



TYPICAL CONSTRUCTION DETAILS 2013

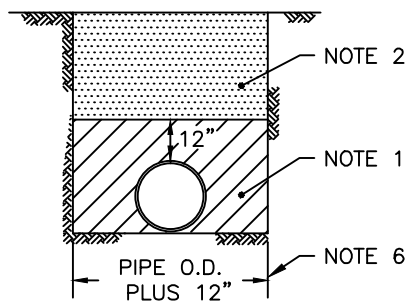
TABLE OF CONTENTS

<u>No.</u>	<u>Detail</u>
1	Pipe Trenching
2	Thrust Blocking
3	Concrete Restraining Block
4	Tieback Rod & Hairpin Rebar
5	Locator Wire
6	Gate Valve
7	Fire Hydrant
8	2" Connection to Main
9	End Cleanouts
10	End Cleanout at Tee or Cross
11	Side Cleanouts
12	Auto Flush Unit
13	1" Service Line Roadway Crossing
14	2" Service Line Roadway Crossing
15	Waterline Installation at Cul-de-sac
16	Typical Roadway Crossings
17	Encasement Pipe Spacer
18	Air Release Pit
19	Detector Check Valve Manhole
20	Water Sampling Station
21	Typical Stream Crossing

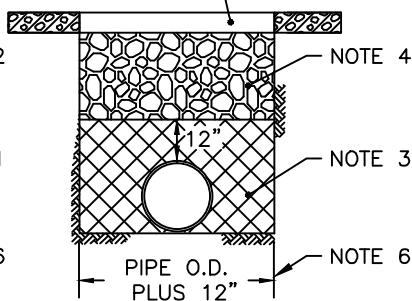
Drawing Name: W:\Proj\18000\18080\AutoCad\Standard Details\STANDARD_DETAILS_Feb_2013.dwg Layout Name: TRENCHING Plotted By: KAS00913 Plotted on: 2/26/2013 10:59:02 AM

MATCH EXISTING SURFACE FOR PRIVATE DRIVES.
USE PVMT PATCH DETAIL PER AGENCY REQUIREMENTS

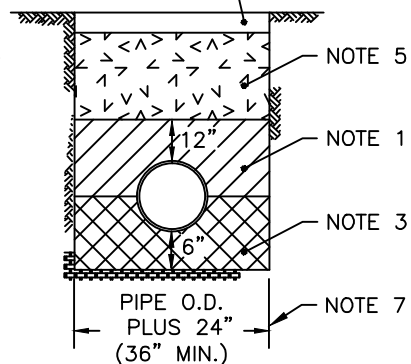
TOP 6" TO MATCH
EXISTING SURFACE



EARTH SECTION



ROAD CROSSING SECTION



ROCK SECTION

BEDDING AND BACKFILL NOTES:

1. SUITABLE EARTH EXCAVATED MATERIAL FREE FROM DEBRIS, MUCK, MUD BALLS, ROCK, AND HARD OBJECTS LARGER THAN 1" DIA. PIPE SHALL REST ON UNDISTURBED EARTH WITH CUTOUT FOR PIPE BELL.
2. SUITABLE EARTH EXCAVATED MATERIAL FREE FROM DEBRIS, MUCK, MUD BALLS, ROCK, AND HARD OBJECTS LARGER THAN 2" DIA.
3. WASTE ROCK 1/4" OR SMALLER.
4. FOR COUNTY ROAD USE 2.5" MINUS LIMESTONE ROCK. FOR OTHER ROADWAYS AND PRIVATE DRIVES USE 1" MINUS LIMESTONE ROCK, OR AS REQUIRED BY LOCAL JURISDICTION.
5. SUITABLE MIX OF EARTH EXCAVATED MATERIAL WITH NO MORE THAN 50% EXCAVATED ROCK NO LARGER THAN 4" SIZE.
6. ADDITIONAL TRENCH WIDTH AS REQUIRED TO INSTALL FITTINGS AND THRUST BLOCKS.
7. ADDITIONAL TRENCH WIDTH TO INSTALL FITTINGS AND THRUST BLOCKS TO BE PIPE O.D. PLUS 32" WITH A MINIMUM OF 42".

GENERAL NOTES:

1. BEDDING MATERIAL SHALL BE TAMPED IN LAYERS UNDER THE PIPE HAUNCHES AND AROUND THE PIPE TO TOP OF PIPE. TO PROVIDE A UNIFORM BEARING SURFACE.
2. ANY OVER EXCAVATION DUE TO REMOVAL OF UNSUITABLE MATERIAL IN THE BOTTOM OF THE TRENCH SHALL BE BACKFILLED WITH ACCEPTABLE MATERIAL AND COMPACTED.
3. COVER OVER THE PIPE SHALL BE 48" UNLESS OTHERWISE SHOWN ON THE PLANS.
4. LOCATOR WIRE, NOT SHOWN, SHALL BE INSTALLED ON ALL PIPE.
5. FOR ROCK SECTION, PROVIDE A 5' LONG EARTHEN DAM SECTION OF SUITABLE EARTH EXCAVATED MATERIAL FROM BOTTOM OF TRENCH TO TOP OF TRENCH A MINIMUM SPACING OF 100 FT, OR AS DIRECTED BY THE DISTRICT INSPECTOR.

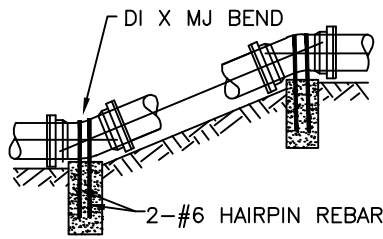
CONSOLIDATED WATER
Boone County, Missouri

BARTLETT & WEST
1719 SOUTHRIDGE DR.
JEFFERSON CITY, MO
PHONE 573-634-3181

**CPWSD NO. 1 OF BOONE COUNTY
PIPE TRENCHING DETAIL**

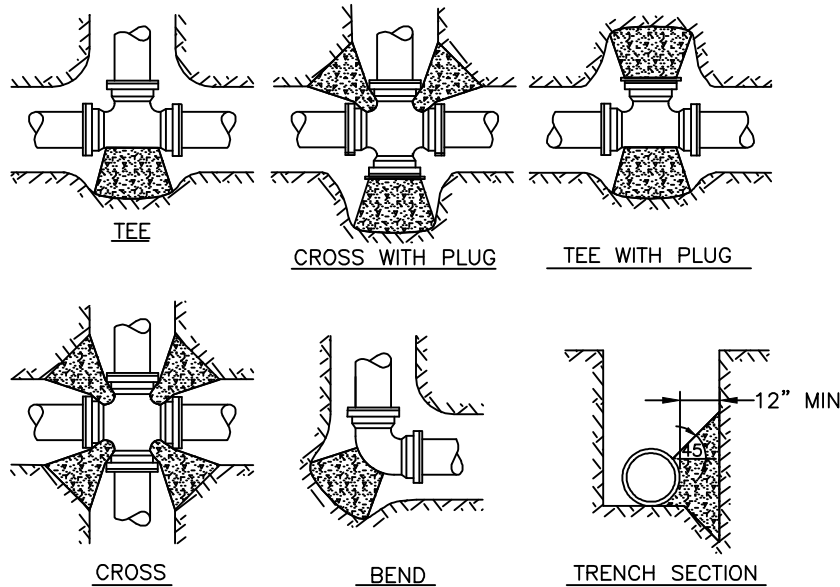
PROJ NO:
18080.000
DATE:
FEB 2013

DETAIL NUMBER
1



VERTICAL THRUST BLOCKS								
Pipe Size	Min. Volume of Concrete				Min. Bearing Area			
(in)	11.25 (cy)	22.5 (cy)	45 (cy)	90 (cy)	11.25 (sf)	22.5 (sf)	45 (sf)	90 (sf)
4	0.2	0.4	0.7	1.0	0.0	0.1	0.6	2.0
6	0.4	0.8	1.5	2.1	0.1	0.3	1.2	4.2
8	0.7	1.4	2.5	3.5	0.1	0.5	2.1	7.2
10	1.1	2.1	3.9	5.5	0.2	0.8	3.3	11.1
12	1.5	3.0	5.5	7.7	0.3	1.2	4.6	15.7

VERTICAL BEND THRUST BLOCK DETAIL



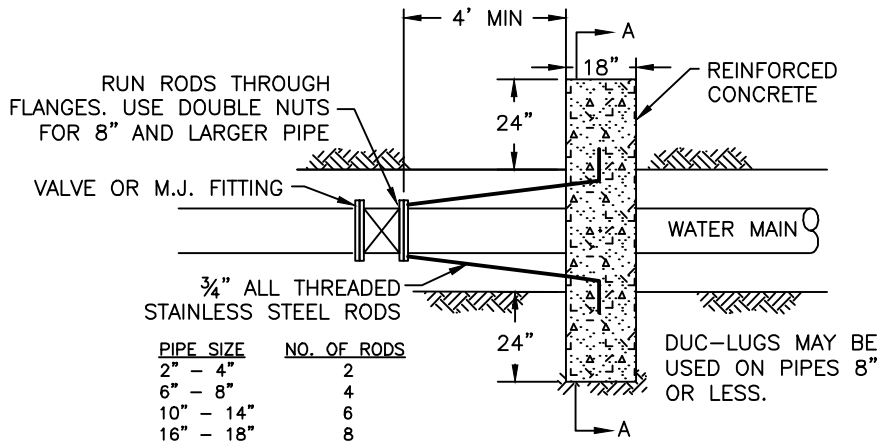
HORIZONTAL THRUST BLOCKS						
Pipe Size	Minimum Bearing Area					
(in)	11.25 (sf)	22.5 (sf)	45 (sf)	90 (sf)	Tee/Plug (sf)	Cross* (sf)
4	0.4	0.8	1.5	2.8	2.0	1.0
6	0.8	1.7	3.2	6.0	4.2	2.1
8	1.4	2.8	5.5	10.1	7.2	3.6
10	2.2	4.4	8.5	15.8	11.1	5.6
12	3.1	6.1	12.0	22.2	15.7	7.8
14	3.7	7.4	14.5	26.7	18.9	9.5
16	4.8	9.6	18.9	34.9	24.7	12.3

* Use at each corner

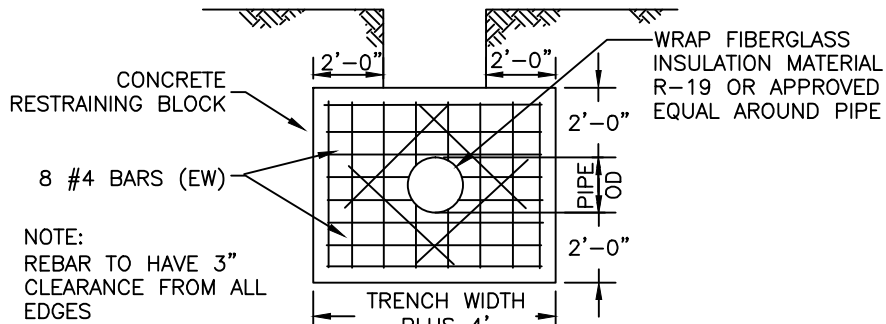
HORIZONTAL BEND THRUST BLOCK DETAIL

- THRUST BLOCKS SHALL BE FORMED AND POURED AGAINST UNDISTURBED SOIL. KEEP "T" BOLTS CLEAR OF CONCRETE, WRAPPED IN 8 MIL VINYL PLASTIC PROTECTOR.
- THICKNESS BETWEEN FITTING AND SOIL SHALL BE A MINIMUM OF 12".
- CONCRETE SHALL HAVE 3000 PSI MINIMUM COMPRESSIVE STRENGTH.
- PLUGS SHALL BE WRAPPED WITH 8 MIL VISQUEEN.

