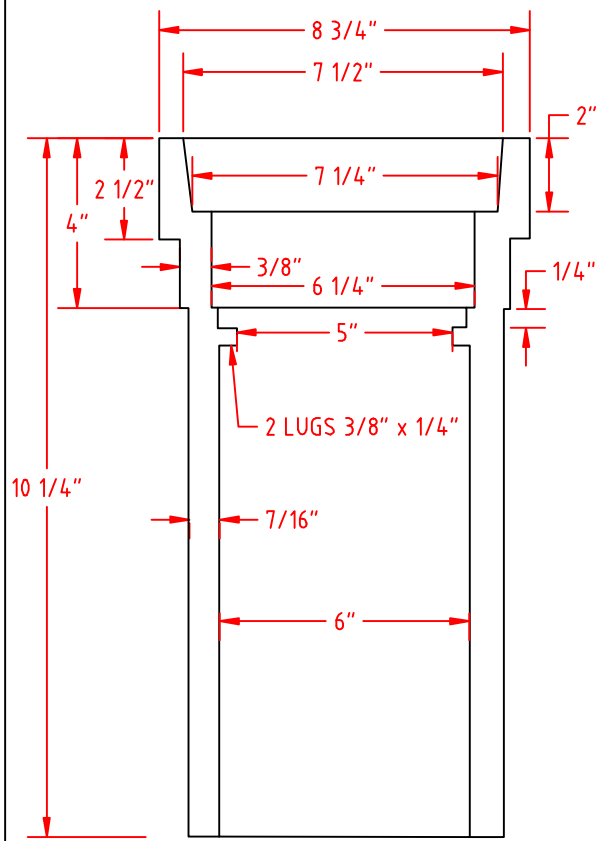


UNION COUNTY PUBLIC WORKS STANDARD DETAILS

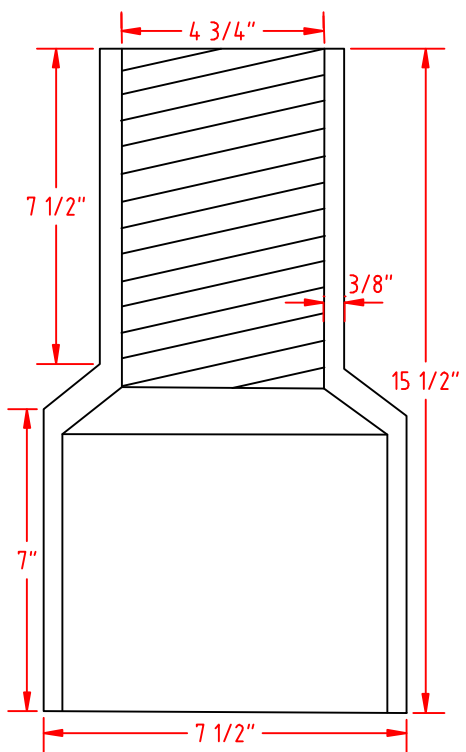
(See <http://www.co.union.nc.us> for copy of details)

NUMBER	TABLE OF CONTENTS	REVISION DATE
1	Valve Box	11/17/06
1A	Valve Box Installation	10/4/11
1B	Dummy Valve Box	10/4/11
2	2" Blow-off	10/4/11
2A	Mainline Future Extension with Blow-off	10/4/11
3	Fire Hydrant	1/2/14
4	Air Release	10/4/11
5	Service Connection	10/4/11
6	Meter Installation for AMR Meters	1/2/14
7	8" or 6" x 2 Reducer	10/4/11
7A	Hydrant Tee x 2" Reducer	10/4/11
8	Pipe Bedding	11/17/06
8A	Sewer Bedding	12/16/13
8B	Water Trench	1/14/10
9	Ring & Cover	9/9/11
9A	Ring & Cover for Sealed Manhole	9/25/12
10	Manhole	7/31/14
10A	Cleanout Manhole	7/29/08
10B	Outside Drop Manhole	5/7/12
11	Sewer Lateral Detail	2/19/14
11A	Dual Sewer Lateral Detail	11/17/06
12	Reinforced Concrete Piers	11/17/06
13	Aerial Creek Crossing	11/17/06
14	Pipe Encasement	11/17/06
15	Pavement Replacement	11/7/14
16	Thrust Block	11/17/06
17	Thrust Block Specifications	11/17/06
18	Tapping Sleeve	11/17/06
19	2" Shortside Service for 1 ½" or 2" Meters	5/22/13
20	2" Longside Service for 1 ½ " or 2" Meters	5/22/13
21	Anti-Seep Collar	11/17/06
22	Water Connection Detail	10/17/08
23	Bypass Emergency Connection for Wet Well	9/27/07
24A	Reduced Pressure Zone Assembly (3/4" - 2")	12/13/13
24B	Reduced Pressure Detector Assembly > 1"	1/2/14
25	Jumper Connection	9/02/10
25A	Direct Tap Jumper Connection (Short Side)	9/02/10
25B	Direct Tap Jumper Connection (Long Side)	9/2/10
26	Grease Interceptor	10/23/07
27	Water Relocation Detail	4/03/08
27A	Water Relocation Detail for Large Water Mains	3/08/11
27B	Water Relocation Detail for Small Water Mains	3/08/11
29	Standard 1 ½" & 2" Meter Installation & Vault	6/13/14

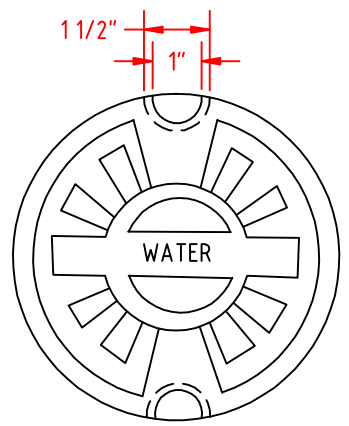
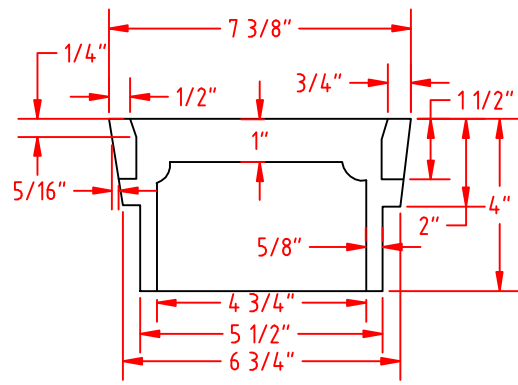
NOTE:
A 27" DIAMETER PRE-CAST
RING SHALL BE PLACED
AROUND EACH VALVE BOX.



TOP



BOTTOM
(SCREW TYPE)



COVER

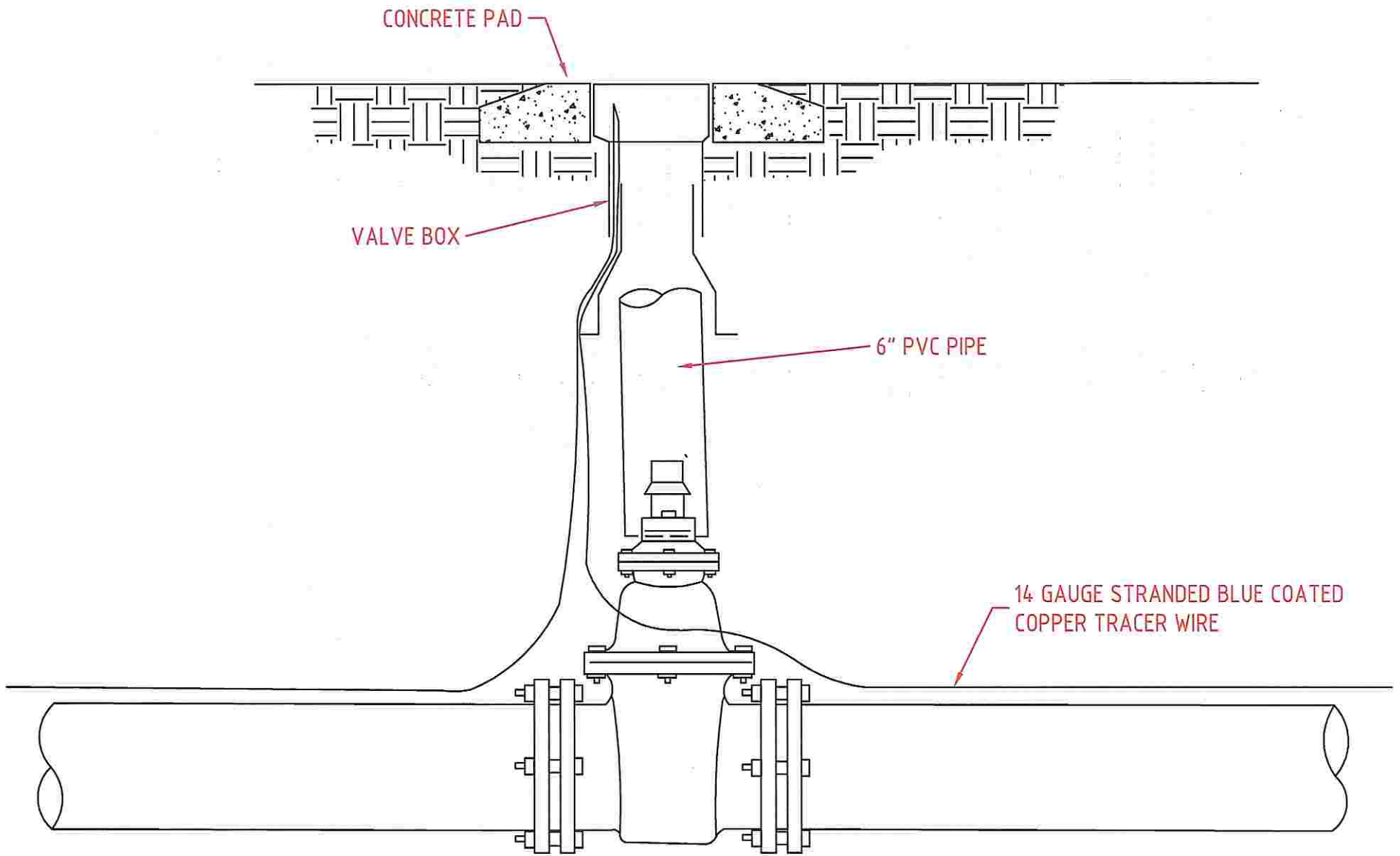
UNION COUNTY PUBLIC WORKS DEPARTMENT
UNION COUNTY, N.C.

STANDARD DETAIL

VALVE BOX

SCALE:
N.T.S.
DATE:
11-17-06

1



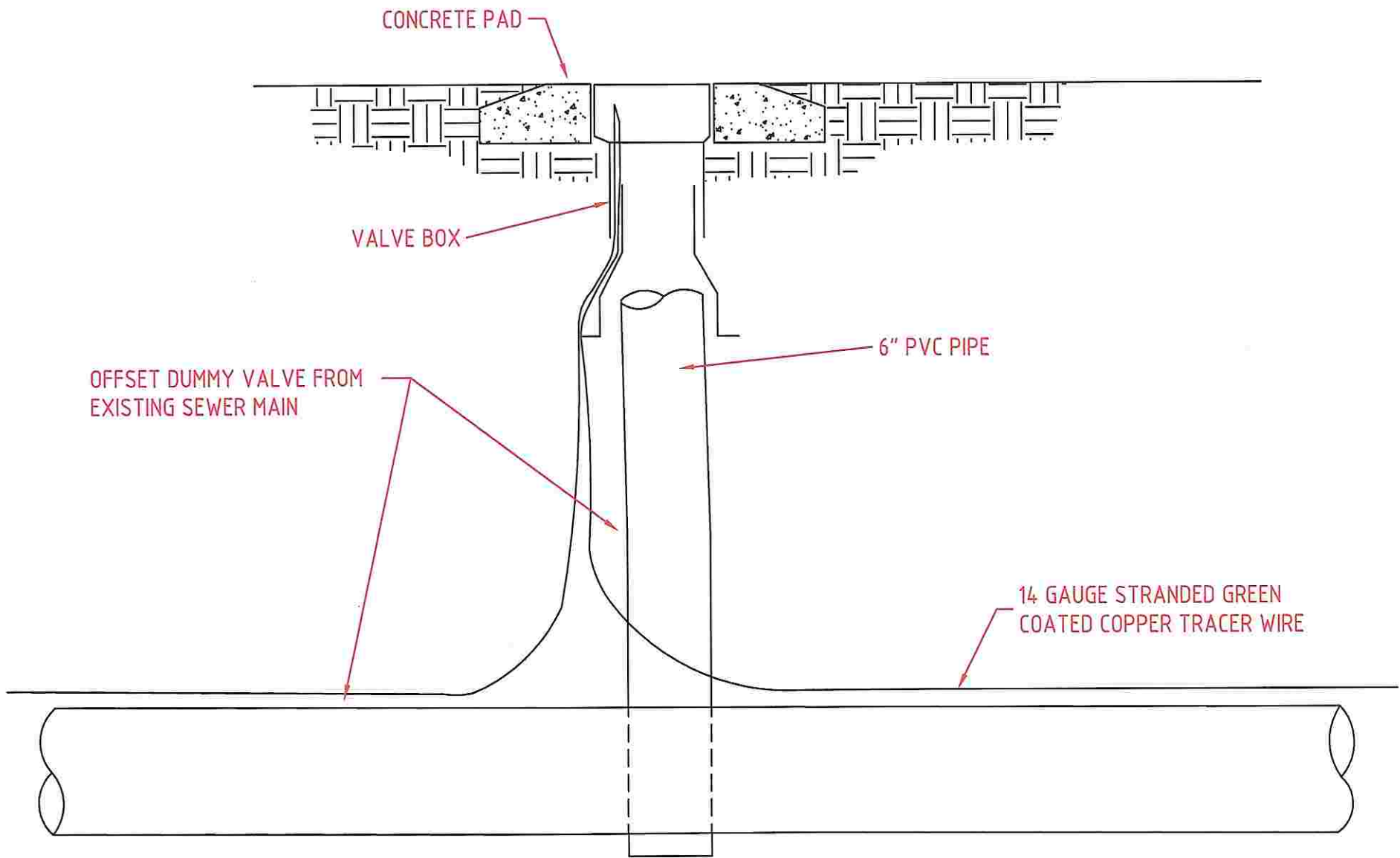
UNION COUNTY PUBLIC WORKS DEPARTMENT
UNION COUNTY, N.C.

STANDARD DETAIL

VALVE BOX INSTALLATION

SCALE:
N.T.S.
DATE:
10-4-11

1A



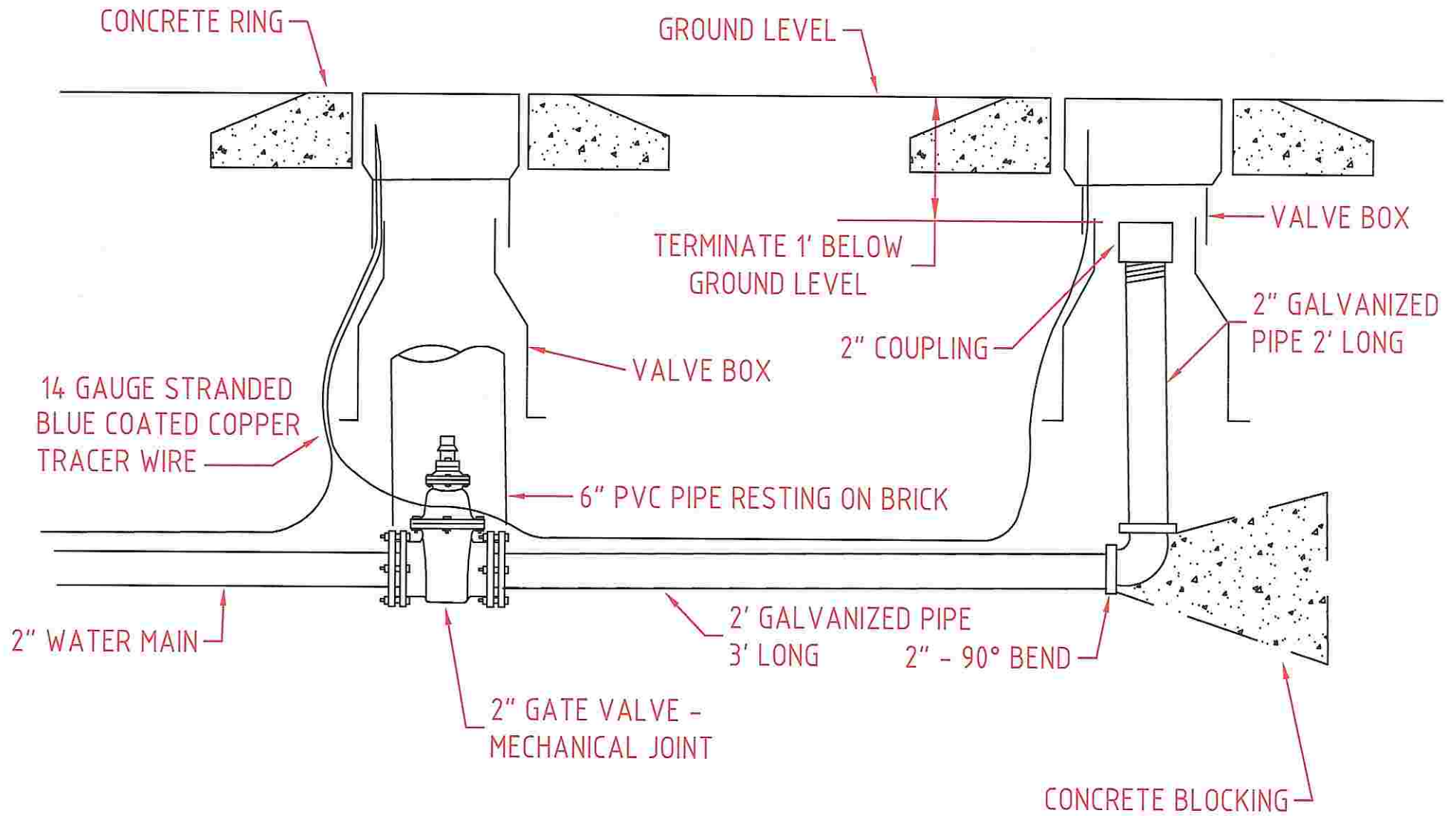
UNION COUNTY PUBLIC WORKS DEPARTMENT
UNION COUNTY, N.C.

STANDARD DETAIL

DUMMY VALVE BOX

SCALE:
N.T.S.
DATE:
10-4-11

1B



UNION COUNTY PUBLIC WORKS DEPARTMENT
UNION COUNTY, N.C.

STANDARD DETAIL

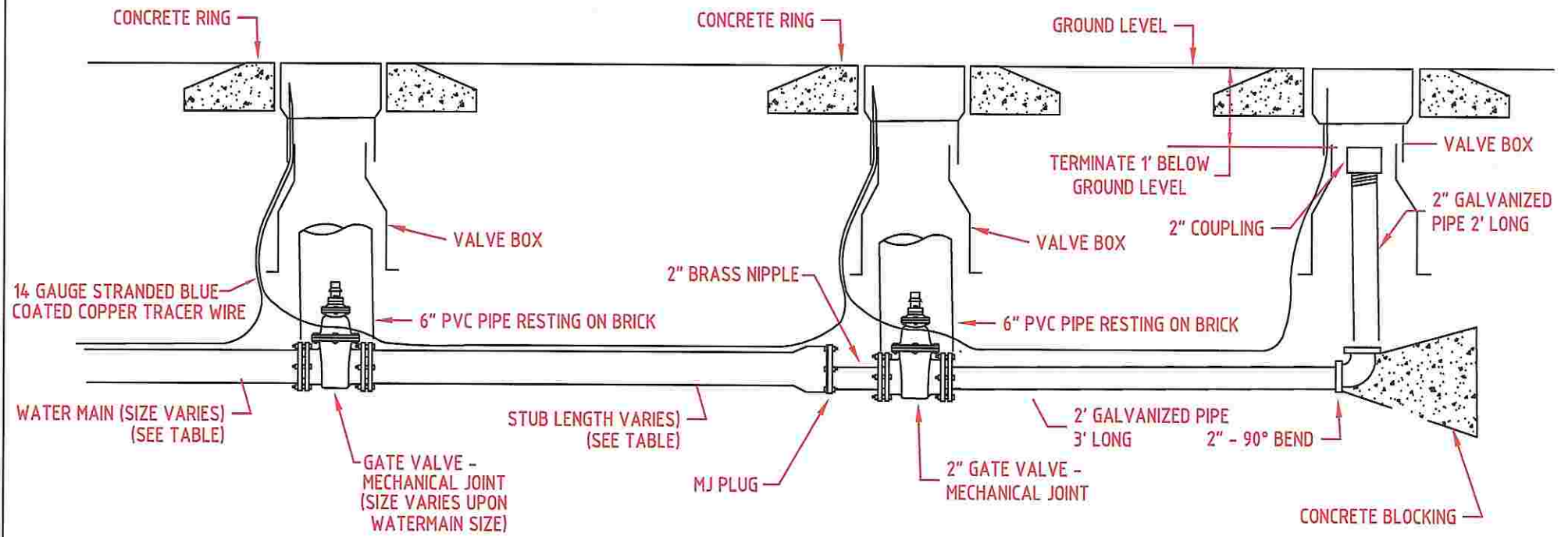
2" BLOW-OFF

SCALE:
N.T.S.
DATE:
10-4-11

2

TABLE

SIZE OF PIPE	LENGTH OF PIPE
6"	40'
8"	40'
12" AND LARGER	BY ENGINEER



UNION COUNTY PUBLIC WORKS DEPARTMENT
UNION COUNTY, N.C.

