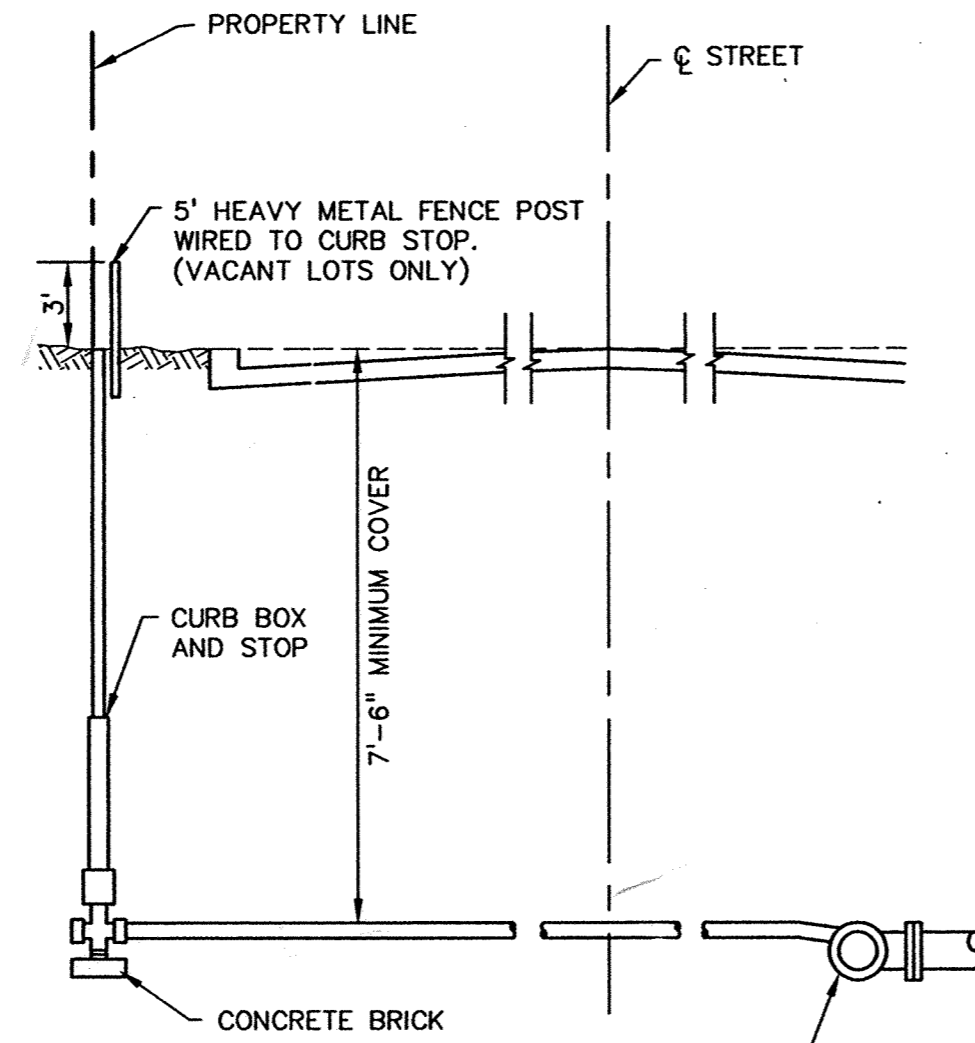