Drawing Name: W:\Proj\18000\18080\18080.000\AutoCad\Standard Details\STANDARD DETAILS Feb 2013.dwg Layout Name: RESTRAIN BLOCK Plotted By: KAS00913 Plotted on: 2/22/2013 3:22:42 PM



PLAN VIEW



SECTION A-A

BARTLETT & WEST
 1719 SOUTHRIDGE DR.
 JEFFERSON CITY, MO
 PHONE 573-634-3181

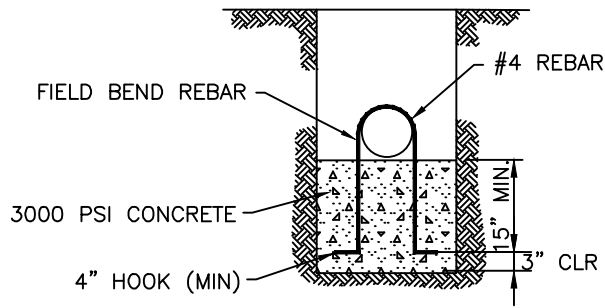
**CPWSD NO. 1 OF BOONE COUNTY
 RESTRAINING BLOCK DETAIL**

PROJ NO:
 18080.000
 DATE:
 FEB 2013

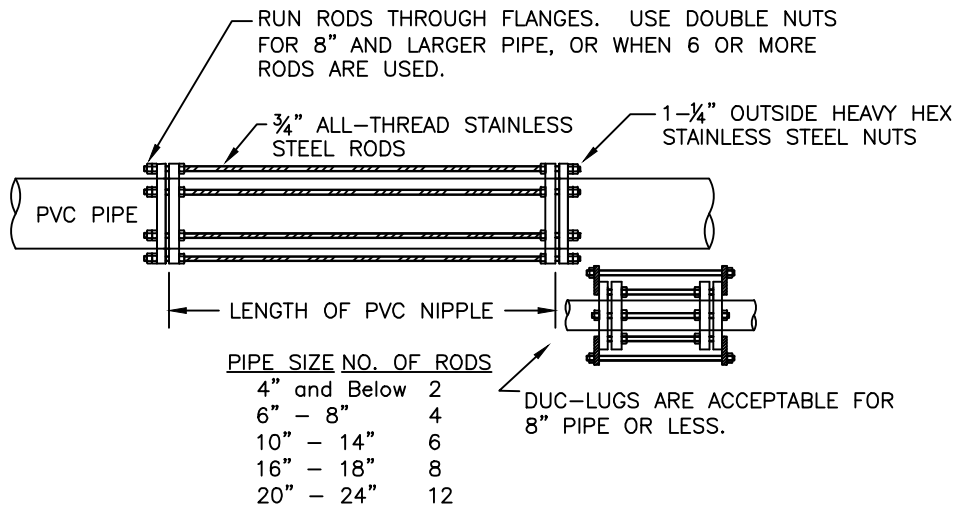
DETAIL NUMBER

3

Drawing Name: W:\Proj\18000\18080\18080.000\AutoCad\Standard Details\STANDARD DETAILS Feb 2013.dwg Layout Name: TIEBACK-HAIRPIN Plotted By: KAS00913 Plotted on: 2/22/2013 3:23:07 PM



HAIRPIN REBAR DETAIL



TIEBACK RODS MAY BE ATTACHED TO D.I. FITTINGS, VALVES, HYDRANTS, AND CONCRETE RESTRAINING BLOCKS.

TIEBACK ROD DETAIL

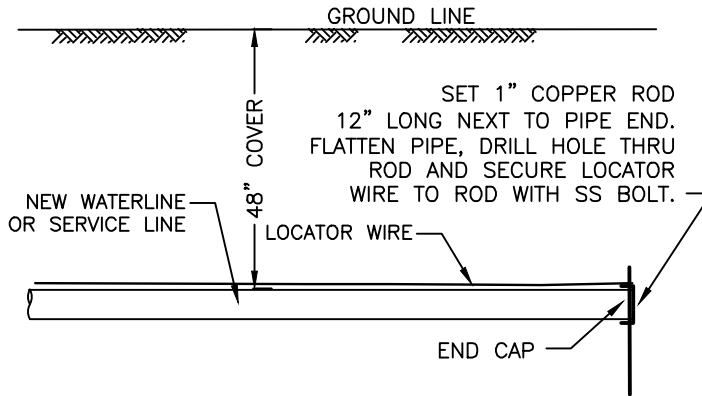
BARTLETT & WEST
 1719 SOUTHRIDGE DR.
 JEFFERSON CITY, MO
 PHONE 573-634-3181

**CPWSD NO. 1 OF BOONE COUNTY
 TIEBACK ROD &
 HAIRPIN REBAR DETAILS**

PROJ NO:
 18080.000
 DATE:
 FEB 2013

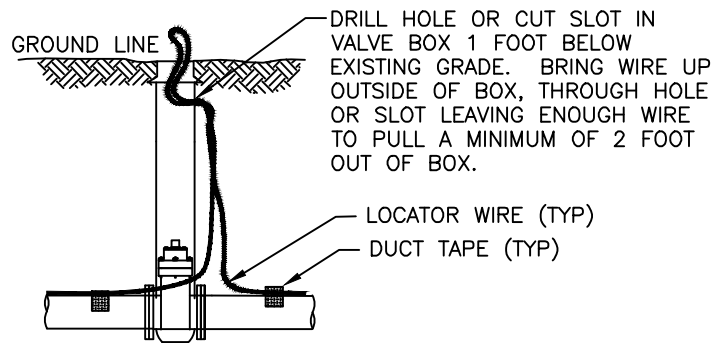
DETAIL NUMBER
4

Drawing Name: W:\Proj\18000\18080\18080.000\AutoCad\Standard Details\STANDARD DETAILS Feb 2013.dwg Layout Name: LOCATOR WIRE Plotted By: KAS00913 Plotted on: 2/22/2013 3:23:30 PM



SECTION VIEW

TERMINATION DETAIL



SECTION VIEW

LOCATOR WIRE NOTES:

1. LOCATOR WIRE TO BE PE-45 SOLID BLUE TRACER WIRE AS MANUFACTURED BY KRIS-TECH WIRE COMPANY.
2. DUCT TAPE LOCATOR WIRE TO TOP OF PIPE ON EACH SIDE OF BELL AND ONE IN THE MIDDLE OF THE PIPE.
3. AT ALL ENDS OF WATER LINES, THE LOCATOR WIRE SHALL BE EXTENDED 2' ABOVE THE TOP OF THE GROUND AND BE ACCESSIBLE. THERE SHALL BE NO MORE THAN ONE SPLICE BETWEEN ACCESS POINTS AT VALVES.
4. TWO SETS OF LOCATOR WIRE SHALL BE INSTALLED ON PIPE AT ALL BORINGS UNDER HIGHWAYS, AND CREEKS, OR AT ADDITIONAL LOCATIONS AS SHOWN ON THE PLANS.
5. DO NOT WRAP WIRE AROUND BOLTS, NUTS, ETC.
6. SPLICE LOCATOR WIRE USING SPLICING KIT 3M DBR. DUCT TAPE LOCATOR WIRE TO PIPE ON EACH END OF THE SPLICE.
7. WHERE CALLED FOR ON THE PLANS FOR A SPLICE BOX, THE SPLICE BOX SHALL BE IDENTICAL TO A VALVE BOX RISER AND LID WITH THE INSTALLATION OF THE WIRE IDENTICAL TO THAT IN A VALVE BOX.
8. LOCATOR WIRE INSTALLATION CONTINUITY SHALL BE WARRANTED UNDER THE SAME 1 YEAR PIPE AND WORKMANSHIP WARRANTY.

BARTLETT & WEST
 1719 SOUTHRIDGE DR.
 JEFFERSON CITY, MO
 PHONE 573-634-3181

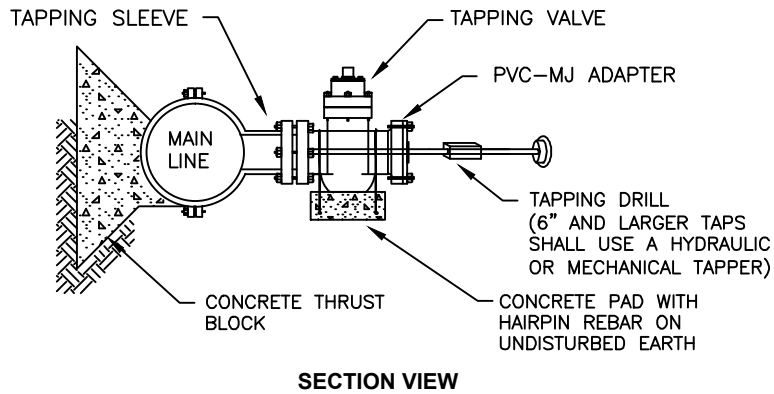
**CPWSD NO. 1 OF BOONE COUNTY
 LOCATOR WIRE DETAILS**

PROJ NO:
 18080.000
 DATE:
 FEB 2013

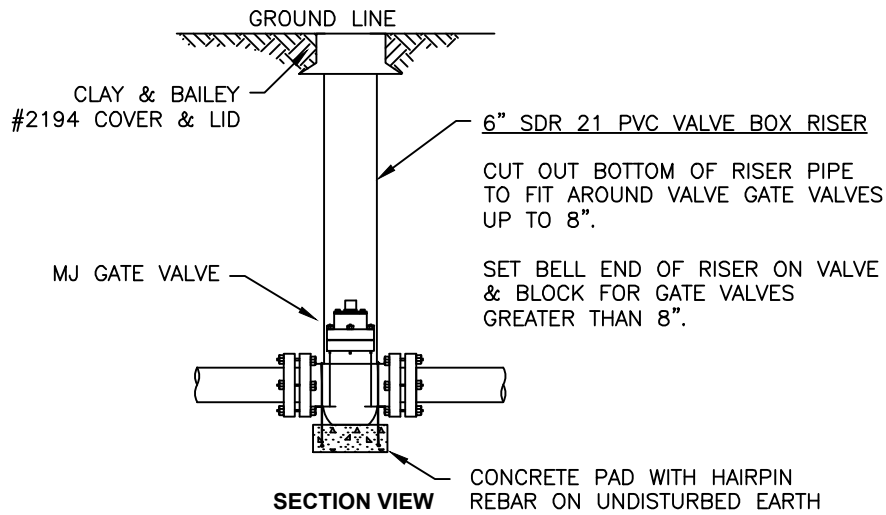
DETAIL NUMBER

5

Drawing Name: W:\Proj\18000\18080\18080.000\AutoCad\Standard Details\STANDARD DETAILS Feb 2013.dwg Layout Name: GATE VALVE Plotted By: KAS00913 Plotted on: 2/22/2013 3:24:15 PM



TAPPING SLEEVE AND VALVE ASSEMBLY



GENERAL NOTES:

1. ANCHOR COUPLING OR PVC PIPE WITH TIEBACK RODS WILL BE REQUIRED BETWEEN VALVE AND FITTINGS
2. WRAP VALVE AND JOINTS WITH VISQUEEN.
3. VALVE AND RISER SHALL BE PLUMB AND CHECKED BY A LEVEL.

