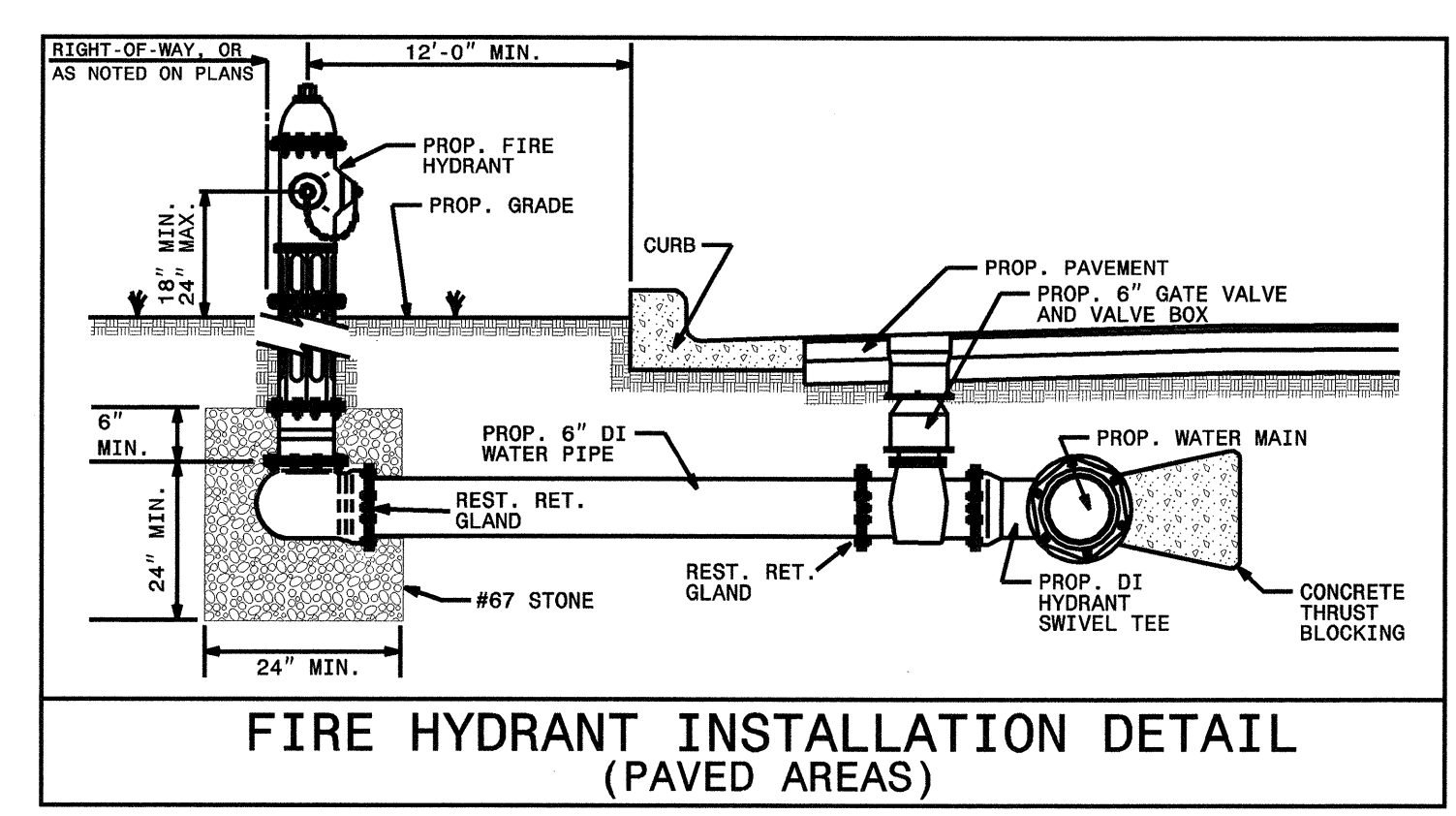
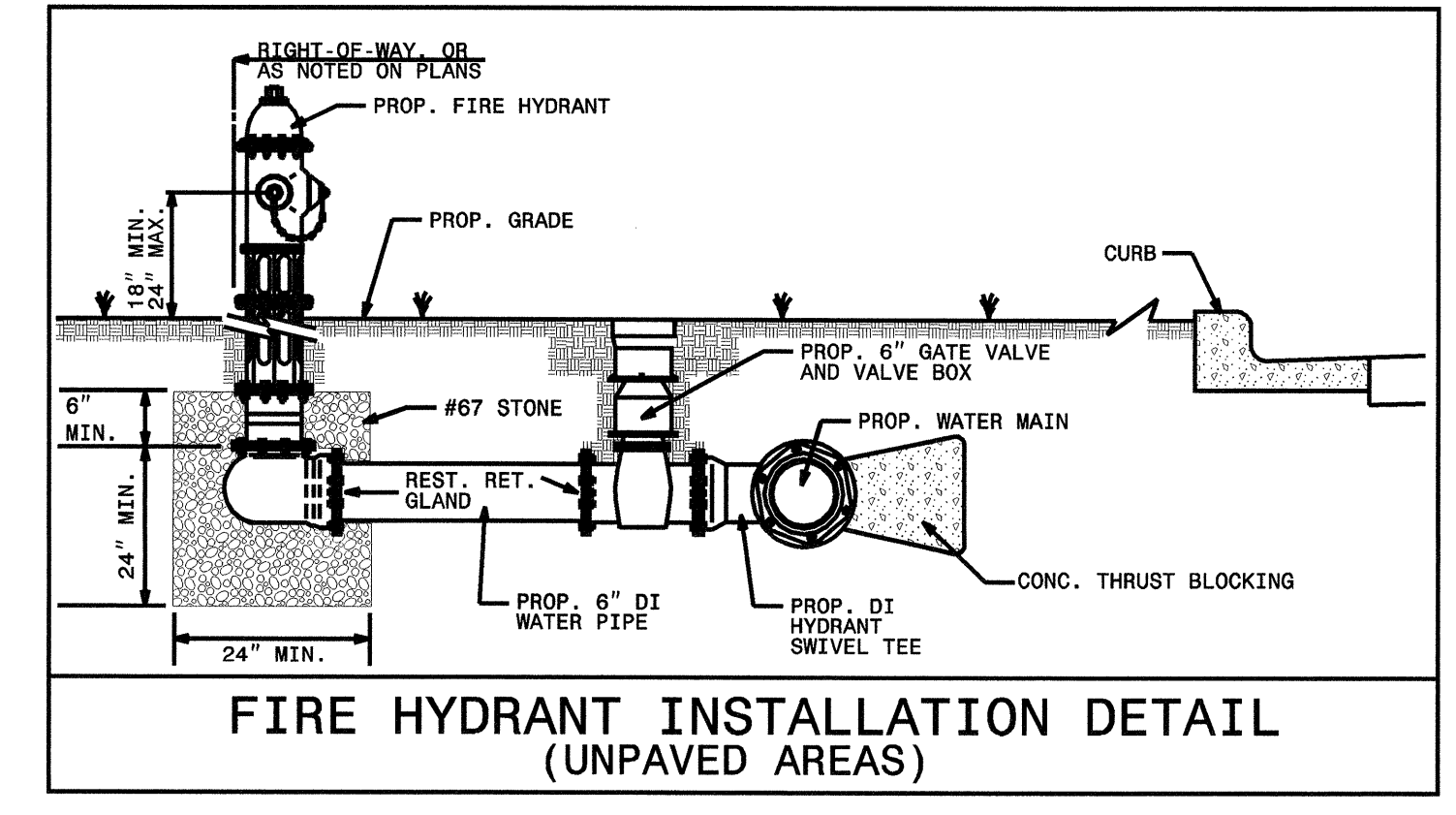


