

DESCRIPTION	DETAIL #
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1" WATER METER BOX	W.02
1 1/2" - 2" METER & METER VAULT	W.03
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STANDARD MULTIPLE BRANCH SERVICES	W.05
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GENERAL NOTES

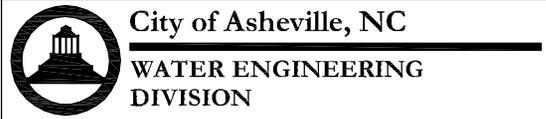
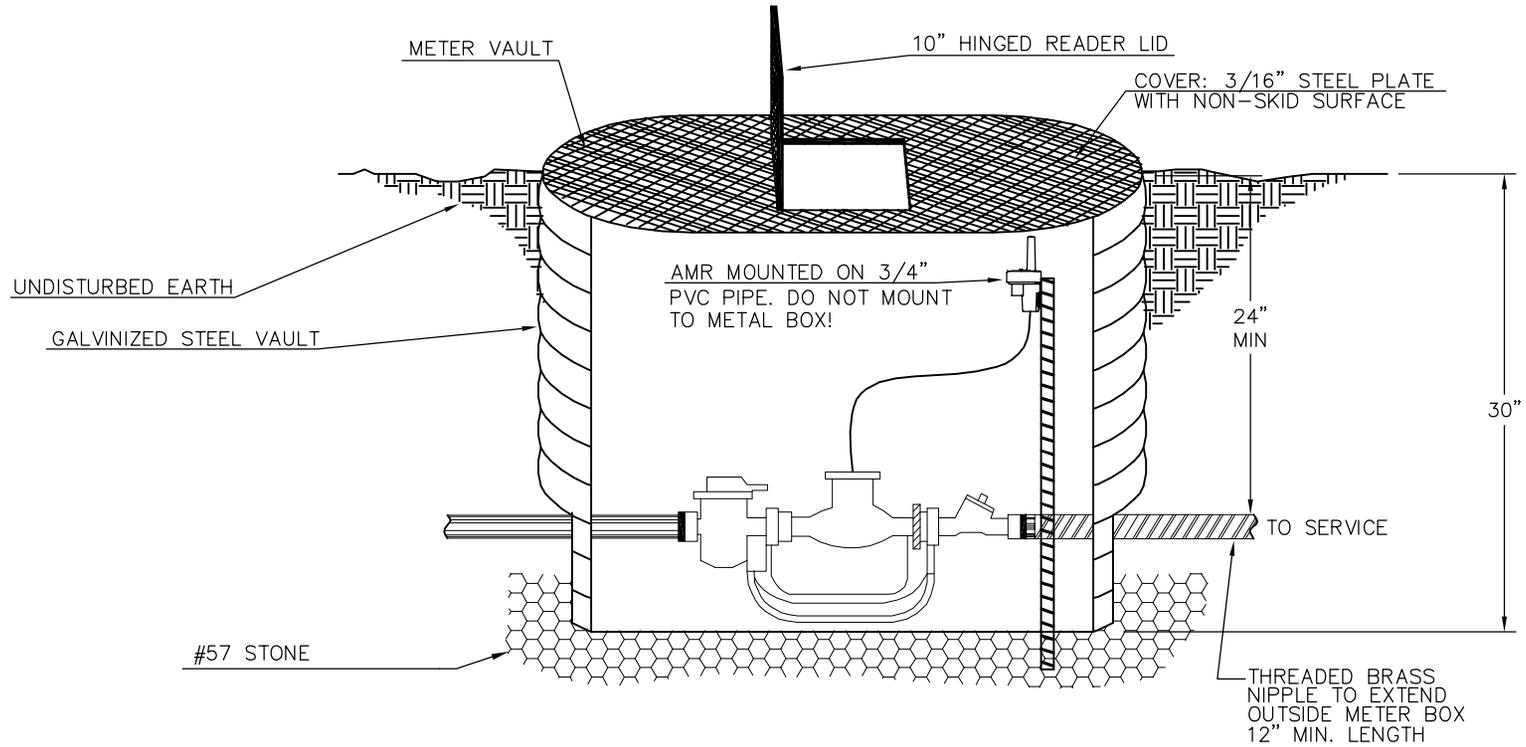
1. DUAL CHECK ON OUTLET
2. REMOTE READING ASSEMBLY TO BE COMPATIBLE WITH CITY OF ASHEVILLE READING DEVICES.
3. ALL METER SERVICE FITTINGS AND APPURTENANCES IN CONTACT WITH WATER SHALL BE LEAD FREE TYPE PRODUCTS.

MATERIAL: COPPER-STEEL GALVINIZED .064

METHOD OF CONSTRUCTION: RIVETED TWO PIECE CONSTRUCTION

LID: 3/16" FLOOR PLATE STEEL-REINFORCED WITH 10"X10" READER DOOR AND 1 1/2 X 1 1/2 ANGLE IRON FITTING BRACKETS @ 90° SPACING.

WEIGHT: 100lbs SIZE: 38"L X 18"W X 26" D



1" WATER METER BOX

REVISIONS	
DATE	DESCRIPTION

STD. NO.

W.02

GENERAL NOTES:

1. BALL VALVE ON INLET.
2. DUAL CHECK ON OUTLET
3. BY-PASS INCLUDES A BALL VALVE WITH PADLOCK WINGS.
4. BRACE PIPE EYELETS.
5. DIFFERENT FLANGE SPACING MAY BE SPECIFIED.
17/4" FOR 2" METER SETTERS
13/4" FOR 1 1/2" METER SETTERS
6. BE SURE THAT COPPER SETTER IS INSTALLED IN THE CORRECT POSITION IN RELATION TO WATER FLOW.
7. SEPARATION VARIES BETWEEN 1 1/2" AND 2" METER SETTERS.

NOTES: ANGLE BALL VALVES SHOULD NOT BE USED ON THE OUTLET SIDE AS A CUSTOMER SHUT OFF. FLANGED ANGLE INVERTED KEY VALVE SHOULD BE USED FOR THIS PURPOSE. METER TO BE FURNISHED AND INSTALLED BY THE CITY OF ASHEVILLE. METER MUST BE SET BEFORE CONNECTION TO BRASS NIPPLE.

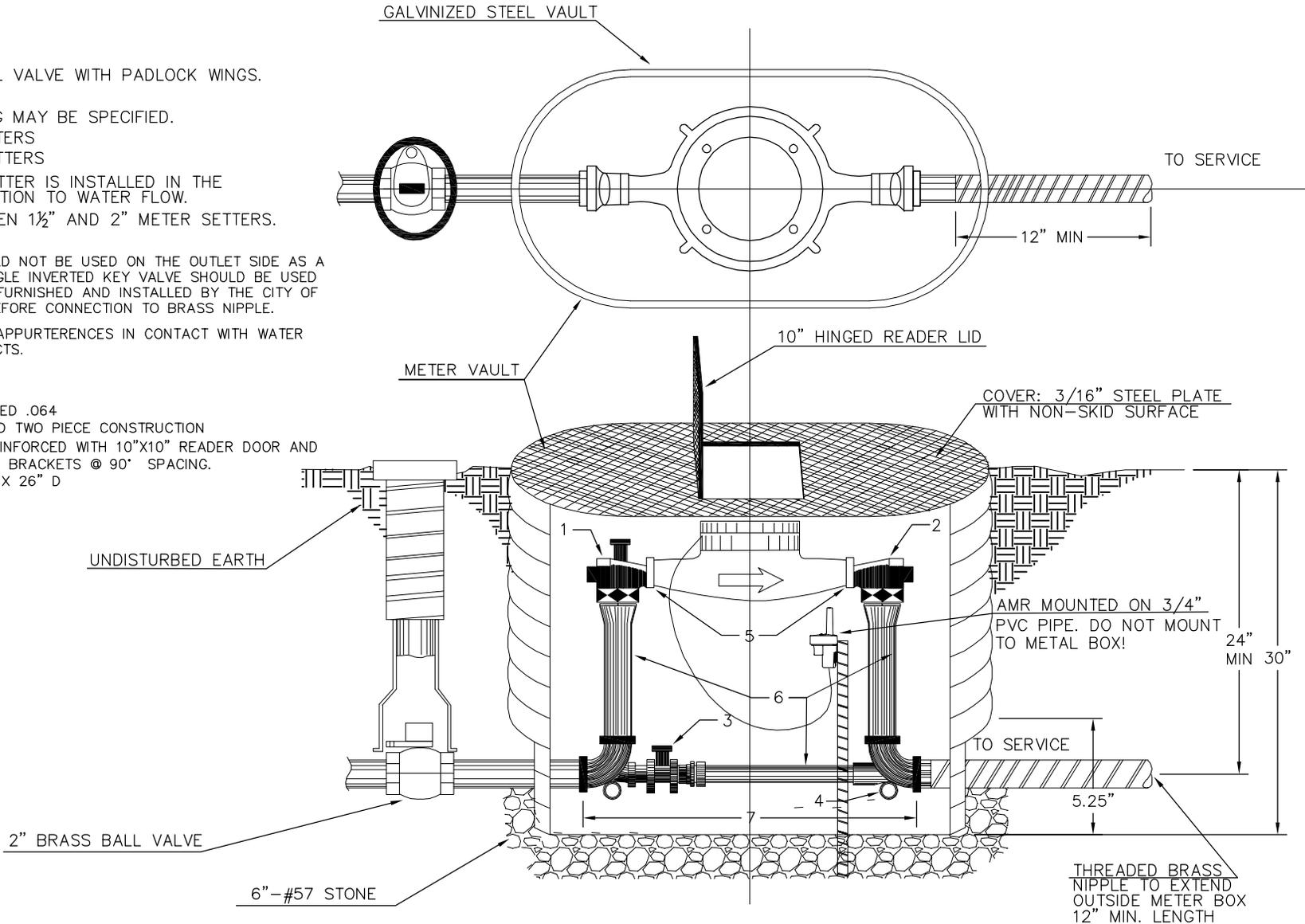
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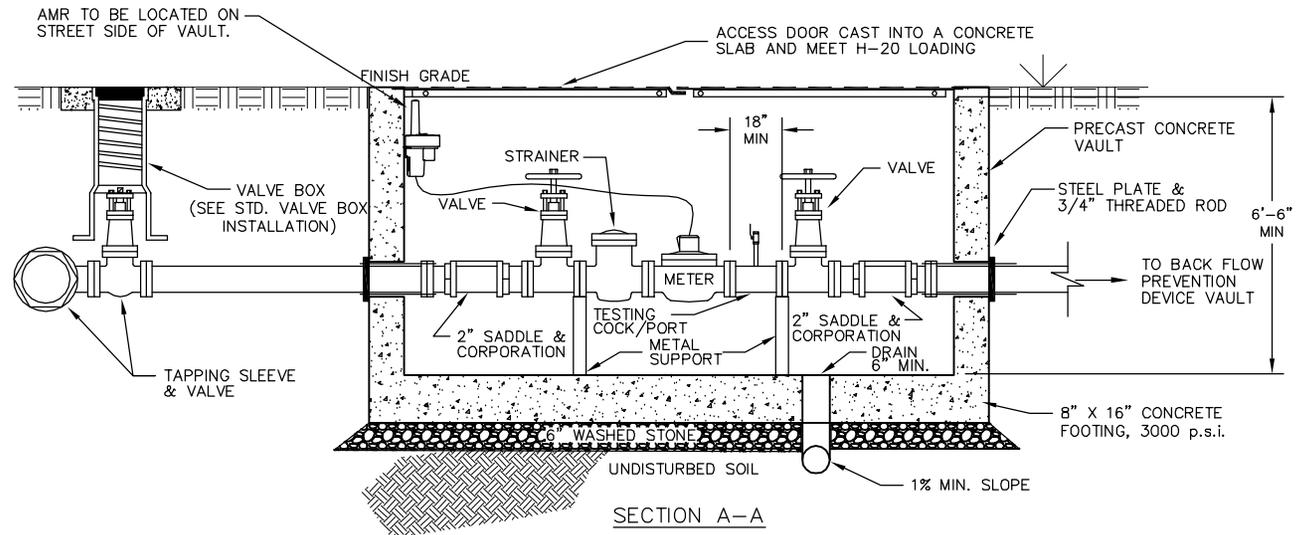
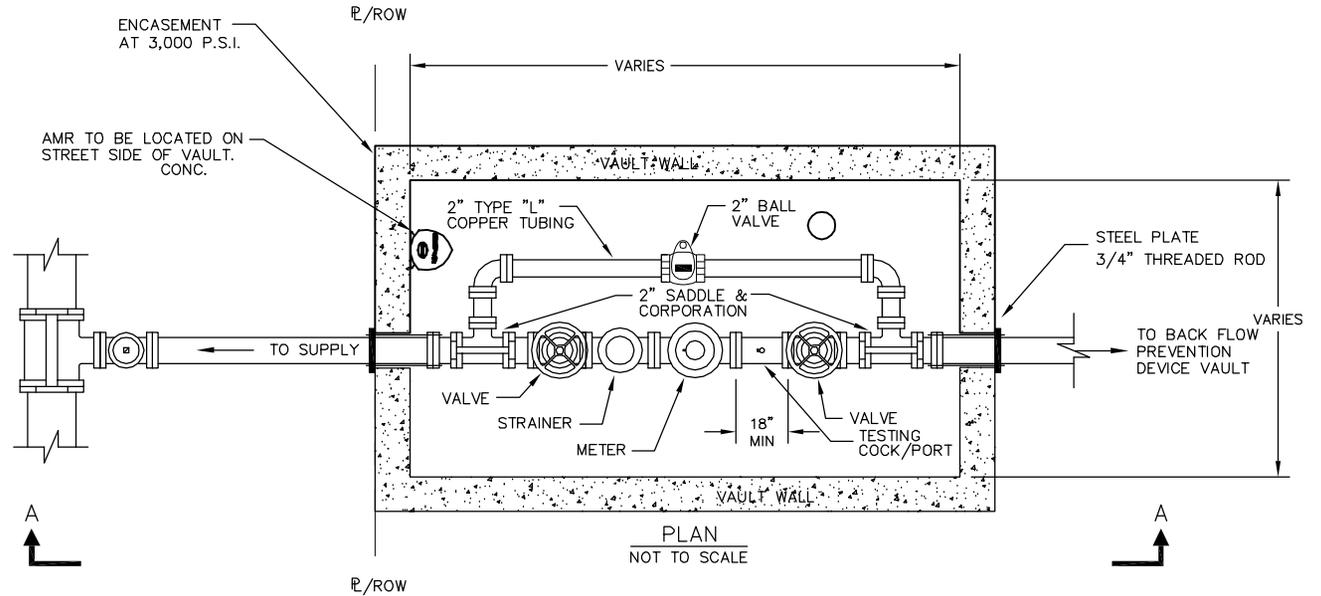
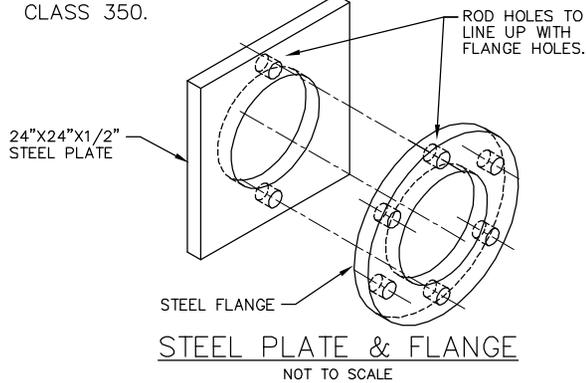
City of Asheville, NC
WATER ENGINEERING
DIVISION

**POSITIVE DISPLACEMENT
1 1/2" - 2" METER & METER VAULT**

REVISIONS		STD. NO.
DATE	DESCRIPTION	
6/2009	REVISED DETAIL FROM 6.02	W.03

GENERAL NOTES:

1. METER ASSEMBLY TO BE DUCTILE IRON FLANGED PIPE
2. METER FACE TO BE A MAXIMUM OF 3.5' BELOW FINISHED GRADE
3. ADJUSTABLE CONNECTING PIECE TO BE CLOW F-1439 ADJUSTABLE CONNECTOR
4. ACCESS DOOR SHALL BE STEEL/ALUMINUM DOUBLE LEAF DOOR WITH A MINIMUM OPENING OF 42" X 36" AND CENTERED OVER METER DOOR SHALL BE REINFORCED FOR AASHTO H-20 LOADING IN AREAS SUBJECT TO VEHICULAR TRAFFIC..
5. VALVES INSIDE VAULT SHALL BE IRON BODY TYPE AND HAND WHEEL OPERATED
6. TO ENSURE POSITIVE DRAINAGE, THE VAULT SHOULD BE TIED INTO THE EXISTING STORM DRAINAGE SYSTEM WHEN POSSIBLE OR DRAINED TO DAYLIGHT.
7. METER DEVICE SHALL BE AS PER CITY OF ASHEVILLE CURRENT REQUIREMENTS.
8. STEEL PLATE THICKNESS TO BE CALCULATED BASED UPON SYSTEM OPERATING PRESSURE
9. ALL FITTINGS AND APPURTENANCES OUTSIDE THE VAULT SHALL BE PROPERLY RESTRAINED.
10. ALL PIPING FOR 3" AND LARGER WATER METERS SHALL BE DUCTILE IRON CLASS 350.



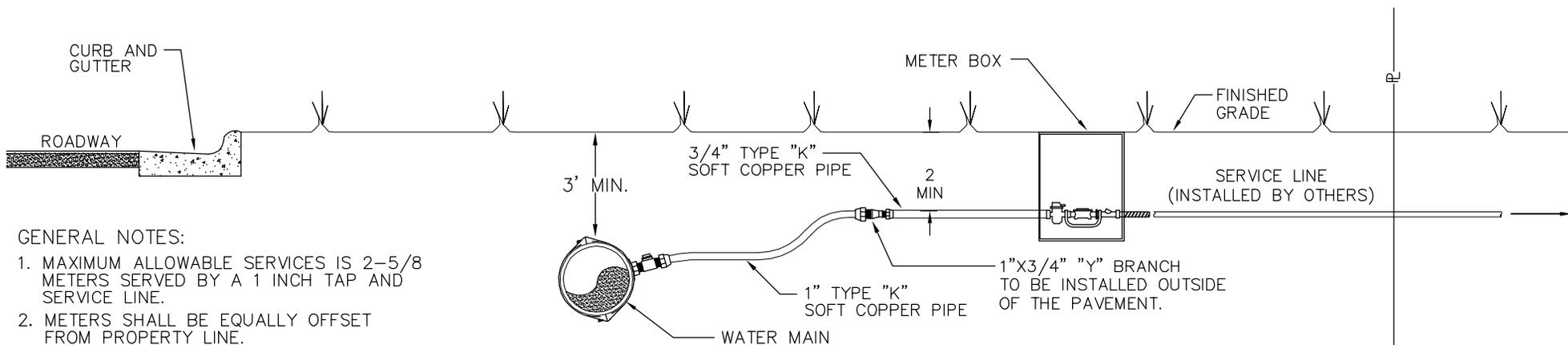
City of Asheville, NC
**WATER ENGINEERING
 DIVISION**

**STANDARD 3" & LARGER COMPOUND
 METER INSTALLATION AND VAULT**

REVISIONS	
DATE	DESCRIPTION
6/2009	REVISED DETAIL FROM 6.03

STD. NO.
W.04

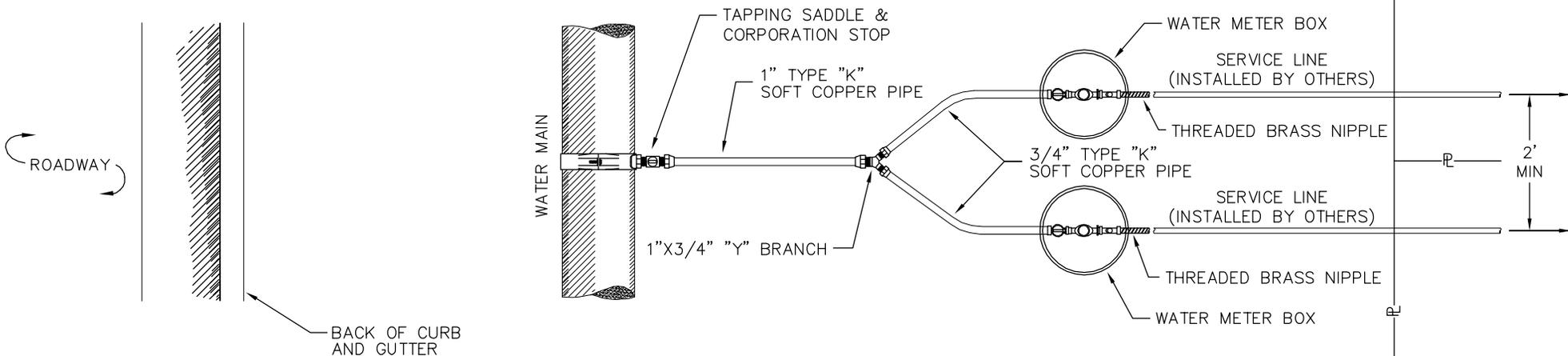
ALL OTHER UTILITIES SHALL BE LOCATED A MINIMUM OF 3' AWAY FROM WATERLINE



GENERAL NOTES:

1. MAXIMUM ALLOWABLE SERVICES IS 2-5/8 METERS SERVED BY A 1 INCH TAP AND SERVICE LINE.
2. METERS SHALL BE EQUALLY OFFSET FROM PROPERTY LINE.
3. METERS SHALL BE LOCATED OUTSIDE DITCHES AND IN RELATIVELY FLAT AREAS
4. MINIMUM LENGTH OF BRASS NIPPLE SHALL BE 12 INCHES (12").
5. ALL FITTINGS IN DIRECT CONTACT WITH WATER SHALL BE LEAD FREE BRASS.