GATE VALVE AND VALVE BOX DETAIL

BARTLETT & WEST
 1719 SOUTHRIDGE DR.
 JEFFERSON CITY, MO
 PHONE 573-634-3181

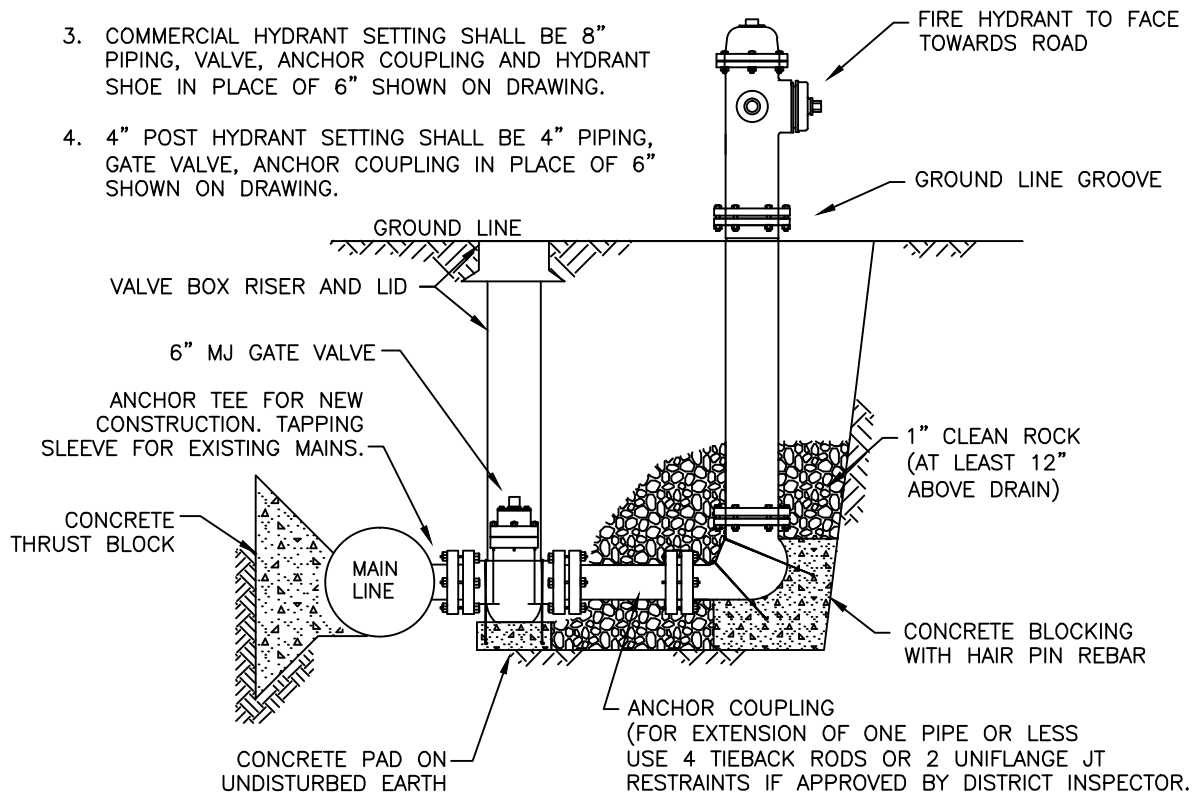
**CPWSD NO. 1 OF BOONE COUNTY
 GATE VALVE DETAIL**

PROJ NO:
 18080.000
 DATE:
 FEB 2013

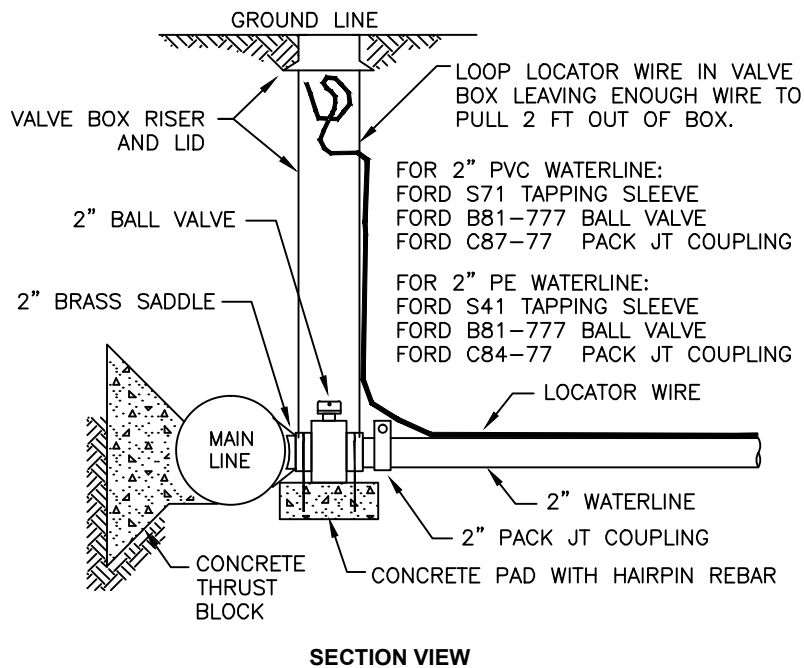
DETAIL NUMBER
6

NOTES:

1. VALVE, VALVE RISER AND DISCHARGE RISER PIPE TO BE PLUMB AND CHECKED BY A LEVEL.
2. APPROVED FIRE HYDRANTS ARE: AMERICAN DARLING B-84-B-5, CLOW MEDALLION, AND MUELLER CENTURION NO. 250.
3. COMMERCIAL HYDRANT SETTING SHALL BE 8" PIPING, VALVE, ANCHOR COUPLING AND HYDRANT SHOE IN PLACE OF 6" SHOWN ON DRAWING.
4. 4" POST HYDRANT SETTING SHALL BE 4" PIPING, GATE VALVE, ANCHOR COUPLING IN PLACE OF 6" SHOWN ON DRAWING.



Drawing Name: W:\Proj\18000\18080\18080.000\AutoCad\Standard Details\STANDARD DETAILS Feb 2013.dwg Layout Name: 2-CONNECTION Plotted By: KAS00913 Plotted on: 2/22/2013 3:25:13 PM



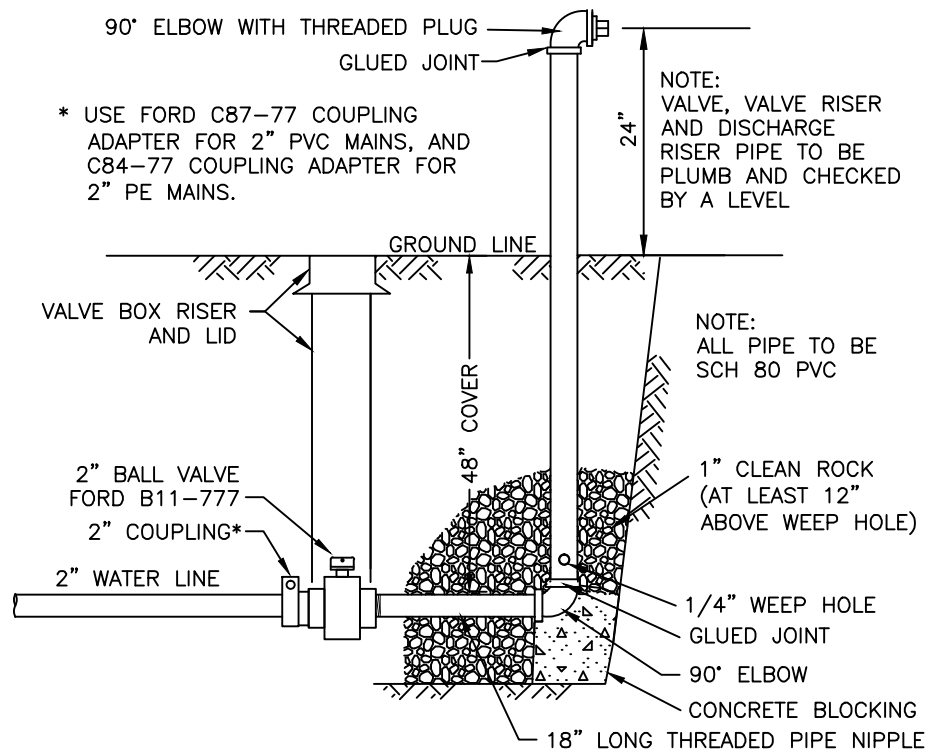
BARTLETT & WEST
 1719 SOUTHRIDGE DR.
 JEFFERSON CITY, MO
 PHONE 573-634-3181

**CPWSD NO. 1 OF BOONE COUNTY
 2" CONNECTION TO MAIN
 DETAIL**

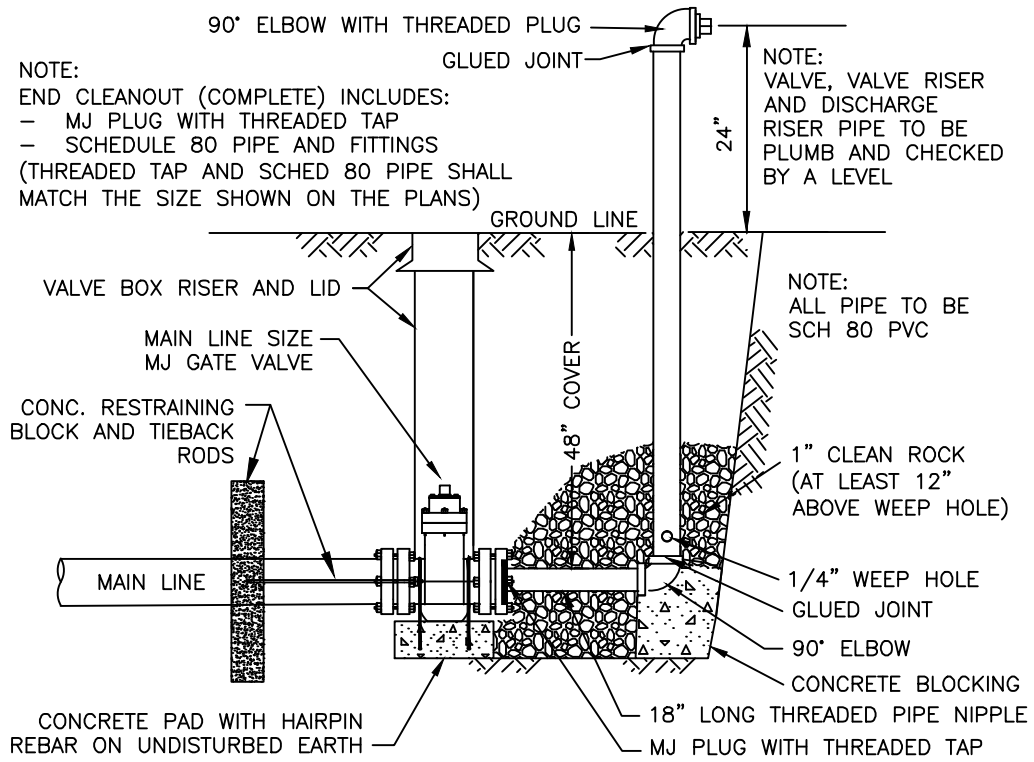
PROJ NO:
 18080.000
 DATE:
 FEB 2013

DETAIL NUMBER
8

Drawing Name: W:\Proj\18000\18080\AutoCad\Standard Details\STANDARD DETAILS Feb 2013.dwg Layout Name: END CLEANOUT Plotted By: KAS00913 Plotted on: 2/22/2013 3:28:35 PM



