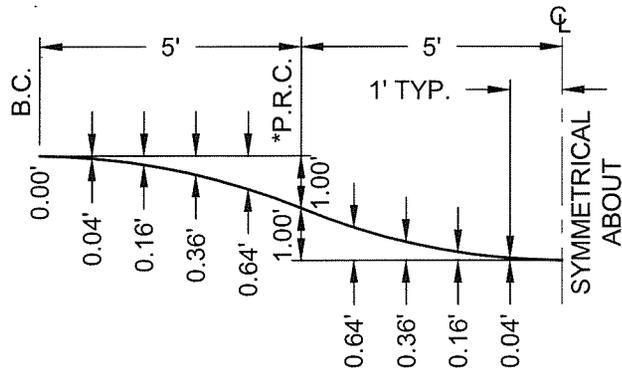
# NOTES:

1. Fire hydrant installation shall be in accordance with Std. Details W-01.0 and W-01.1.
2. Concrete sidewalk construction shall conform to Std. Details H-06.0 and H-06.1.
3. Any variance to the sidewalk modification to conform to conditions other than shown requires approval of the Engineer.

\*P.R.C. - Point of Reverse Curve



**PLAN**

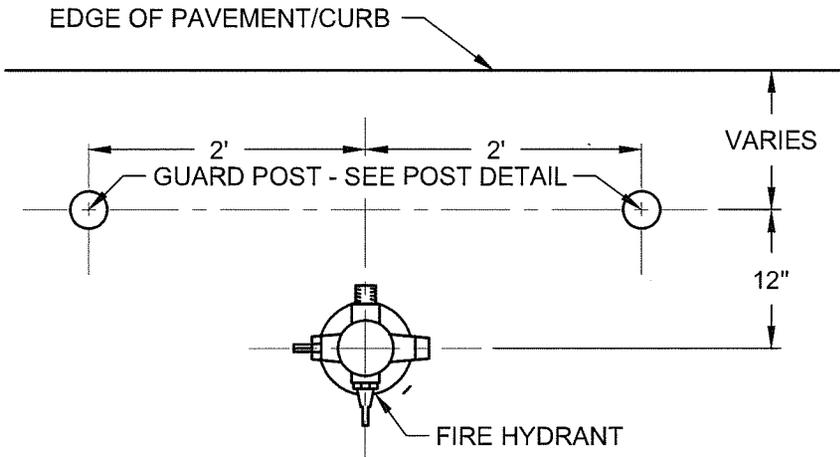


**BACK OF SIDEWALK OFFSET AT ONE-FOOT INTERVALS**



## SIDEWALK MODIFICATION AT FIRE HYDRANT

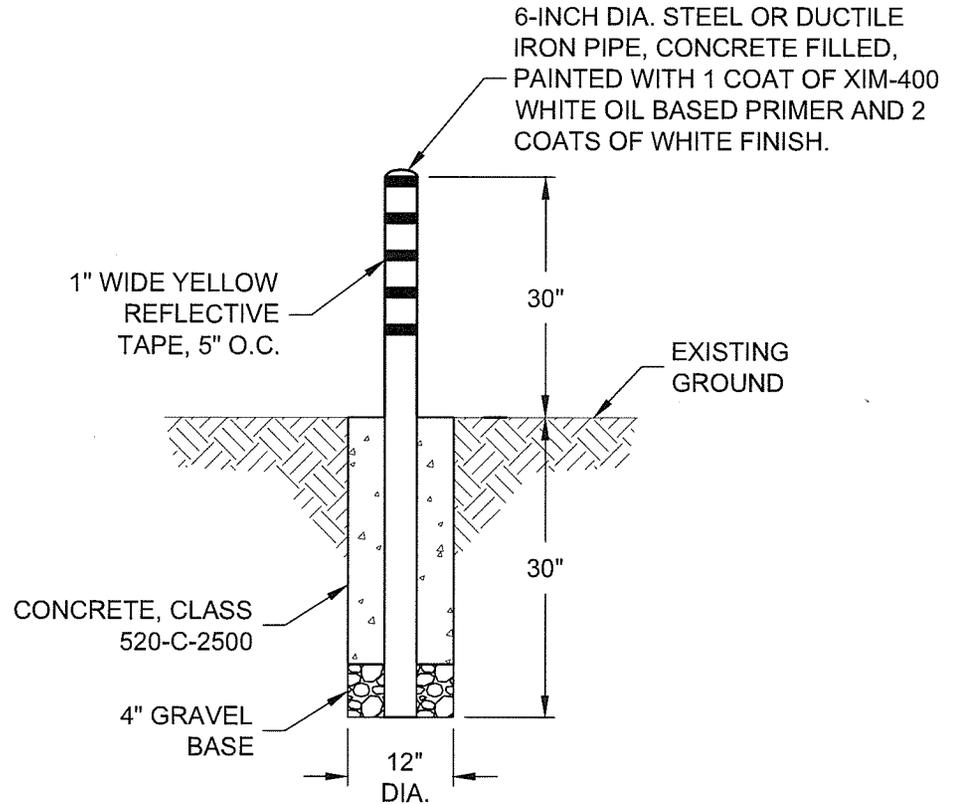
STREETS:	REV. DATE: 11/12	DETAIL: W-02.0
TRANS OPS:	APPROVED: <i>[Signature]</i>	
FACILITIES:	CITY ENGINEER	
WATER RESOURCES:	PUBLIC WORKS DIRECTOR	



**PLAN**

**NOTES:**

1. Guard posts shall be installed plumb. Concrete for setting guard posts shall be Class 520-C-2500.
2. Concrete shall be placed against firm undisturbed native soil and shall be thoroughly consolidated.
3. Any variance to the guard post layout to conform to conditions other than shown must be approved by the Engineer.

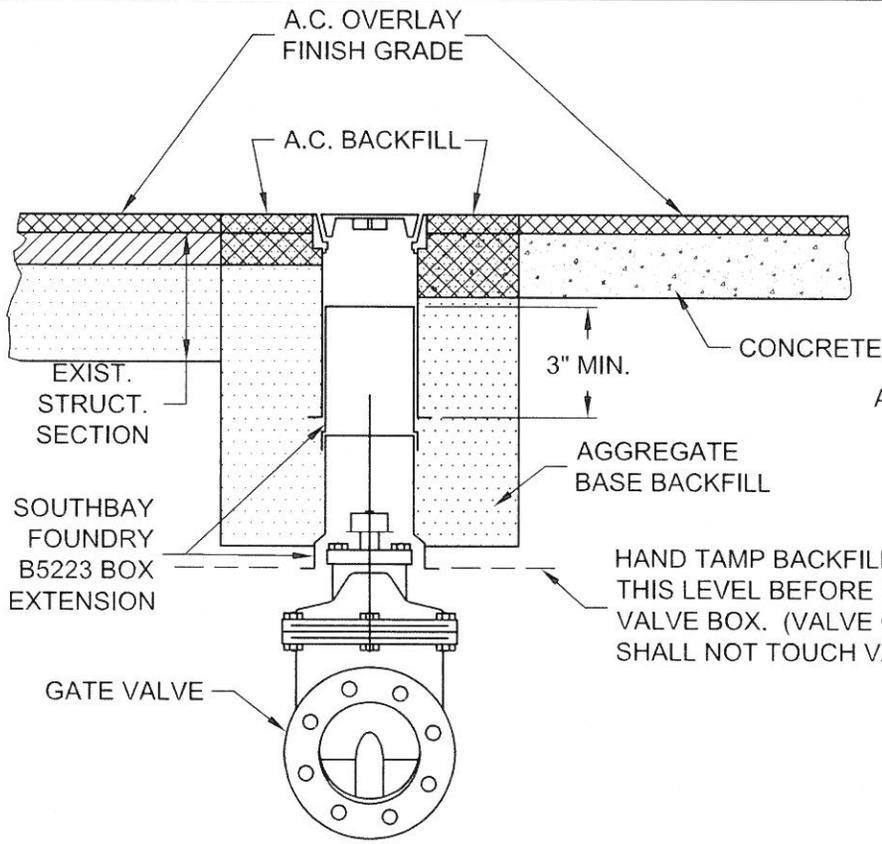


**POST DETAIL**

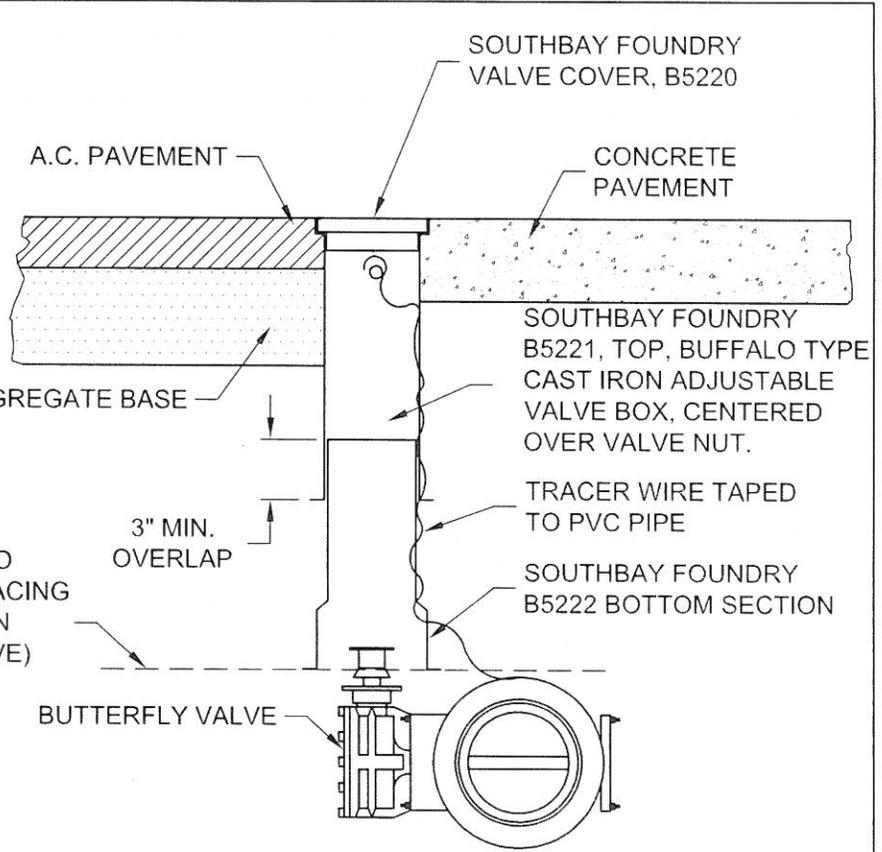


**FIRE HYDRANT  
GUARD POST**

STREETS:	REV. DATE: 11/12	DETAIL: W-03.0
TRANS OPS:	APPROVED: <i>[Signature]</i>	
FACILITIES:	CITY ENGINEER	
WATER RESOURCES: <i>[Signature]</i>	PUBLIC WORKS DIRECTOR	



ADJUSTMENT TO GRADE



TYPICAL NEW INSTALLATION

**NOTES:**

1. Nut shaft extension, fitted with self-centering device and adaptor by Pratt, or approved equal, shall be provided when cover over valve nut exceeds 2.5 feet.
2. If existing valve box is not a standard box, a box will be provided by the City and installed by the Contractor.
3. At no time shall the valve box rest directly on the valve body.



**VALVE BOX**

STREETS:	REV. DATE: 8/17	DETAIL: W-04.0
TRANS OPS:	APPROVED:	
FACILITIES:	<i>[Signature]</i> CITY ENGINEER	
WATER RESOURCES:	<i>[Signature]</i> PUBLIC WORKS DIRECTOR	

## SERVICE CONNECTION NOTES:

1. Contractor shall furnish all material, except meter.
2. James Jones Co. designations are used to identify fittings.
3. Install J-969 saddle with gaskets & Corporation Stop (CC) thread when connecting services to all P.V.C. pipe. Use J-979 when connecting services to D.I.P. pipe.
4. Tap all steel pipe through saddle, welded coupling or approved equal.
5. Minimum distance between services shall be one foot. Multiple taps shall be spaced one foot apart at 10 o'clock or 2 o'clock angle.
6. Services shall be installed perpendicular to the main unless approved by the Engineer.
7. Meter boxes shall not be permitted in driveways. All meter box lids shall be skid resistant.
8. Contractor shall leave an appropriate "meter space" for meter installation by the City (see City Standard Detail W-05.1).
9. All new service installations and all services to be replaced shall be of 1-inch or 2-inch Type "K" copper tubing, using the material specified.
10. Private fire service/private water main distinction:
  - A. Private Fire Service: A privately owned and maintained connection from the City distribution system that serves only private fire hydrant(s), fire sprinkler system(s), or other fire protection systems, and does not serve any City water service connections.
  - B. Private Water Main: A privately owned and maintained connection from the City distribution system that serves one or more City water service connections, and which may also serve private fire hydrants, fire sprinkler systems, or other fire protection systems.

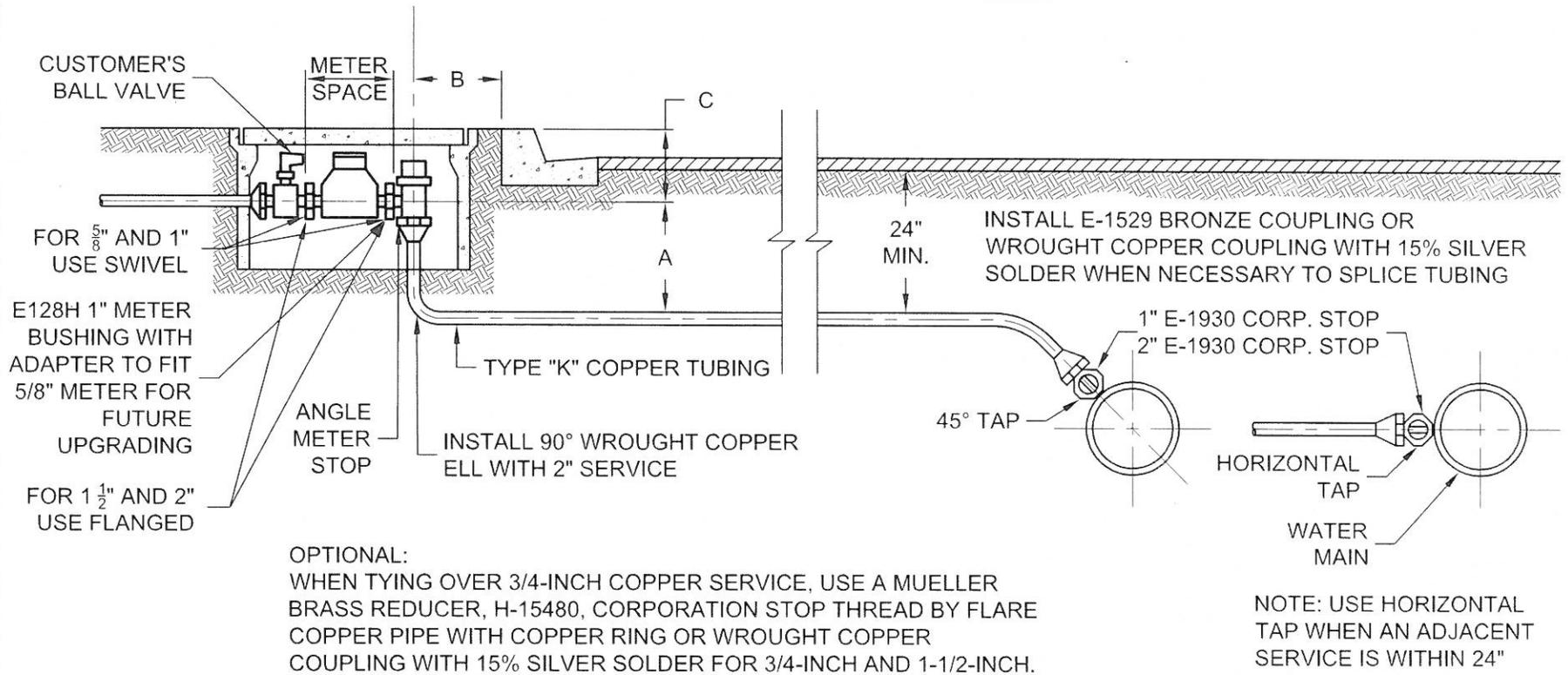


# SERVICE CONNECTION NOTES

STREETS:	REV. DATE: 11/12	DETAIL: W-05.0
TRANS OPS:	APPROVED: <i>Pat Kelly</i>	
FACILITIES:	CITY ENGINEER	
WATER RESOURCES:	<i>Christina Anderson</i> PUBLIC WORKS DIRECTOR	

