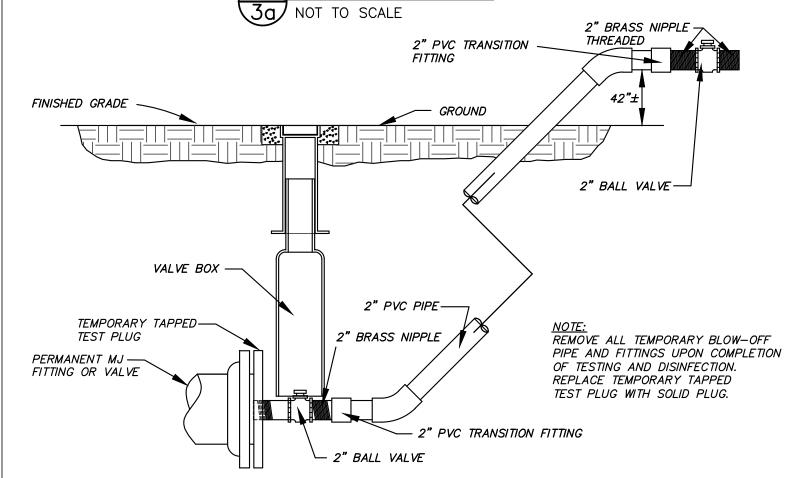
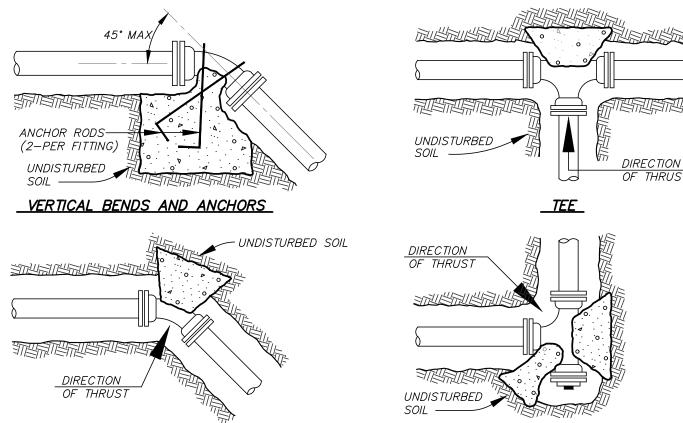
PLACE FOUNDATION CONDITIONING MATERIAL BELOW BEDDING IF REQUIRED, AS DIRECTED BY ENGINEER. PIPE BEDDED IN SELECT MATERIAL, CLASS II (TYPE 1) OR CLASS III. TRENCH BACKFILLED IN LOOSE 6" LAYERS COMPACTED TO TOP OF TRENCH USING LOCAL EXCAVATED MATERIAL IF APPROVED BY THE ENGINEER, OR SELECT MATERIAL. ALL MATERIAL SHALL BE FREE OF ROCKS, FOREIGN MATERIAL, AND FROZEN EARTH. COMPACTION SHALL BE TO APPROXIMATELY 95% DENSITY IN ACCORDANCE WITH AASHTO T-99 AS MODIFIED BY THE DEPARTMENT OF TRANSPORTATION.