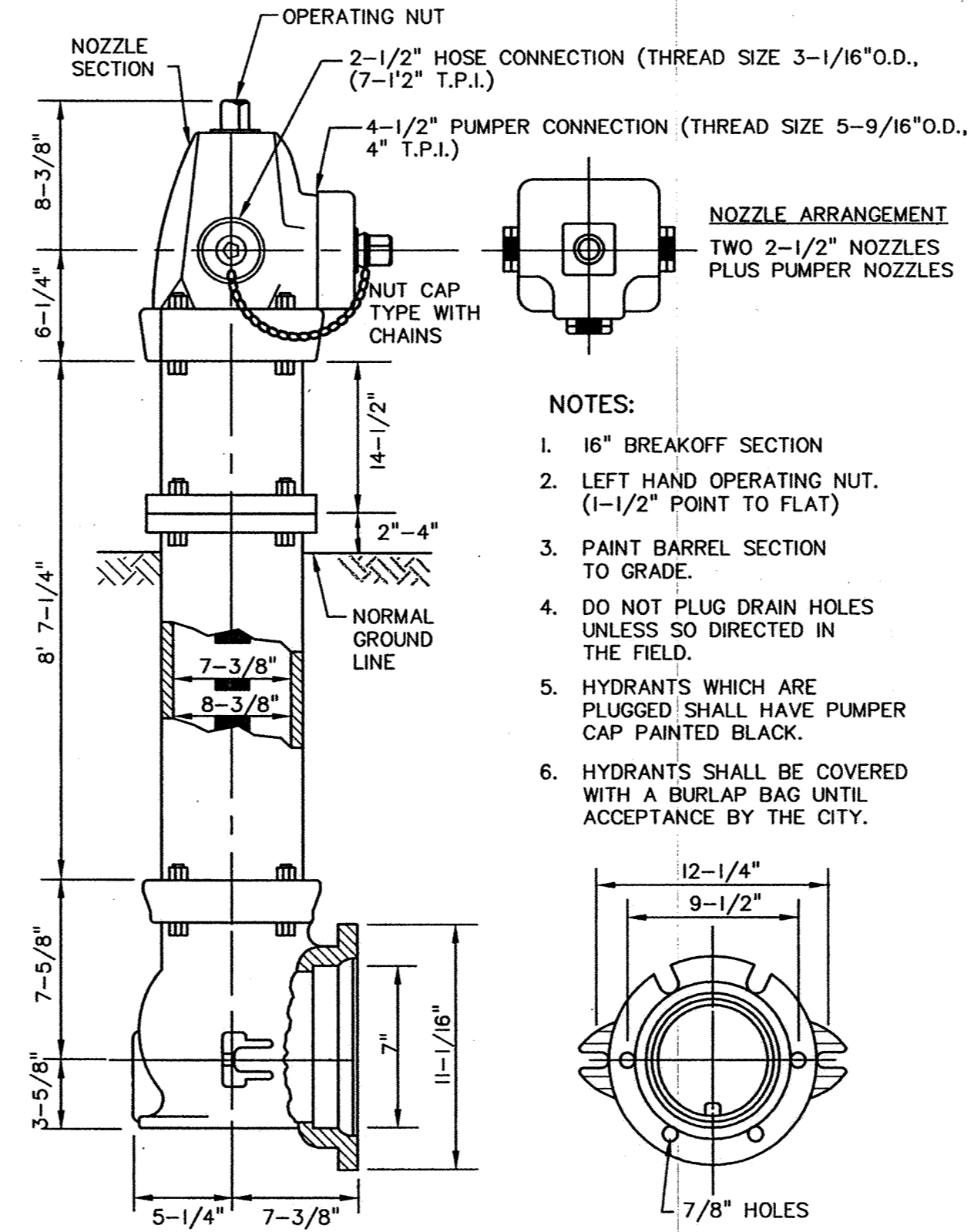