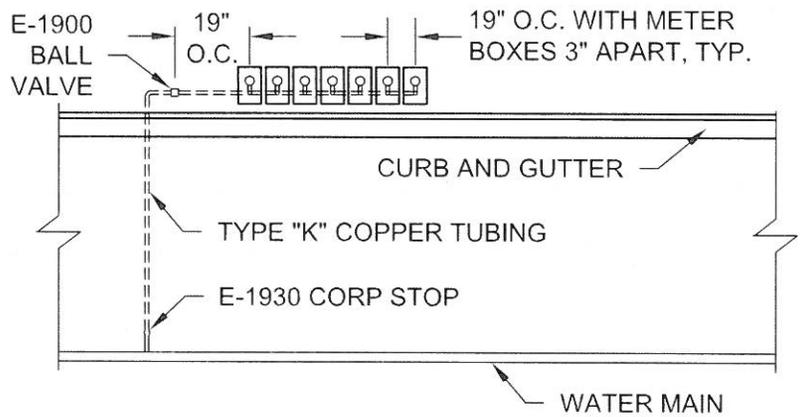
METER SIZE	ANGLE METER STOP	CORP STOP	BALL VALVE	METER SPACE	A	B	C
5/8"	E-1964W	E-1930	E-1900W	7-3/4"	21"	8"	9"
1"	E-1964W	E-1930	E-1900W	11-1/4"	21"	8"	9"
1-1/2", 2"	E-1973W	E-1930	E-1912WJ	17-1/4"	18"	12"	12"

## MATERIAL & DIMENSIONS



# SERVICE CONNECTION

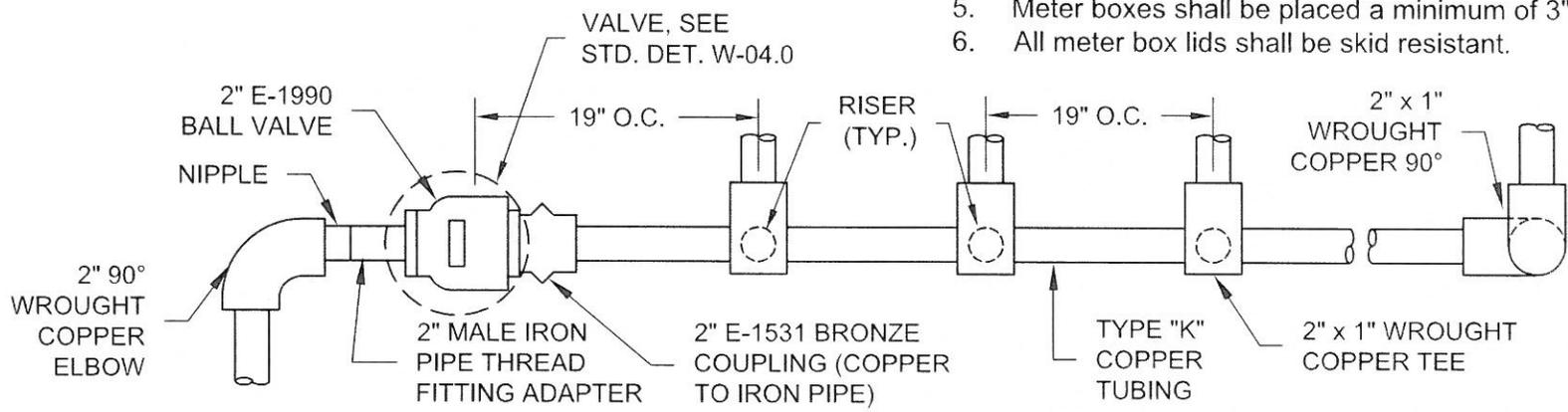
STREETS:	REV. DATE: 8/17	DETAIL: W-05.1
TRANS OPS:	APPROVED:	
FACILITIES:	<i>Brisla</i> CITY ENGINEER	
WATER RESOURCES:	<i>Kenneth Bjork</i> PUBLIC WORKS DIRECTOR	



**PLAN OF MANIFOLD ASSEMBLY**

**NOTES:**

1. Maximum of eight (8) 5/8-inch meters per manifold. Maximum of two (2) 1-inch meters per manifold. All meter boxes per City Standard Details W-06.0 and W-06.1.
2. All piping to be type "K" copper tubing.
3. All brass service connection fittings to be flared type.
4. Contractors shall meet with Water Resources Distribution personnel prior to installation of property service line to confirm that proposed connections will be sequenced in a manner approved by Water Resources Division and in conformance with approved addresses assigned to the property by the City.
5. Meter boxes shall be placed a minimum of 3" apart.
6. All meter box lids shall be skid resistant.

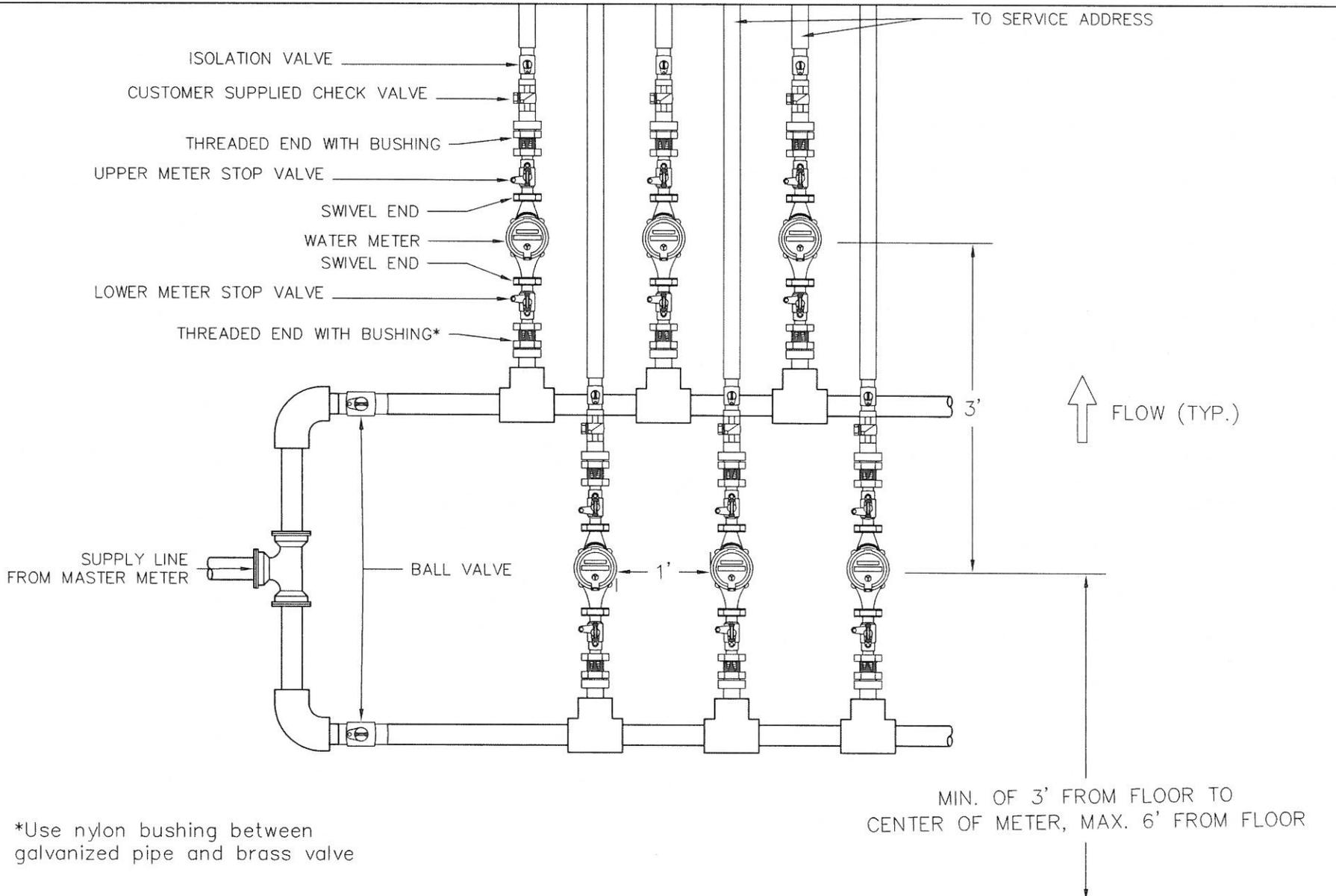


**(PLAN VIEW) DETAIL**



**2-INCH  
SERVICE CONNECTION MANIFOLD**

STREETS:	REV. DATE: 8/17	DETAIL: W-05.2
TRANS OPS:	APPROVED:	
FACILITIES:	<i>[Signature]</i> CITY ENGINEER	
WATER RESOURCES:	<i>[Signature]</i> PUBLIC WORKS DIRECTOR	



\*Use nylon bushing between galvanized pipe and brass valve

MIN. OF 3' FROM FLOOR TO CENTER OF METER, MAX. 6' FROM FLOOR

1 OF 2



# VERTICAL WATER METER BANK INSTALLATION

STREETS:	REV. DATE: 8/17	DETAIL: W-05.2.5
TRANS OPS:	APPROVED:	
FACILITIES:	CITY ENGINEER	
WATER RESOURCES: <i>CT</i>	PUBLIC WORKS DIRECTOR	

**NOTES:**

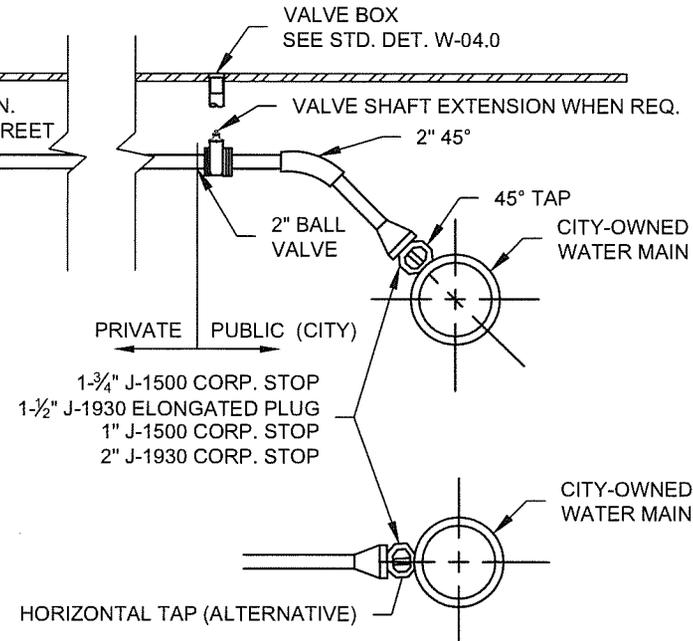
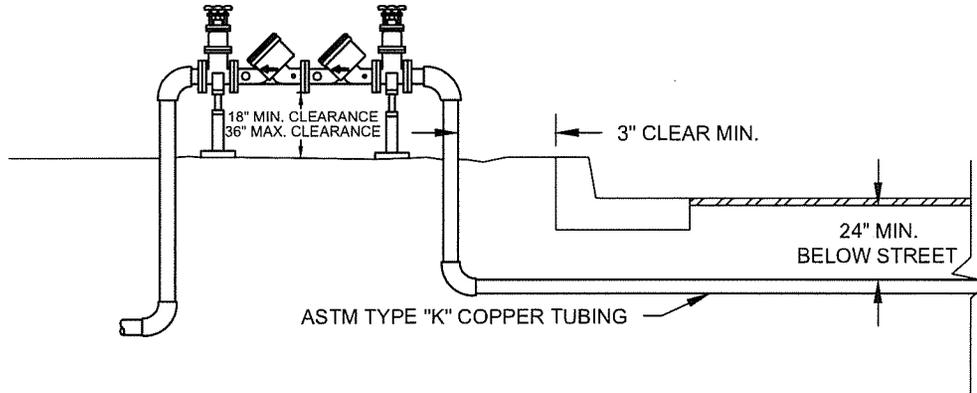
1. All supply lines and meters shall be sized by a licensed, qualified person to meet projected demands of the project, as defined in the project application to the City Planning Department.
2. Meter layout shall be consecutively ordered by unit number and grouped by floor number.
3. The minimum horizontal separation between meters shall be 12"
4. A maximum of two rows of meters shall be installed on a vertical wall. When two rows are installed, set the lower row of meters at 3' above the floor. Set the higher row of meters 3 feet above the lower row. If only one row of meters is utilized, set the meters 5' above the floor.
5. Meters shall be a minimum of 6" from the wall. Meters shall be a minimum of 12" from any corner.
6. City shall provide the upper and lower meter stop valves for installation by applicant.
7. Meter stop valves are to be Mueller E-1900 series IP thread x swivel, or equal. Valve sizes shall match meter size, except use  $\frac{3}{4}$ " valve for  $\frac{5}{8}$ " meter.
8. Service line piping installed by applicant shall include bushings where the meter stop valves connect, to provide a fitting that can be securely clasped by a pipe wrench.
9. Each meter shall be marked with the individual service account address. The applicant shall provide a metallic tag, attached to the meter, indicating the service address. Meters as labeled shall match the layout as shown on the approved plan sheets.
10. Check valves installed shall be drip tight in the normal direction of flow when the inlet pressure is at least 1.0 psi (pound per square inch) and the outlet pressure is zero psi. The check valves shall permit no leakage in the direction which is reverse to normal flow. The closure elements shall be internally loaded to promote rapid and positive closure. The check valves shall have elastomer type, resilient seat with no metal to metal seals. Check valves shall be installed in such a way as to be in-line serviceable and always accessible for maintenance and replacement.
11. Applicant shall not interconnect the services lines within the building. Each metered service shall exclusively supply the address corresponding to the assigned meter.
12. The City shall be responsible for maintenance, repair and replacement of the water supply system up to and including the master meters which shall be located in the public right-of-way. For City authorized public sub-metering installations, the City shall maintain, repair, and replace the meters and the lower shut off valve on the City side of each meter. The remainder of the water service system shall be maintained, repaired, and operated by the applicant.
13. The applicant shall dedicate an easement, on a form to be provided by the City, for access and maintenance activity at sub-meter locations that are not in the public right of way. The easement document shall delineate the maintenance, repairs, and replacement responsibilities of the public and private parties.
14. Meters that are installed vertically shall be 1" or smaller.



**VERTICAL WATER  
METER BANK INSTALLATION**

STREETS:	REV. DATE: 8/17	DETAIL: W-05.2.5
TRANS OPS:	APPROVED:	
FACILITIES:	 CITY ENGINEER	
WATER RESOURCES:	 PUBLIC WORKS DIRECTOR	

DOUBLE CHECK DETECTOR ASSEMBLY  
(SEE STANDARD DETAIL W-13.0 AND  
NOTE 3 THIS PAGE)



NOTES:

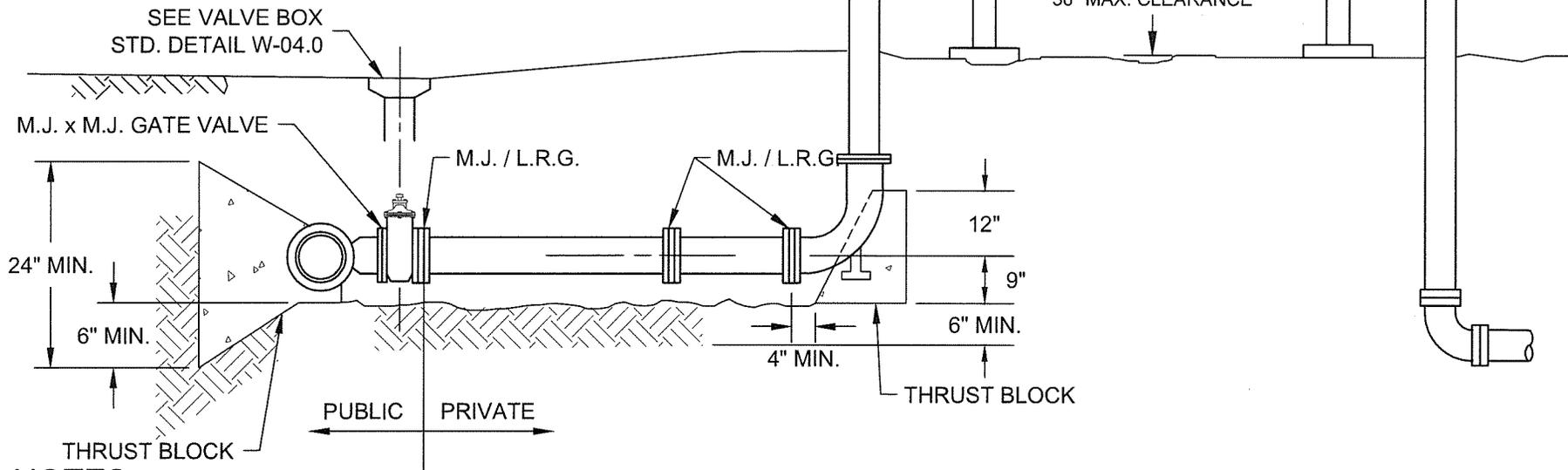
1. NFPA 13 requires a separate fireline. NFPA 13D or 13R do not. See Standard Detail W-05.5 for approved methods for connecting private firelines.
2. Install backflow device as close to property line as possible.
3. Double check detector assembly (with bypass meter and bypass backflow) may be replaced by a reduced pressure principal assembly with meter depending on degree of hazard and approval by the City's Cross-Connection Specialist. See Standard Details W-12 and W-13 as applicable.
4. Line is privately owned from the valve to the building.
5. Inspection and approval by the City's Cross-Connection Specialist is required.
6. Install J-1529 bronze coupling or wrought copper coupling with 15% silver solder when necessary to splice tubing.
7. OPTIONAL: When tying over 3/4" copper service, use a Mueller brass reducer, H-15480, corp. stop thread by flare copper pipe with copper ring or wrought copper coupling with 15% silver solder for 3/4" and 1-1/2" services.