SECTION VIEW



SECTION VIEW

BARTLETT & WEST
1719 SOUTHRIDGE DR.
JEFFERSON CITY, MO
PHONE 573-634-3181

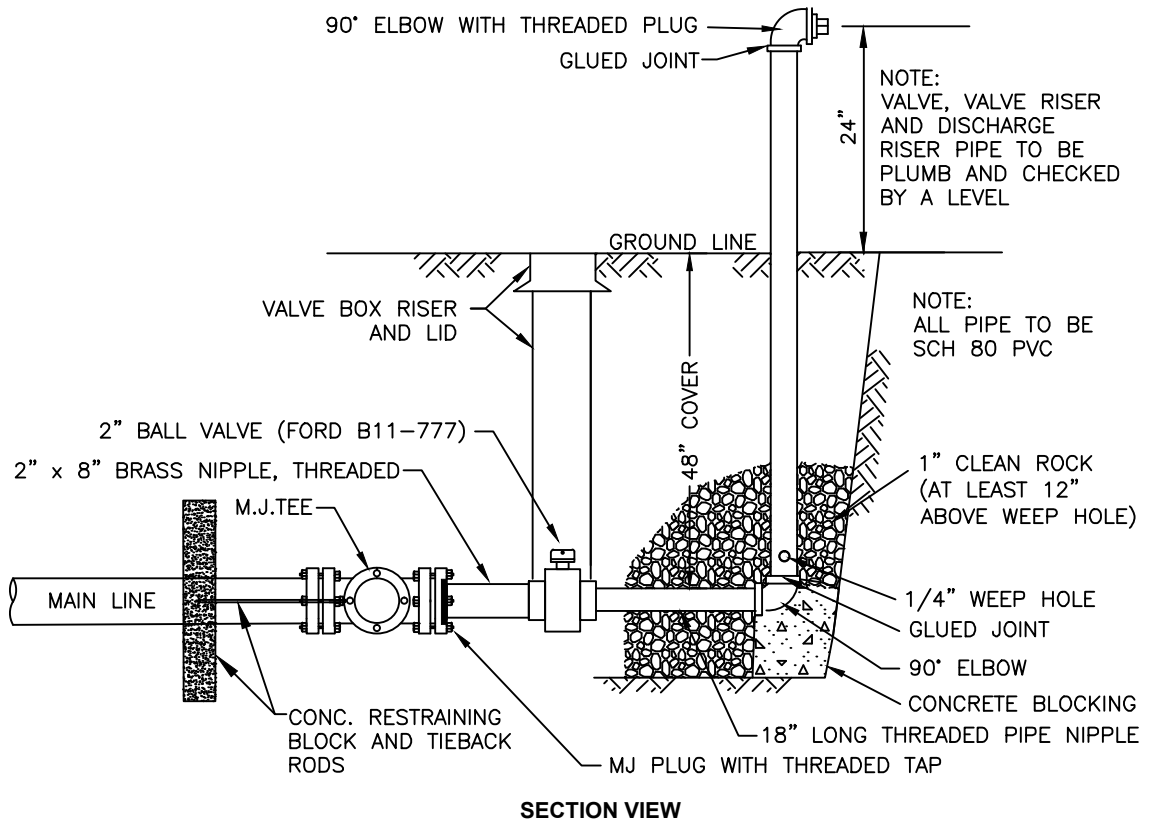
**CPWSD NO. 1 OF BOONE COUNTY
END CLEANOUT DETAILS**

PROJ NO:
18080.000
DATE:
FEB 2013

DETAIL NUMBER

9

Drawing Name: W:\Proj\18000\18080\18080.000\AutoCad\Standard Details\STANDARD DETAILS Feb 2013.dwg Layout Name: END CLEANOUT (2) Plotted By: KAS00913 Plotted on: 2/22/2013 3:28:58 PM



BARTLETT & WEST
1719 SOUTHRIDGE DR.
JEFFERSON CITY, MO
PHONE 573-634-3181

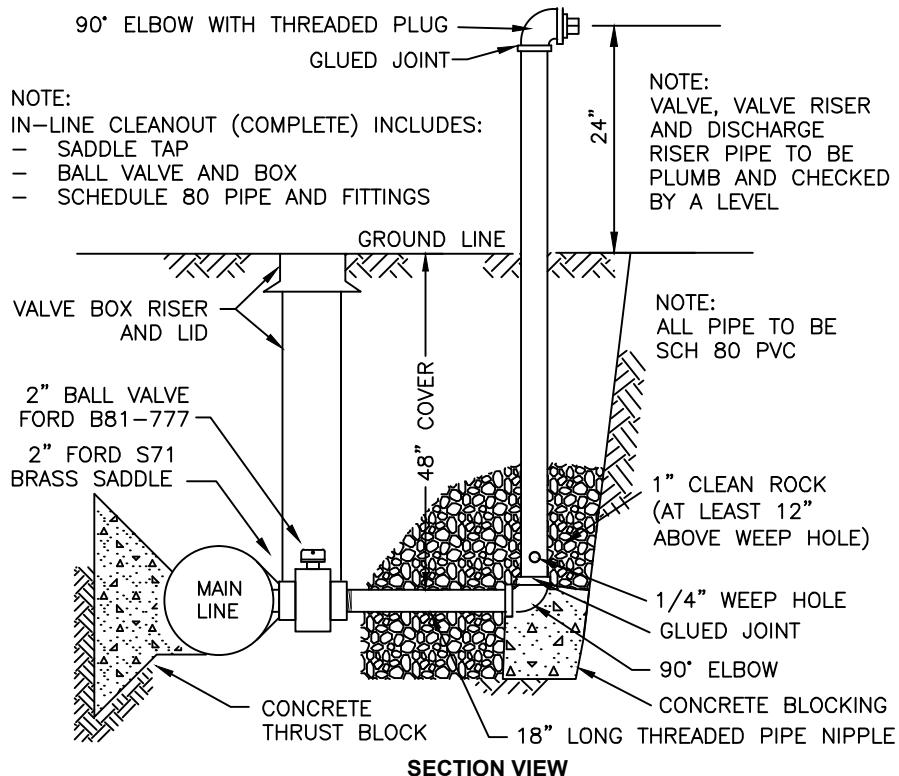
**CPWSD NO. 1 OF BOONE COUNTY
END CLEANOUT DETAIL
AT TEE OR CROSS**

PROJ NO:
18080.000
DATE:
FEB 2013

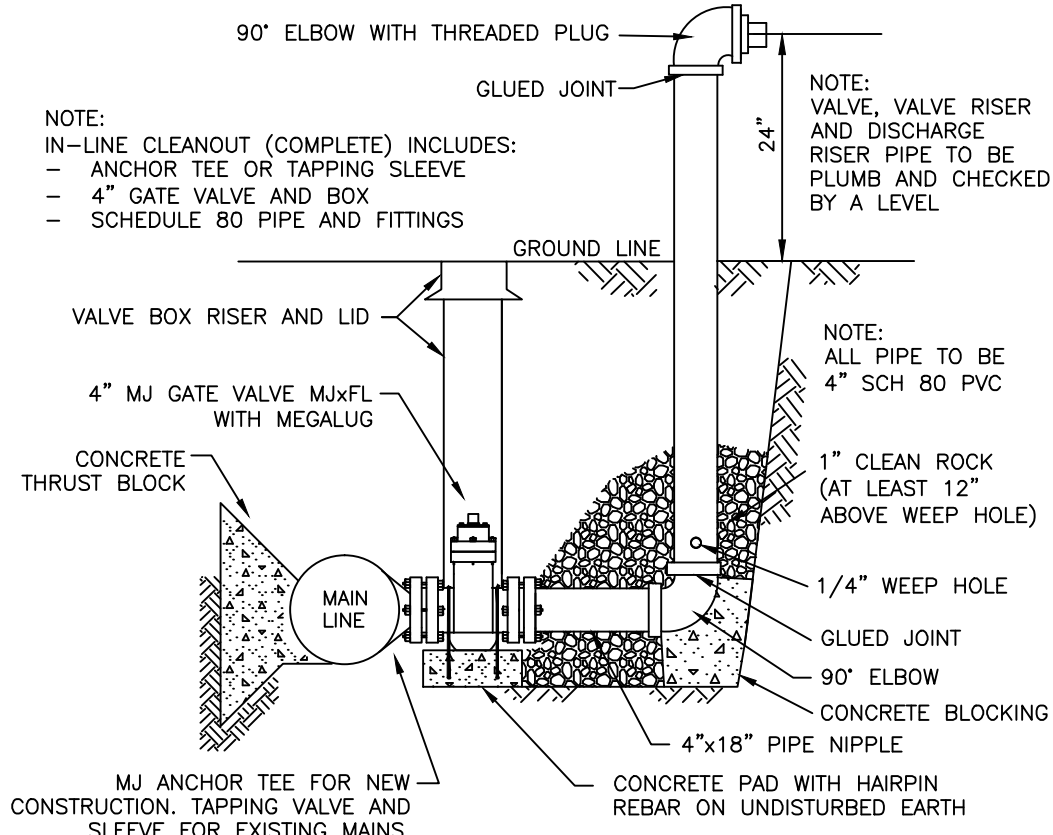
DETAIL NUMBER

10

Drawing Name: W:\Proj\18000\18080\18080.000\AutoCad\Standard Details\STANDARD DETAILS Feb 2013.dwg Layout Name: SIDE CLEANOUT Plotted By: KAS00913 Plotted on: 2/22/2013 3:29:18 PM



