

WATER MAIN TRENCH IN UNPAVED AREAS

N.T.S.

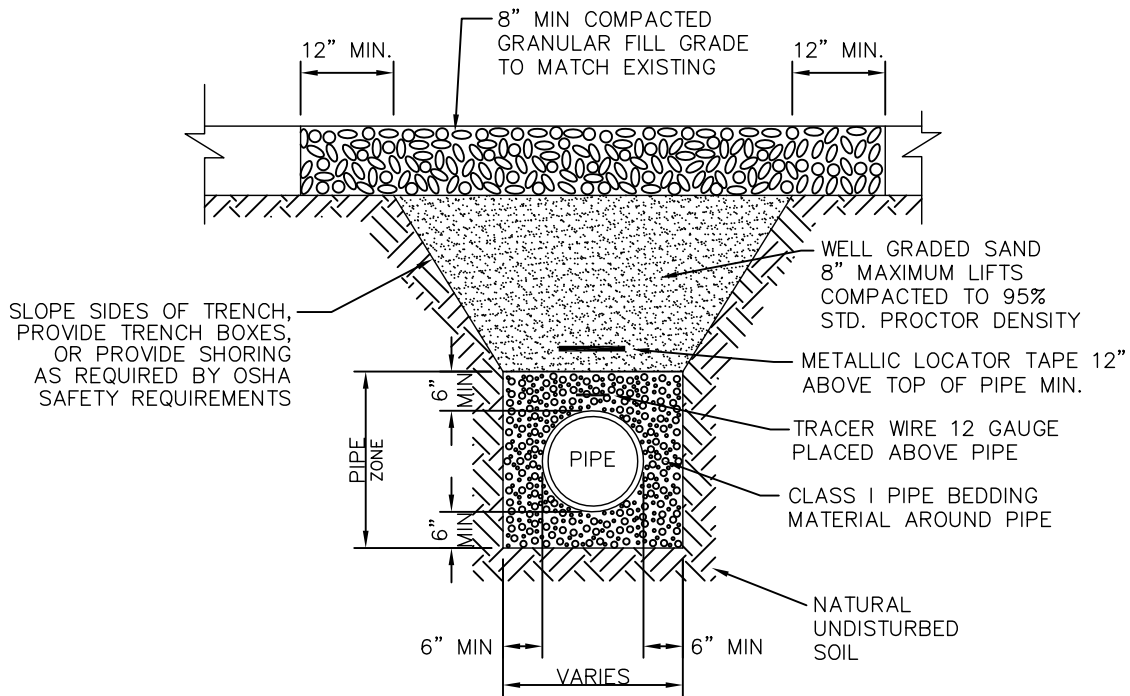


BENTON UTILITIES
1827 Dale Ave.
Benton, AR 72015
Phone: (501) 776-5984

SECTION: **WATER DETAILS**
DESCRIPTION: **WATER TRENCH (NON-PAVED AREA)**

ISSUE DATE:
SEPTEMBER 2015
REVISION DATE:

SHEET:
W-1



FOR TRENCH CONSTRUCTED IN ROCK, INSTALL CRUSHED STONE OR WASHED GRAVEL, 3/4" TO 1/4", FROM 6" BELOW BOTTOM OF PIPE TO 6" ABOVE TOP OF PIPE.

FOR UNSTABLE TRENCH BOTTOM, PROVIDE MIN 8" OF 1 1/2" TO #4 SIZE CRUSHED STONE OR OTHER MATERIAL AS APPROVED BY THE ENGINEER.

DISPOSE OF EXCESS EXCAVATED MATERIAL OFF SITE

WATER MAIN TRENCH IN GRAVEL SHOULDER OR DRIVEWAY

N.T.S.



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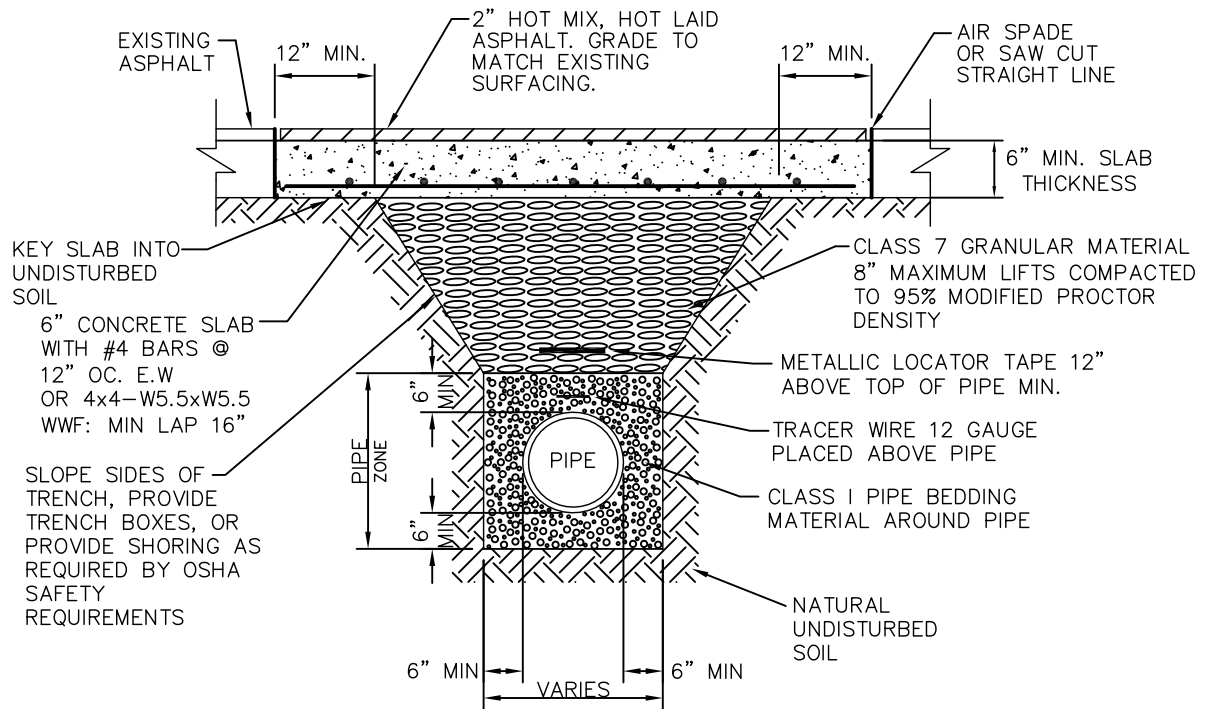
SECTION: **WATER DETAILS**

DESCRIPTION: **WATER TRENCH
(GRAVEL SHOULDER OR DRIVEWAY)**

ISSUE DATE:
SEPTEMBER 2015

REVISION DATE:

SHEET:
W-2



FOR TRENCH CONSTRUCTED IN ROCK, INSTALL CRUSHED STONE OR WASHED GRAVEL, 3/4" TO 1/4", FROM 6" BELOW BOTTOM OF PIPE TO 6" ABOVE TOP OF PIPE.

FOR UNSTABLE TRENCH BOTTOM, PROVIDE MIN 8" OF 1 1/2" TO #4 SIZE CRUSHED STONE OR OTHER MATERIAL AS APPROVED BY THE ENGINEER.

DISPOSE OF EXCESS EXCAVATED MATERIAL OFF SITE

WATER MAIN TRENCH UNDER ASPHALT

N.T.S.

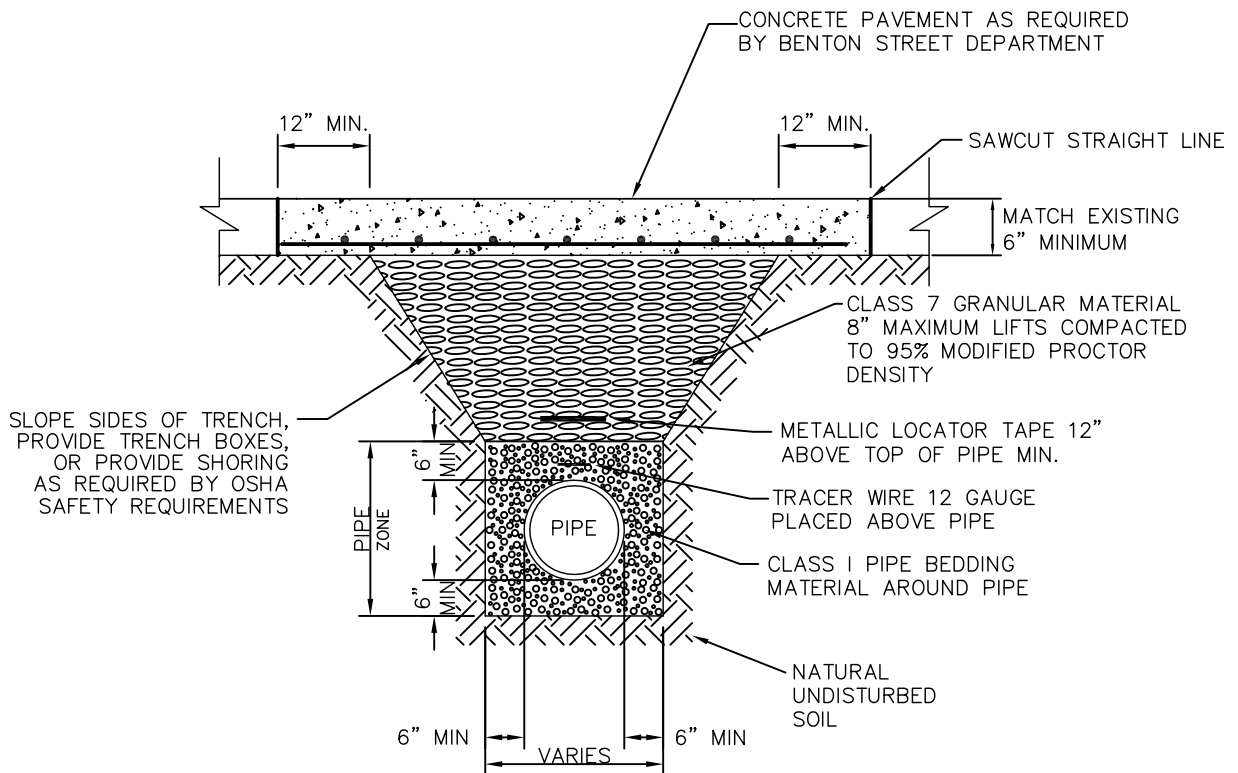


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SECTION:	WATER DETAILS
DESCRIPTION:	WATER TRENCH (UNDER ASPHALT)

ISSUE DATE:	SEPTEMBER 2015
REVISION DATE:	

SHEET:	W-3
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FOR TRENCH CONSTRUCTED IN ROCK, INSTALL CRUSHED STONE OR WASHED GRAVEL, 3/4" TO 1/4", FROM 6" BELOW BOTTOM OF PIPE TO 6" ABOVE TOP OF PIPE.

FOR UNSTABLE TRENCH BOTTOM, PROVIDE MIN 8" OF 1 1/2" TO #4 SIZE CRUSHED STONE OR OTHER MATERIAL AS APPROVED BY THE ENGINEER.

DISPOSE OF EXCESS EXCAVATED MATERIAL OFF SITE

WATER MAIN TRENCH UNDER CONCRETE

N.T.S.



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SECTION:

WATER DETAILS

DESCRIPTION:

WATER TRENCH
(UNDER CONCRETE)

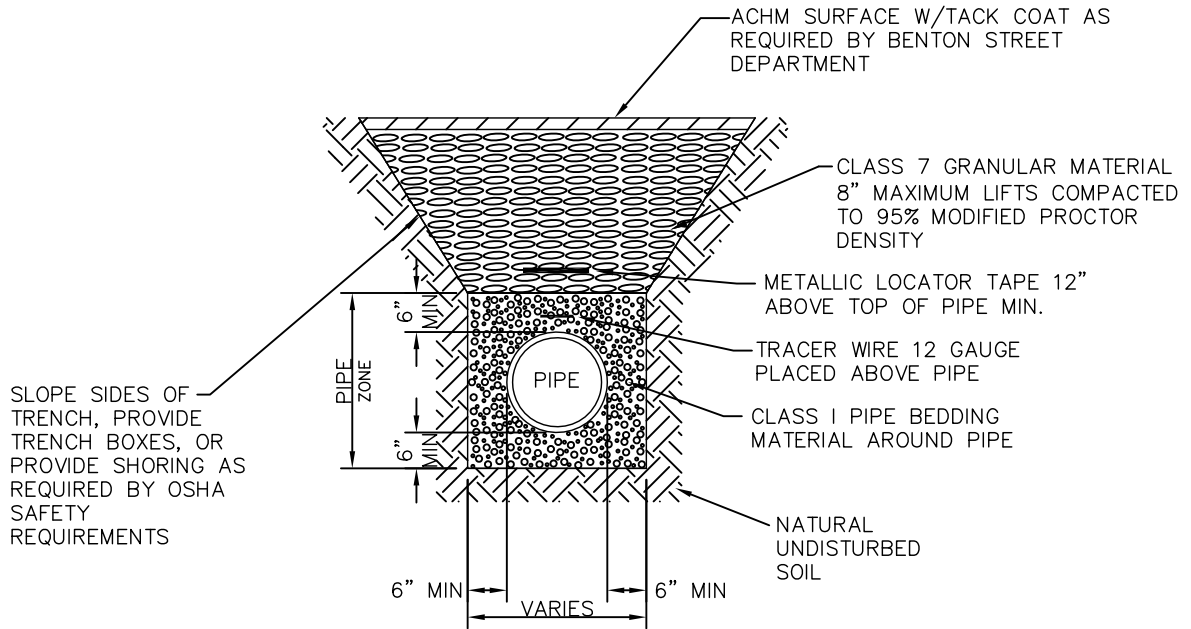
ISSUE DATE:

SEPTEMBER 2015

REVISION DATE:

SHEET:

W-4



FOR TRENCH CONSTRUCTED IN ROCK, INSTALL CRUSHED STONE OR WASHED GRAVEL, 3/4" TO 1/4", FROM 6" BELOW BOTTOM OF PIPE TO 6" ABOVE TOP OF PIPE.

FOR UNSTABLE TRENCH BOTTOM, PROVIDE MIN 8" OF 1 1/2" TO #4 SIZE CRUSHED STONE OR OTHER MATERIAL AS APPROVED BY THE ENGINEER.

DISPOSE OF EXCESS EXCAVATED MATERIAL OFF SITE

WATER MAIN TRENCH
PRIOR TO ROADWAY
CONSTRUCTION

N.T.S.



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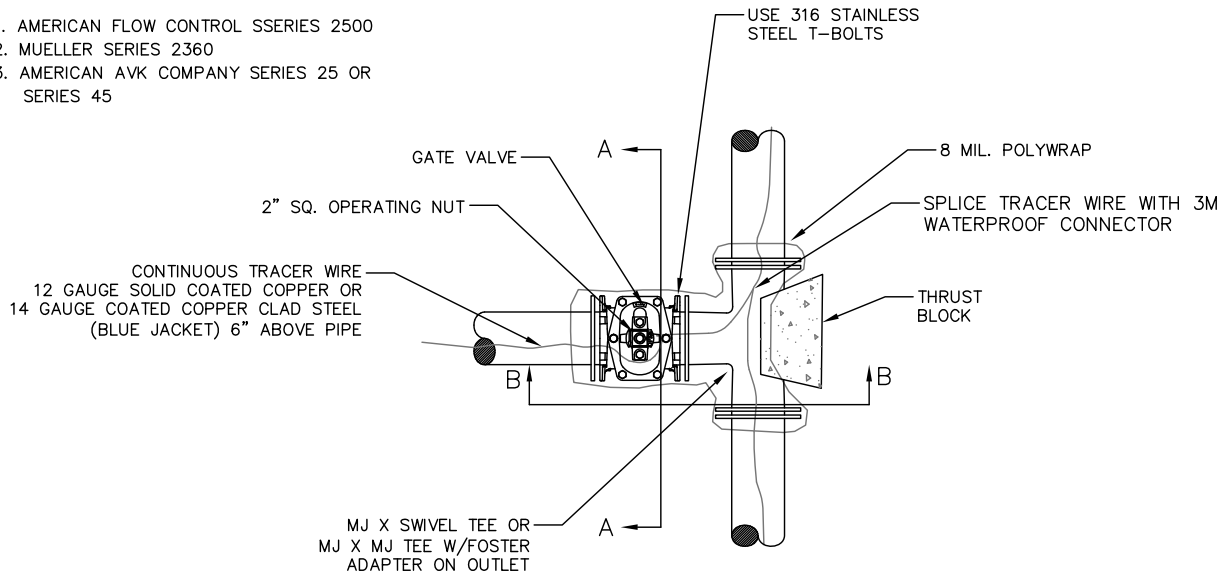
SECTION:	WATER DETAILS
DESCRIPTION:	WATER TRENCH (PRIOR TO ROADWAY CONSTRUCTION)

ISSUE DATE:	SEPTEMBER 2015
REVISION DATE:	