ELEVATION VIEW



PLAN VIEW



City of Asheville, NC
**WATER ENGINEERING
 DIVISION**

**STANDARD MULTIPLE
 BRANCH SERVICES**

REVISIONS	
DATE	DESCRIPTION
6/2009	REVISED DETAIL FROM 6.15

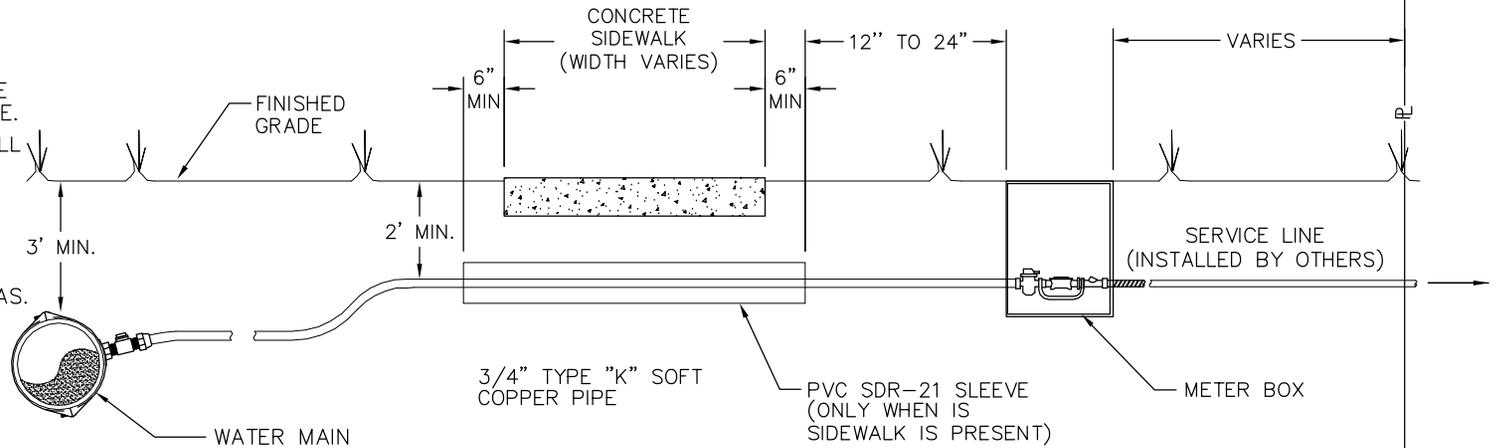
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W.05

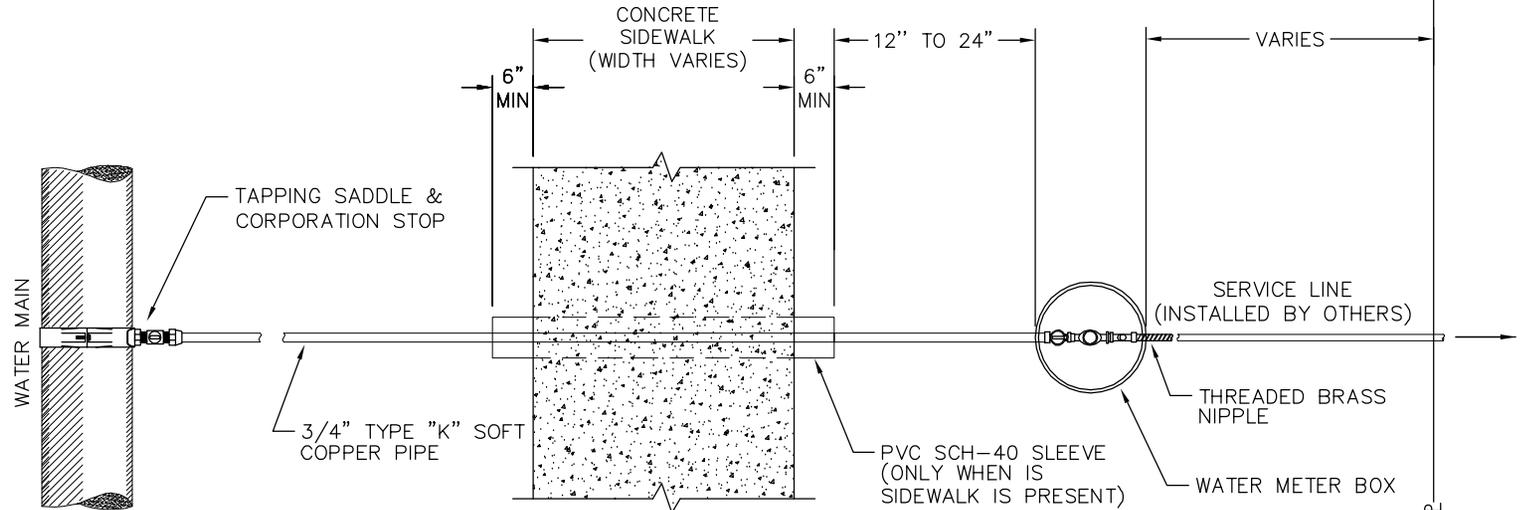
GENERAL NOTES:

1. PVC SLEEVE SHALL EXTEND A MINIMUM OF 6" EITHER SIDE OF SIDEWALK.
2. PVC SLEEVE DIAMETER SHALL BE AT LEAST 1/2" LARGER THAN THE OUTSIDE DIAMETER OF THE COPPER SERVICE LINE.
3. SLEEVE REQUIREMENT APPLICABLE TO ALL SERVICE LINES INSTALLED UNDERNEATH SIDEWALKS, REGARDLESS OF SIZE.
4. MINIMUM LENGTH OF BRASS NIPPLE SHALL BE 12 INCHES (12").
5. METERS SHALL BE LOCATED OUTSIDE DITCHES AND IN RELATIVELY FLAT AREAS.

ALL OTHER UTILITIES SHALL BE LOCATED A MINIMUM OF 3' AWAY FROM WATERLINE



ELEVATION VIEW



PLAN VIEW



City of Asheville, NC
WATER ENGINEERING
DIVISION

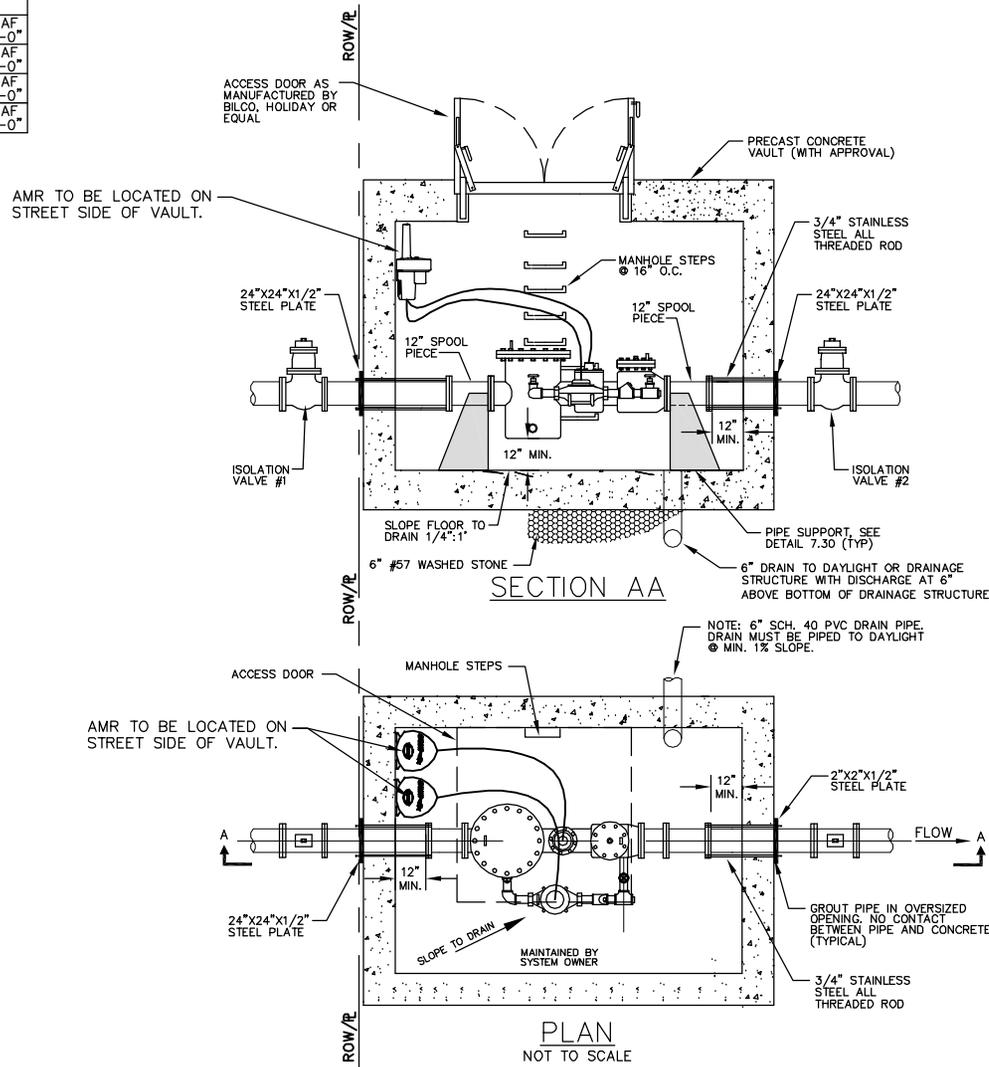
**TYPICAL WATER SERVICE
 INSTALLATION WITH SIDEWALK**

REVISIONS	
DATE	DESCRIPTION

STD. NO.
W.06

LINE SIZE	INSIDE PIT DIMENSIONS			ACCESS DOOR SIZE
	LENGTH	WIDTH	DEPTH	
6" or >	8'-0"	6'-0"	6'-6"	DOUBLE LEAF 4'-0" x 4'-0"
8"	9'-0"	6'-0"	7'-0"	DOUBLE LEAF 5'-0" x 5'-0"
10"	10'-0"	6'-0"	7'-0"	DOUBLE LEAF 4'-0" x 6'-0"
GREATER THAN 10"	VARIABLE	VARIABLE	VARIABLE	DOUBLE LEAF 4'-0" x 6'-0"

*MINIMUM UNIT DIMENSIONS REQUIRED AND CONTRACTOR TO CONFIRM ALL CLEARANCES.



GENERAL NOTES:

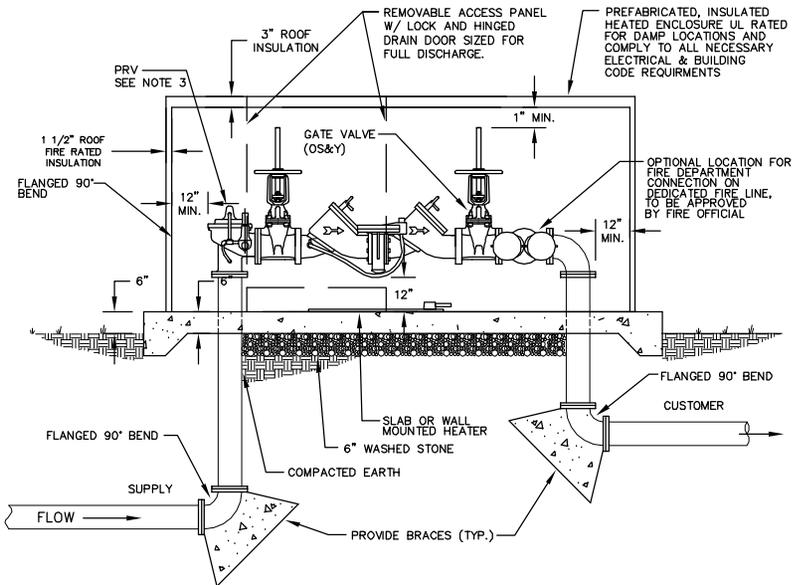
1. WHERE SPRINKLER SYSTEMS ARE USED, A FIRE DEPARTMENT CONNECTION SHALL BE PROVIDED ON THE STREET SIDE OF THE BUILDING, FULLY VISIBLE AND RECOGNIZABLE FROM THE STREET OR NEAREST POINT OF FIRE DEPARTMENT VEHICLE ACCESS OR AS OTHERWISE APPROVED BY THE GOVERNING FIRE OFFICIAL.
2. THERE SHALL BE A MINIMUM 12" OF FREE CLEARANCE BETWEEN THE SIDES AND BOTTOM OF THE VAULT AND THE COMBINATION METER.
3. ISOLATION VALVE #2 REQUIRED WHEN BACKFLOW DEVICE IS NOT INSTALLED ADJACENT TO MASTER METER VAULT
4. AMR'S ASSEMBLIES REQUIRED FOR BOTH METERS.



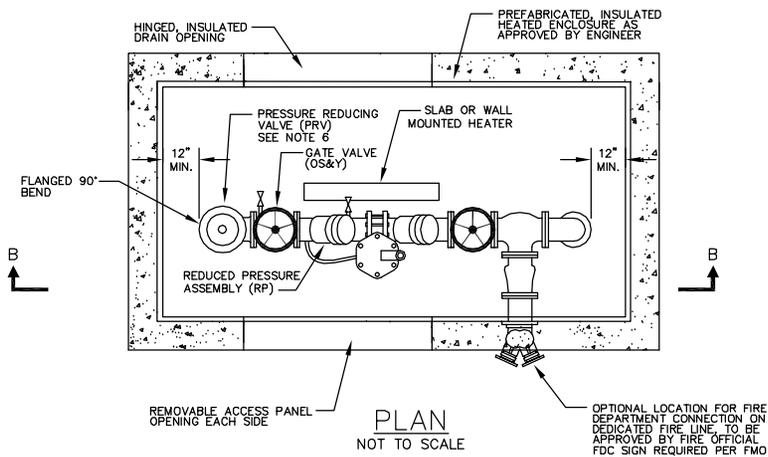
City of Asheville, NC
WATER ENGINEERING
DEPARTMENT

COMBINATION METER / VAULT ENCLOSURE

REVISIONS		STD. NO.
DATE	DESCRIPTION	
		W.07



SECTION BB
NOT TO SCALE



PLAN
NOT TO SCALE

GENERAL NOTES:

- WHERE SPRINKLER SYSTEMS ARE USED, A FIRE DEPARTMENT CONNECTION SHALL BE PROVIDED ON THE BUILDING OR AS OTHERWISE APPROVED BY FIRE OFFICIAL. CONNECTION LOCATION(S) MUST BE APPROVED BY FIRE OFFICIAL.
- AMR ASSEMBLIES REQUIRED FOR THE METER.
- A PRESSURE REDUCING VALVE (PRV) MUST BE INSTALLED BEFORE THE BACKFLOW PREVENTER IF THE AVERAGE SYSTEM PRESSURE EXCEEDS 175 PSI PRV SIZE SHALL MATCH LINE SIZE.
- ALL REDUCED PRESSURE PRINCIPLE (RPZ) ASSEMBLIES ARE TO BE INSTALLED WITH A MIN. SWING CHECK VALVE IMMEDIATELY PRIOR TO THE ASSEMBLY. PRV AND SWING CHECK VALVE SHALL BE UL/FM APPROVED WHEN USED ON A FIRE LINE APPLICATION.
- IN BUILDING INSTALLATION WILL "ONLY" BE ALLOWED WHERE EXISTING SITE CONDITIONS MAKE IT UNFEASIBLE TO COMPLY WITH CHART BELOW. APPROVAL WILL BE GRANTED ON A CASE BY CASE BASIS AND WILL REQUIRE THE EXECUTION OF AN ESTOPPEL CERTIFICATE BY THE OWNER / DEVELOPER.
- ALL NON-METERED FIRE SERVICE MAINS SHALL HAVE A DETECTOR METER WITH A REMOTE READING DEVICE INSTALLED AT THE FACE OF THE BUILDING / ENCLOSURE OR TOP OF VAULT.
- THERE SHALL BE A MINIMUM OF 12" SEPARATION OR FREE CLEARANCE BETWEEN THE SIDES AND BOTTOM OF THE ENCLOSURE / VAULT AND BACKFLOW ASSEMBLY.

FIRE LINE SIZE	INSIDE PIT DIMENSIONS			ACCESS DOOR SIZE
	LENGTH	WIDTH	DEPTH	
6 INCH	VARIES			DOUBLE LEAF 4'-0" x 4'-0"
8 INCH	SIZE VAULT SO THAT THE TOP IS A MINIMUM 6' FROM THE BOTTOM AND ALSO TO PROVIDE A MINIMUM 12" OF CLEARANCE FROM BOTTOM AND SIDES.			DOUBLE LEAF 4'-0" x 4'-0"
10 INCH				DOUBLE LEAF 4'-0" x 6'-0"

GENERAL INSTALLATION REQUIREMENTS

DEGREE OF HAZARD	TYPE OF SERVICE	TYPE OF BACKFLOW PREVENTION ON DEVICE	SIZE OF DEVICE	LOCATION REQUIREMENTS	INSTALLATION REQUIREMENTS
MODERATE	DOMESTIC	DOUBLE CHECK ASSEMBLY	¾" TO 2"	WITHIN 15 FEET OF THE WATER METER	BELOW GROUND IN A LARGE METER BOX.
MODERATE	DOMESTIC	DOUBLE CHECK ASSEMBLY	2 1/2" & ABOVE	WITHIN 15 FEET OF THE WATER METER	BELOW GROUND IN A PRECAST DRAINABLE PIT.
HIGH	DOMESTIC / IRRIGATION	REDUCED PRESSURE ZONE ASSEMBLY	¾" & ABOVE	WITHIN 15 FEET OF THE WATER METER	ABOVE GROUND INSULATED HEATED ENCLOSURE. HORIZONTAL INSTALLATION ONLY.
MODERATE	FIRE (UN-METERED) NO FDC	DOUBLE CHECK DETECTOR ASSEMBLY	2" & ABOVE	ADJACENT TO ROAD RIGHT-OF-WAY	BELOW GROUND IN A PRECAST DRAINABLE PIT
MODERATE	FIRE (METERED) NO FDC	DOUBLE CHECK ASSEMBLY	2" & ABOVE	WITHIN 15 FEET OF THE WATER METER	BELOW GROUND IN A PRECAST DRAINABLE PIT
HIGH	FIRE (UN-METERED)	REDUCED PRESSURE ZONE DETECTOR ASSEMBLY	2" & ABOVE	ADJACENT TO ROAD RIGHT-OF-WAY	ABOVE GROUND INSULATED HEATED ENCLOSURE. HORIZONTAL INSTALLATION ONLY.
HIGH	FIRE (METERED)	REDUCED PRESSURE ZONE ASSEMBLY	2" & ABOVE	ADJACENT TO ROAD RIGHT-OF-WAY	ABOVE GROUND INSULATED HEATED ENCLOSURE. HORIZONTAL INSTALLATION ONLY.