2" SIDE CLEANOUT



4" SIDE CLEANOUT

BARTLETT & WEST
1719 SOUTHRIDGE DR.
JEFFERSON CITY, MO
PHONE 573-634-3181

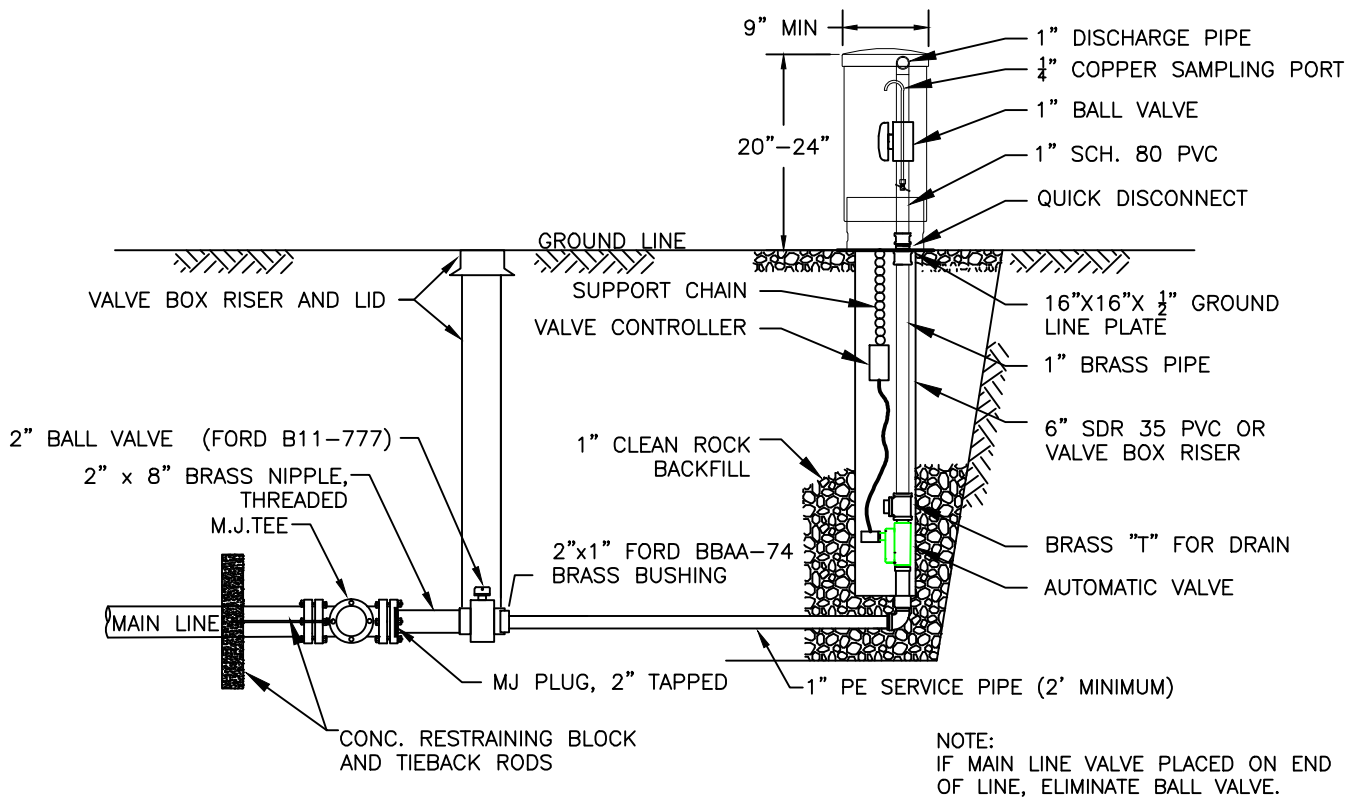
**CPWSD NO. 1 OF BOONE COUNTY
SIDE CLEANOUT DETAILS**

PROJ NO:
18080.000
DATE:
FEB 2013

DETAIL NUMBER

11

Drawing Name: W:\Proj\18000\18080\AutoCad\Standard Details\STANDARD DETAILS - Feb 2013.dwg Layout Name: AUTO_FLUSH_Plotting By: KAS00913 Plotted on: 2/26/2013 11:29:50 AM



NOTE:
IF MAIN LINE VALVE PLACED ON END OF LINE, ELIMINATE BALL VALVE.

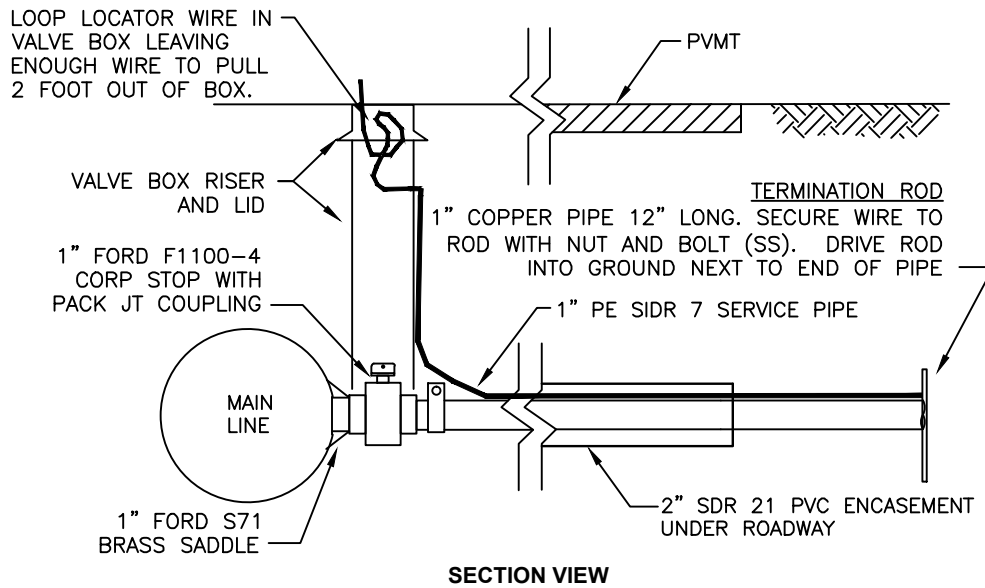
BARTLETT & WEST
 1719 SOUTHRIDGE DR.
 JEFFERSON CITY, MO
 PHONE 573-634-3181

**CPWSD NO. 1 OF BOONE COUNTY
 AUTO FLUSH UNIT DETAIL**

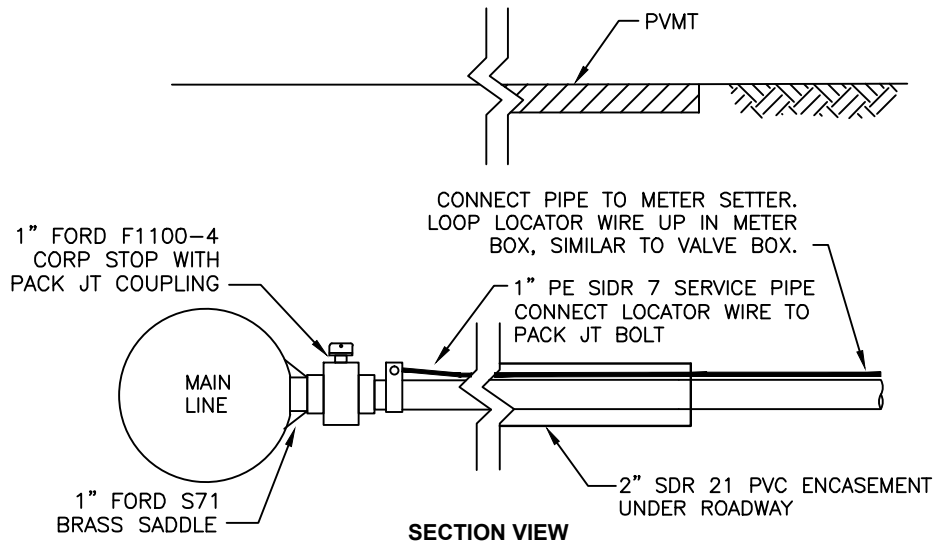
PROJ NO:
18080.000
 DATE:
FEB 2013

DETAIL NUMBER
12

Drawing Name: W:\Proj\18000\18080\AutoCad\Standard Details\STANDARD DETAILS - Feb 2013.dwg Layout Name: 1-CROSSINGS Plotted By: KAS00913 Plotted on: 3/26/2013 10:33:20 AM



1" SERVICE LINE ROADWAY CROSSING WITHOUT METER CONNECTION



1" SERVICE LINE ROADWAY CROSSING

BARTLETT & WEST
 1719 SOUTHRIDGE DR.
 JEFFERSON CITY, MD
 PHONE 573-634-3181

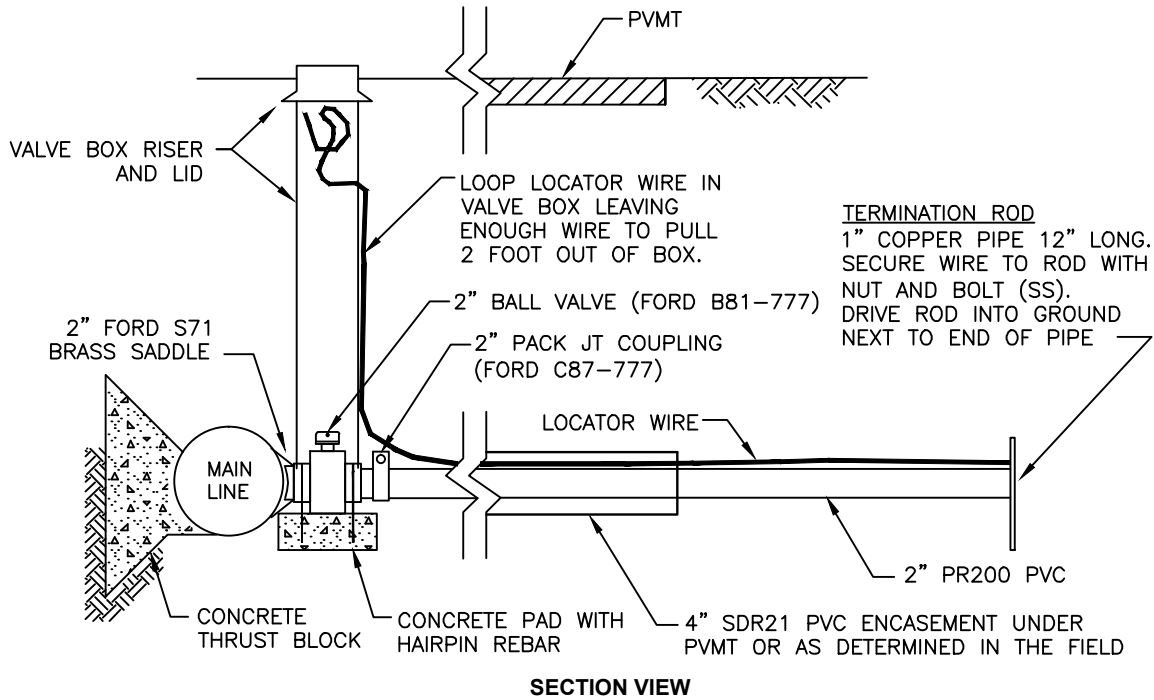
CPWSD NO. 1 OF BOONE COUNTY
1" SERVICE LINE ROADWAY
CROSSING DETAILS

PROJ NO:
 18080.000
 DATE:
 FEB 2013

DETAIL NUMBER

13

Drawing Name: W:\Proj\18000\18080\18080.000\AutoCad\Standard Details\STANDARD DETAILS - Feb 2013.dwg Layout Name: 2-CROSSING Plotted By: KAS00913 Plotted on: 3/26/2013 10:34:03 AM