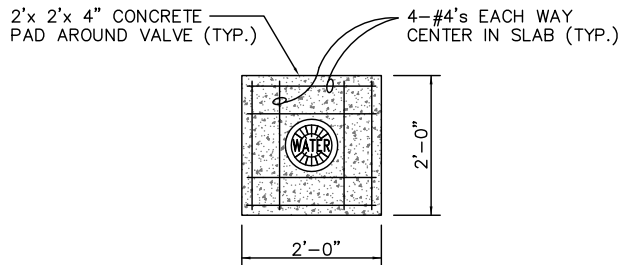
SHEET:
W-5

PERMITTED VALVES

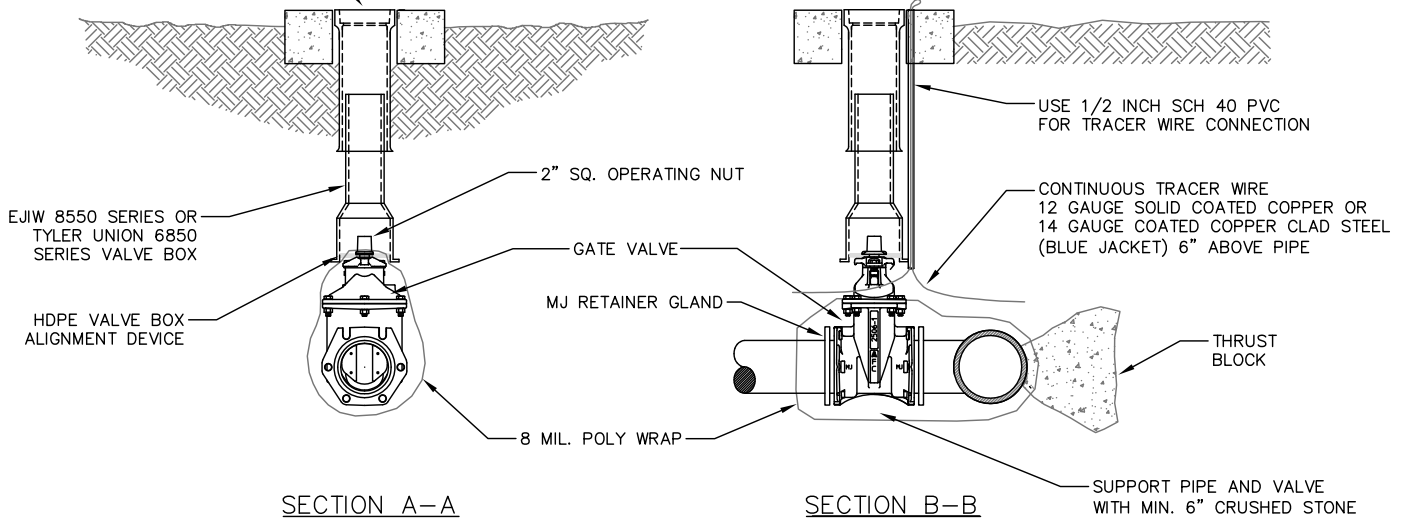
1. AMERICAN FLOW CONTROL S SERIES 2500
2. MUELLER SERIES 2360
3. AMERICAN AVK COMPANY SERIES 25 OR SERIES 45



PLAN



WORD "WATER" ON COVER
 "FIRE" FOR FIRE LINES
 "2" VALVE" FOR 2" VALVES



SECTION A-A

SECTION B-B

NOTES:

1. ALL VALVES SHALL BE SECURELY ANCHORED TO THE TEE.
2. ALL HARDWARE SHALL BE 316 STAINLESS STEEL.
3. IF DEPTH OF BURRY EXCEEDS 4 FT., A VALVE STEM EXTENSION SHALL BE REQUIRED. THE VALVE STEM EXTENSION NUT SHALL BE WITHIN 24-INCHES TO 12-INCHES OF THE FINISHED GRADE.



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SECTION:	WATER DETAILS
DESCRIPTION:	GATE VALVE DETAIL (2"-12")

ISSUE DATE:	SEPTEMBER 2015
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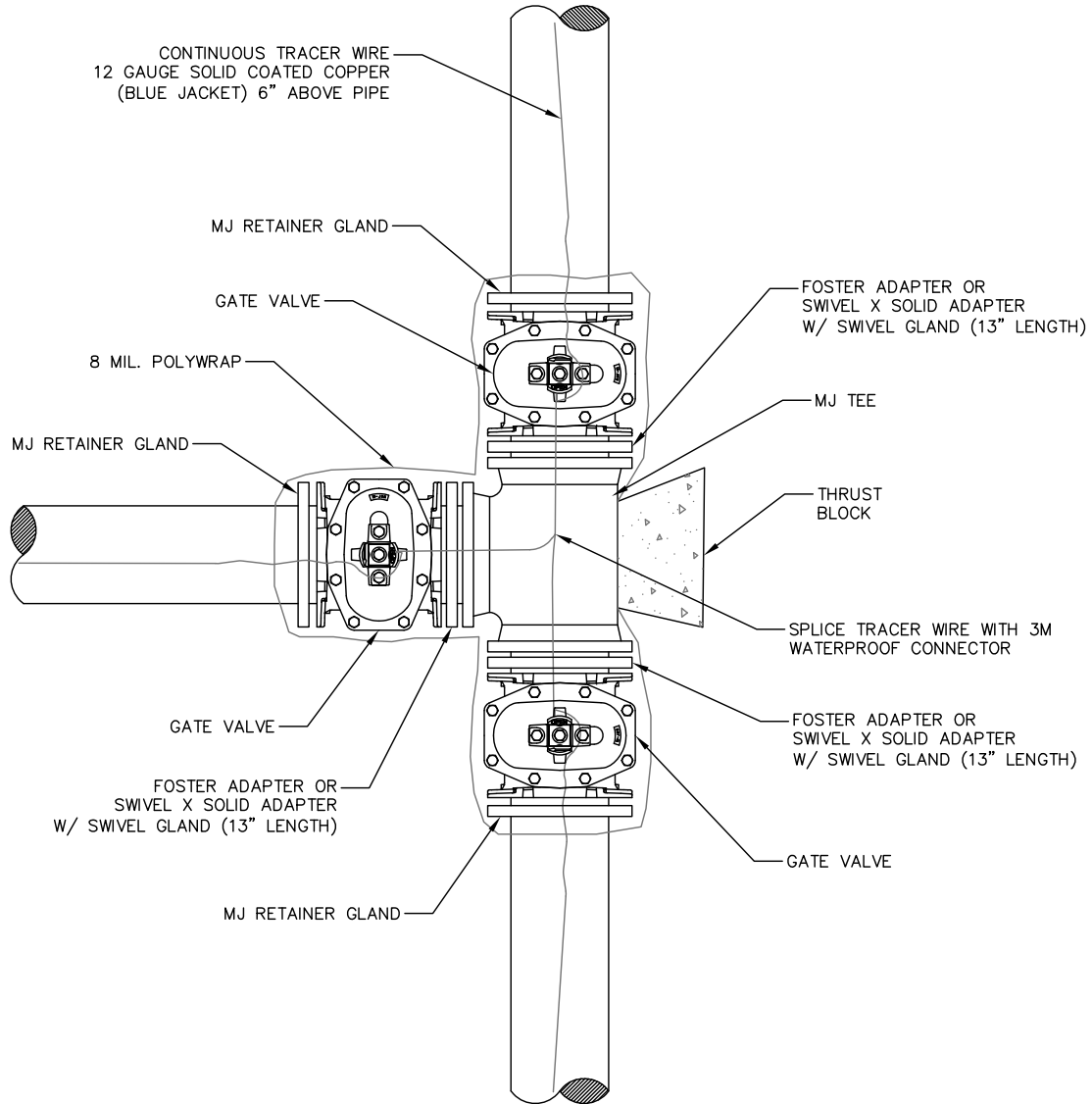
SHEET:
W-6

PERMITTED VALVES

1. AMERICAN FLOW CONTROL SERIES 2500
2. MUELLER SERIES 2360
3. AMERICAN AVK COMPANY SERIES 25 OR SERIES 45

NOTES:

1. ALL VALVES SHALL BE SECURELY ANCHORED TO THE TEE.
2. ALL HARDWARE SHALL BE 316 STAINLESS STEEL.
3. IF DEPTH OF BURRY EXCEEDS 4 FT., A VALVE STEM EXTENSION SHALL BE REQUIRED. THE VALVE STEM EXTENSION NUT SHALL BE WITHIN 24-INCHES TO 12-INCHES OF THE FINISHED GRADE.



3-WAY GATE VALVE DETAIL



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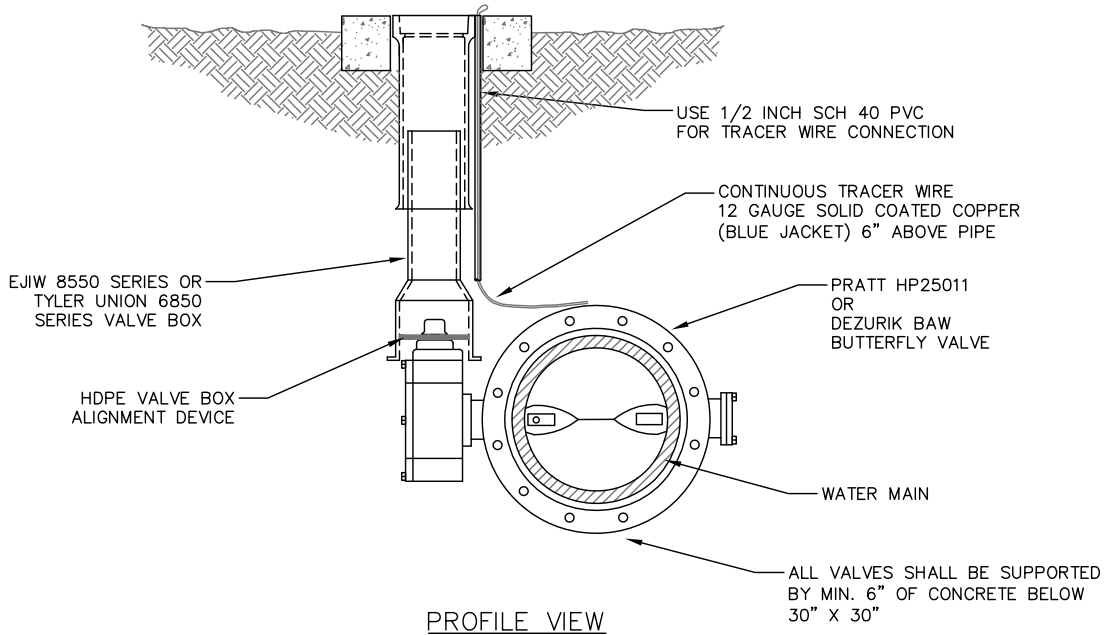
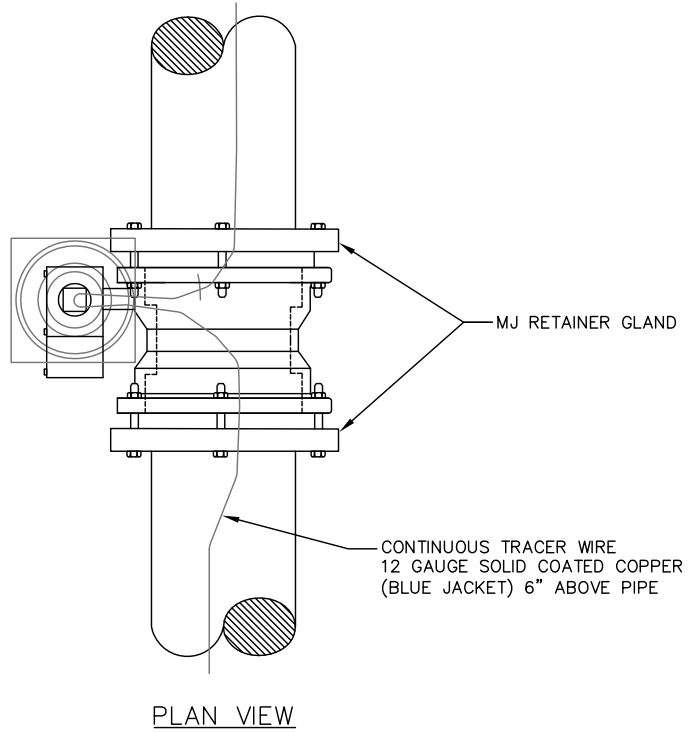
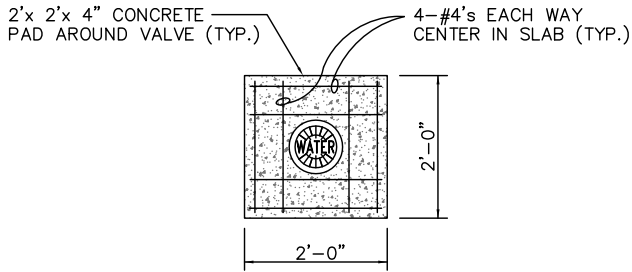
SECTION: WATER DETAILS
 DESCRIPTION: 3-WAY GATE VALVES

ISSUE DATE: SEPTEMBER 2015
 REVISION DATE:

SHEET: W-7

NOTES:

1. ALL HARDWARE SHALL BE 316 STAINLESS STEEL.
2. IF DEPTH OF BURRY EXCEEDS 4 FT., A VALVE STEM EXTENSION SHALL BE REQUIRED. THE VALVE STEM EXTENSION NUT SHALL BE WITHIN 24-INCHES TO 12-INCHES OF THE FINISHED GRADE.
3. ALL VALES SHALL BE DOUBLE WRAPPED WITH 8 MIL POLY.



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SECTION:

WATER DETAILS

DESCRIPTION:

BUTTERFLY VALVE DETAIL
 (14" AND LARGER)

ISSUE DATE:

SEPTEMBER 2015

REVISION DATE:

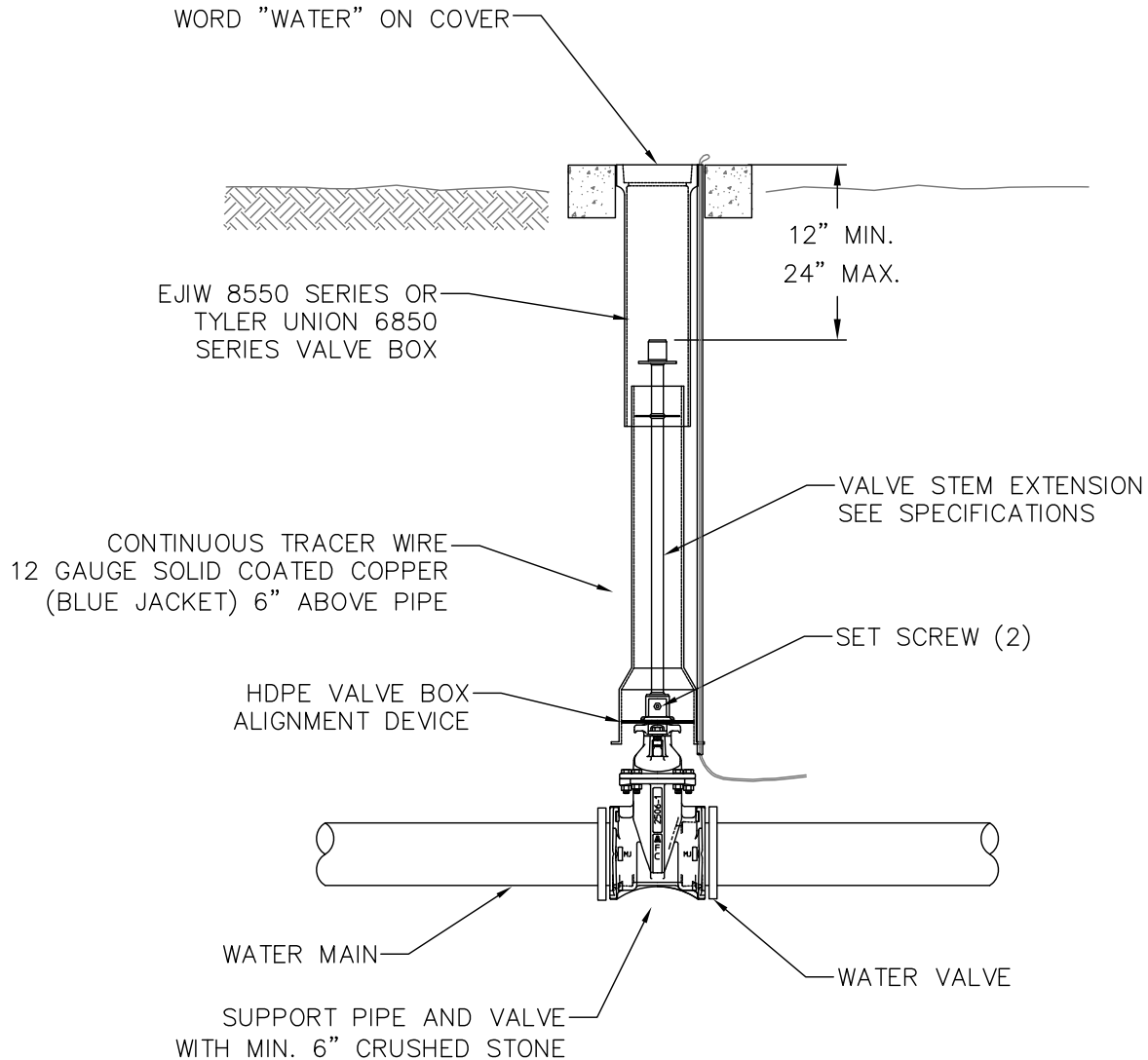
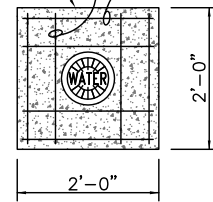
SHEET:

W-8

NOTES:

1. OPERATING NUT EXTENSIONS SHALL BE USED WHEN THE TOP OF THE OPERATING NUT IS GRATER THAN 4 FEET FROM THE TOP OF THE FINISHED GRADE.
2. THE STEM EXTENSION SHALL BE OF ADEQUATE LENGTH TO REACH FROM THE VALVE OPERATING NUT TO A POINT WITHIN 24-INCHES TO 12-INCHES OF THE FINISHED GRADE.

2'x 2'x 4" CONCRETE PAD AROUND VALVE (TYP.)
4-#4's EACH WAY CENTER IN SLAB (TYP.)



