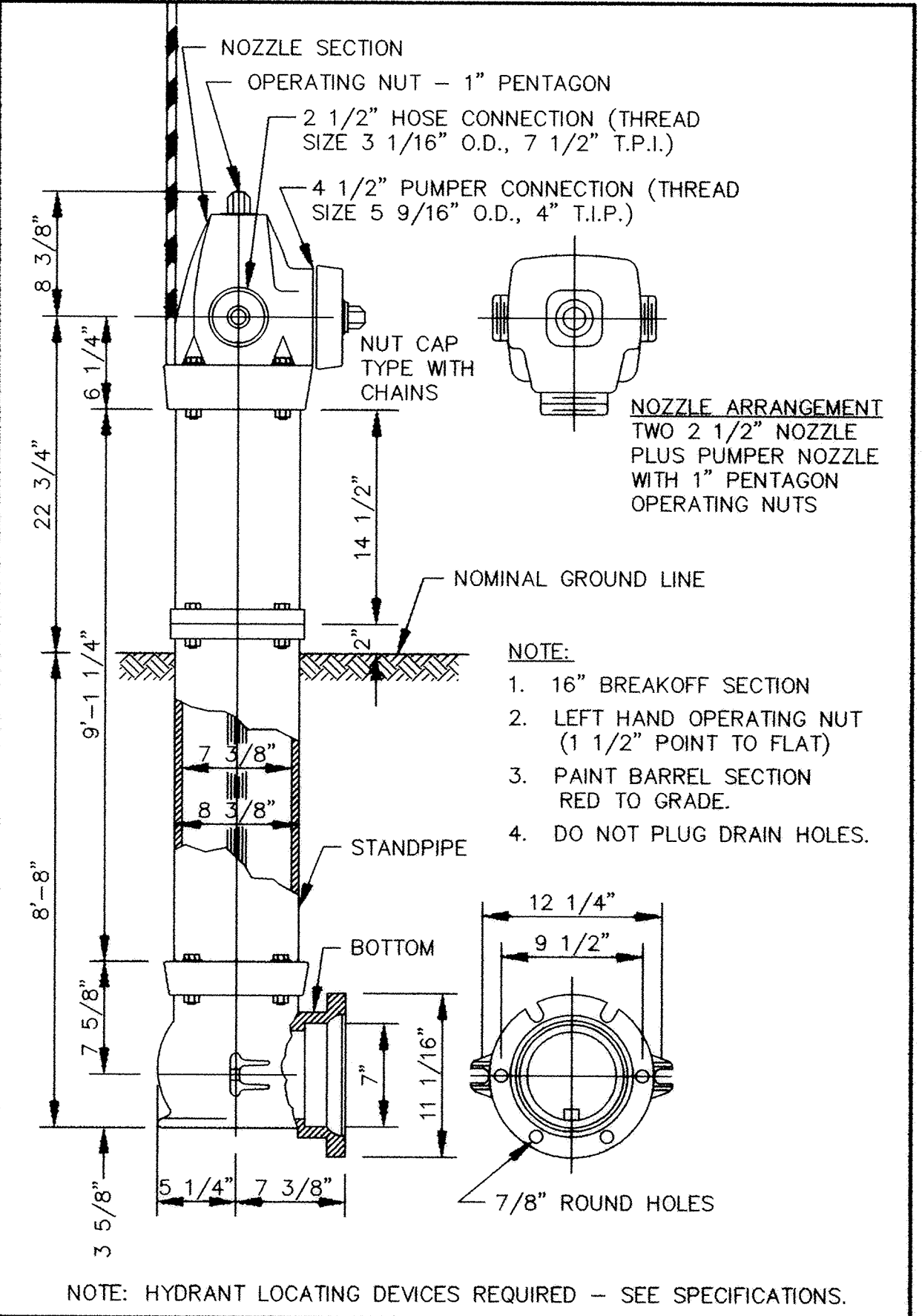


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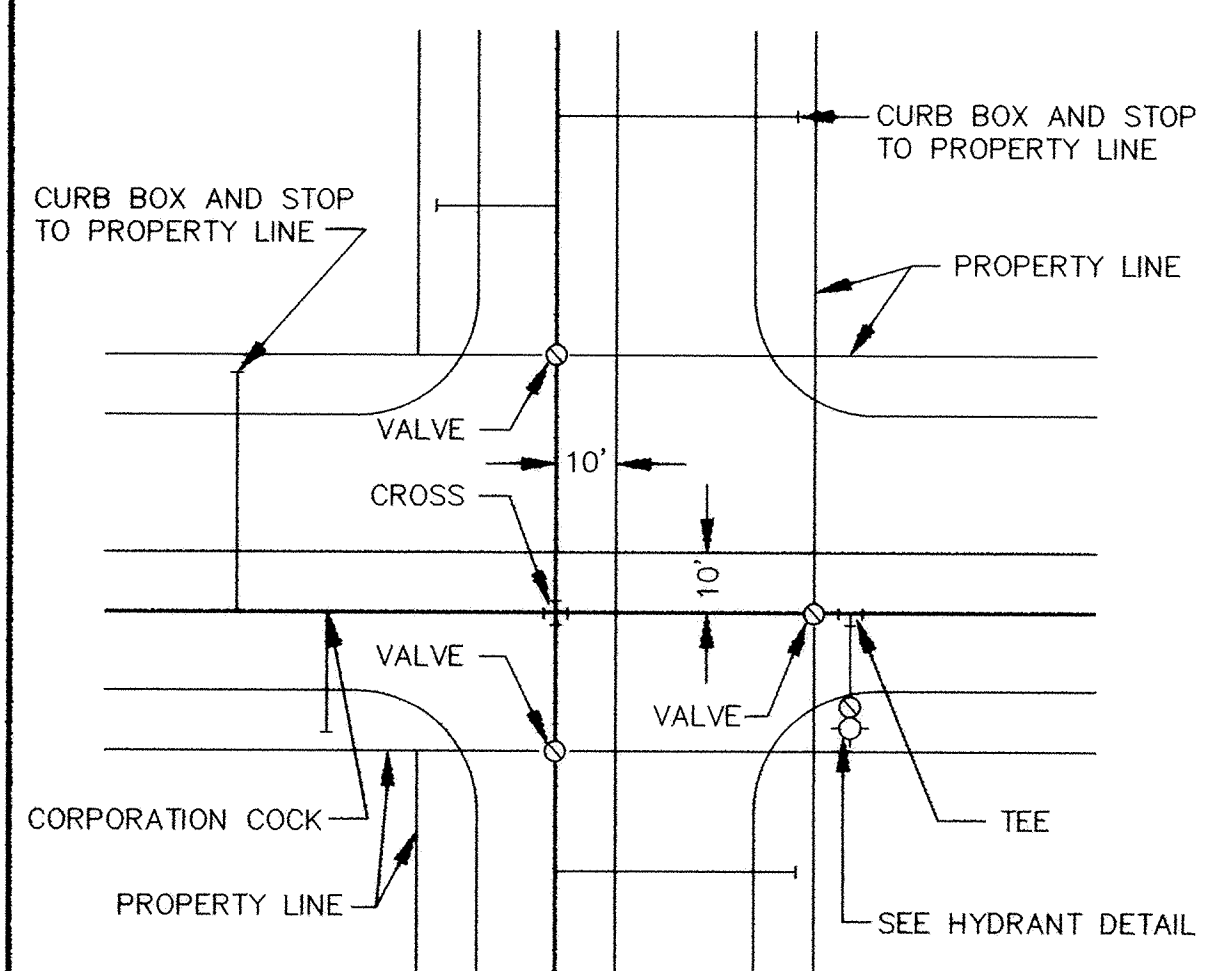