CONDITIONING AS REQUIRED

1 TRENCH DETAIL



3 TEMPORARY 2" BLOW OFF VALVE CONNECTED TO TEMPORARY TAPPED TEST PLUGOT TO SCALE



CONCRETE THRUST BLOCKING SCHEDULE							CONCRETE SCHEDULE VERTICAL BENDS			ANCHOR ROD SIZE
FITTING	BE	EARING AF	REA IN SO	QUARE FEE	ΞT	MIN	. CU. YAF	RDS CONCE	RETE	FOR VERTICAL
SIZE	TEE/PLUG	90°	45°	22-1/2°	11-1/4°	90°	45°	22-1/2°	11-1/2°	BEND AND ANCHORS
4"	1	2	1	1	1	1	1	1	1	1/2"
6"	3	3	2	1	1	1	1	1	1	1/2
8"	4	6	3	2	1	2	2	1	1	3/4"
10"	7	9	5	3	2	3	3	2	1	5/4
12"	9	12	7	4	2	5	3	2	1	
14"	12	17	9	5	3	6	4	3	2	7/8"
16"	16	22	12	6	3	8	6	3	2	
18"	20	27	15	8	4	10	7	4	2	
20"	24	34	18	10	5	12	9	5	3	
24"	34	48	26	14	7	17	12	7	4	1-1/8"
30"	53	75	41	21	11	27	19	10	5	
36"	77	108	59	30	15	38	27	15	8	1-3/8"
NOTE.	<u>S:</u>									

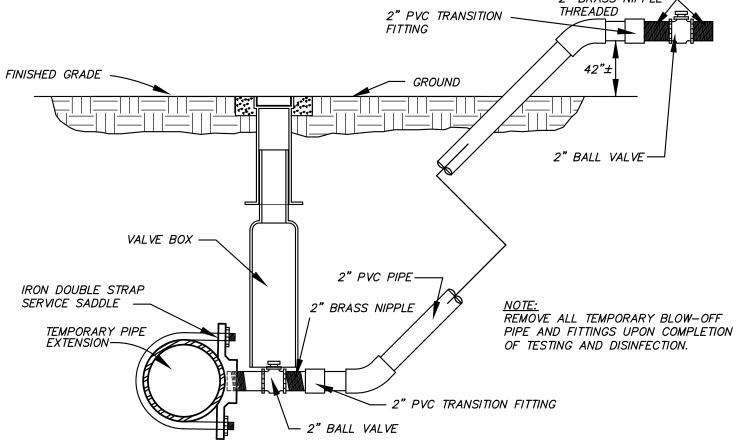
TEE AND PLUG

- 1. MINIMUM BEARING AREA (IN SQUARE FEET) AGAINST UNDISTURBED TRENCH WALL OF SAND. 2. AREAS SHOWN ARE FOR 150 PSI TEST PRESSURE. IF TEST PRESSURE IS OTHER THAN 150 PSI, ADJUST AREA OF REACTION BACKING IN DIRECT PROPORTION.
- 3. <u>OTHER SOIL CONDITIONS</u> CEMENTED SAND OR HARDPAN MULTIPLY ABOVE BY 0.5 GRAVEL OR HARD DRY CLAY - MULTIPLY ABOVE BY 0.7 MULTIPLY ABOVE BY 2.0

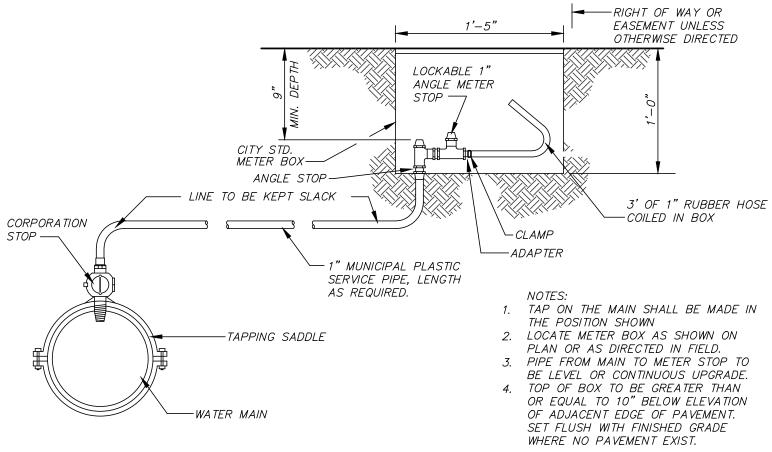
HORIZONTAL BENDS

MUCK: SECURE ALL FITTINGS WITH APPROVED HARNESS OR TIE ROD CLAMPS, WITH CONCRETE REACTION BACKING THE SAME AS LISTED FOR SAND CONDITIONS. THRUST BLOCKING AND ANCHORING SCHEDULE NOT TO SCALE