VALVE WITH STEM EXTENSION



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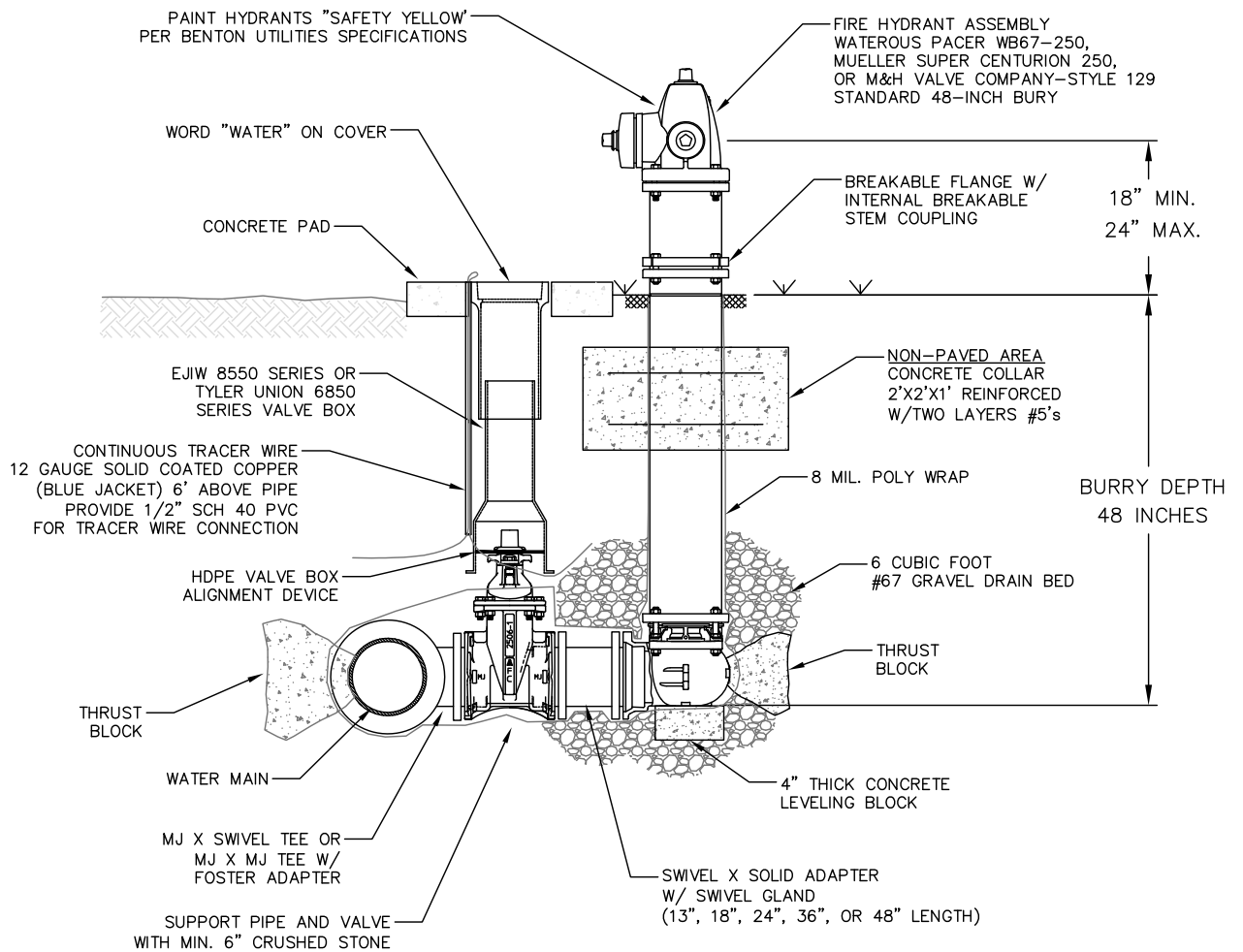
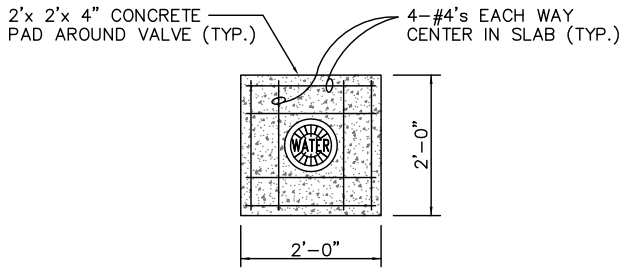
SECTION:	WATER DETAILS
DESCRIPTION:	VALVE STEM EXTENSION

ISSUE DATE:	SEPTEMBER 2015
REVISION DATE:	

SHEET:
W-9

NOTES:

1. THE 6" GATE VALVE SHALL BE POSITIVELY RESTRAINED TO THE MAIN BY THE USE OF EITHER A SWIVEL TEE OR FOSTER ADAPTER.
2. FIRE HYDRANTS SHALL BE DESIGNED FOR A MINIMUM 48" BURY.
3. BURY LINE OF HYDRANT SHALL BE NO LESS THAN THE PROPOSED FINISHED ELEVATION OF BACK OF CURB, OR SIDEWALK, WHICHEVER IS GREATER.
4. EXTENSIONS SHALL BE WATEROUS K562 OR MUELLER A-320 WITH NO MORE THAN ONE EXTENSION PER HYDRANT.
5. IF SIDEWALK IS PRESENT, HYDRANT SHALL BE INSTALLED 2' MINIMUM BEHIND THE BACK OF SIDEWALK OR CURB. VALVES SHALL BE INSTALLED 1' MINIMUM BEHIND THE BACK OF THE SIDEWALK OR CURB.
6. DO NOT COVER UP WEEP HOLE WITH CONCRETE.
7. MJ RETAINER GLANDS WITH MEGALUGS ARE REQUIRED FOR ALL FITTINGS.
8. AN ADDITIONAL GUARDIAN VALVE IS REQUIRED FOR ALL FIRE HYDRANT LEADS GREATER THAN 30 FEET IN LENGTH.



FIRE HYDRANT & VALVE CONNECTION

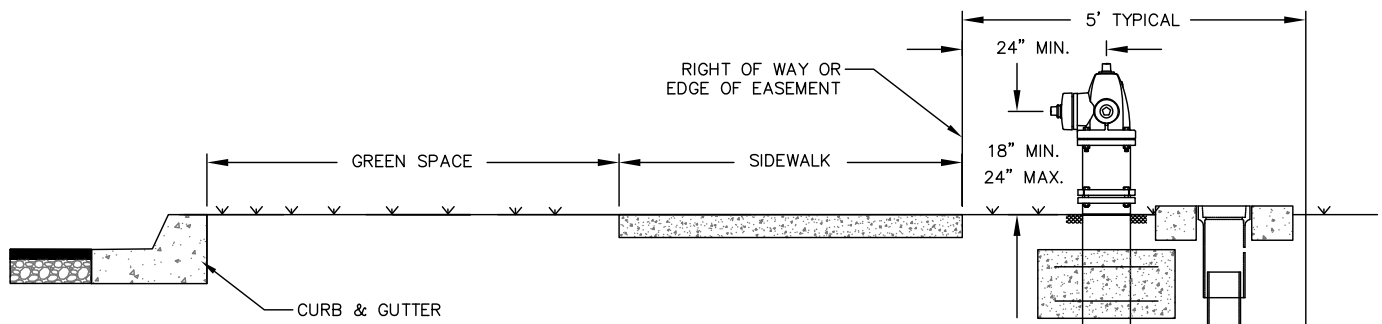


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SECTION: **WATER DETAILS**
DESCRIPTION: **FIRE HYDRANT AND VALVE CONNECTION**

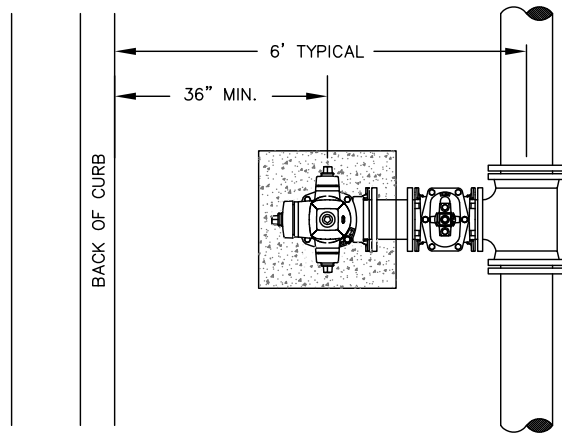
ISSUE DATE: **SEPTEMBER 2015**
REVISION DATE:

SHEET: **W-10**

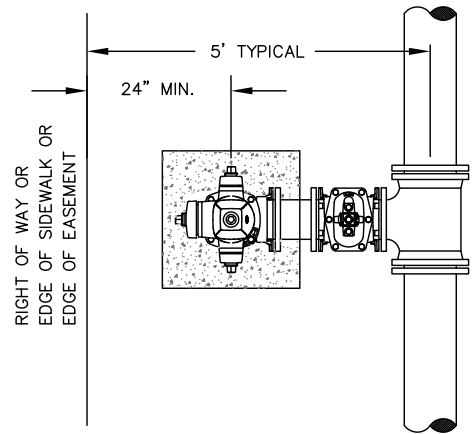


NOTES:

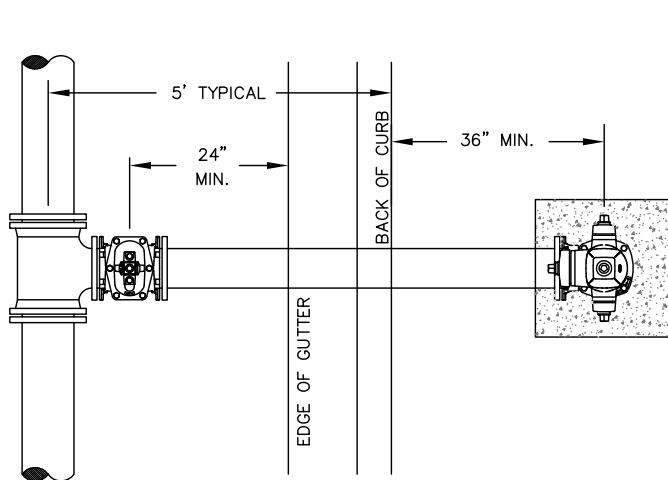
1. THE 6" GATE VALVE SHALL BE POSITIVELY RESTRAINED TO THE MAIN BY THE USE OF EITHER A SWIVEL TEE OR FOSTER ADAPTER.
2. FIRE HYDRANTS SHALL BE DESIGNED FOR A MINIMUM 48" BURY.
3. EXTENSIONS SHALL BE WATEROUS K562 OR MUELLER A-320 WITH NO MORE THAN ONE EXTENSION PER HYDRANT.
4. IF SIDEWALK IS PRESENT, HYDRANT SHALL BE INSTALLED 2' MINIMUM BEHIND THE BACK OF SIDEWALK OR CURB. VALVES SHALL BE INSTALLED 1' MINIMUM BEHIND THE BACK OF THE SIDEWALK OR CURB.
5. DO NOT COVER UP WEEP HOLE WITH CONCRETE.
6. MJ RETAINER GLANDS WITH MEGALUGS ARE REQUIRED FOR ALL FITTINGS.
7. 6" DUCTILE IRON PIPE IS REQUIRED FOR ALL FIRE HYDRANT LEADS GREATER THAN 48-INCHES FROM THE MAIN VALVE.
8. AN ADDITIONAL GUARDIAN VALVE IS REQUIRED FOR ALL FIRE HYDRANT LEADS GREATER THAN 30 FEET IN LENGTH.



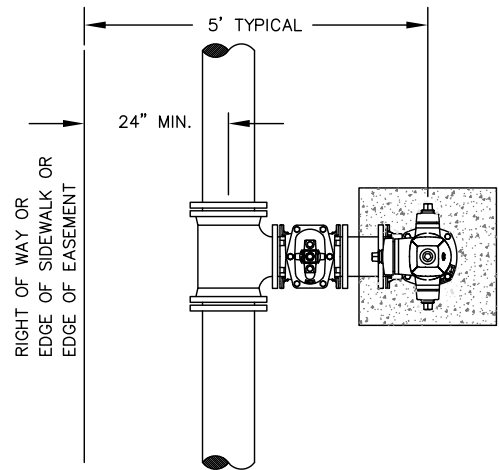
WATER LINE BEHIND CURB
INSIDE ROW



WATER LINE IN EASEMENT
OUTSIDE ROW



WATER LINE IN STREET
INSIDE ROW



WATER LINE IN EASEMENT
OUTSIDE ROW



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SECTION:

WATER DETAILS

DESCRIPTION:

FIRE HYDRANT PLACEMENT

ISSUE DATE:

SEPTEMBER 2015

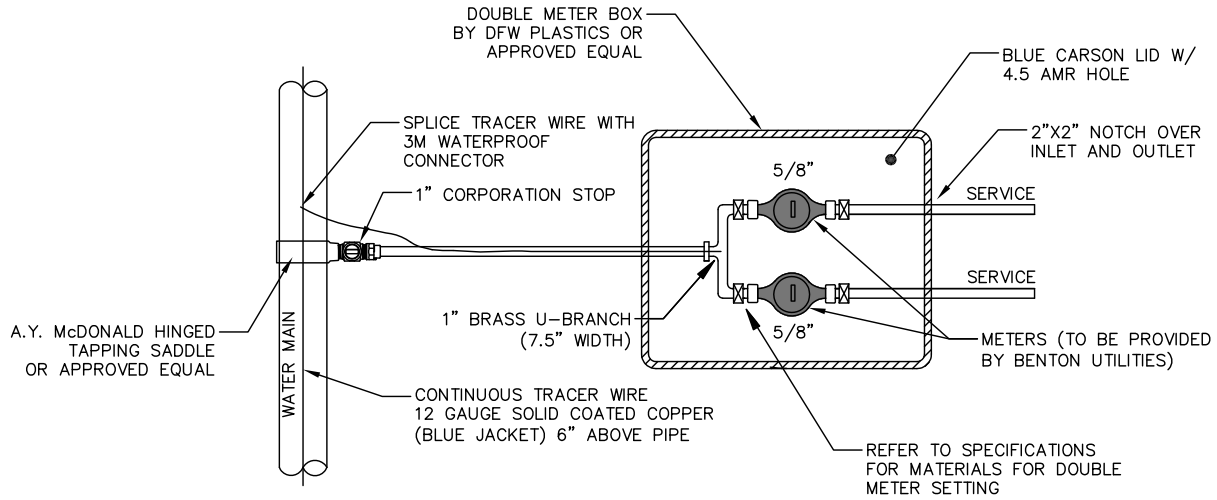
REVISION DATE:

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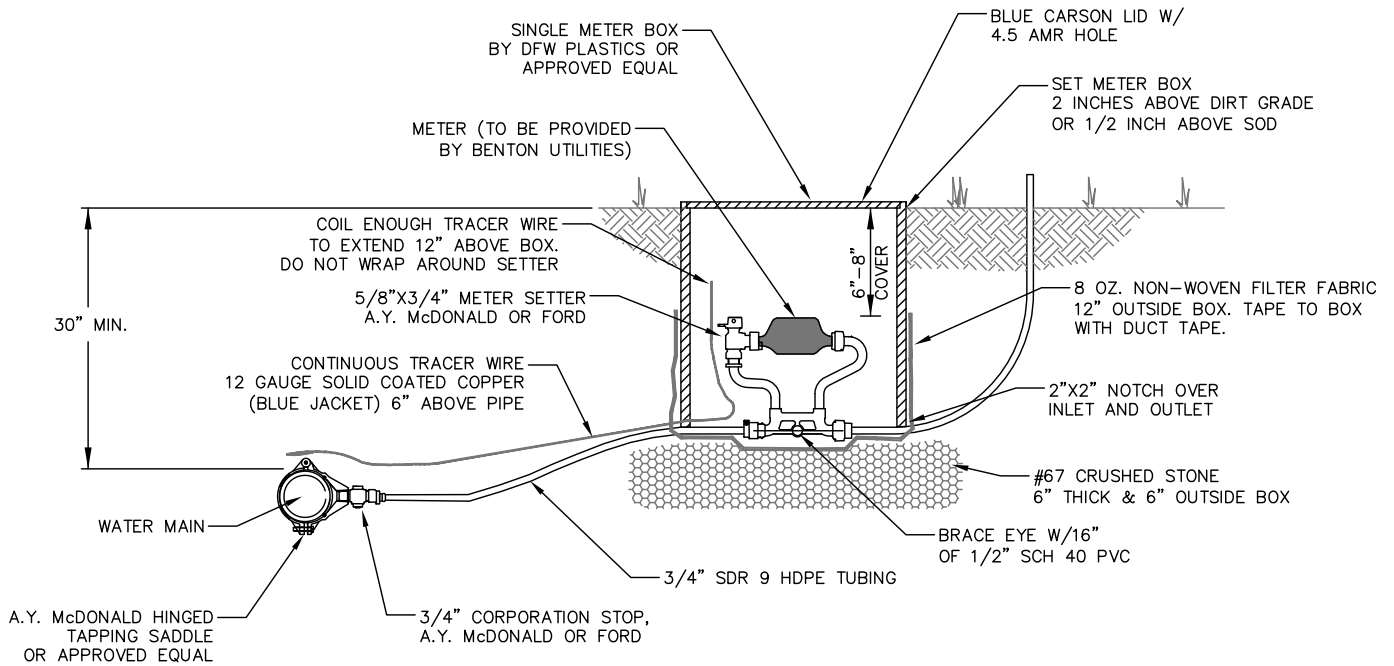
W-11

NOTES:

1. TRACER WIRE SHALL BE INSTALLED W/SERVICE LINE AND WRAPPED AROUND TAPPING CORP SEVERAL TURNS.
2. SERVICE LINE MATERIAL REMOVED FOR NEW CONSTRUCTION SHALL BE RETURNED TO BENTON UTILITIES
3. CUSTOMER METERS ARE NOT PERMITTED ON A.H.T.D. RIGHT-OF-WAY.
4. PRIOR TO INSTALLATION OF METERS, ALL SERVICE APPLICATIONS MUST BE COMPLETED AND APPROVED, SERVICE FEES PAID IN FULL, AND AS-BUILT DRAWINGS SUBMITTED AND APPROVED.
5. METERS WILL NOT BE SET PRIOR TO A SUCCESSFUL BACTERIOLOGICAL TEST.