City of Asheville, NC
Transportation & Engineering
Department

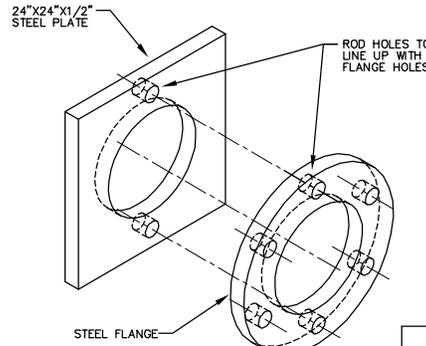
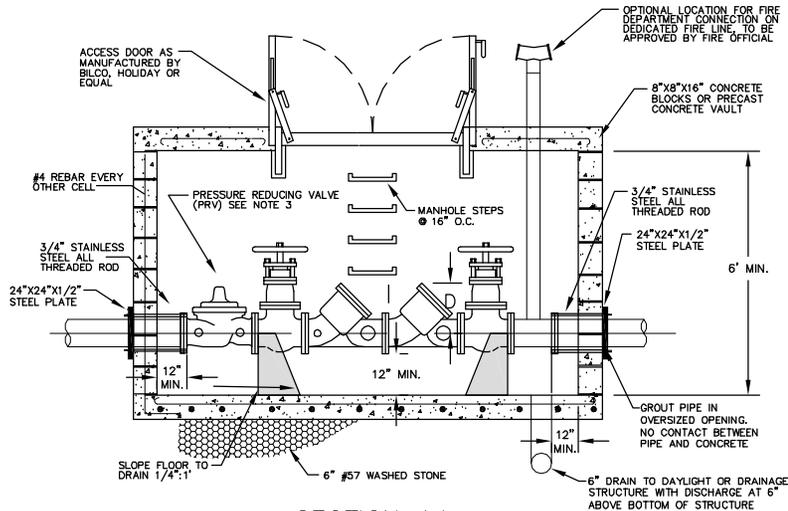
ABOVE GROUND BACKFLOW / ENCLOSURE

REVISIONS		STD. NO.
DATE	DESCRIPTION	
		W.08

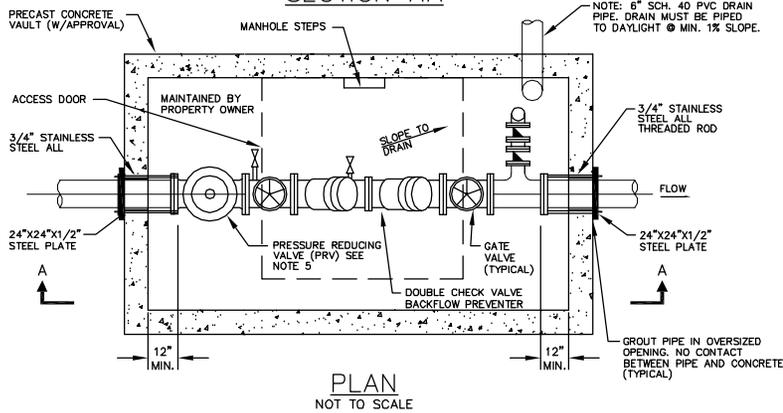
FIRE LINE SIZE	INSIDE PIT DIMENSIONS			ACCESS DOOR SIZE
	LENGTH	WIDTH	DEPTH	
6 INCH	VARIES			DOUBLE LEAF 4'-0" x 4'-0"
8 INCH	SIZE VAULT SO THAT THE TOP IS A MINIMUM 6" FROM THE BOTTOM AND ALSO TO PROVIDE A MINIMUM 12" OF CLEARANCE FROM BOTTOM AND SIDES.			DOUBLE LEAF 4'-0" x 4'-0"
10 INCH				DOUBLE LEAF 4'-0" x 6'-0"

GENERAL NOTES:

- WHERE SPRINKLER SYSTEMS ARE USED, A FIRE DEPARTMENT CONNECTION SHALL BE PROVIDED ON THE BUILDING OR AS OTHERWISE APPROVED BY FIRE OFFICIAL. CONNECTION LOCATION(S) MUST BE APPROVED BY FIRE OFFICIAL.
- AMR ASSEMBLIES REQUIRED FOR THE METER.
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- IN BUILDING INSTALLATION WILL "ONLY" BE ALLOWED WHERE EXISTING SITE CONDITIONS MAKE IT UNFEASIBLE TO COMPLY WITH CHART BELOW. APPROVAL WILL BE GRANTED ON A CASE BY CASE BASIS AND WILL REQUIRE THE EXECUTION OF AN ESTOPPEL CERTIFICATE BY THE OWNER / DEVELOPER.
- ALL NON-METERED FIRE SERVICE MAINS SHALL HAVE A DETECTOR METER WITH A REMOTE READING DEVICE INSTALLED AT THE FACE OF THE BUILDING / ENCLOSURE OR TOP OF VAULT.
- THERE SHALL BE A MINIMUM OF 12" SEPARATION OR FREE CLEARANCE BETWEEN THE SIDES AND BOTTOM OF THE ENCLOSURE / VAULT AND BACKFLOW ASSEMBLY.



STEEL PLATE & FLANGE
NOT TO SCALE



GENERAL INSTALLATION REQUIREMENTS

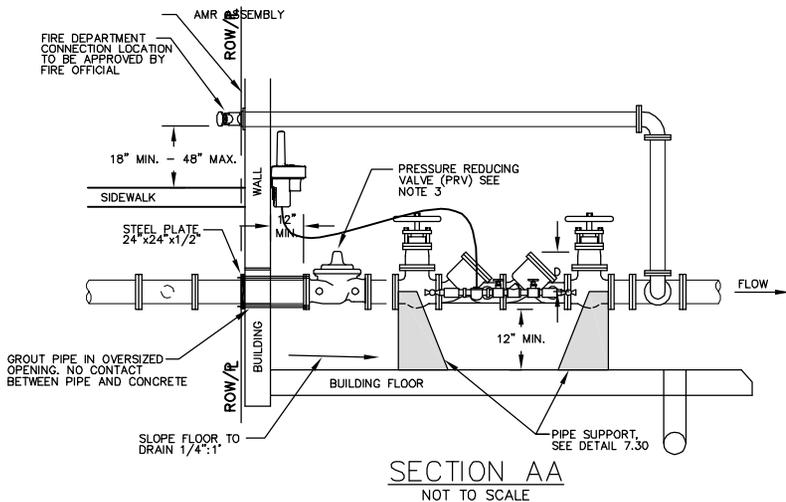
DEGREE OF HAZARD	TYPE OF SERVICE	TYPE OF BACKFLOW PREVENTION DEVICE	SIZE OF DEVICE	LOCATION REQUIREMENTS	INSTALLATION REQUIREMENTS
MODERATE	DOMESTIC	DOUBLE CHECK ASSEMBLY	3/4" TO 2"	WITHIN 15 FEET OF THE WATER METER	BELOW GROUND IN A LARGE METER BOX.
MODERATE	DOMESTIC	DOUBLE CHECK ASSEMBLY	2 1/2" & ABOVE	WITHIN 15 FEET OF THE WATER METER	BELOW GROUND IN A PRECAST DRAINABLE PIT.
HIGH	DOMESTIC / IRRIGATION	REDUCED PRESSURE ZONE ASSEMBLY	3/4" & ABOVE	WITHIN 15 FEET OF THE WATER METER	ABOVE GROUND INSULATED HEATED ENCLOSURE. HORIZONTAL INSTALLATION ONLY.
MODERATE	FIRE (UN-METERED) NO FDC	DOUBLE CHECK DETECTOR ASSEMBLY	2" & ABOVE	ADJACENT TO ROAD RIGHT-OF-WAY	BELOW GROUND IN A PRECAST DRAINABLE PIT
MODERATE	FIRE (METERED) NO FDC	DOUBLE CHECK ASSEMBLY	2" & ABOVE	WITHIN 15 FEET OF THE WATER METER	BELOW GROUND IN A PRECAST DRAINABLE PIT
HIGH	FIRE (UN-METERED)	REDUCED PRESSURE ZONE DETECTOR ASSEMBLY	2" & ABOVE	ADJACENT TO ROAD RIGHT-OF-WAY	ABOVE GROUND INSULATED HEATED ENCLOSURE. HORIZONTAL INSTALLATION ONLY.
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City of Asheville, NC
Transportation & Engineering
Department

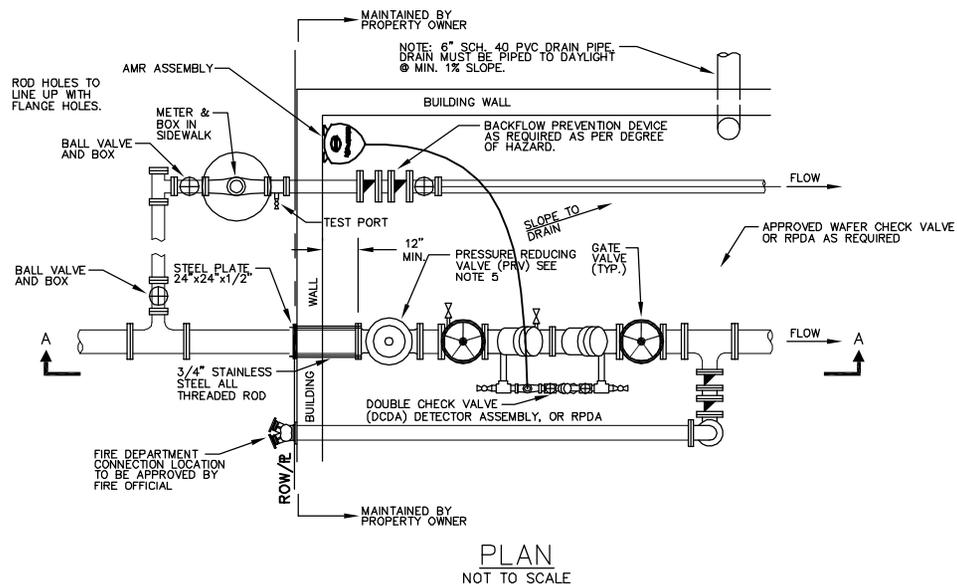
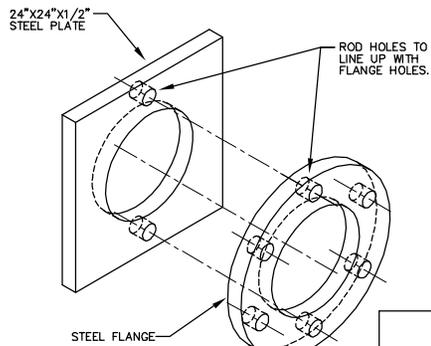
BELOW GROUND BACKFLOW / ENCLOSURE

REVISIONS		STD. NO.
DATE	DESCRIPTION	
		W.09



GENERAL NOTES:

1. WHERE SPRINKLER SYSTEMS ARE USED, A FIRE DEPARTMENT CONNECTION SHALL BE PROVIDED ON THE BUILDING OR AS OTHERWISE APPROVED BY FIRE OFFICIAL. CONNECTION LOCATION(S) MUST BE APPROVED BY FIRE OFFICIAL.
2. AMR ASSEMBLIES REQUIRED FOR THE METER.
3. A PRESSURE REDUCING VALVE (PRV) MUST BE INSTALLED BEFORE THE BACKFLOW PREVENTER IF THE AVERAGE SYSTEM PRESSURE EXCEEDS 175 PSI. PRV SIZE SHALL MATCH LINE SIZE.
4. ALL REDUCED PRESSURE PRINCIPLE (RPZ) ASSEMBLIES ARE TO BE INSTALLED WITH A MIN. SWING CHECK VALVE IMMEDIATELY PRIOR TO THE ASSEMBLY. PRV AND SWING CHECK VALVE SHALL BE UL/FM APPROVED WHEN USED ON A FIRE LINE APPLICATION.
5. IN BUILDING INSTALLATION WILL "ONLY" BE ALLOWED WHERE EXISTING SITE CONDITIONS MAKE IT UNFEASIBLE TO COMPLY WITH CHART BELOW. APPROVAL WILL BE GRANTED ON A CASE BY CASE BASIS AND WILL REQUIRE THE EXECUTION OF AN ESTOPPEL CERTIFICATE BY THE OWNER / DEVELOPER.
6. ALL NON-METERED FIRE SERVICE MAINS SHALL HAVE A DETECTOR METER WITH A REMOTE READING DEVICE INSTALLED AT THE FACE OF THE BUILDING / ENCLOSURE OR TOP OF VAULT.
7. THERE SHALL BE A MINIMUM OF 12" SEPARATION OR FREE CLEARANCE BETWEEN THE SIDES AND BOTTOM OF THE ENCLOSURE / VAULT AND BACKFLOW ASSEMBLY.



GENERAL INSTALLATION REQUIREMENTS					
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MODERATE	DOMESTIC	DOUBLE CHECK ASSEMBLY	3/4" TO 2"	WITHIN 15 FEET OF THE WATER METER	BELOW GROUND IN A LARGE METER BOX.
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REFER TO APPLICABLE CITY OF ASHEVILLE STANDARD DETAILS FOR PROPER INSTALLATION OF ALL WATER LINE APURTENANCES.

Proposed ___" (Type Of Device) Backflow Assembly
(Type of device required, double check valve assembly or reduced pressure assembly, is dependent on type of sprinkler system.) Refer to Std. Detail W.26

10' MIN

Proposed 6" PVC Drain Line With Flapper Valve at Outlet
(If installed under ground a drain line will be required.)

Proposed Fire Department Connection
(If fire department connection is to be installed on backflow enclosure, it must be indicated.)

Proposed 6" PVC Drain Line With Flapper Valve at Outlet

End of C.O.A. Maintenance

Proposed ___" Water Meter installed in Below Ground Vault

15' MAX

ROAD RIGHT-OF-WAY / PROPERTY LINE

ROAD RIGHT-OF-WAY / PROPERTY LINE

Proposed 20' Wide Water Line Easement

Gate Valve to isolate meter

Proposed Fire Hydrant Assembly
(If there is not an existing fire hydrant within 100' of the FDC, a complete fire hydrant assembly must be installed for compliance. Fire hydrant shall be installed within public right-of-way.)
Refer To Std. Detail W.10 and W.11

Existing City of Asheville Water Line

___" x ___" Tapping Sleeve & ___" Valve
Refer To Std. Detail W.12

NOT TO SCALE



City of Asheville, NC
WATER ENGINEERING
DIVISION

METERED FIRE LINE SCHEMATIC

REVISIONS	
DATE	DESCRIPTION
6/2009	New Drawing

STD. NO.

W.11

REFER TO APPLICABLE CITY OF ASHEVILLE STANDARD DETAILS FOR PROPER INSTALLATION OF ALL WATER LINE APURTENANCES.

Proposed Drain Line
(If installed under ground a drain line will be required. Drain line must be equipped with flapper valve at outlet.)

Proposed ___" (Type Of Device) Backflow Assembly
(Type of device required, double check valve assembly or reduced pressure assembly, is dependent on type of sprinkler system.)
Refer To Std. Detail W.26

Proposed Remote Reading Pad or in compliance with the latest COA reading equipment mounted on Exterior of Vault or on above ground enclosure.

Proposed Fire Department Connection
(If fire department connection is to be installed on backflow enclosure, it must be indicated.)

Proposed ___" (Type Of Device) Backflow Assembly
(Type of device required, double check valve assembly or reduced pressure assembly, is dependent on facility hazard rating.)
Refer To Std. Detail W.25

ROAD RIGHT-OF-WAY / PROPERTY LINE

ROAD RIGHT-OF-WAY / PROPERTY LINE

Proposed 20' Wide Water Line Easement

Gate Valve to isolate meter

Proposed ___" Domestic Water Meter
Refer To Std. Detail W.01, W.02 or W.03

Proposed ___" Tapping Saddle & ___" Ball Valve w/Box

Proposed Fire Hydrant Assembly
(If there is not an existing fire hydrant within 100' of the FDC, a complete fire hydrant assembly must be installed for compliance. Fire hydrant shall be installed within public right-of-way.)
Refer To Std. Details W.10 and W.11

Existing City of Asheville Water Line

___" x ___" Tapping Sleeve & ___" Valve
Refer To Std. Detail W.12

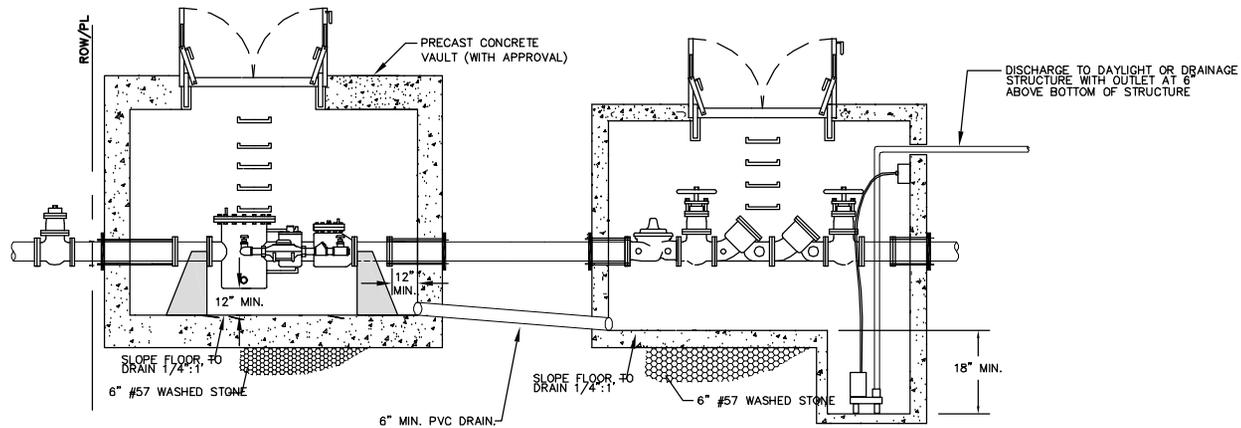
NOT TO SCALE



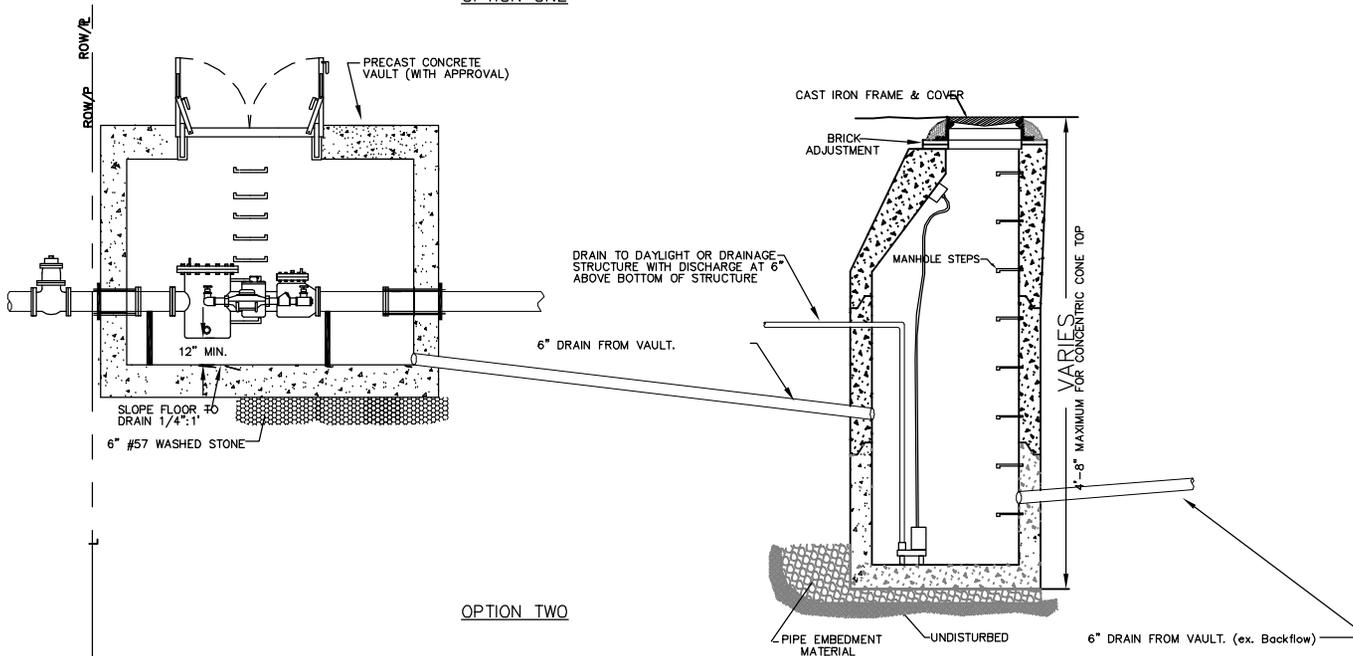
City of Asheville, NC
WATER ENGINEERING
DIVISION

DEDICATED FIRE LINE SCHEMATIC

REVISIONS		STD. NO.
DATE	DESCRIPTION	
6/2009	New Drawing	W.12



OPTION ONE



OPTION TWO

GENERAL NOTES:

1. SUMP PUMPS MAY ONLY BE USED WHEN IT IS IMPOSSIBLE TO DRAIN VAULT(S) TO DAYLIGHT OR DRAINAGE SYSTEM VIA GRAVITY.
2. SUMP PUMP CAN BE PLACED IN BACKFLOW VAULT WITH METER VAULT DRAINING INTO BACK FLOW VAULT. (OPTION 1)
3. IN CASES WHERE BACKFLOW VAULT IS HIGHER THEN METER VAULT OPTION 2 MUST BE USED. (OPTION 2)
4. ALL 6" DRAINS MUST BE MIN. 1% SLOPE BETWEEN VAULTS OR TO THE SUMP MAN HOLE.
5. ALL SUMP PUMP DISCHARGE LINES MUST BE A MIN. OF 1.5" PIPE DISCHARGING TO DAY LIGHT OR TO A STORM DRAIN STRUCTURE WITH A FLAP VALVE AND A MINIMUM OF 6" ABOVE BOTTOM OF STRUCTURE IF THE LINE IS EMPTING INTO A STORM SEWER.
6. SUMP PUMP INSTALLATION SHALL BE IN ACCORDANCE TO NC BUILDING CODE REQUIREMENTS AND SHALL BE INSPECTED AND APPROVED BY APPROPRIATE BUILDING CODE OFFICIAL.