STANDARD DETAIL

MAINLINE FUTURE EXTENSION WITH BLOW-OFF

SCALE:
N.T.S.
DATE:
10-4-11

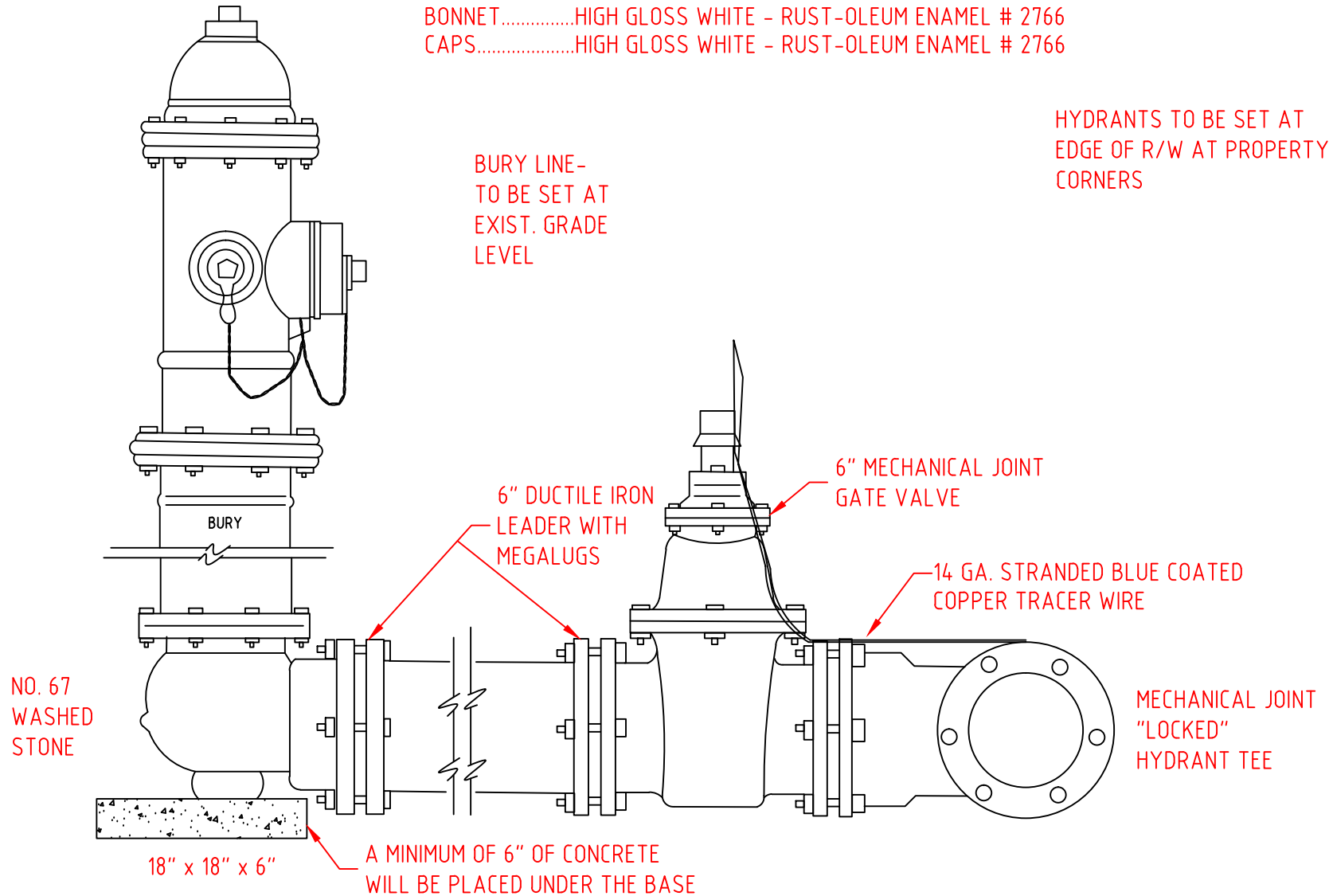
2A

PAIN T COLORS

BODY.....FIRE HYDRANT RED - RUST-OLEUM ENAMEL # 1210 FIRE HYDRANT RED
 BONNET.....HIGH GLOSS WHITE - RUST-OLEUM ENAMEL # 2766
 CAPS.....HIGH GLOSS WHITE - RUST-OLEUM ENAMEL # 2766

HYDRANTS TO BE SET AT
 EDGE OF R/W AT PROPERTY
 CORNERS

BURY LINE-
 TO BE SET AT
 EXIST. GRADE
 LEVEL



STANDARD DETAIL

UNION COUNTY PUBLIC WORKS DEPARTMENT
 UNION COUNTY, N.C.

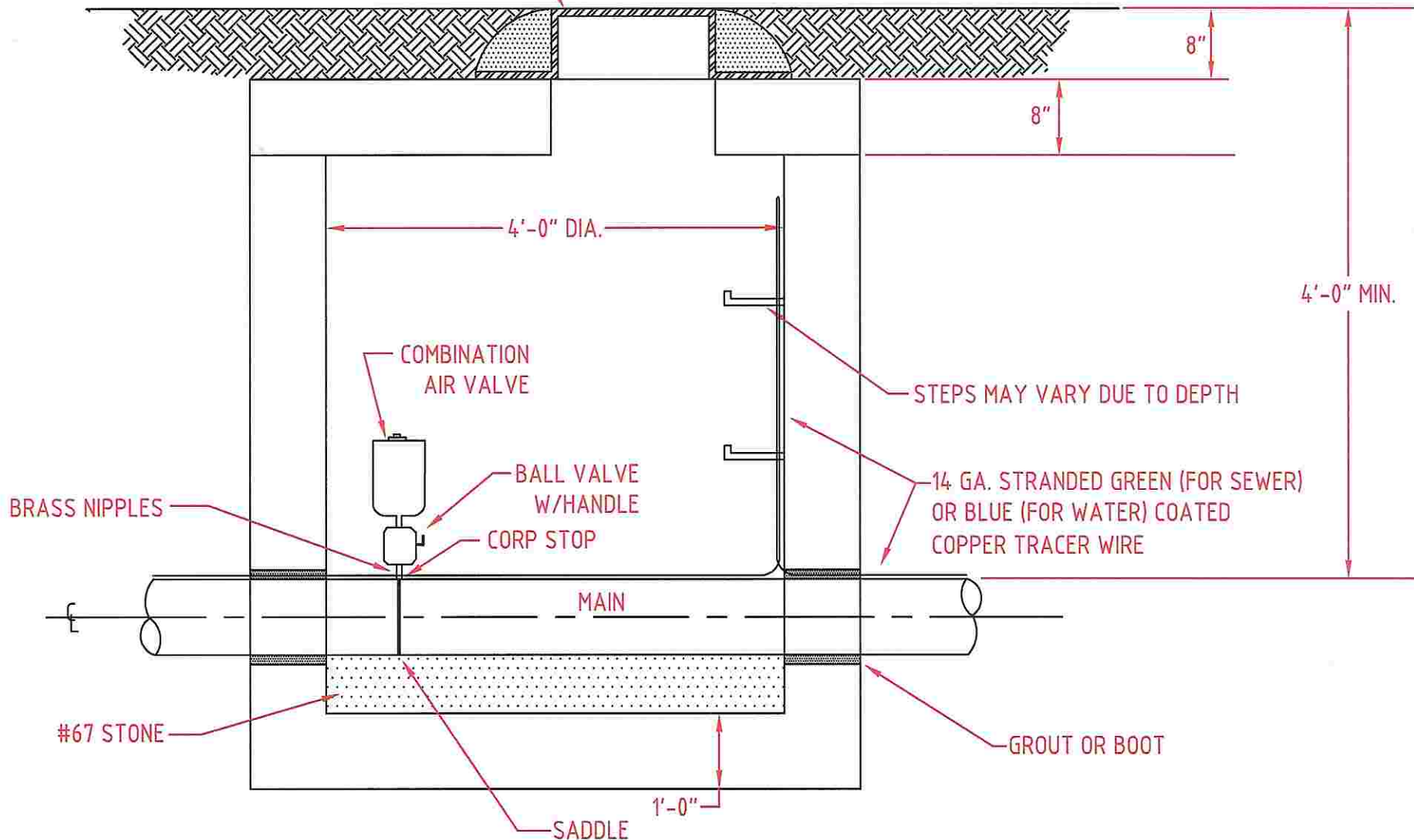
FIRE HYDRANT INSTALLATION

SCALE:
 N.T.S.
 DATE:
 1-2-14

3

APPROVED VALVES	WATER		SEWER
	1"	2"	2"
APCO	No. 50	No. 200	VENT-O-MAT
CRISPIN	No. 10	No. 20	VENT-O-MAT
VAL-MATIC	No. 25	No. 50	VENT-O-MAT

DEWEY BROTHERS MANHOLE 2001
FRAME & COVER OR APPROVED EQUAL



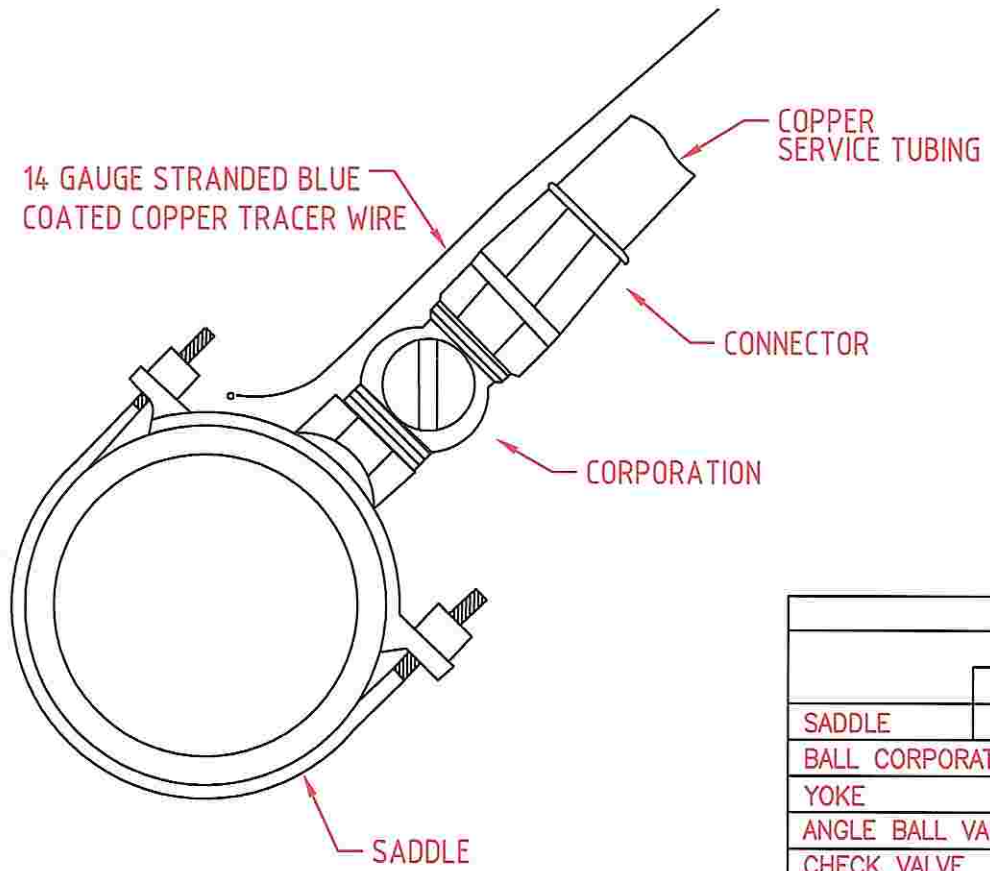
UNION COUNTY PUBLIC WORKS DEPARTMENT
UNION COUNTY, N.C.

STANDARD DETAIL

AIR RELEASE

SCALE:
N.T.S.
DATE:
10-4-11

4



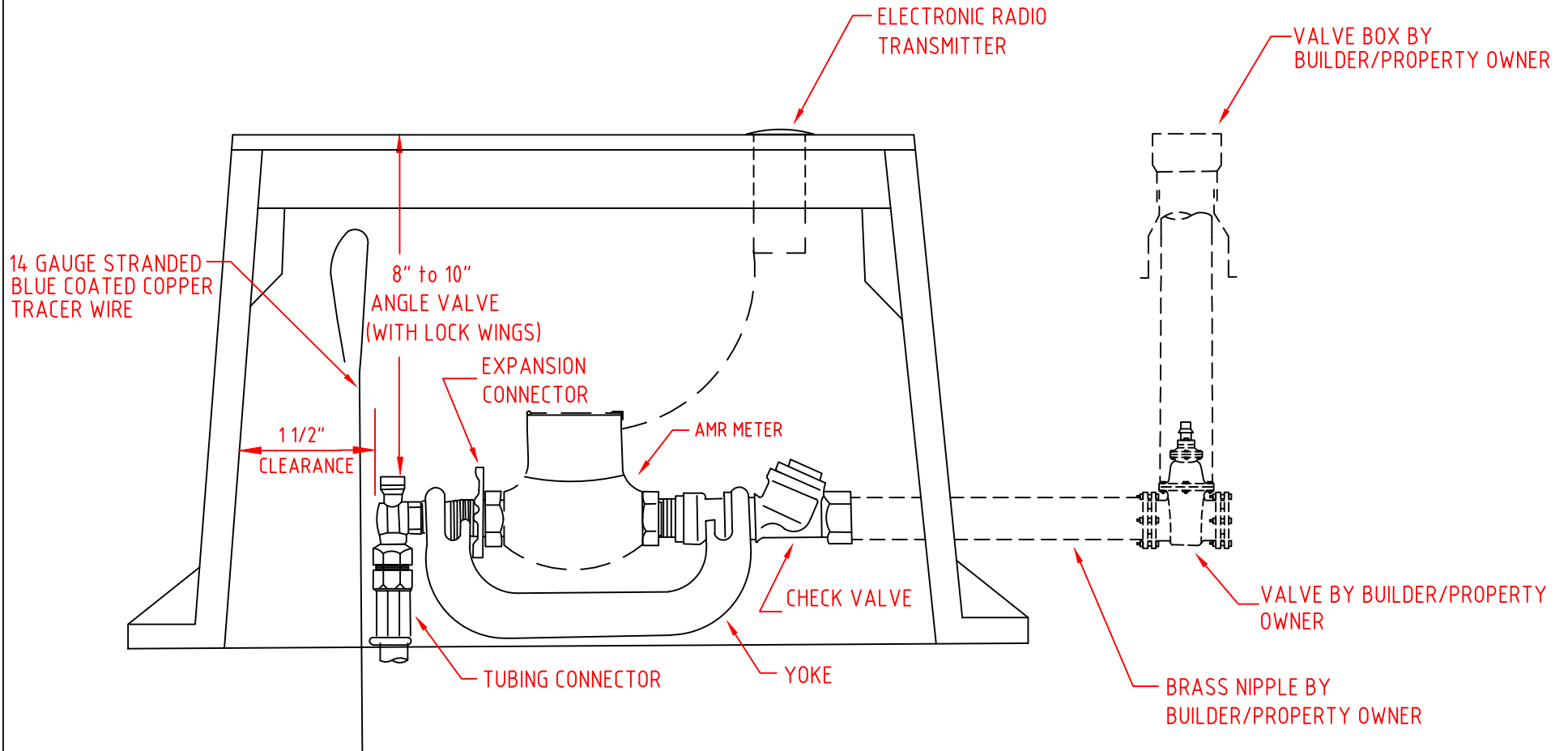
APPROVED SERVICE HARDWARE			
		MUELLER	FORD
	2" PVC	H-13420	S70
SADDLE	UP TO 8"	SEE NOTE	FC 101
BALL CORPORATION		B-25008	FB1000G
YOKE		H-5020	Y 502
ANGLE BALL VALVE		B-24273	BA94-323WG
CHECK VALVE		H-14247-A	HHS91-323
CONNECTORS	COPPER	STYLE 110	GRIP JOINT
EXPANSION CONNECTION			EC 23

NOTE:
 ROMAC 101N SHALL REPLACE MUELLER FOR PIPE
 DIAMETER UP TO 8"

SMITH BLAIR 317, FORD FC 202 OR ROMAC 202N SHALL
 REPLACE MUELLER FOR PIPE DIA. 12" AND UP

GENERAL NOTES:

- 1) METER BOX LID TO HAVE AMR LOCATOR (ALLIANCE 1200 OR EQUAL FOR 50W ERT, STANDARD LID FOR 60W ERT)
- 2) BUILDER/PROPERTY OWNER TO INSTALL NIPPLE, VALVE AND VALVE BOX BEFORE METER WILL BE SET.
- 3) METER AND ERT BY UNION COUNTY @ PREVAILING RATE



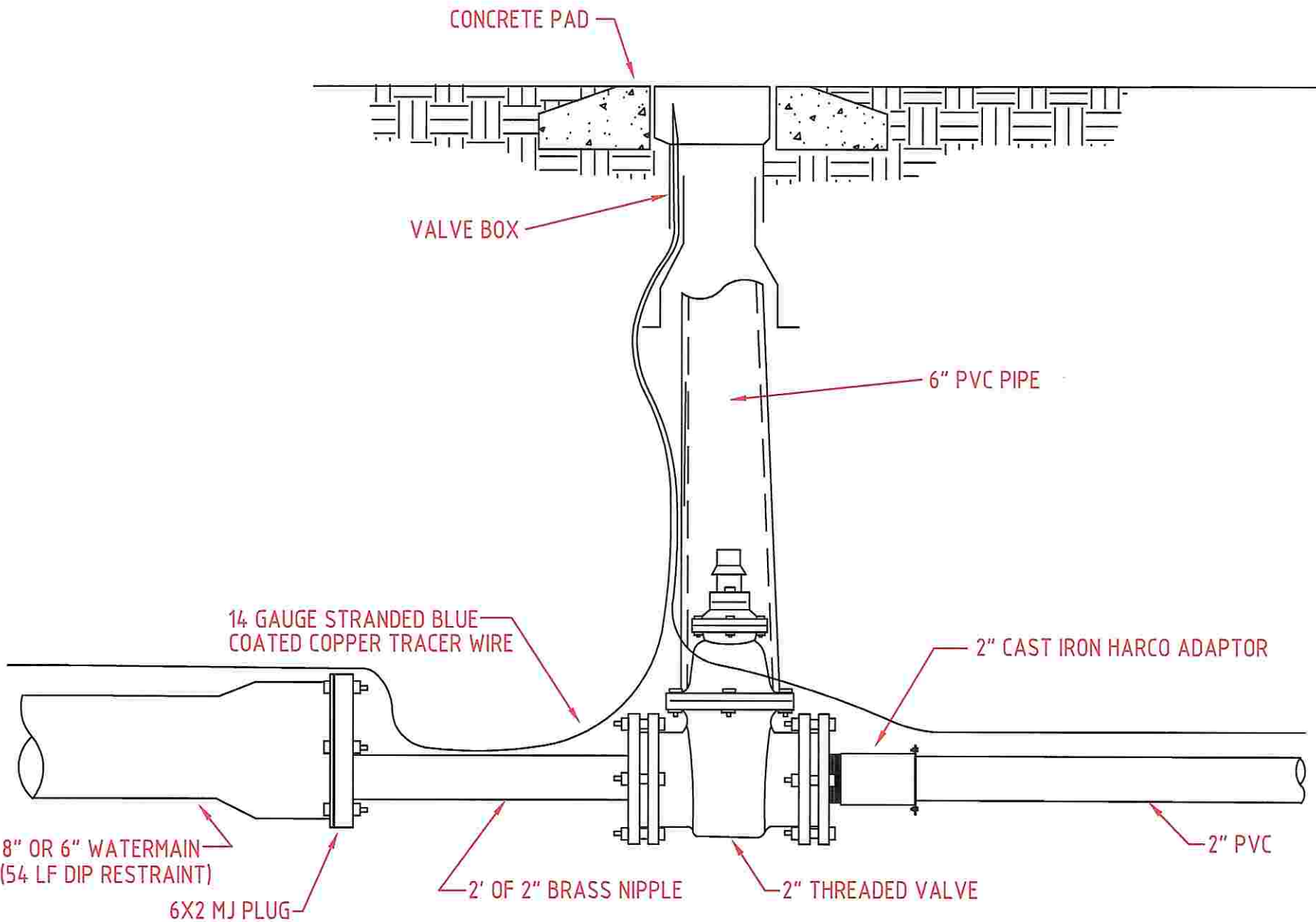
UNION COUNTY PUBLIC WORKS DEPARTMENT
UNION COUNTY, N.C.

STANDARD DETAIL

METER INSTALLATION FOR AMR METERS

SCALE:
N.T.S.
DATE:
1-2-14

6



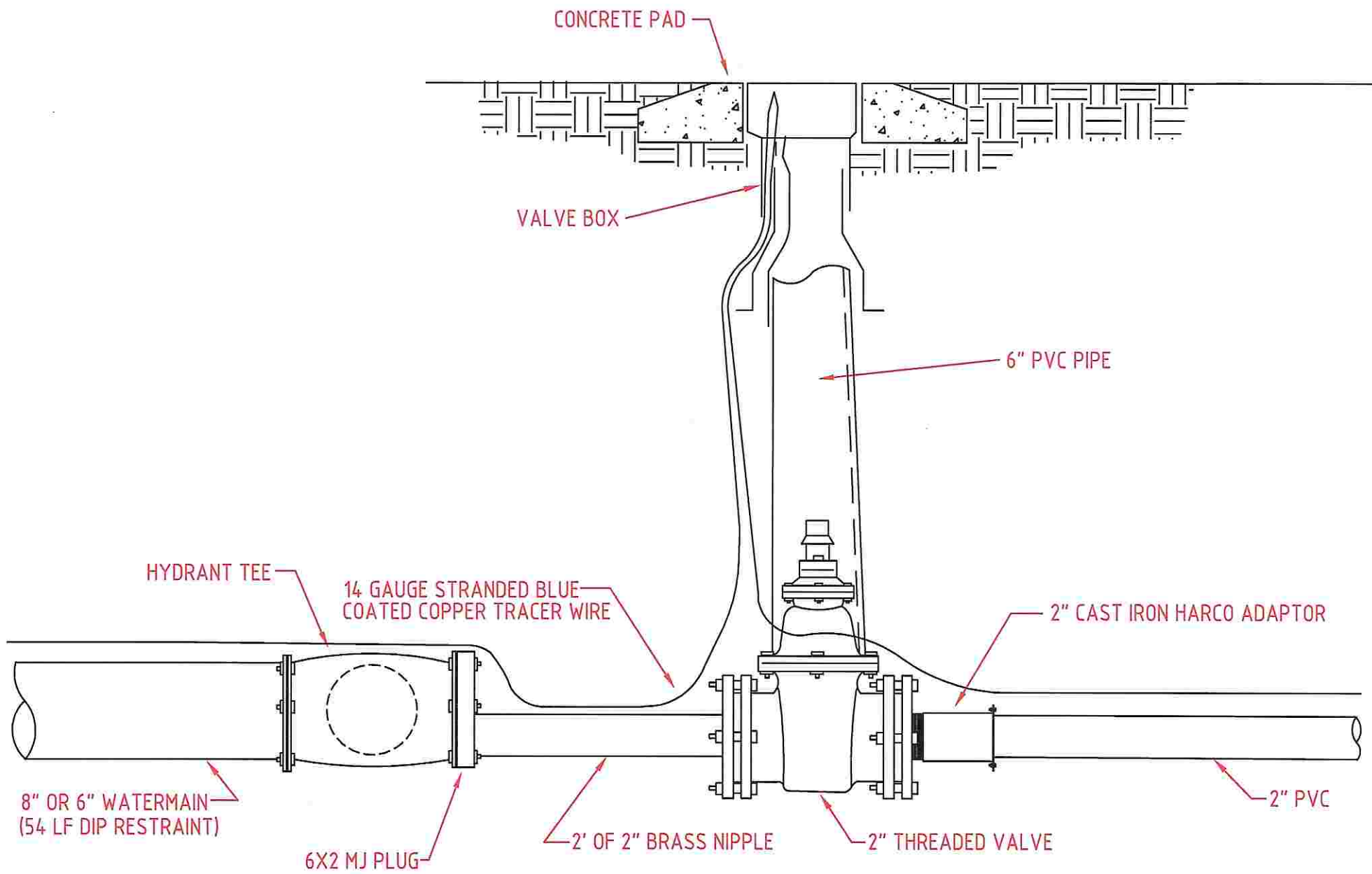
UNION COUNTY PUBLIC WORKS DEPARTMENT
UNION COUNTY, N.C.

STANDARD DETAIL

8" OR 6" X 2" REDUCER

SCALE:
N.T.S.
DATE:
10-4-11

7



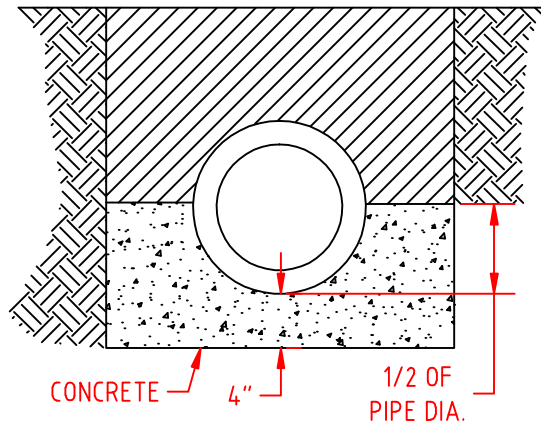
UNION COUNTY PUBLIC WORKS DEPARTMENT
UNION COUNTY, N.C.