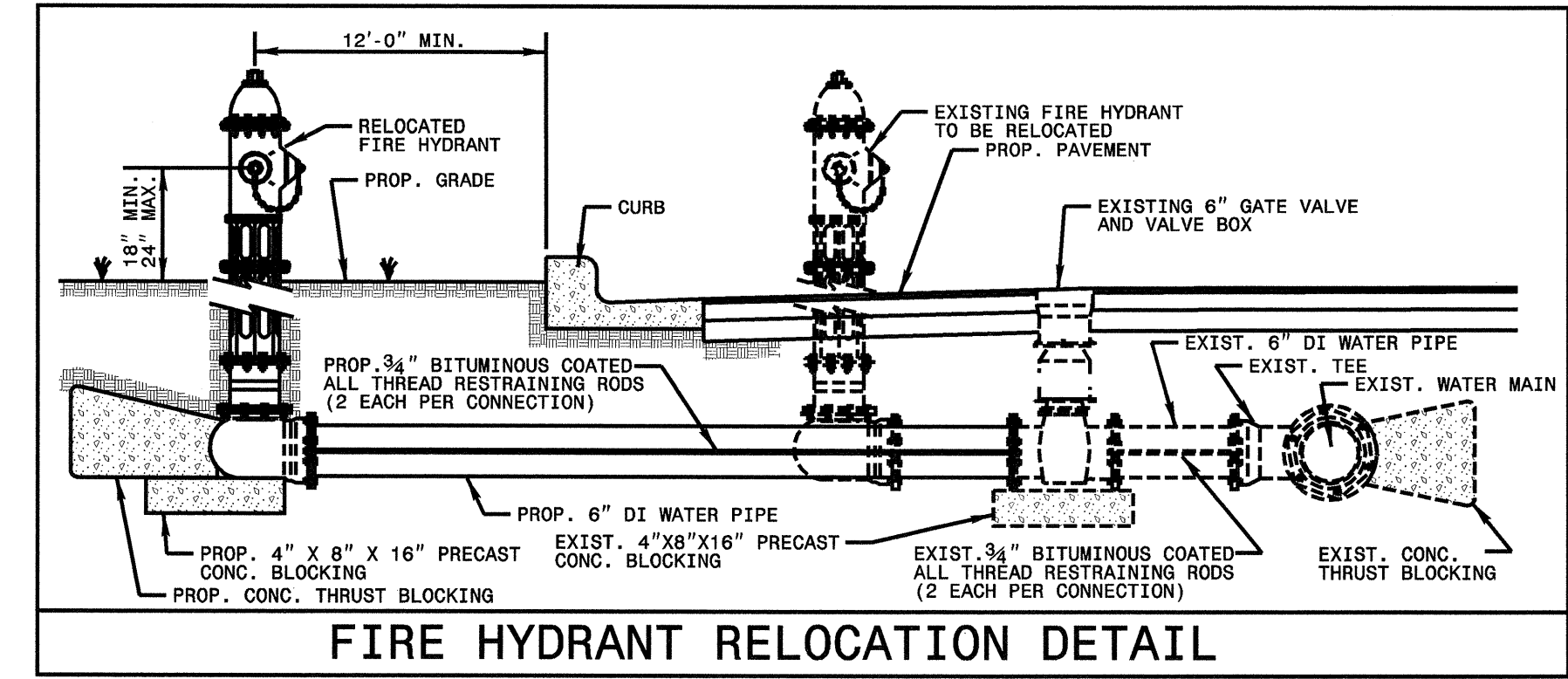
WATER METER RELOCATION