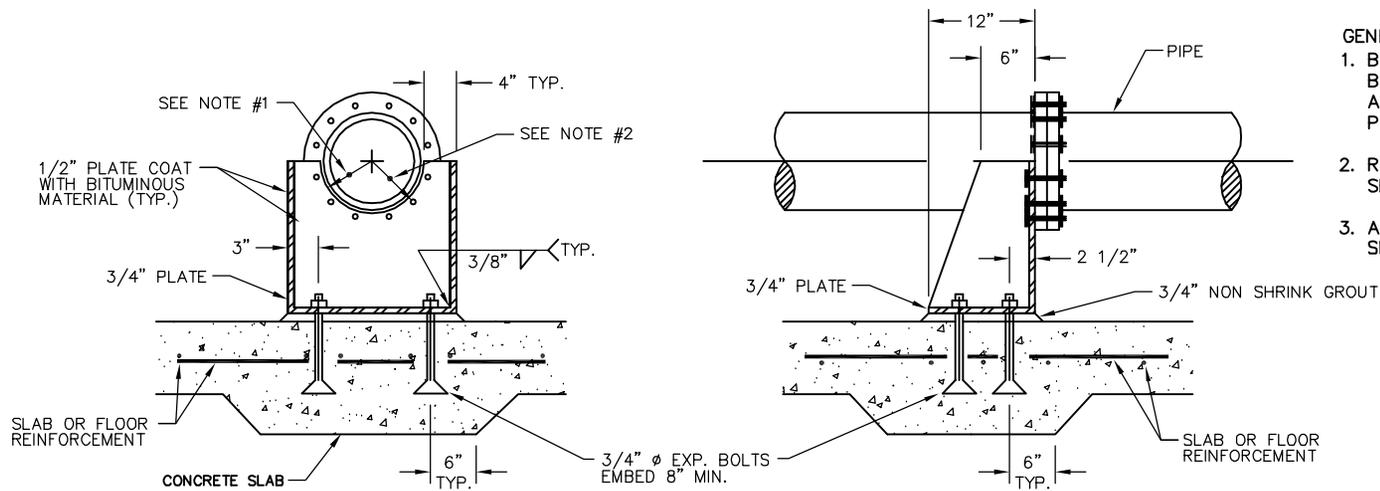
City of Asheville, NC
**WATER ENGINEERING
 DEPARTMENT**

SUMP PUMP FOR VAULTS / MANHOLES

REVISIONS	
DATE	DESCRIPTION

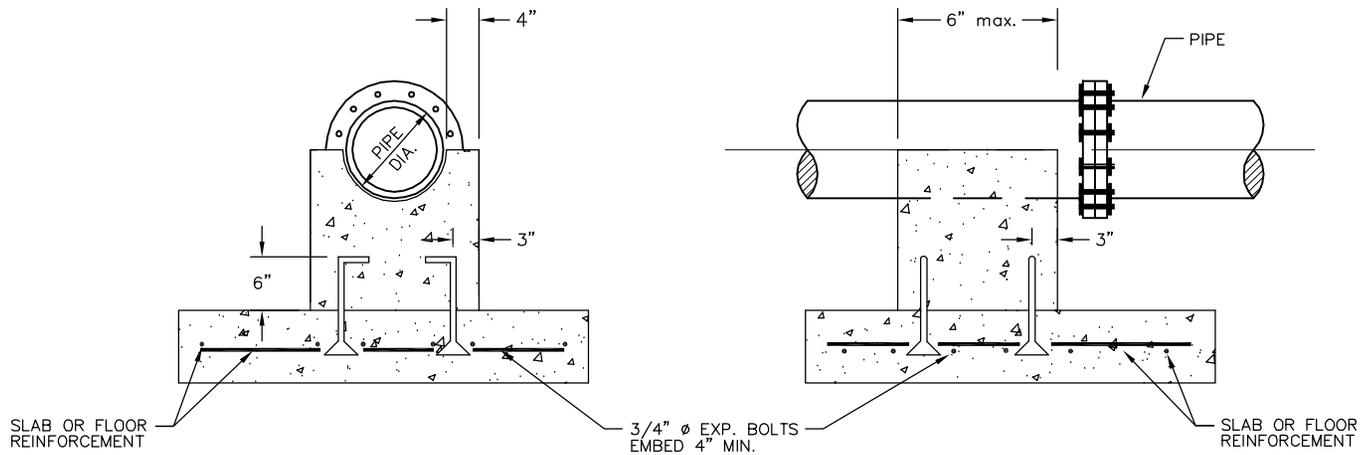
STD. NO.

W.13



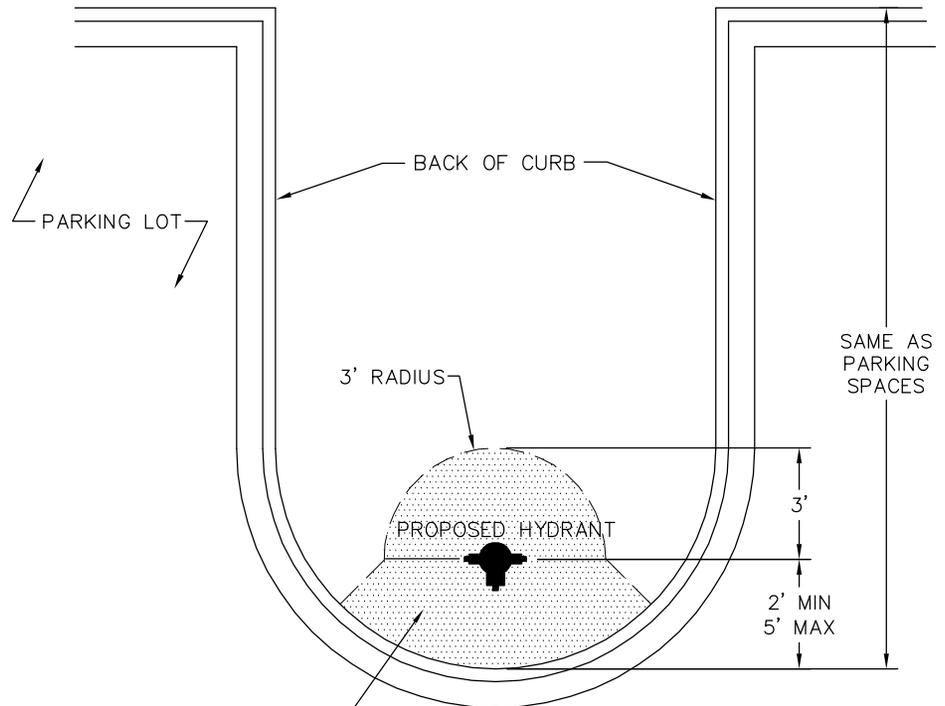
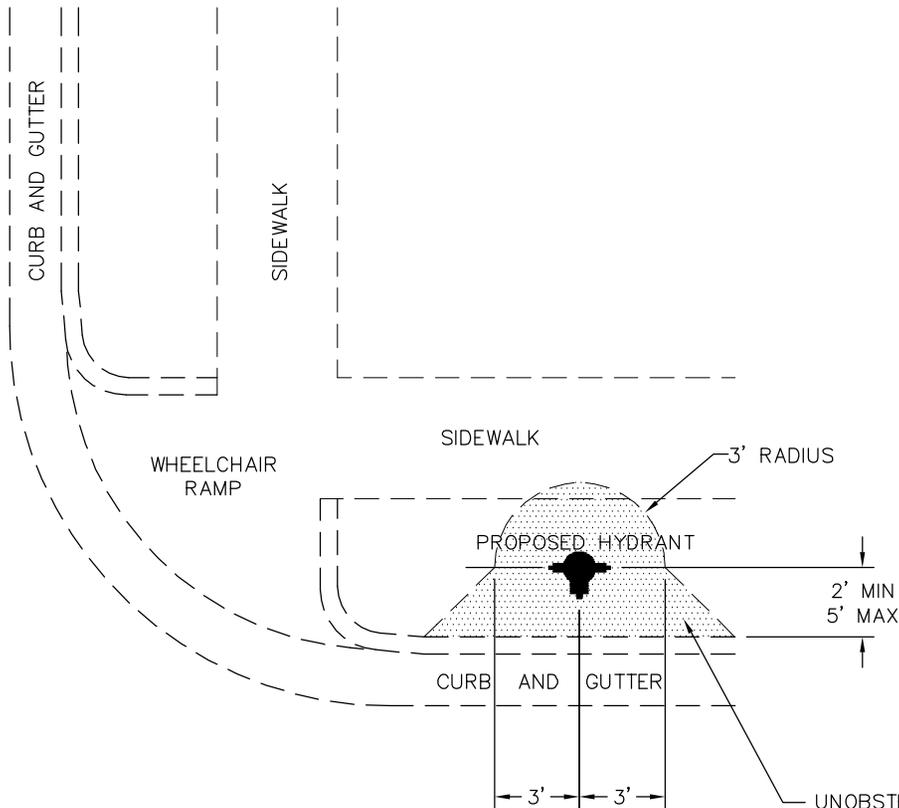
METAL PIPE SUPPORT
NOT TO SCALE

- GENERAL NOTES:
1. BOLT CIRCLE IN 1/2" PLATE AND BOLT DIAMETER SHALL BE SET IN ACCORDANCE WITH BOLT CIRCLE OF PIPE FLANGE AND FLANGE BOLTS.
 2. RADIUS OF 1/2" PLATE SHALL BE SET BY RADIUS OF PIPE O.D.
 3. ALL WELDS SHALL BE GROUND SMOOTH.



CONCRETE PIPE SUPPORT
NOT TO SCALE

REVISIONS	
DATE	DESCRIPTION
6/2009	REVISED DETAIL FROM 6.28



UNOBSTRUCTED ARE MUST ALSO BE FLAT TO ALLOW ACCESS TO AND OPERATION OF THE FIRE HYDRANT.

GENERAL NOTES:

1. LOCATION SHOULD BE COORDINATED WITH NCDOT ALONG STATE MAINTAINED ROADWAYS.
2. OBSTRUCTION FREE AREA SHALL APPLY TO ALL LOCATIONS FOR FIRE HYDRANT INSTALLATION.
3. HYDRANT LOCATION SHALL NOT INTERFERE WITH THE REQUIREMENTS OF THE NORTH CAROLINA BUILDING CODE.
4. CONCRETE BOLLARDS WILL BE REQUIRED FOR INSTALLATION WITHIN PARKING AREAS



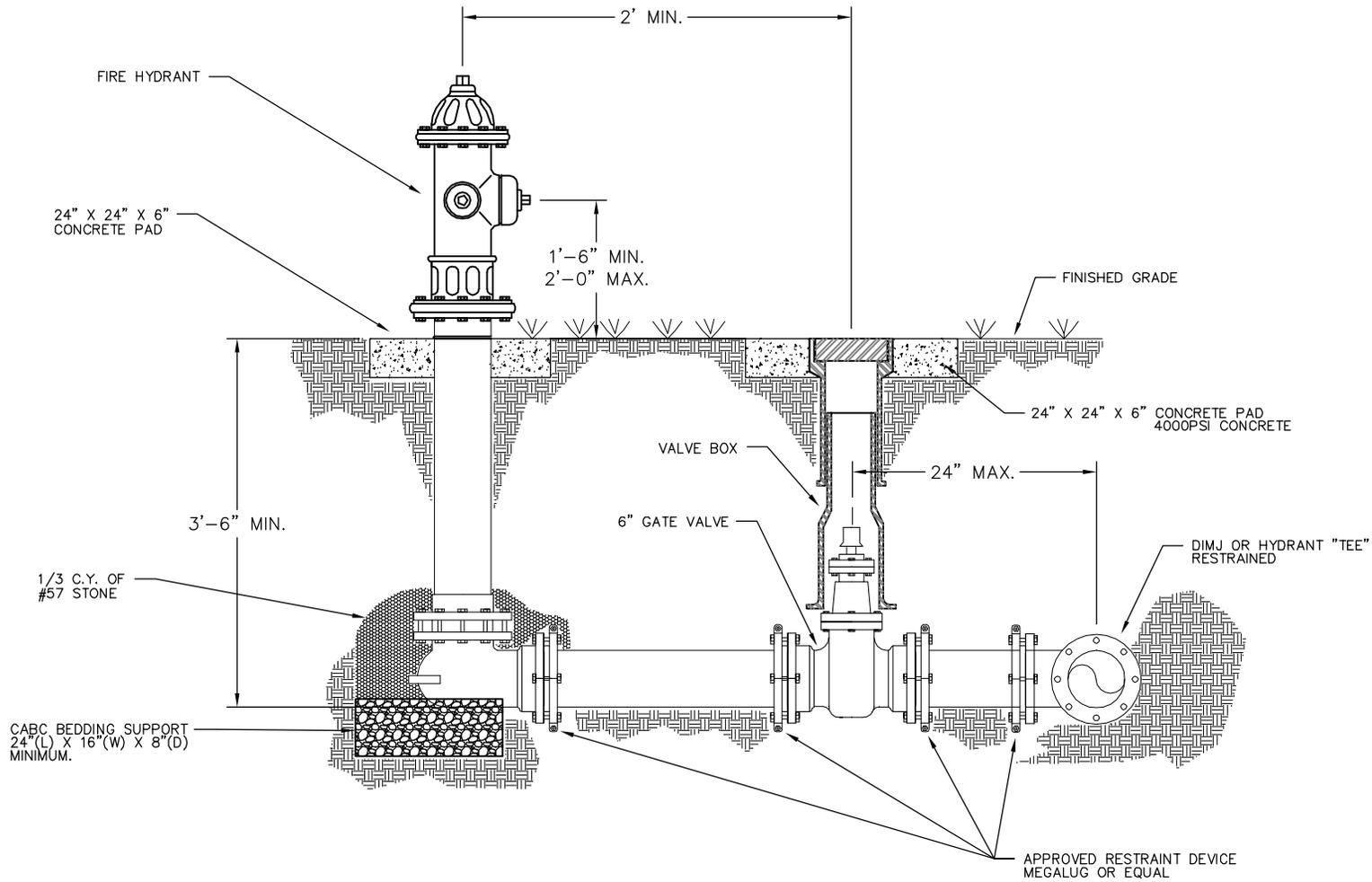
City of Asheville, NC
WATER ENGINEERING
DIVISION

STANDARD HYDRANT LOCATION

REVISIONS	
DATE	DESCRIPTION
6/2009	REVISED DETAIL FROM 6.07

STD. NO.

W.15

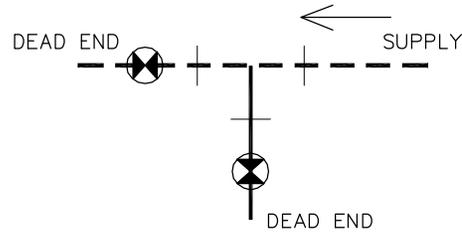
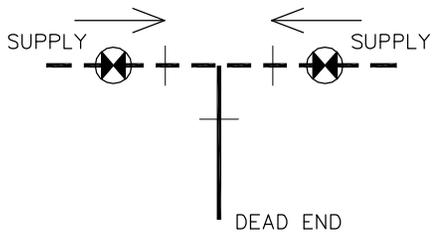


City of Asheville, NC
**WATER ENGINEERING
 DIVISION**

FIRE HYDRANT INSTALLATION

REVISIONS	
DATE	DESCRIPTION
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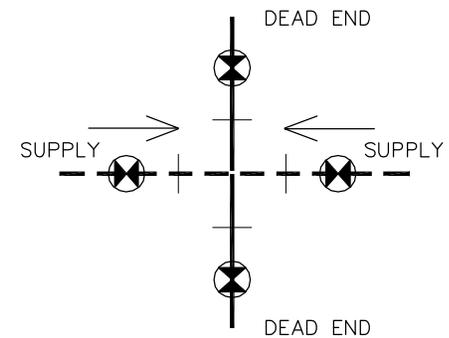
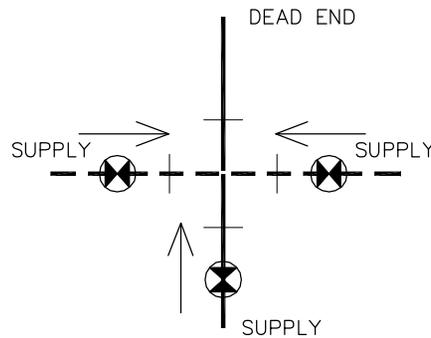
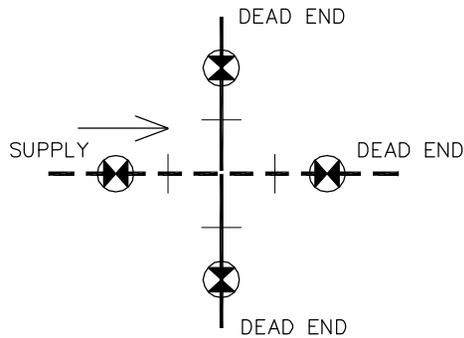
STD. NO.
W.16



NOTES:

1. WHEN THERE IS ONLY ONE SUPPLY LEG FEEDING TWO DEAD END LEGS, PLACE VALVES ON DEAD END LEGS.
2. WHEN THERE ARE TWO SUPPLY LEGS FEEDING ONE DEAD END LEG, PLACE VALVES ON SUPPLY LEGS.
3. WHEN ALL THREE LEGS ARE SUPPLY, ENGINEER'S CHOICE.
4. CITY MAY DESIGNATE A CURRENT DEAD END LEG AND A FUTURE SUPPLY LEG ACCORDING TO WATER PLANNING AND REQUIRE VALVE PLACEMENT ACCORDINGLY.
5. ON HYDRANT TEE, ONE VALVE IS ALWAYS ON HYDRANT LEG.