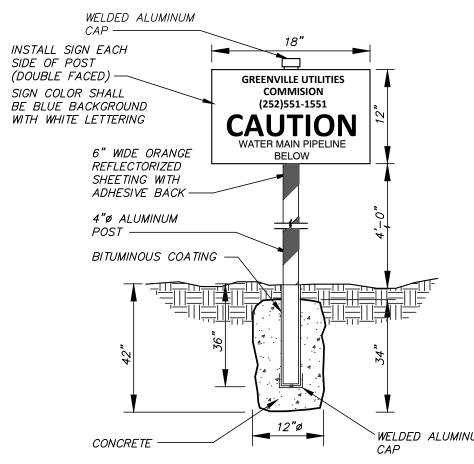
## PROJECT TYPICAL DETAILS



TEMPORARY 2" BLOW OFF VALVE CONNECTED TO TEMPORARY PIPE EXTENSIONNOT TO SCALE



5 TYP. 1" AIR RELEASE VALVE 3a NOT TO SCALE



6 WATER MAIN CROSSING SIGN DETAIL 3a NOT TO SCALE

BEND TYPE	ANGLE (DEG)	DIAMETER (IN)	BARE RESTRAINT (FT)	POLY-WRAPPED RESTRAINT (FT)		
	11.25	4	2	3		
	22.5	4	5	6		
	30	4	6	8		
	45	4	10	12		
	60	4	14	16		
	90 11.25	4	24	28		
	22.5	6	7	<u>4</u> 8		
	30	6	9	11		
	45	6	14	17		
	60	6	19	23		
	90	6	33	40		
	11.25	8	4	5		
HORIZONTAL	22.5	8	9	10		
AND VERTICAL	30 45	8 8	11 18	<u>14</u> 21		
BEND	60	8	25	30		
ÜP	90	8	43	51		
	11.25	10	5	6		
	22.5	10	10	12		
	30	10	14	17		
	45	10	21	26		
	60 90	10	30 52	<u>36</u> 62		
	11.25	12	6	7		
	22.5	12	12	14		
	30	12	16	19		
	45	12	25	30		
	60	12	35	42		
	90 11.25	12	60	72		
	22.5	4	8	6 12		
	30	4	11	16		
	45	4	17	24		
	60	4	24	34		
	90	4	41	59		
	11.25	6	8	8		
	22.5 30	6	12	17 22		
	45	6	24			
	60	6	34	48		
	90	6	59	84		
	11.25	8	7	11		
	22.5	8	15	22		
VERTICAL	30	8	20	29		
BEND DOWN	45 60	8	31 44	45 62		
DOWN	90	8 8	76	108		
	11.25	10	9	13		
	22.5	10	18	26		
	30	10	25	35		
	45	10	38	54		
	60	10	53	76		
	90	10 12	92	131 15		
	11.25 22.5	12	21	30		
	30	12	29	41		
	45	12	44	63		
	60	12	62	88		
	90	12	107	153		
TEE	N/A	4	35	50		
TEE	N/A	6	52	75		
	N/A	8 10	70 85	99 122		
	N/A N/A	12	101	122 144		
	N/A N/A	4x1	13	19		
	N/A	4x2	13	19		
			7.0			

7 PIPE RESTRAINT DETAIL
30 NOT TO SCALE

REDUCER

N/A

N/A N/A

N/A

N/A

PROJECT REFERENCE NO. SHEET NO. BR-0119 UC-3a DESIGNED BY: FLS DRAWN BY: JML CHECKED BY: FLS APPROVED BY: FLS **REVISED:** NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. Frederick L. 

## **UTILITY CONSTRUCTION**

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED