

PROJECT TYPICAL DETAILS

PROJECT REFERENCE NO.
U-5810

SHEET NO.
UC-38

DESIGNED BY: A. CREES

DRAWN BY: R. MOSS

CHECKED BY:

APPROVED BY:

REVISED:

5-7-26

NORTH CAROLINA
PROFESSIONAL
ENGINEER
SEAL
27044

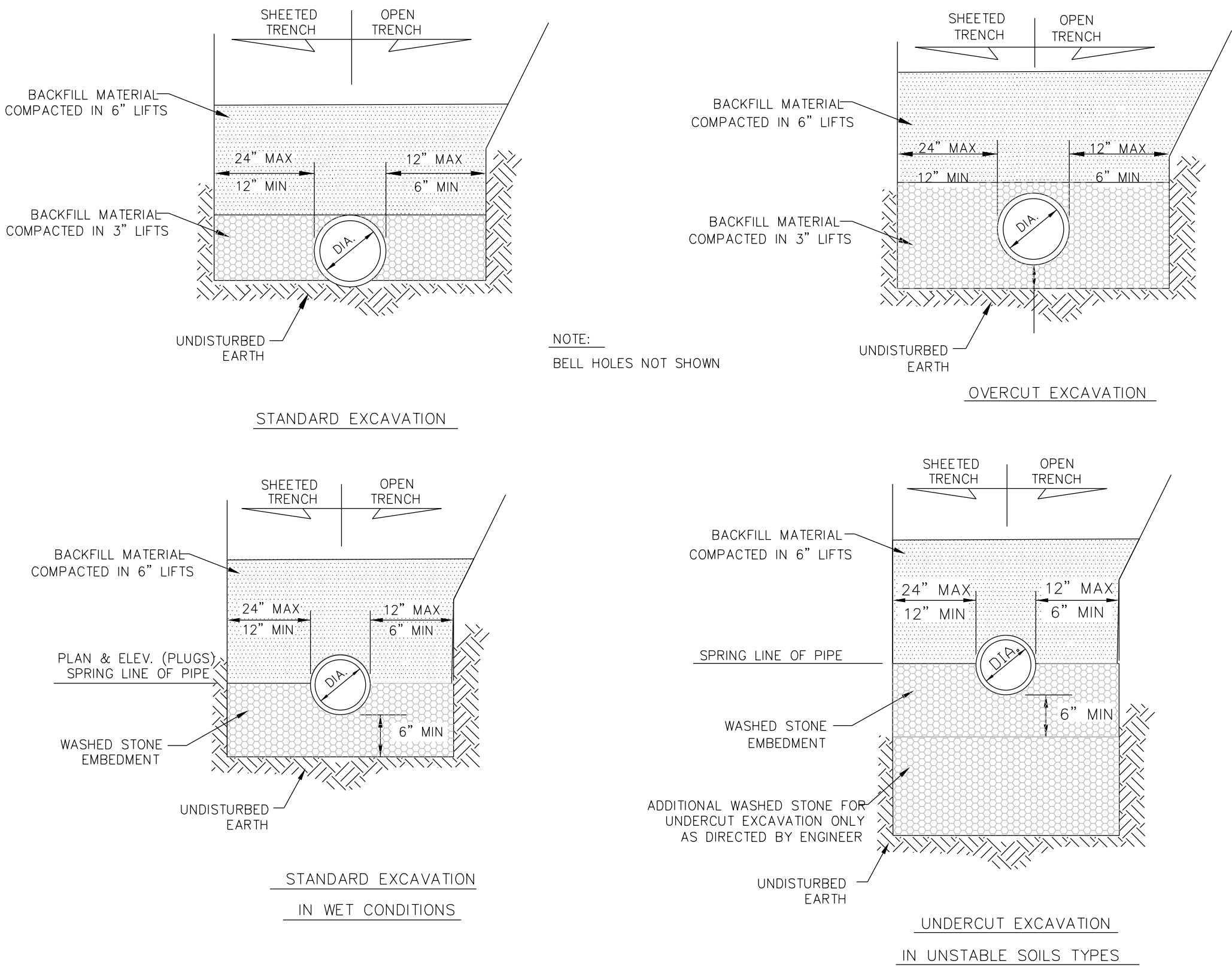
Signed by
A. CREES
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MUNICIPAL ENGINEERING, INC.