TYPICAL WATERMAIN INSULATION



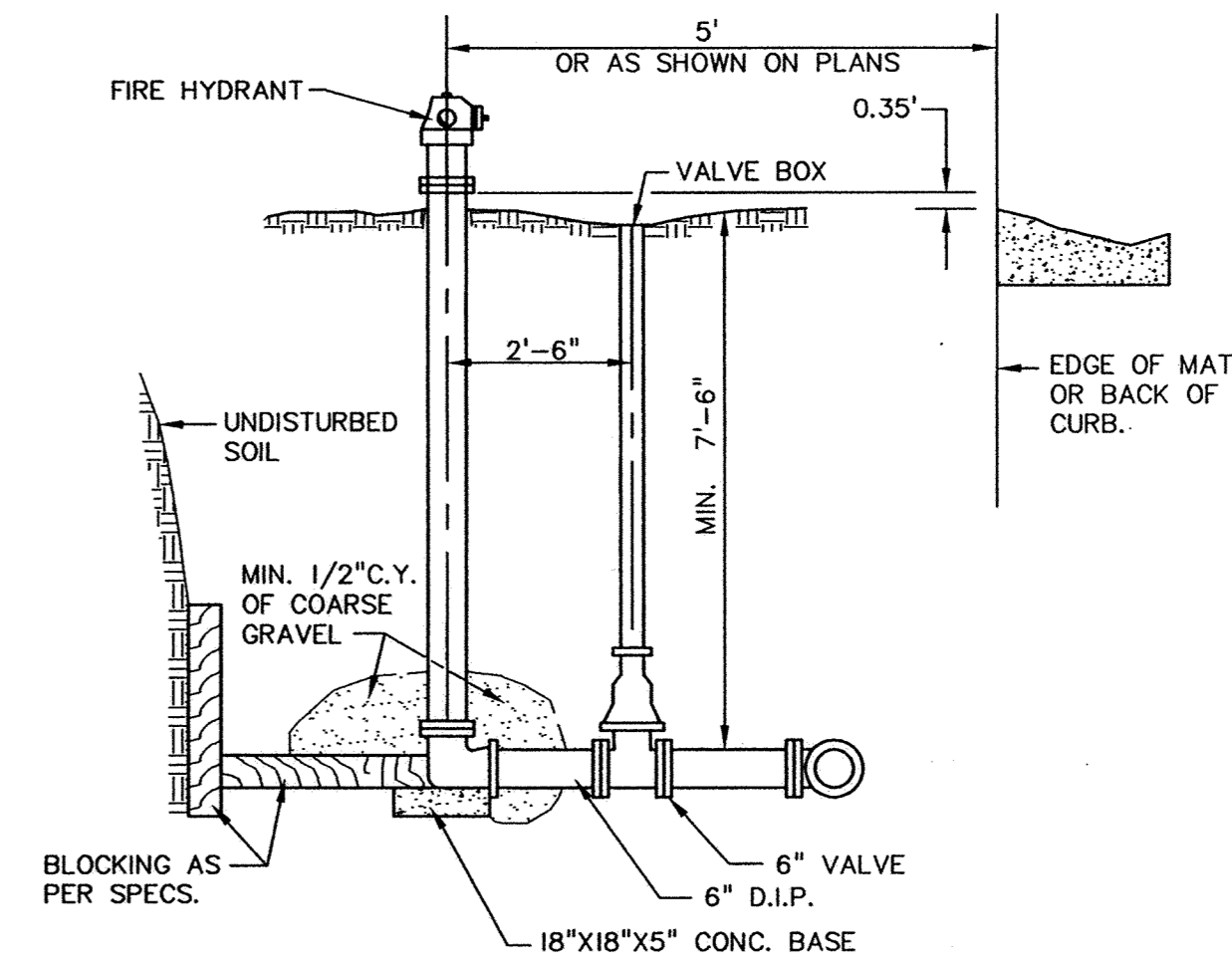
NOTE:
SERVICE TAP SHALL BE MADE SLIGHTLY ABOVE HORIZONTAL CENTER OF PIPE.

TYPICAL WATER SERVICE CONNECTION



- NOTES:
- 16" BREAKOFF SECTION
 - LEFT HAND OPERATING NUT. (1-1/2" POINT TO FLAT)
 - PAINT BARREL SECTION TO GRADE.
 - DO NOT PLUG DRAIN HOLES UNLESS SO DIRECTED IN THE FIELD.
 - HYDRANTS WHICH ARE PLUGGED SHALL HAVE PUMPER CAP PAINTED BLACK.
 - HYDRANTS SHALL BE COVERED WITH A BURLAP BAG UNTIL ACCEPTANCE BY THE CITY.