2-INCH  
FIRELINE

STREETS:	REV. DATE: 11/12	DETAIL: W-05.3
TRANS OPS:	APPROVED: <i>Pat Kelly</i>	
FACILITIES:	CITY ENGINEER	
WATER RESOURCES:	<i>Christina Anderson</i> PUBLIC WORKS DIRECTOR	

DOUBLE CHECK DETECTOR ASSEMBLY  
(SEE STANDARD DETAIL W-13.0 AND  
NOTE 7 THIS PAGE)



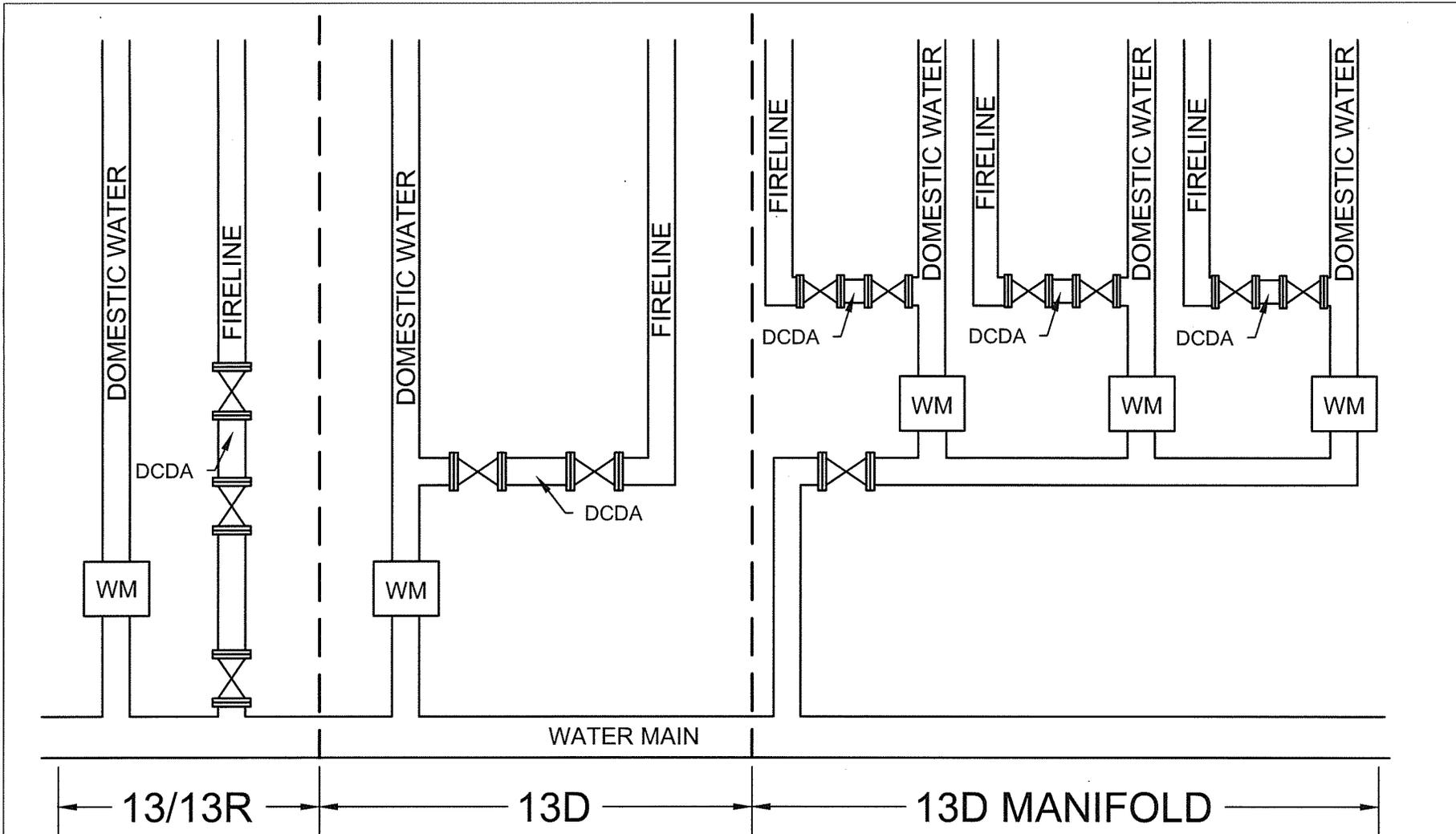
NOTES:

1. All pipe in the street right-of-way shall be D.I.P. with mechanical joints and "MEGALUG" retainer glands or approved equal.
2. All ductile iron pipe, including valves and fittings shall be encased with a 8-mil. thick black polyethylene sheet and taped as specified in A.W.W.A. C-105/A21.5-99-PRINTED.
3. All City fittings shall be epoxy lined.
4. Fireline beyond the valve to the building is the responsibility of the property owner.
5. NFPA 13 requires a separate fireline. NFPA 13D or 13R do not. See Standard Detail W-05.5 for approved methods for connecting private firelines.
6. Install backflow device as close to property line as possible.
7. Double check valve assembly may be replaced by a reduced pressure principle assembly with meter depending on degree of hazard and approval by the City's Cross-Connection Specialist. See Standard Details W-12 and W-13 as applicable.
8. Inspection and approval of the fireline by a City Public Works Inspector is required.



# 4-INCH AND LARGER FIRELINE

STREETS:	REV. DATE: 11/12	DETAIL: W-05.4
TRANS OPS:	APPROVED: <i>Pat Kelly</i> CITY ENGINEER	
FACILITIES:	<i>Christina Anderson</i> PUBLIC WORKS DIRECTOR	
WATER RESOURCES:		

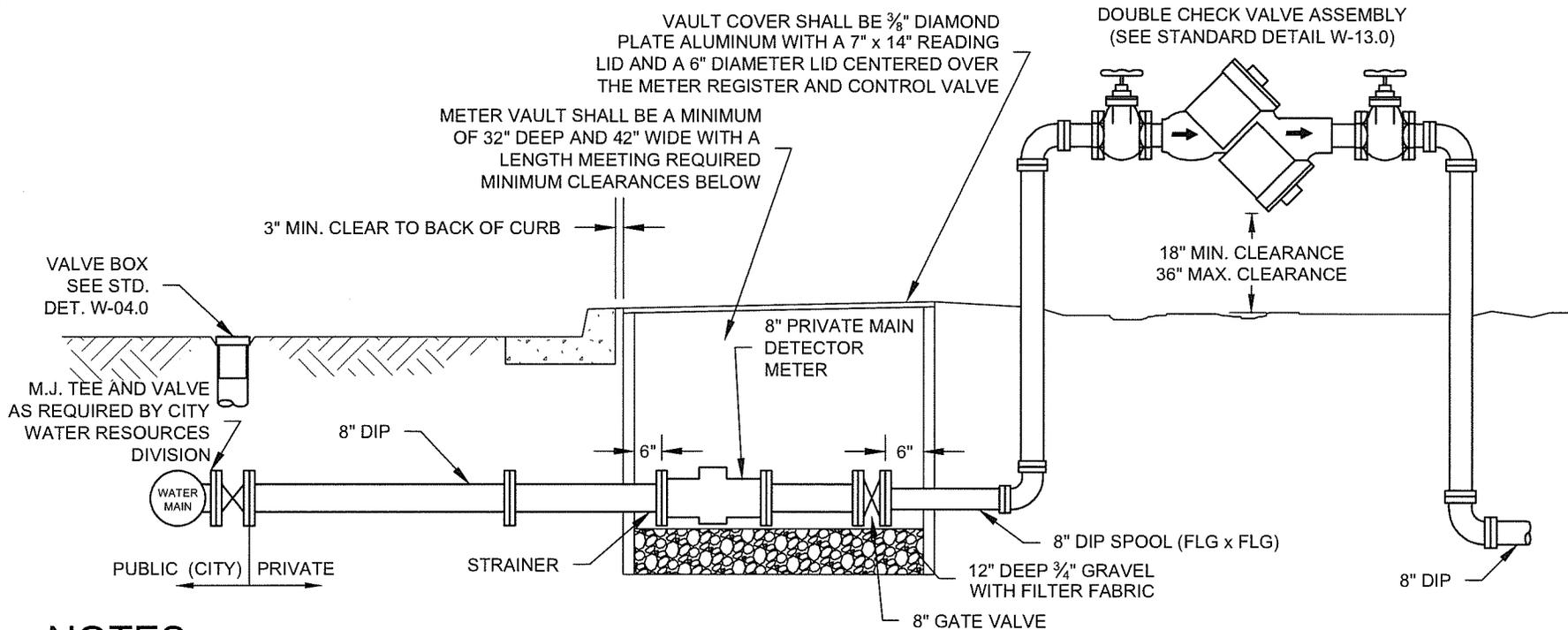


13 = COMMERCIAL  
 13D = FIRELINE FOR DOMESTIC DUPLEX - 1/2 FAMILY RESIDENTIAL  
 13R = HOTEL/MOTEL/3 OR MORE UNITS IN A SINGLE BUILDING  
 DCDA = DOUBLE CHECK DETECTOR ASSEMBLY



## APPROVED METHODS FOR CONNECTING PRIVATE FIRELINES

STREETS:	REV. DATE: 11/12	DETAIL: W-05.5
TRANS OPS:	APPROVED: <i>Pat Kelly</i>	
FACILITIES:	CITY ENGINEER	
WATER RESOURCES:	<i>Christopher Anderson</i> PUBLIC WORKS DIRECTOR	



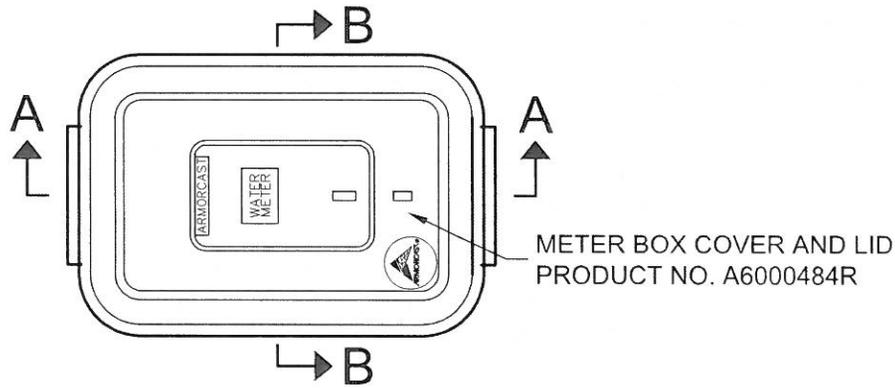
**NOTES:**

1. Water meter shall be approved by the Water Resources Division of Public Works Department.
2. All piping shall be of the same size as the meter.
3. All pipe in the street right-of-way shall be D.I.P. with mechanical joints and "MEGALUG" retainer glands or approved equal.
4. All ductile iron pipe, including valves and fittings shall be encased with a 8-mil. thick black polyethylene sheet and taped as specified in A.W.W.A. C-105/A21.5-99-PRINTED.
5. All fittings shall be epoxy lined.
6. Service line beyond the valve to the building is the responsibility of the property owner.
7. Install backflow device as close to property line as possible.
8. Inspection and approval by the City's Cross-Connection Specialist is required.



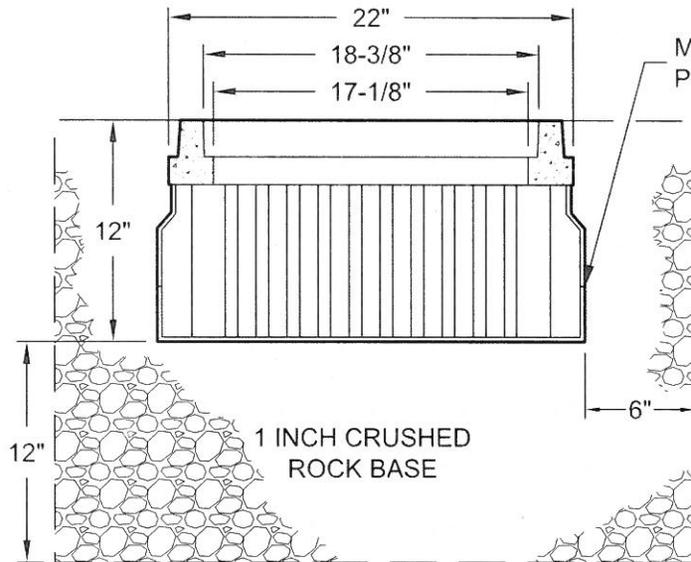
**PRIVATE WATER MAIN**

STREETS:	REV. DATE: 11/12	DETAIL: W-05.6
TRANS OPS:	APPROVED: <i>[Signature]</i>	
FACILITIES:	CITY ENGINEER	
WATER RESOURCES:	<i>[Signature]</i> PUBLIC WORKS DIRECTOR	



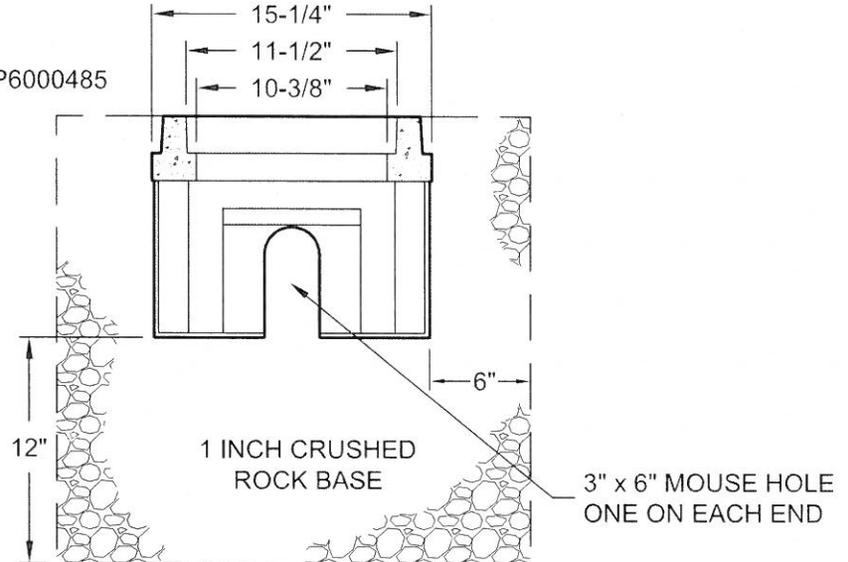
METER BOX COVER AND LID  
PRODUCT NO. A6000484R

PLAN VIEW



METER BOX  
PRODUCT NO. P6000485

SIDE VIEW  
SECTION A-A



END VIEW  
SECTION B-B

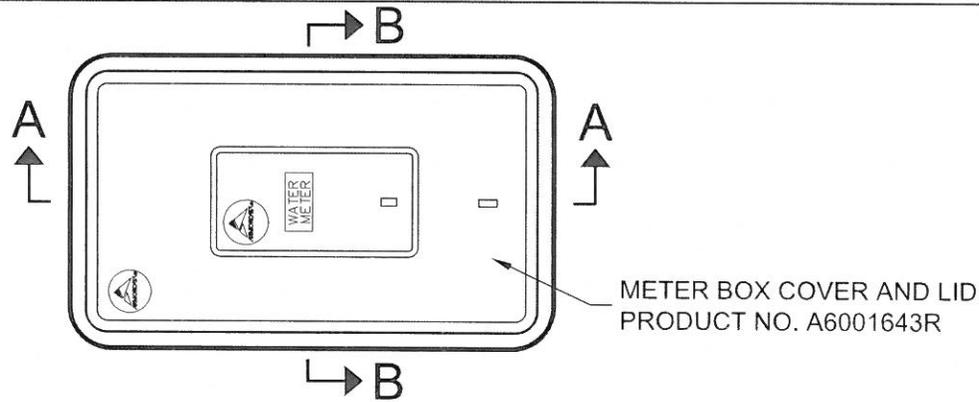
**NOTES:**

1. Meter box shall be non skid Polymer Concrete as Manufactured by:  
Armorcast Products Company,  
13230 Saticoy Street,  
North Hollywood, CA 91605,  
(818) 982-3600
2. Bottom of meter box shall rest firmly on a 12 inch thick bed of 1 inch crushed rock extending 6 inches beyond the outside walls of the meter box.