STANDARD DETAIL

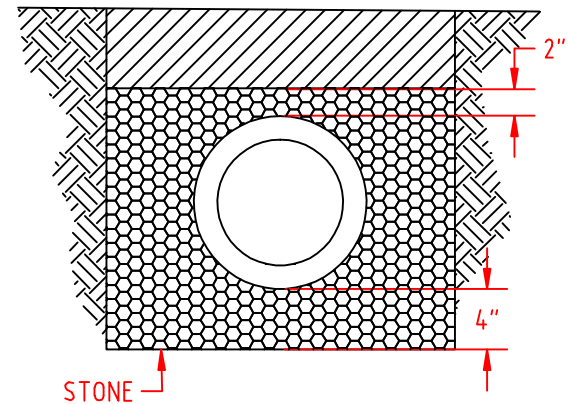
HYDRANT TEE X2" REDUCER

SCALE:
N.T.S.
DATE:
10-4-11

7A



CLASS A



CLASS B

NOTES:
 ALL CONCRETE = 3000 PSI
 ALL STONE = N.C.D.O.T. NO. 67

UNION COUNTY PUBLIC WORKS DEPARTMENT
 UNION COUNTY, N.C.

STANDARD DETAIL

PIPE BEDDING

SCALE:
 N.T.S.
 DATE:
 11-17-06

8

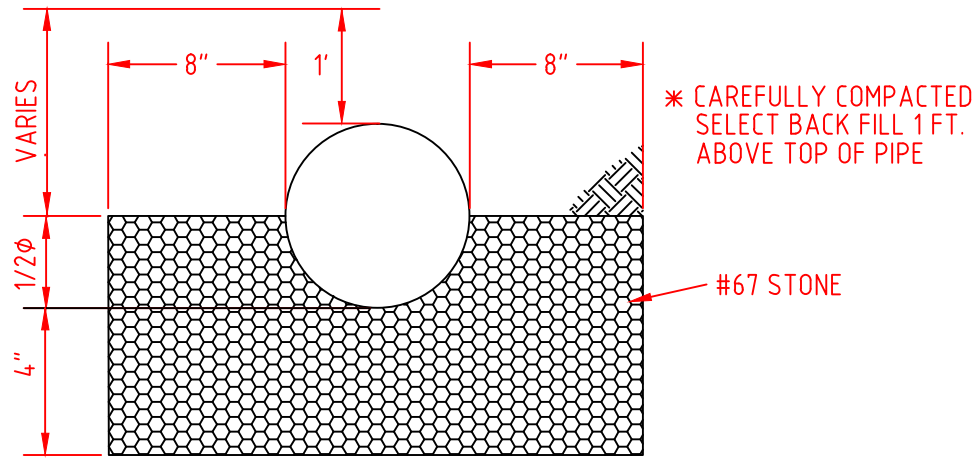
GRAVITY SEWER - BEDDING DETAIL

NOTES:

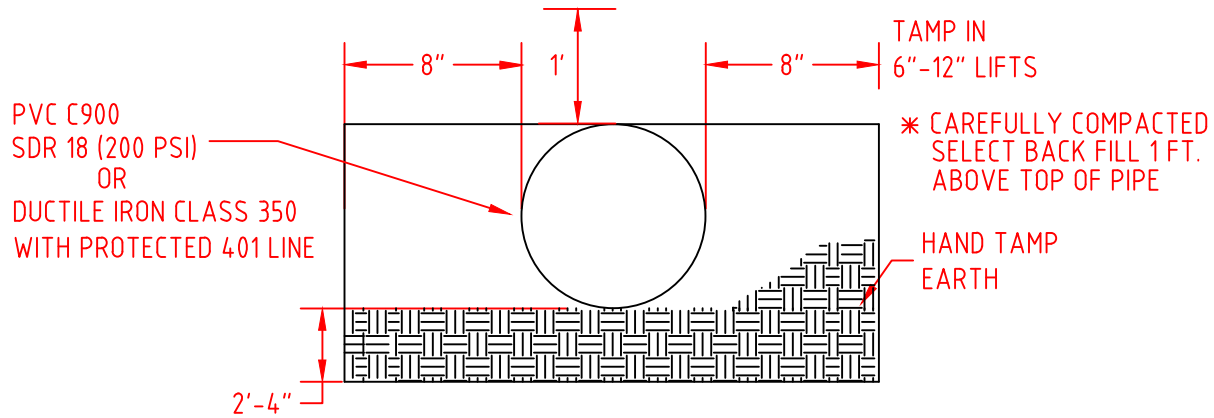
FOR PVC -- USE SDR 35 FOR 10 FT. OR LESS.
USE SDR 26 FOR 10 FT. OR MORE.

USE DUCTILE IRON - IF UNDER 3 FT. DEEP
OR OVER 18 FT. DEEP.

* NO STONES LARGER THAN # 67 STONE
SHALL BE USED IN SELECT BACKFILL



CLASS C

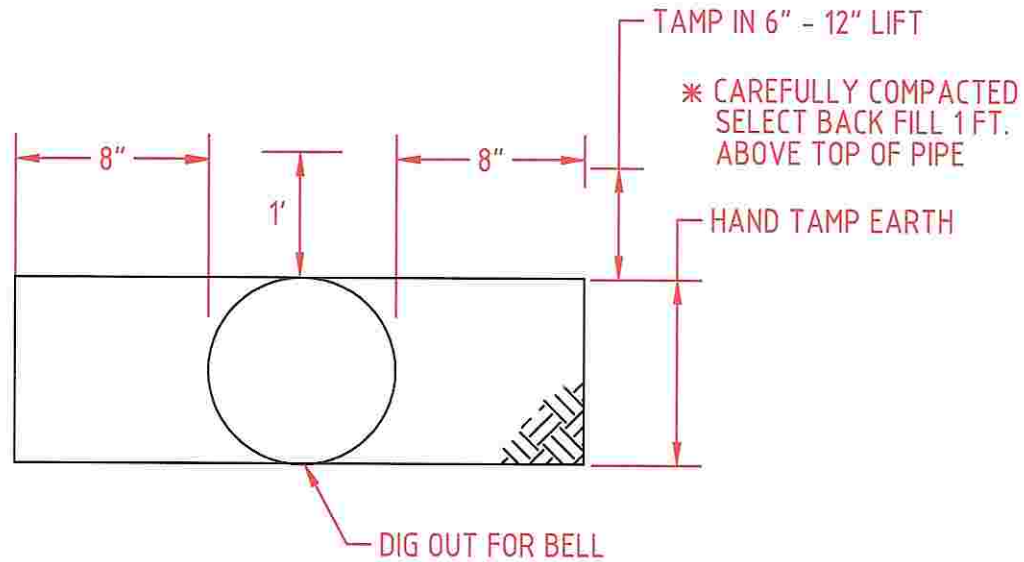


FORCE MAIN

NOTES:

MINIMUM COVER IS 36"
2" PVC SDR 21 (200 PSI)
6"-8" PVC SDR 18
12" OR LARGER DIP

* NO STONES LARGER THAN # 67 STONE
SHALL BE USED IN SELECT BACKFILL



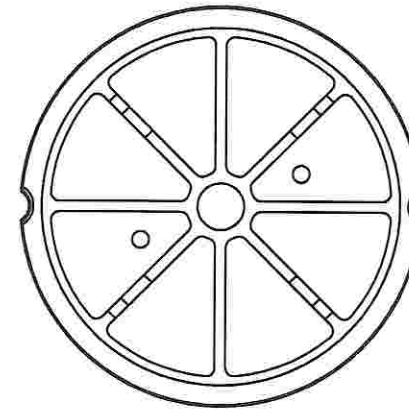
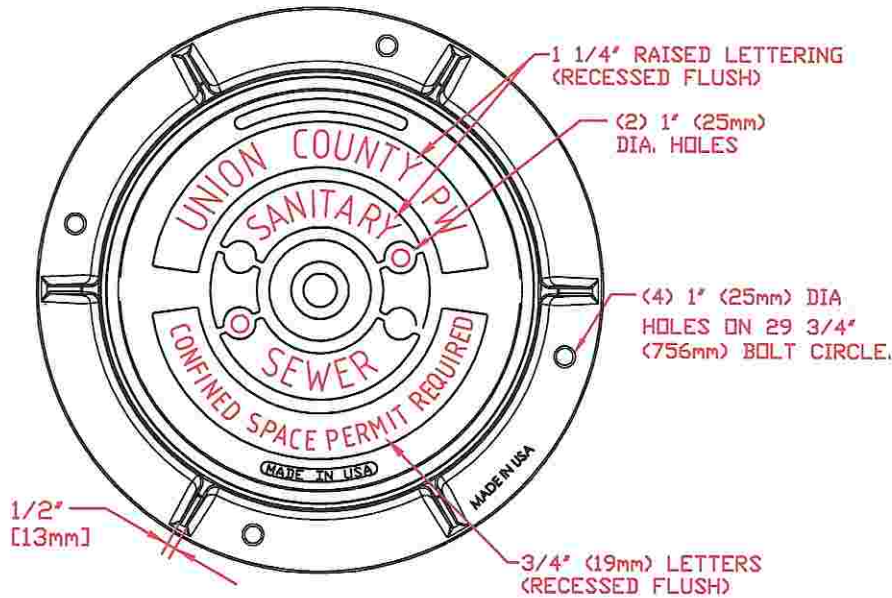
UNION COUNTY PUBLIC WORKS DEPARTMENT
UNION COUNTY, N.C.

STANDARD DETAIL

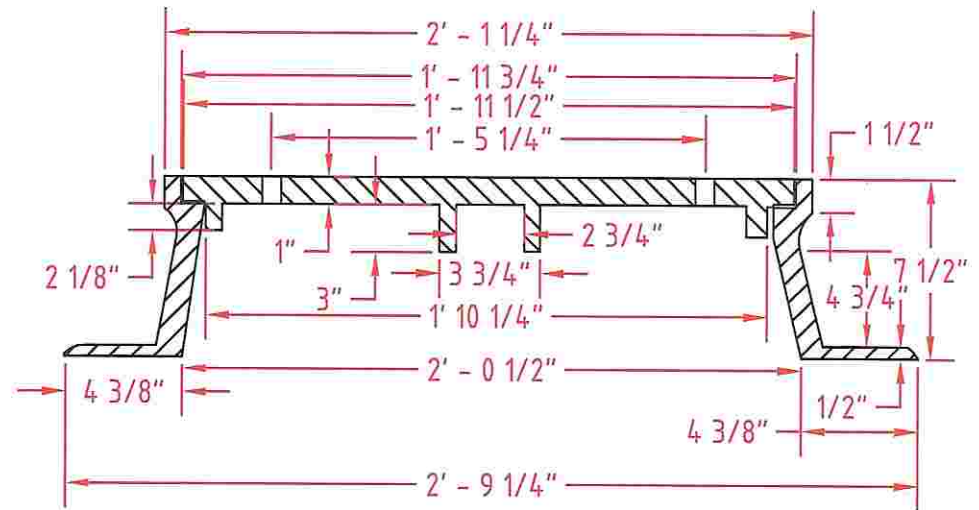
WATER TRENCH

SCALE:
N.T.S.
DATE:
1-14-10

8B



BOTTOM VIEW



(U.S. FOUNDRY - 669, VULCAN - 1384 OR EQUAL)

NOTES:

1. ALL CASTINGS TO BE FREE FROM SAND HOLES. NO PLUGGING ALLOWED.
2. MACHINE ALL CONTACT SURFACES BETWEEN RING AND COVER.
3. PROVIDE TWO VENT HOLES IN COVER, 1" DIA. TAPERED TO 1-1/8" ON REVERSE SIDE.
4. MINIMUM WEIGHTS: COVER - 120 LBS. RING - 190 LBS.
5. ALL MANHOLE RINGS OUT OF ROAD RIGHT OF WAY SHALL BE BOLTED INTO MANHOLE WITH 5/8" DIAMETER KWIK BOLT STUD ANCHOR SYSTEM. HILTI BRAND OR APPROVED EQUAL.

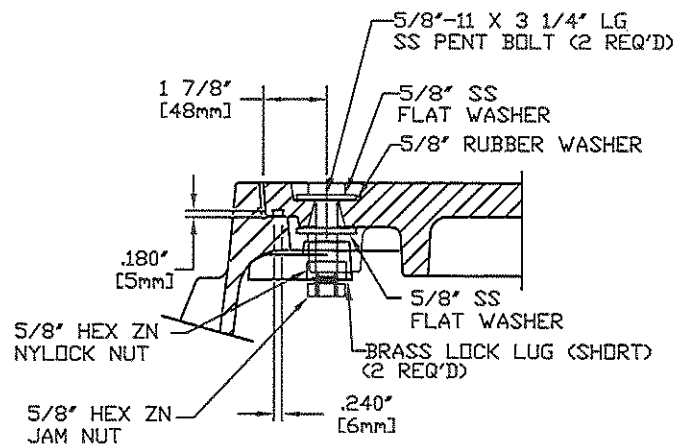
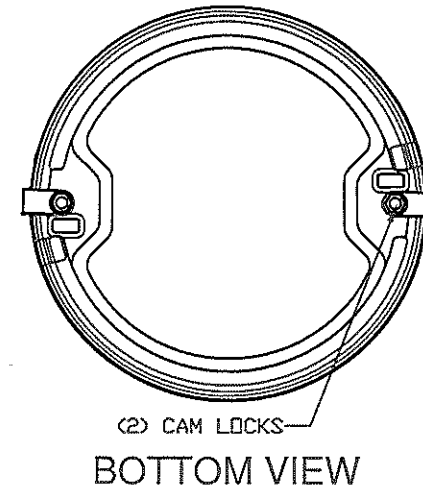
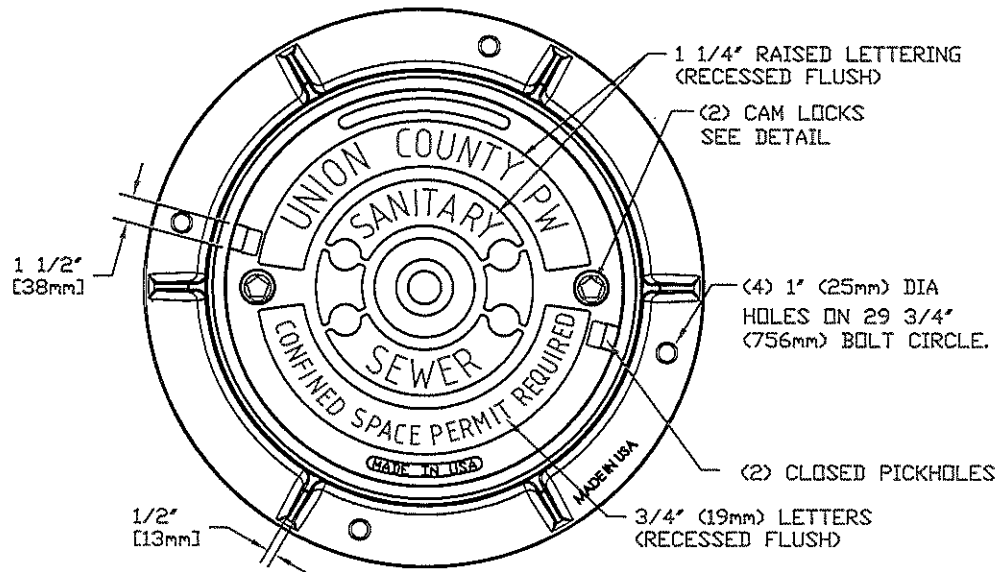
UNION COUNTY PUBLIC WORKS DEPARTMENT
UNION COUNTY, N.C.

STANDARD DETAIL

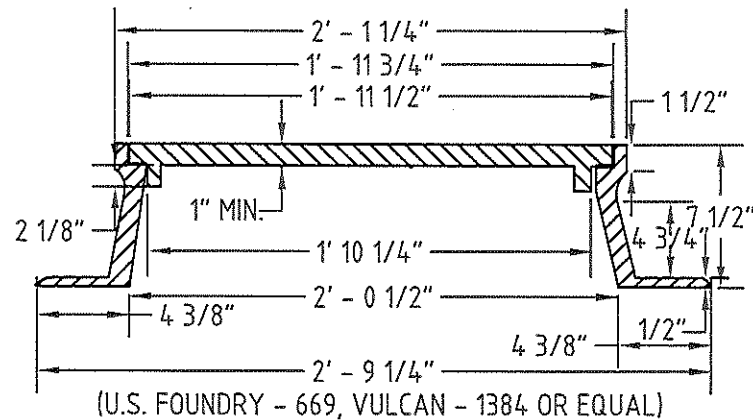
RING & COVER

SCALE:
N.T.S.
DATE:
9-9-11

9



CAM & GASKET GROOVE
DETAIL



NOTES:

1. ALL CASTINGS TO BE FREE FROM SAND HOLES. NO PLUGGING ALLOWED.
2. MACHINE ALL CONTACT SURFACES BETWEEN RING AND COVER.
3. PROVIDE 2 CLOSED PICKHOLES
4. MINIMUM WEIGHTS: COVER - 95 LBS. RING - 190 LBS.
5. ALL MANHOLE RINGS OUT OF ROAD RIGHT OF WAY SHALL BE BOLTED INTO MANHOLE WITH 5/8" DIAMETER KWIK BOLT STUD ANCHOR SYSTEM. HILTI BRAND OR APPROVED EQUAL.

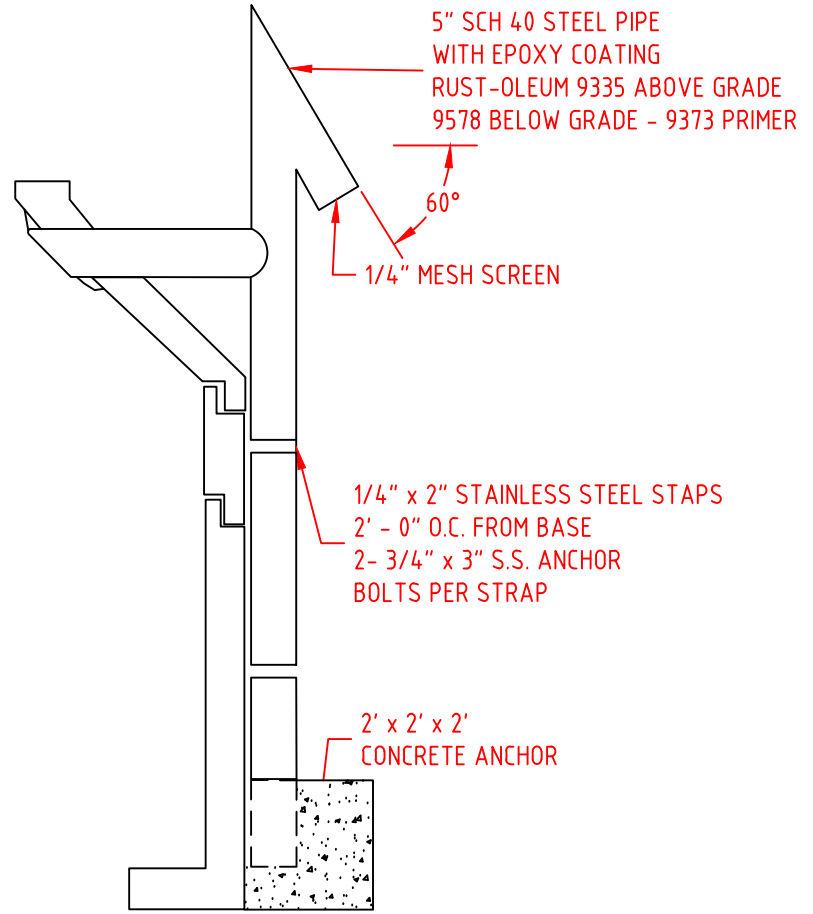
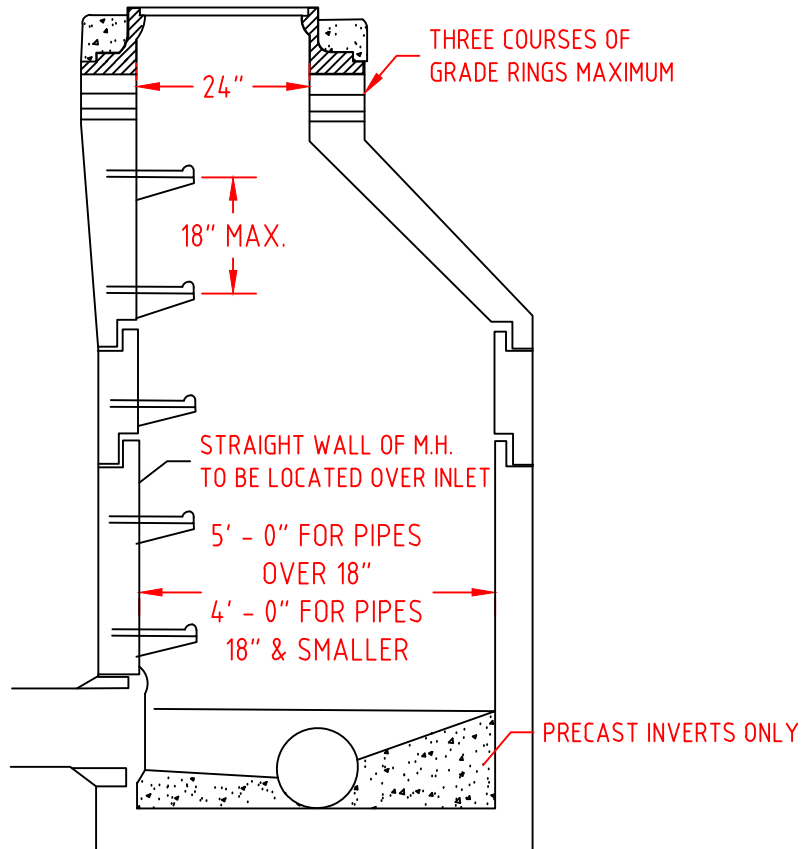
UNION COUNTY PUBLIC WORKS DEPARTMENT
UNION COUNTY, N.C.