820-B STATE FARM RD.
BOONE NC, 28607
(828) 262-1767

UTILITY CONSTRUCTION
PLANS ONLY

UTILITY CONSTRUCTION



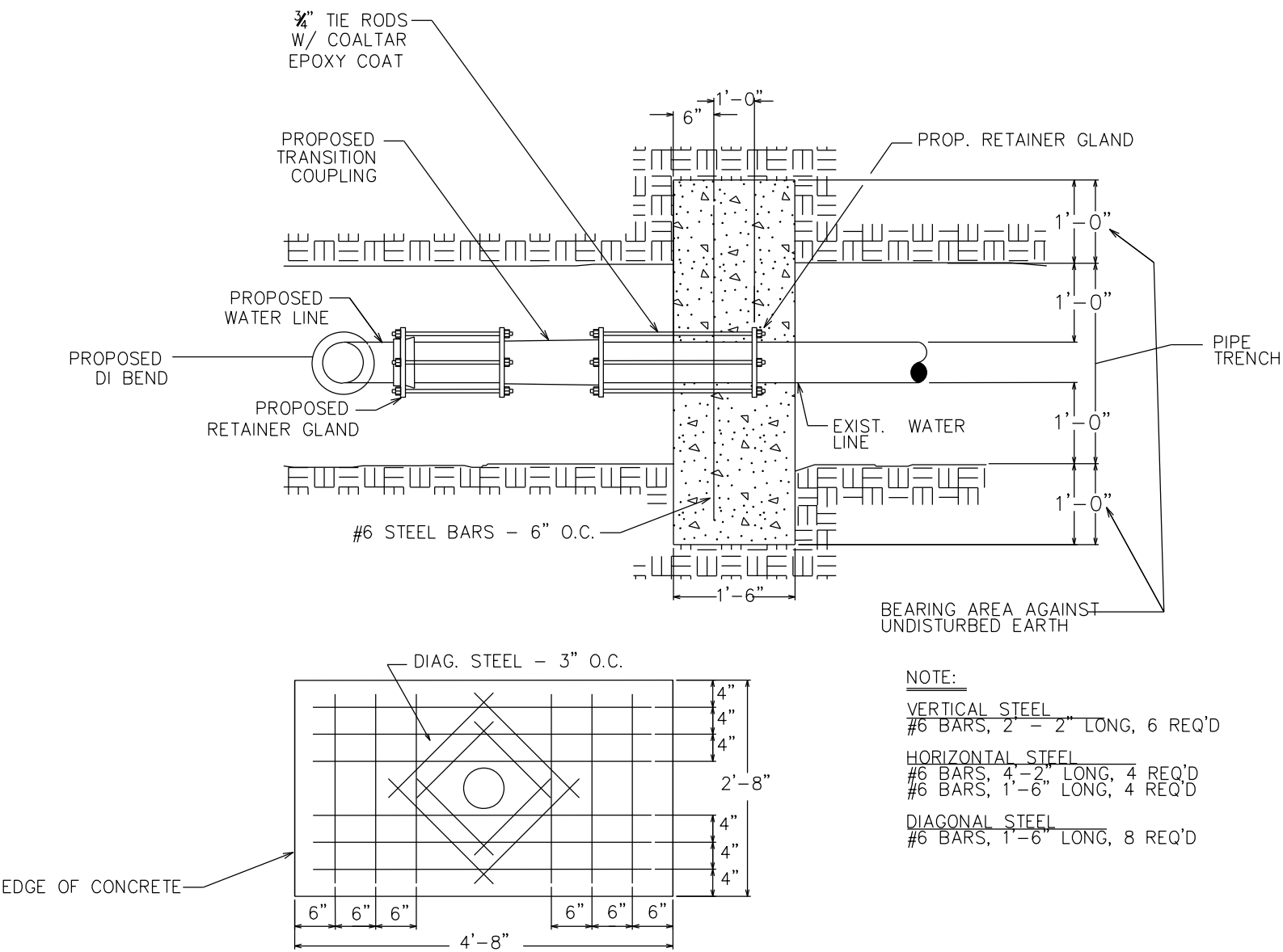
TYPICAL TRENCH DETAIL

MAXIMUM TRENCH WIDTH AT TOP OF PIPE			
NOMINAL PIPE SIZE (INCHES)	TRENCH WIDTH (INCHES)	NOMINAL PIPE SIZE (INCHES)	TRENCH WIDTH (INCHES)
6	30	24	48
10	34	36	60
16	40	54	78

NOTES:
CONSTRUCTION OF TRENCHES
SHALL BE IN ACCORDANCE
WITH THE LATEST OSHA
REGULATIONS. CONTRACTOR