**METER BOX**  
**5/8-INCH AND 1-INCH METERS**

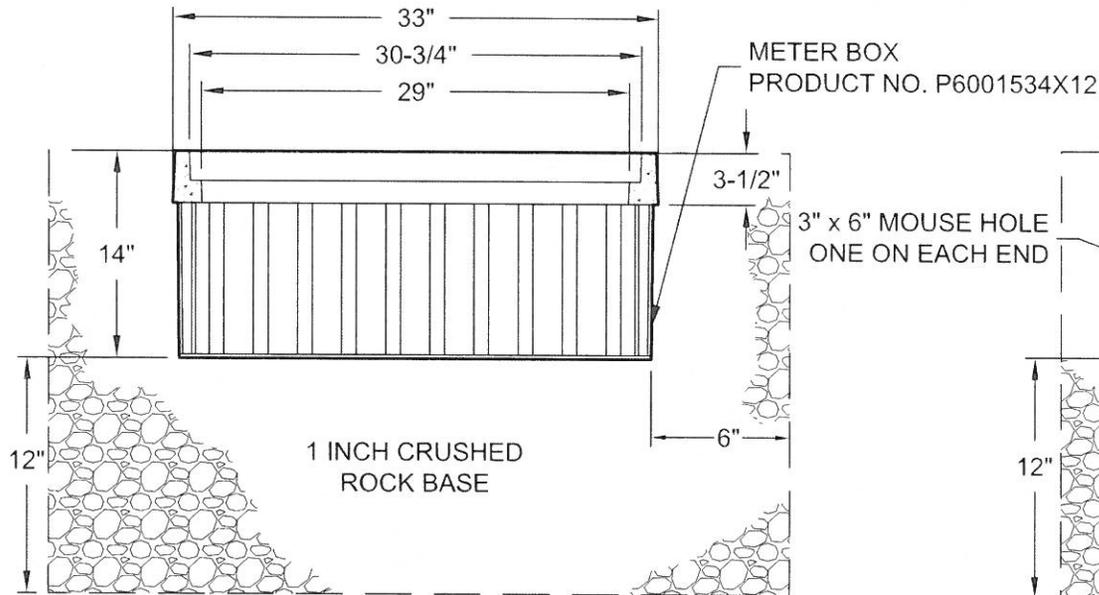
STREETS:	REV. DATE: 10/17	DETAIL: W-06.0
TRANS OPS:	APPROVED:	
FACILITIES:	 CITY ENGINEER	
WATER RESOURCES:	 PUBLIC WORKS DIRECTOR	



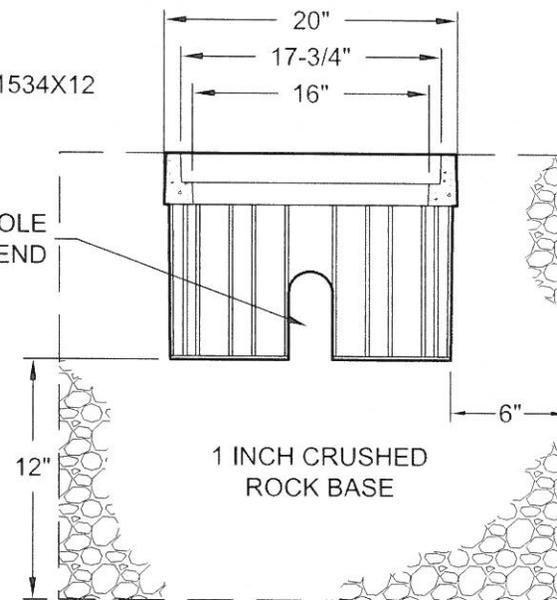
**PLAN VIEW**

**NOTES:**

1. Meter box shall be non skid Polymer Concrete as Manufactured by:  
 Armorcast Products Company,  
 13230 Saticoy Street,  
 North Hollywood, CA 91605,  
 (818) 982-3600
2. Bottom of meter box shall rest firmly on a 12 inch thick bed of 1 inch crushed rock extending 6 inches beyond the outside walls of the meter box.



**SIDE VIEW  
SECTION A-A**

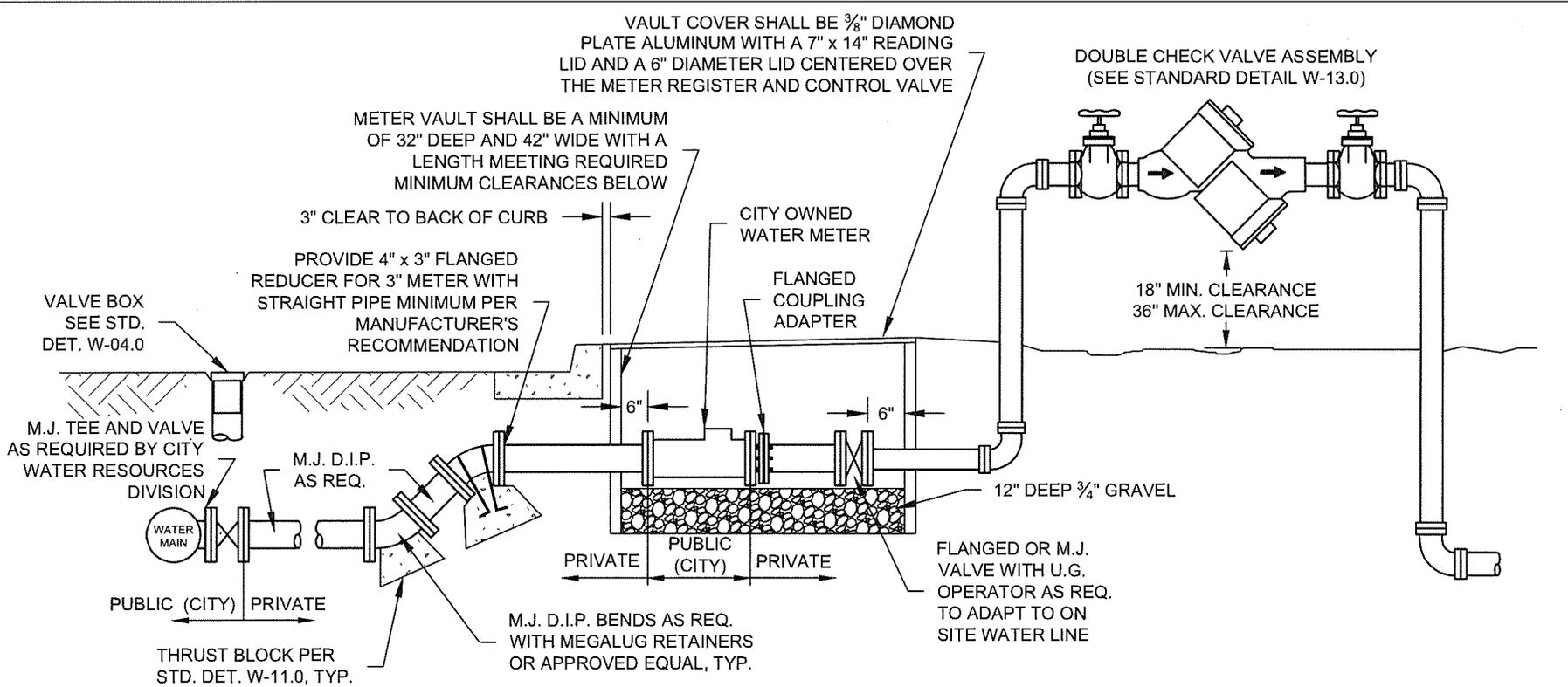


**END VIEW  
SECTION B-B**



**METER BOX**  
**1 1/2-INCH AND 2-INCH METERS**

STREETS:	REV. DATE: 10/17	DETAIL: W-06.1
TRANS OPS:	APPROVED:	
FACILITIES:	 CITY ENGINEER	
WATER RESOURCES:	 PUBLIC WORKS DIRECTOR	



**NOTES:**

1. Water meter shall be approved by the Water Resources Division of Public Works Department.
2. All piping shall be of the same size as the meter.
3. All pipe in the street right-of-way shall be D.I.P. with mechanical joints and "MEGALUG" retainer glands or approved equal.
4. All ductile iron pipe, including valves and fittings shall be encased with a 8-mil. thick black polyethylene sheet and taped as specified in A.W.W.A. C-105/A21.5-99-PRINTED.
5. All fittings shall be epoxy lined.
6. Service line beyond the valve to the building is the responsibility of the property owner.



# 4-INCH AND LARGER SERVICE CONNECTION

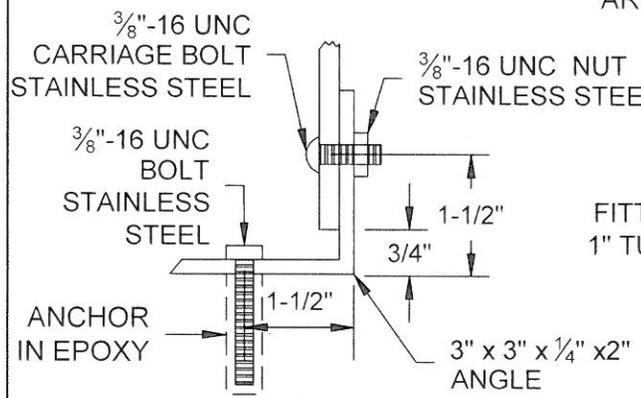
STREETS:	REV. DATE: 11/12	DETAIL: W-07.0
TRANS OPS:	APPROVED: <i>Pat Kelly</i>	
FACILITIES:	CITY ENGINEER	
WATER RESOURCES:	<i>Christopher Pedersen</i> PUBLIC WORKS DIRECTOR	



3" x 3" x 1/4" x 2" ANGLE.  
SEE BOLT DOWN DETAIL.

3" MIN. TYP.

CLASS 520-C-2500 CONCRETE FOUNDATION PLACED ON NATIVE SOIL COMPACTED TO 90% MIN. RELATIVE DENSITY WITH (2) #3 BARS EACH WAY 18" LONG AT MID DEPTH. 30"x30"x4"



**BOLT DOWN DETAIL**

1/2" Ø HOLE, TYP.

E-1900 SLOPE TO DRAIN

WRAP 10 MIL TAPE AROUND COPPER

FITTINGS AS REQUIRED. 1" TUBING MAY BE BENT,

ARMORCAST COVER IN FOREST GREEN OR SANDSTONE (USE SANDSTONE UNLESS LOCATED IN VEGETATION) ARMORCAST P6002002 (36" x 20"Ø)

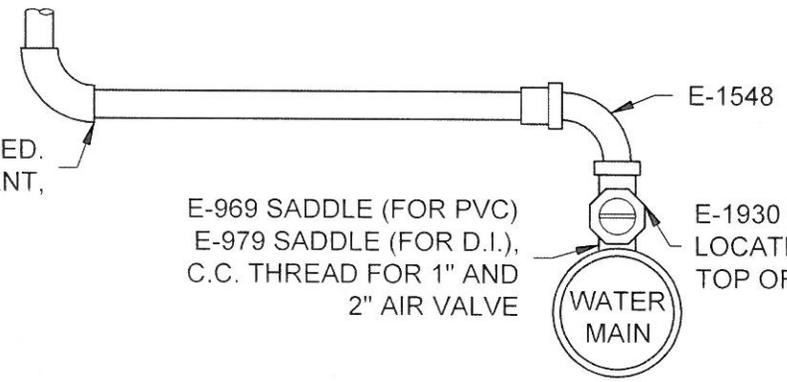
(2) 2" STREET ELLS AND FITTINGS AS REQUIRED TO CLEAR AIR VALVE. INSTALL SCREENED OUTLET.

MULTIPLEX CRISPEN UNIVERSAL AIR VALVE, OR COMBINATION AIR VALVE AND VAC 1" AND 2" THREADED, EPOXY LINED.

BRASS NIPPLE

E-1930-2" OR E-1531-1"

COPPER TUBING, TYPE "K", SAME SIZE AS AIR VALVE. 2' MIN. COVER. PROVIDE PROTECTIVE TAPE.



E-969 SADDLE (FOR PVC)  
E-979 SADDLE (FOR D.I.),  
C.C. THREAD FOR 1" AND 2" AIR VALVE

E-1548  
E-1930 (FOR 1" - 2")  
LOCATE ON TOP OF PIPE.



# AIR/VACUUM VALVE

## 1-INCH AND 2-INCH

STREETS:	REV. DATE: 8/17	DETAIL: W-08.0
TRANS OPS:	APPROVED:	
FACILITIES:	 CITY ENGINEER	
WATER RESOURCES:	 PUBLIC WORKS DIRECTOR	

**NOTES:**

1. Meter box per Standard Detail W-06.1 without bottom. Meter box lid shall be skid resistant.
2. Use silver solder for all sweat joints.