STANDARD DETAIL

RING & COVER FOR SEALED MANHOLES

SCALE:
N.T.S.
DATE:
9-25-12

9 A

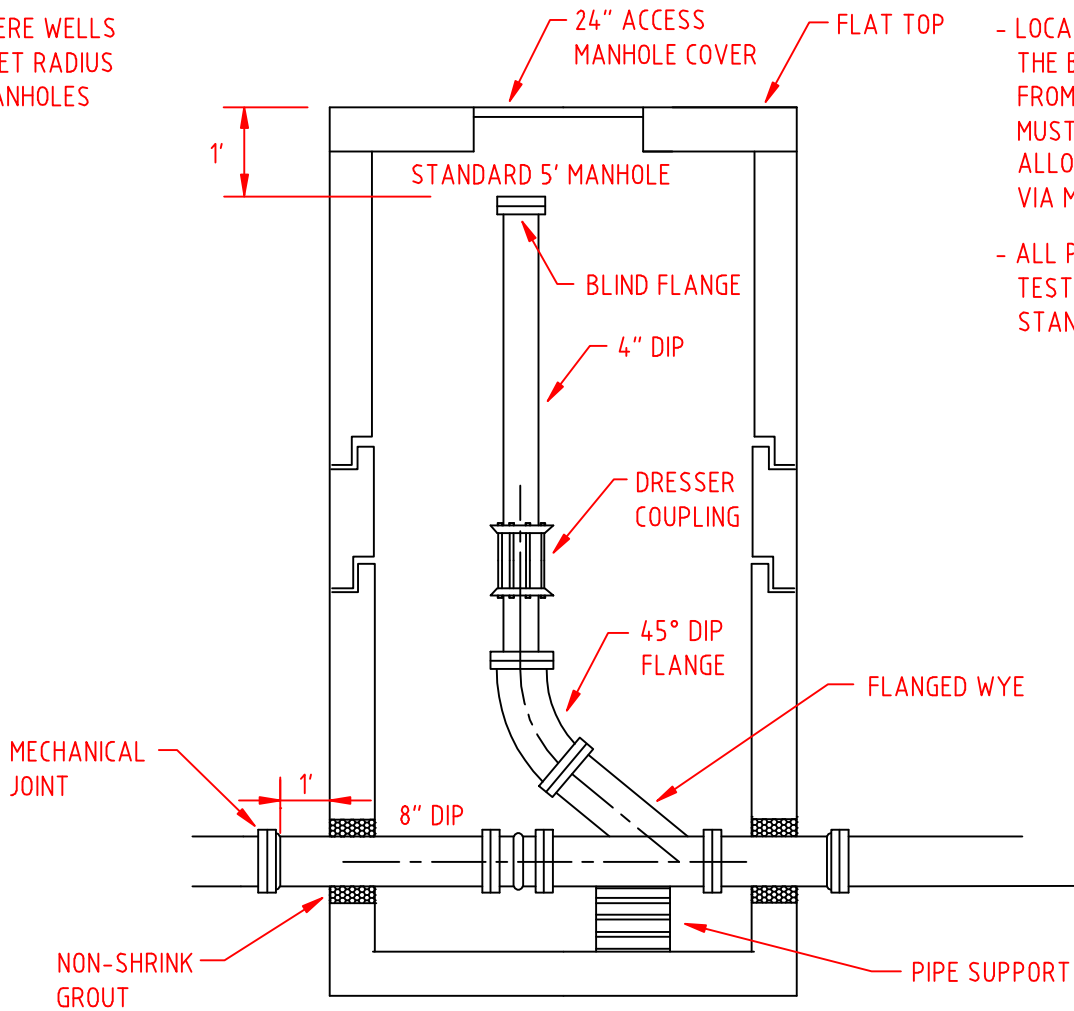


GENERAL NOTES:

- (1) 1 ROLL OF MASTIC AND A 6" EXTERNAL JOINT/SEAM WRAP INSTALLED ON EACH MANHOLE SECTION
- (2) MANHOLE VACUUM TESTING - AFTER EACH MANHOLE IS INSTALLED AND ALL PIPES ARE CONNECTED, BUT BEFORE BACKFILLING, THE MANHOLE SHALL BE VACUUM TESTED. ALL PIPES ENTERING THE MANHOLE SHALL BE PLUGGED AND BRACED. THE CONTRACTOR SHALL FURNISH ALL MATERIALS, LABOR AND EQUIPMENT NECESSARY TO PERFORM THE TESTING. A VACUUM OF 10 INCHES OF MERCURY SHALL BE CREATED ON THE INSIDE OF THE MANHOLE. AT THE VACUUM OF 10 INCHES OF MERCURY, THE PUMP SHALL BE STOPPED AND THE TIME SHALL BE MEASURED FOR THE VACUUM TO DROP TO 9 INCHES. FAILURE OF THE TEST SHALL BE ANY AMOUNT OF TIME LESS THAN THE FOLLOWING.
 - 4 FT. DIAMETER MANHOLE = 60 SECONDS
 - 5 FT. DIAMETER MANHOLE = 75 SECONDS
 - 6 FT. DIAMETER MANHOLE = 90 SECONDS
 - 7 FT. DIAMETER MANHOLE = 105 SECONDS
 - 8 FT. DIAMETER MANHOLE = 120 SECONDS
 - 10 FT. DIAMETER MANHOLE = 150 SECONDS
 UPON TEST FAILURE, THE CONTRACTOR SHALL REPAIR ALL LEAKS AND RETEST THE MANHOLE UNTIL THE TEST HAS PASSED.

UNION COUNTY PUBLIC WORKS DEPARTMENT UNION COUNTY, N.C.	STANDARD DETAIL		10
	MANHOLE		
		SCALE: N.T.S.	
		DATE: 7-31-14	

- FOR USE ONLY WHERE WELLS ARE WITHIN 100 FEET RADIUS OF SEWER LINE/MANHOLES



- LOCATE ACCESS COVER SUCH THAT THE BLIND FLANGE IS ACCESSIBLE FROM TOP OF MANHOLE. COVER MUST ALSO BE IN A POSITION TO ALLOW MANHOLE INGRESS/EGRESS VIA MANHOLE STEPS.

- ALL PIPE AND FITTINGS TO BE TESTED TO WATER QUALITY STANDARDS.

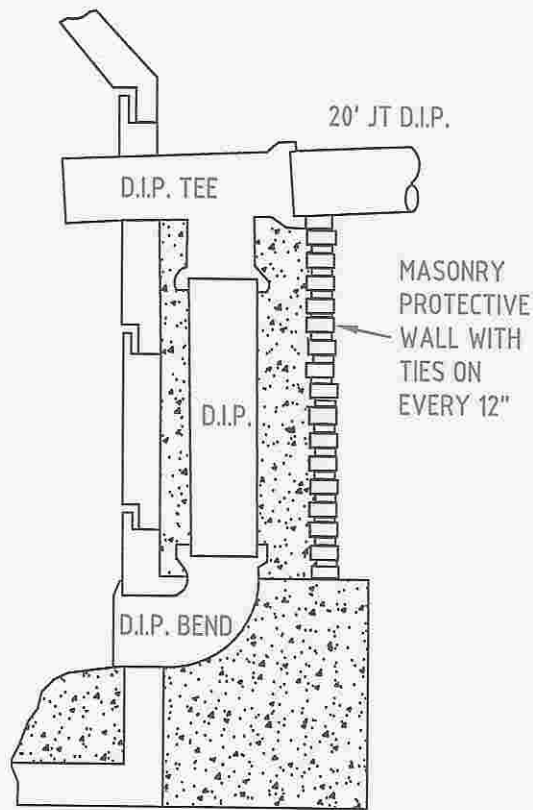
UNION COUNTY PUBLIC WORKS DEPARTMENT
UNION COUNTY, N.C.

STANDARD DETAIL

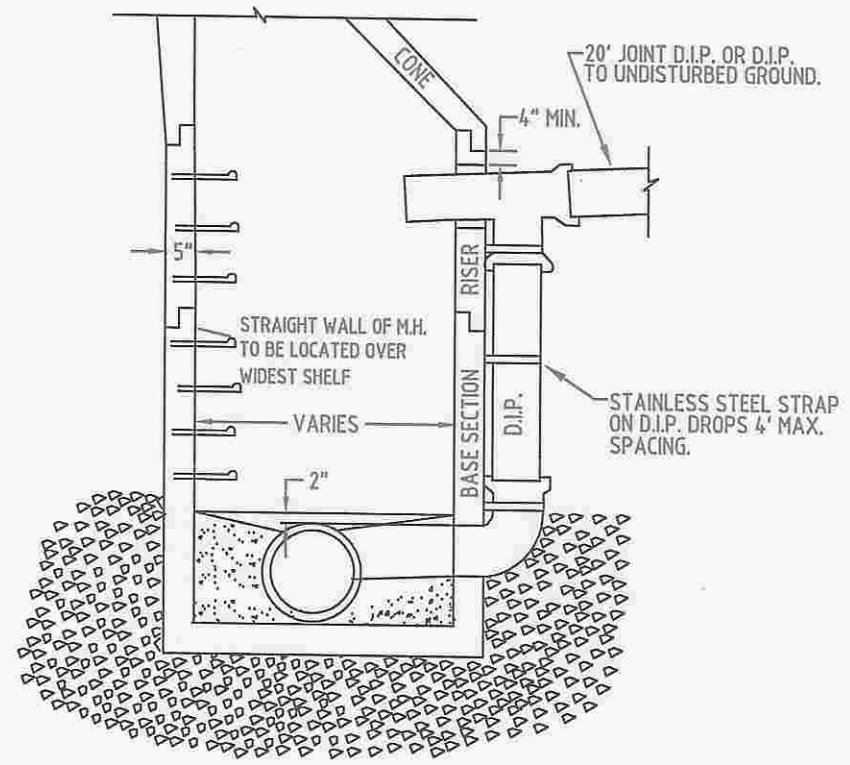
CLEANOUT MANHOLE

DATE:
7-29-08

10A



OPTION 'A'



OPTION 'B'

#67 STONE

GENERAL NOTES:

- (1) CARE MUST BE TAKEN TO FORM A SMOOTH FINISHED TROUGH FROM ENTRANCE PIPES TO EXIT PIPE, AND IN CURVED MANHOLES THE TROUGH MUST BE A SMOOTH CIRCULAR ARC TANGENT TO THE INSIDE WALLS OF THE PIPES AT THEIR ENDS.
- (2) THE SLOPE OF THE OUTSIDE DROP TROUGH SHALL BE 1/4" PER FOOT.
- (3) ALL PIPE OPENINGS TO BE NO GREATER THAN 3" LARGER THAN O.D. OF PIPE AND ADDITIONALLY REINFORCED WITH A MINIMUM OF 0.20 SQ. IN. OF STEEL AT 90 DEGREES. PIPE TO BE CENTERED IN OPENINGS. ADDITIONAL REINFORCEING NOT REQUIRED FOR CORED OPENINGS.
- (4) OUTSIDE DROP SHALL NOT ENTER MANHOLE IN CONE SECTION.
- (5) MATCH DROP INFLUENT CROWN TO CROWN WITH EFFLUENT PIPE.

UNION COUNTY PUBLIC WORKS DEPARTMENT
UNION COUNTY, N.C.

STANDARD DETAIL

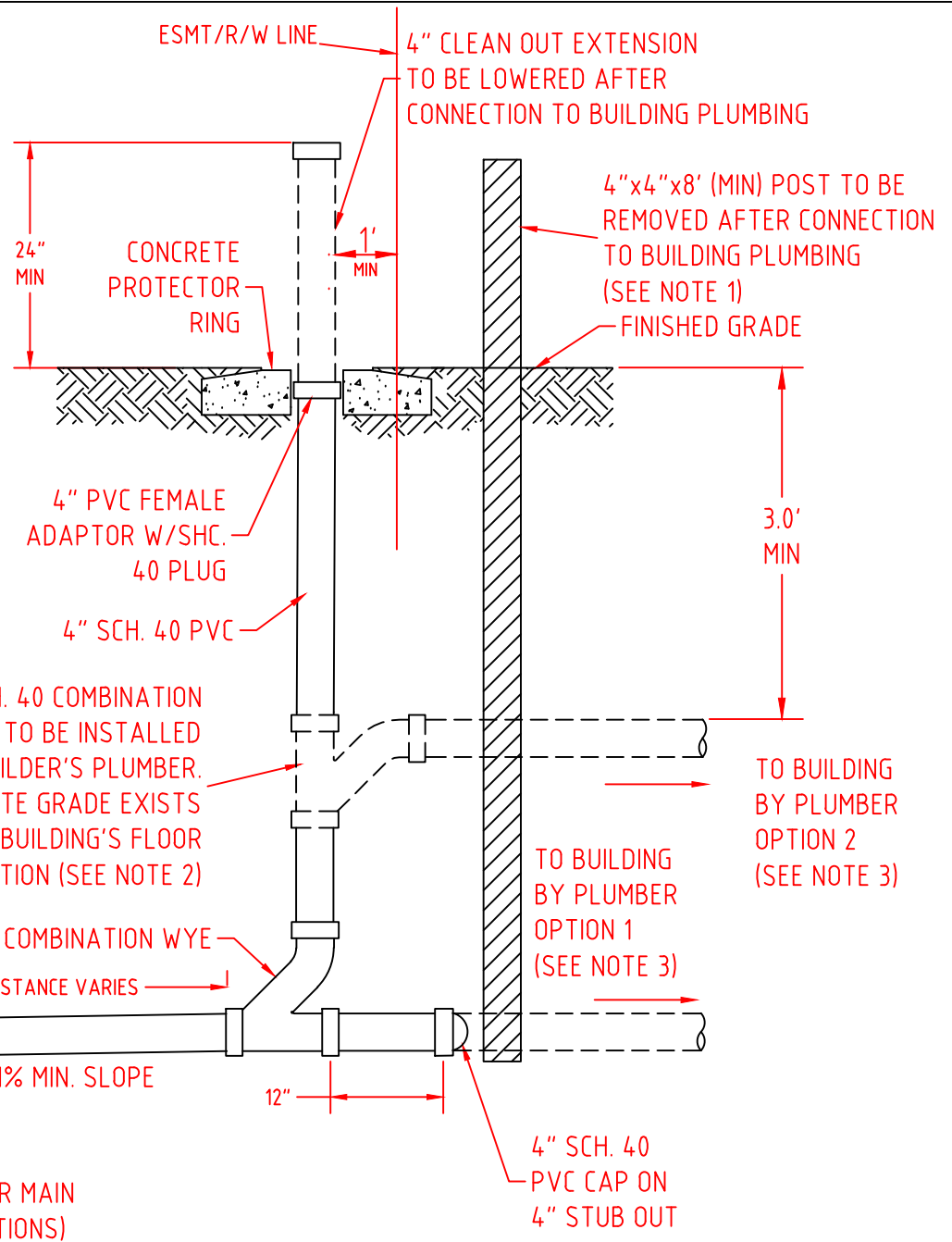
OUTSIDE DROP MANHOLE

SCALE:
N.T.S.
DATE:
5-7-12

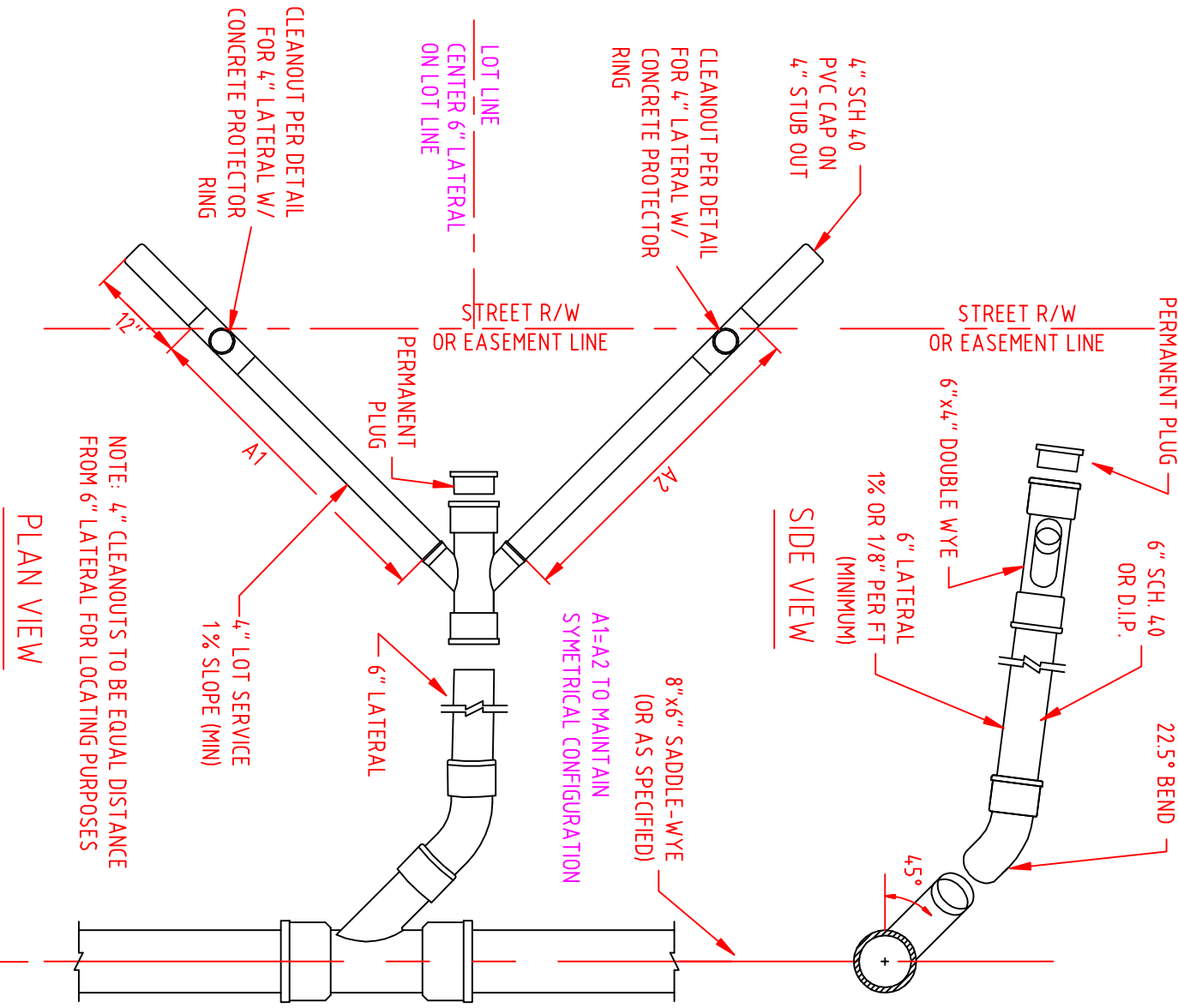
10B

NOTES:

1. THE CLEAN-OUT SHALL BE ADJUSTED TO GRADE AND THE POST REMOVED BY THE PLUMBER UPON CONNECTION TO THE TAP.
2. PLUMBER SHALL HAVE THE OPTION TO INSTALL A ONE PIECE 4" SCH. 40 COMBINATION WYE TO MINIMIZE TRENCH DEPTH OR INSTALL THE SEWER SERVICE LATERAL FROM THE 4" STUB OUT.
3. ALL CONSTRUCTION BY THE PLUMBER, EITHER OPTION 1 OR OPTION 2, SHALL BE INSPECTED AND APPROVED BY UNION COUNTY PLUMBING INSPECTOR UNDER A VALID PLUMBING PERMIT.
4. CONTRACTOR OR UNION COUNTY PUBLIC WORKS PERSONNEL MAY ADJUST SERVICE LATERAL ELEVATION WITH FITTINGS IF ADEQUATE GRADE EXISTS.
5. LATERAL CONNECTIONS TO MANHOLES MUST BE CORED AND BOOT INSTALLED.



NOTE: SEE DETAIL 11 FOR
SEWER LATERAL CLEANOUT
DETAIL



PLAN VIEW

SIDE VIEW

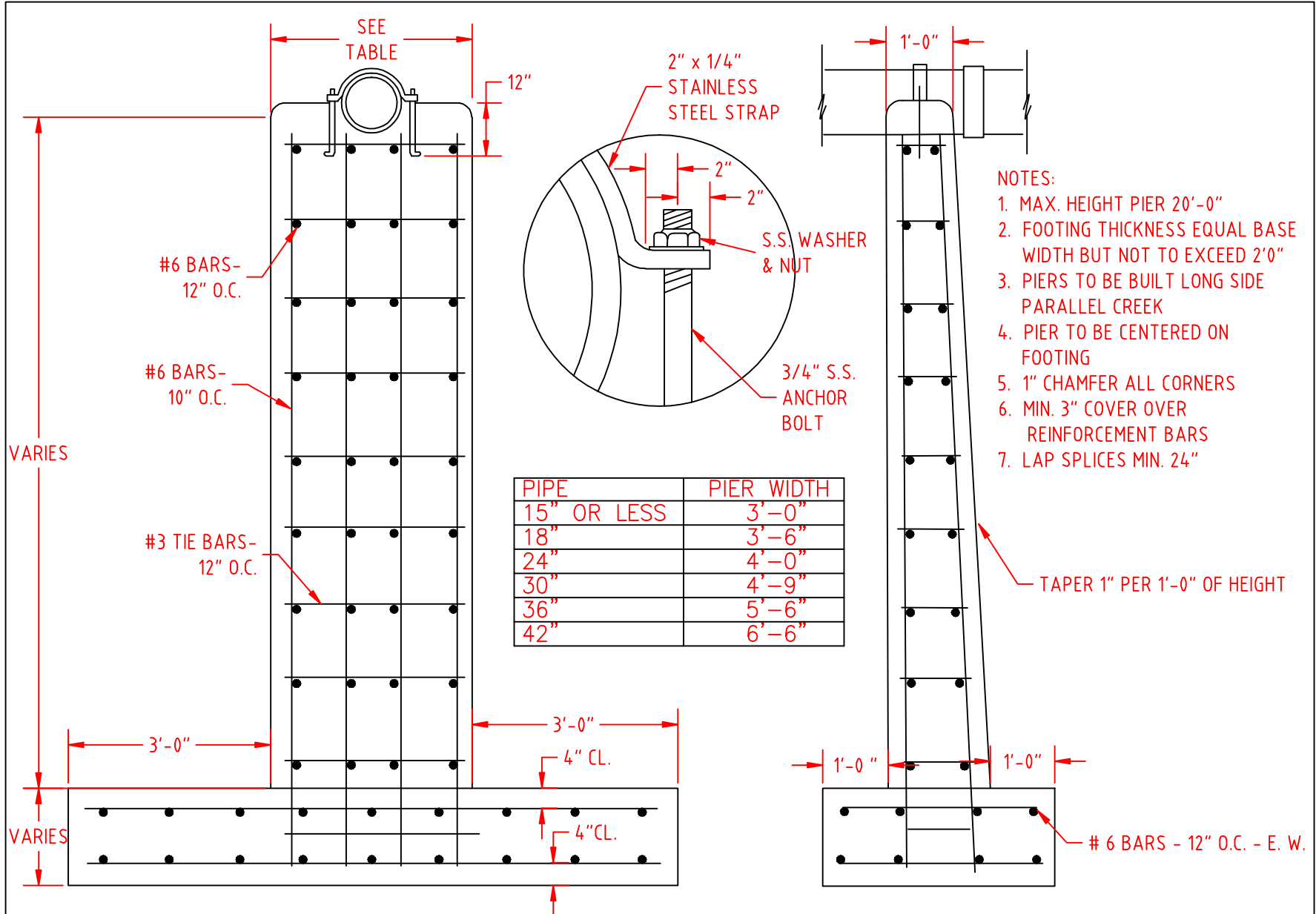
STANDARD DETAIL

DUAL SEWER LATERAL

SCALE:
N.T.S.
DATE:
11-17-06

11A

UNION COUNTY PUBLIC WORKS DEPARTMENT
UNION COUNTY, N.C.



UNION COUNTY PUBLIC WORKS DEPARTMENT
UNION COUNTY, N.C.

