2016-6-8

REVISIONS

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT REFERENCE NO.	SHEET NO.
B-4929	UC-3A

DESIGNED BY: JPC
DRAWN BY: JPC
CHECKED BY: WGS
APPROVED BY: JPC
REVISED:

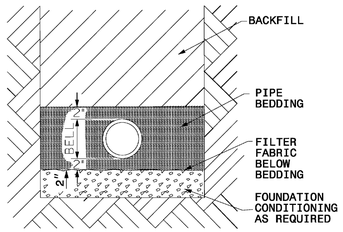
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
UTILITIES ENGINEERING SEC.
PHONE: (919)707-6690
FAX: (919)250-4151

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 039790 JEFFREY P. CAPPADONA 6/16/2016

UTILITY CONSTRUCTION PLANS ONLY

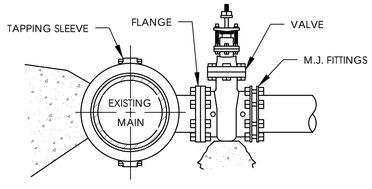
UTILITY CONSTRUCTION

TRENCH DETAIL

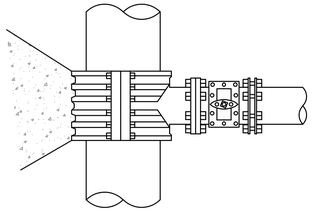


PLACE FOUNDATION CONDITIONING MATERIAL BELOW BEDDING IF REQUIRED, AS DIRECTED BY ENGINEER. PIPE BEDDED IN SELECT MATERIAL, CLASS IV. TRENCH BACKFILLED IN LOOSE 6" LAYERS COMPACTED TO TOP OF TRENCH USING LOCAL EXCAVATED MATERIAL IF APPROVED BY THE ENGINEER, OR SELECT MATERIAL. ALL MATERIAL SHALL BE FREE OF ROCKS, FOREIGN MATERIAL, AND FROZEN EARTH. COMPACTION SHALL BE TO APPROX. 95% DENSITY IN ACCORDANCE WITH AASHTO T-99 AS MODIFIED BY THE DEPARTMENT OF TRANSPORTATION.

TRENCH DETAIL
DETAIL 1 UC-3A
SCALE: *NOT TO SCALE*



ELEVATION

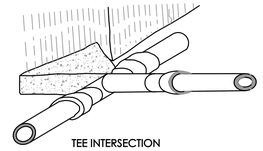


PLAN

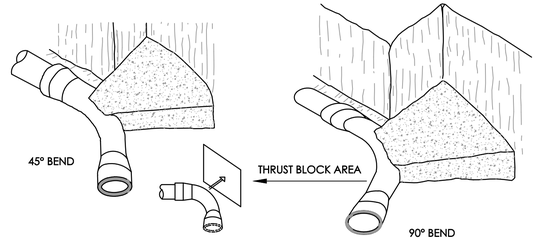
NOTES:

1. CONCRETE SHALL NOT CONTACT BOLTS OR ENDS OR MECHANICAL JOINT FITTINGS.
2. SEE STANDARD THRUST BLOCK TABLES, DETAIL 6/UC-3A, FOR AREA OF CONCRETE REQUIRED.
3. SOLID CONCRETE OR BRICK BLOCKING SHALL BE USED AS FOOTING FOR DUCTILE IRON PIPE.
4. PVC PIPE SHALL REQUIRE A 2,500 P.S.I. CONCRETE FOOTING.

1 1/2"-12" STANDARD TAPPING SLEEVE AND VALVE ASSEMBLY
DETAIL 5 UC-3A
SCALE: *NOT TO SCALE*



TEE INTERSECTION



1. CONCRETE SHALL BE 3,000 PSI.
2. CONCRETE SHALL NOT CONTACT BOLTS OR ENDS OF MECHANICAL JOINT FITTINGS.
3. TRENCHES SHALL CONFORM TO STANDARD DETAILS AS SHOWN ON THIS SHEET.
4. SEE STANDARD THRUST BLOCK QUANTITY TABLE (RIGHT) FOR CONCRETE REQUIRED.
5. ALL BENDS AND INTERSECTIONS SHALL HAVE CONCRETE THRUST BLOCKING.

REACTION BEARING AREAS FOR HORIZONTAL PIPE BENDS

BASED ON TEST PRESSURE OF 200 P.S.I. (ALL AREA IN SQUARE FEET)