TWO VALVES AT A TEE



NOTES:

1. WHEN THERE IS ONLY ONE SUPPLY AND THREE DEAD END LEGS, PLACE VALVES ON DEAD END LEGS.
2. WHEN THERE ARE THREE SUPPLY LEGS AND ONE DEAD END LEG, PLACE VALVES ON SUPPLY LEGS.
3. WHEN THERE ARE TWO SUPPLY LEGS AND TWO DEAD END LEGS, PLACE VALVES ON ALL FOUR LEGS.
4. CITY MAY REQUIRE VALVE PLACEMENT BASED ON CURRENT OR FUTURE NEEDS.
5. WHEN ONE LEG AT A INTERSECTION IS A HYDRANT LEG, VALVE MUST BE PLACED ON A HYDRANT LEG. VALVING ON REMAINING LEGS TO BE PLACED AS THOUGH THEY MADE UP A TEE.
6. A "SUPPLY LEG" IS ANY LEG CONNECTED TO THE TREATED WATER SOURCE BY PIPING EQUAL AND OR GREATER THAN ITS SIZE AND SEPARATE FROM THE TEE OR CROSS BEING CONSIDERED.

THREE AND FOUR VALVES AT A INTERSECTION



City of Asheville, NC
**WATER ENGINEERING
 DIVISION**

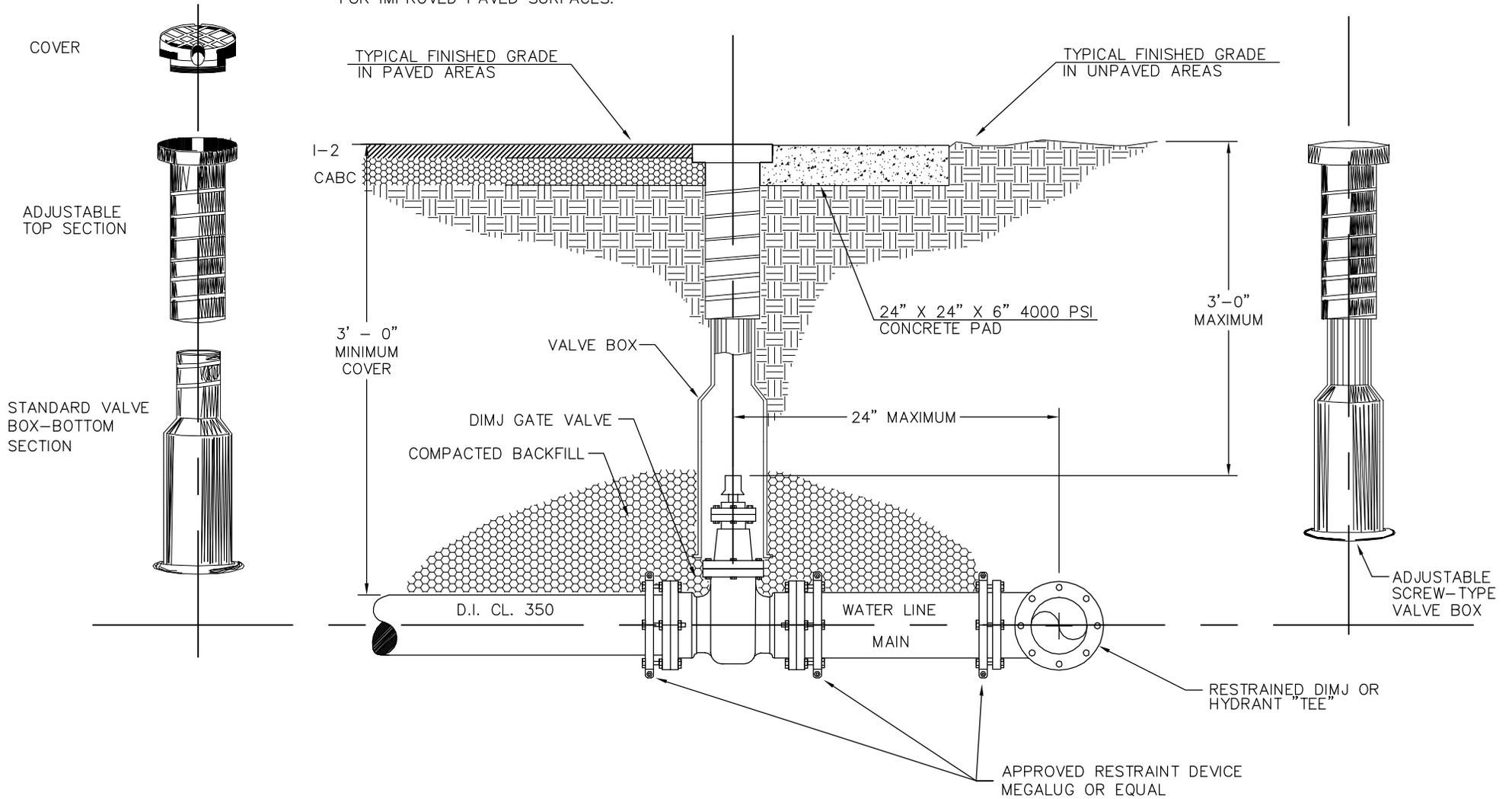
**TYPICAL VALVING
 CONFIGURATION**

REVISIONS	
DATE	DESCRIPTION
6/2009	REVISED DETAIL FROM 6.17

STD. NO.
W.17

GENERAL NOTES:

1. VALVE BOX SHALL NOT CONTACT WATER MAIN OR VALVE.
2. VALVE PAD REQUIREMENTS SHALL NOT BE APPLICABLE FOR IMPROVED PAVED SURFACES.
3. VALVE BOX ADJUSTMENT MUST BE DONE BY ADJUSTING/RAISING THE TOP SECTION OF THE EXISTING ADJUSTABLE SCREW-TYPE VALVE BOX TO GRADE OR BY INSTALLING A NEW VALVE BOX TOP SECTION. THE USE OF PAVING RINGS OR ADJUSTING C.I. SLEEVES IS NOT ALLOWED.



City of Asheville, NC
**WATER ENGINEERING
 DIVISION**

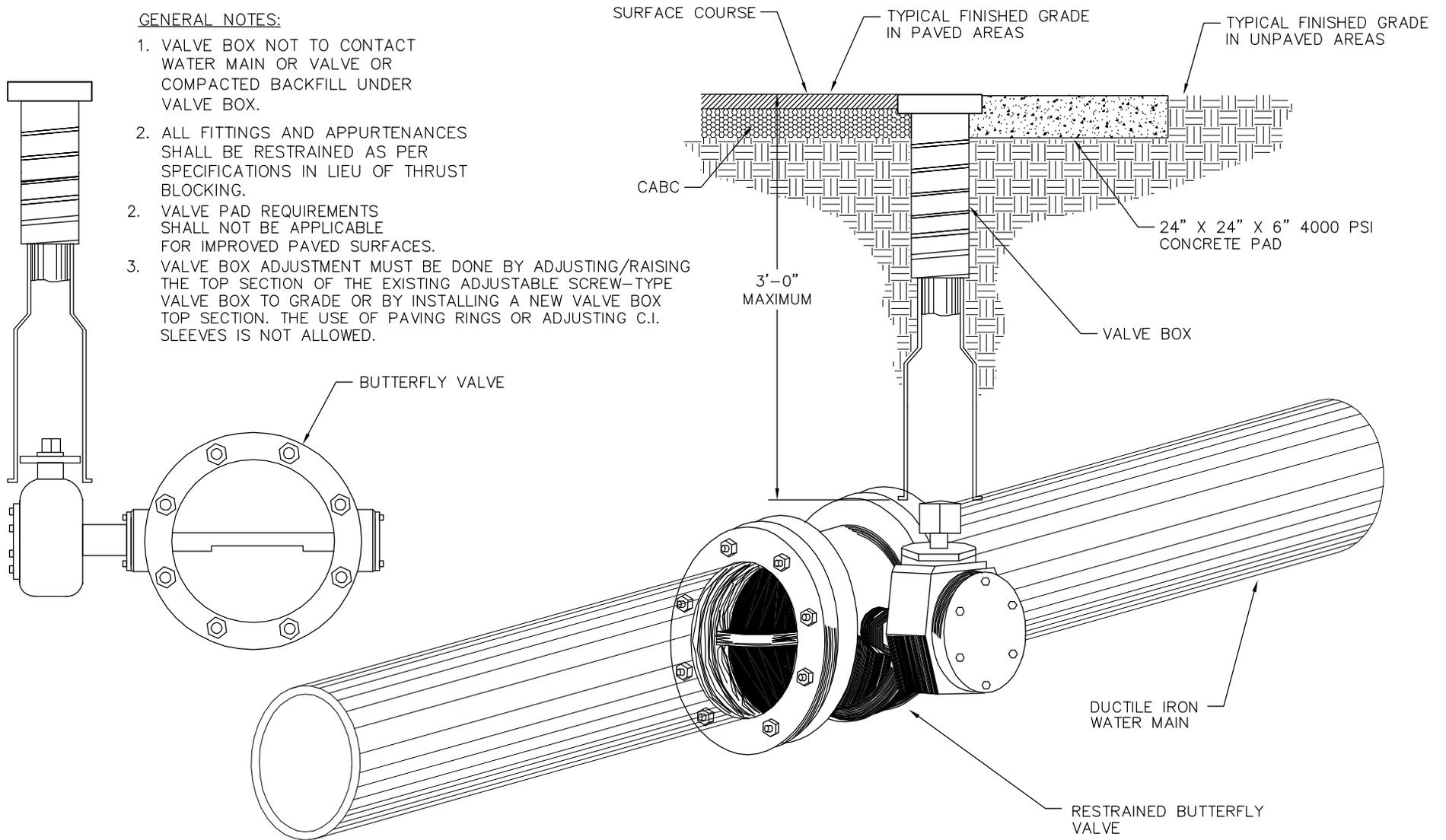
**TYPICAL VALVE & VALVE BOX
 INSTALLATION / ADJUSTMENT**

REVISIONS	
DATE	DESCRIPTION
6/2009	REVISED DETAIL FROM 6.06

STD. NO.
W.18

GENERAL NOTES:

1. VALVE BOX NOT TO CONTACT WATER MAIN OR VALVE OR COMPACTED BACKFILL UNDER VALVE BOX.
2. ALL FITTINGS AND APPURTENANCES SHALL BE RESTRAINED AS PER SPECIFICATIONS IN LIEU OF THRUST BLOCKING.
2. VALVE PAD REQUIREMENTS SHALL NOT BE APPLICABLE FOR IMPROVED PAVED SURFACES.
3. VALVE BOX ADJUSTMENT MUST BE DONE BY ADJUSTING/RAISING THE TOP SECTION OF THE EXISTING ADJUSTABLE SCREW-TYPE VALVE BOX TO GRADE OR BY INSTALLING A NEW VALVE BOX TOP SECTION. THE USE OF PAVING RINGS OR ADJUSTING C.I. SLEEVES IS NOT ALLOWED.



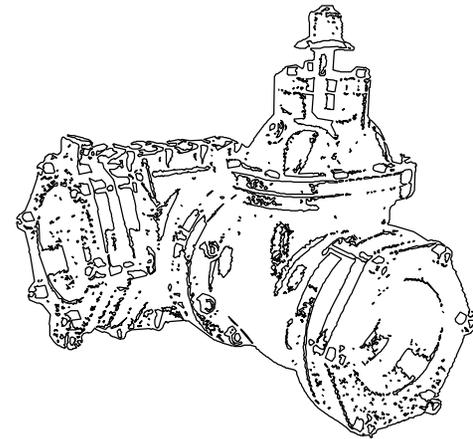
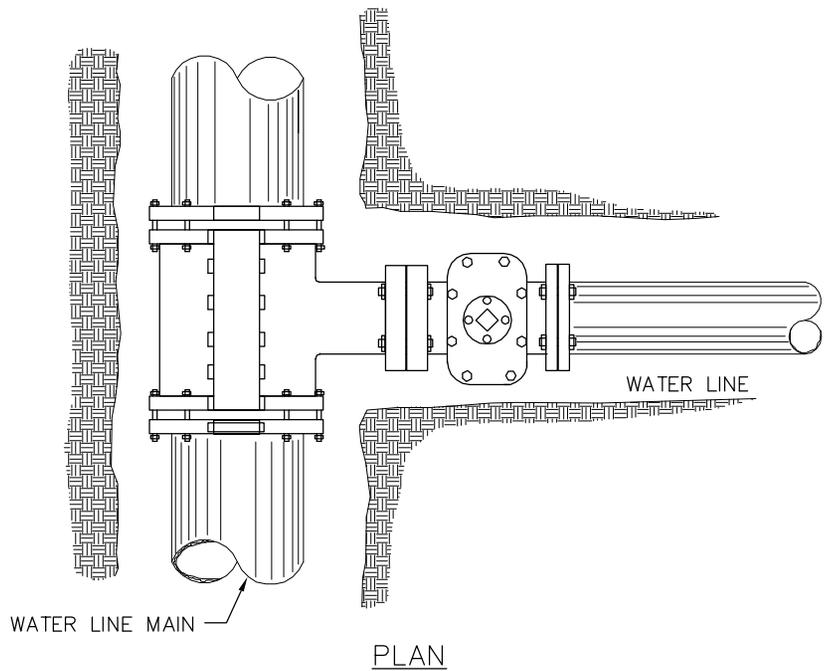
City of Asheville, NC
**WATER ENGINEERING
 DIVISION**

**TYPICAL BUTTERFLY
 VALVE INSTALLATION**

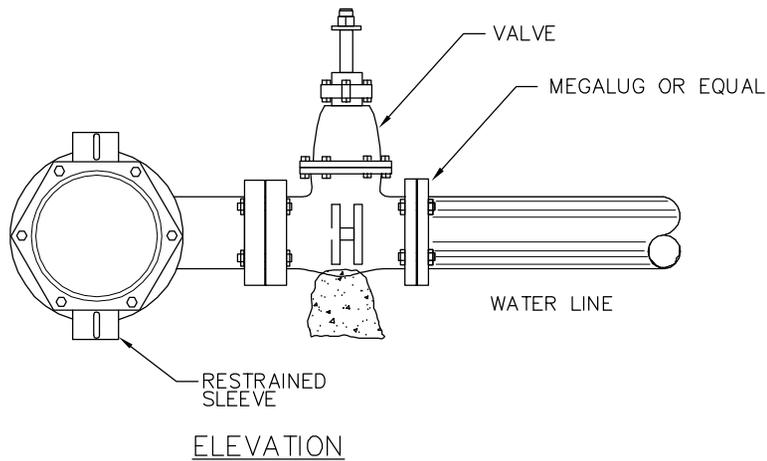
REVISIONS	
DATE	DESCRIPTION
6/2009	REVISED DETAIL FROM 6.20

STD. NO.

W.19



TAPPING SLEEVE



NOTES:

1. TAPPING SLEEVE WILL BE MUELLER #H-615 OR APPROVED EQUAL.
2. APPROVED RESILIENT SEAT TAPPING VALVE.
3. SOLID CONCRETE OR BRICK BLOCKING WILL BE USED AS FOOTING FOR DUCTILE IRON PIPE.
4. ALL FITTINGS AND APPURTENANCES SHALL BE RESTRAINED AS PER IN LIEU OF THRUST BLOCKING SPECIFICATIONS



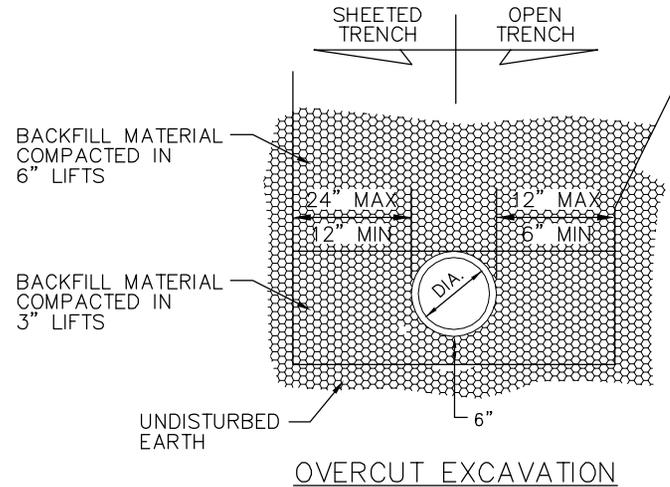
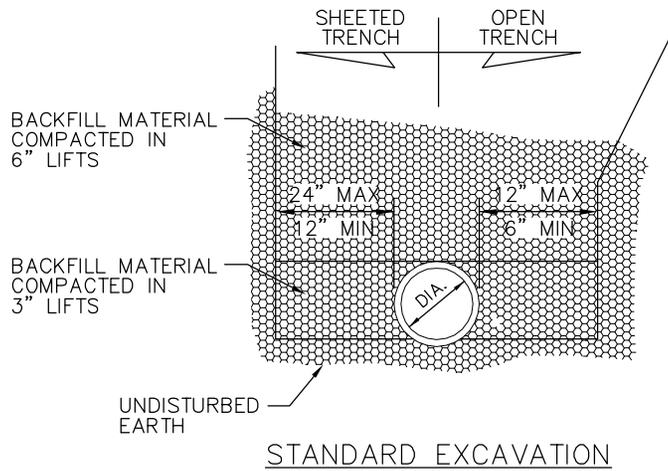
City of Asheville, NC
**WATER ENGINEERING
 DIVISION**

**TAPPING SLEEVE AND
 VALVE ASSEMBLY**

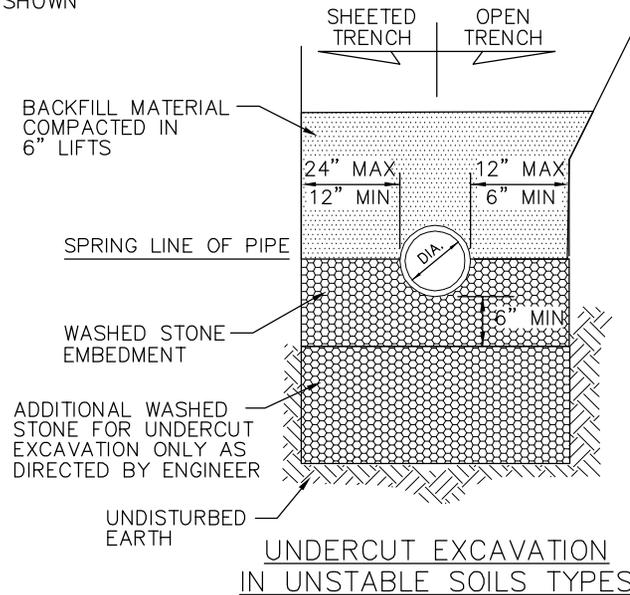
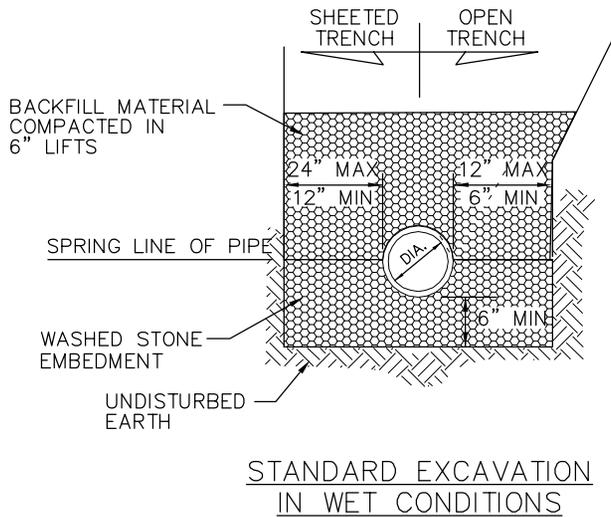
REVISIONS	
DATE	DESCRIPTION
6/2009	REVISED DETAIL FROM 6.22

STD. NO.