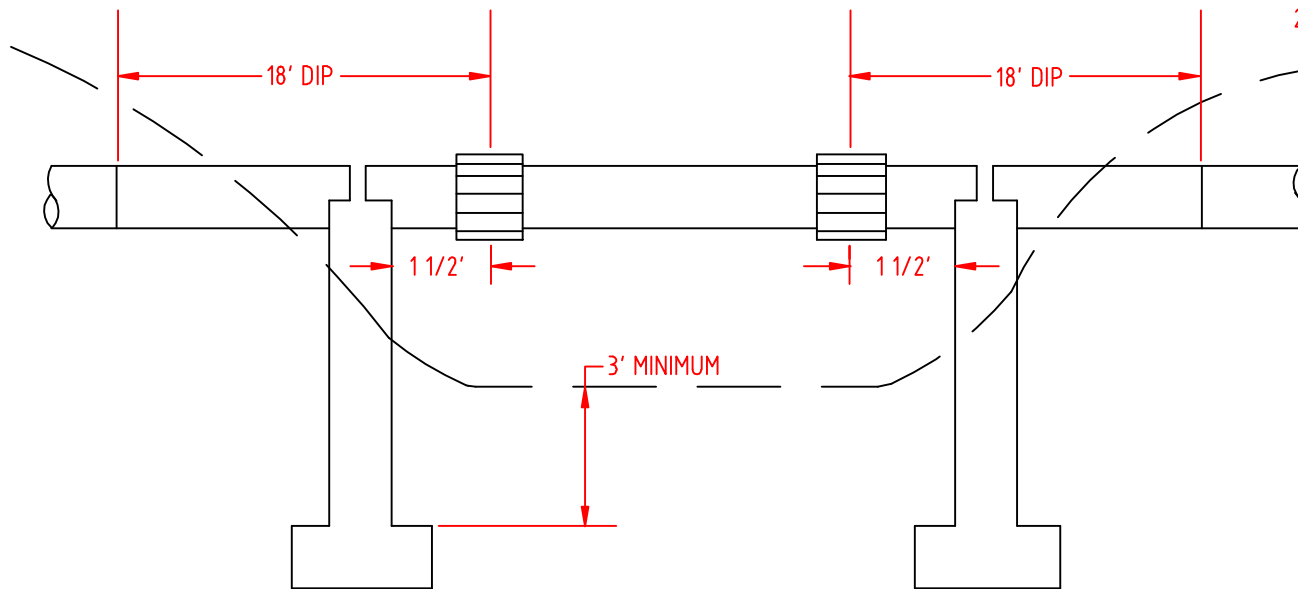
STANDARD DETAIL

REINFORCED CONCRETE PIERS

SCALE:
N.T.S.
DATE:
11-17-06

12

1. TRANSITION COUPLINGS FROM STEEL TO DUCTILE IRON PIPE TO BE ROCKWELL STYLE 441 OR EQUAL
 2. DUCTILE IRON PIPE TO BE CLASS 52
 3. STEEL PIPE TO BE ASTM A53, TYPE S, GRADE B
MIN. THICKNESS = 0.250"
- COATING:
1. SURFACE PREP. SSPC-SP-6
 2. PRIMER-RUST-OLEUM 9373
2 MILS D.F.T.
 3. INTERMEDIATE-RUST-OLEUM 9391-2 MILS D.F.T.
 4. FINISH-RUST-OLEUM 9582
2 COATS 6 MILS D.F.T.EACH



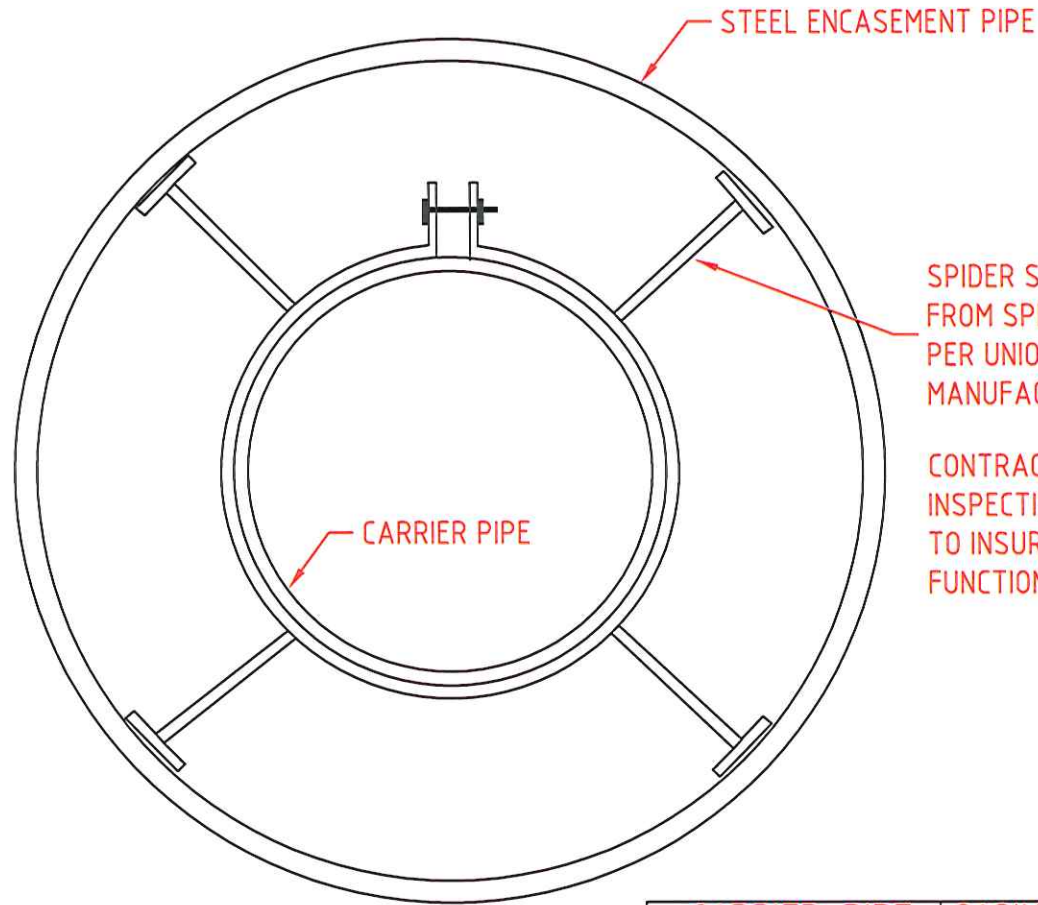
UNION COUNTY PUBLIC WORKS DEPARTMENT
UNION COUNTY, N.C.

STANDARD DETAIL

AERIAL CREEK CROSSING

SCALE:
N.T.S.
DATE:
11-17-06

13



SPIDER SUPPORT AND SPACER AVAILABLE FROM SPIDER MANUFACTURING, INC. INSTALL PER UNION COUNTY INSPECTOR AND PER MANUFACTURERS SPECIFICATIONS.

CONTRACTOR RESPONSIBLE FOR INSPECTING MATERIALS AND WELDS TO INSURE ALL SPIDERS WILL FUNCTION PROPERLY.

CARRIER PIPE	CASING PIPE I.D.	WALL THICKNESS
4"	8"	0.188"
6"	12"	0.188"
8"	16"	0.250"
10"	16"	0.250"
12"	20"	0.281"
16"	24"	0.344"
24"	30"	0.406"
30"	42"	0.500"
36"	48"	0.500"

NOTES:

1. NO PIPE SHALL BE SUPPORTED BY BELL.
2. END SECTIONS LESS THAN 4' MAY BE UNSUPPORTED.
3. WALL THICKNESS AS PER TABLE UNLESS OTHERWISE SHOWN ON PLAN.
4. MASONRY SEAL AT ENDS -- 2" x 4" WEEP HOLE AT LOW END
5. ALL PRESSURE PIPES TO HAVE TRACING WIRE IN ALL CASING BORES.

UNION COUNTY PUBLIC WORKS DEPARTMENT
UNION COUNTY, N.C.

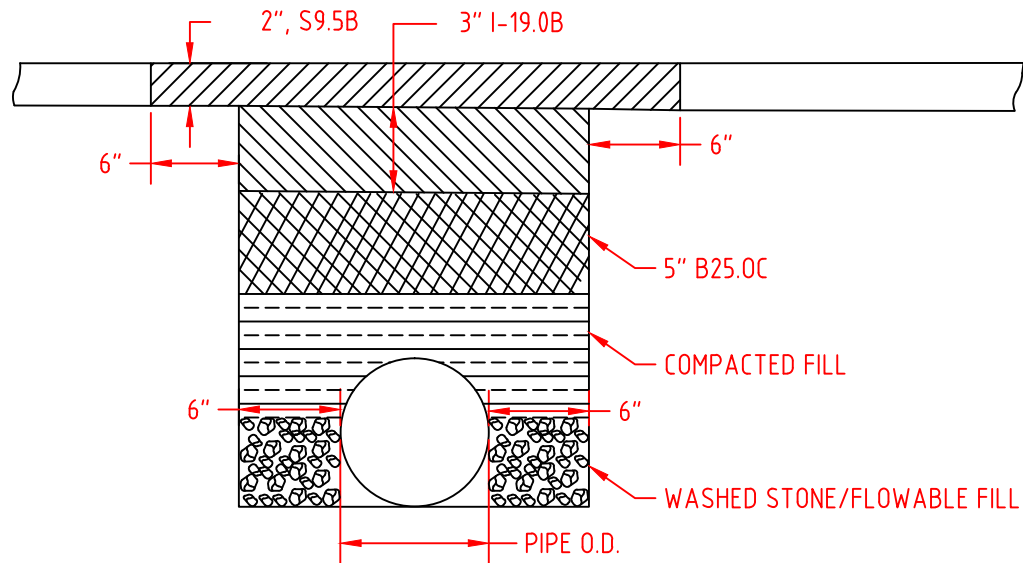
STANDARD DETAIL

PIPE ENCASEMENT

SCALE:
N.T.S.
DATE:
11-17-06

14

NOTE:
 FOR CONCRETE PAVEMENT SUBSTITUTE 3500 PSI
 CONCRETE TO MATCH EXISTING THICKNESS FOR
 I-2 ASPHALT 4" ABC STONE FOR H BASE.



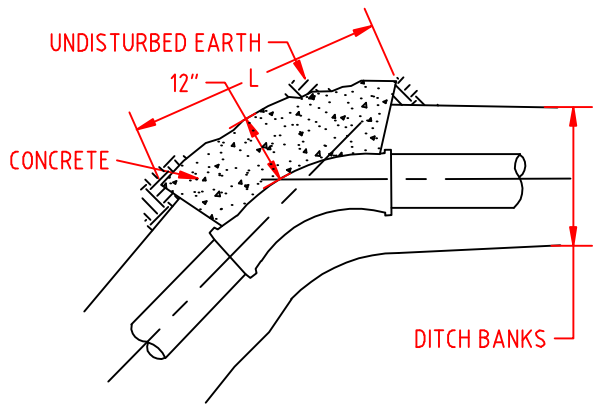
UNION COUNTY PUBLIC WORKS DEPARTMENT
 UNION COUNTY, N.C.

STANDARD DETAIL

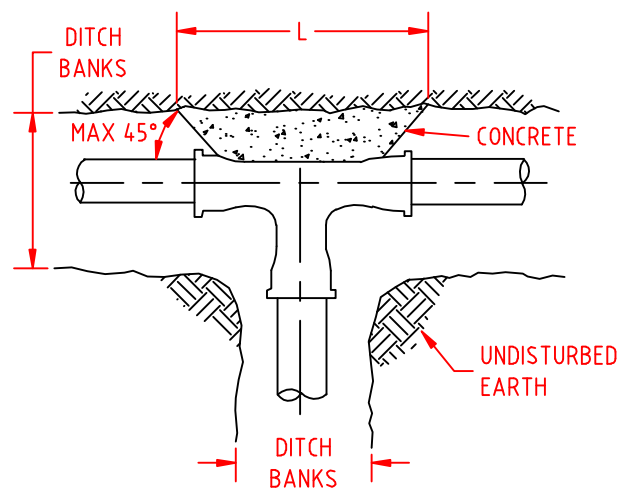
PAVEMENT REPLACEMENT

SCALE:
 N.T.S.
 DATE:
 11-7-14

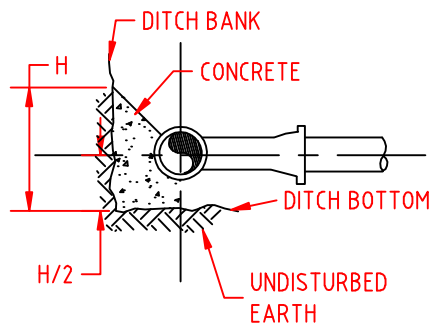
15



PLAN 45° BENDS
ALSO 90°, 22 1/2°, 11 1/2°

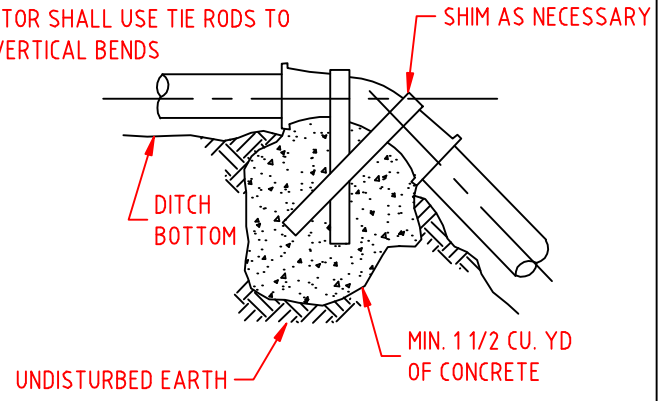


PLAN TEE



ELEVATION AT FITTINGS

CONTRACTOR SHALL USE TIE RODS TO SECURE VERTICAL BENDS



VERTICAL BEND

UNION COUNTY PUBLIC WORKS DEPARTMENT
 UNION COUNTY, N.C.

STANDARD DETAIL
 THRUST BLOCK

SCALE:
 N.T.S.
 DATE:
 11-17-06

ANCHORAGE SCHEDULE											
PIPE SIZE	11 1/4° BEND		22 1/2° BEND		45° BEND		90° BEND		TEE		TEST PRESSURE (P.S.I.)
	L	H	L	H	L	H	L	H	L	H	
6"	1'3"	1'0"	2'3"	1'0"	2'6"	1'6"	2'9"	1'6"	2'0"	1'6"	200
	1'6"	1'3"	2'3"	1'6"	3'0"	1'6"	4'0"	1'6"	3'0"	1'6"	300
8"	1'6"	1'6"	2'6"	1'9"	3'0"	2'0"	3'9"	2'0"	2'6"	2'0"	200
	2'0"	1'6"	3'0"	2'0"	3'9"	2'3"	4'6"	2'6"	3'6"	2'3"	300
12"	2'6"	1'9"	4'0"	2'3"	4'3"	3'0"	5'0"	3'3"	4'0"	3'0"	200
	3'6"	2'0"	5'3"	2'6"	6'0"	3'3"	7'0"	3'6"	5'0"	3'6"	300
14"	3'0"	1'0"	4'0"	3'0"	4'6"	3'9"	6'0"	3'9"	4'6"	3'6"	200
	4'0"	2'6"	5'3"	3'6"	6'0"	4'3"	6'6"	5'0"	5'0"	5'0"	300
16"	3'0"	2'9"	4'6"	3'6"	5'0"	4'6"	7'0"	4'3"	5'0"	4'0"	200
	4'0"	3'0"	6'3"	3'9"	6'5"	5'3"	8'0"	5'3"	7'6"	4'0"	300

THRUST BLOCK DIMENSIONS BASED ON SOIL BEARING CAPACITY OF 2000 P.S.F. AND A WATER TEST PRESSURE OF 150 P.S.I. SIZES OF THRUST BLOCKS MAY BE REVISED BY THE ENGINEER WHERE BEARING CAPACITY OF SOIL VARIES.

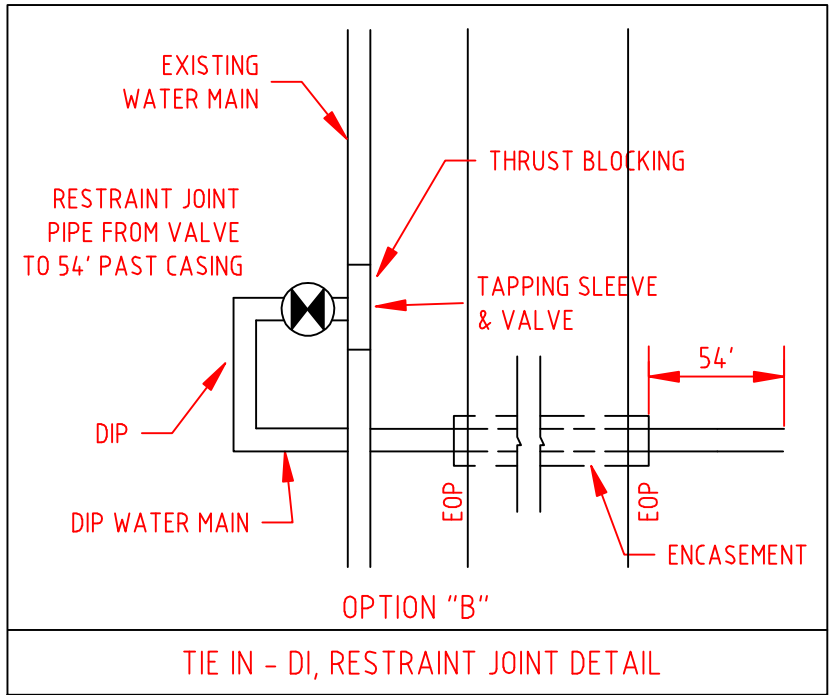
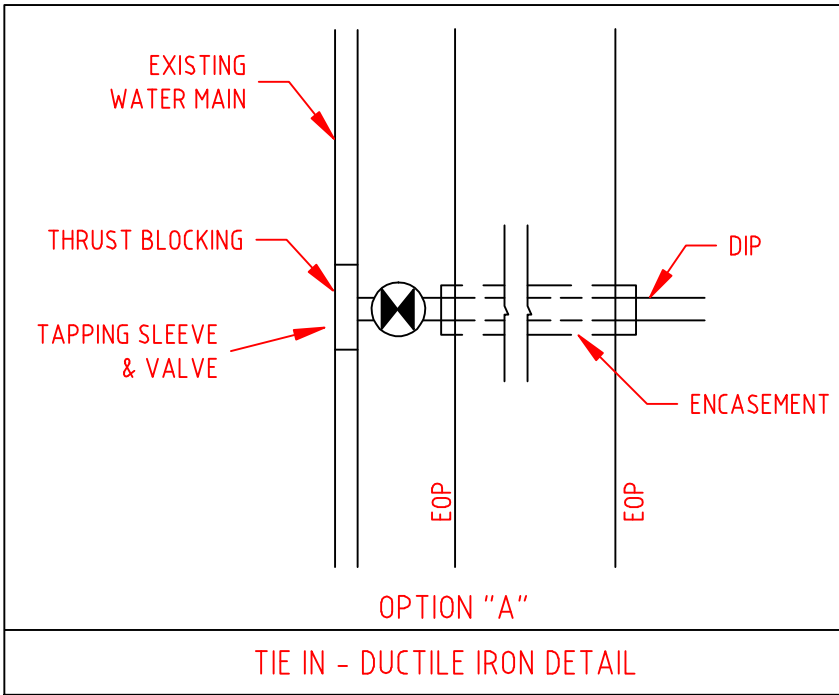
PROVIDE TAR PAPER JOINT BETWEEN CONCRETE THRUST BLOCK AND PORTION OF PIPE BEING ANCHORED.

ALL CONCRETE THRUST BLOCKS SHALL BE 2500 P.S.I. CONCRETE.

MAXIMUM VERTICAL DEFLECTION SHALL BE 22 1/2°.

JOINTS SHALL REMAIN FREE OF CONCRETE FOR INSPECTION, REPAIR OR REPLACEMENT OF JOINTS.

UNION COUNTY PUBLIC WORKS DEPARTMENT UNION COUNTY, N.C.	STANDARD DETAIL		SCALE: N/A DATE: 11-17-06	17
	THRUST BLOCK SPECIFICATIONS			



NOTE:
 OPTION "A" OR "B" WILL BE REQUIRED, DEPENDING ON
 THE AMOUNT OF SPACE AVAILABLE, TO BE FIELD VERIFIED

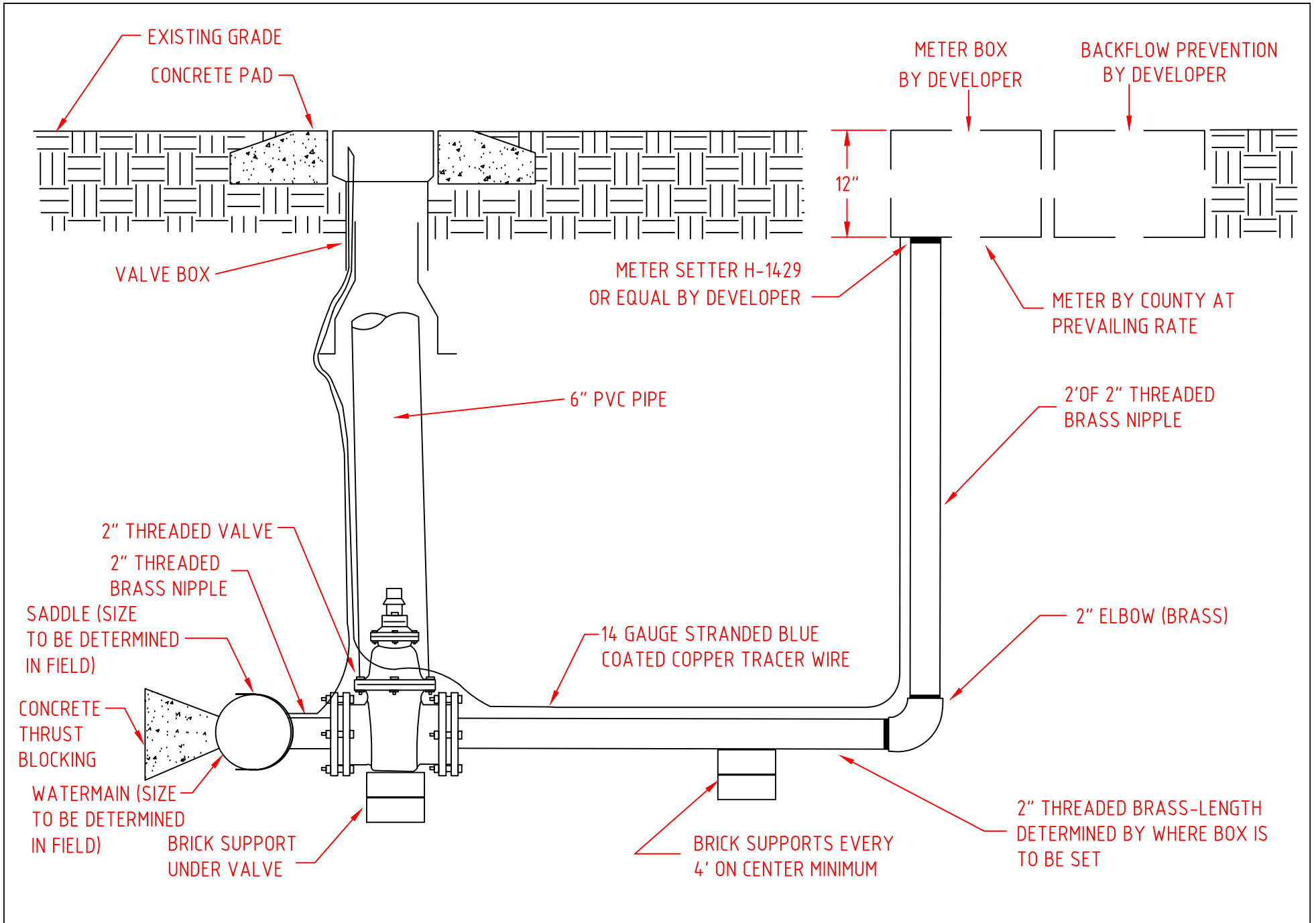
UNION COUNTY PUBLIC WORKS DEPARTMENT
 UNION COUNTY, N.C.