DOUBLE METER SETTING



SINGLE METER SETTING



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SECTION:

WATER DETAILS

DESCRIPTION:

METER SETTINGS

ISSUE DATE:

SEPTEMBER 2015

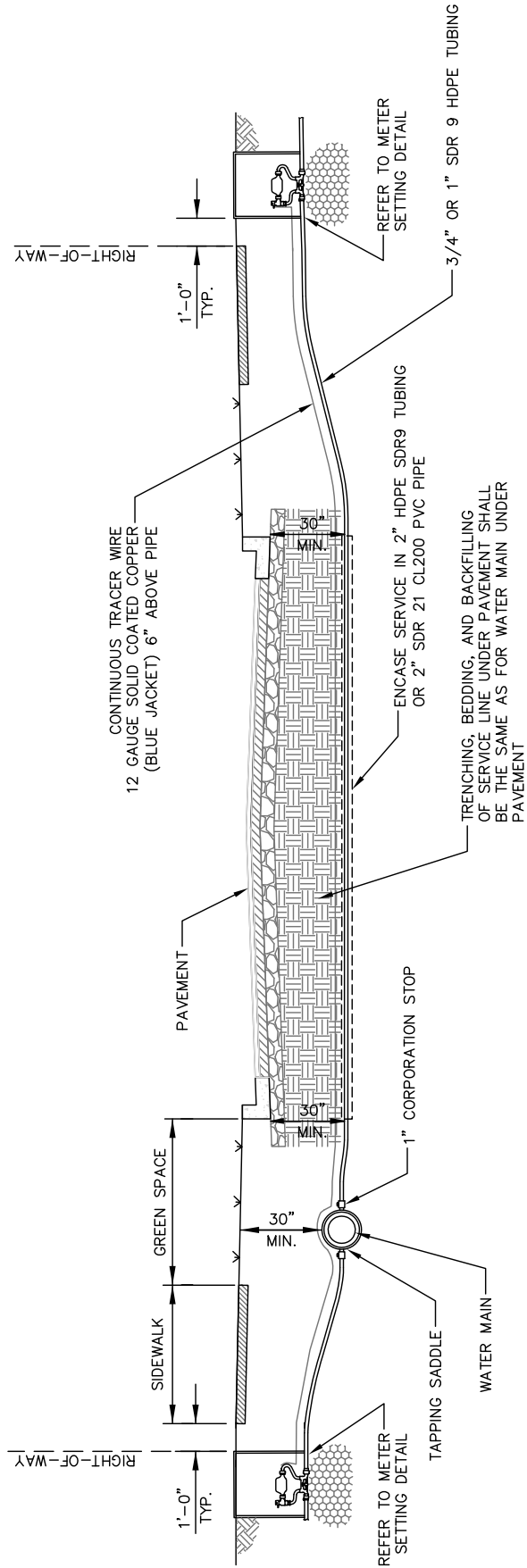
REVISION DATE:

SHEET:

W-12

NOTES:

1. ALL WATER AND SANITARY SEWER TRENCHES UNDER PROPOSED STREETS SHALL BE BACKFILLED AS SHOWN ON THE STANDARD DETAILS.
2. MINIMUM HORIZONTAL SEPARATION BETWEEN WATER LINES AND SEWER LINES SHALL BE 10 FEET.
3. MINIMUM VERTICAL SEPARATION BETWEEN WATER LINE AND SEWER LINE CROSSINGS SHALL BE 18" (WATER ON TOP)
4. 24-INCHES OF SEPARATION IS REQUIRED BETWEEN SERVICE TAPS.
5. ALL METER BOXES SHALL BE INSTALLED ON THE CUSTOMER SIDE OF THE WATER MAIN.



WATER SERVICE LINE
UNDER PAVEMENT

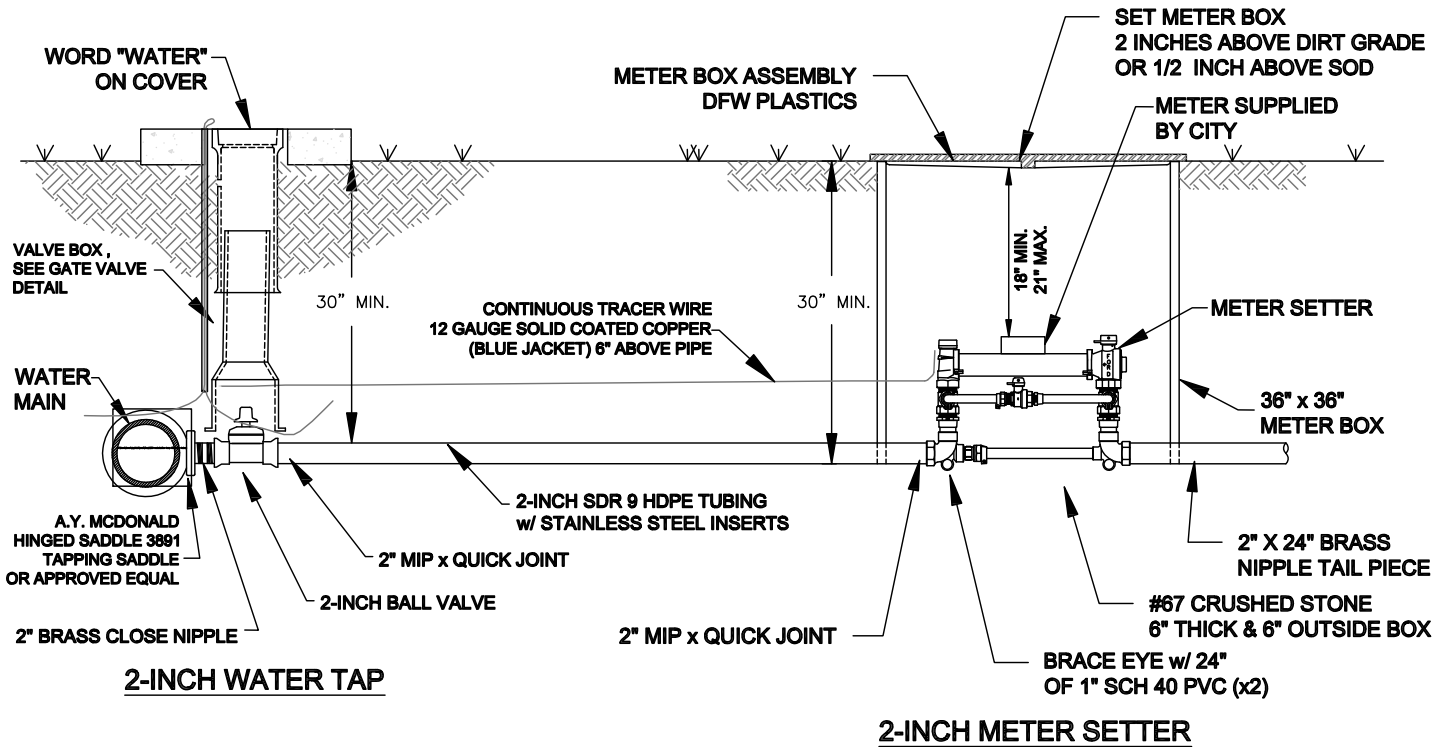


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SECTION: **WATER DETAILS**
DESCRIPTION: **WATER SERVICE LINE CROSSING**

ISSUE DATE: **SEPTEMBER 2015**
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SHEET: **W-13**



NOTES:

1. COORDINATE INSTALLATION AND CONFIGURATION OF ALL 1-1/2" AND LARGER METER SETTINGS WITH BENTON UTILITIES.
2. ALL METER BOXES SHALL BE INSTALLED IN NON-PAVED AREAS. ANY METER BOX THAT GETS PLACED IN A PAVED AREA SHALL BE RELOCATED AT THE OWNER'S EXPENSE BEFORE A WATER METER WILL BE INSTALLED.
3. SUPPORT METER INSTALLATION WITH 1"x24" SCH 40 PVC THROUGH EACH BRACE EYE.

2" WATER SERVICE AND WATER METER



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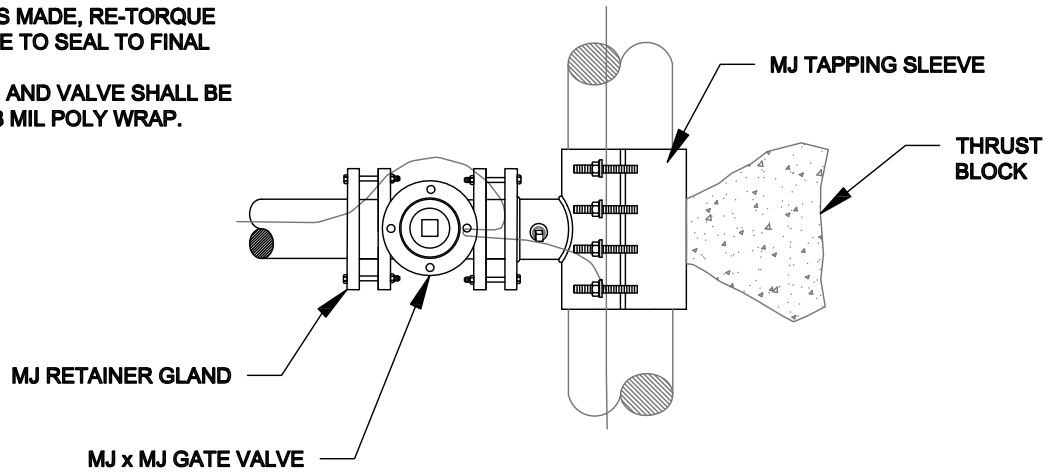
SECTION:	WATER DETAILS
DESCRIPTION:	2" WATER METER

ISSUE DATE:	SEPTEMBER 2015
REVISION DATE:	

SHEET:	W-14
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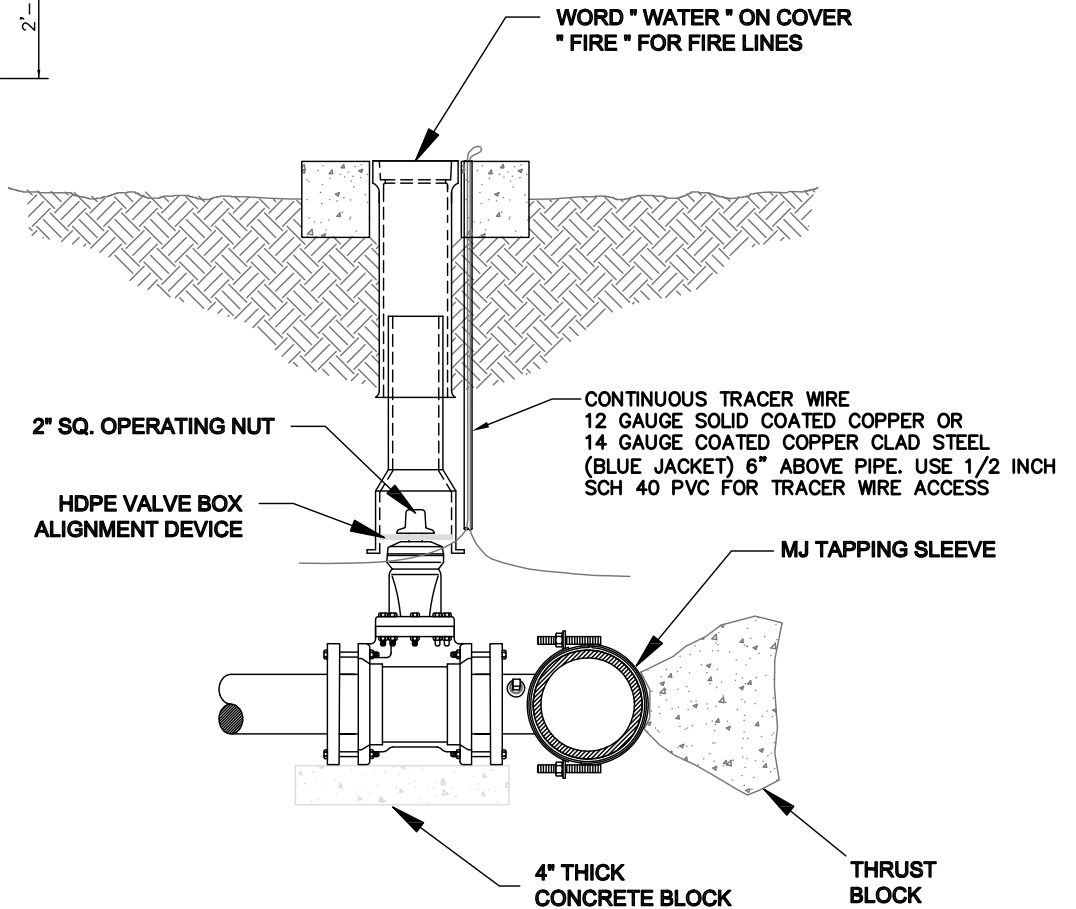
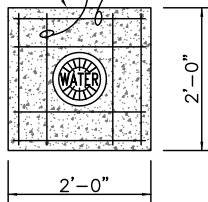
NOTES:

1. TAPPING SLEEVE SHALL BE SMITH-BLAIR 662 OR FORD FAST.
2. AFTER THE TAP IS MADE, RE-TORQUE BOLTS ON SLEEVE TO SEAL TO FINAL SHAPE OF PIPE.
3. TAPPING SLEEVE AND VALVE SHALL BE WRAPPED WITH 8 MIL POLY WRAP.



PLAN VIEW

2'x 2'x 4" CONCRETE PAD AROUND VALVE (TYP.)
 4-#4's EACH WAY CENTER IN SLAB (TYP.)



PROFILE VIEW

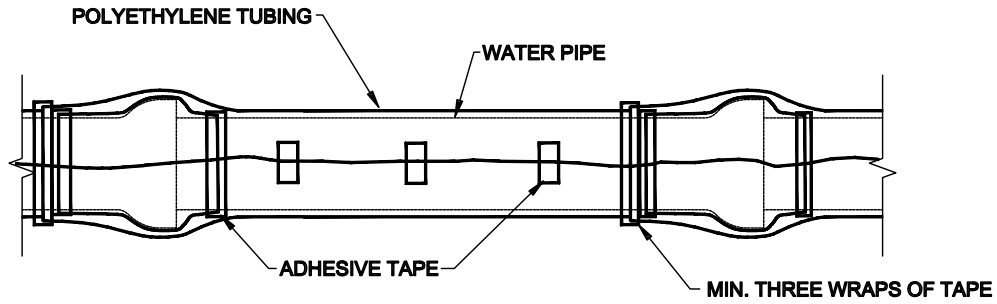


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SECTION: **WATER DETAILS**
 DESCRIPTION: **TAPPING SLEEVE AND VALVE**

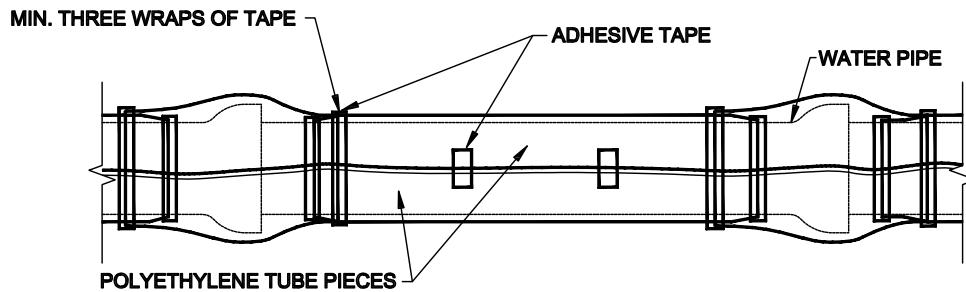
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 REVISION DATE:

SHEET:
W-15



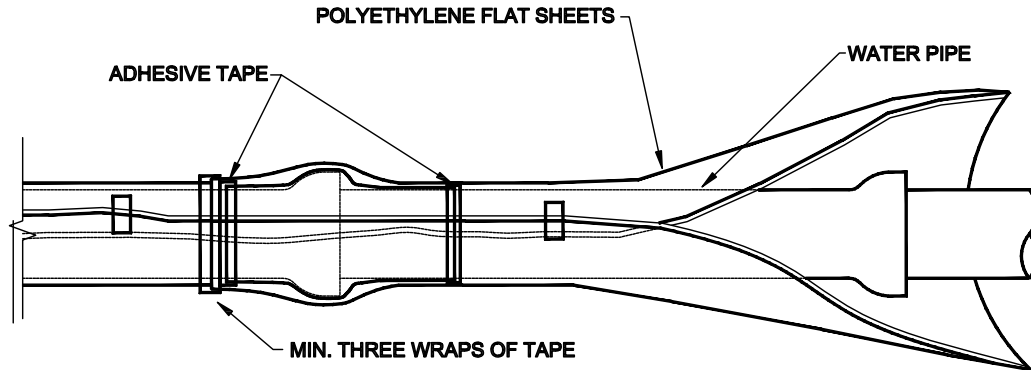
METHOD 'A'

METHOD 'A' USES ONE LENGTH OF POLYETHYLENE TUBE, OVERLAPPED AT THE JOINTS A MINIMUM OF 2 FEET.



METHOD 'B'

METHOD 'B' USES SEPARATE PIECES OF POLYETHYLENE TUBE FOR THE BARREL OF THE PIPE AND THE JOINTS. SHORT PIECES SHALL BE APPROXIMATELY 6' LONG AND OVERLAP BARREL SECTION BY A MINIMUM OF 2 FEET.



METHOD 'C'

METHOD 'C' - USED FOR PIPE-SHAPED AND ODD- SHAPED APPURTENANCES SUCH AS BENDS, REDUCERS, OFFSETS, VALVES, TEES, ETC.

ALL DUCTILE IRON PIPE AND FITTINGS SHALL BE POLY WRAPPED.

THE ANSI/AWWA C105/A21.5 STANDARD OUTLINES THREE METHODS OF INSTALLING POLYETHYLENE ENCASEMENT/ SLEEVING.