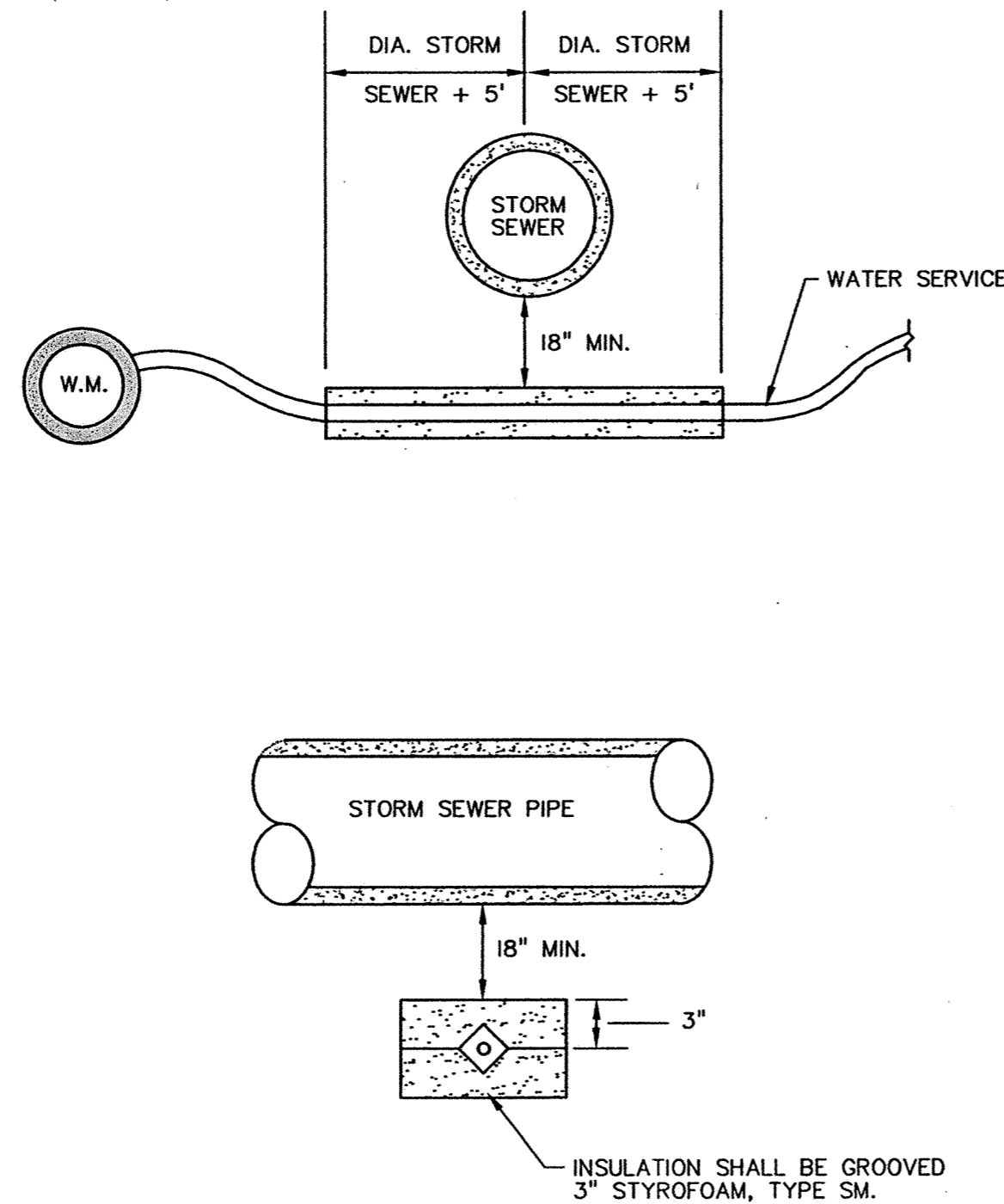
PACER TRAFFIC FLANGE HYDRANT (W-01)