W.20



NOTE:
BELL HOLES NOT SHOWN



GENERAL NOTES:

1. CONSTRUCTION OF TRENCHES SHALL BE IN ACCORDANCE WITH THE LATEST OSHA REGULATIONS. CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLIANCE WITH ALL APPLICABLE REGULATIONS.
2. NO BOULDERS OR STONES IN EXCESS OF 4" IN SIZE SHALL BE USED AS PART OF THE INITIAL BACKFILL.
3. PIPE BEDDING MATERIAL SHALL BE # 57 WASHED STONE.
4. SELECT BACKFILL MATERIAL SHALL BE CLASS I OR II AS PER NCDOT STANDARD SPECIFICATIONS.



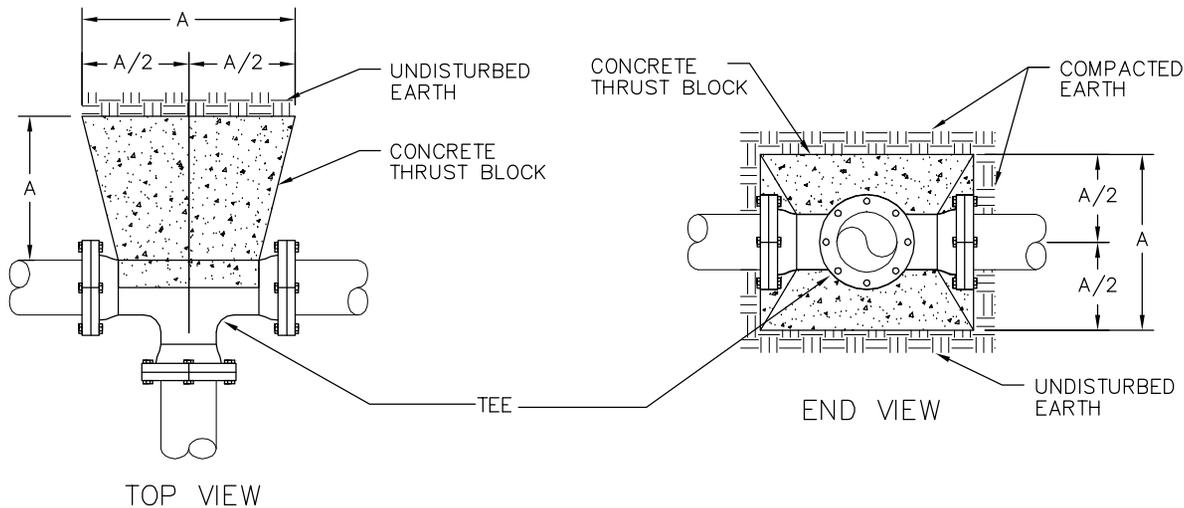
City of Asheville, NC
WATER ENGINEERING DIVISION

TYPICAL TRENCH DETAIL

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STD. NO.

W.21



RECOMMENDED MINIMUM RESTRAINED LENGTH
REQUIRED EACH SIDE OF FITTING (FEET)

FITTING TYPE	SIZE	WORKING PRESSURE (PSI)			
		125	150	175	200
HORIZ. 11 1/4 DEG.	6"	4	4	5	6
	8"	5	6	7	8
	10"	6	7	8	9
HORIZ. 22 1/2 DEG.	6"	7	9	10	12
	8"	10	12	14	16
	10"	12	14	17	19
REDUCER	8"X6"	14	17	20	23
	10"X8"	14	17	20	23
	12"X10"	14	17	20	23
HORIZ. 45 DEG.	6"	16	19	22	25
	8"	20	24	28	33
	10"	25	30	35	40
DEAD END	6"	26	31	36	41
	8"	34	41	48	55
	10"	42	50	58	67
TEE	TO BE CALCULATED ON A CASE BY CASE BASIS.				
90 DEG. VERT. BENDS	TO BE CALCULATED ON A CASE BY CASE BASIS.				

= 1 JOINT EQUIVALENT
 = 2 JOINTS EQUIVALENT
 = 3 JOINTS EQUIVALENT
 = 4 JOINTS EQUIVALENT

GENERAL NOTES:

1. ALL FITTINGS MUST BE RESTRAINED AS SPECIFIED IN THE STANDARD SPECIFICATIONS AND DETAILS MANUAL.
2. DIMENSION TABLE GIVEN IS A GUIDE ONLY. TO ENGINEER SHALL BE RESPONSIBLE TO CALCULATE THRUST BLOCK DIMENSIONS AND/OR BASED ON RESTRAINED LENGTH ACTUAL SOIL AND OPERATING PRESSURE CONDITIONS.
3. FITTING JOINTS SHALL BE KEPT FREE OF CONCRETE. A LAYER OF POLYETHYLENE PLASTIC SHALL BE PLACED BETWEEN THE FITTING AND THE CONCRETE.
4. PRE-CAST THRUST BLOCKS ARE NOT ACCEPTABLE.
5. CONCRETE SHALL HAVE 4000 P.S.I. COMPRESSIVE STRENGTH.

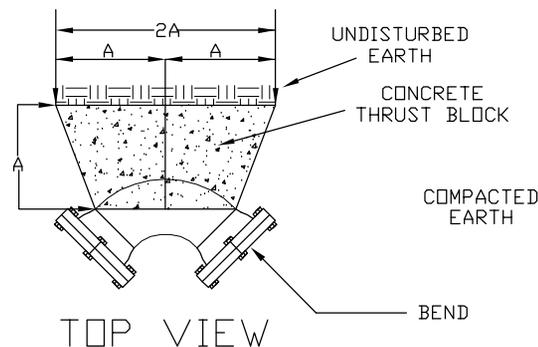


TABLE OF "A" DIMENSIONS (IN FEET)

BEND	90	45	22 1/2	11 1/4	TEE
PIPE SIZE (NOMINAL DIAMETER IN INCHES)	6	1.4	1.1	1.0	1.0
	8	1.9	1.5	1.5	1.5
	10	2.4	1.8	1.8	1.8
	12	2.8	2.1	2.0	2.0
	16	3.8	2.8	2.5	2.5
	24	5.6	4.2	3.0	3.0



City of Asheville, NC
WATER ENGINEERING
DIVISION

THRUST BLOCK FOR FITTINGS & RESTRAINING REQUIREMENTS

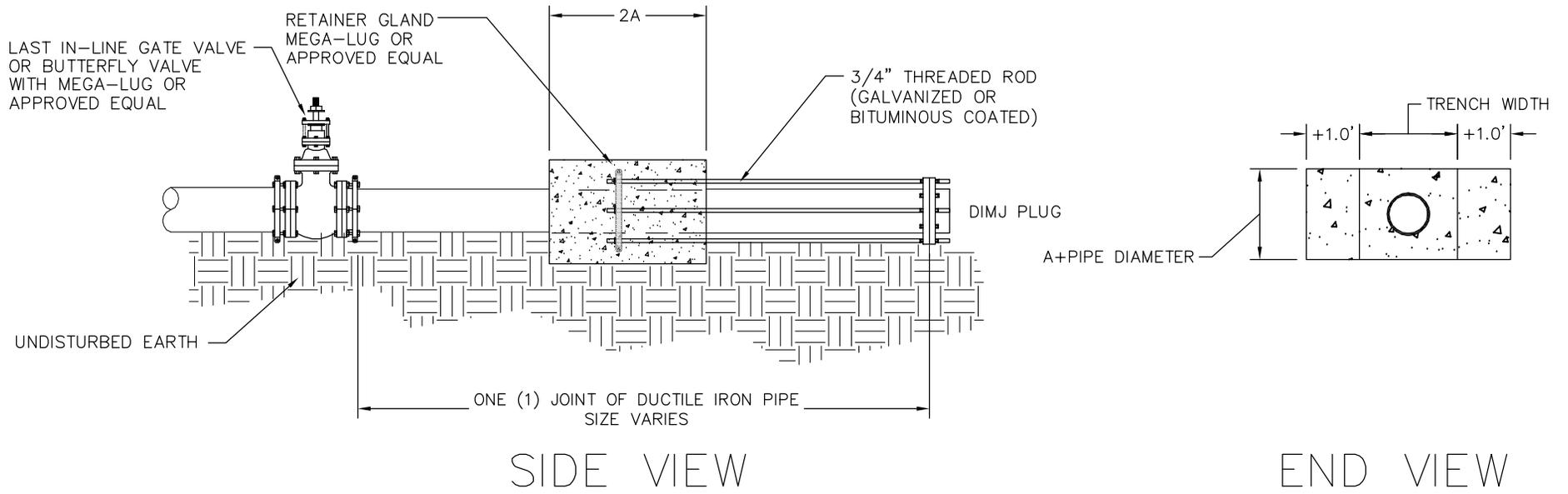
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W.22

GENERAL NOTES

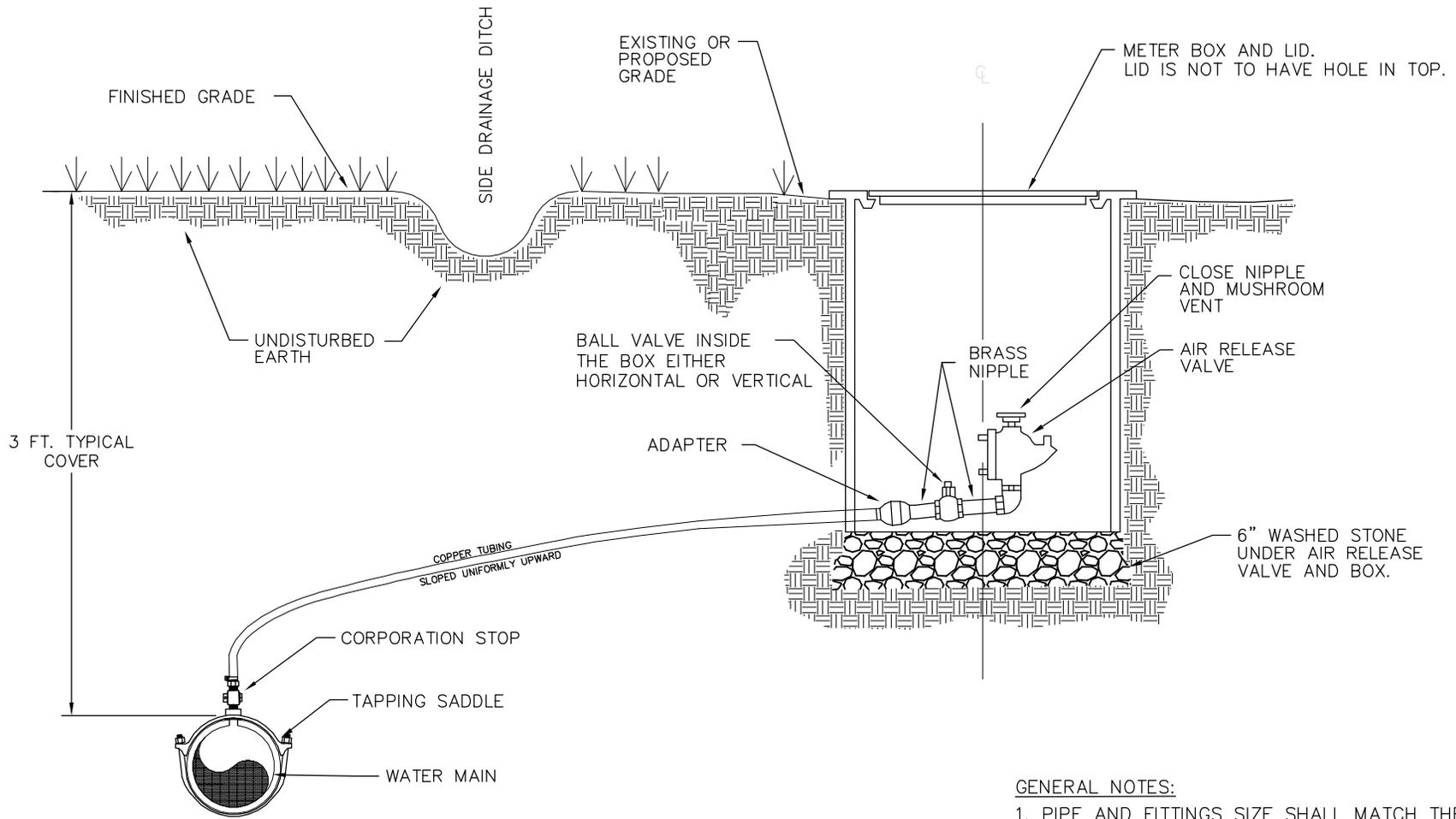
1. ALL FITTINGS MUST BE RESTRAINED AS SPECIFIED IN THE STANDARD SPECIFICATIONS AND DETAILS MANUAL
2. DIMENSION TABLE GIVEN IS A GUIDE ONLY. ENGINEER SHALL BE RESPONSIBLE TO CALCULATE THRUST BLOCK DIMENSIONS BASED ON ACTUAL SOIL AND OPERATING
3. FITTING JOINTS SHALL BE KEPT FREE OF CONCRETE. A LAYER OF POLYETHYLENE PLASTIC SHALL BE PLACED BETWEEN THE FITTING AND THE CONCRETE.
4. CONTRACTOR HAS THE OPTION TO RESTRAIN PIPE JOINTS IN LIEU OF CONCRETE DEADMAN & RODDING.

"A" DIMEN. IN FEET	PIPE SIZE (NOMINAL DIAMETER IN INCHES)					
	6	8	10	12	16	24
	1.2	1.6	2.0	2.4	2.8	4.5



END OF LINE PLUG

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GENERAL NOTES:

1. PIPE AND FITTINGS SIZE SHALL MATCH THE SIZE OF THE PROPOSED AIR RELEASE VALVE TO BE INSTALLED.
2. REFER TO STANDARD DETAIL FOR METER BOX SPECIFICATIONS.
3. LOCATION TO BE SAME AS METER BOX DETAILS W.01 & W.05

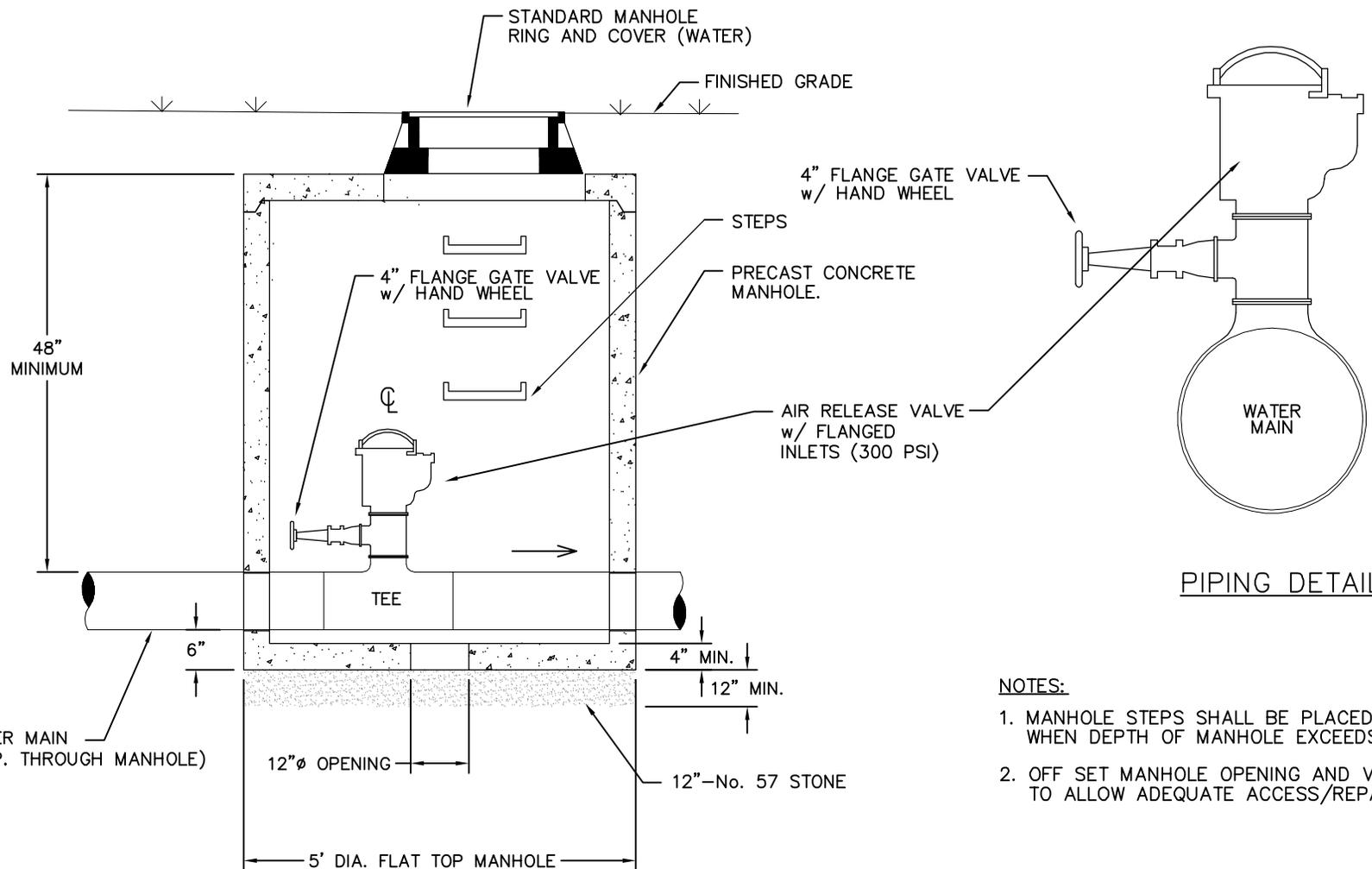


City of Asheville, NC
**WATER ENGINEERING
 DIVISION**

**STANDARD AIR RELEASE VALVE
 INSTALLATION**

REVISIONS	
DATE	DESCRIPTION
6/2009	REVISED DETAIL FROM 6.10

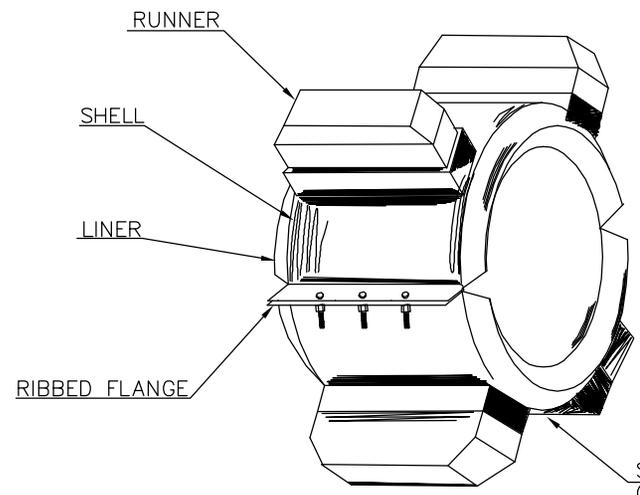
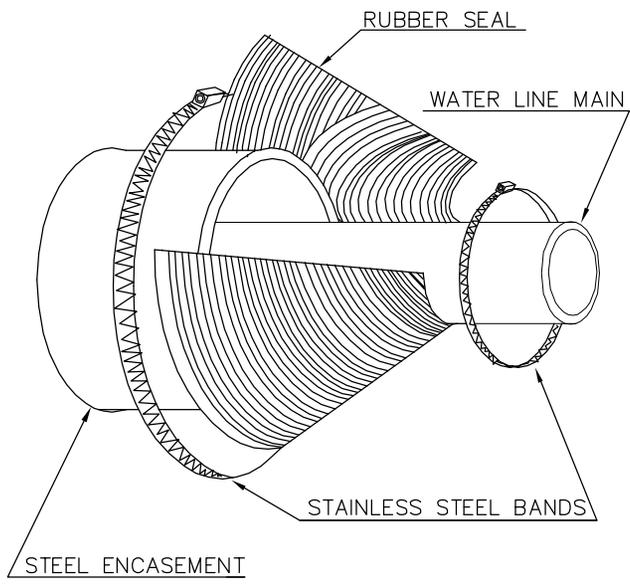
STD. NO.
W.24



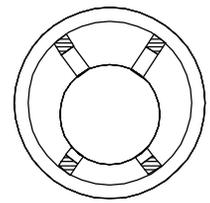
- NOTES:**
1. MANHOLE STEPS SHALL BE PLACED 16" O.C. WHEN DEPTH OF MANHOLE EXCEEDS 5 FEET.
 2. OFF SET MANHOLE OPENING AND VALVE TO ALLOW ADEQUATE ACCESS/REPAIR SPACE.