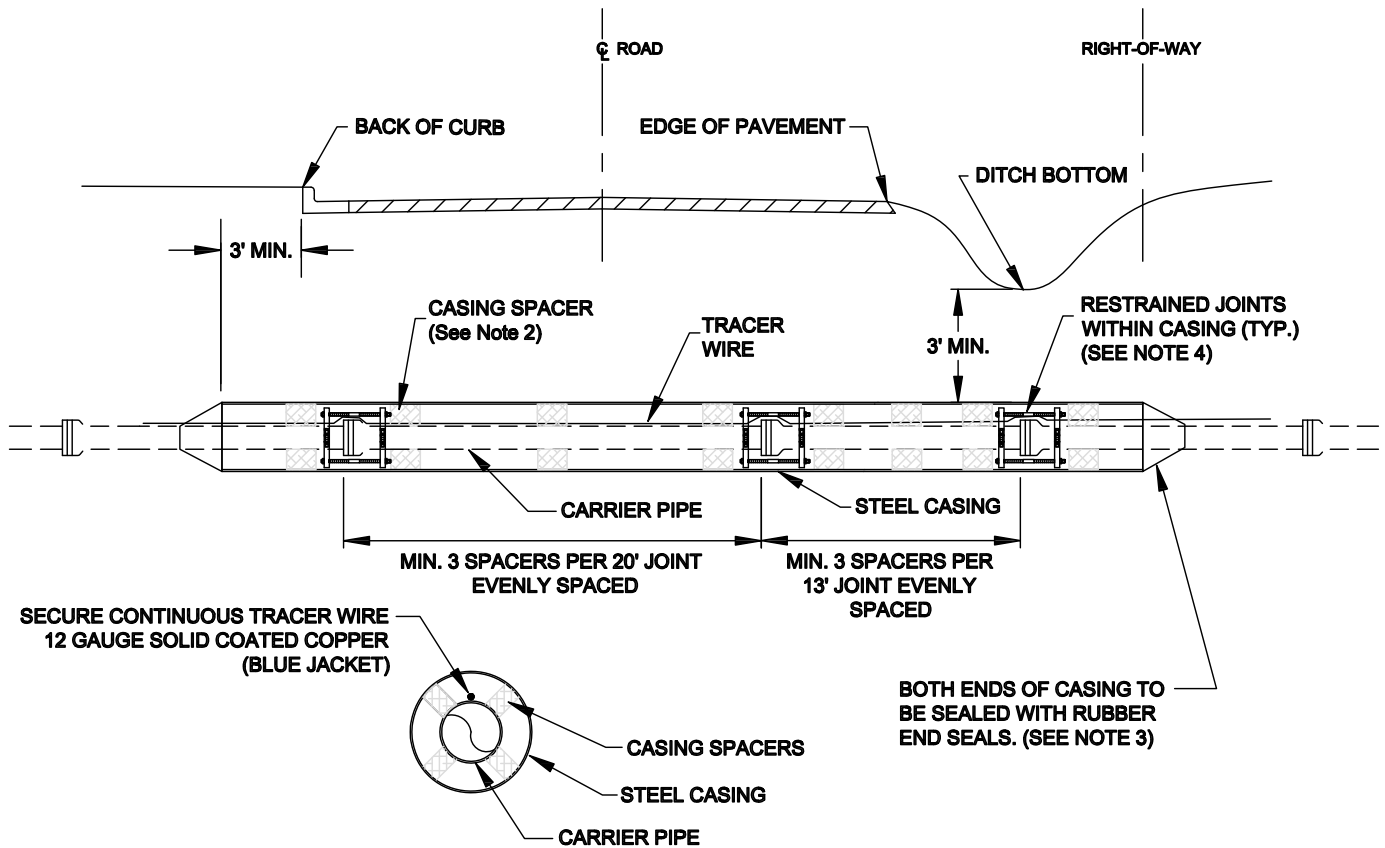


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SECTION:	WATER DETAILS
DESCRIPTION:	POLYETHYLENE PROTECTION MATERIAL

ISSUE DATE:	SEPTEMBER 2015
REVISION DATE:	

SHEET:	W-16
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NOTES:

1. STEEL CASING SHALL BE CONSTRUCTED OF SPIRAL OR STRAIGHT WELDED STEEL WITH A MINIMUM DIAMETER AND THICKNESS AS SHOWN BELOW (SEE TABLE).
2. PROVIDE CASING SPACERS BY CASCADE MODEL CCS AS MANUFACTURED BY CASCADE WATERWORKS MFG. CO., OR APPROVED EQUAL.
3. PROVIDE END SEALS BY CASCADE MODEL CCES AS MANUFACTURED BY CASCADE WATERWORKS MFG. CO., OR APPROVED EQUAL.
4. WHERE ENCASEMENTS ARE GREATER THAN 25 FEET IN LENGTH, SELF-RESTRAINING GASKETS OR BELL RESTRAINTS SHALL BE USED FOR ALL JOINTS INSIDE THE ENCASEMENT PIPE AND FOR THE FIRST JOINT IN EACH DIRECTION OUTSIDE THE ENCASEMENT PIPE.
5. BELL RESTRAINTS FOR PVC SHALL BE SERIES 1900 RESTRAINT HARNESS AND BELL RESTRAINTS FOR DIP SHALL BE SERIES 1700 RESTRAINT HARNESS BY EBAA IRON INC., OR APPROVED EQUAL.
6. DIRECT BURY STEEL ENCASEMENT SHALL BE POLY WRAPPED.
7. JACK AND BORE STEEL ENCASEMENT SHALL HAVE 17# HP MAGNESIUM ANODES CAD WELDED TO THE END OF THE ENCASEMENT PIPE.

CARRIER AND CASING SIZES							
CARRIER (ID)	2"	3"	4"	6"	8"	10"	12"
CASING (ID)	5"	6"	8"	12"	16"	20"	24"
CASING WALL THICKNESS	0.250	0.250	0.250	0.250	0.250	0.250	0.375
CARRIER (ID)	14" - 16"	18" - 20"	24"	30"	36"	42"	48"
CASING (ID)	30"	36"	42"	48"	54"	60"	72"
CASING WALL THICKNESS	0.375	0.500	0.625	0.625	0.625	0.625	0.750

STEEL ENCASEMENT

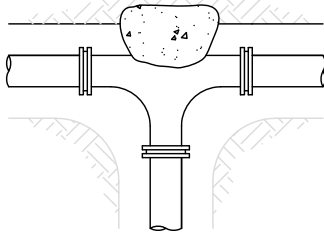


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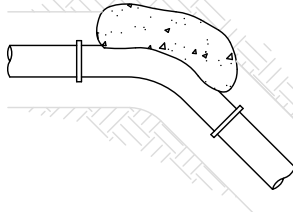
SECTION:	WATER DETAILS
DESCRIPTION:	
	STEEL ENCASEMENT

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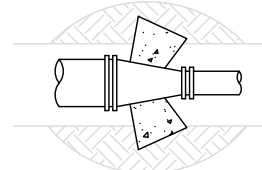
SHEET:
 W-17



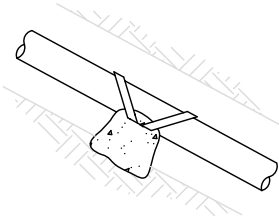
TEE



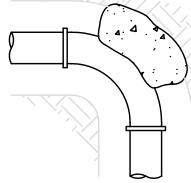
**11 1/4°, 22 1/2°
AND/OR 45° BEND**



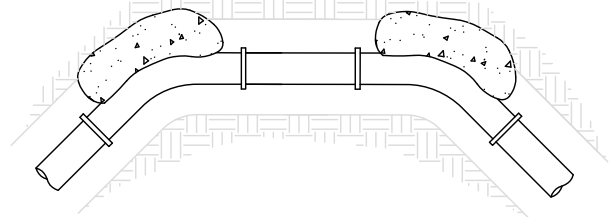
REDUCER



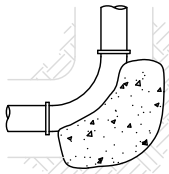
HORIZONTAL RUN



90° BEND *

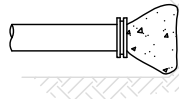


**USE 2-45° BENDS
IN PLACE OF 90° BEND**

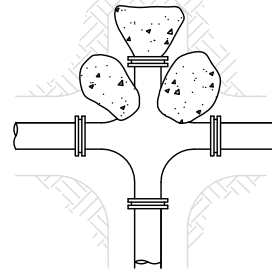


**VERTICAL RUN
SEE SHEET W18 FOR
VERTICAL TIE-DOWN BLOCKING**

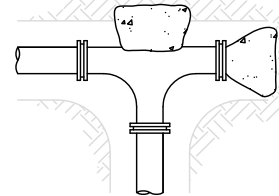
NATURAL
UNDISTURBED
SOIL TYP.



**END PLUG, CAP
OR BLIND FLANGE**



CROSS WITH PLUG



TEE WITH PLUG

THRUST BLOCK SCHEDULE												
(2000 PSF SOIL, 200 PSI WATER PRESSURE, 100 PSI WATER HAMMER)												
BEARING AREA OF THRUST BLOCKS IN SQ. FT. (HORIZONTAL BENDS)						VOLUME OF THRUST BLOCK IN CU. FEET (VERTICAL BENDS)						
FITTING SIZE	PLUG TEE OR CAP	BEND ANGLE				FITTING SIZE	BEND ANGLE				ROD DIAM.	EMBEDMENT
		90° *	45°	22 1/2°	11 1/4°		90° *	45°	22 1/2°	11 1/4°		
2, 3, & 4	1.9	2.7	1.4	0.7	0.4	2, 3, & 4	35.5	19.2	9.8	4.9	.50"	30"
6	5.6	7.9	4.3	2.2	1.1	6	105.8	57.2	29.2	14.7	.75"	30"
8	9.6	13.6	7.4	3.8	1.9	8	181.9	98.5	50.2	25.2	.75"	30"
12	20.5	29.0	16.7	8.0	4.0	12	387.1	209.5	106.8	53.7	1.0"	30"
16	35.7	50.4	27.3	13.9	7.0	16	672.6	364.0	185.6	93.2	1.0"	36"
18	44.8	63.4	34.3	17.5	8.8	18	844.7	457.2	233.1	117.1	1.0"	36"
24	78.4	110.9	60.0	30.6	15.4	24	1478.7	800.3	406.0	205.0	1.5"	36"

* 90 DEGREE BENDS SHALL ONLY BE USED ON A BY-EXCEPTION BASIS, AND MUST EACH BE SPECIFICALLY APPROVED BY CITY.

THRUST BLOCK NOTES:

1. CONCRETE FOR THRUST BLOCKS - CLASS A CONCRETE SHALL DEVELOP NOT LESS THAN 3000 P.S.I. COMPRESSIVE STRENGTH AT 28 DAYS AND BE PLACED AGAINST UNDISTURBED SOIL.
2. ALL BENDS, BOTH HORIZONTAL AND VERTICAL, SHALL BE BACKED WITH CONCRETE. VERTICAL BENDS SHALL BE PLACED ON CONCRETE PADS WHERE BENDS TURN UP, OR LOADED WHERE BENDS TURN DOWN.
3. WRAP PIPE JOINTS IN 8 MIL "POLYETHYLENE" BEFORE PLACING CONCRETE.
4. BEARING AREA SHOWN IN TABLE, IS BASED UPON A 2000 LB/SF. SOIL BEARING, AND UPON A PIPELINE PRESSURE OF 200 psi. PLUS 100 psi. WATER HAMMER. AREAS SHOWN SHALL BE ADJUSTED, SHOULD FIELD CONDITIONS VARY.
5. MJ RESTRAINTS ARE REQUIRED FOR ALL FITTINGS.
6. USE LONG-RADIUS FITTINGS WHEREVER POSSIBLE.
7. ALL BOLTS FOR FITTINGS SHALL BE 316 STAINLESS STEEL.
8. ALL DUCTILE IRON FITTINGS SHALL BE FUSION-BONDED EPOXY COATED INSIDE AND OUTSIDE IN ACCORDANCE WITH ANSI/AWWA C118/A21.16.
9. UNIT WEIGHT OF CONCRETE FOR VERTICAL THRUST BLOCKS IS 150 LBS/CU. FT.

THRUST BLOCKING



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1827 Dale Ave.
Benton, AR 72015
Phone: (501) 776-5984

SECTION: **WATER DETAILS**
DESCRIPTION: **THRUST BLOCKING**

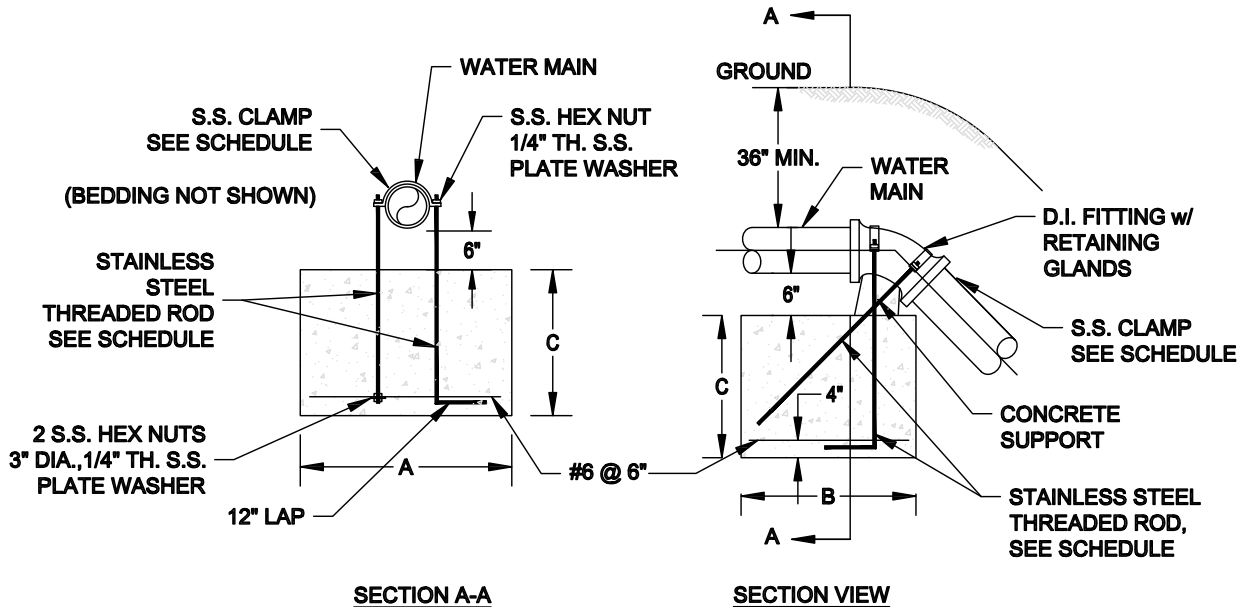
ISSUE DATE: **SEPTEMBER 2015**
REVISION DATE:

SHEET: **W-18**

BLOCKING SCHEDULE					
PIPE SIZE	BENDS			ROD DIA.	
		45°	22 1/2°		
	VOLUME REQ'D (CU. FT.)	98.5	50.2	25.2	
8"	A (FT.)	5.00'	4.00'	3.00'	3/4 IN.
	B (FT.)	4.00'	3.20'	2.80'	
	C (FT.)	5.00'	4.00'	3.00'	
	MIN. CLAMP (2 EA.)	3/8 IN. x 2 IN.			
	VOLUME REQ'D (CU. FT.)	209.5	106.8	53.7	
12"	A (FT.)	6.00'	5.00'	4.00'	3/4 IN.
	B (FT.)	6.00'	4.25'	3.50'	
	C (FT.)	6.00'	5.00'	4.00'	
	MIN. CLAMP (2 EA.)	1/2 IN. x 2 IN.			
	VOLUME REQ'D (CU. FT.)	457.2	233.1	117.1	
18"	A (FT.)	8.00'	6.50'	5.00'	1 IN.
	B (FT.)	7.25'	5.50'	4.75'	
	C (FT.)	8.00'	6.50'	5.00'	
	MIN. CLAMP (2 EA.)	5/8 IN. x 3 IN.			
	VOLUME REQ'D (CU. FT.)	800.3	408.0	205.0	
24"	A (FT.)	9.50'	7.50'	6.00'	1 1/4 IN.
	B (FT.)	9.00'	7.25'	5.75'	
	C (FT.)	9.50'	7.50'	6.00'	
	MIN. CLAMP (2 EA.)	5/8 IN. x 3 IN.			

VOLUME CALCULATED ON THE BASIS OF CONCRETE REACTING THRUST ON THE RESPECTIVE BENDS UNDER AN INTERNAL PRESSURE OF 250 PSI, 50 PSI SURGE AND THE WEIGHT OF CONCRETE IS 150 POUNDS PER CU. FT.