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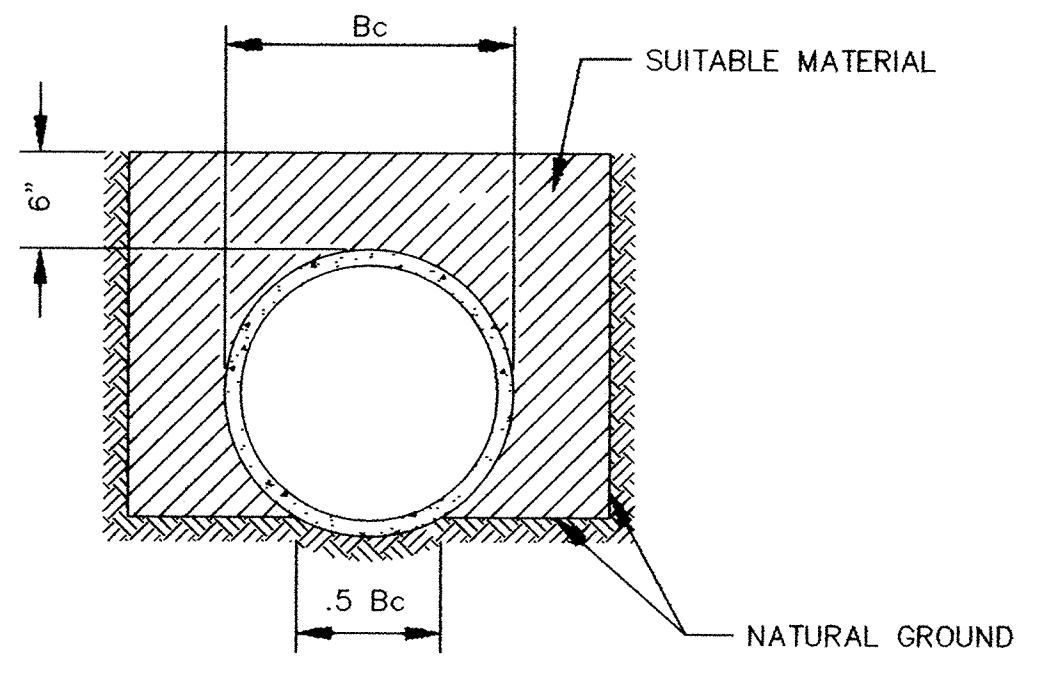
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PACER HYDRANT DETAIL



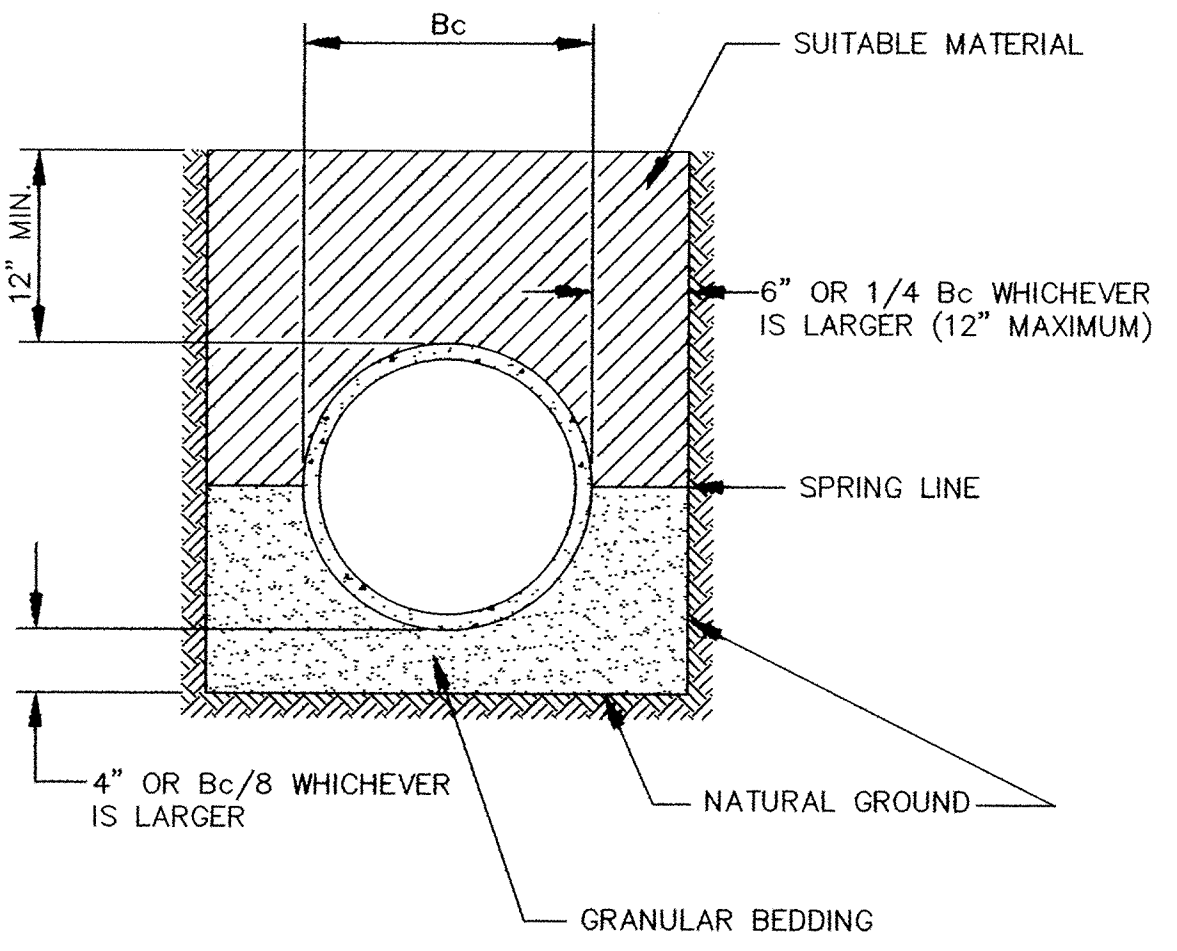
TYPICAL WATER LAYOUT



THE BOTTOM OF THE TRENCH SHALL BE SHAPED TO FIT THE PIPE BARREL FOR AT LEAST 50% OF THE OUTSIDE DIAMETER. THE REMAINDER OF THE PIPE IS SURROUNDED TO A HEIGHT OF AT LEAST 6" ABOVE ITS TOP BY SELECT FILL