STANDARD 4" AND LARGER AIR RELEASE VALVE INSTALLATION

REVISIONS	
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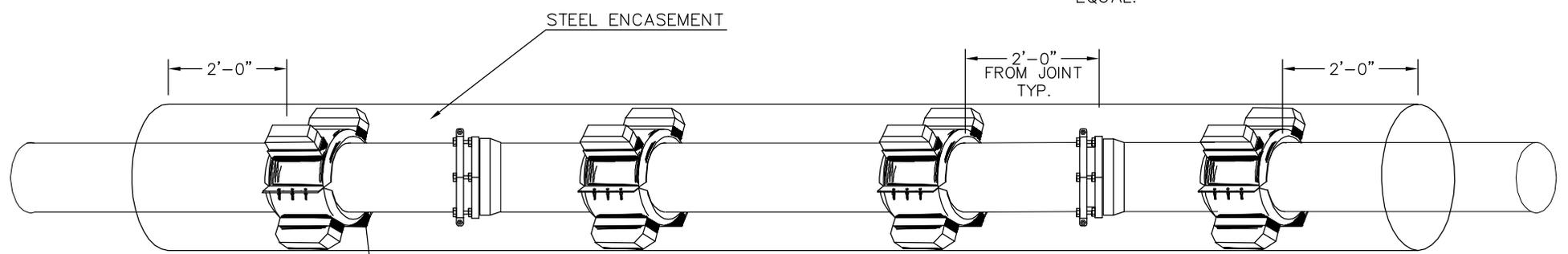


POSITIONING



RESTRAINED: KEEPS CARRIER FROM FLOATING OR BUCKING UNDER SUDDEN PRESSURE SURGES

STAINLESS STEEL CASING SPACER
2 PER JOINT OF CARRIER PIPE (TYPICAL)
MFG. BY CASCADE WATERWORKS, MFG. CO. OR APPROVED EQUAL.

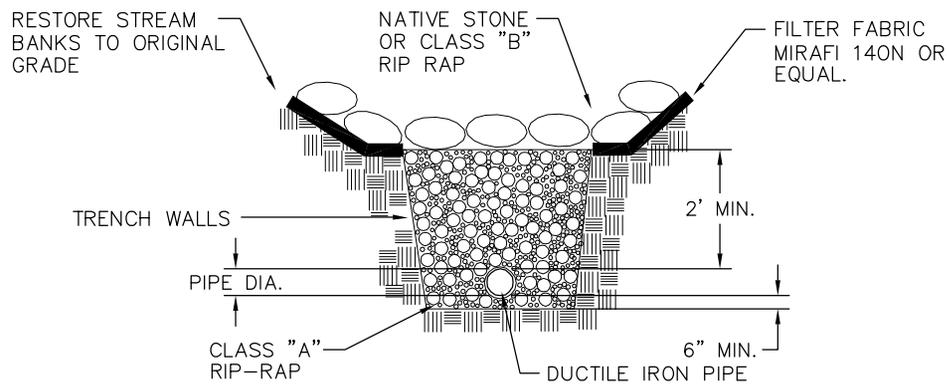
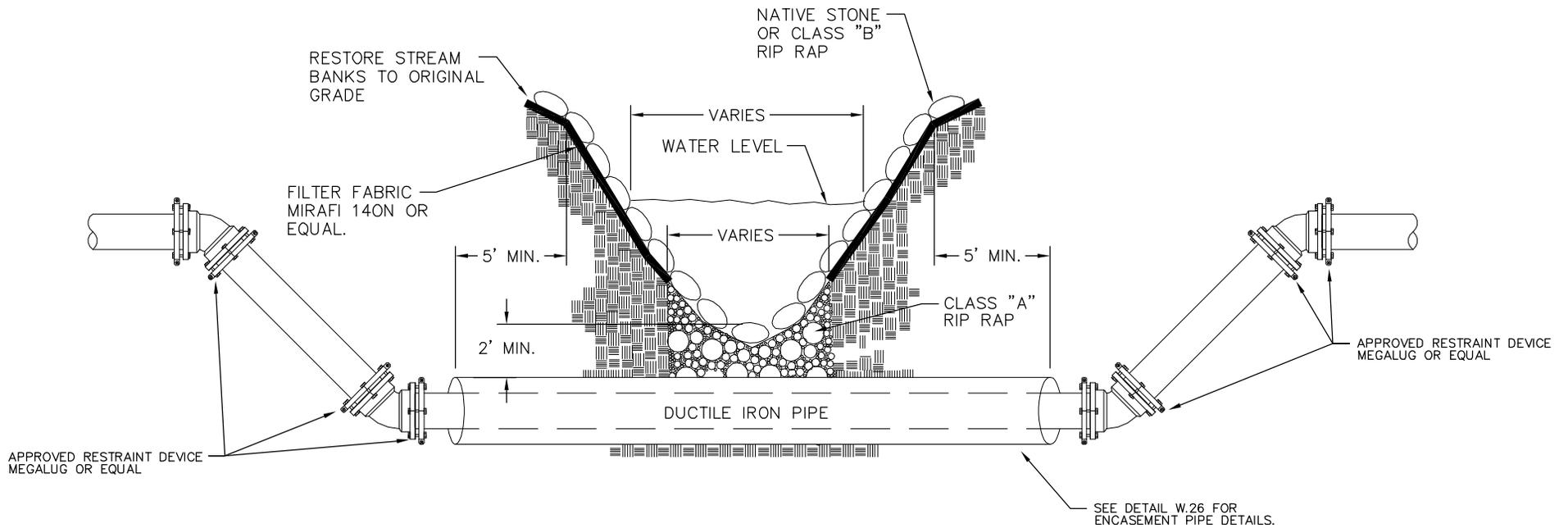


GENERAL NOTES:

1. RESTRAINED POSITIONING TO BE USED AT ALL TIMES.
2. CARRIER PIPE JOINTS SHALL BE RESTRAINED.
3. CONTRACTOR MAY USE BRICK MASONRY AND NON-SHRINK GROUT TO SEAL ENCASEMENT ENDS IN LIEU OF RUBBER SEAL. A 3/4" WEEPHOLE MUST BE PROVIDED AT LOW POINT OF CASING.

CARRIER PIPE IN STEEL ENCASEMENT

REVISIONS	
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GENERAL NOTES:

1. CONTRACTOR MUST RESTRAIN AT LEAST 3 JOINTS EITHER SIDE OF THE LAST VERTICAL BEND OR AS OTHERWISE SPECIFIED BY THE ENGINEER.
2. APPROVED RESTRAINING DEVICES INCLUDE RETAINING GLANDS (MEGALUGS), FIELD LOCK GASKETS AND RESTRAINT SYSTEMS, PROVIDED BY APPROVED PIPE MANUFACTURERS.
3. ALL CREEK CROSSINGS WILL REQUIRE STEEL ENCASEMENT PIPE TO EXTEND A MINIMUM 5' VERTICALLY PAST THE VISIBEL HIGH WATER MARK ON THE BANK OR PAST THE TOP EDGE OF THE BANK.



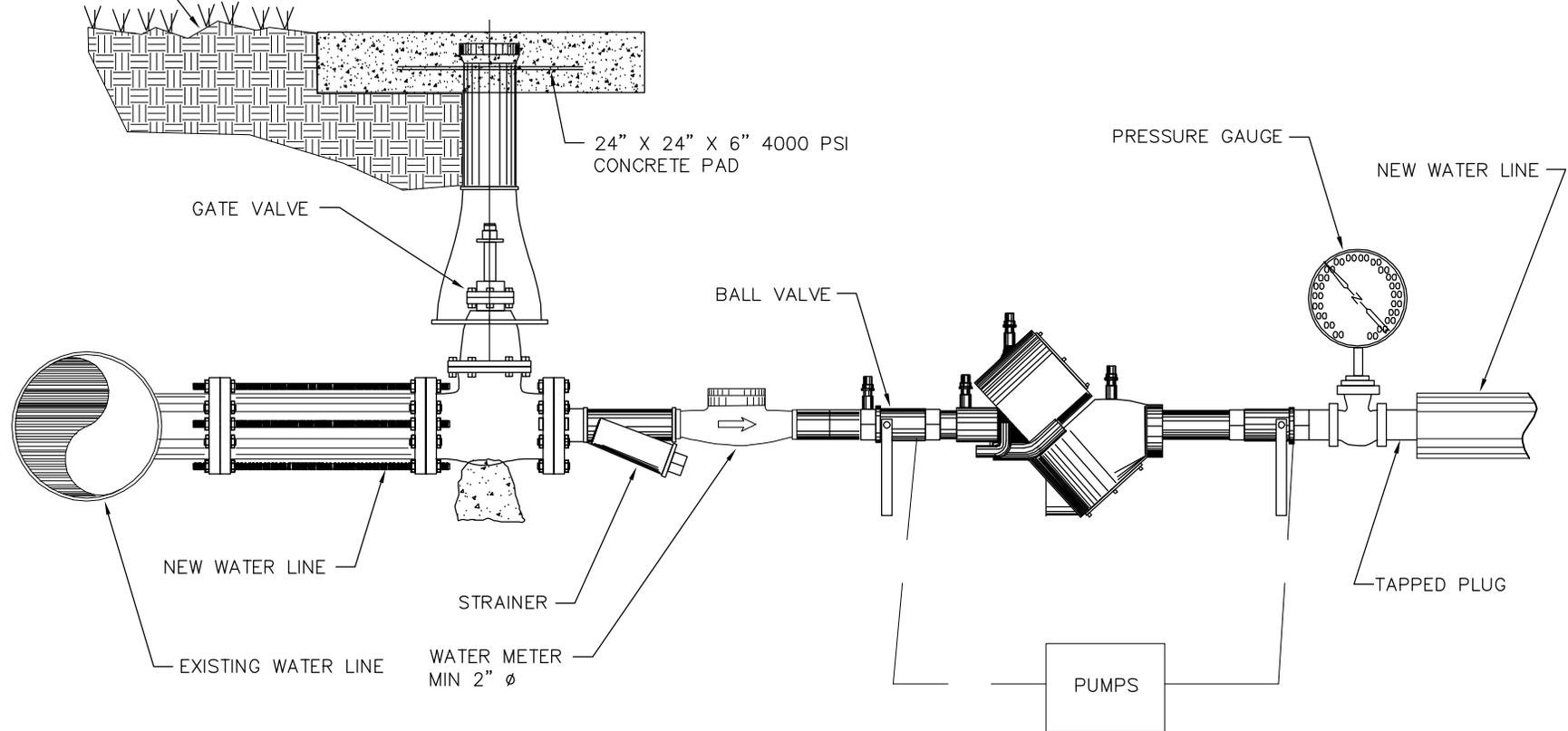
City of Asheville, NC
**WATER ENGINEERING
 DIVISION**

**CREEK CROSSING
 BELOW CREEK BOTTOM**

REVISIONS	
DATE	DESCRIPTION
6/2009	REVISED DETAIL FROM 6.23

STD. NO.
W.27

TYPICAL FINISHED GRADE
IN UNPAVED AREAS



GENERAL NOTES:

1. PRIOR TO CONNECTING TO THE EXISTING WATERLINE, THE NEW WATER LINE WILL BE PRESSURE TESTED, DISINFECTED AND A CLEAR WATER SAMPLE OBTAINED.
2. ALL WATER FOR FILLING AND FLUSHING OF NEW WATER LINE WILL BE DRAWN THROUGH THE DOUBLE CHECK VALVE ASSEMBLY.
3. THE COSTS FOR PROVIDING DOUBLE CHECK VALVE ASSEMBLY AND SLEEVE NECESSARY FOR FINAL CONNECTION WILL BE INCIDENTAL TO THE WATER LINE INSTALLATION.
4. CONTRACTOR WILL BE REQUIRED TO HAVE WATER METER TESTED TO MEET ACCURACY STANDARDS OF AWWA C700, BY THE CITY OF ASHEVILLE WATER MAINTENANCE DIVISION ANNUALLY. METER MUST BEAR A CERTIFICATION TAG AT ALL TIMES.



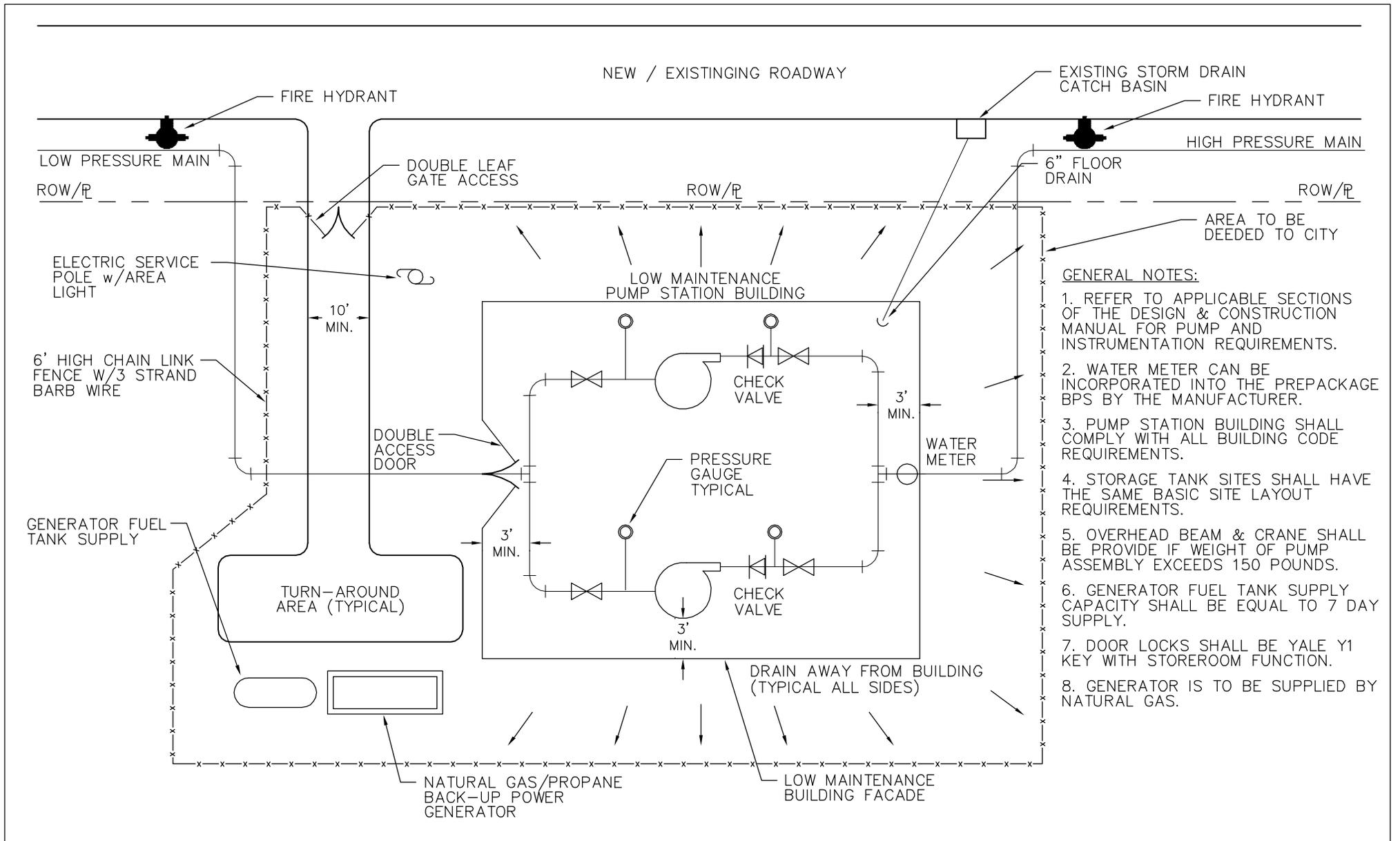
City of Asheville, NC
WATER ENGINEERING
DIVISION

**NEW WATER LINE PRESSURE TEST
BACKFLOW PREVENTION ASSEMBLY**

REVISIONS	
DATE	DESCRIPTION
6/2009	REVISED DETAIL FROM 6.21

STD. NO.

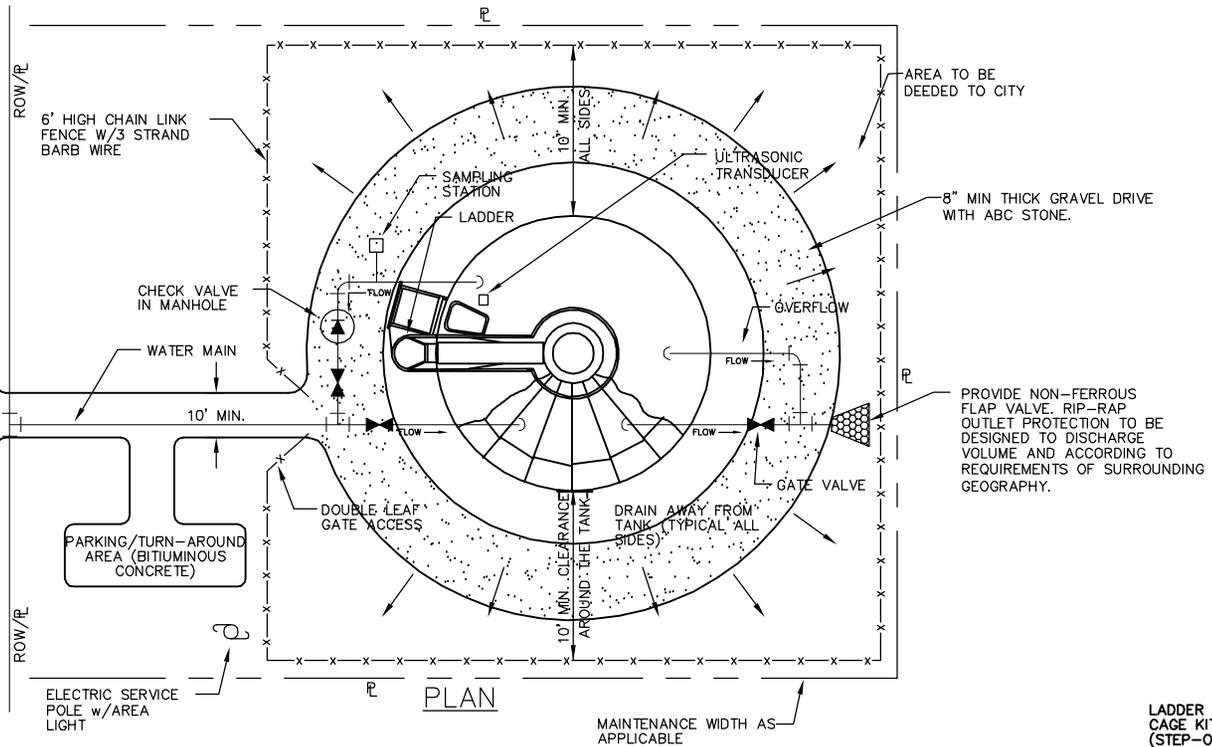
W.28



- GENERAL NOTES:**
1. REFER TO APPLICABLE SECTIONS OF THE DESIGN & CONSTRUCTION MANUAL FOR PUMP AND INSTRUMENTATION REQUIREMENTS.
 2. WATER METER CAN BE INCORPORATED INTO THE PREPACKAGE BPS BY THE MANUFACTURER.
 3. PUMP STATION BUILDING SHALL COMPLY WITH ALL BUILDING CODE REQUIREMENTS.
 4. STORAGE TANK SITES SHALL HAVE THE SAME BASIC SITE LAYOUT REQUIREMENTS.
 5. OVERHEAD BEAM & CRANE SHALL BE PROVIDE IF WEIGHT OF PUMP ASSEMBLY EXCEEDS 150 POUNDS.
 6. GENERATOR FUEL TANK SUPPLY CAPACITY SHALL BE EQUAL TO 7 DAY SUPPLY.
 7. DOOR LOCKS SHALL BE YALE Y1 KEY WITH STOREROOM FUNCTION.
 8. GENERATOR IS TO BE SUPPLIED BY NATURAL GAS.