90° STREET ELBOW, FLANGE, TO COPPER. AS REQ. BY METER SIZE

SERVICE CONNECTION PER STD. DET. W-05.1

2" COPPER TYPE "K"

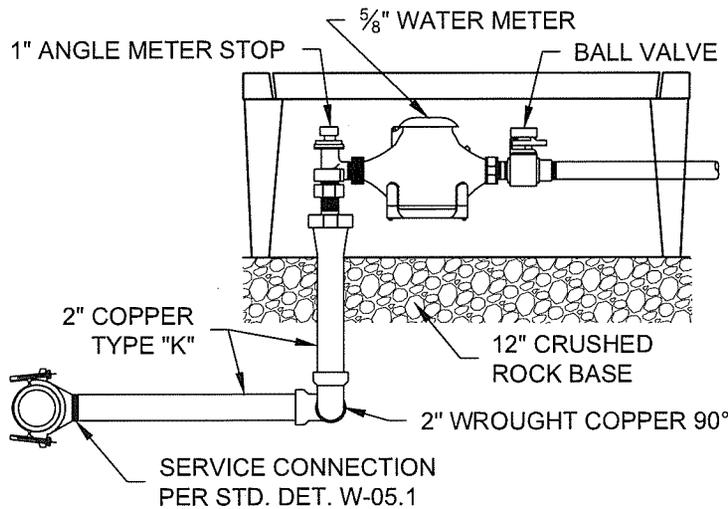
J-969 SADDLE

TEE COPPER, AS REQ. BY METER SIZE

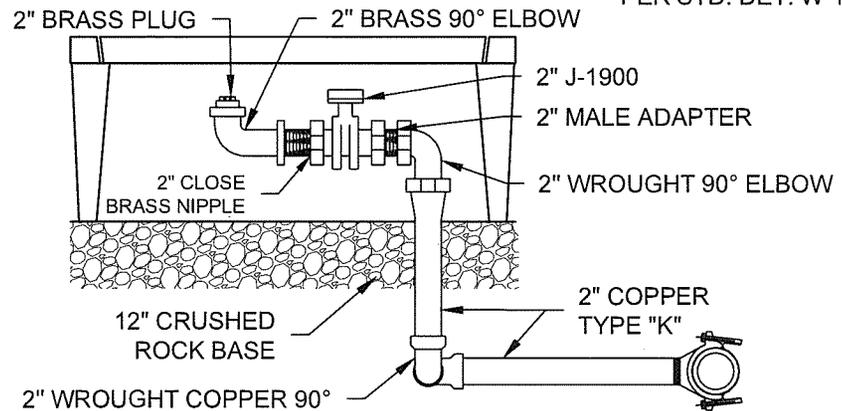
END CAP  
M/J CAP

CONC. THRUST BLOCK PER STD. DET. W-11.0

**PLAN VIEW**



**BACK SIDE VIEW**



**FRONT SIDE VIEW**



**2-INCH BLOW OFF  
WITH 1-INCH SERVICE**

STREETS:

TRANS OPS:

FACILITIES:

WATER RESOURCES:

REV. DATE: 11/12

DETAIL: W-09.0

APPROVED:

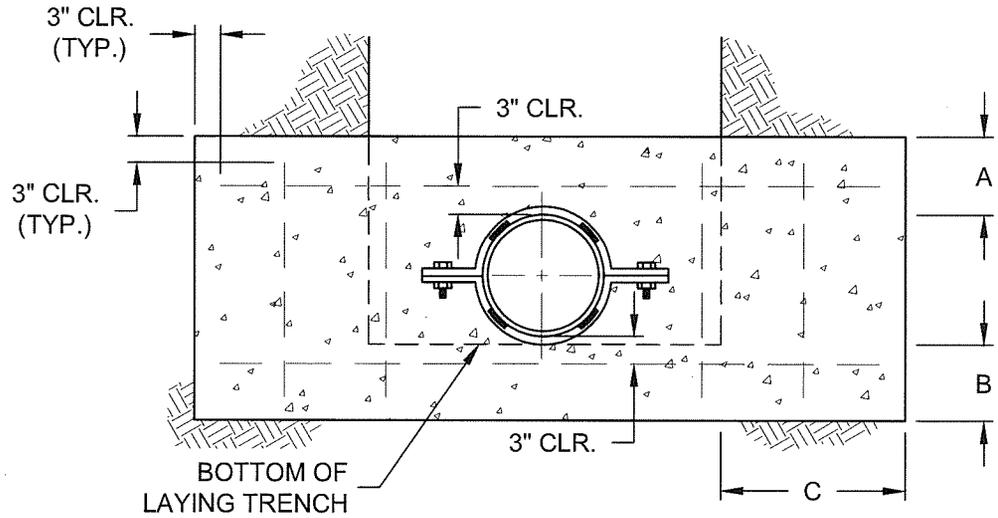
CITY ENGINEER

PUBLIC WORKS DIRECTOR

*Pat Kelly*  
*Christina Anderson*

MAIN SIZE	PRESSURE (PSI)	A	B	C
8" OR LESS	0-300	6"	6"	12"
10"	0-150	6"	6"	12"
10"	150-300	6"	8"	15"
12"	0-150	6"	6"	12"
12"	150-300	6"	10"	18"

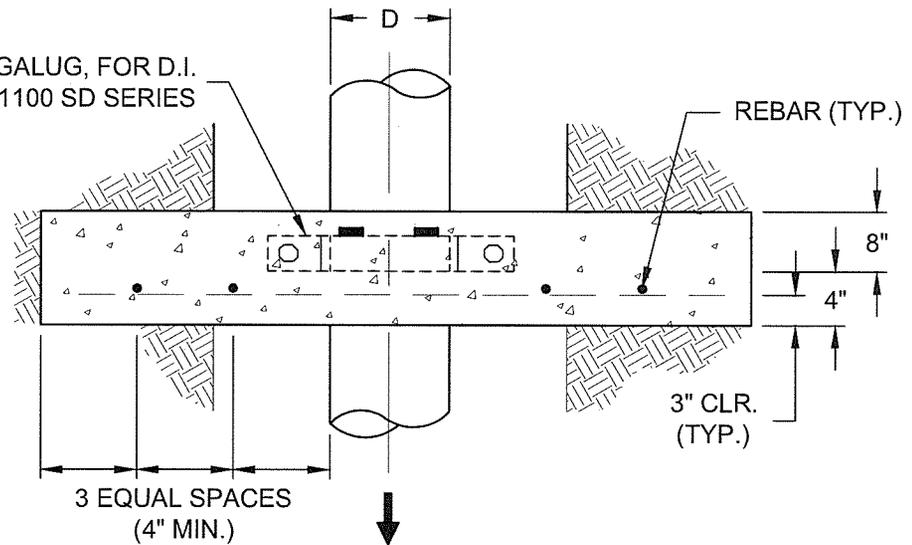
\* NOTE: THRUST COLLAR NOT TO BE INSTALLED ON P.V.C.



## NOTES:

1. Concrete thrust collar shall be placed solidly against firm undisturbed native soil with a soil bearing pressure not less than 1500 psf.
2. Concrete mix shall be CLASS 520-C-2500.
3. All reinforcing bars shall be No. 4.
4. Thrust collars in non-native soil shall be approved by the City Engineer before installation.

SPLIT MEGALUG, FOR D.I. AND C.I. - 1100 SD SERIES



# CONCRETE THRUST COLLAR

STREETS:	REV. DATE: 11/12	DETAIL: W-10.0
TRANS OPS:	APPROVED: <i>Pat Kelly</i>	
FACILITIES:	CITY ENGINEER	
WATER RESOURCES:	<i>Christina Anderson</i>	
	PUBLIC WORKS DIRECTOR	

# CONCRETE THRUST BLOCK NOTES:

- Concrete mix shall be Class 520-C-2500.
- Concrete placed against the pipe fitting shall not extend beyond the joints.
- Concrete thrust blocks shall be installed to the dimensions and configurations as shown. Thrust Block Requirements table is designed for a test water pressure of 150psi and a soil bearing pressure of 2000 psf with a safety factor of 1.5. Thrust blocks for all other values for water pressure and soil bearing must use multiplier tables accordingly, see example below.
- Concrete thrust blocks shall be placed solidly against firm undisturbed native soil. Soil bearing pressure of undisturbed native soil must be considered in design, see multiplier table below.
- For configurations with multiple thrust blocks, required bearing area square footage values represent the cumulative total of all thrust block bearing areas.
- The ratio of thrust block height (H) to length (L) shall be at minimum 1:2 and at maximum 1:1 (square), with preference toward 1:1.
- All thrust blocks shall extend a minimum of 24" outward from the pipe. Exceptions for small sized thrust blocks may be made at Engineer's discretion.
- In locations where the water table is higher than the thrust block, special design is required.

## THRUST BLOCK REQUIREMENTS (at 150psi water pressure and 2000psf soil bearing capacity):

Pipe inner diameter (in.)	Horizontal Bends (required S.F. bearing area)					Vertical bends (required C.Y.)		
	Tees, crosses, & plugs	90°	45°	22.5°	11.25°	45°	22.5°	11.25°
4	2.0	2.9	1.6	0.8	0.4	0.8	0.4	0.2
6	4.2	5.9	3.2	1.6	0.8	1.7	0.9	0.4
8	7.2	10.2	5.5	2.8	1.4	2.9	1.5	0.8
10	10.9	15.4	8.3	4.2	2.1	4.4	2.2	1.1
12	15.4	21.8	11.8	6.0	3.0	6.2	3.2	1.6
14	20.7	29.3	15.8	8.1	4.1	8.4	4.3	2.1
16	26.8	37.8	20.5	10.4	5.2	10.8	5.5	2.8

### SOIL MULTIPLIERS:

Actual Soil Bearing (psf)	Multiplier
1000	2.00
1500	1.33
2000	1.00
2500	0.80
3000	0.67
3500	0.57

### WATER MULTIPLIERS:

Actual Test Water Pressure (psi)	Multiplier
100	0.67
150	1.00
200	1.33
250	1.67
300	2.00
350	2.33

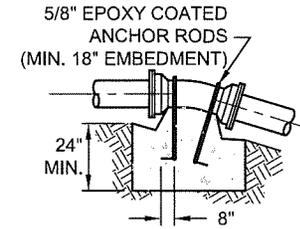
### EXAMPLE:

10" pipe, 90° bend, 250psi test water pressure, 1500psf soil bearing capacity:

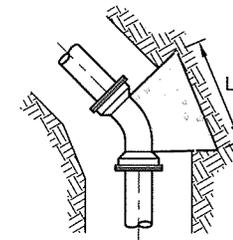
From Thrust Block Requirements table, 10" pipe on a 90° bend requires 15.4 S.F. bearing area.

Adjust values using multiplier tables:

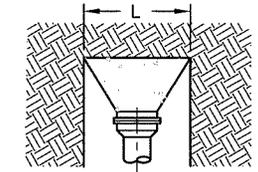
$$\begin{aligned} \text{Required S.F.} &= (\text{Table value})(\text{Multiplier, 1500psf soil})(\text{Multiplier, 250psi water}) \\ &= (15.4 \text{ S.F.})(1.33)(1.67) \\ &= \boxed{34.2 \text{ S.F. required thrust block bearing area}} \end{aligned}$$



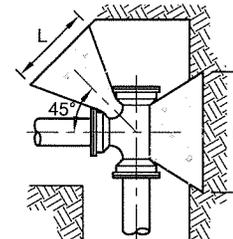
**VERTICAL BEND**



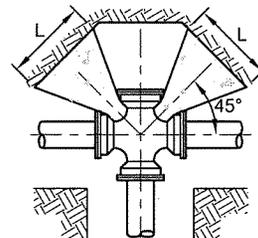
**HORIZONTAL BEND**



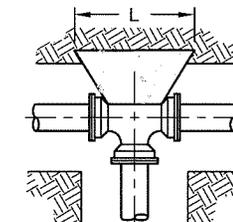
**END CAP**



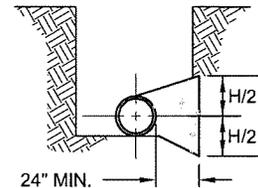
**TEE (ONE END PLUGGED)**



**CROSS (ONE END PLUGGED)**



**TEE**



**TYPICAL SECTION**



# CONCRETE THRUST BLOCK

STREETS:	REV. DATE: 11/12	DETAIL: W-11.0
TRANS OPS:	APPROVED: <i>Pat Kelly</i>	
FACILITIES:	CITY ENGINEER	
WATER RESOURCES:	<i>Christina Anderson</i>	
	PUBLIC WORKS DIRECTOR	

# NOTES:

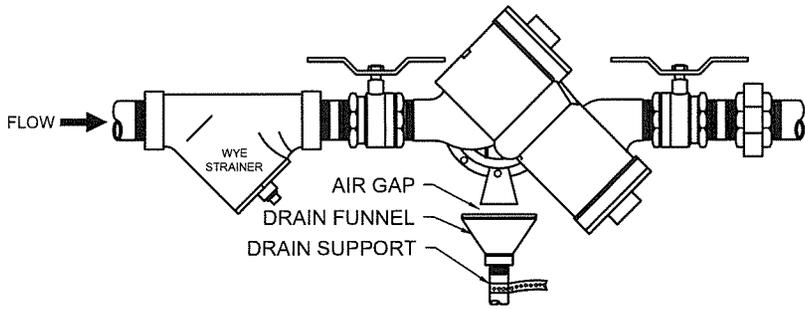
Proper installation of the assembly is essential to the protection of the water supply. The following are important characteristics of a proper installation.

1. The assembly shall be installed in a horizontal position with a minimum clearance of 18 inches and maximum of 36 inches between the relief valve discharge port and floor or grade, and a minimum of 18 inches of horizontal clearance around the unit for access and ease of testing and maintenance of the relief valve.
2. A Reduced Pressure Assembly shall not be installed in a pit. Flooding of the pit can result in cross connection contamination.
3. Placement of the assembly should be planned where water discharged from the relief port will not be objectionable.
4. The assembly must be purchased and installed with resilient seat valves as approved by the University of California Foundation for Cross-Connection Control and Hydraulic Research (USC).  
CAUTION: Open and close resilient seated shut-offs slowly to prevent water hammer damage to the system and assembly.
5. Since the reduced pressure assembly is designed to be serviced while in line, the unit need not be removed from the line during servicing. Union connections between the shut-off valves are recommended for ease of removal for damaged units 2 inch and smaller.
6. Ensure the supply water pressure does not exceed the manufacturer's maximum water pressure rating of the assembly to avoid damage to the system or the assembly caused by system pressure. In addition, protection must be provided against thermal water expansion, extreme backpressure and/or water hammer.
7. Most field problems occur because dirt or debris present in the system at the time of installation becomes trapped in the first check seating area, resulting in continuous discharge from the relief valve in a static or backflow condition. THE SYSTEM SHOULD BE FLUSHED BEFORE THE ASSEMBLY IS INSTALLED. If debris is in the water system continues to cause fouling, a strainer can be installed upstream of the assembly.
8. Backflow assembly shall be lead free.

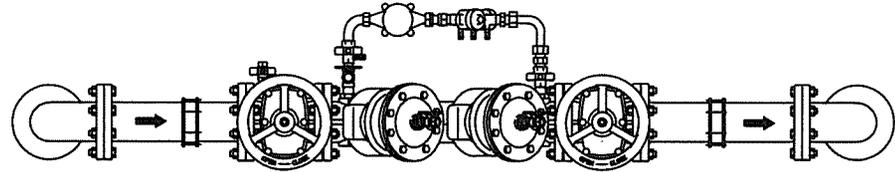


**REDUCED PRESSURE PRINCIPLE ASSEMBLY  
BACKFLOW PREVENTION ASSEMBLY (TYPE 1) NOTES**

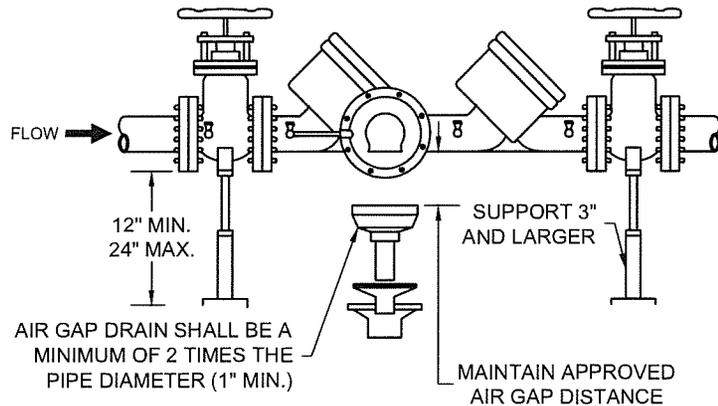
STREETS:	REV. DATE: 11/12	DETAIL: W-12.0
TRANS OPS:	APPROVED: <i>Pat Kelly</i>	
FACILITIES:	CITY ENGINEER	
WATER RESOURCES:	<i>Christina Anderson</i> PUBLIC WORKS DIRECTOR	