STANDARD DETAIL

TAPPING SLEEVE

SCALE:
 N.T.S.
 DATE:
 11-17-06

18



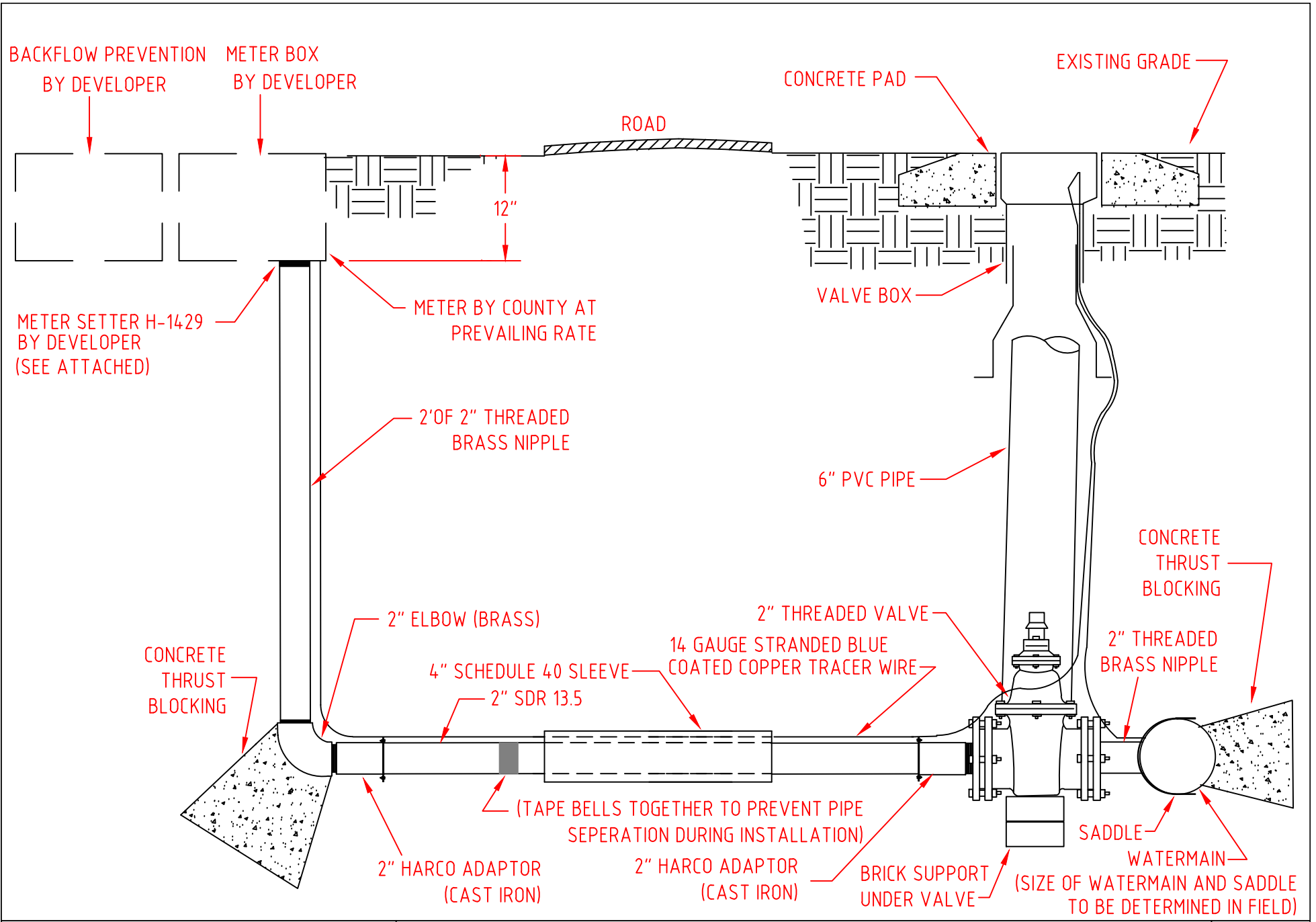
UNION COUNTY PUBLIC WORKS DEPARTMENT
UNION COUNTY, N.C.

STANDARD DETAIL

2" SHORTSIDE SERVICE FOR 1 1/2" OR 2" METERS

SCALE:
N.T.S.
DATE:
5-22-13

19



UNION COUNTY PUBLIC WORKS DEPARTMENT
UNION COUNTY, N.C.

STANDARD DETAIL

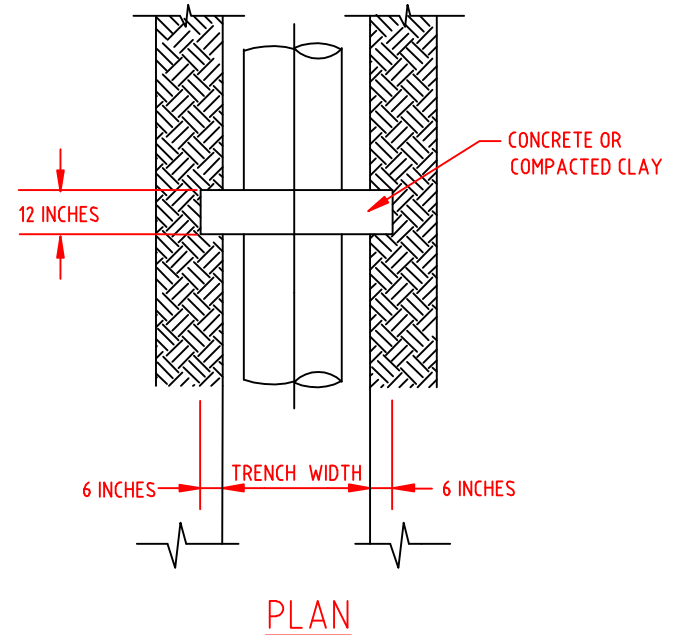
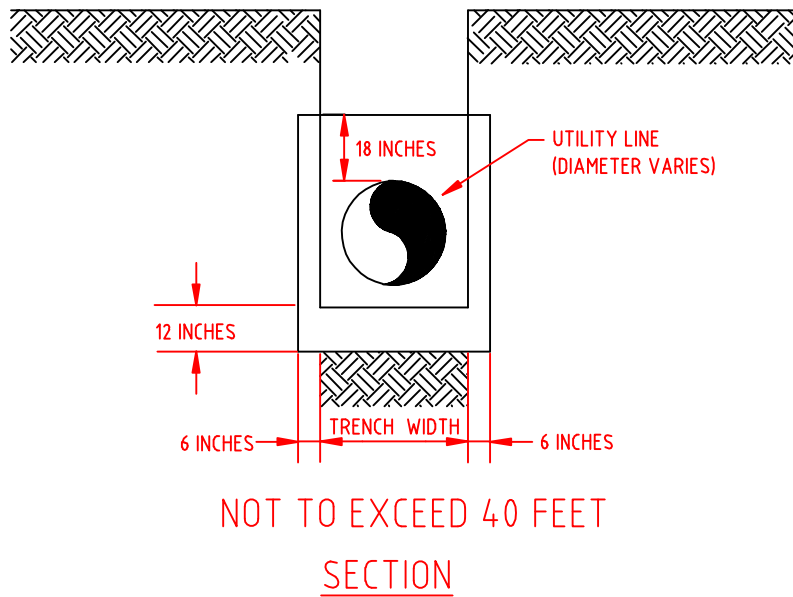
2" LONGSIDE SERVICE FOR 1 1/2" OR 2" METERS

SCALE:
N.T.S.
DATE:
5-22-13

20

Anti-seep collars may be constructed with class B concrete or compacted clay. The compacted clay shall have a specific discharge of 1×10^{-5} cm/sec or less. The following specifications apply to class B concrete:

- a. Minimum cement content, sacks per cubic yard with rounded course aggregate 5.0
- b. Minimum cement content, sacks per cubic yard with angular course aggregate 5.5
- c. Maximum water-cement ratio gallons per sack 6.8
- d. Slump range 2" to 4"
- e. Minimum strength - 28 day psi 2,500



UNION COUNTY PUBLIC WORKS DEPARTMENT
UNION COUNTY, N.C.

STANDARD DETAIL

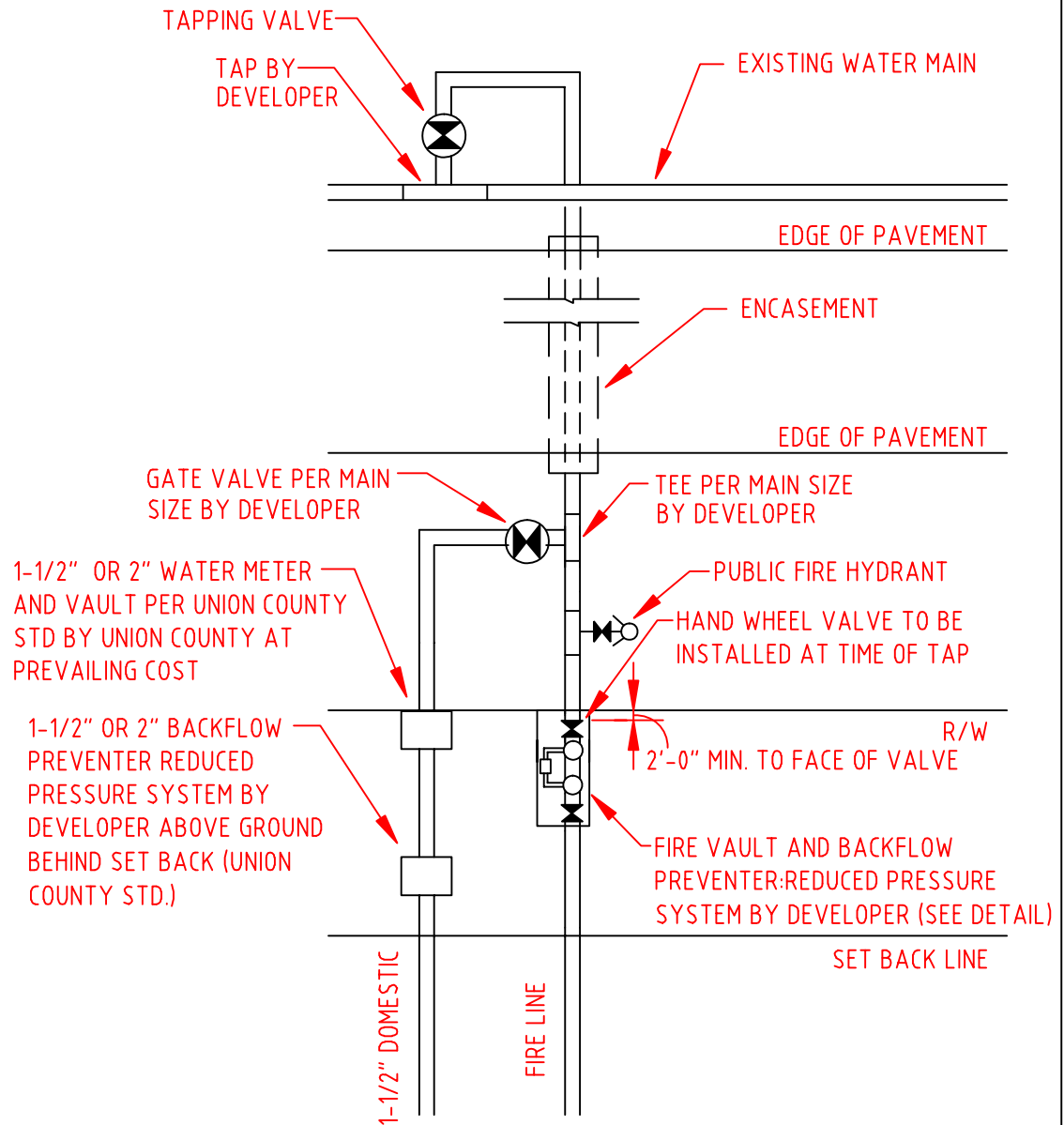
ANTI-SEEP COLLAR DETAIL

SCALE:
N.T.S.
DATE:
11-17-06

21

NOTES:

- 1) INSTALLATION, MATERIALS AND DEVICES SHALL CONFORM TO UNION COUNTY PUBLIC WORKS SPECIFICATIONS AND REQUIREMENTS.
- 2) ALL PIPE TO BE RESTRAINT JOINT DIP FROM TAP TO BACKFLOW AND/OR FIRE VAULT. THE 1-1/2" & 2" INCH PIPE SHALL BE BRASS TO THE BACKFLOW. ALTERNATE (3 INCH VALVE AND RESTRAINT JOINT DIP IN LIEU OF BRASS)
- 3) FEES MUST BE PAID PRIOR TO INSTALLATION.
- 4) NO PVC PIPE SHALL BE USED WITHIN 5 FEET EACH END OF BACKFLOW PREVENTER.
- 5) 3 INCH & LARGER: CONTRACTOR INSTALLS APPROPRIATE DIP LINE THROUGH VAULT AND SUPPLIES VAULT. UNION COUNTY WILL INSTALL METER AND BYPASS AT PREVAILING COSTS. CONTRACTOR TO INSTALL APPROPRIATE SIZE RPZ.
- 6) FIRE DEPARTMENT CONNECTION (FDC) MUST BE WITHIN 100 FT MAX OF PUBLIC HYDRANT PER FIRE CODE.



UNION COUNTY PUBLIC WORKS DEPARTMENT
UNION COUNTY, N.C.

STANDARD DETAIL

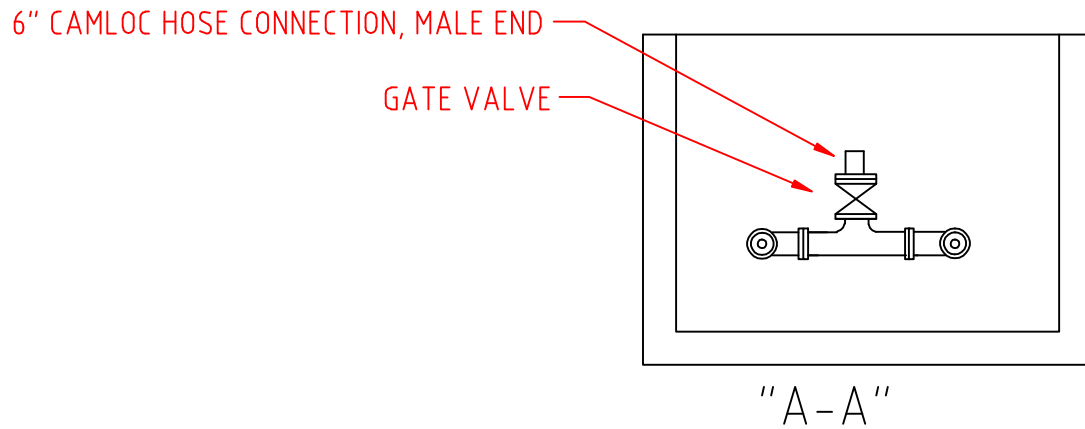
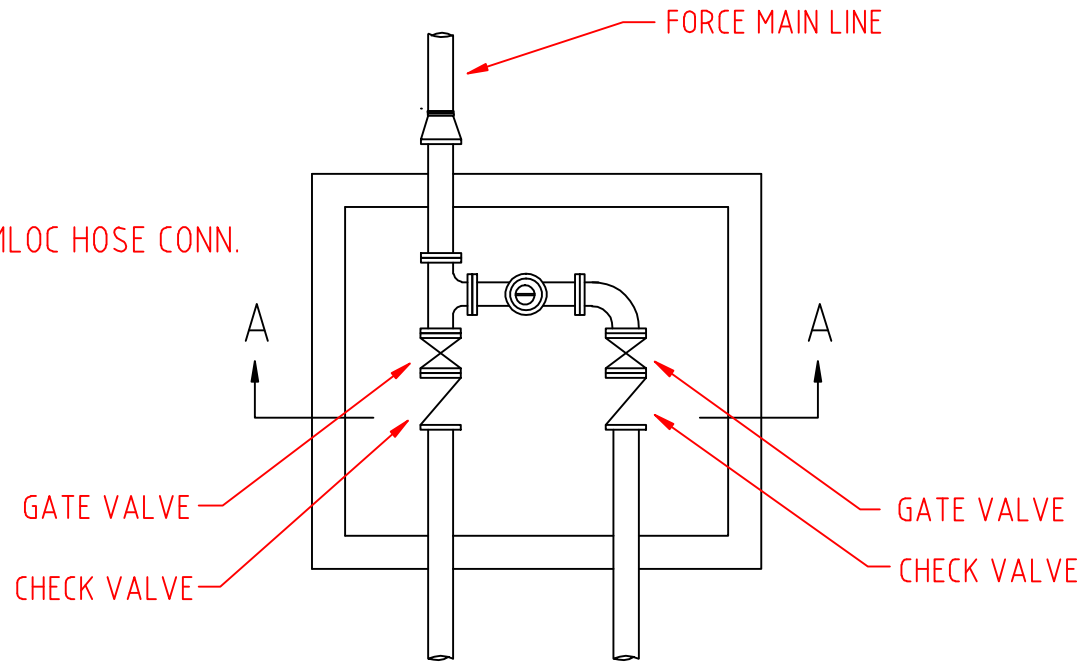
WATER CONNECTION

SCALE:
N.T.S.
DATE:
10-17-08

22

EMERGENCY CONNECTION

- 1 EA. FLANGE TEE
- 1 EA. FLANGE GATE VALVE
- 1 EA. COMPANION FLANGE (9"x4")
- 1 EA. 6" MALE 1PT. x 6" MALE CAMLOC HOSE CONN.
- 4 EA. FLANGE ACCESSORY SETS



UNION COUNTY PUBLIC WORKS DEPARTMENT
UNION COUNTY, N.C.

STANDARD DETAIL

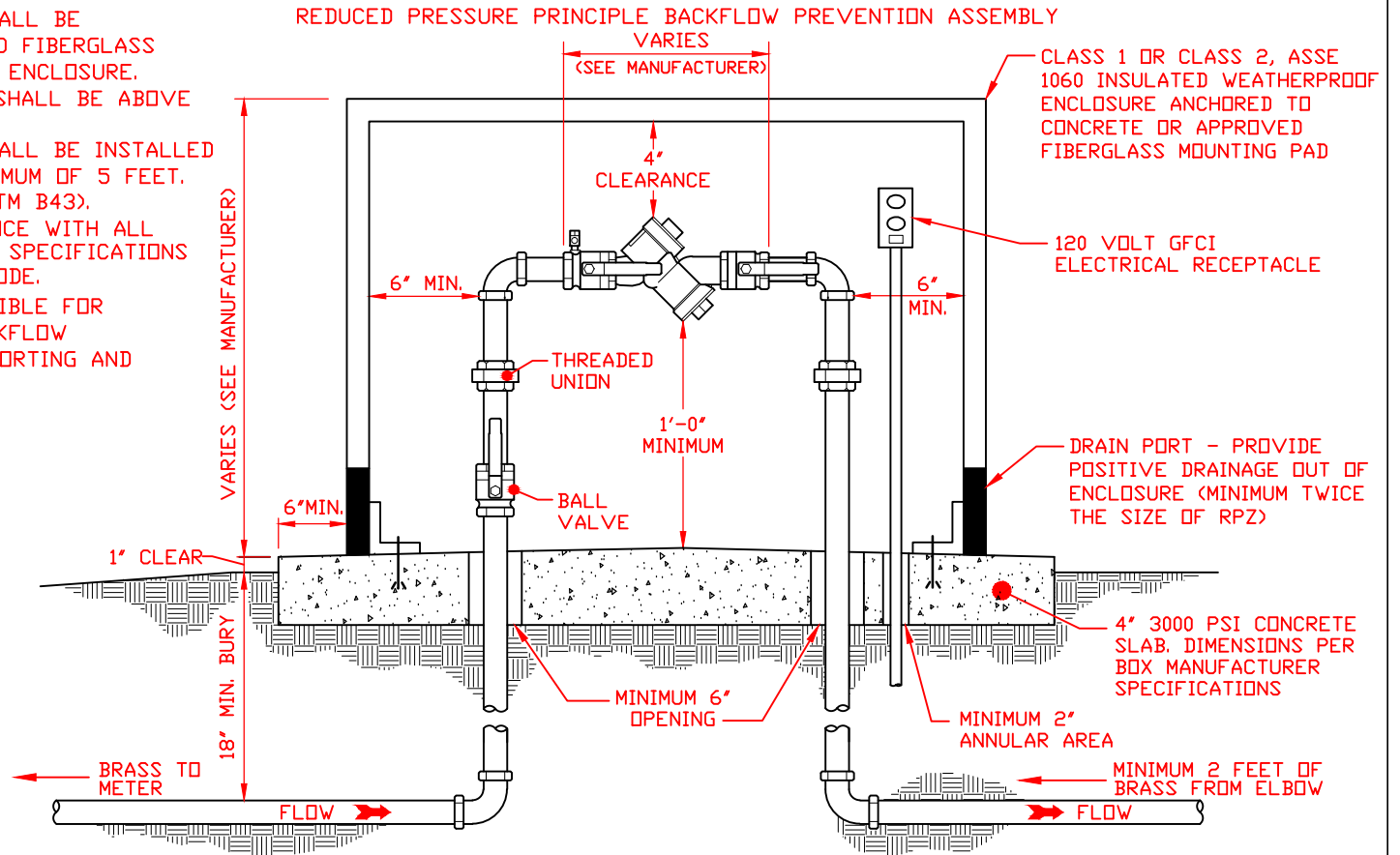
BYPASS EMERGENCY CONNECTION FOR WET WELL

SCALE:
N.T.S.
DATE:
9-27-07

23

GENERAL NOTES

- (1) RPZ SHALL BE INSTALLED FOR CUSTOMER APPLICATIONS APPROVED BY UNION COUNTY PUBLIC WORKS.
- (2) REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION ASSEMBLY SHALL COMPLY WITH ASSE 1013 & AWWA C511 (FEBCO 825Y, WILKINS MODEL 975XL, HERSEY MODEL FRPII OR EQUAL).
- (3) OWNER SHALL PROVIDE WRITTEN CERTIFICATION TO THE COUNTY THAT THE RPZ HAS BEEN TESTED BY A CERTIFIED BACKFLOW PREVENTION TECHNICIAN AFTER INSTALLATION.
- (4) BACKFLOW PREVENTION ASSEMBLY SHALL BE CENTERED ON CONCRETE OR APPROVED FIBERGLASS MOUNTING PAD AND CENTERED WITHIN ENCLOSURE.
- (5) REDUCER PRESSURE ZONE ASSEMBLY SHALL BE ABOVE GROUND ONLY.
- (6) BACKFLOW PREVENTION ASSEMBLY SHALL BE INSTALLED OUTSIDE OF THE RIGHT OF WAY, MAXIMUM OF 5 FEET.
- (7) PIPE MATERIAL SHALL BE BRASS (ASTM B43).
- (8) INSTALLATION SHALL BE IN COMPLIANCE WITH ALL APPLICABLE COUNTY ORDINANCES AND SPECIFICATIONS IN ADDITION TO THE N.C. PLUMBING CODE.
- (9) PROPERTY OWNER SHALL BE RESPONSIBLE FOR MAINTENANCE AND OPERATION OF BACKFLOW ASSEMBLY AND COMPLIANCE WITH REPORTING AND TESTING REQUIREMENTS.