MATERIALS, PLACED BY HAND TOOLS AND COMPACTED TO COMPLETELY FILL ALL SPACES UNDER AND ADJACENT TO THE PIPE.

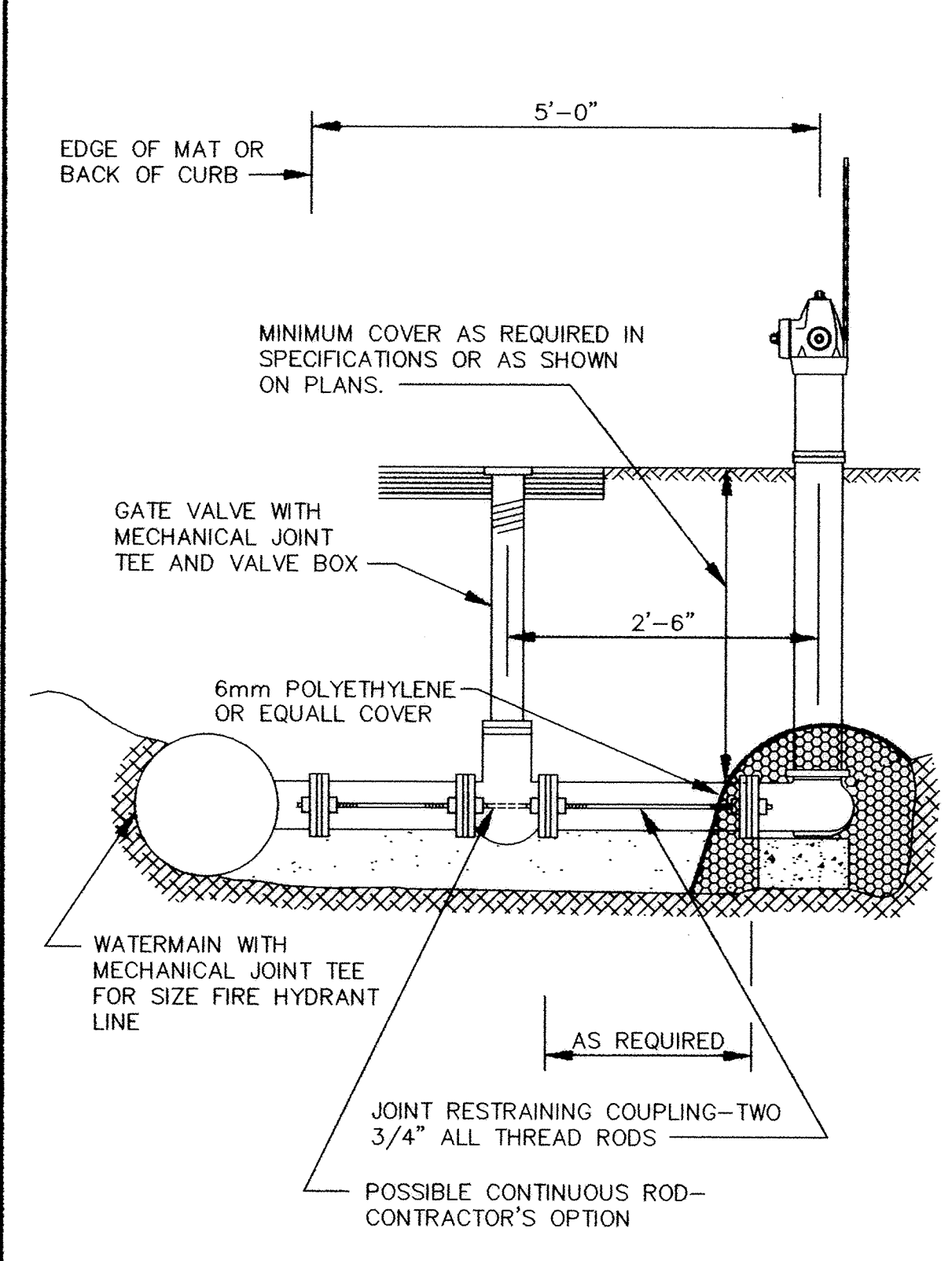
NOTE: ALL COSTS OF EXCAVATION BELOW GRADE AND PLACEMENT OF GRANULAR BEDDING SHALL BE INCLUDED IN THE BID PRICES FOR PIPE ITEMS.