ALL FITTINGS SHALL BE MECHANICAL JOINTS WITH RETAINING GLANDS. BEDDING NOT SHOWN



VERTICAL TIE-DOWN BLOCKING



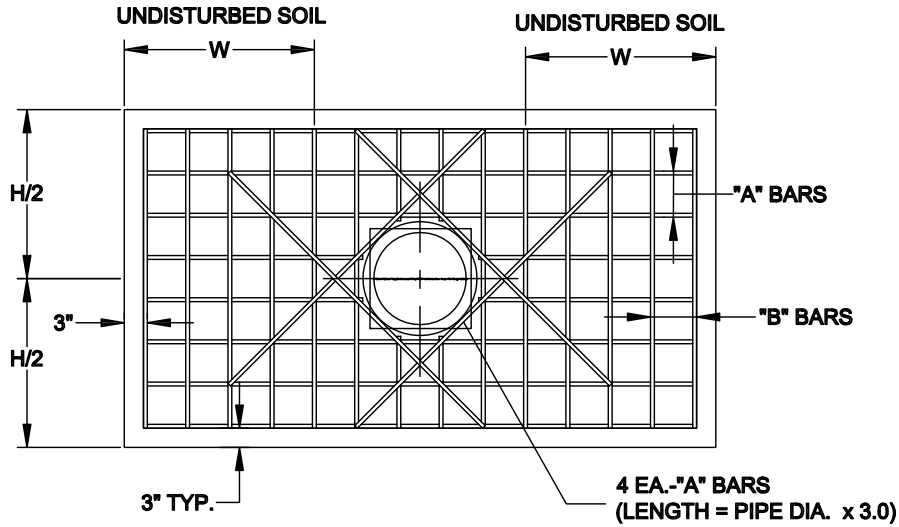
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 Benton, AR 72015
 Phone: (501) 776-5984

SECTION: WATER DETAILS
 DESCRIPTION: VERTICAL TIE-DOWN BLOCKING

ISSUE DATE: SEPTEMBER 2015
 REVISION DATE:

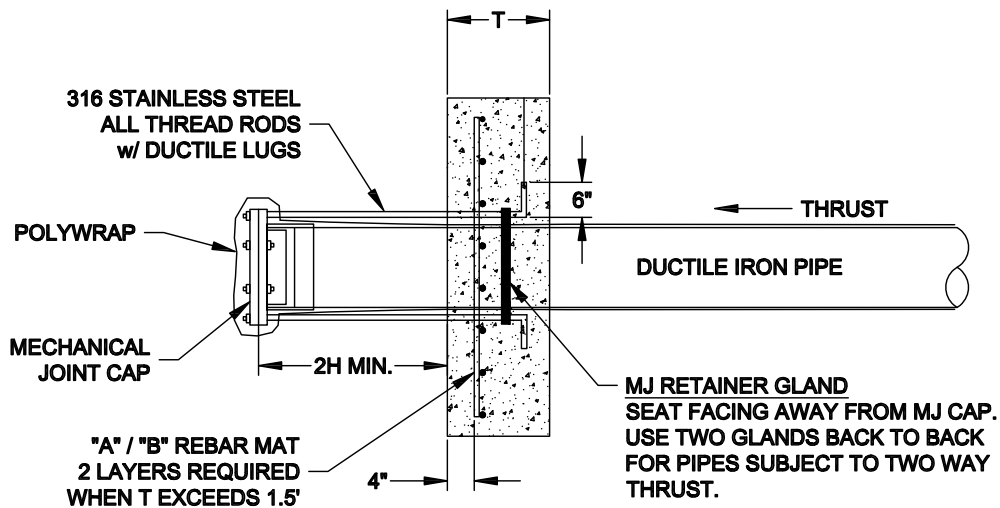
SHEET: W-19

ANCHOR COLLAR SCHEDULE					
PIPE SIZE	* MINIMUM DIMENSIONS *			REINFORCING BARS	
	W	H	T	"A" BARS	"B" BARS
6"	1.5'	2.0'	1.0'	#6 @ 6"	#6 @ 6"
8"	2.0'	2.5'	1.0'	#6 @ 6"	#6 @ 6"
12"	2.5'	4.0'	1.5'	#6 @ 6"	#6 @ 6"
16"	3.5'	5.0'	1.5'	#6 @ 6"	#6 @ 6"
20"	5.0'	5.5'	2.0'	#6 @ 6"	#6 @ 6"
24"	6.5'	6.0'	2.0'	#7 @ 6"	#7 @ 10"



NOTES:

1. DESIGN PRESSURE IS 200 PSI PLUS 100 PSI SURGE AND 2,000 PSI SOIL BEARING.
2. ALL DIMENSIONS ARE MINIMUM REQUIREMENTS. ACTUAL FIELD CONDITIONS MAY REQUIRE LARGER DIMENSIONS.
3. ALL RETAINER GLANDS SHALL BE MEGA-LUG BY EBAA IRON.

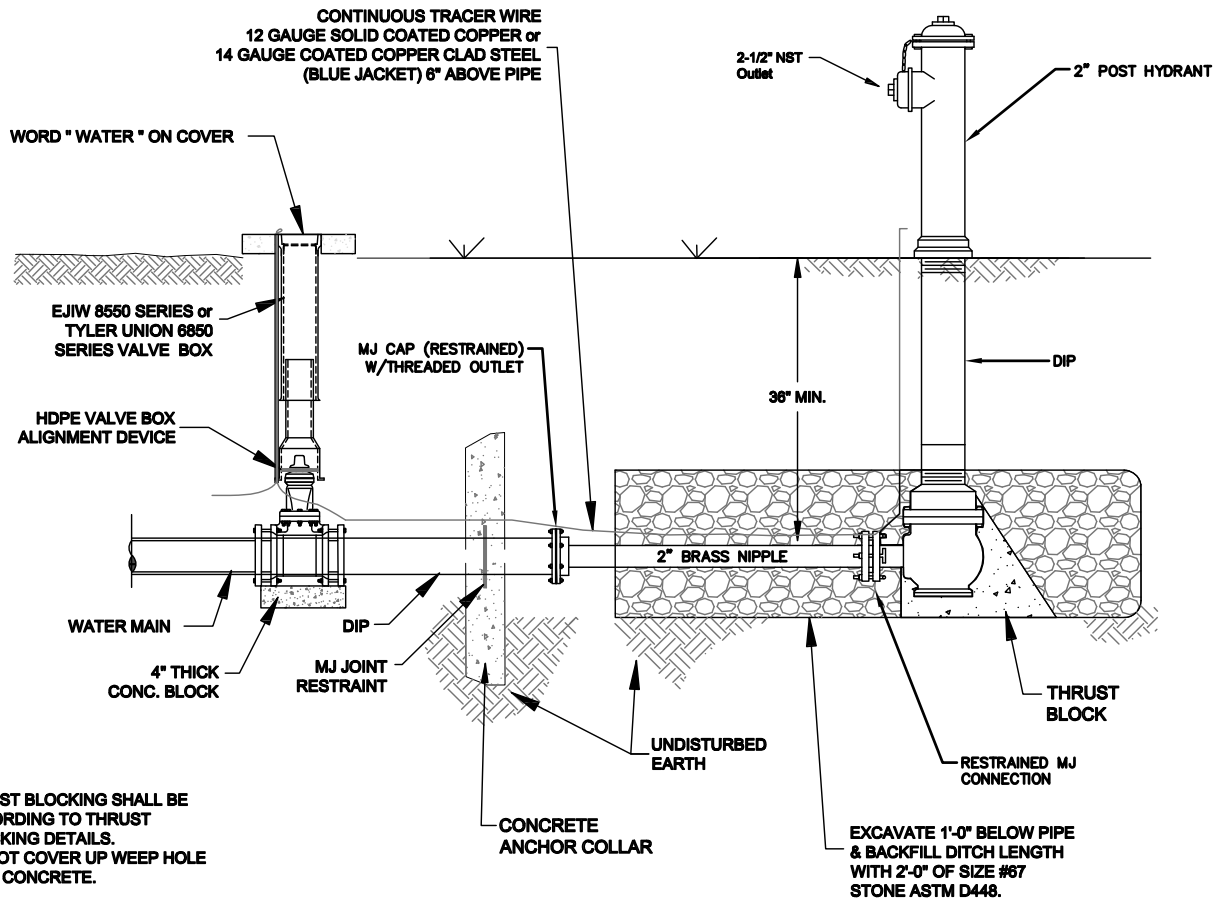


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SECTION: WATER DETAILS
 DESCRIPTION: ANCHOR COLLAR

ISSUE DATE: SEPTEMBER 2015
 REVISION DATE:

SHEET: W-20



BLOW-OFF ASSEMBLY



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SECTION: WATER DETAILS
DESCRIPTION: BLOW-OFF ASSEMBLY

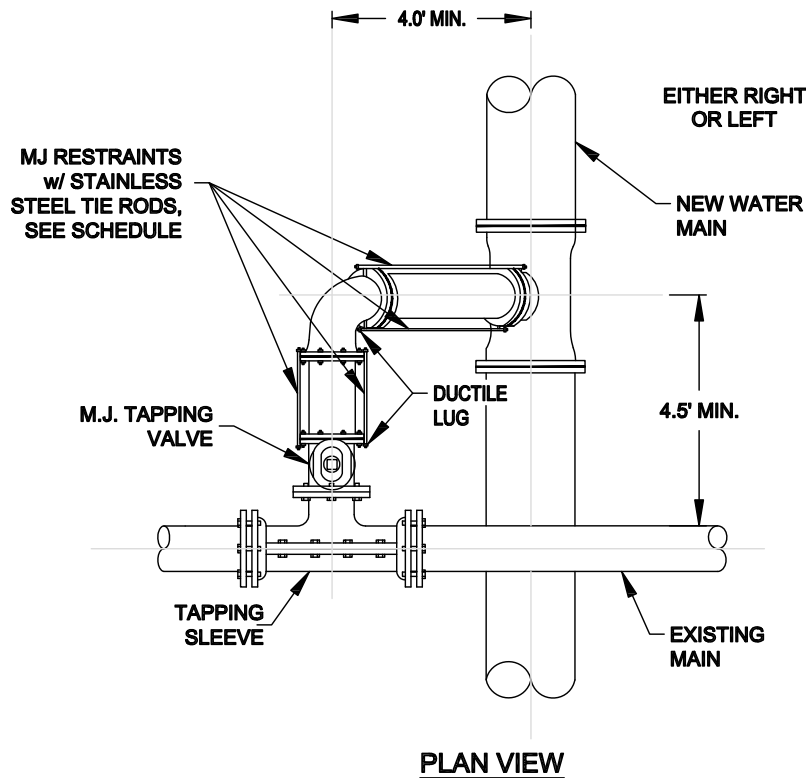
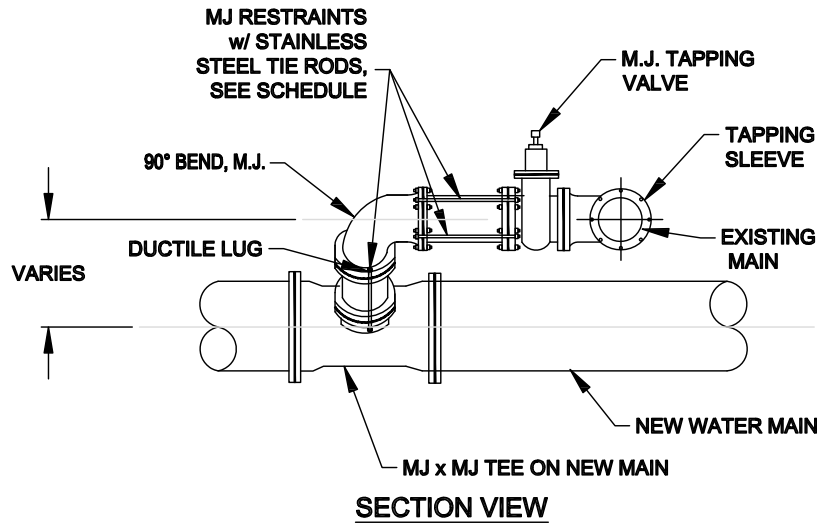
ISSUE DATE:
SEPTEMBER 2015
REVISION DATE:

SHEET:
W-21

NOTES:

1. SWING CONNECTIONS USING 90° BENDS SHALL BE PERMITTED BY THE CITY ON A CASE BY CASE BASIS.
2. CONTRACTOR SHALL LOCATE EXISTING MAIN IN ADVANCE OF LAYING NEW LINE IN ORDER TO ASSURE ADEQUATE LENGTH TO ADJUST DEPTH OF NEW MAIN.
3. DIMENSIONS SHOWN ARE RECOMMENDED MINIMUMS TO PROVIDE ADEQUATE ROOM FOR TIGHTENING BOLTS ON JOINTS (OTHER DIMENSIONS MAY BE USED).
4. PROVIDE ALL THREAD STAINLESS STEEL TIE RODS WITH DUCTILE LUGS FOR ANCHORING ALL JOINTS.
5. ROTATE TEE UP & ELBOW DOWN AS REQUIRED TO MATCH.
6. TRACER WIRE SHALL BE INSTALLED ON ALL NEW WATER LINES.
7. ALL FITTINGS, VALVES, AND DIP SHALL BE POLY WRAPPED.

SCHEDULE OF TIE RODS		
SIZE	NUMBER OF ROD PER FITTING	DIAMETER OF S.S. RODS
8"	4	3/4"
12"	4	3/4"



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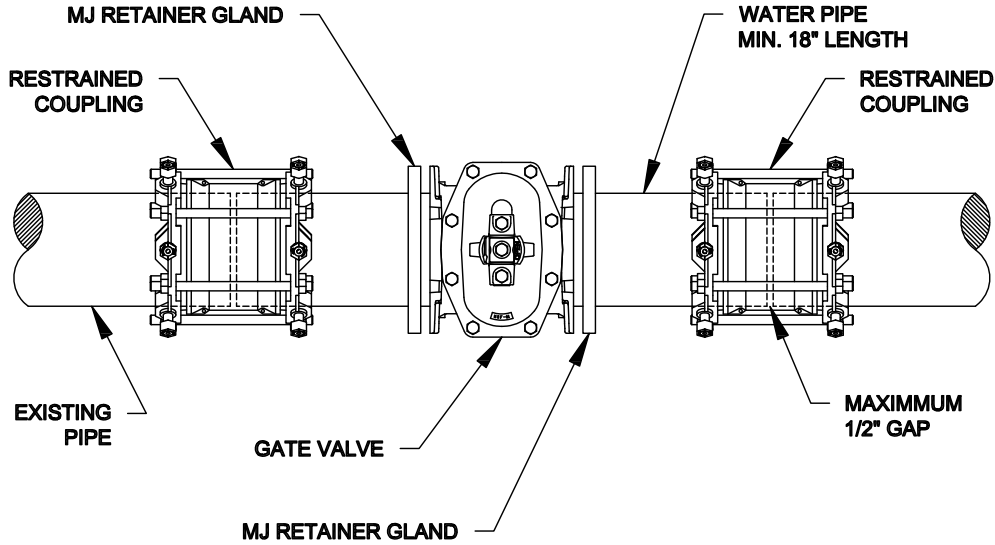
SECTION: **WATER DETAILS**
 DESCRIPTION: SWING CONNECTION-
 NEW MAIN TO EXISTING MAIN

ISSUE DATE:
 SEPTEMBER 2015
 REVISION DATE:

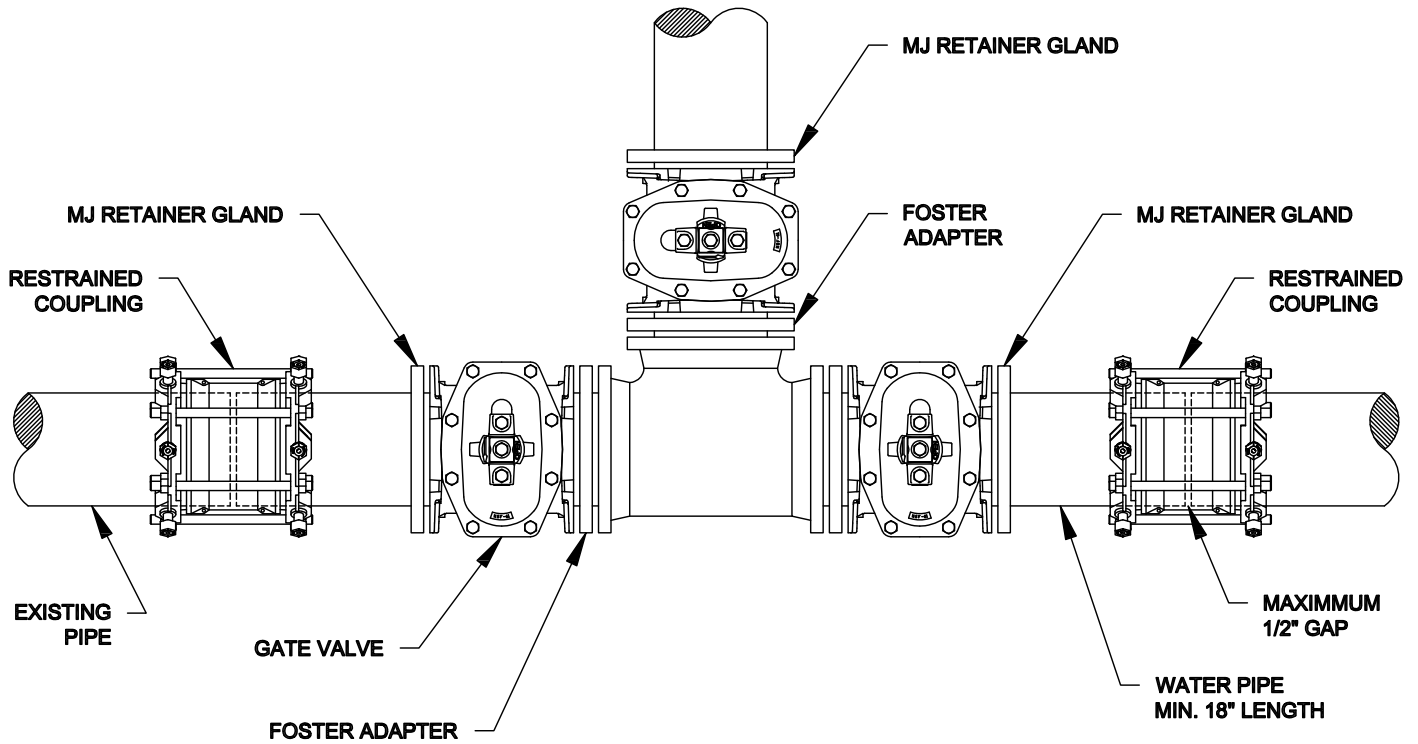
SHEET:
W-22

NOTES:

1. ALL VALVES SHALL BE SECURELY ANCHORED.
2. ALL HARDWARE SHALL BE 316 STAINLESS STEEL.
3. IF DEPTH OF BURY EXCEEDS 4 FT., A VALVE STEM EXTENSION SHALL BE REQUIRED. THE VALVE STEM EXTENSION NUT SHALL BE WITHIN 24-INCHES TO 12-INCHES OF THE FINISHED SURFACE.