SHALL BE RESPONSIBLE FOR
COMPLIANCE WITH ALL
APPLICABLE REGULATIONS.

NO BOULDERS OR STONES
IN EXCESS OF 4" IN SIZE
SHALL BE USED AS PART
OF THE INITIAL BACKFILL.

PIPE BEDDING MATERIAL
SHALL BE # 57 WASHED
STONE.



NOTE:
VERTICAL STEEL
#6 BARS, 2'-2" LONG, 6 REQ'D
HORIZONTAL STEEL
#6 BARS, 4'-2" LONG, 4 REQ'D
#6 BARS, 1'-6" LONG, 4 REQ'D
DIAGONAL STEEL
#6 BARS, 1'-8" LONG, 8 REQ'D

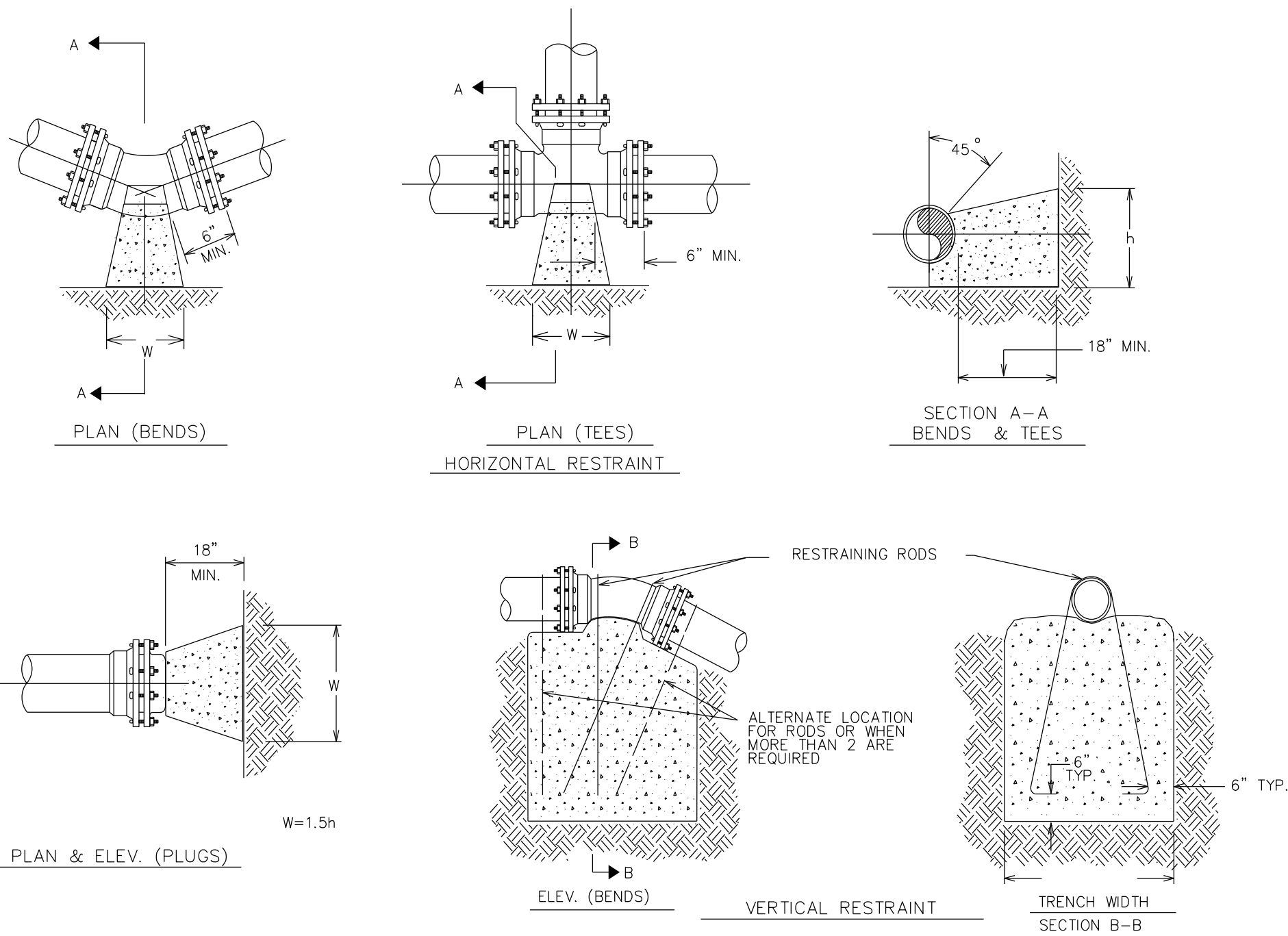
BASED ON TEST PRESSURE OF 200 P.S.I.

