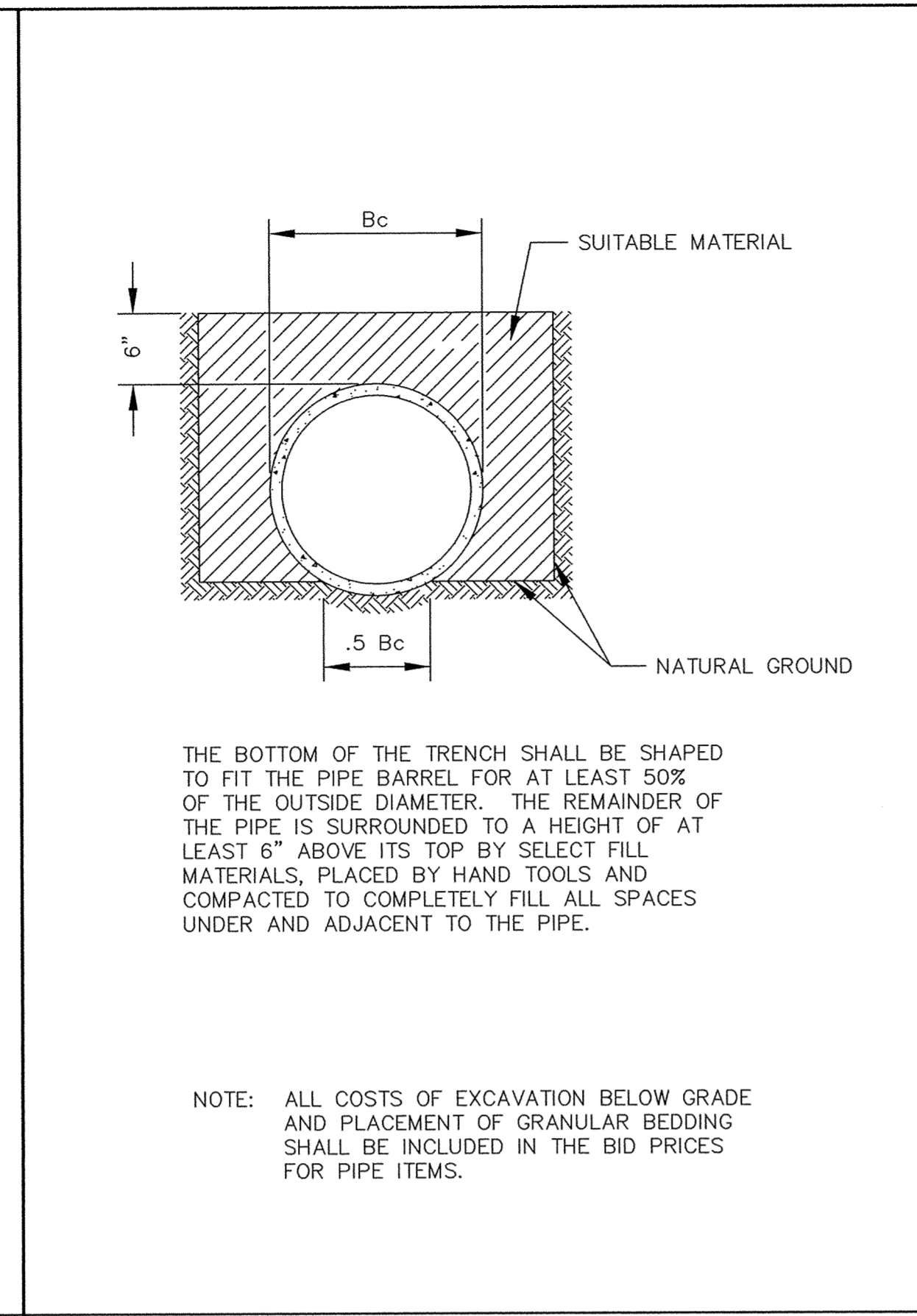
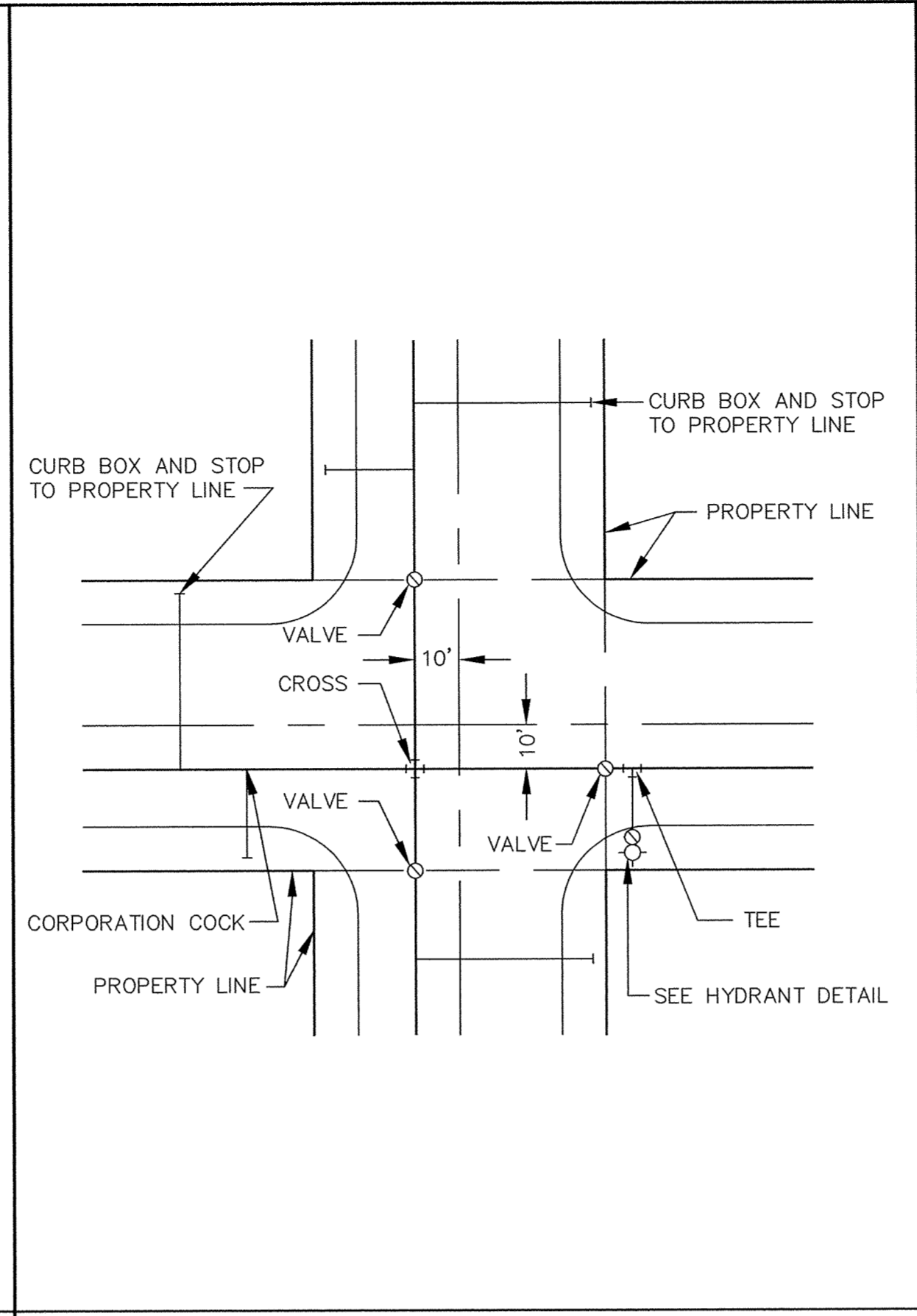


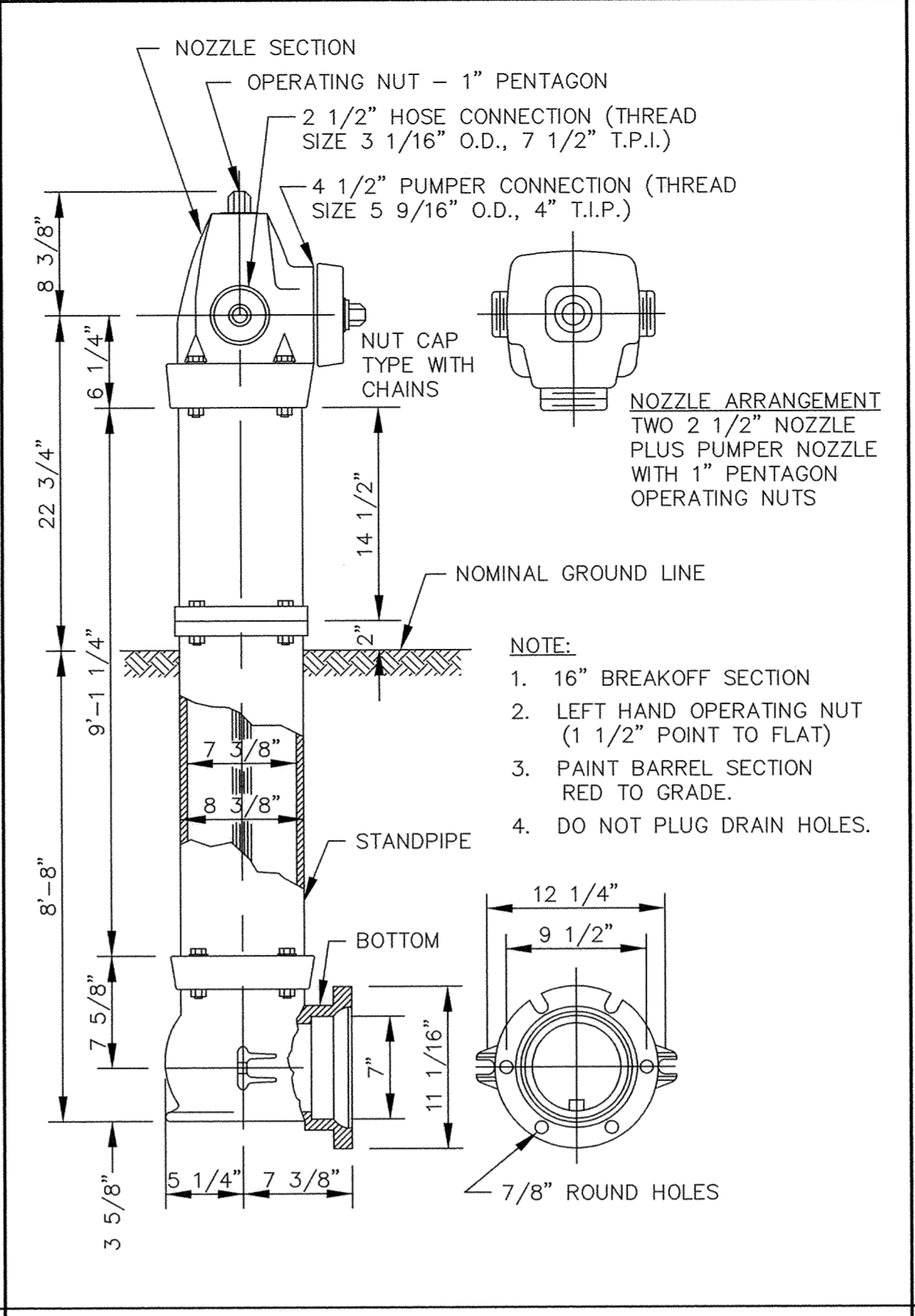
CLASS B PIPE BEDDING



CLASS C PIPE BEDDING



TYPICAL WATER LAYOUT

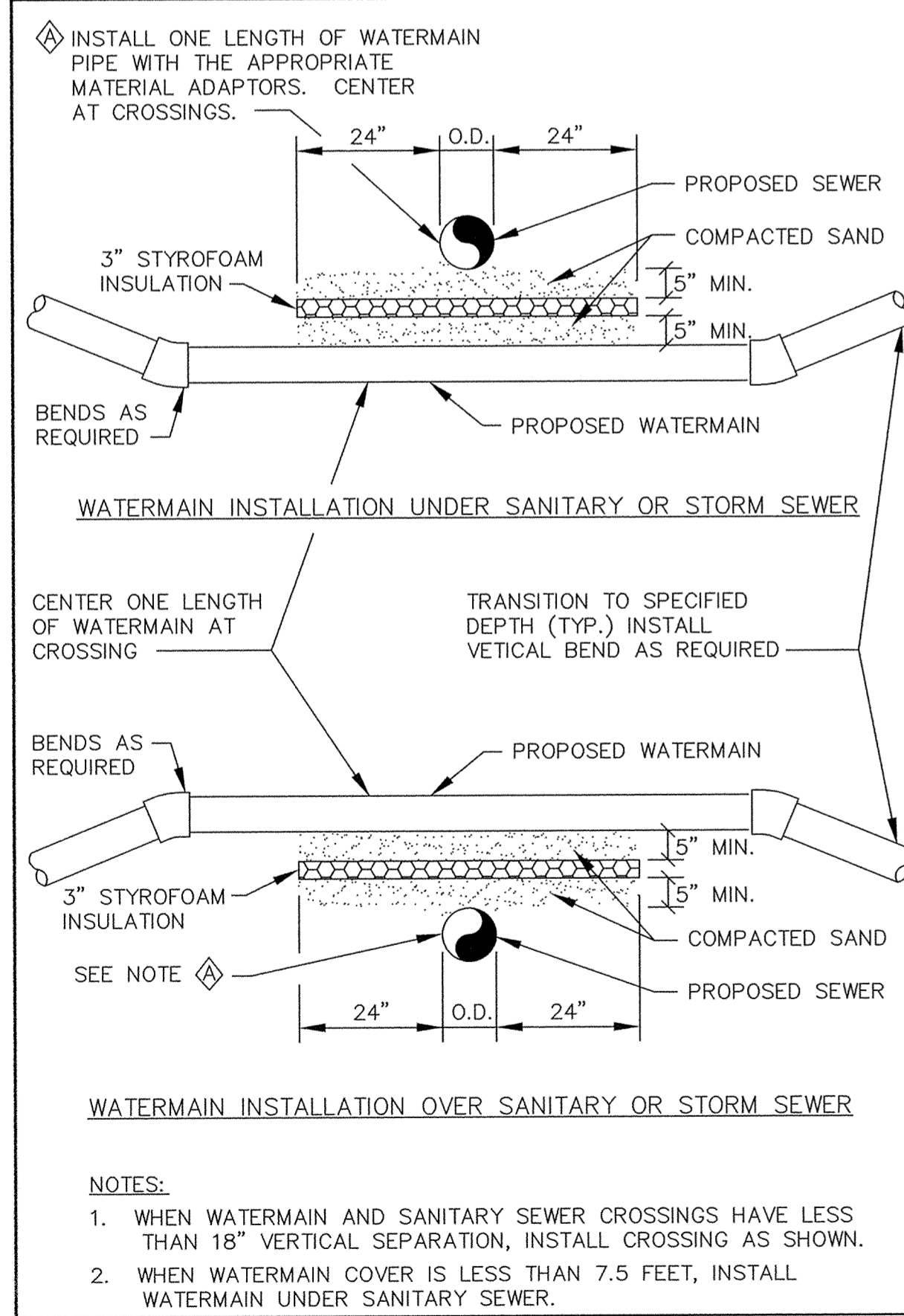


PACER HYDRANT DETAIL

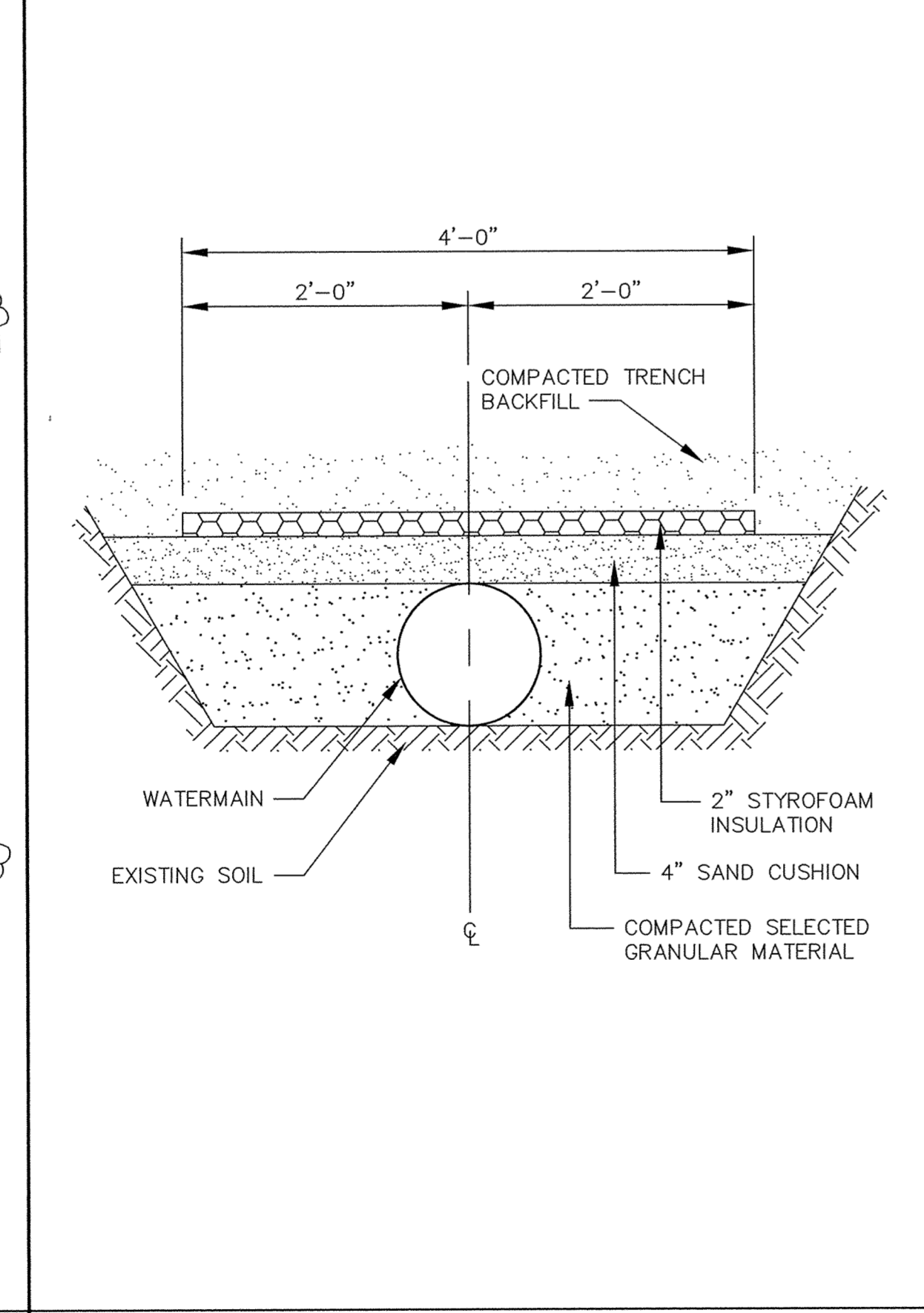
NOMINAL FITTING SIZE (INCHES)	TEE, WYE, PLUG OR CAP	90° BEND, PLUGGED CROSS	TEE PLUGGED ON RUN		45° BEND	22 1/2° BEND	11 1/4° BEND
			A <sup>1</sup>	A <sup>2</sup>			
4	1.0	1.4	1.9	1.4	1.0	---	---
6	2.1	3.0	4.3	3.0	1.6	1.0	---
8	3.8	5.3	7.6	5.4	2.9	1.5	1.0
10	5.9	8.4	11.8	8.4	4.6	2.6	1.2