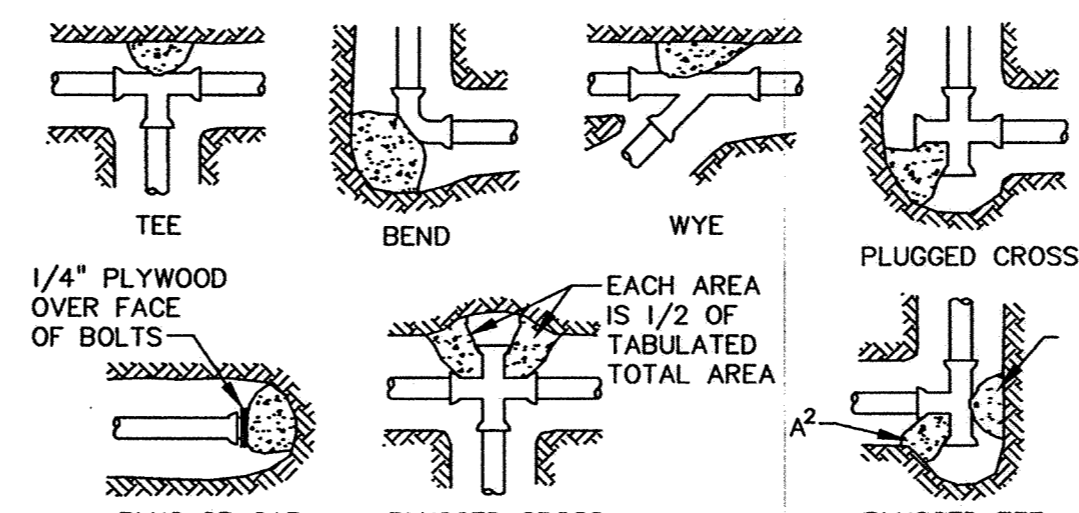
- NOTES:
- HYDRANTS TO BE ORDERED FOR 8'-0" BURY. IN AREAS OF EXTRA DEPTH ON THE WATERMAIN, HYDRANT EXTENSIONS MAY BE REQUIRED.
 - HYDRANT SHALL BE BLOCKED OR TIED TO THE TEE AT MAIN WITH 2-3/4" DIAMETER TIE RODS. ALL TIE RODS TO BE COAL TAR COATED AFTER INSTALLATION. MEGALUGS MAY BE USED WHERE APPROVED BY THE ENGINEER.
 - PROVIDE HYDRAFINDERS WITH EACH HYDRANT.

TYPICAL HYDRANT AND VALVE BOX

PRIME CONTRACTOR/UTILITIES: KUECHLE UNDERGROUND, INC.
EARTHWORK: NORTH PINE AGGREGATE, INC.
CURB & GUTTER: SCHMIDT CURB COMPANY, INC.
STREETS: BAUERLY BROTHERS CO.
INSPECTION: HOWARD R. GREEN, INC.
SURVEY: JOHN OLIVER & ASSOCIATES, INC.
RECORD DRAWINGS: FRED FRITSCHER, JOHN OLIVER & ASSOCIATES, INC.
CONSTRUCTED: 2002



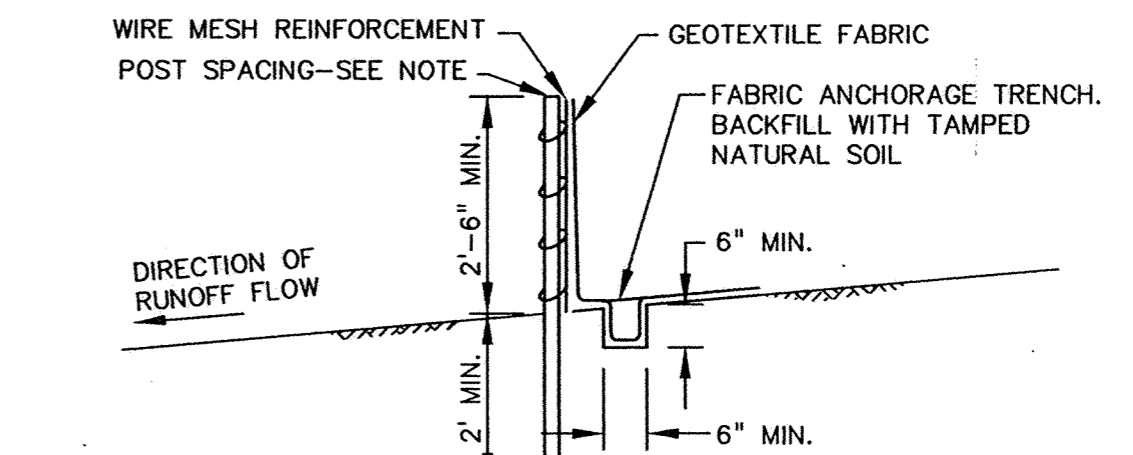
TYPICAL SERVICE INSULATION (W-07)