STANDARD DETAIL

UNION COUNTY PUBLIC WORKS DEPARTMENT
UNION COUNTY, N.C.

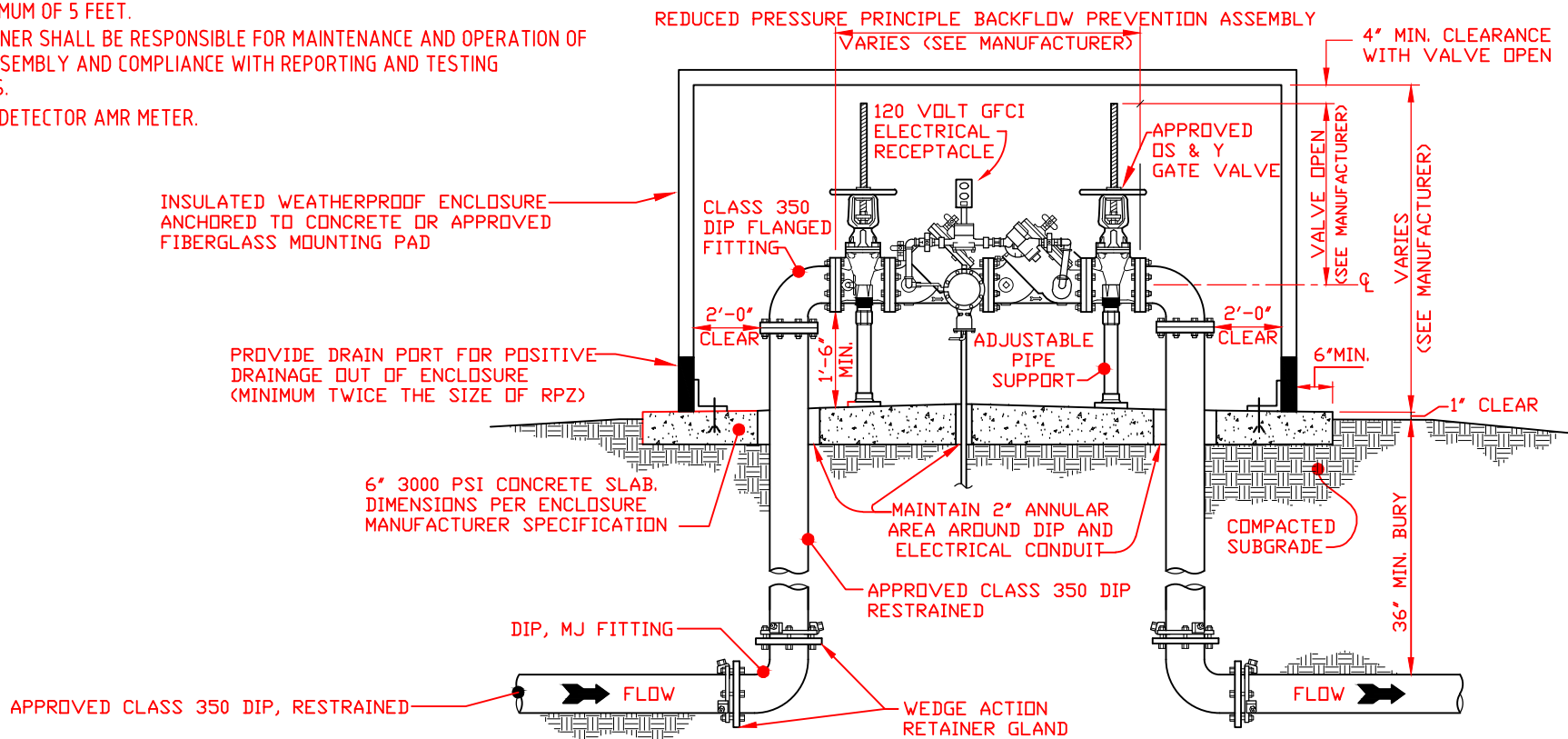
REDUCED PRESSURE ZONE ASSEMBLY
(3/4" - 2")

SCALE:
N.T.S.
DATE:
12-13-13

24A

GENERAL NOTES:

- (1) RPDVA SHALL BE INSTALLED FOR CUSTOMER APPLICATIONS APPROVED BY UNION COUNTY PUBLIC WORKS.
- (2) REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION ASSEMBLY SHALL COMPLY WITH ASSE 1047 & AWWA C511 (1) FEBCO 826YD, (2) WILKINS MODEL 375ADA, (3) AMES SERIES 5000 CIV. OR EQUAL
- (3) OWNER SHALL PROVIDE WRITTEN CERTIFICATION TO THE COUNTY THAT THE RPDVA HAS BEEN TESTED BY A CERTIFIED BACKFLOW PREVENTION TECHNICIAN AFTER INSTALLATION.
- (4) COUNTY APPROVED 3"-10" RPDVA INCLUDES SHUTOFF VALVES AS PART OF THE ASSEMBLY. SHUT OFF VALVES SHALL BE OS&Y RESILIENT SEAT GATE VALVES WITH HANDWHEEL OPERATORS AND SHALL CONFORM TO AWWA C500 LATEST EDITION. RPDVA SHALL BE SUPPORTED AT CENTER WITH A MASONRY PEDESTAL ADEQUATE TO MAINTAIN THE WEIGHT OF THE STRUCTURE AND PLUS AN ADDITIONAL 1,000 POUND LOAD.
- (5) REDUCED PRESSURE DETECTOR ASSEMBLY SHALL BE ABOVE GROUND ONLY.
- (6) BACKFLOW PREVENTION ASSEMBLY SHALL BE INSTALLED OUTSIDE OF THE RIGHT OF WAY, MAXIMUM OF 5 FEET.
- (7) PROPERTY OWNER SHALL BE RESPONSIBLE FOR MAINTENANCE AND OPERATION OF BACKFLOW ASSEMBLY AND COMPLIANCE WITH REPORTING AND TESTING REQUIREMENTS.
- (8) 3/4" BYPASS DETECTOR AMR METER.



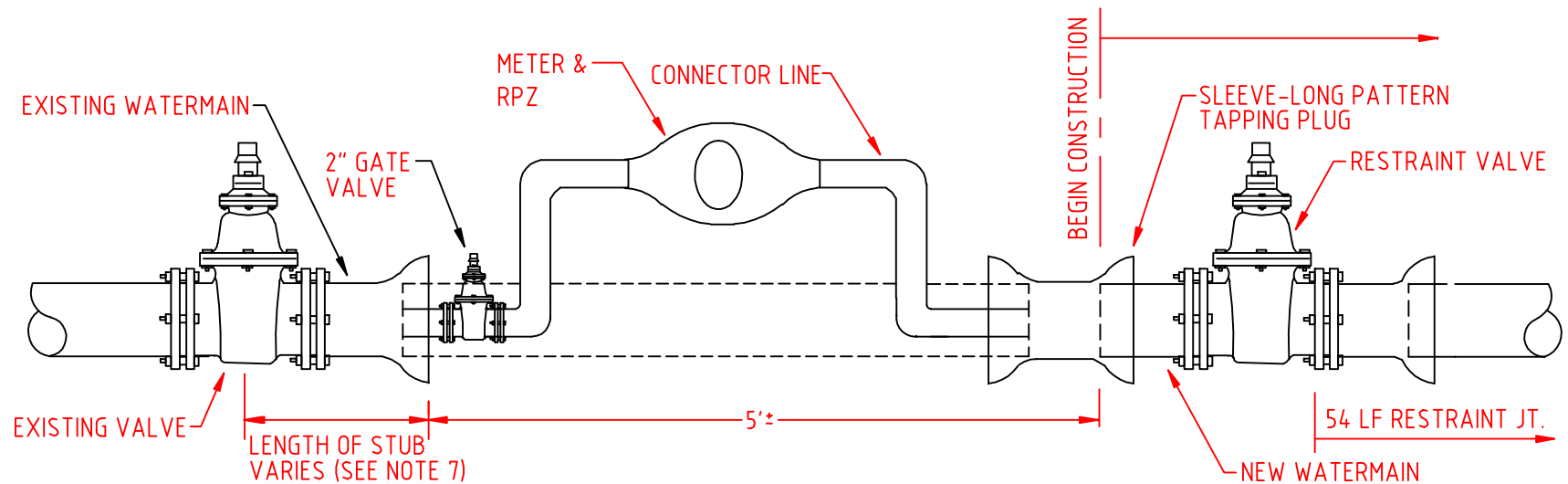
STANDARD DETAIL

UNION COUNTY PUBLIC WORKS DEPARTMENT
UNION COUNTY, N.C.

REDUCED PRESSURE DETECTOR ASSEMBLY

SCALE:
N.T.S.
DATE:
1-2-14

24B



GENERAL NOTES:

- (1) INSTALL CONNECTOR LINE FROM EXISTING BLOW OFF ASSEMBLY TO NEW MAIN FOR FILLING, TESTING AND STERILIZING NEW MAIN.
- (2) CONNECTOR LINE TO BE ASSEMBLED WITH RPZ AND METER BY CONTRACTOR AND TO BE OPERATED AND INDEPENDENT OF EXISTING MAIN.
- (3) BLOCKING ON EXISTING LINE NOT TO BE DISTURBED.
- (4) FINAL CONNECTION TO EXISTING MAIN TO BE MADE ONLY AFTER TOTAL PROJECT IS ACCEPTED BY UNION COUNTY PUBLIC WORKS.
- (5) VALVES ON EXISTING SYSTEM TO BE OPERATED BY UCPW FORCES ONLY.
- (6) ONLY ONE CONNECTION WILL BE ALLOWED BETWEEN THE EXISTING SYSTEM AND THE NEW CONSTRUCTION UNTIL TESTING AND DISINFECTION IS COMPLETE.
- (7) 6" OR 8" DIAMETER PIPE= 40 LF OF STUB, 12" OR 16" DIAMETER PIPE= 72 LF OF STUB

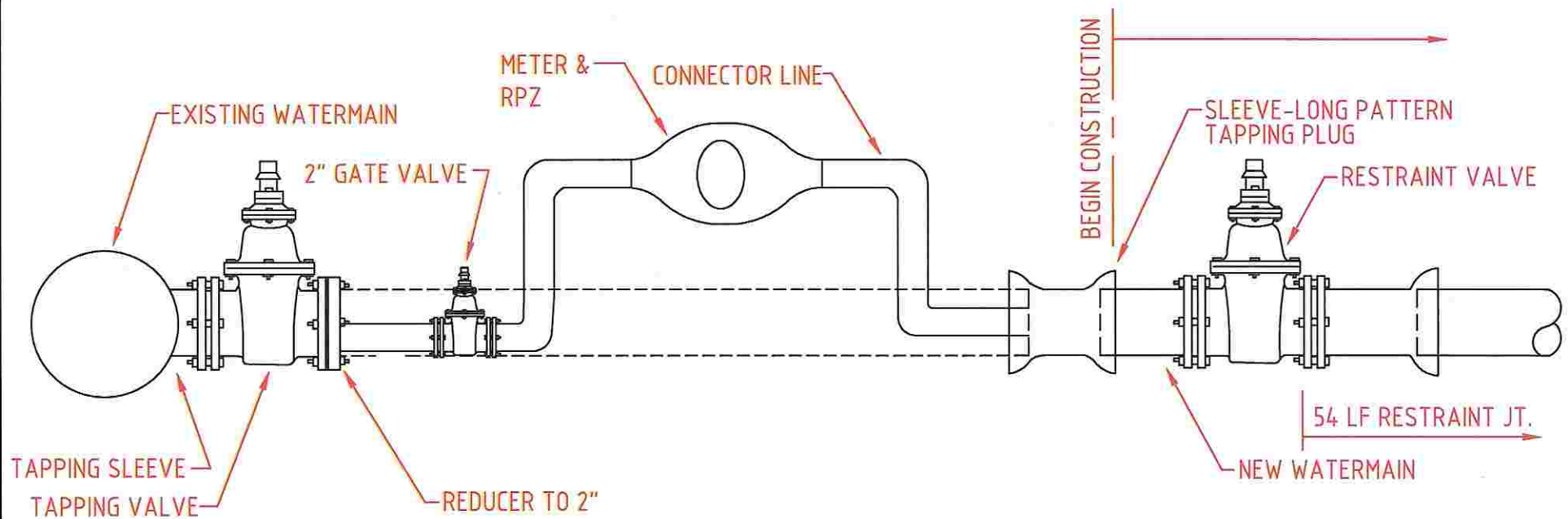
STANDARD DETAIL

UNION COUNTY PUBLIC WORKS DEPARTMENT
UNION COUNTY, N.C.

JUMPER CONNECTION

SCALE:
N.T.S.
DATE:
9-2-10

25



GENERAL NOTES:

- (1) INSTALL CONNECTOR LINE FROM TAPPING VALVE TO NEW MAIN FOR FILLING, TESTING AND STERILIZING NEW MAIN.
- (2) CONNECTOR LINE TO BE ASSEMBLED WITH RPZ AND METER BY CONTRACTOR AND TO BE OPERATED AND INDEPENDENT OF EXISTING MAIN.
- (3) FINAL CONNECTION TO EXISTING MAIN TO BE MADE ONLY AFTER TOTAL PROJECT IS ACCEPTED BY UNION COUNTY PUBLIC WORKS.
- (4) VALVES ON EXISTING SYSTEM TO BE OPERATED BY UCPW FORCES ONLY.
- (5) ONLY ONE CONNECTION WILL BE ALLOWED BETWEEN THE EXISTING SYSTEM AND THE NEW CONSTRUCTION UNTIL TESTING AND DISINFECTION IS COMPLETE.

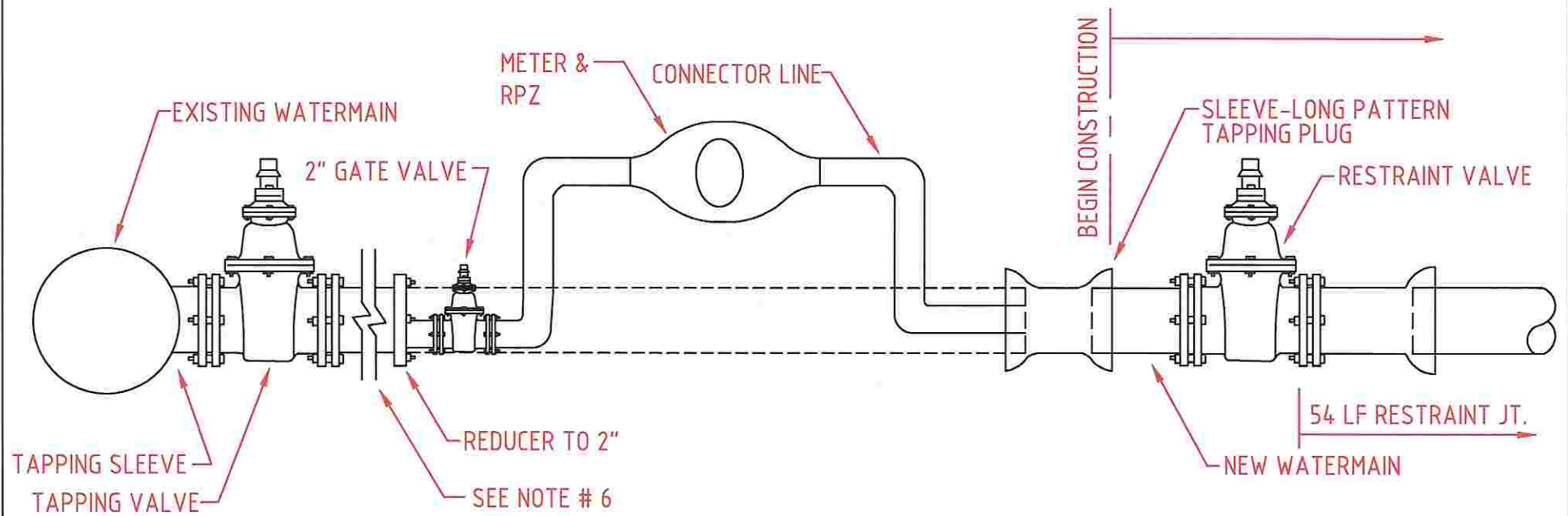
STANDARD DETAIL

UNION COUNTY PUBLIC WORKS DEPARTMENT
UNION COUNTY, N.C.

DIRECT TAP JUMPER CONN. - SHORTSIDE

SCALE:
N.T.S.
DATE:
9-2-10

25A



GENERAL NOTES:

- (1) INSTALL CONNECTOR LINE FROM TAPPING VALVE TO NEW MAIN FOR FILLING, TESTING AND STERILIZING NEW MAIN.
- (2) CONNECTOR LINE TO BE ASSEMBLED WITH RPZ AND METER BY CONTRACTOR AND TO BE OPERATED AND INDEPENDENT OF EXISTING MAIN.
- (3) FINAL CONNECTION TO EXISTING MAIN TO BE MADE ONLY AFTER TOTAL PROJECT IS ACCEPTED BY UNION COUNTY PUBLIC WORKS.
- (4) VALVES ON EXISTING SYSTEM TO BE OPERATED BY UCPW FORCES ONLY.
- (5) ONLY ONE CONNECTION WILL BE ALLOWED BETWEEN THE EXISTING SYSTEM AND THE NEW CONSTRUCTION UNTIL TESTING AND DISINFECTION IS COMPLETE.
- (6) MAXIMUM LENGTH OF PIPE NOT TO EXCEED 100'.

UNION COUNTY PUBLIC WORKS DEPARTMENT
UNION COUNTY, N.C.

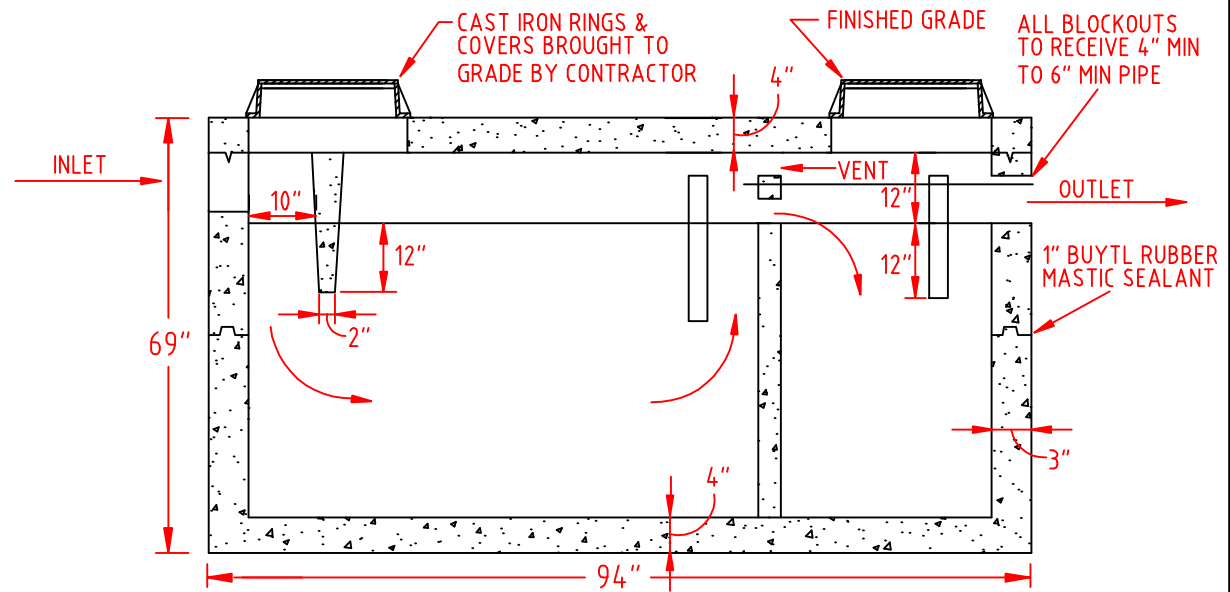
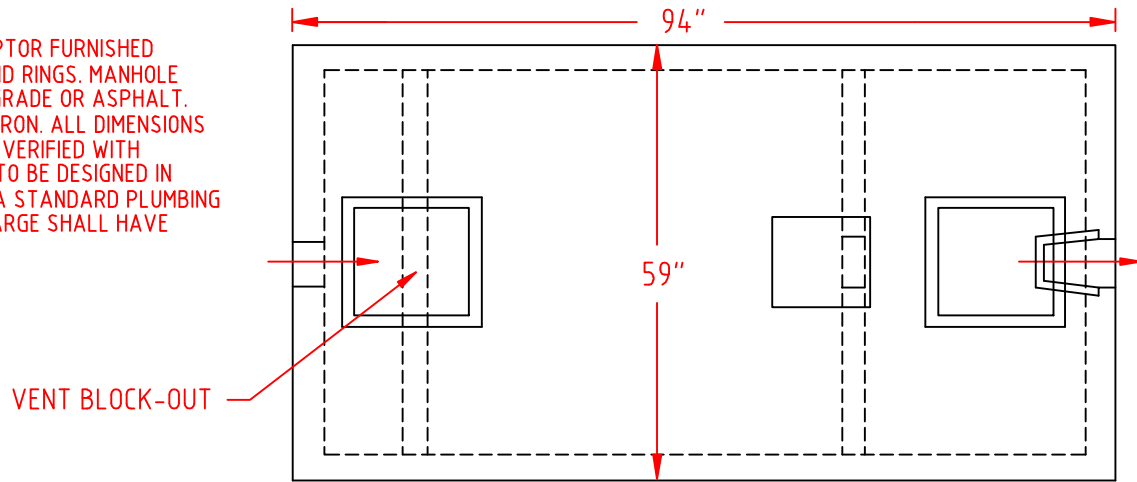
STANDARD DETAIL

DIRECT TAP JUMPER CONN. - LONGSIDE

SCALE:
N.T.S.
DATE:
9-2-10

25B

1,000 GALLON MINIMUM GREASE INTERCEPTOR FURNISHED COMPLETE WITH CAST IRON MANHOLE AND RINGS. MANHOLE COVER SHALL BE FLUSH WITH FINISHED GRADE OR ASPHALT. ALL PIPE AND FITTINGS SHALL BE CAST IRON. ALL DIMENSIONS ARE APPROXIMATE ONLY AND SHALL BE VERIFIED WITH MANUFACTURER. GREASE INTERCEPTOR TO BE DESIGNED IN ACCORDANCE WITH THE NORTH CAROLINA STANDARD PLUMBING CODE LATEST EDITION. INLET AND DISCHARGE SHALL HAVE TEES EQUAL TO NEENAH MODEL R-1660.