VALVE CUT-IN



TEE AND VALVES CUT-IN



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 Phone: (501) 776-5984

SECTION: WATER DETAILS

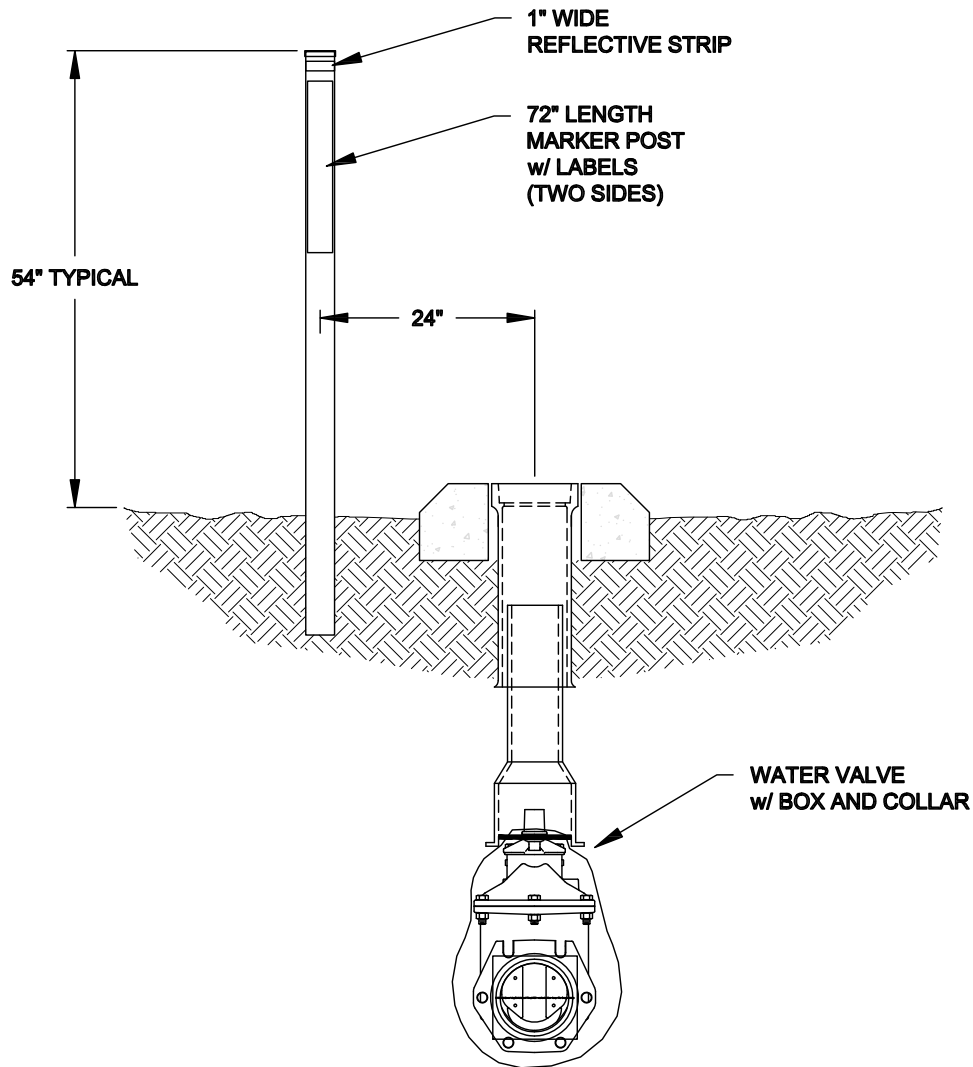
DESCRIPTION: VALVE CUT-IN

ISSUE DATE: SEPTEMBER 2015
 REVISION DATE:

SHEET: W-23

NOTES:

1. WATER LINE MARKERS SHALL BE TRI-VIEW MARKING SYSTEM BY RHINO MARKING AND PROTECTION SYSTEMS OR CARSONITE INTERNATIONAL DUAL-SIDED UTILITY MARKER (CIB-380).
2. THE UPPERMOST PORTION OF THE CARSONITE MARKER SHALL BE MADE OF VISIBILITY ENHANCER (CVE-360).
3. TRI-VIEW MARKERS DO NOT REQUIRE VISIBILITY ENHANCERS.
4. AN ADDITIONAL WHITE 1" WIDE REFLECTIVE TAPE (3M OR EQUAL) SHALL BE PLACED AROUND THE FULL CIRCUMFERENCE OF THE TOP OF THE MARKER.



VALVE MARKER

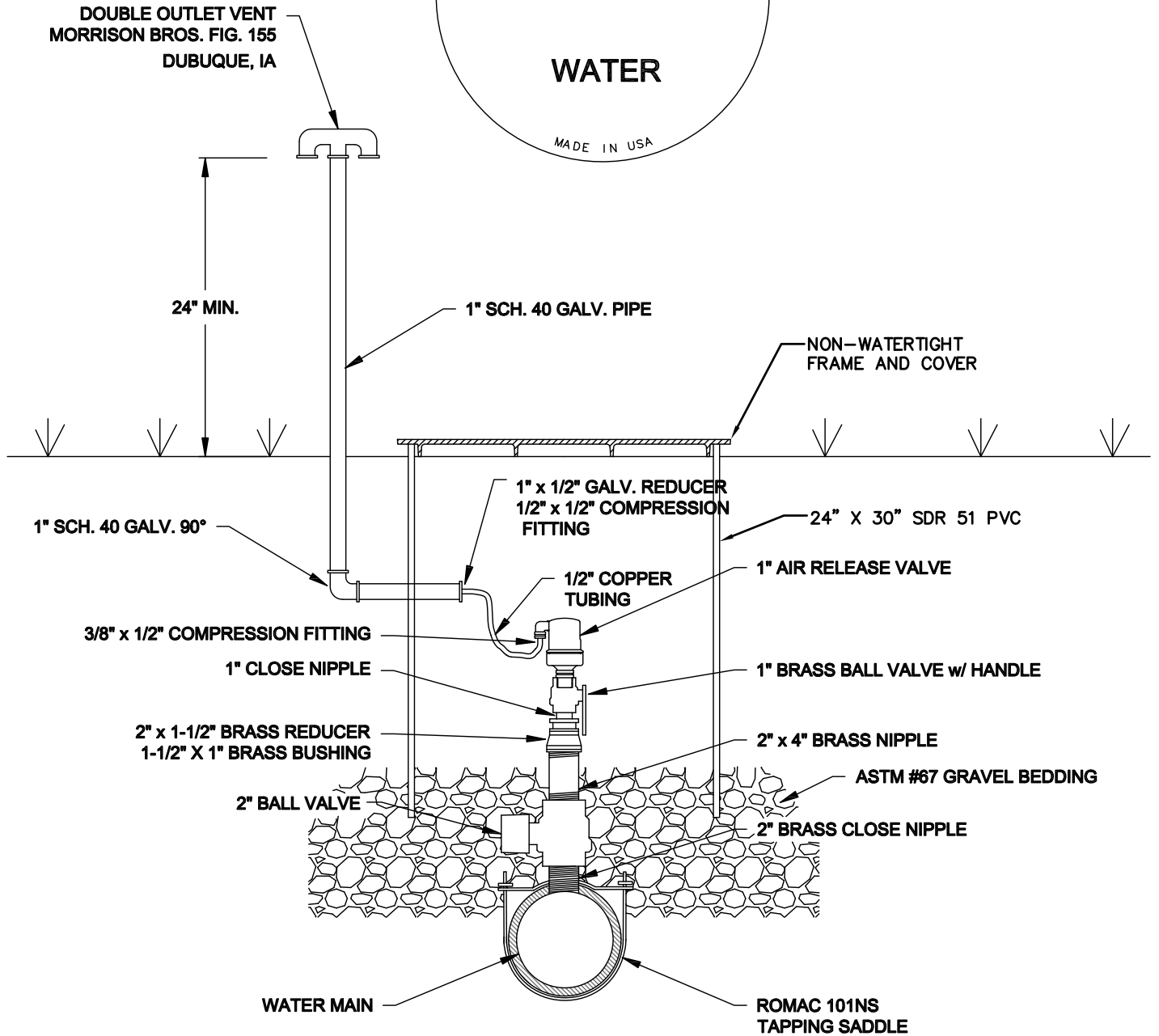


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SECTION: WATER DETAILS
DESCRIPTION: VALVE MARKER

ISSUE DATE: SEPTEMBER 2015
REVISION DATE:

SHEET: W-24



NOTES:

1. AIR VALVES SHALL HAVE NPT INLET AND OUTLETS.
2. TOP OF AIR VALVE SHALL BE MIN. 12" BELOW GROUND.
3. SEAL WALL PENETRATIONS WITH BUTYL SEALANT.

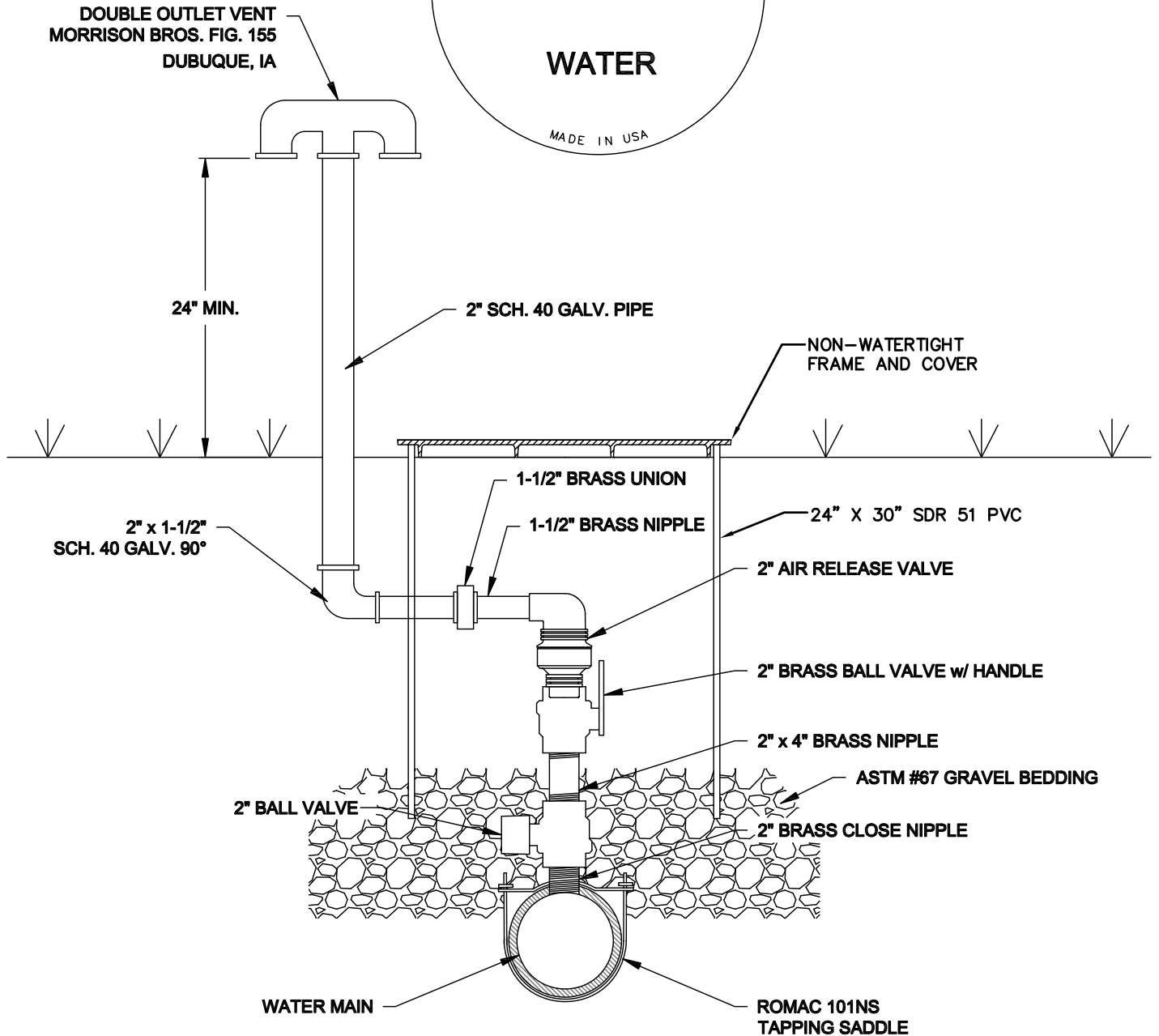
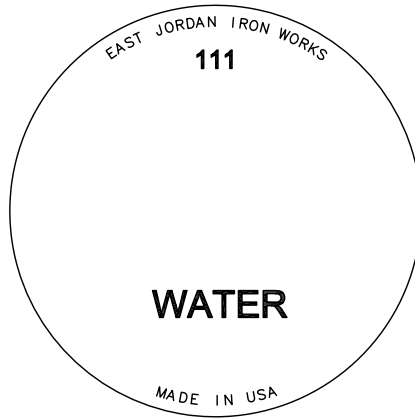


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SECTION:	WATER DETAILS	
DESCRIPTION:	1" COMBINATION AIR VALVE	

ISSUE DATE:	SEPTEMBER 2015
REVISION DATE:	

SHEET:
W-25



NOTES:

1. AIR VALVES SHALL HAVE NPT INLET AND OUTLETS.
2. TOP OF AIR VALVE SHALL BE MIN. 12" BELOW GROUND.
3. SEAL WALL PENETRATIONS WITH BUTYL SEALANT..



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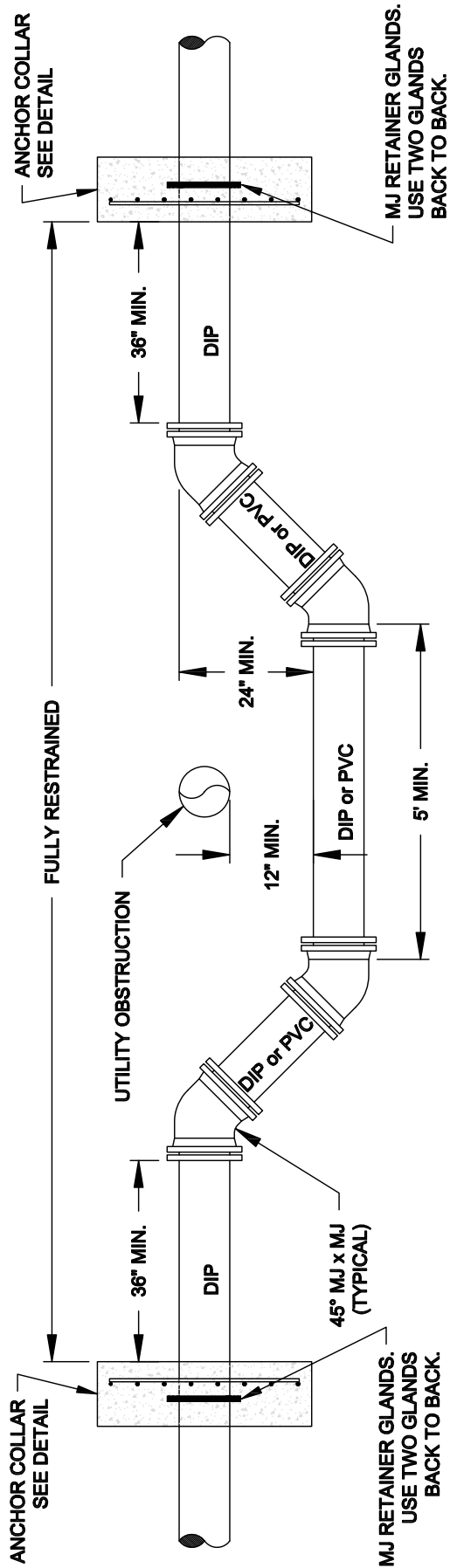
SECTION:	WATER DETAILS
DESCRIPTION:	2" COMBINATION AIR VALVE

ISSUE DATE:	SEPTEMBER 2015
REVISION DATE:	

SHEET:
W-26

NOTES:

1. THIS DETAIL IS FOR 12-INCH AND SMALLER WATER LINES. OTHER SIZES WILL HAVE TO HAVE A DETAILED DESIGN TO RESIST UPLIFT.
2. ALL PIPE AND FITTINGS SHALL BE FULLY RESTRAINED.
3. ALL HARDWARE SHALL BE 316 STAINLESS STEEL.
4. ALL DIP SHALL BE POLY WRAPPED.
5. ENCASEMENT IS REQUIRED IF WATER LINE HAS TO GO UNDER A SEWER LINE. ENCASEMENT SHALL EXTEND A MINIMUM OF 10' PAST THE EITHER EDGE OF THE SEWER LINE.



VERTICAL OFFSET



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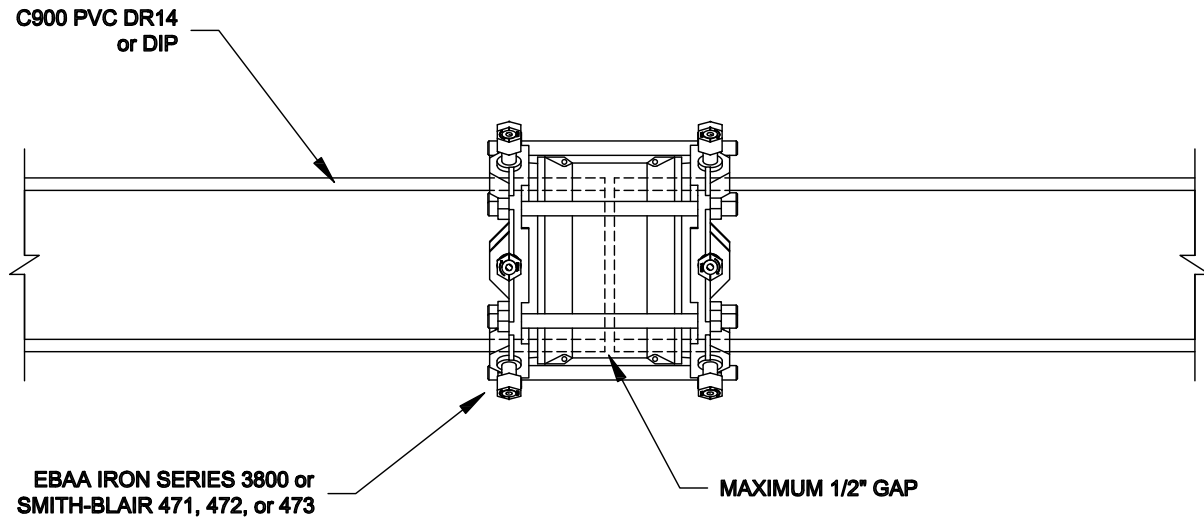
SECTION:	WATER DETAILS
DESCRIPTION:	
VERTICAL OFFSET	

ISSUE DATE:	SEPTEMBER 2015
REVISION DATE:	

SHEET:
W-27

NOTE:

RESTRAINED COUPLINGS SHALL BE USED WHEN JOINING TWO CUT PIECES OF PIPE, GENERALLY WHEN CUTTING IN VALVES AND TEES.