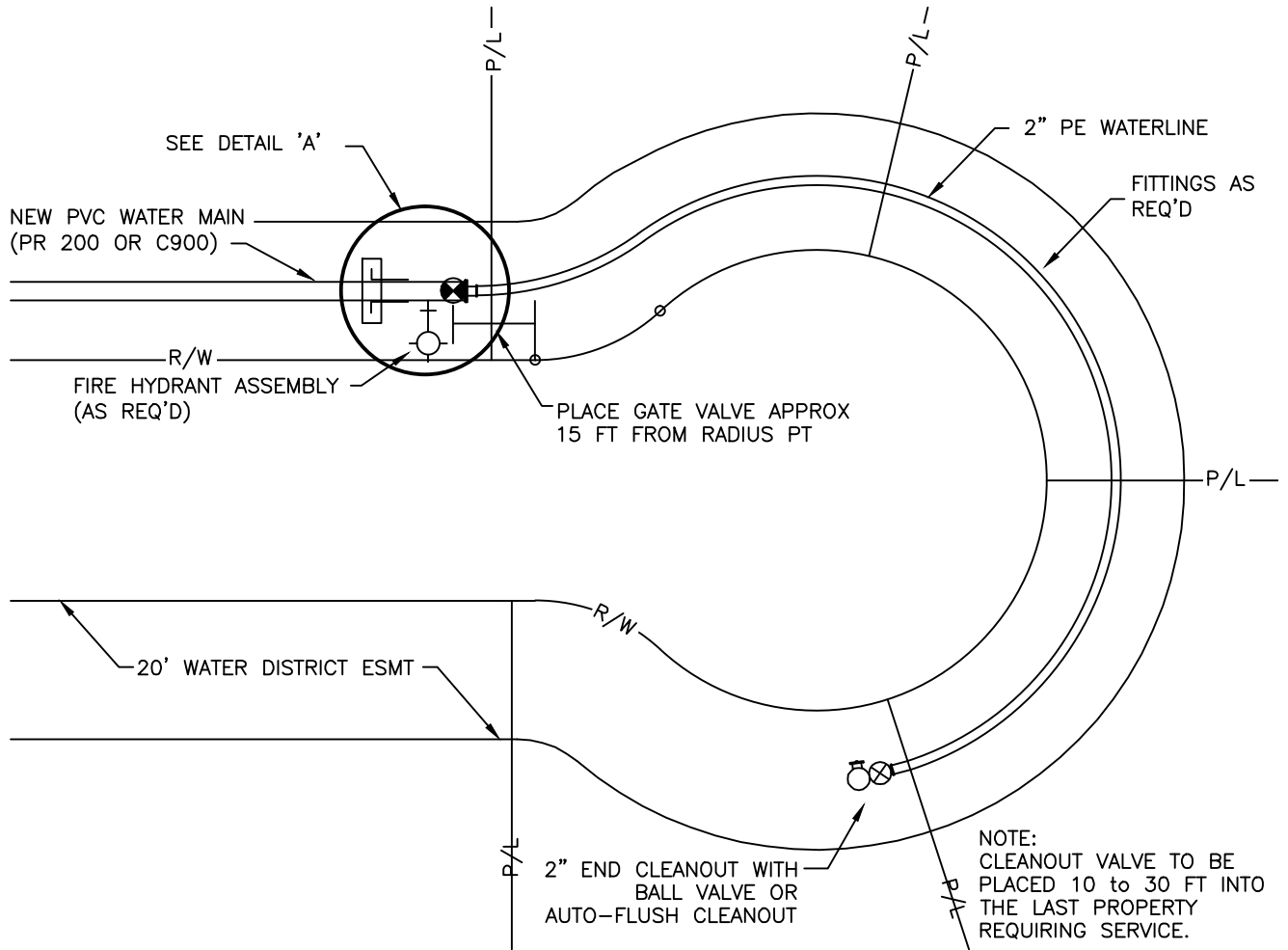
BARTLETT & WEST
 1719 SOUTHRIDGE DR.
 JEFFERSON CITY, MD
 PHONE 573-634-3181

**CPWSD NO. 1 OF BOONE COUNTY
 2" SERVICE LINE ROADWAY
 CROSSING DETAIL**

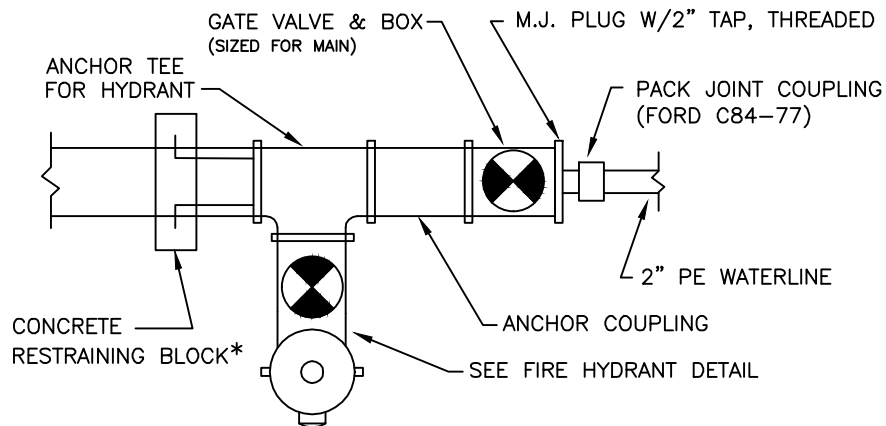
PROJ NO:
 18080.000
 DATE:
 FEB 2013

DETAIL NUMBER
14

Drawing Name: W:\Proj\18000\18080\18080.000\AutoCad\Standard Details\STANDARD DETAILS - Feb 2013.dwg Layout Name: CUL-DE-SAC Plotted By: KAS00913 Plotted on: 3/26/2013 10:37:27 AM



PLAN VIEW



*IF FIRE HYDRANT IS NOT REQUIRED, THEN ANCHOR CONCRETE RESTRAINING BLOCK TO GATE VALVE AND OMIT ANCHOR COUPLING

DETAIL A

BARTLETT & WEST
 1719 SOUTHRIDGE DR.
 JEFFERSON CITY, MD
 PHONE 573-634-3181

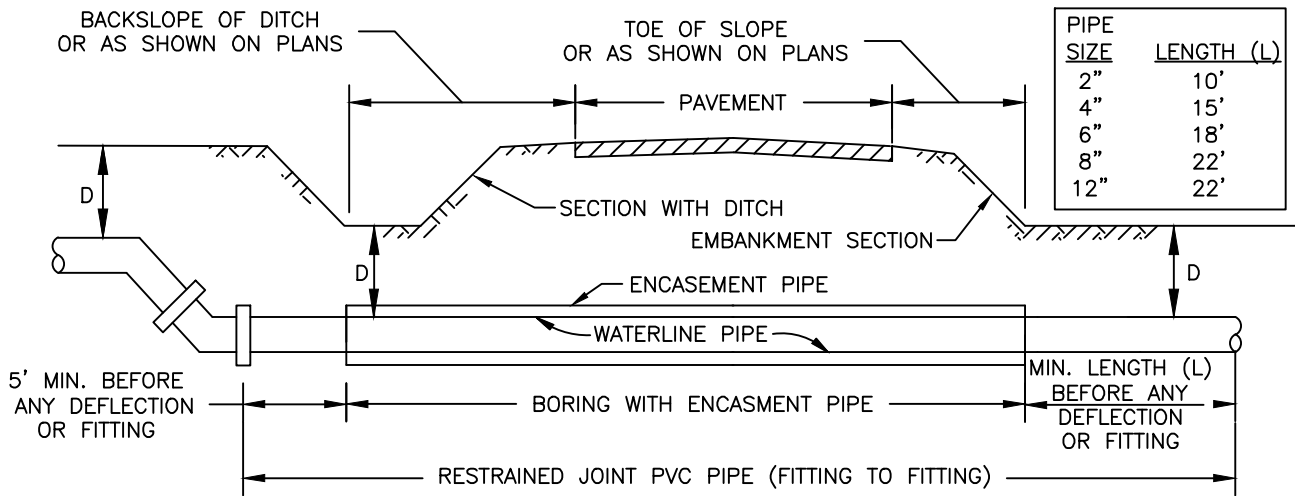
**CPWSD NO. 1 OF BOONE COUNTY
 WATERLINE INSTALLATION
 AT CUL-DE-SAC**

PROJ NO:
 18080.000
 DATE:
 FEB 2013

DETAIL NUMBER

15

Drawing Name: W:\Proj\18000\18080\AutoCad\Standard Details\STANDARD DETAILS Feb 2013.dwg Layout Name: RD_CROSSINGS Plotted By: KAS00913 Plotted on: 3/26/2013 10:38:13 AM

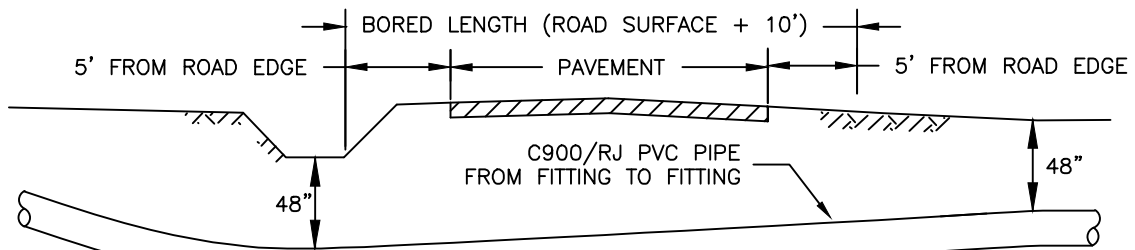


"D" - 48" FOR STEEL ENCASUREMENT AND 72" FOR HDPE ENCASUREMENT UNLESS OTHERWISE SPECIFIED

- NOTES:
1. CASING TYPE, SIZE AND THICKNESS TO BE DETERMINED BY PERMITTING AGENCY OR SHOWN ON PLANS.
 2. REFER TO ENCASUREMENT DETAIL FOR SPACER AND END SEAL INSTALLATION.
 3. LOCATOR WIRE IS NOT SHOWN.