CLASS C PIPE BEDDING

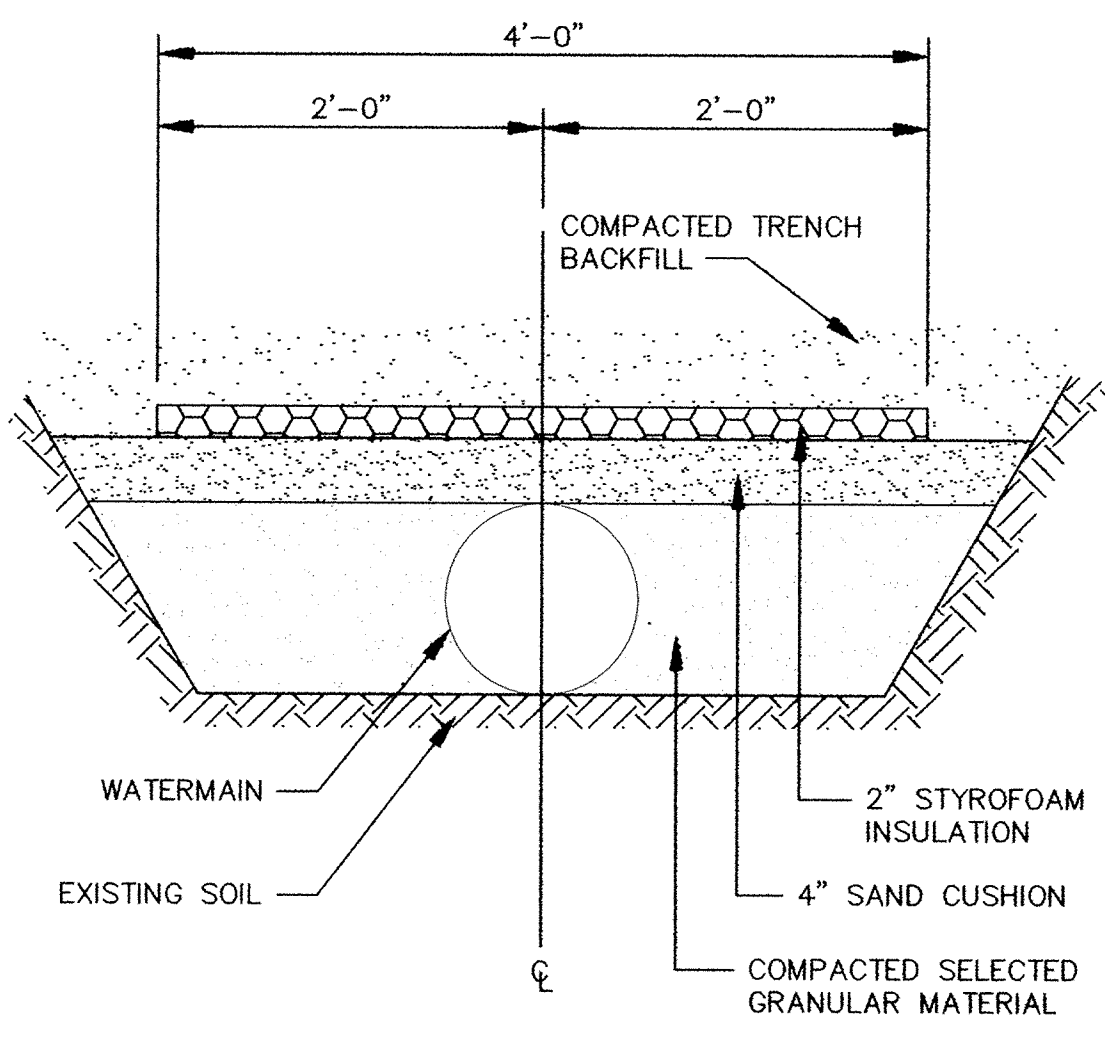


NOTE: ALL COSTS OF EXCAVATION BELOW GRADE AND PLACEMENT OF GRANULAR BEDDING SHALL BE INCLUDED IN THE BID PRICES FOR PIPE ITEMS.