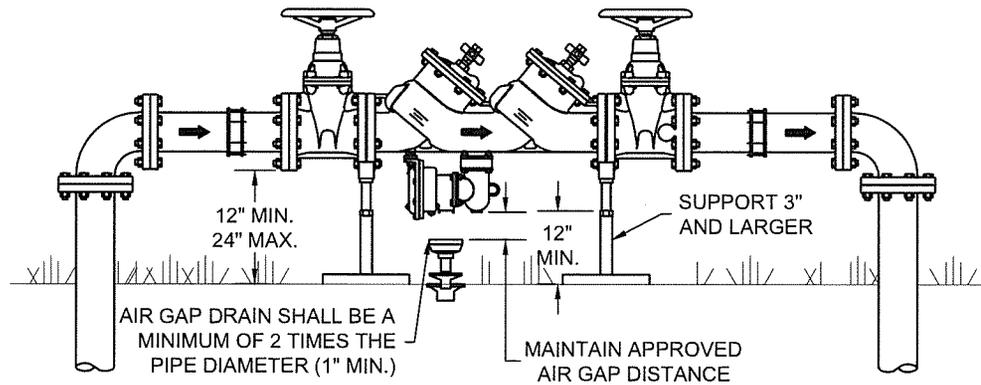
INDOOR INSTALLATION  
TOP VIEW



INDOOR/OUTDOOR INSTALLATION WITH DETECTOR  
TOP VIEW



OUTDOOR INSTALLATION  
TOP VIEW



INDOOR/OUTDOOR INSTALLATION WITH DETECTOR  
SIDE VIEW



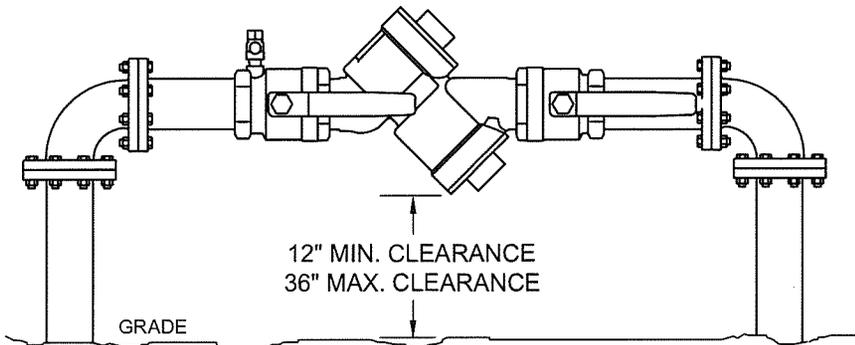
REDUCED PRESSURE PRINCIPLE ASSEMBLY  
BACKFLOW PREVENTION ASSEMBLY (TYPE 1)

STREETS:	REV. DATE: 11/12	DETAIL: W-12.1
TRANS OPS:	APPROVED: <i>Pat Kelly</i>	
FACILITIES:	CITY ENGINEER	
WATER RESOURCES:	<i>Christopher Anderson</i> PUBLIC WORKS DIRECTOR	

# NOTES:

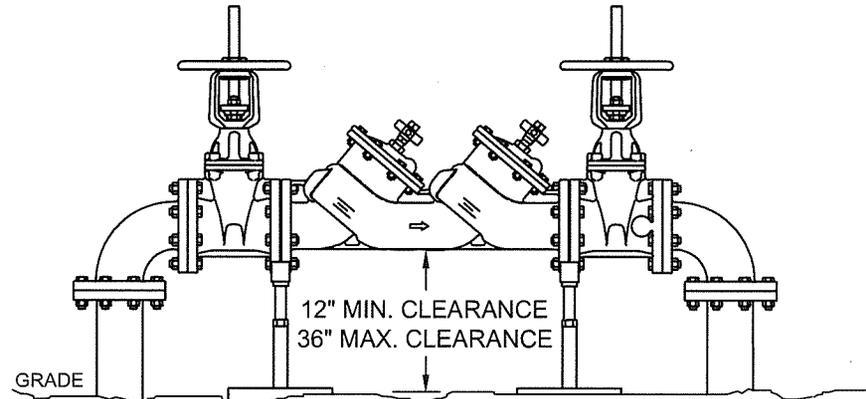
1. The Double Check Valve Assembly must be installed where it is accessible for periodic testing and maintenance.
2. PRIOR TO INSTALLING IN LINE, FLUSH SUPPLY LINE OF ALL FOREIGN MATERIAL. Failure to flush the lines completely may cause the checks to become fouled and require disassembly and cleaning.
3. The device shall only be installed per manufacturer's specifications.
4. When threading the device in line, place wrench only on ball valve hex ends. Keep pipe dope off interior surfaces of valve. On 2-1/2-inch and larger devices, DO NOT LIFT THE DEVICE WITH GATE VALVE HANDWHEELS OR STEMS. ALSO DO NOT SUPPORT DEVICE FROM ONLY ONE END.
5. After installation, fill device and bleed air from unit. Test to ensure proper operation. If either check fails to hold 1.0 PSI, it is most likely due to fouling. The cap must be removed and the seat and/or seat disc cleaned.
6. The device must be protected from freezing. Thermal water expansion and/or water hammer downstream of the backflow preventer can cause excessive pressure increases. Excessive pressure situations should be eliminated to avoid possible damage to the system and device.
7. All potable dedicated fire lines will be required to have double check detector check.
8. Any backflow prevention assembly installed overhead (5' or more) must have a permanent platform built for accessibility.
9. Refer to Uniform Plumbing Code (UPC) chapter 6, sections 603.00 thru 603.4.20 for more information.

	<h2>DOUBLE DETECTOR CHECK ASSEMBLY</h2> <p>BACKFLOW PREVENTION ASSEMBLY (TYPE 2) NOTES</p>	STREETS:	REV. DATE: 11/12	DETAIL: W-13.0
		TRANS OPS:	APPROVED: <i>Pat Kelly</i>	
		FACILITIES:	CITY ENGINEER	
		WATER RESOURCES: <i>[Signature]</i>	<i>Christina Pedersen</i> PUBLIC WORKS DIRECTOR	



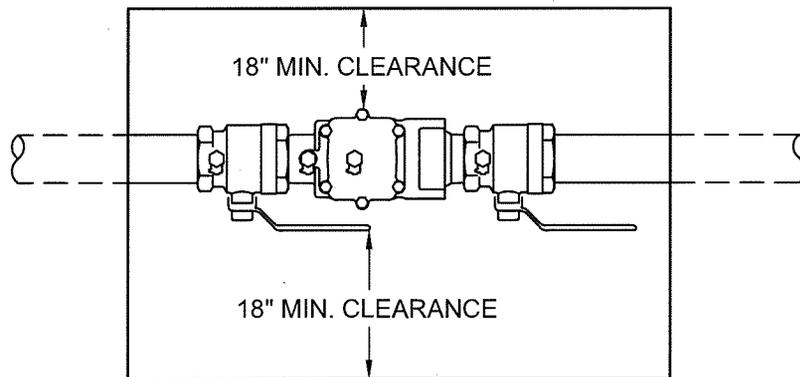
OUTSIDE INSTALLATION  
(SIDE VIEW)  
(SIZES 3/4" THROUGH 2")

DOUBLE CHECK VALVE ASSEMBLY

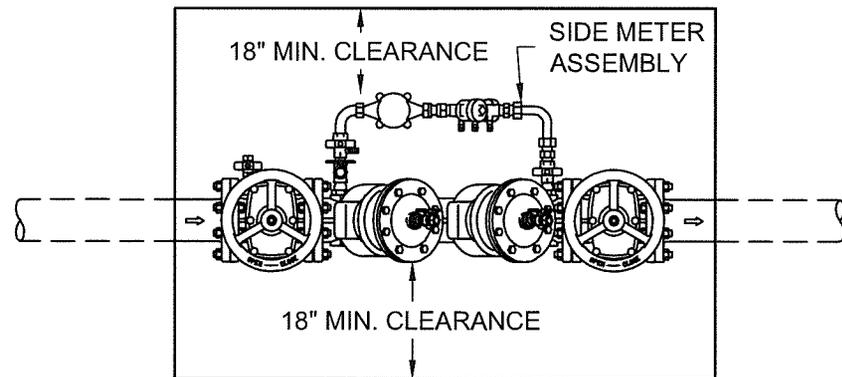


OUTSIDE INSTALLATION  
(SIDE VIEW)  
(SIZES 2-1/2" AND LARGER)

DOUBLE CHECK DETECTOR CHECK ASSEMBLY



PIT INSTALLATION  
(TOP VIEW)  
(SIZES 3/4" THROUGH 2")

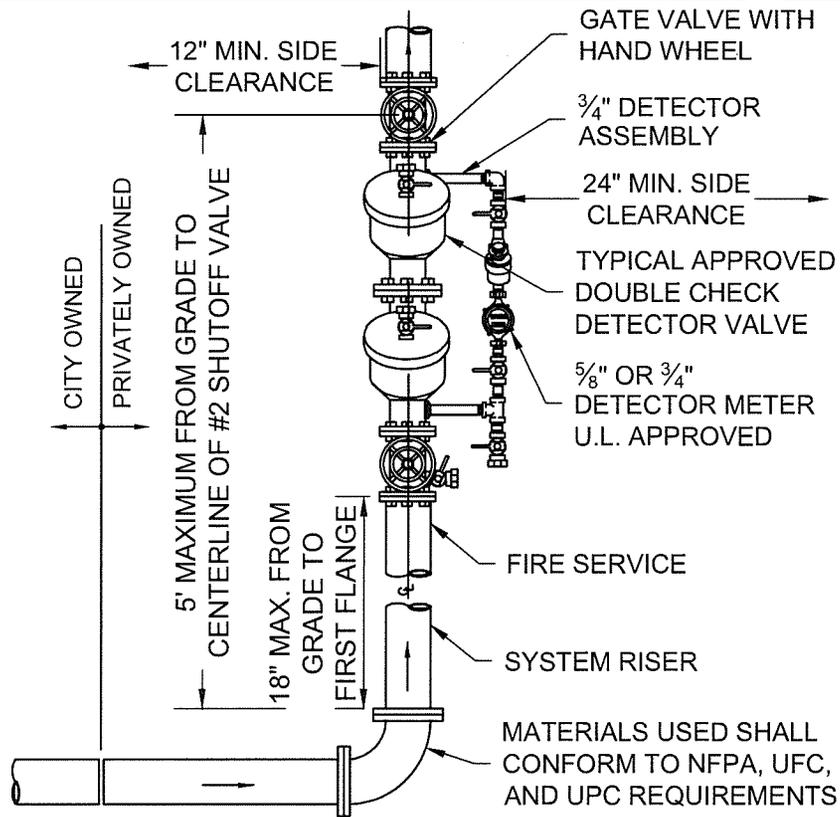


PIT INSTALLATION  
(TOP VIEW)  
(SIZES 2-1/2" AND LARGER)

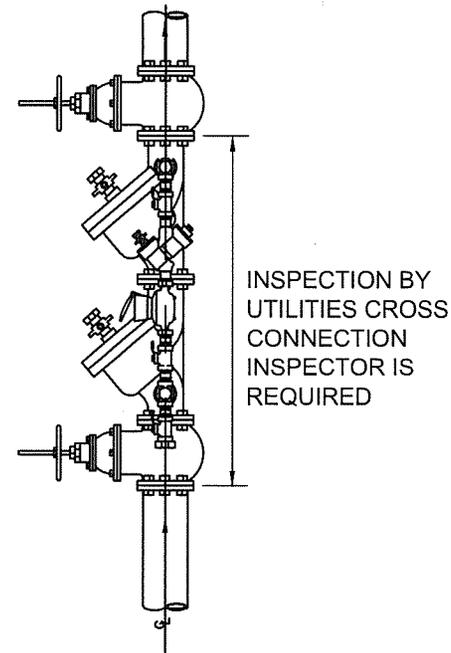


**DOUBLE DETECTOR CHECK ASSEMBLY  
BACKFLOW PREVENTION ASSEMBLY (TYPE 2)**

STREETS:	REV. DATE: 11/12	DETAIL: W-13.1
TRANS OPS:	APPROVED: <i>Pat Kelly</i>	
FACILITIES:	CITY ENGINEER	
WATER RESOURCES:	<i>Christopher Decker</i> PUBLIC WORKS DIRECTOR	



**ELEVATION**



**SIDE VIEW**

**NOTES:**

1. Assembly and installation shall conform to Standard Detail W-13.0.
2. Double check detector required on all potable dedicated firelines.
3. Side clearance shall be 12" minimum from back of backflow device to any wall or other obstruction.
4. Clearance from detector side of backflow assembly shall be a minimum of 24" from all obstructions.
5. Assembly must be installed as a unit.
6. Distance from grade to centerline of the #2 shut off valve shall be a maximum of 5 feet.
7. Minimum of 18" from grade to first flange of #1 shut off valve.
8. Assembly must be an approved assembly from USC list or equivalent.

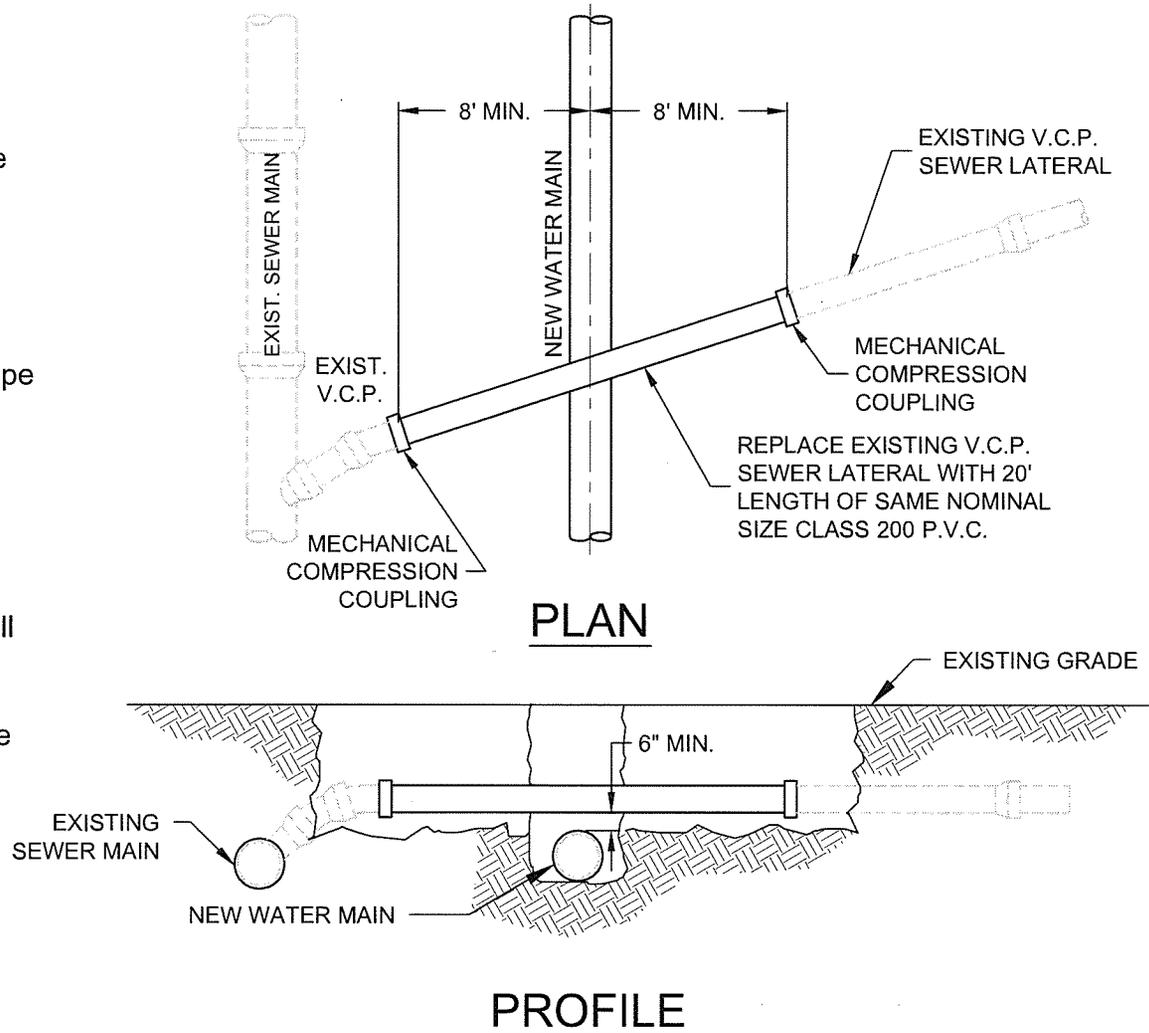


**DOUBLE DETECTOR CHECK ASSEMBLY  
VERTICAL INSTALLATION**

STREETS:	REV. DATE: 11/12	DETAIL: W-13.2
TRANS OPS:	APPROVED: <i>Pat Kelly</i> CITY ENGINEER	
FACILITIES:	<i>Christina Pedersen</i> PUBLIC WORKS DIRECTOR	
WATER RESOURCES:		

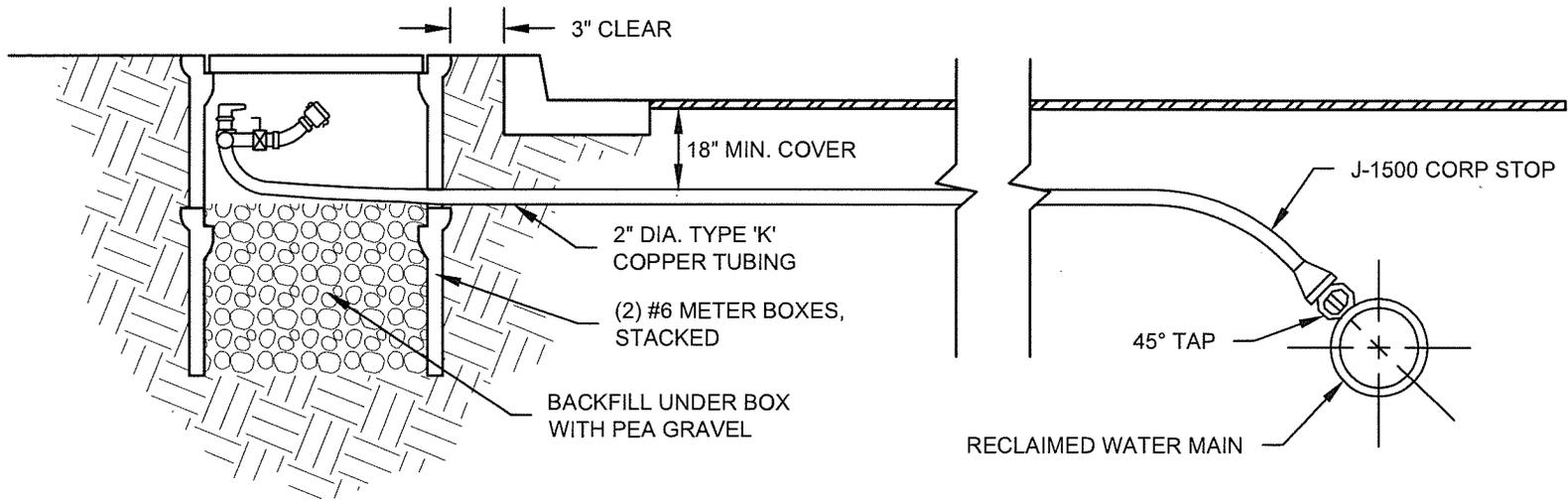
**NOTES:**

1. Any variation from that shown must be approved by the City Public Works Inspector.
2. Sewer laterals shall maintain original slope.
3. PVC pipe shall be Class 200 P.V.C. pipe per AWWA C900.
4. Backfill shall be Class I as defined in Standard Detail 7-001.0 and shall be placed in accordance with ASTM D 2321.
5. Mechanical compression coupling shall be a band seal type repair with an outside stainless steel shear ring, "strong back" or approved equal by the Engineer.