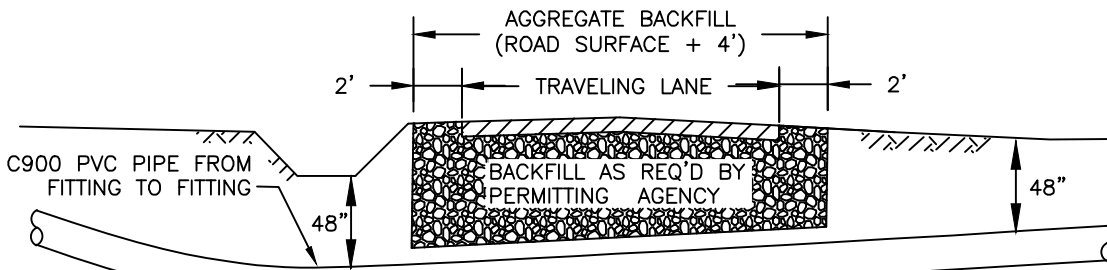
ROADWAY CROSS-SECTION

TYPICAL BORING UNDER STATE HIGHWAY



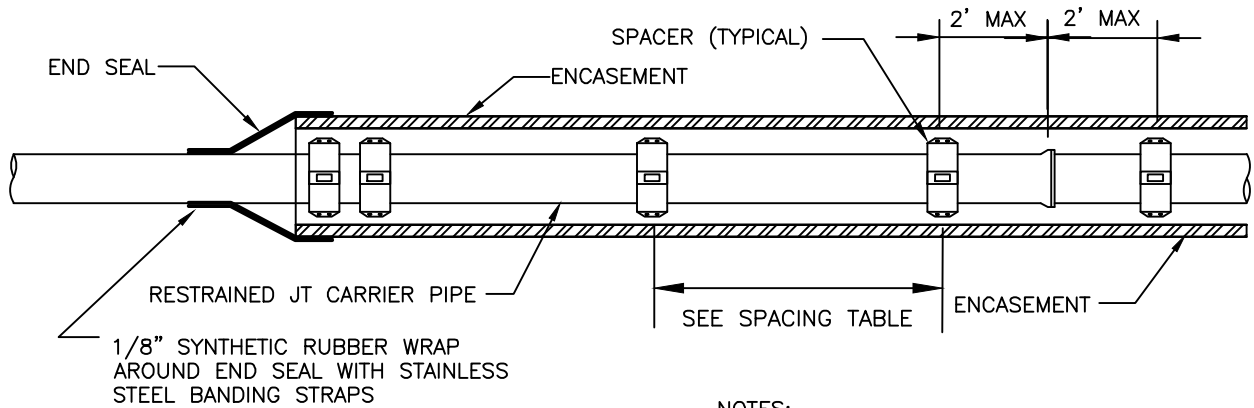
ROADWAY CROSS-SECTION NOTE: LOCATOR WIRE NOT SHOWN.

TYPICAL BORED ROAD CROSSING



ROADWAY CROSS-SECTION NOTE: LOCATOR WIRE NOT SHOWN.

TYPICAL OPEN CUT ROAD CROSSING

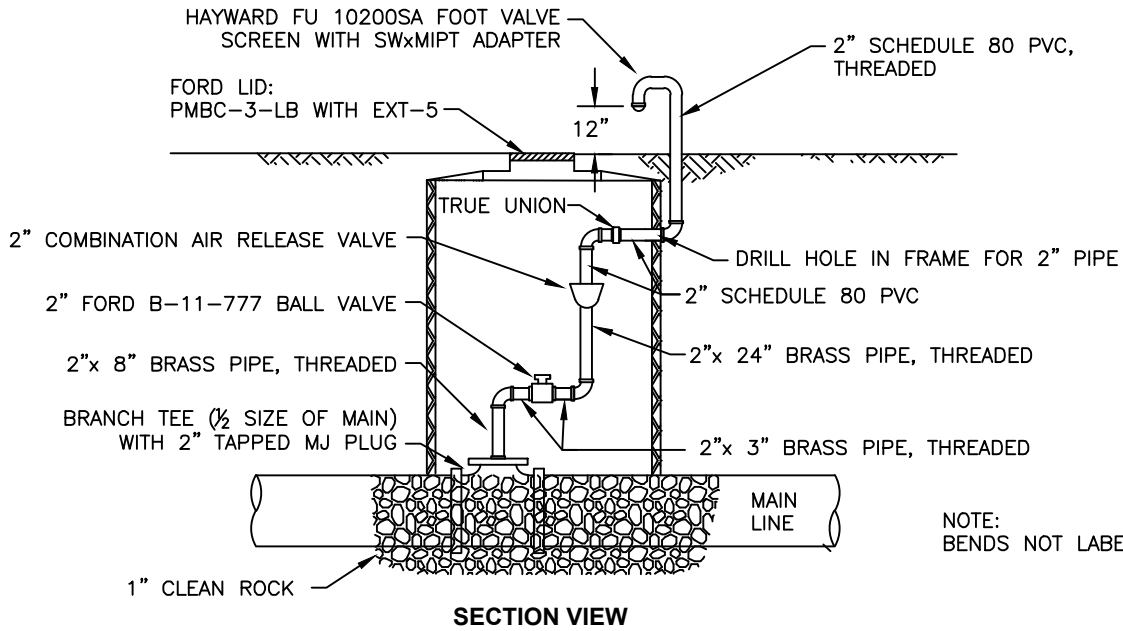
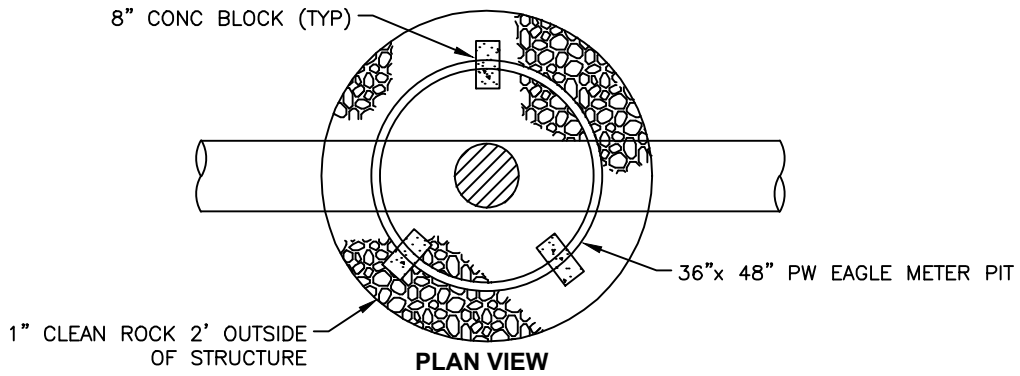


SPACING TABLE		
Carrier Pipe Diameter (in)	Skid Spacing Maximum (ft)	Spacer Width (inch)
3	3	5
4	4.5	6
6	6	6
8	7	8
10	8.5	8
12	9.5	8
12+	10	8

NOTES:

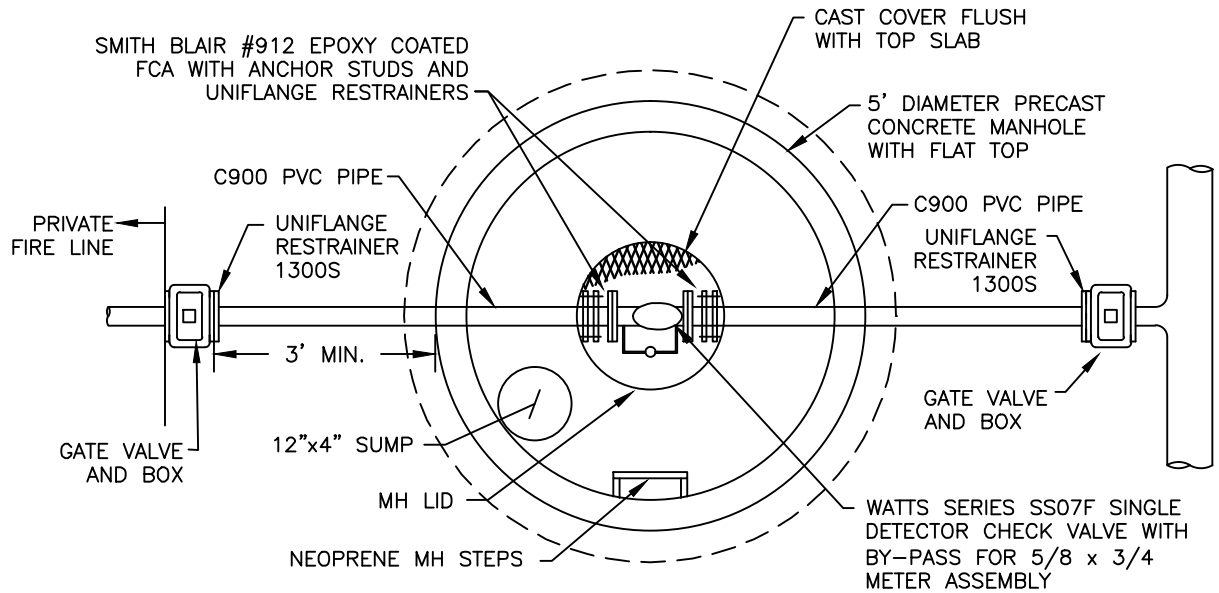
1. SPACER O.D. SHALL BE AT LEAST 1/2" LARGER THAN PIPE BELL O.D.
2. CLEARANCE BETWEEN SPACER O.D. AND ENCASEMENT PIPE I.D. SHALL BE AT LEAST 1-1/2".
3. A MINIMUM OF 3 SPACERS PER INDIVIDUAL PIPE REGARDLESS OF PIPE LENGTH.
4. USE DOUBLE SPACERS AT END & ONE EACH SIDE OF A JOINT CASING.
5. END SEALS TO BE SYNTHETIC RUBBER BOOT WITH STAINLESS STEEL ADJUSTING BINDING STRAPS.
6. LOCATOR WIRE NOT SHOWN.