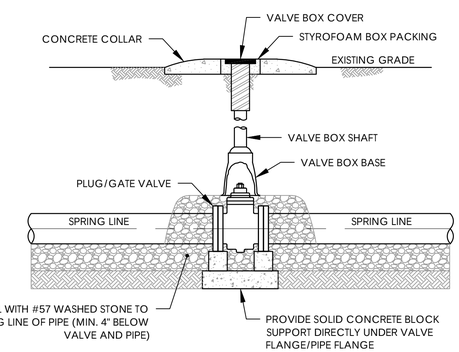
SIZE AND DEGREE OF BEND	STATIC THRUST IN POUNDS	EARTH, VERY CLAY 4000 LBS/FT Sq.	SOFT CLAY 2000 LBS/FT Sq.	GRAVEL - COARSE SAND 1600 LBS/FT Sq.	DRY CLAY-ALWAYS DRY 8000 LBS/FT Sq.	SAND, COMPACT, FIRM 8000 LBS/FT Sq.	SAND-CLEAN, DRY 4000 LBS/FT Sq.	QUICKSAND, VERY POOR SOIL 1000 LBS/FT Sq.	ROCK-POOR 10,000 LBS/FT Sq.
6"									
11 1/4°	1,108	1	1	1	1	1	2	1	
22 1/2°	2,207	1	2	2	1	1	3	1	
45°	4,576	2	3	3	1	2	5	1	
90°	7,996	2	4	5	1	1	2	8	1
PLUG	5,655	2	3	4	1	1	2	6	1
8"									
11 1/4°	1,970	1	1	2	1	1	1	2	1
22 1/2°	3,922	1	2	3	1	1	1	4	1
45°	7,694	2	4	5	1	1	2	8	1
90°	14,215	4	8	9	2	2	4	15	2
PLUG	10,053	3	5	6	2	2	3	10	1
12"									
11 1/4°	4,433	2	3	3	1	1	2	5	1
22 1/2°	8,826	3	5	6	2	2	3	9	1
45°	17,312	5	9	11	3	3	5	18	2
90°	31,983	8	16	19	4	4	8	32	4
PLUG	22,619	6	12	14	3	3	6	23	3
16"									
11 1/4°	7,881	2	4	5	1	1	2	8	1
22 1/2°	15,691	4	8	10	2	2	4	16	2
45°	30,779	8	16	19	4	4	8	31	4
90°	56,861	15	29	35	8	8	15	57	6
PLUG	40,213	10	21	25	5	5	10	41	5

NOTES:

REACTION BEARING AREAS ARE IN SQUARE FEET MEASURED IN A VERTICAL PLANE IN THE TRENCH SIDE AT AN ANGLE OF 90° TO THE THRUST VECTOR.

USE 6"-90° BEND VALUE FOR HYDRANTS FOR ADDITIONAL SAFETY FACTOR

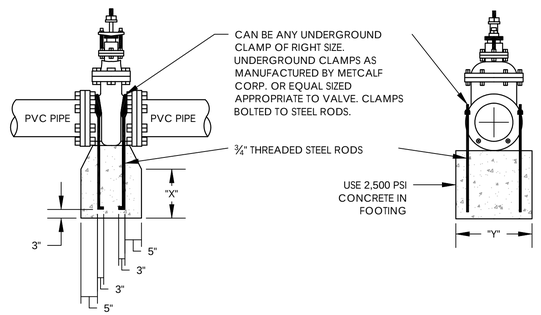
STANDARD THRUST BLOCKING VIEWS AND DESIGN QUANTITY TABLE
DETAIL 6 UC-3A
SCALE: *NOT TO SCALE*



NOTES:

1. A VALVE BOX SHOULD BE PROVIDED FOR EACH VALVE USED IN BURIED SERVICE APPLICATION. VALVE BOXES SHOULD BE INSTALLED SUCH THAT NO LOAD IS TRANSFERRED TO THE VALVE.
2. PREPARE PIPE ENDS ACCORDING TO MANUFACTURERS INSTRUCTIONS. INSTALL VALVE PER PROPER METHODS ACCORDING TO END JOINT TYPE. ALL PIPING SHOULD BE PROPERLY SUPPORTED TO AVOID LINE STRESS ON THE VALVE. DO NOT USE THE VALVE AS A JACK TO FORCE A PIPELINE INTO POSITION.

TYPICAL PLUG/GATE VALVE, VALVE BOX, & PROTECTION
DETAIL 4 UC-3A
SCALE: *NOT TO SCALE*



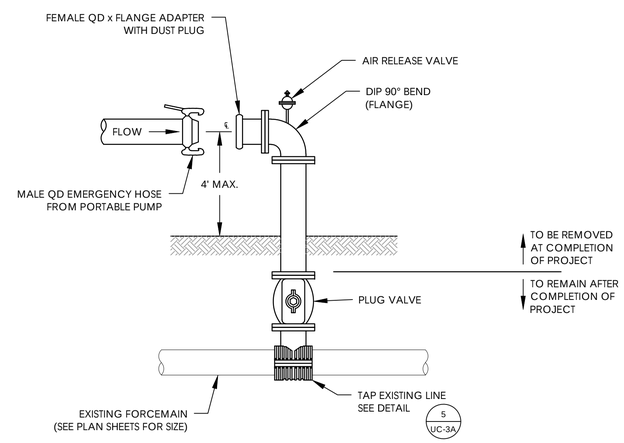
NOTES:

1. RODS SHOULD EXTEND TO TOP OF PIPE CROWN.
2. X x Y MUST EQUAL THE SQUARE FOOTAGE OF THE BEARING AREA SHOWN IN THE TABLE BELOW.

BEARING SURFACE AREA FOR VALVE FOOTINGS			
TYPE OF MATERIAL			
	4"	6"	8"
QUICKSAND, POOR SOIL (1,000 psf)	3	7	12
GRAVEL, COURSE SAND (1,600 psf)	2	5	8
SOFT CLAY (2,000 psf)	2	4	6
FAIRLY DRY CLAY, CLEAN DRY SAND (4,000 psf)	1	2	3
DRY CLAY, COMPACT SAND (8,000 psf)	1	1	2
POOR ROCK (10,000 psf)	1	1	2

3. COAT EXPOSED STEEL RODS AND CLAMPS WITH BITUMINOUS BASE PAINT.

VALVE FOOTING FOR PVC MAINS
DETAIL 14 UC-3A
SCALE: *NOT TO SCALE*



NOTE: ALL PIPES AND FITTINGS SHALL MATCH SIZE OF EXISTING FORCEMAIN, SEE PLANS

PUMP AROUND RISER
DETAIL 8 UC-3A
SCALE: *NOT TO SCALE*