RESTRAINED COUPLING

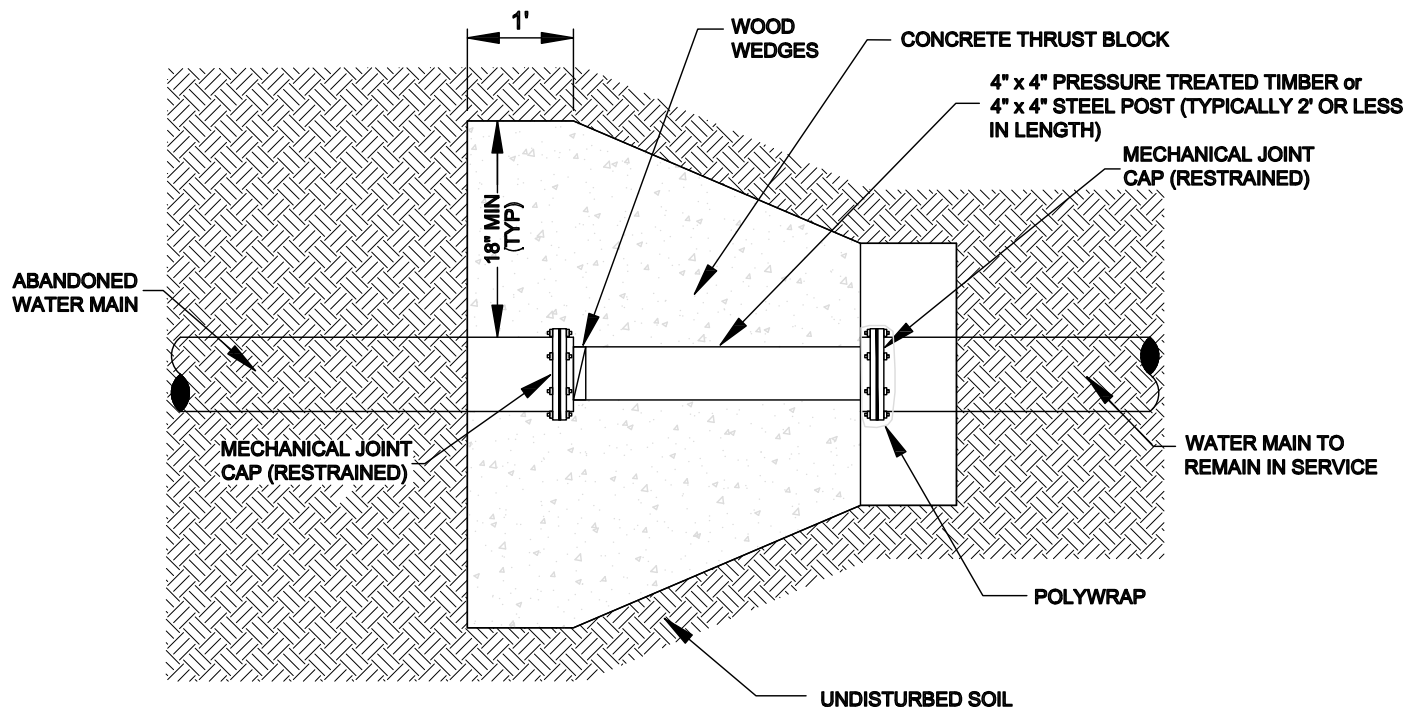


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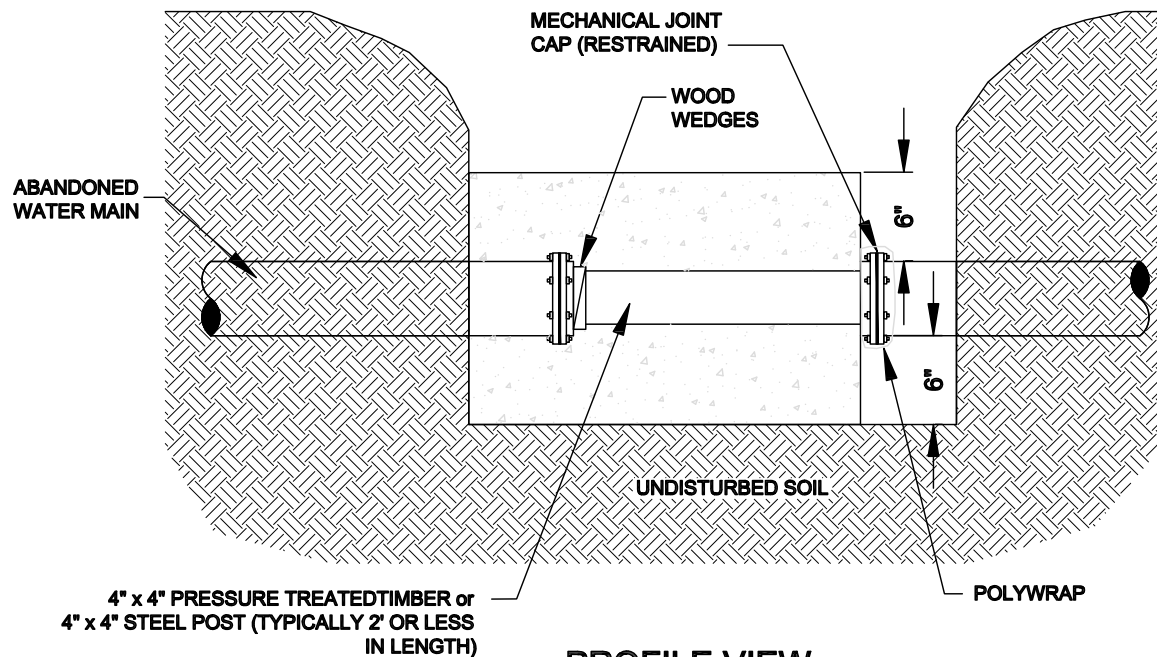
SECTION: WATER DETAILS
DESCRIPTION: RESTRAINED COUPLING

ISSUE DATE:
SEPTEMBER 2015
REVISION DATE:

SHEET:
W-28



PLAN VIEW



PROFILE VIEW

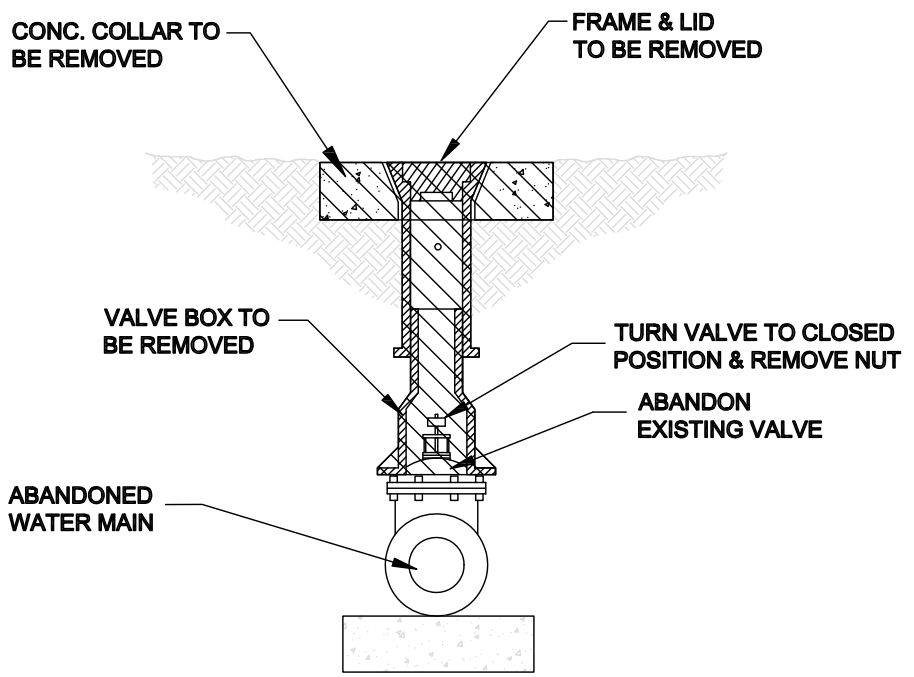


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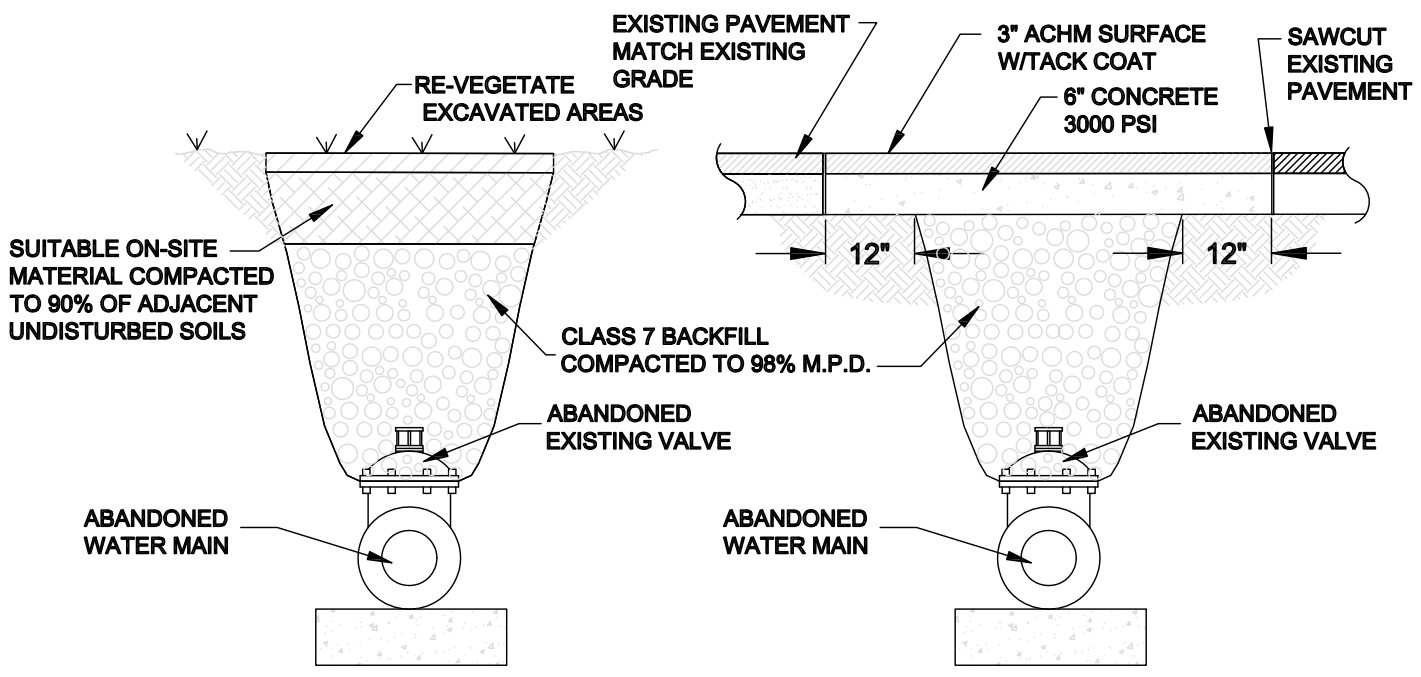
SECTION: **WATER DETAILS**
 DESCRIPTION: **CUT AND CAP WATER LINE**

ISSUE DATE: **SEPTEMBER 2015**
 REVISION DATE:

SHEET: **W-29**



ABANDON WATER VALVE



TRENCH AFTER VALVE BOX REMOVED (NON-PAVED AREA)

TRENCH AFTER VALVE BOX REMOVED (UNDER ASPHALT)



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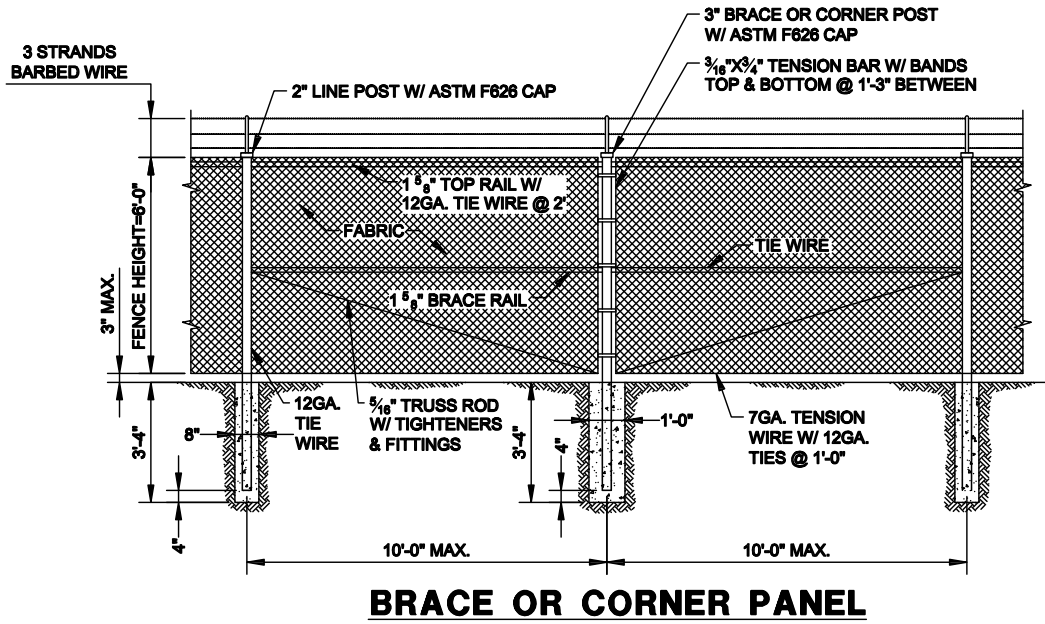
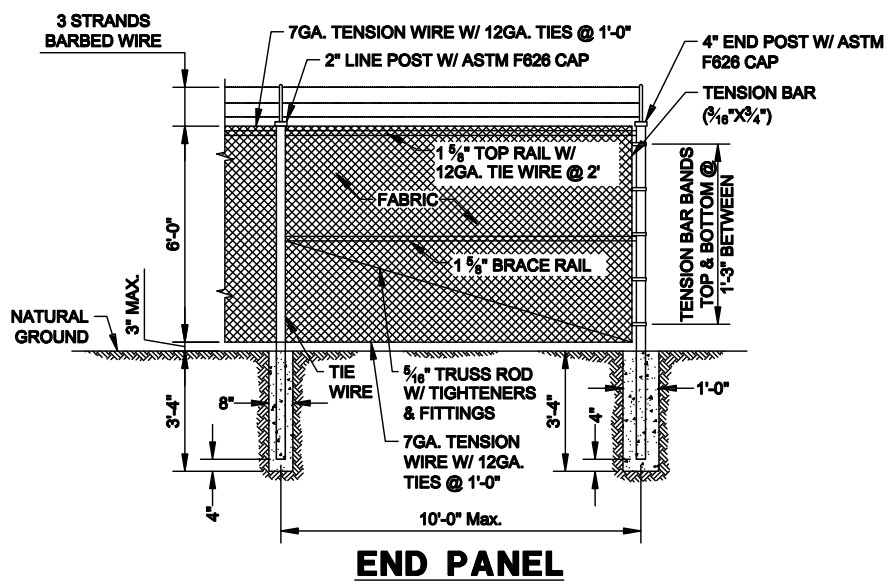
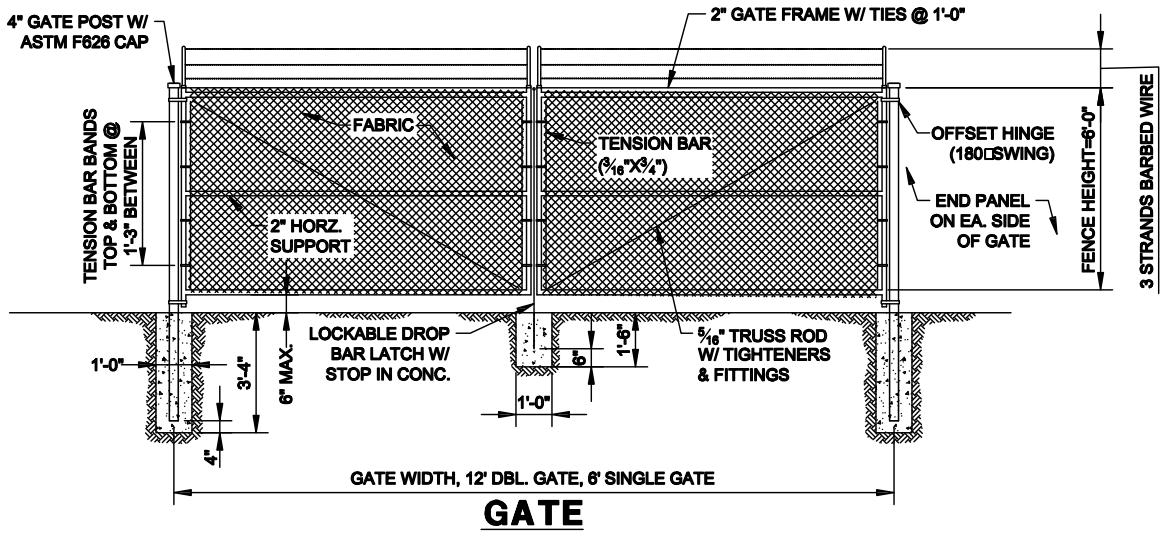
SECTION: **WATER DETAILS**

DESCRIPTION: **ABANDON WATER VALVE**

ISSUE DATE: **SEPTEMBER 2015**

REVISION DATE:

SHEET: **W-30**



BENTON UTILITIES
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SECTION: WATER DETAILS
 DESCRIPTION: CHAIN LINK FENCE DETAILS

ISSUE DATE: SEPTEMBER 2015
 REVISION DATE:

SHEET: W-31