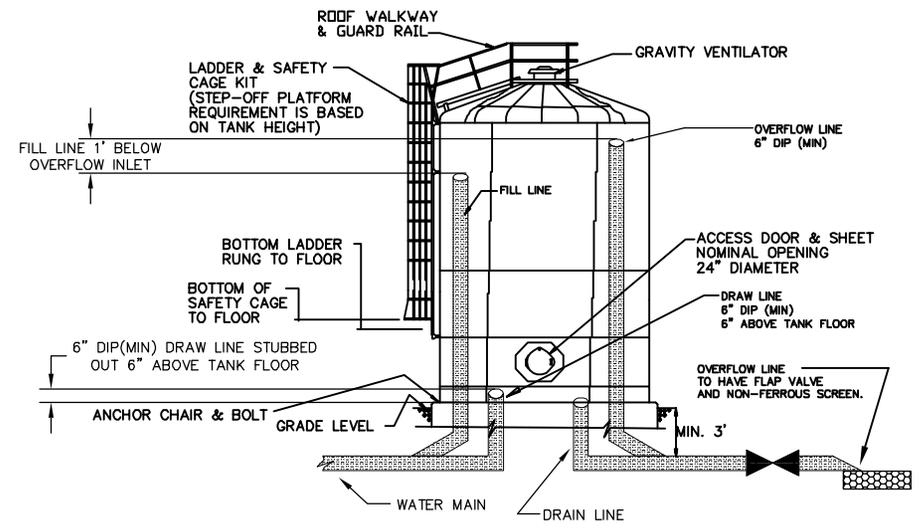
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NEW / EXISTING ACCESS ROAD
(BITUMINOUS CONCRETE, 15% MAX. GRADE)



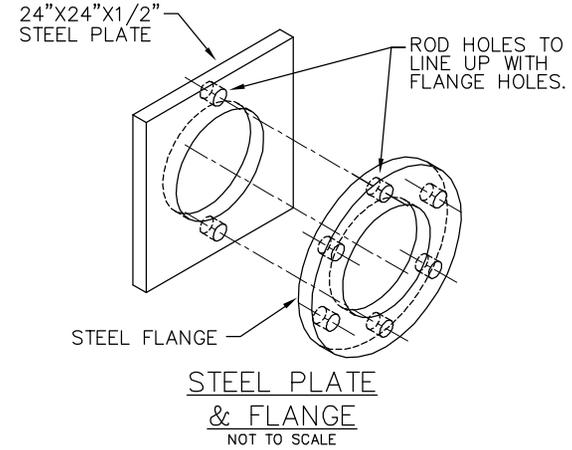
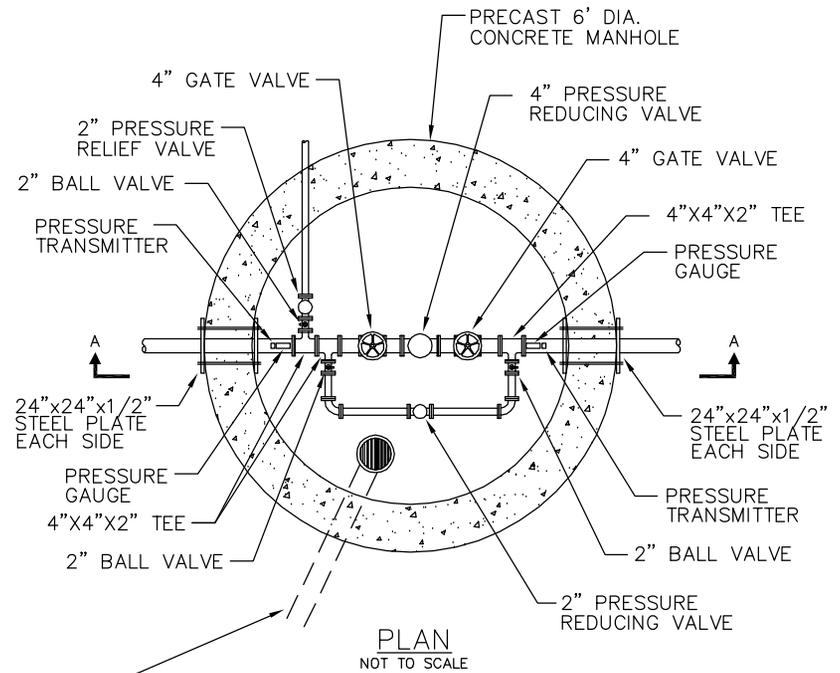
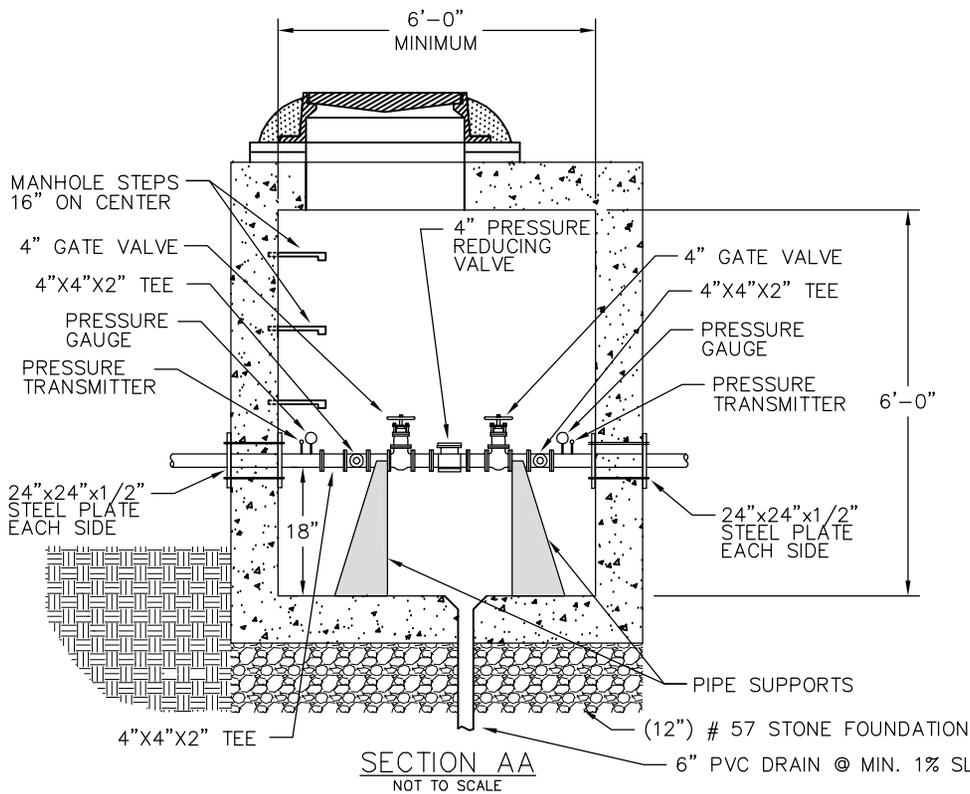
NOTES:

1. INSTALL RISER WITH FLANGED END CAP 6" BELOW GROUND SURFACE ENCLOSED WITHIN STANDARD METER BOX.
2. REFER TO WATER RESOURCES DESIGN & CONSTRUCTION MANUAL THE STANDARD SPECIFICATIONS FOR TANK ACCESSORIES AND INSTRUMENTATION REQUIREMENTS.
3. TRANSDUCER MOUNTING "4" FLANGE & PIPE" LOCATION MUST BE REACHABLE FROM TANK LADDER LANDING AREA.
4. TRANSDUCER SHALL NOT BE ABOVE FILL LINE INLET AND SHALL BE INSTALLED AT LEAST 90 DEGREES FROM END OF FILL LINE.
5. MANUAL TANK LEVEL INDICATOR SHALL BE VISIBLE FROM GATE AND DRIVE.



BASIC PIPING LAYOUT SCHEMATIC & WATER STORAGE RESERVOIR

REVISIONS	
DATE	DESCRIPTION
6/2009	REVISED DETAIL FROM 6.30



NOTE:

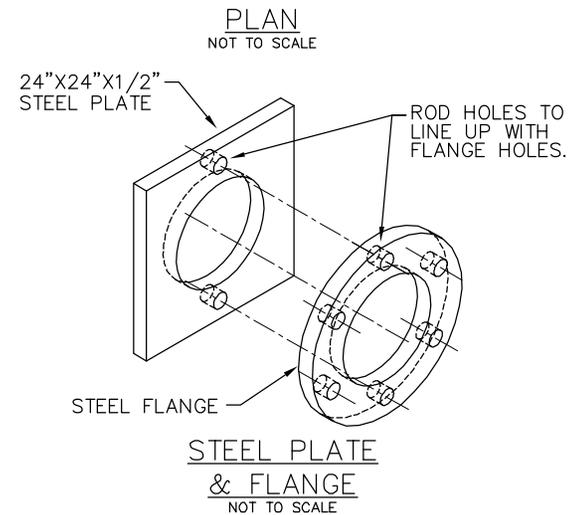
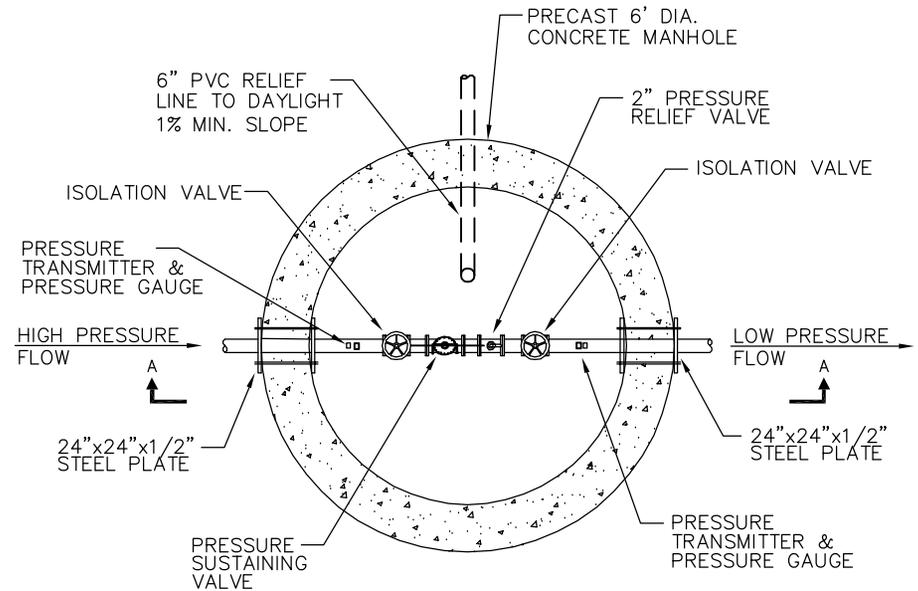
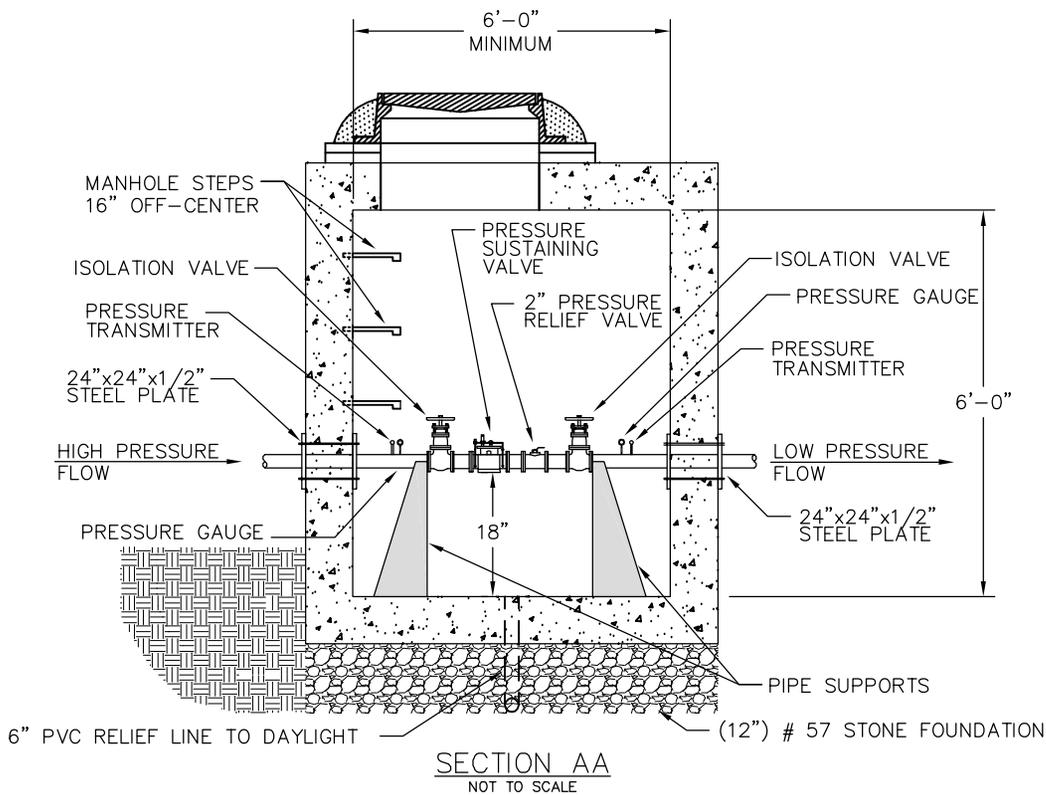
1. CONTROL VALVE INSTRUMENTATION SHALL COMPLY WITH CURRENT CITY OF ASHEVILLE SCADA REQUIREMENTS.
2. PRESSURE REDUCING VALVE SIZE MAY VARY.
3. PRESSURE TRANSMITTER TO BE ROSEMOUNT 3051S OR APPROVED EQUAL. TRANSMITTER DOES NOT HAVE TO HAVE A DIGITAL READ-OUT.
4. SPRINKLER CONTRACTOR MAY NEED TO BE CONSULTED IF INSTALLED ON A FIRELINE WITH A SPRINKLER SYSTEM.
5. IF THERE IS POWER AVAILABLE THERE WILL BE LIGHTS AND RECEPTACLES IN THE VAULT
6. COMMUNICATIONS BOX IS TO BE MOUTED OUTSIDE IN A LOCKED BOX.
7. PARKING AREA MUST BE PROVIDED.



City of Asheville, NC
**WATER ENGINEERING
 DIVISION**

MAIN LINE PRESSURE REDUCING VALVE STATION

REVISIONS		STD. NO.
DATE	DESCRIPTION	
		7.31



NOTE:

1. CONTROL VALVE INSTRUMENTATION SHALL COMPLY WITH CURRENT CITY OF ASHEVILLE SCADA REQUIREMENTS.
2. PRESSURE REDUCING VALVE SIZE MAY VARY.
3. PRESSURE TRANSMITTER TO BE ROSEMOUNT 3051S OR APPROVED EQUAL. TRANSMITTER DOES NOT HAVE TO HAVE A DIGITAL READ-OUT.
4. IF THERE IS POWER AVAILABLE THERE WILL BE LIGHTS AND RECEPTACLES IN THE VAULT
5. IF THERE IS POWER AVAILABLE THERE WILL BE LIGHTS AND RECEPTACLES IN THE VAULT
6. COMMUNICATIONS BOX IS TO BE MOUTED OUTSIDE IN A LOCKED BOX.
7. PARKING AREA MUST BE PROVIDED.

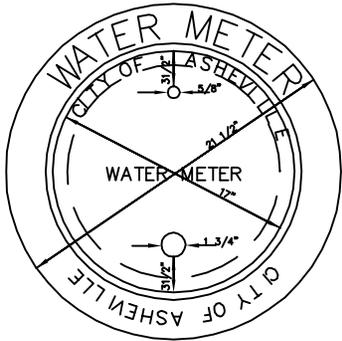


City of Asheville, NC
WATER ENGINEERING
DIVISION

MAIN LINE PRESSURE SUSTAINING VALVE STATION

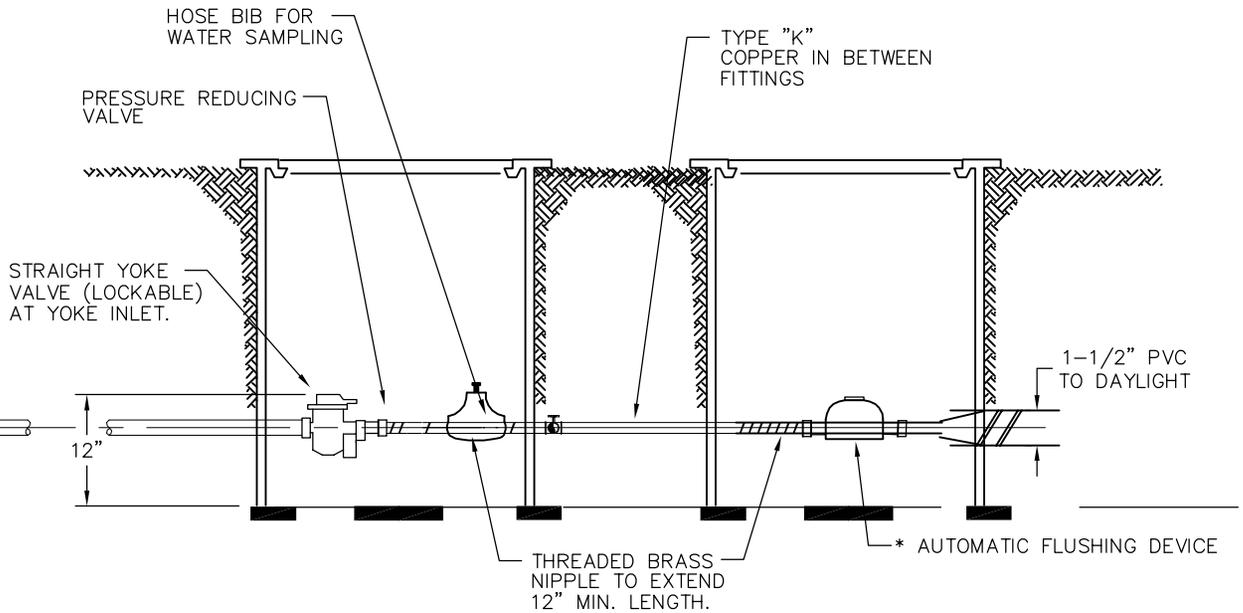
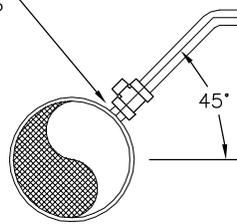
REVISIONS		STD. NO.
DATE	DESCRIPTION	
		W.32

CAST IRON RING & COVER



NOTE:
 CAST IRON RING & COVER MIN WEIGHT 54 LBS.
 "CITY OF ASHEVILLE" LOGO ON BOTH RING AND
 COVER TOP OF LID-ANTI-SKID GRID SURFACE.

3/4" SERVICE SADDLE
 WITH CORPORATION STOP



* AUTOMATIC FLUSHING DEVICE MUST BE BATTERY
 OPERATED AND MUST HAVE AT LEAST A 24-HOUR TIMER



City of Asheville, NC
 Transportation & Engineering
 Department

AUTOMATIC FLUSHER & TIMER

REVISIONS	
DATE	DESCRIPTION

STD. NO.

W.33