12	8.5	12.0	17.0	12.0	6.6	3.4	1.7
14	11.5	16.3	23.0	16.3	8.9	4.6	2.3
16	15.0	21.3	30.0	21.3	11.6	6.0	3.0
18	19.0	27.0	38.0	27.0	14.6	7.6	3.8
20	23.5	33.3	47.0	33.3	18.1	9.4	4.7
24	34.0	48.0	68.0	48.0	26.2	13.6	6.8

NOTE:  
 1. CONCRETE THRUST BLOCKING TO BE POURED AGAINST UNDISTURBED EARTH.  
 2. KEEP CONCRETE CLEAR OF JOINT AND ACCESSORIES.  
 3. IF NOT SHOWN ON PLANS, REQUIRED BEARING AREAS AT FITTING SHALL BE AS INDICATED ABOVE, ADJUSTED IF NECESSARY, TO CONFORM TO THE TEST PRESSURE(S) AND ALLOWABLE SOIL BEARING STRESS(ES).  
 4. BEARING AREAS AND SPECIAL BLOCKING DETAILS SHOWN ON PLANS TAKE PRECEDENCE OVER BEARING AREAS AND BLOCKING DETAILS SHOWN IN THIS STANDARD DETAIL.  
 5. ABOVE BEARING AREAS BASED ON TEST PRESSURE OF 150 P.S.I. AND AN ALLOWABLE SOIL BEARING STRESS OF 2000 POUNDS PER SQUARE FOOT. TO COMPUTE BEARING AREAS FOR DIFFERENT TEST PRESSURES AND SOIL BEARING STRESSES, USE THE FOLLOWING EQUATION: BEARING AREA = (TEST PRESSURE/150) X (2000/SOIL BEARING STRESS) X (TABLE VALUE).