Drawing Name: W:\Proj\18000\18080\18080.000\AutoCad\Standard Details\Standard Details\Feb 2013.dwg Layout Name: AIR RELEASE PIT Plotted on: 3/26/2013 10:41:11 AM

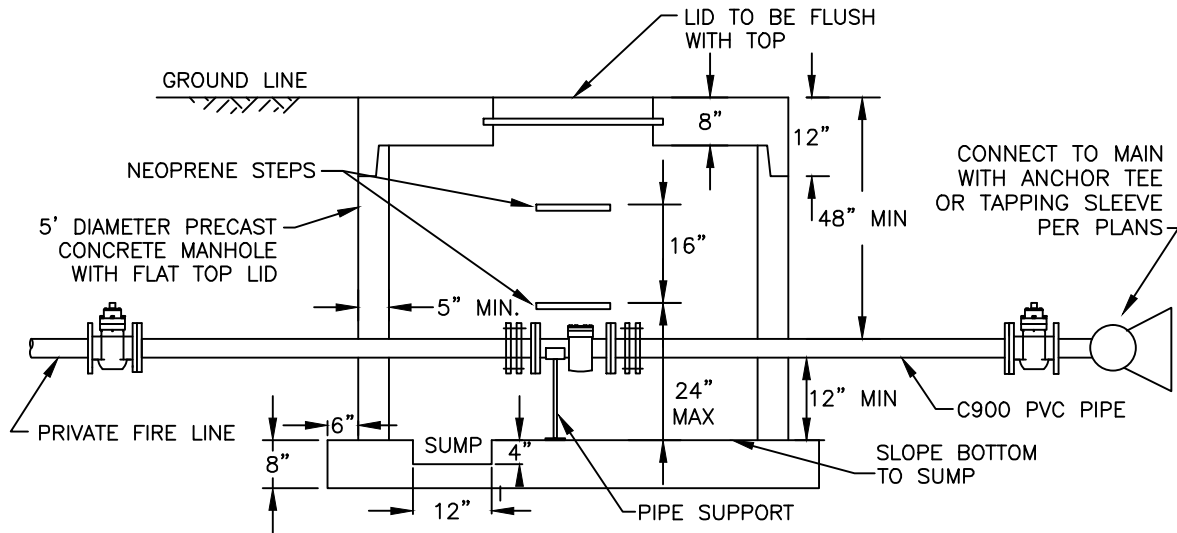


NOTE:
BENDS NOT LABELED

Drawing Name: W:\Proj\18000\18080\18080.000\AutoCad\Standard Details\STANDARD DETAILS - Feb 2013.dwg Layout Name: DETECTOR CHECK Plotted on: 3/26/2013 10:41:39 AM



PLAN VIEW



SECTION VIEW

GENERAL NOTES:

1. PRECAST STRUCTURE TO MEET ASTM C478 USING 4000 PSI CONCRETE.
2. RISER JOINTS TO BE A 2.1"x1" MASTIC ROPE.
3. ALL BASES & BOTTOM RISER TO BE POURED MONOLITHIC.
4. FRAME & COVER TO BE DEETER 1180 OR NEENAH R-1960-A.
5. STEP TO BE AMERICAN STEP ML-13 OR EQUAL.
6. ALL PIPE PENETRATIONS TO BE Z-LOCK SEALED.
7. MANHOLE TO BE ORDERED CUSTOM BUILT TO HEIGHT AND EXACT PIPE DEPTH. FOR CORRECT PLACEMENT OF THE PIPE Z LOCK SEALS, MAY REQUIRE EXPOSING EXISTING MAIN TO DETERMINE CORRECT PIPE CENTERLINE DEPTH PRIOR TO ORDERING MANHOLE. PROVIDE PRE-CASTER SIZE OF PIPE, DISTANCE FROM CENTERLINE OF PIPE TO GROUND LINE. THE MANHOLE HEIGHT AND DISTANCE BETWEEN THE CENTERLINE OF PIPE AND TOP OF FLOOR WILL NEED TO BE DETERMINED WITH PRE-CASTER.

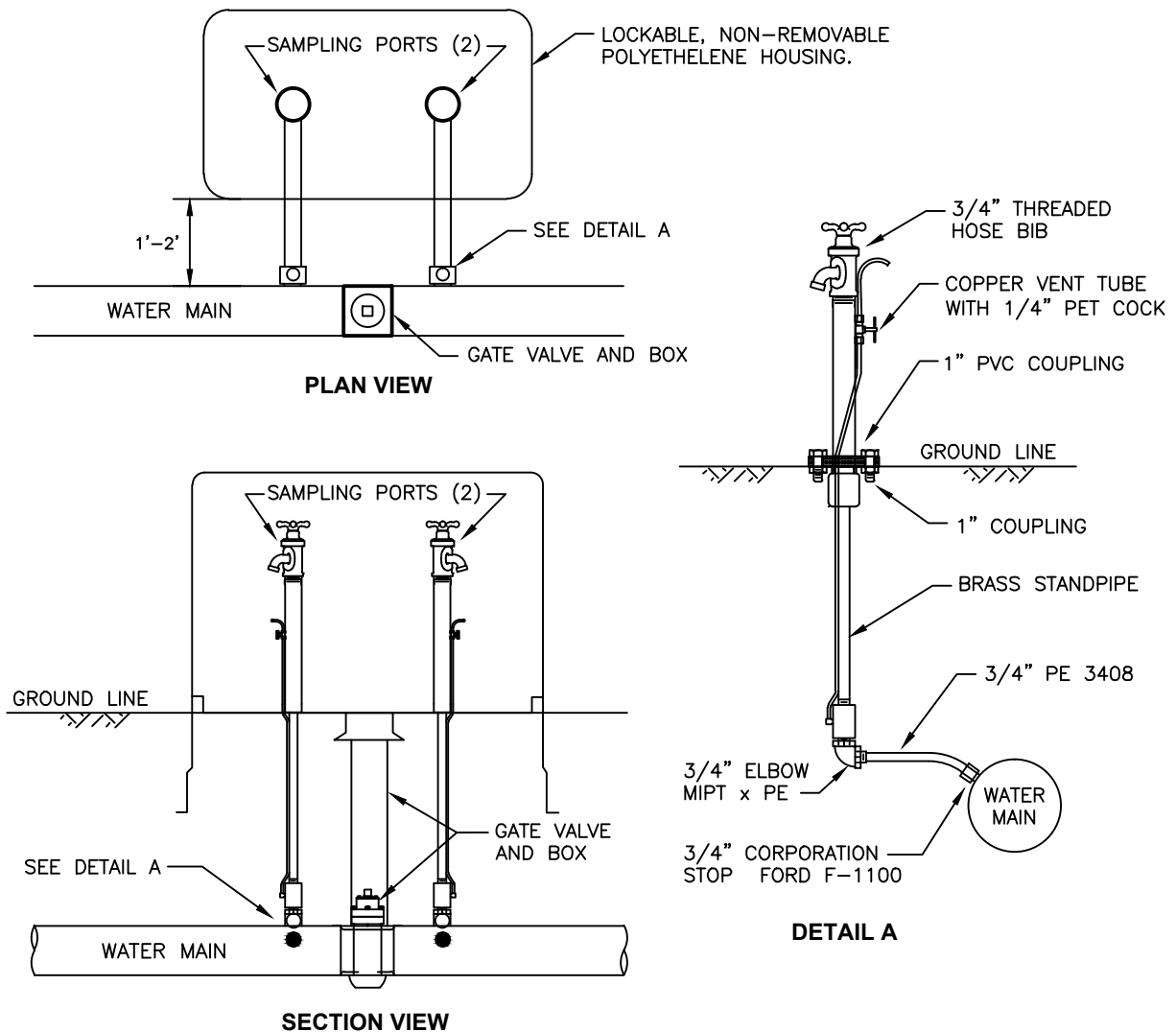
BARTLETT & WEST
 1719 SOUTHRIDGE DR.
 JEFFERSON CITY, MO
 PHONE 573-634-3181

**CPWSD NO. 1 OF BOONE COUNTY
 DETECTOR CHECK
 VALVE MANHOLE**

PROJ NO:
 18080.000
 DATE:
 FEB 2013

DETAIL NUMBER
19

Drawing Name: W:\Proj\18000\18080\AutoCad\Standard Details\STANDARD DETAILS - Feb 2013.dwg Layout Name: SAMPLING_STA Plotted on: 3/26/2013 10:42:28 AM



NOTE:

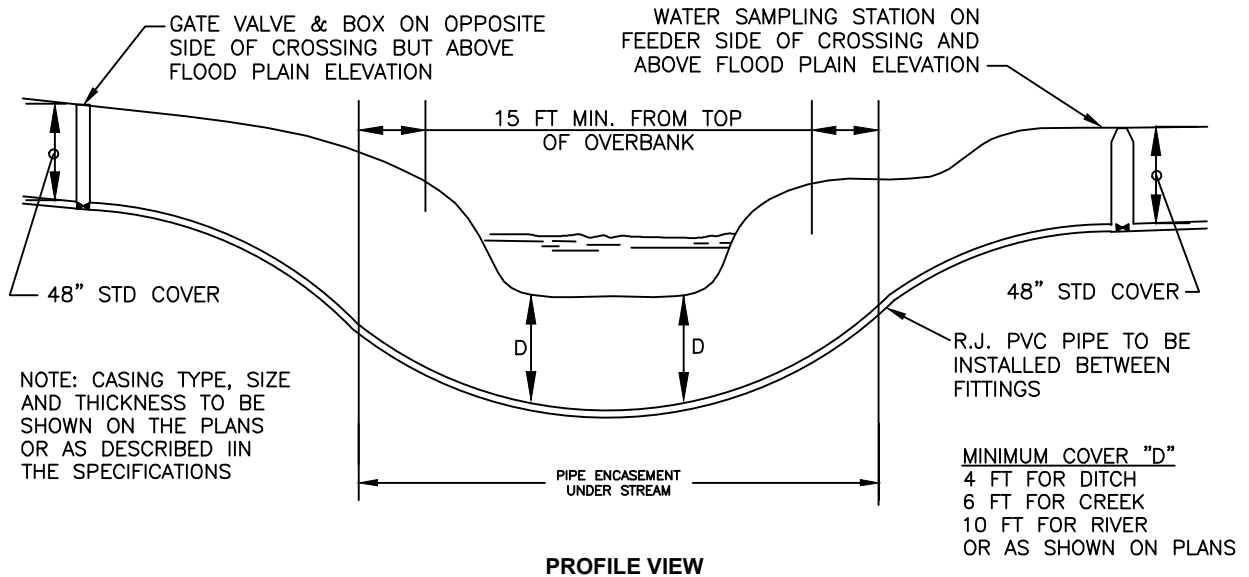
SAMPLING STATION SHALL BE DUAL STANDPIPE DESIGN, PROVIDING TWO INDEPENDENT ALL-BRASS WATER STREAMS FOR UPSTREAM AND DOWNSTREAM SAMPLING.

EACH SAMPLING STATION SHALL BE PROVIDED WITH TWO INLETS, 3/4" IN SIZE, AND TWO THREADED BRASS SAMPLING BIBBS LOCATED ABOVE GROUND NEAR TOP OF EACH STANDPIPE. A COPPER VENT TUBE ON EACH 3 1/2' BURY STANDPIPE WILL ENABLE THE WATERWAYS TO BE PUMPED FREE OF STANDING WATER TO PREVENT FREEZING AND MINIMIZE BACTERIA GROWTH.

EACH STANDPIPE SHALL OPERATE INDEPENDENTLY USING A ROTATING HANDLE AND BE ENCLOSED IN ONE UV-RATED LOCKABLE PLASTIC ENCLOSURE.

ALL WORKING PARTS SHALL BE BRASS AND REMOVABLE FROM ABOVE GROUND WITH NO DIGGING, AS MANUFACTURED BY KUPFERLE FOUNDRY COMPANY, ST. LOUIS, MO. MODEL #8100, OR APPROVED EQUAL.

Drawing Name: W:\Proj\18000\18080\18080.000\AutoCad\Standard Details\Standard Details.dwg Layout Name: STREAM_CROSSING_Plotting By: KAS00913 Plotted on: 3/26/2013 10:43:09 AM



BARTLETT & WEST
1719 SOUTHRIDGE DR.
JEFFERSON CITY, MO
PHONE 573-634-3181

**CPWSD NO. 1 OF BOONE COUNTY
TYPICAL STREAM CROSSING**

PROJ NO:
18080.000
DATE:
FEB 2013

DETAIL NUMBER
21