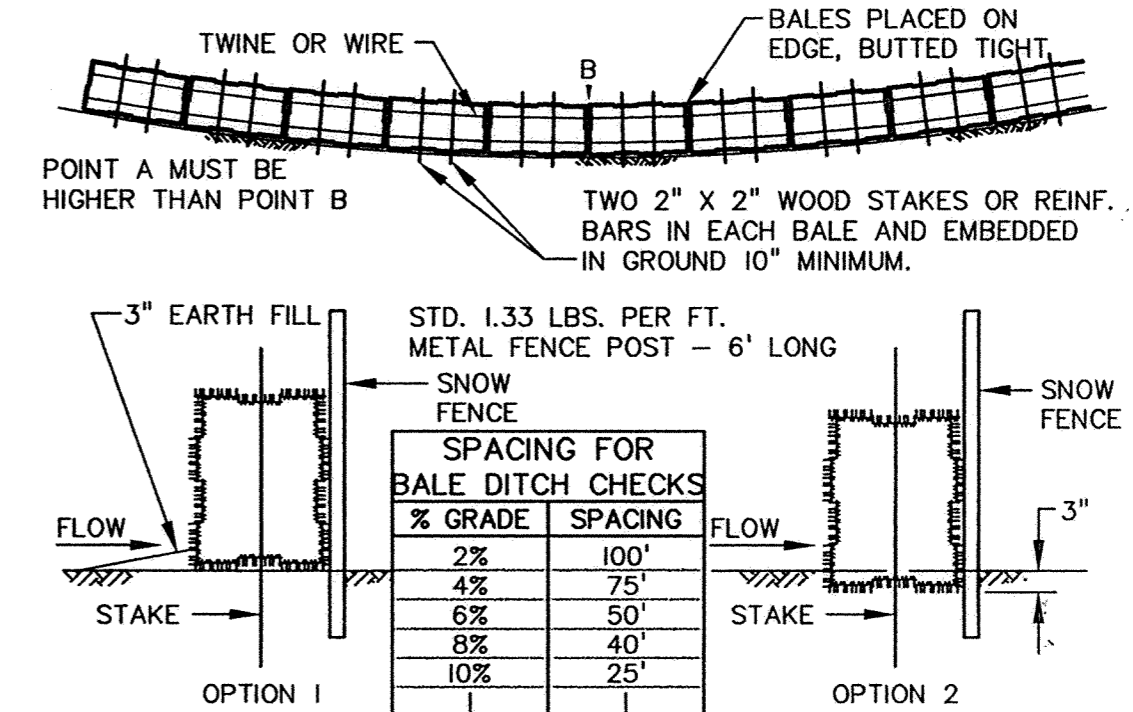
NOMINAL FITTING SIZE (INCHES)	TEE, WYE, PLUG OR CAP	90° BEND, PLUGGED CROSS	TEE PLUGGED ON RUN		45° BEND	22 1/2° BEND	11 1/4° BEND
			A ¹	A ²			
4	1.0	1.4	1.9	1.4	1.0	---	---
6	2.1	3.0	4.3	3.0	1.6	1.0	---
8	3.8	5.3	7.6	5.4	2.9	1.5	1.0
10	5.9	8.4	11.8	8.4	4.6	2.6	1.2
12	8.5	12.0	17.0	12.0	6.6	3.4	1.7
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
- CONCRETE THRUST BLOCKING TO BE POURED AGAINST UNDISTURBED EARTH.
 - KEEP CONCRETE CLEAR OF JOINT AND ACCESSORIES.
 - 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).
 - BEARING AREAS AND SPECIAL BLOCKING DETAILS SHOWN ON PLANS TAKE PRECEDENCE OVER BEARING AREAS AND BLOCKING DETAILS SHOWN IN THIS STANDARD DETAIL.
 - 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