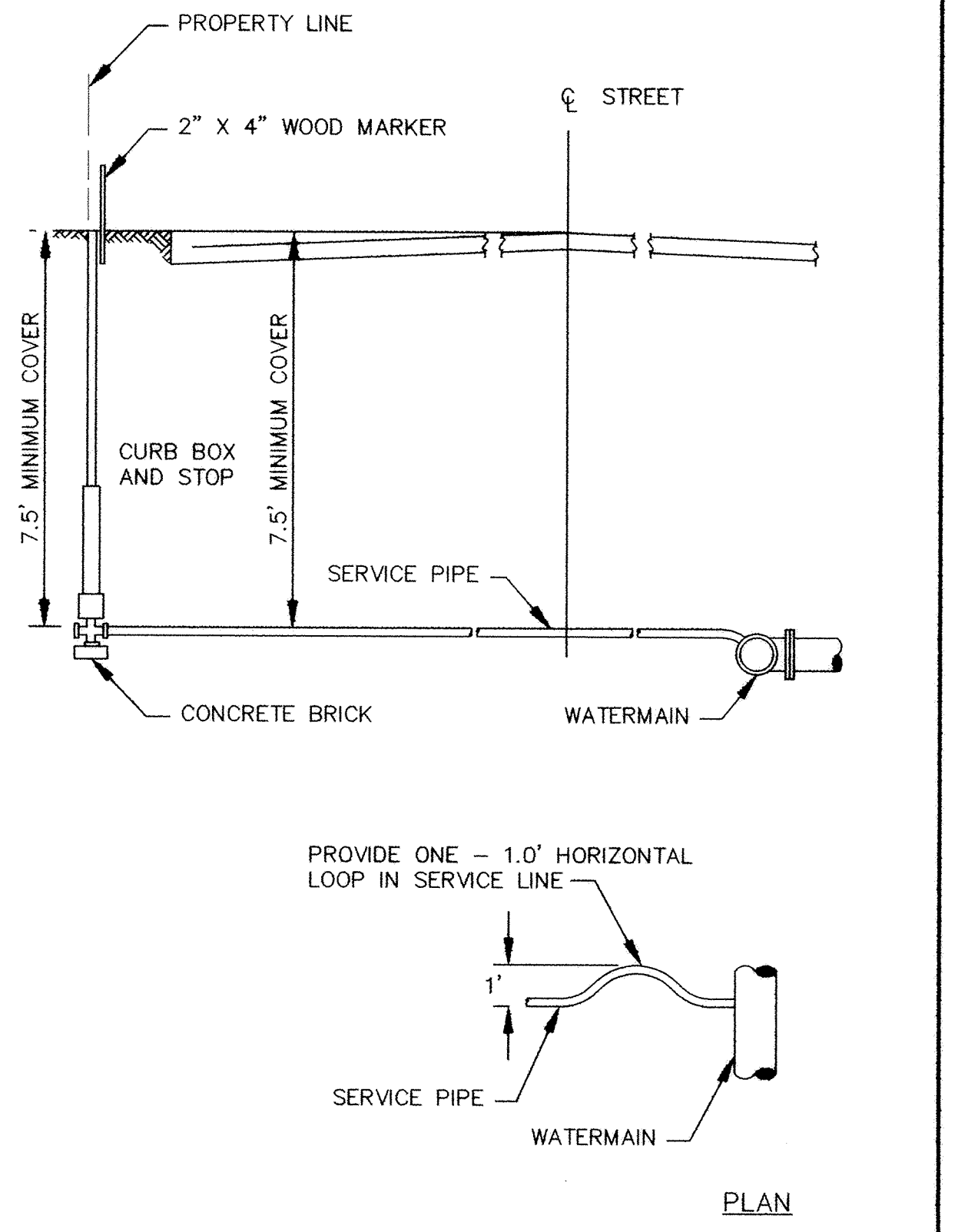
CLASS B PIPE BEDDING



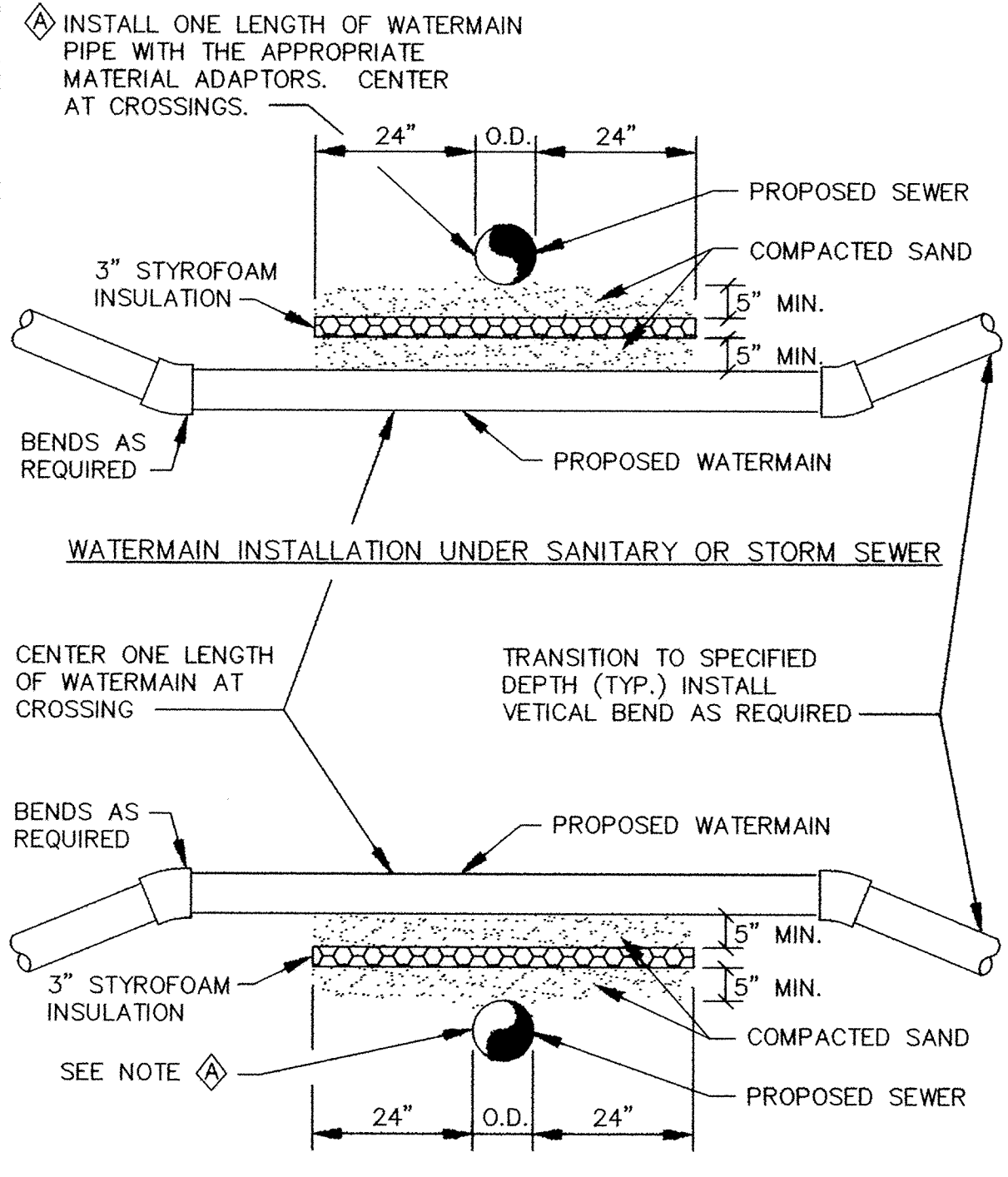
RODDING DETAIL



PIPE INSULATION DETAIL

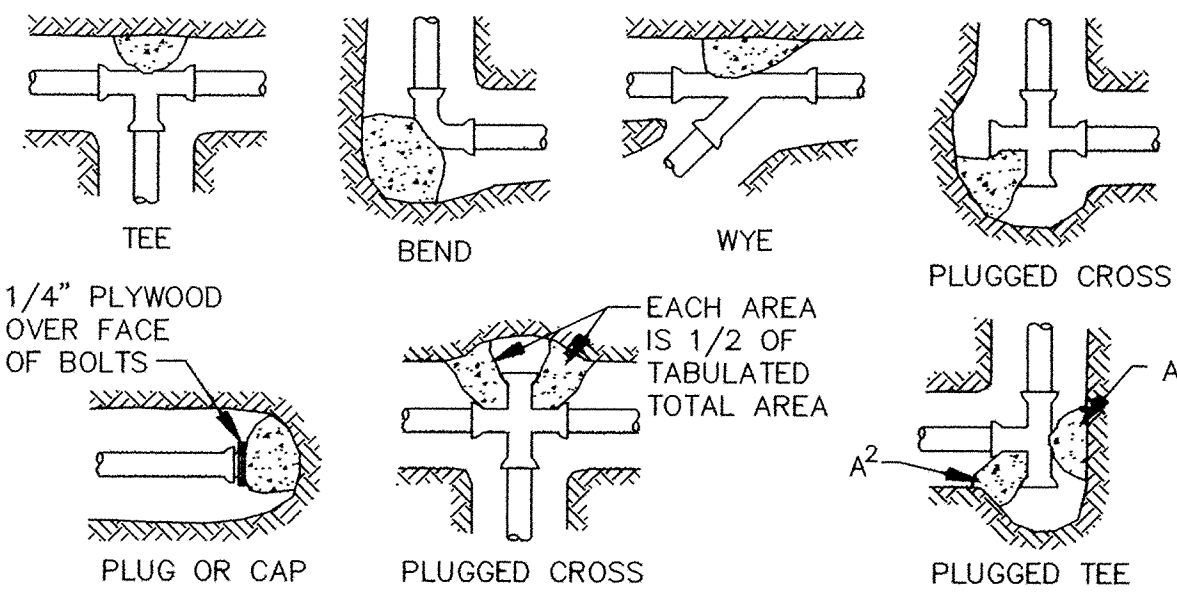


TYPICAL SERVICE DETAIL



NOTES:
1. WHEN WATERMAIN AND SANITARY SEWER CROSSINGS HAVE LESS THAN 18" VERTICAL SEPARATION, INSTALL CROSSING AS SHOWN.
2. WHEN WATERMAIN COVER IS LESS THAN 7.5 FEET, INSTALL WATERMAIN UNDER SANITARY SEWER.

WATERMAIN CROSSING



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
		A1	A2	A1	A2			
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

DESIGNED BY: _____ DRAWN BY: EY
APPROVED BY: _____ JOB NUMBER 811385J
CAD DATE: February 01, 2003 9:45:44 a.m.
CAD FILE: 811385\dwg\811385-WM.DWG (JLALLEN)

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.
DATE: 8/05/2002
TERRY J. MAURER, P.E. LIC. NO. 15316

NO.	DATE	BY	REVISION DESCRIPTION

1326 ENERGY PARK DRIVE
ST. PAUL, MINNESOTA 55108
(651) 644-4389
Howard R Green Company
CONSULTING ENGINEERS

CITY OF ELK RIVER
THE WOODS OF HILLSIDE III
STREET AND UTILITY IMPROVEMENTS

WATERMAIN CONSTRUCTION DETAILS

SHEET NO.
11
OF
11