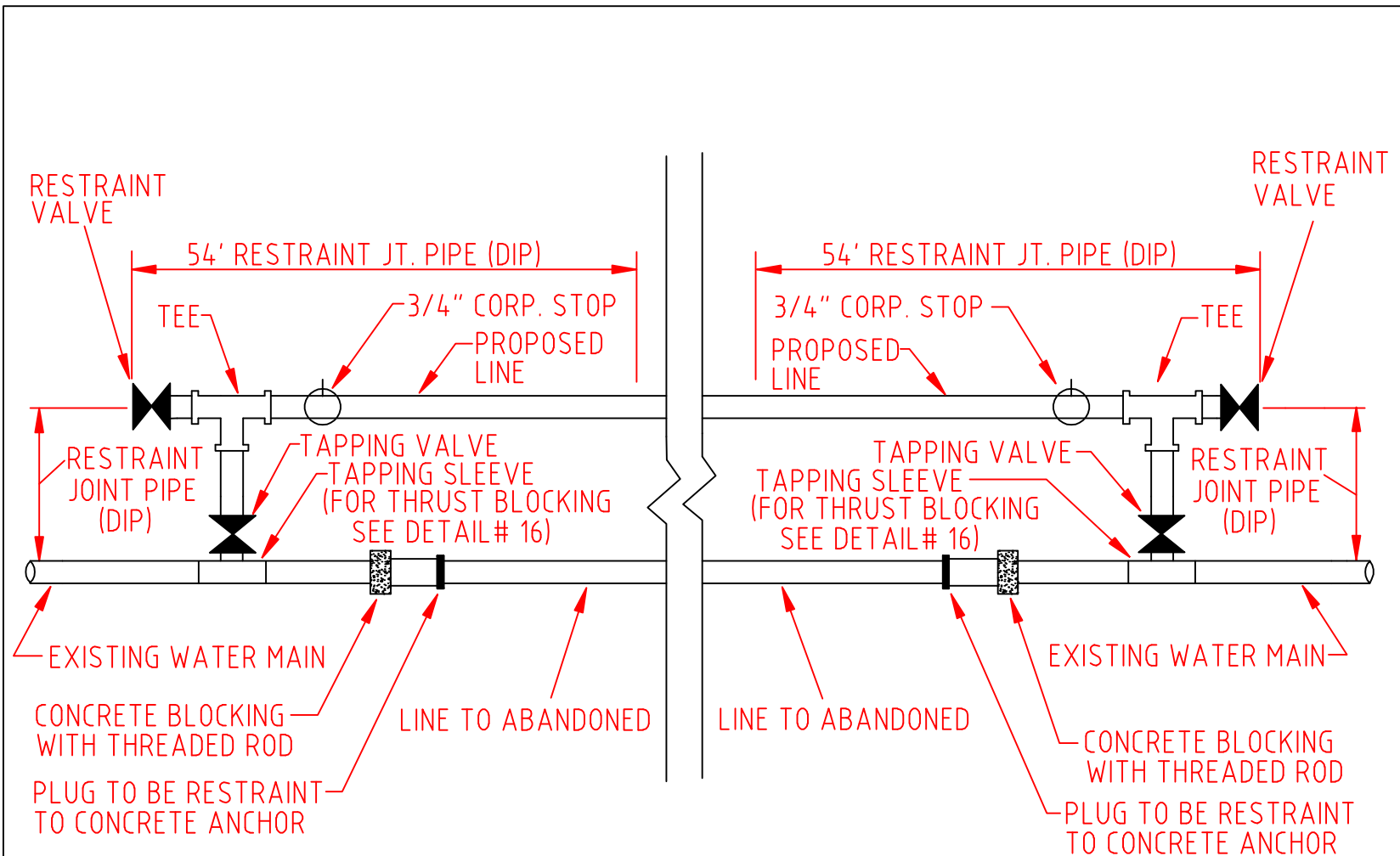
STANDARD DETAIL

UNION COUNTY PUBLIC WORKS DEPARTMENT
UNION COUNTY, N.C.

GREASE INTERCEPTOR

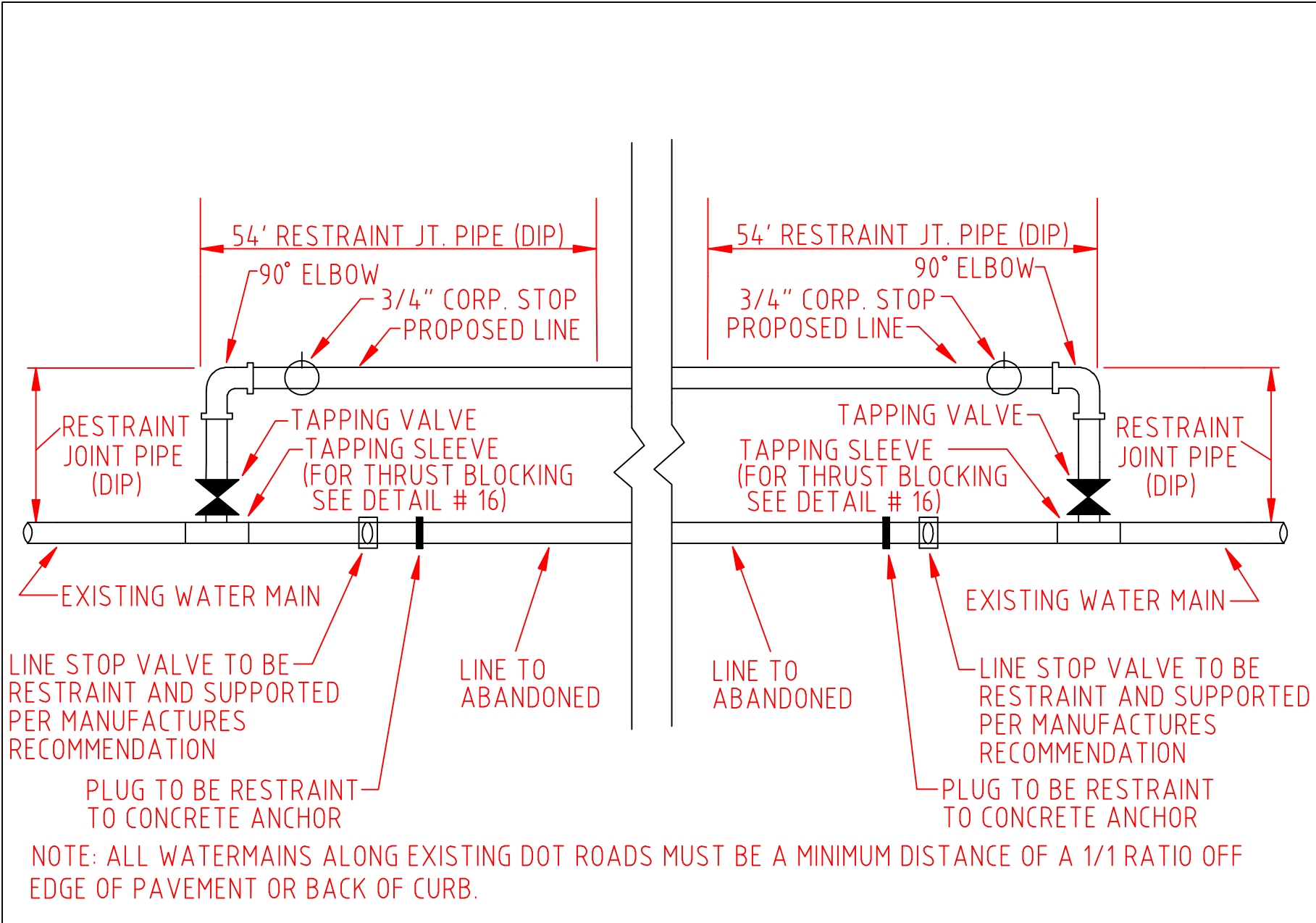
SCALE:
N.T.S.
DATE:
10-23-07

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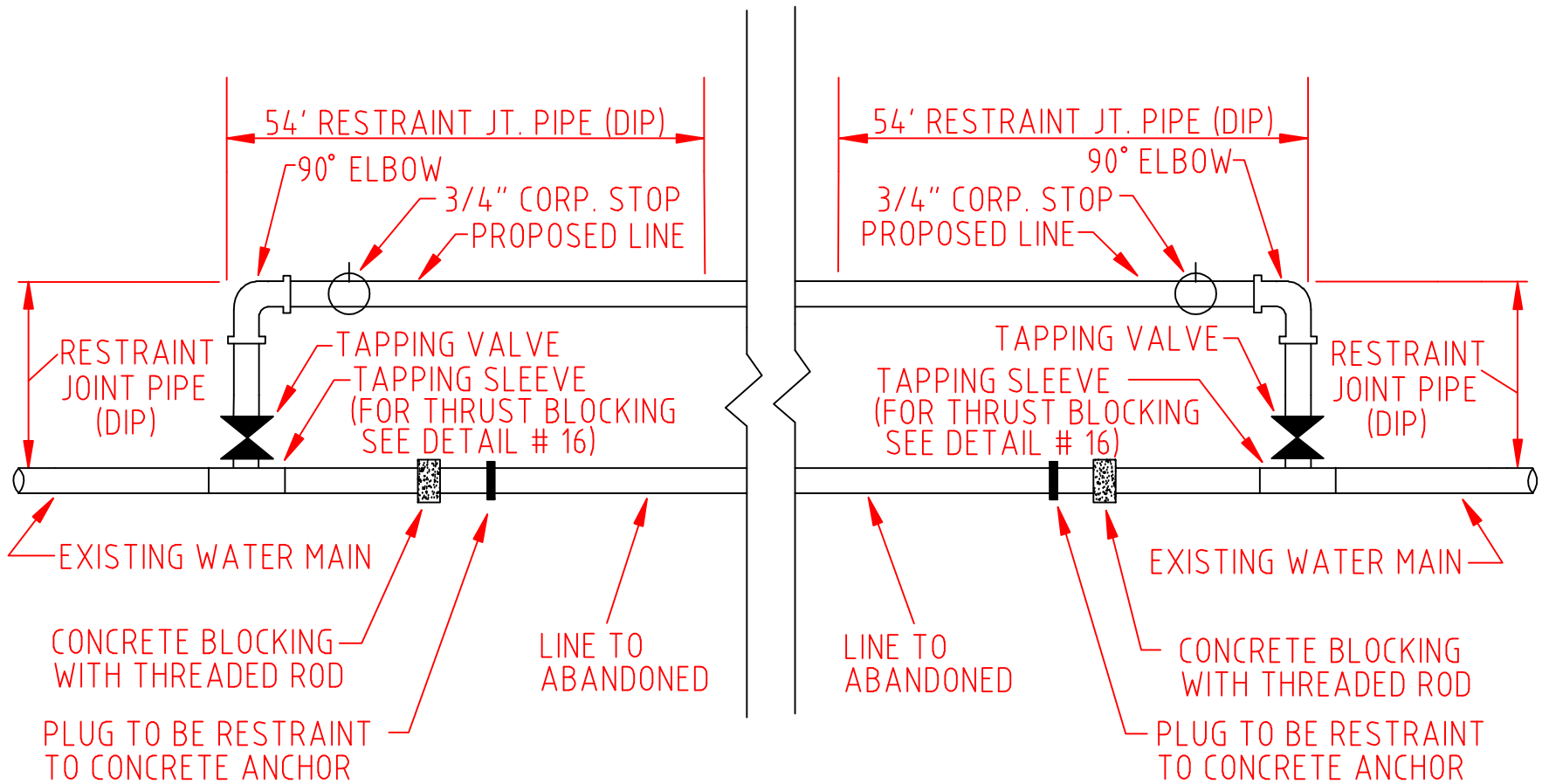


NOTE: ALL WATERMANS ALONG EXISTING DOT ROADS MUST BE A MINIMUM DISTANCE OF A 1/1 RATIO OFF EDGE OF PAVEMENT OR BACK OF CURB.

UNION COUNTY PUBLIC WORKS DEPARTMENT UNION COUNTY, N.C.	STANDARD DETAIL		27
	WATERMAIN RELOCATION		
		SCALE: N.T.S.	
		DATE: 4-3-08	



UNION COUNTY PUBLIC WORKS DEPARTMENT UNION COUNTY, N.C.	STANDARD DETAIL	SCALE: N.T.S. DATE: 3-8-11 27A
	WATERMAIN RELOCATION FOR LARGE WATERMANS	



NOTE: ALL WATERMANS ALONG EXISTING DOT ROADS MUST BE A MINIMUM DISTANCE OF A 1/1 RATIO OFF EDGE OF PAVEMENT OR BACK OF CURB.

UNION COUNTY PUBLIC WORKS DEPARTMENT
UNION COUNTY, N.C.

STANDARD DETAIL

WATERMAIN RELOCATION FOR SMALL WATERMANS

SCALE:
N.T.S.
DATE:
3-8-11

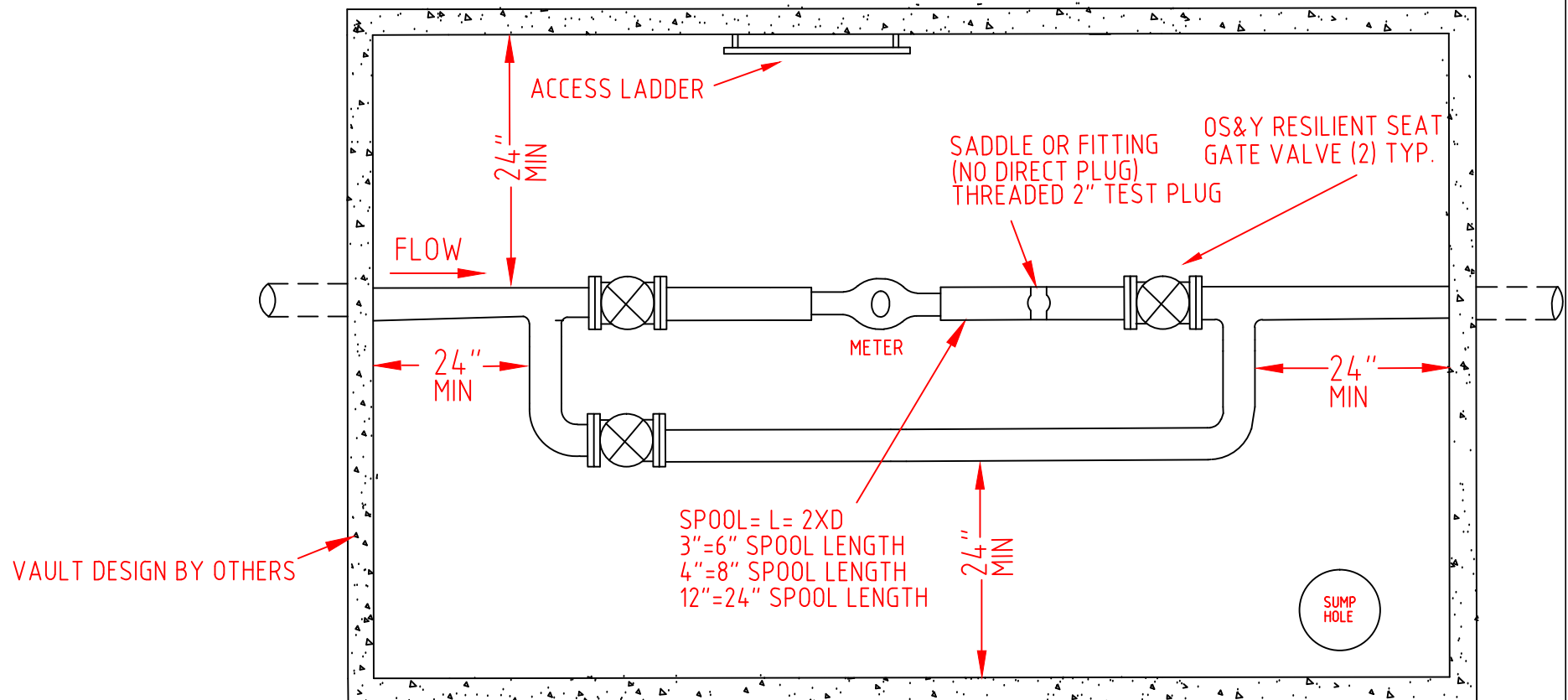
27B

GENERAL NOTES:

- (1) PIPING AND FITTINGS SHALL BE DUCTILE IRON (AWWA C151) CLASS 350 AND SHALL BE RESTRAINED JOINT OR FLANGED AS INDICATED ON THE DETAIL. RESTRAINED JOINTS SHALL BE MEGA-LUG RESTRAINED OR AN APPROVED EQUAL.
- (2) ALL VAULTS SHALL BE 3800 PSI CONCRETE AND CAPABLE OF WITHSTANDING 150 PSF LOADING IN NON TRAFFIC AREAS.
- (3) ACCESS HATCHES SHALL BE ALUMINUM 150 PSF WITH LOCKABLE COVER DEVICE. MANUFACTURER SHALL BE BILCO, HALIDAY OR APPROVED EQUAL.
- (4) INSTALL VAULT AT EDGE OF RIGHT OF WAY. DO NOT PLACE IN PAVEMENT.
- (5) PIPING TO BE A MINIMUM OF 18" OFF OF FLOOR.
- (6) DEVELOPER MUST CONTACT UCPW CUSTOMER SERVICE TO PAY METER COST & INSTALLATION FEES AND SCHEDULE THE WATER METER INSTALLATION
- (7) BYPASS PIPE EQUAL TO METER SIZE

METER DIMENSIONS

Model	Octave			
NOMINAL SIZE	3"	4"	6"	8"
L- LENGTH	12"	14"	18"	20"
B- WIDTH	7 1/2"	9"	11"	13 1/2"
H- HEIGHT	8 1/2"	9 7/8"	10 7/8"	12 7/8"



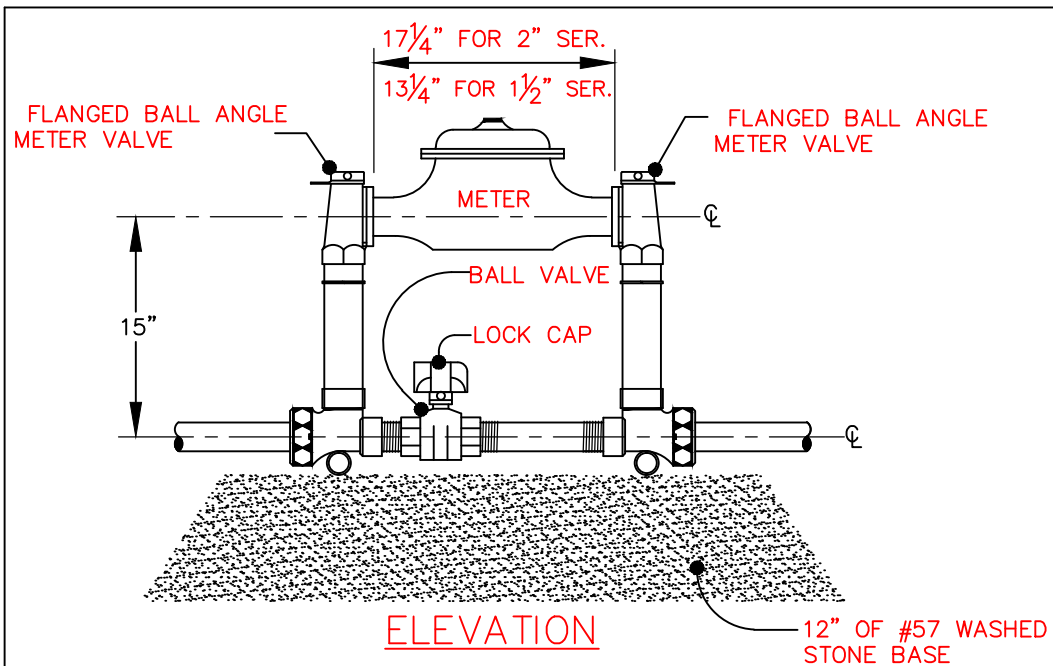
STANDARD DETAIL

UNION COUNTY PUBLIC WORKS DEPARTMENT
 UNION COUNTY, N.C.

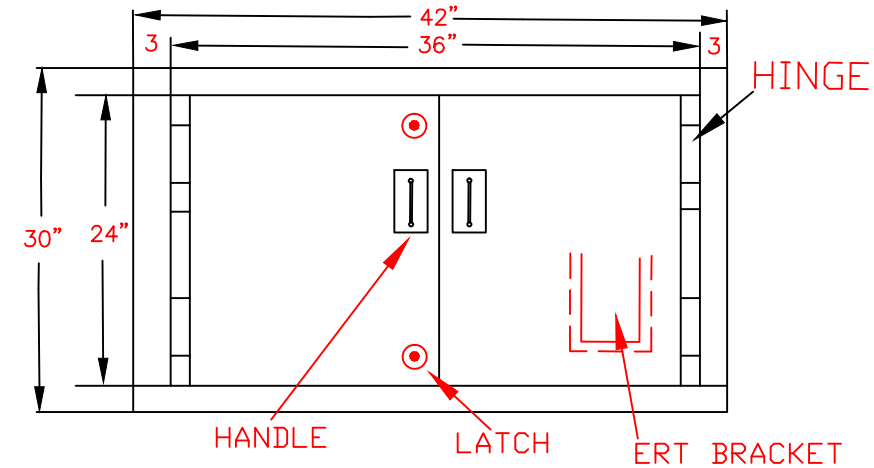
METER AND VAULT- 3" OR LARGER

SCALE:
 N.T.S.
 DATE:
 10-22-14

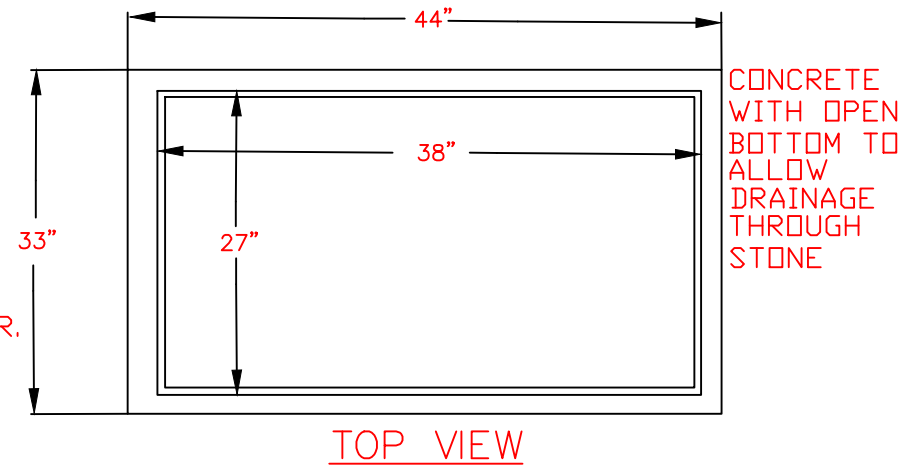
28



HS-20 TRAFFIC RATED STEEL 2'X3' FRAME & COVER



METER VAULT



- NOTES:
- 1) PIPING TO BE BRASS AND COPPER TUBING. METER INLET AND OUTLET TO BE EQUIPPED WITH FLANGED BALL ANGLE METER.
 - 2) CUSTOM SETTERS SHALL BE EQUIPPED WITH STANDARD LOW BYPASS WITH BALL VALVE AND PADLOCK WINGS
 - 3) CUSTOM SETTERS SHALL BE AS MANUFACTURED BY MUELLER, FORD, ANY MCDONALD, OR APPROVED EQUAL.
 - 4) CUSTOM SETTER SHALL BE INSTALLED SUCH THAT METER REGISTER IS LOCATED 5 TO 8 INCHES BELOW METER BOX COVER.
 - 5) METER BY COUNTY @ PREVAILING RATE

STANDARD DETAIL

UNION COUNTY PUBLIC WORKS DEPARTMENT
UNION COUNTY, N.C.

STANDARD 1 1/2" & 2" METER INSTALLATION & VAULT

SCALE:
N.T.S.
DATE:
6-13-14