THRUST BLOCKING DETAIL

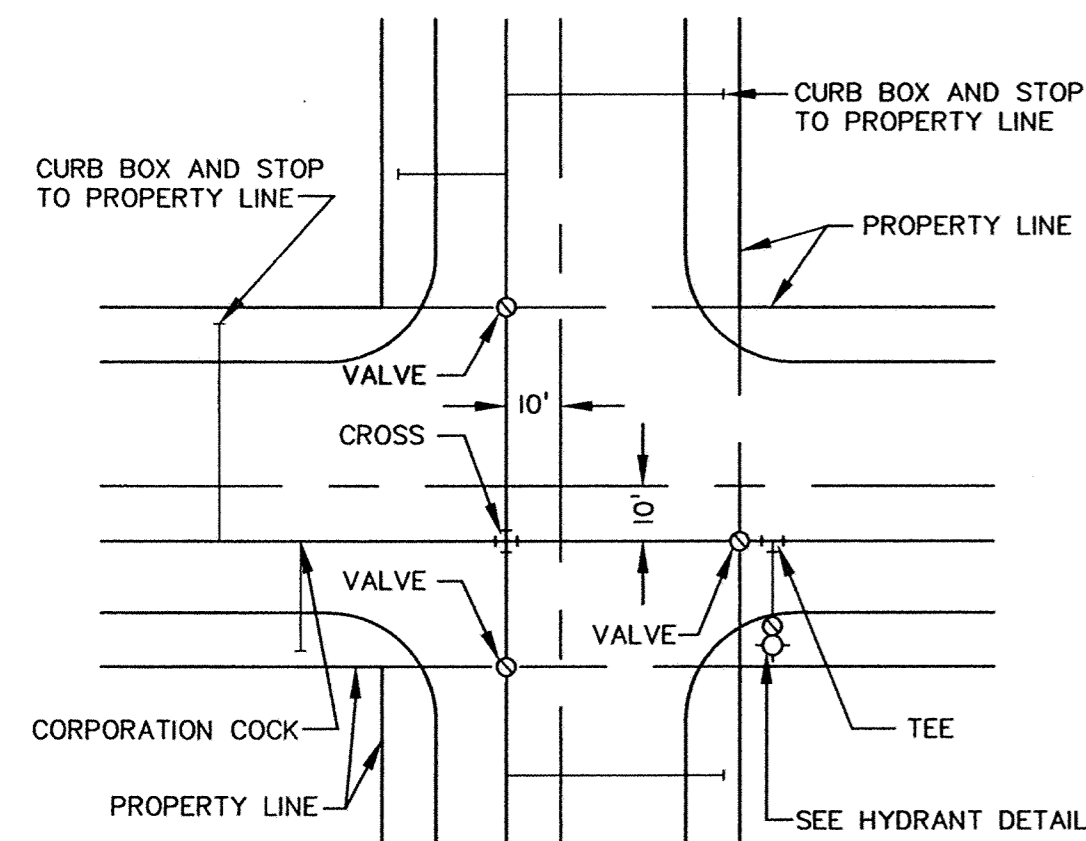


- NOTE:
- SILT FENCES CONSTRUCTED WITH SUPPORT FENCES, POSTS SHALL BE SPACED AT 10' OR LESS, AND DRIVEN AT LEAST 2' INTO THE GROUND.
 - SILT FENCES CONSTRUCTED WITHOUT SUPPORT FENCES, POST SHALL BE SPACED AT 4' OR LESS, AND DRIVEN AT LEAST 3' INTO THE GROUND.



TO BE USED WITH SNOW FENCE AT LOCATIONS AS SHOWN ON PLAN SHEETS. ALSO TO BE USED WITH OR WITHOUT SNOW FENCE AT OTHER LOCATIONS AS DIRECTED BY THE ENGINEER.

EROSION CONTROL DETAIL



TYPICAL WATER LAYOUT

REV. NO.	DATE	DESCRIPTION
1	9/9/02	CITY COMMENTS
2	2/26/03	RECORD DRAWINGS

DESIGN BY: TM, CSA
DRAWN BY: TM, CSA
CHECKED BY: TM, CSA
DWC: 11-13DEI
TEXT: NONE
FILE NO.: 6521.30-03

Signature: [Signature]
Date: 8/2/02 Reg. No. 20363

John Oliver & Associates, Inc.
Civil Engineering, Land Surveying, Land Planning
560 Dodge Avenue
Elk River, Minnesota 55330
763-441-2072 FAX 763-441-5665
Offices in: Elk River, Burnsville
and Brooklyn Center, Minnesota

MISSISSIPPI OAKS 3RD ADDITION
ELK RIVER, MN
FOR
MISSISSIPPI OAKS DEVELOPMENT CORP.
DETAIL SHEET

SHEET NO. 13 OF 13