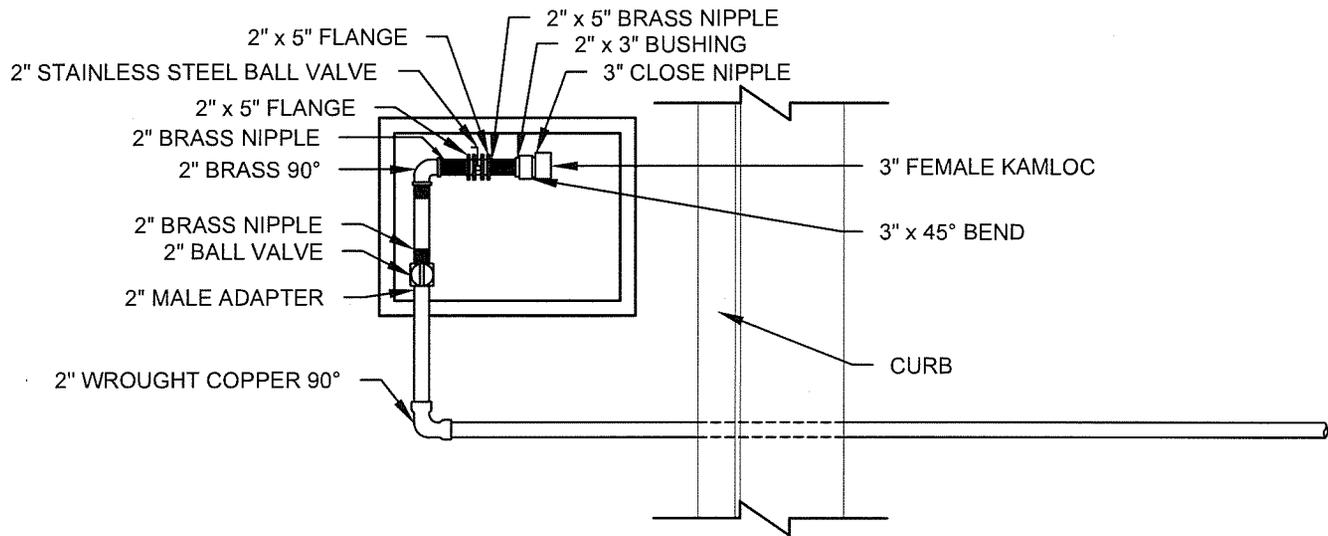


**MODIFICATION OF SEWER LATERAL  
OVER WATER MAIN**

STREETS:	REV. DATE: 11/12	DETAIL: W-14.0
TRANS OPS:	APPROVED: <i>Pat Kelly</i>	
FACILITIES:	CITY ENGINEER	
WATER RESOURCES:	<i>Christopher Pedersen</i> PUBLIC WORKS DIRECTOR	



**SECTION**

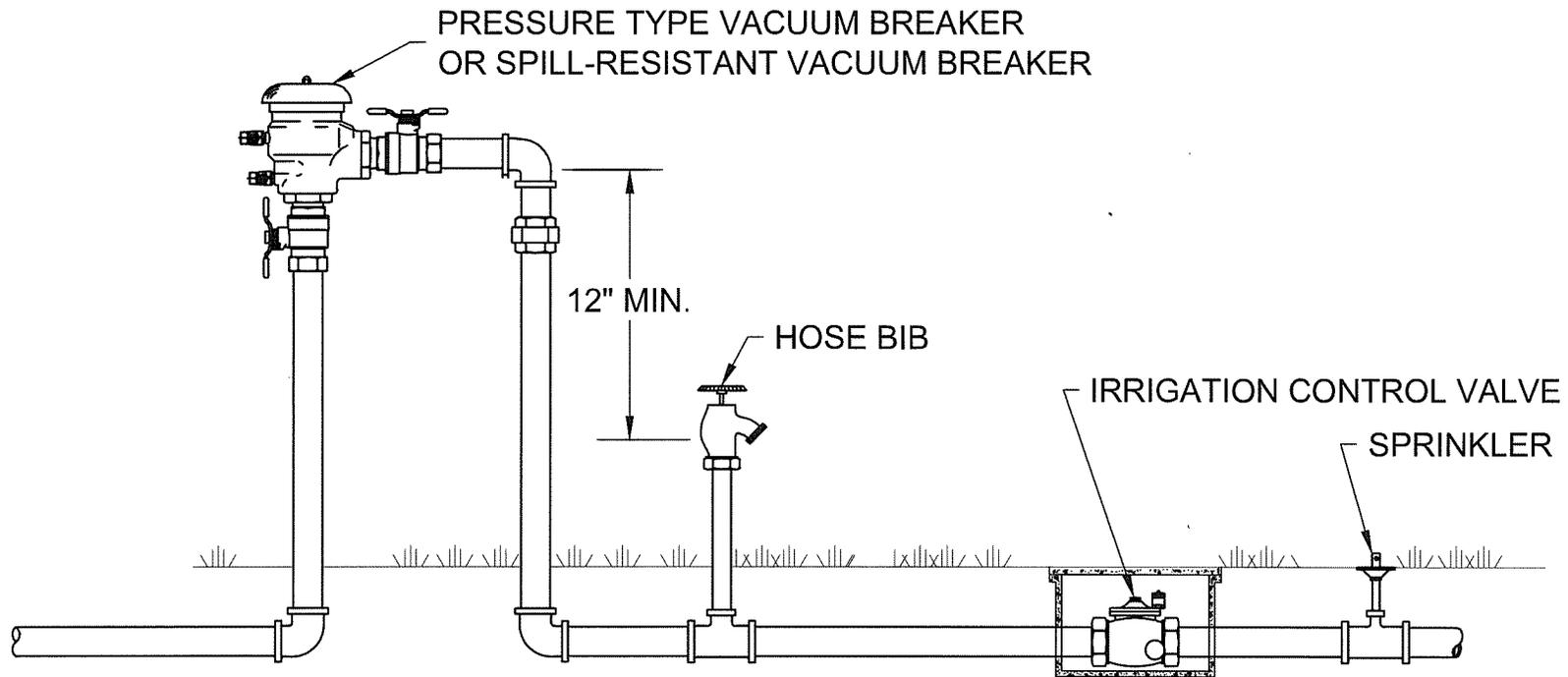


**PLAN**



**RECLAIMED WATER  
FILL STATION**

STREETS:	REV. DATE: 11/12	DETAIL: W-15.0
TRANS OPS:	APPROVED: <i>John Kelly</i> CITY ENGINEER	
FACILITIES:	<i>Christopher Anderson</i> PUBLIC WORKS DIRECTOR	
WATER RESOURCES:		



PLAN VIEW

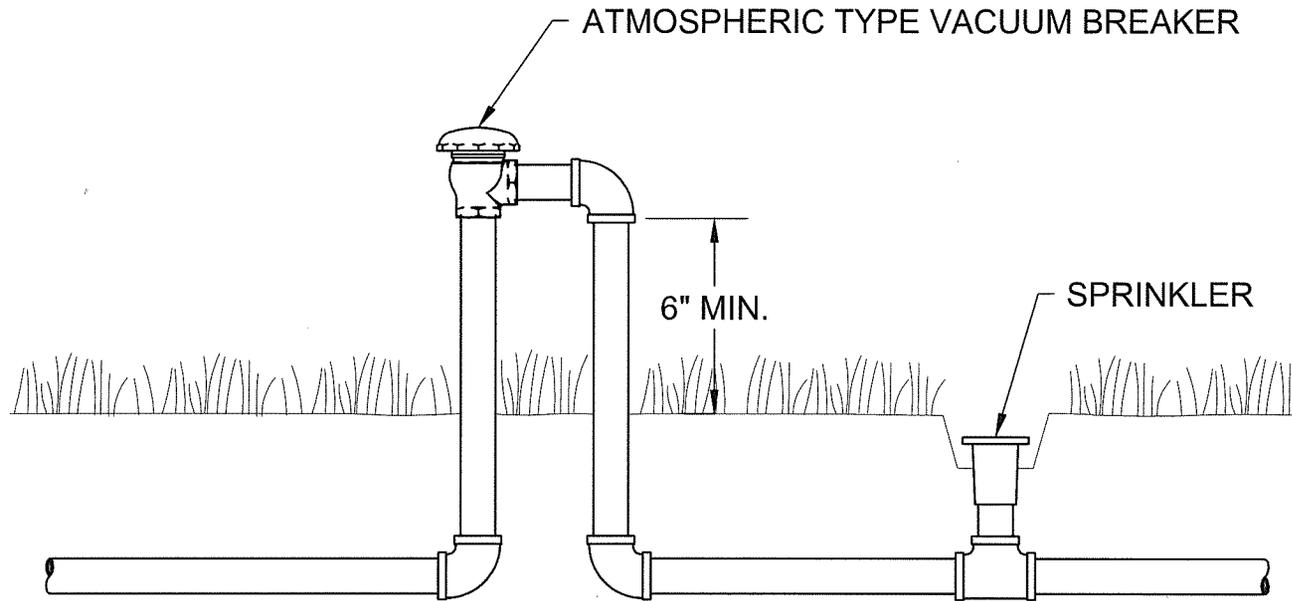
**NOTES:**

1. Downstream side of pressure type vacuum breaker may be maintained under pressure by a valve, but any backpressure by pump or other means is strictly prohibited.
2. PVB's (Pressure Vacuum Breakers) and SVB's (Spill-Resistant Vacuum Breakers) are designed to protect against back siphonage only; not backpressure.
3. PVB's and SVB's shall be installed where occasional water discharge caused by pressure fluctuations is acceptable.
4. PVB's and SVB's shall be installed a minimum of 12 inches above the highest downstream piping and/or outlets.
5. PVB's and SVB's shall always be installed above the 100 year flood level unless otherwise approved by Engineer or designee.
6. Provide minimum clearances for testing and repair.



# PRESSURE TYPE VACUUM BREAKER

STREETS:	REV. DATE: 11/12	DETAIL: W-16.0
TRANS OPS:	APPROVED: <i>Pat Kell</i>	
FACILITIES:	CITY ENGINEER	
WATER RESOURCES:	<i>Christina Anderson</i> PUBLIC WORKS DIRECTOR	



PLAN VIEW

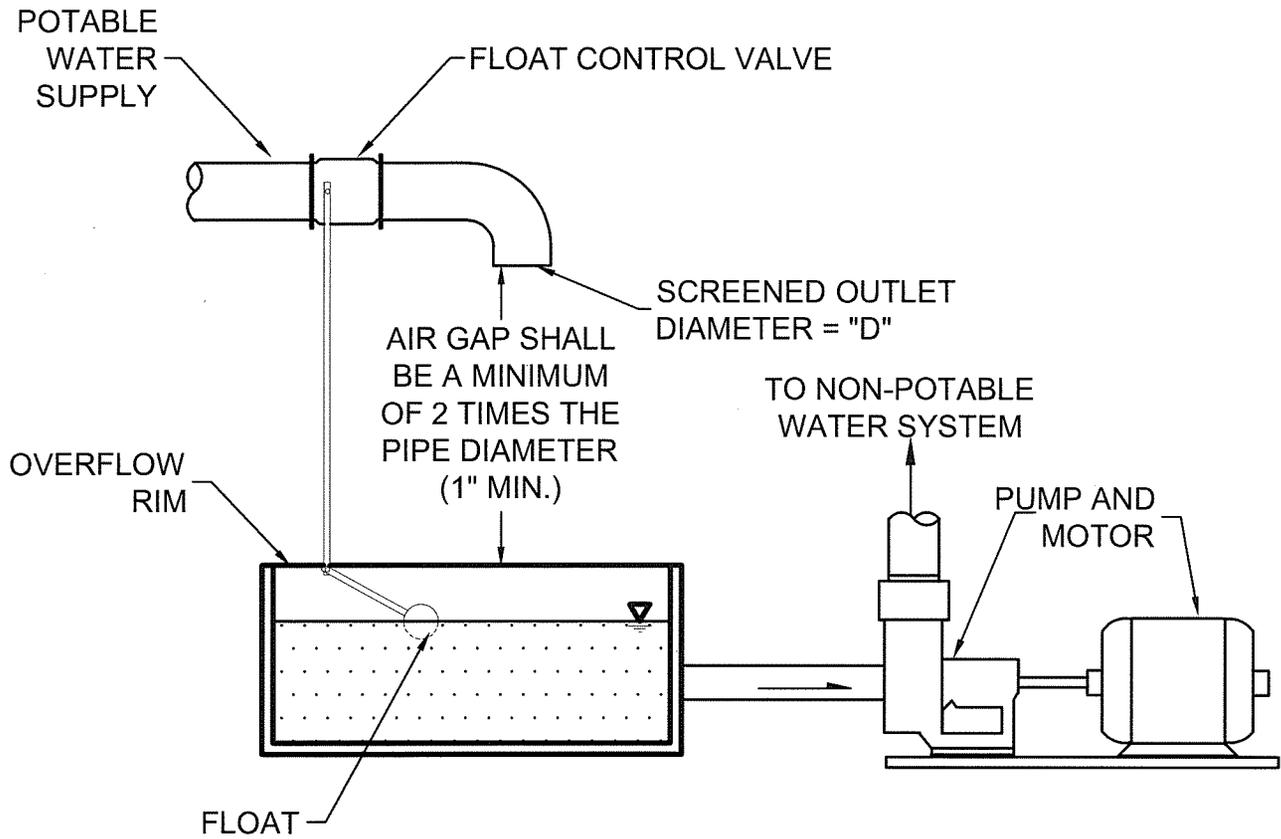
**NOTES:**

1. Downstream side of atmospheric type vacuum breaker (AVB) shall not contain any means of shut off.
2. AVB's shall not be subject to any backpressure.
3. AVB's are for intermittent use only and shall not be pressurized for more than 12 hours in any 24 hour period.
4. AVB's shall not be installed where occasional dusty or corrosive conditions occur.
5. AVB's shall be installed a minimum of 6 inches above the highest downstream piping and/or outlets.
6. AVB's shall always be installed above the 100 year flood level unless otherwise approved by Engineer or designee.