HORIZONTAL RESTRAINT (ALL AREAS GIVEN ARE IN SQUARE FEET)										VERTICAL RESTRAINT (ALL VOLUMES GIVEN ARE IN CUBIC YARDS)**						
PIPE SIZE	DEGREE OF BEND	LBS. STATIC THRUST *	ALLOWABLE SOIL BEARING (PSF)								PIPE SIZE	RESTRAINING RODS		DEGREE OF BEND		
			1000	2000	3000	4000	5000	6000	7000	8000		NO.REQ'D	DIA.	11/4°	22 1/2°	45°
6"	11/4°	1,385	2	1	1	1	1	1	1	1	6"	2	1/2"	0.50	1.0	1.75
	22 1/2°	2,758	3	2	1	1	1	1	1	1						
	45°	5,409	5	3	2	2	1	1	1	1						
	90°	9,999	10	5	3	3	2	2	2	1						
	TEE/PLUG	7,068	7	4	3	2	2	1	1	1						
	11/4°	3,846	4	2	2	1	1	1	1	1						
10"	22 1/2°	17,661	8	4	3	2	2	1	1	1	10"	2	3/4"	1.25	2.25	4.50
	45°	15,028	15	8	5	4	3	2	2	2						
	90°	27,768	28	14	9	7	6	5	4	3						
	TEE/PLUG	19,635	20	10	7	5	4	3	3	2						
	11/4°	9,854	10	5	3	3	2	2	2	2						
	22 1/2°	19,612	20	10	7	5	4	3	3	3						
16"	45°	38,471	38	17	13	10	8	6	5	5	16"	4	3/4"	3.0	6.0	11.50
	90°	71,085	71	36	24	18	14	12	10	9						
	TEE/PLUG	50,265	50	25	17	13	10	8	7	6						

* INCLUDES 1.25 SAFETY FACTOR

GENERAL NOTES:
1. CONCRETE SHALL BE CLASS "B"
2. CONCRETE SHALL NOT CONTACT BOLTS ENDS OF MECHANICAL JOINT FITTINGS.
3. CONSULT WITH ENGINEER FOR CONCRETE REQUIREMENTS ON MAINS LARGER THAN 16 INCHES.
(FOR VERTICAL & HORIZONTAL BENDS)
4. ALLOWABLE SOIL BEARING SHALL BE DETERMINED BY THE ENGINEER.

THRUST RESTRAINT FOR WATER MAINS



THRUST RESTRAINT FOR PIPE LINES