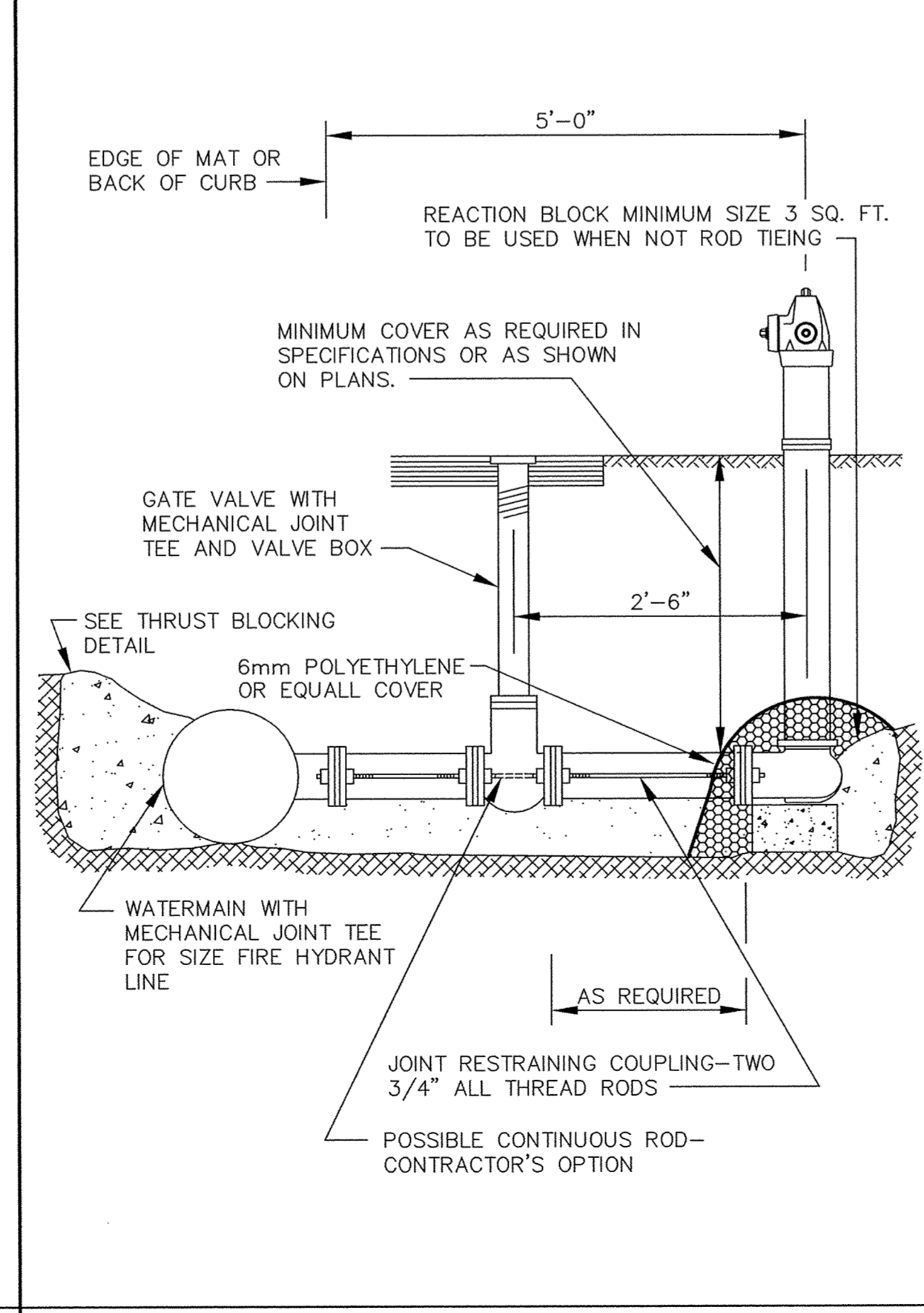
THRUST BLOCKING DETAIL



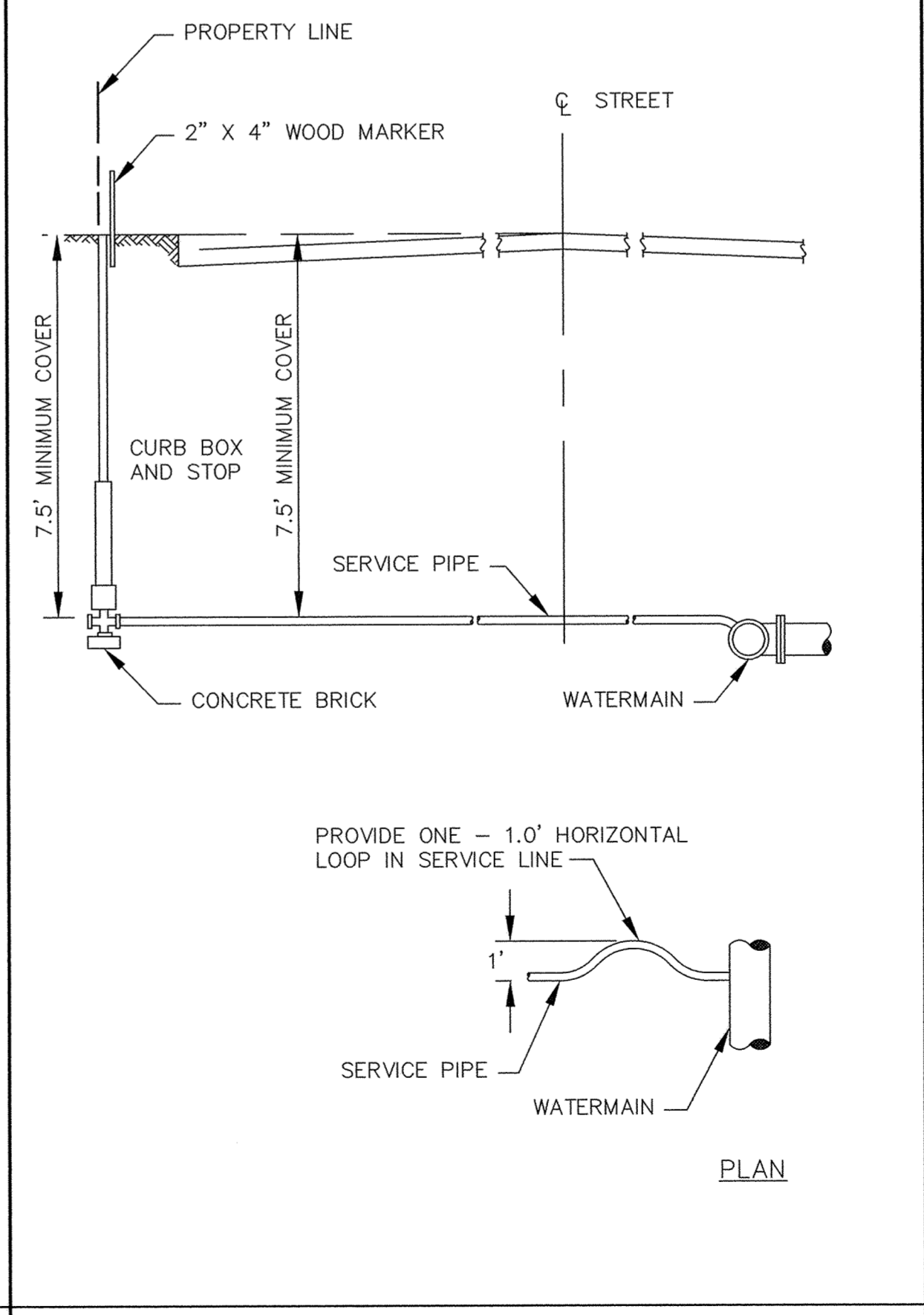
WATERMAIN CROSSING



PIPE INSULATION DETAIL



RODDING DETAIL



TYPICAL SERVICE DETAIL

**RECORD PLAN**  
JANUARY 1997

ER292-D2

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

*Carol Munn*  
 DATE 5/21/96 REG. NO. 15316

**MSA**  
CONSULTING ENGINEERS

1326 ENERGY PARK DRIVE ST. PAUL, MINNESOTA 55108 (612) 644-4389	DATE	DESCRIPTION	DESIGNED - SEF
			CHECKED
			DRAWN - RKM
			GRAPHIC SCALE
			0 HORIZ.
			0 VERT.

CITY OF ELK RIVER  
HILLSIDE ESTATES FIFTH ADDITION  
WATERMAIN DETAILS

DATE JULY 1996 SHEET 14 OF 16 SHEETS PROJECT NO. 230-292

DRAWING NUMBER  
 HILLSIDES 96  
 14  
 DRAWING NUMBER  
 1061