# ATMOSPHERIC TYPE VACUUM BREAKER

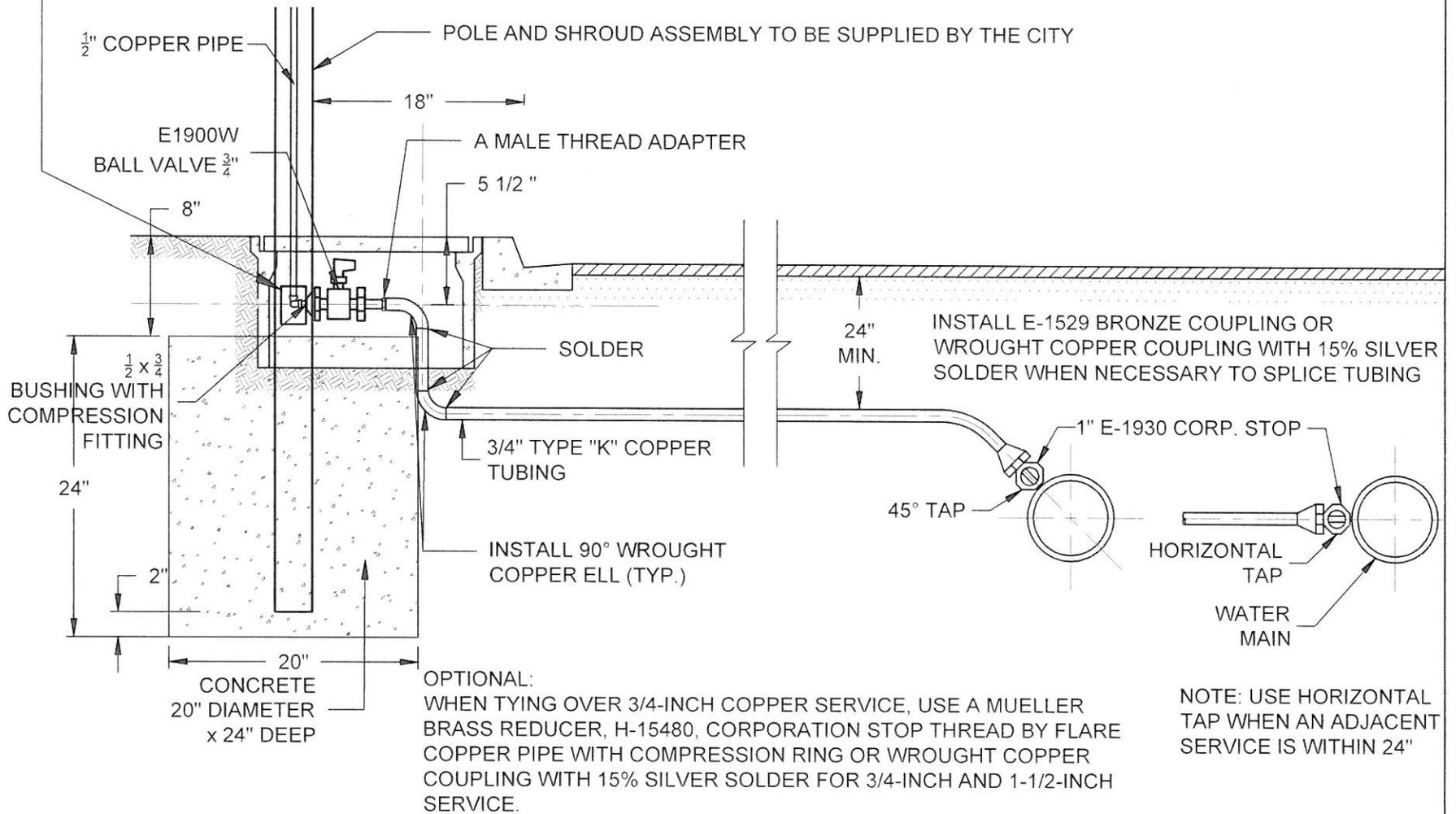
STREETS:	REV. DATE: 11/12	DETAIL: W-17.0
TRANS OPS:	APPROVED: <i>Pat Kelly</i>	
FACILITIES:	CITY ENGINEER	
WATER RESOURCES: <i>[Signature]</i>	<i>Christina Anderson</i> PUBLIC WORKS DIRECTOR	



# AIR GAP SEPARATION

STREETS:	REV. DATE: 11/12	DETAIL: W-18.0
TRANS OPS:	APPROVED: <i>Pat Kelly</i>	
FACILITIES:	CITY ENGINEER	
WATER RESOURCES:	<i>Christina Anderson</i>	
	PUBLIC WORKS DIRECTOR	

NOTE: TAPE OVER THE OPENING WITH 10 MIL TAPE AFTER PIPING IS IN PLACE



1 OF 3

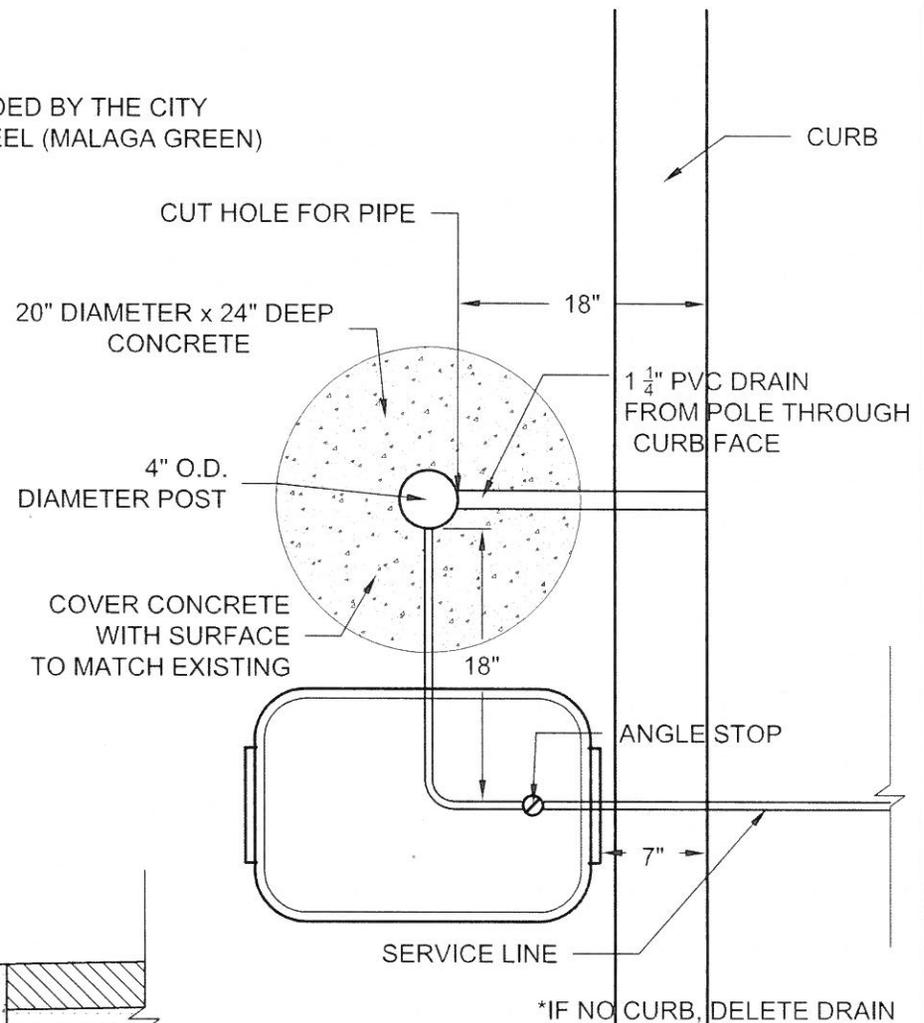
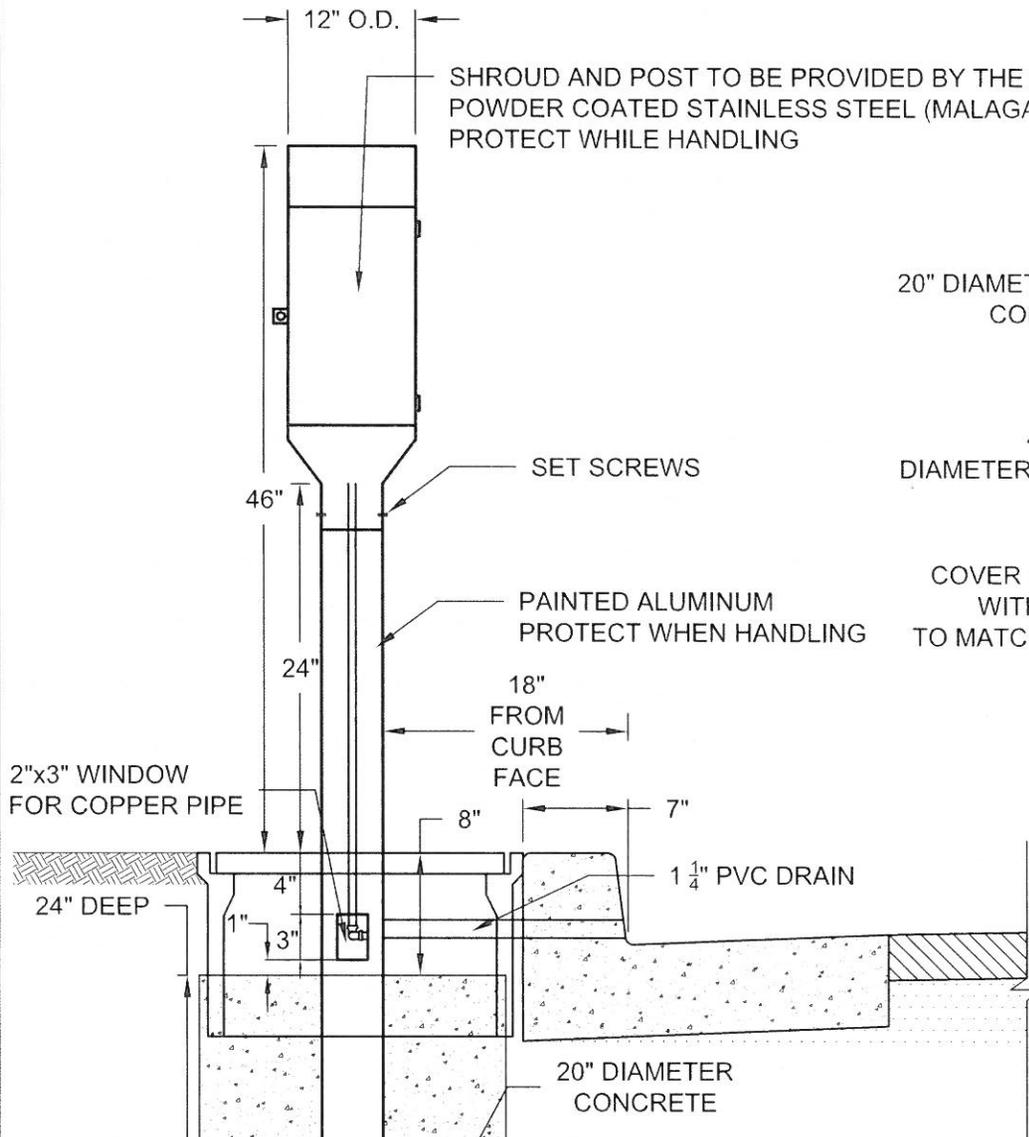


# WATER SAMPLE STATION SERVICE LINE

STREETS:	REV. DATE: 8/17	DETAIL: W-19.0
TRANS OPS:	APPROVED:	
FACILITIES:	 CITY ENGINEER	
WATER RESOURCES:	 PUBLIC WORKS DIRECTOR	

# ELEVATION

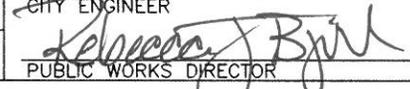
# LAYOUT

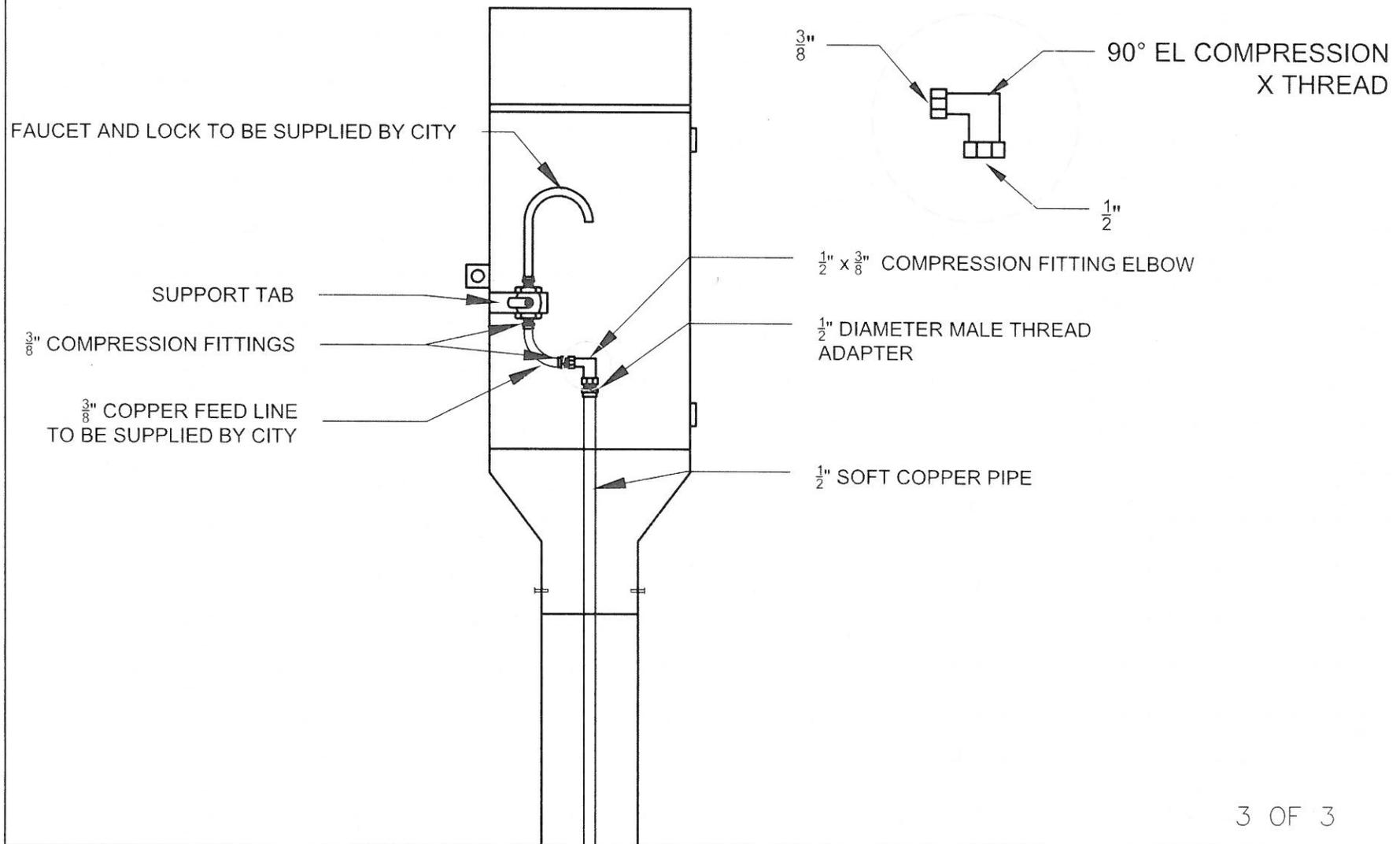


2 OF 3



## WATER SAMPLE STATION LAYOUT AND ELEVATION

STREETS:	REV. DATE: 8/17	DETAIL: W-19.0
TRANS OPS:	APPROVED:	
FACILITIES:	 CITY ENGINEER	
WATER RESOURCES:	 PUBLIC WORKS DIRECTOR	



3 OF 3



# WATER SAMPLE STATION DISPENSING UNIT

STREETS:	REV. DATE: 8/17	DETAIL: W-19.0
TRANS OPS:	APPROVED: <i>B. O'Connell</i> CITY ENGINEER	
FACILITIES:	<i>Richard J. Bono</i> PUBLIC WORKS DIRECTOR	
WATER RESOURCES: <i>CT</i>		