DETAIL



FIRE HYDRANT INSTALLATION DETAIL (PAVED AREAS)



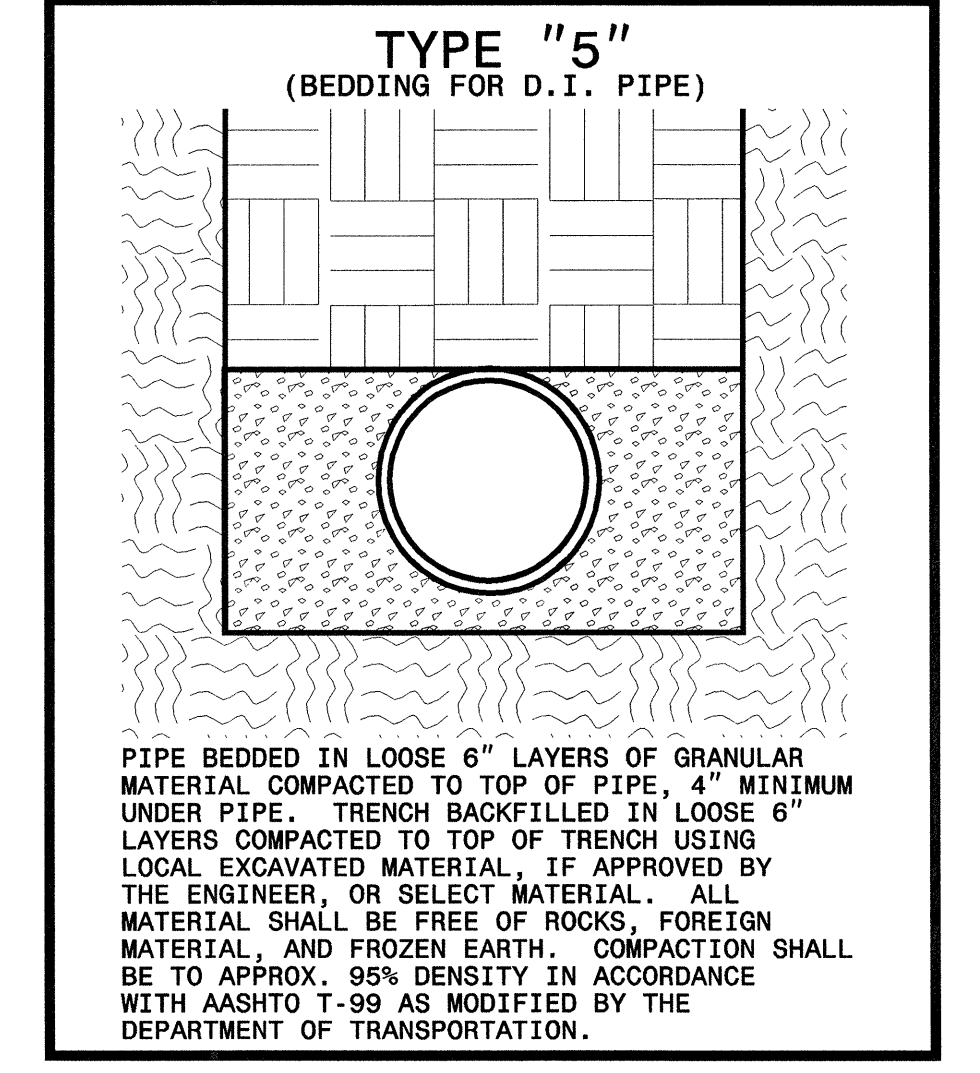
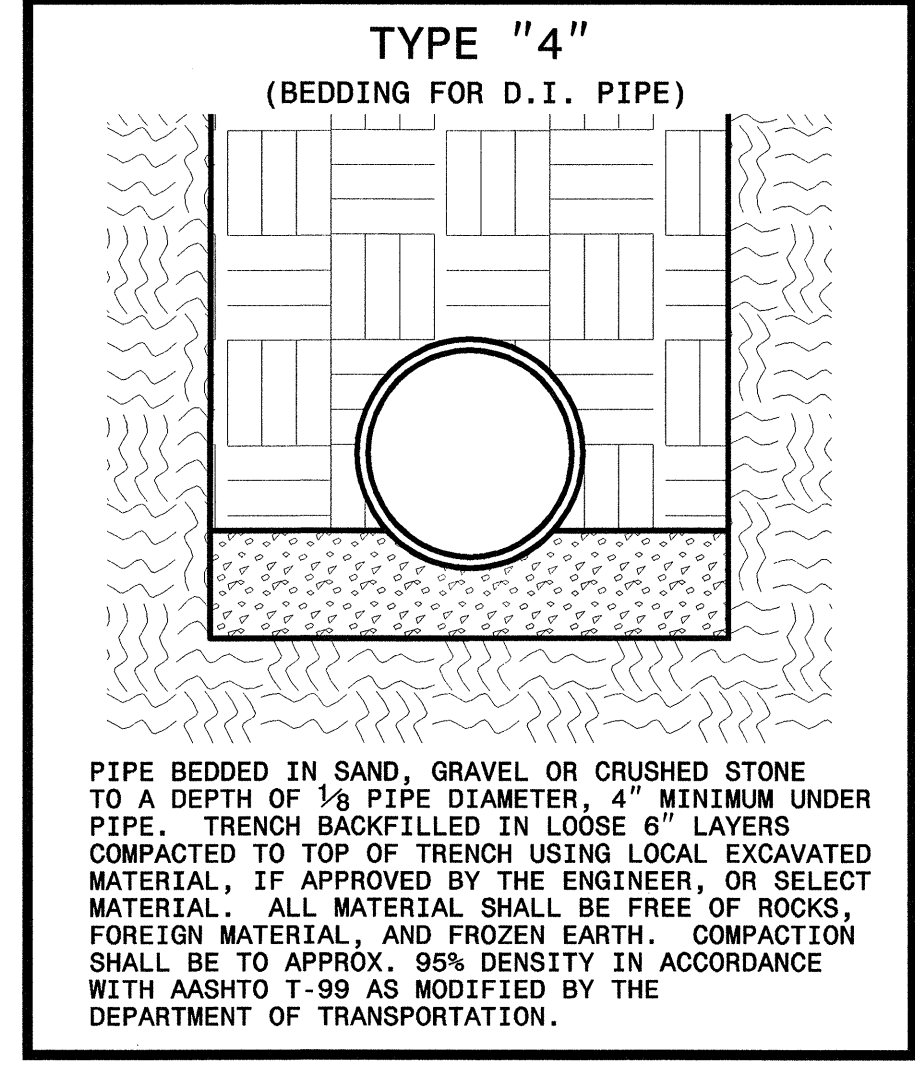
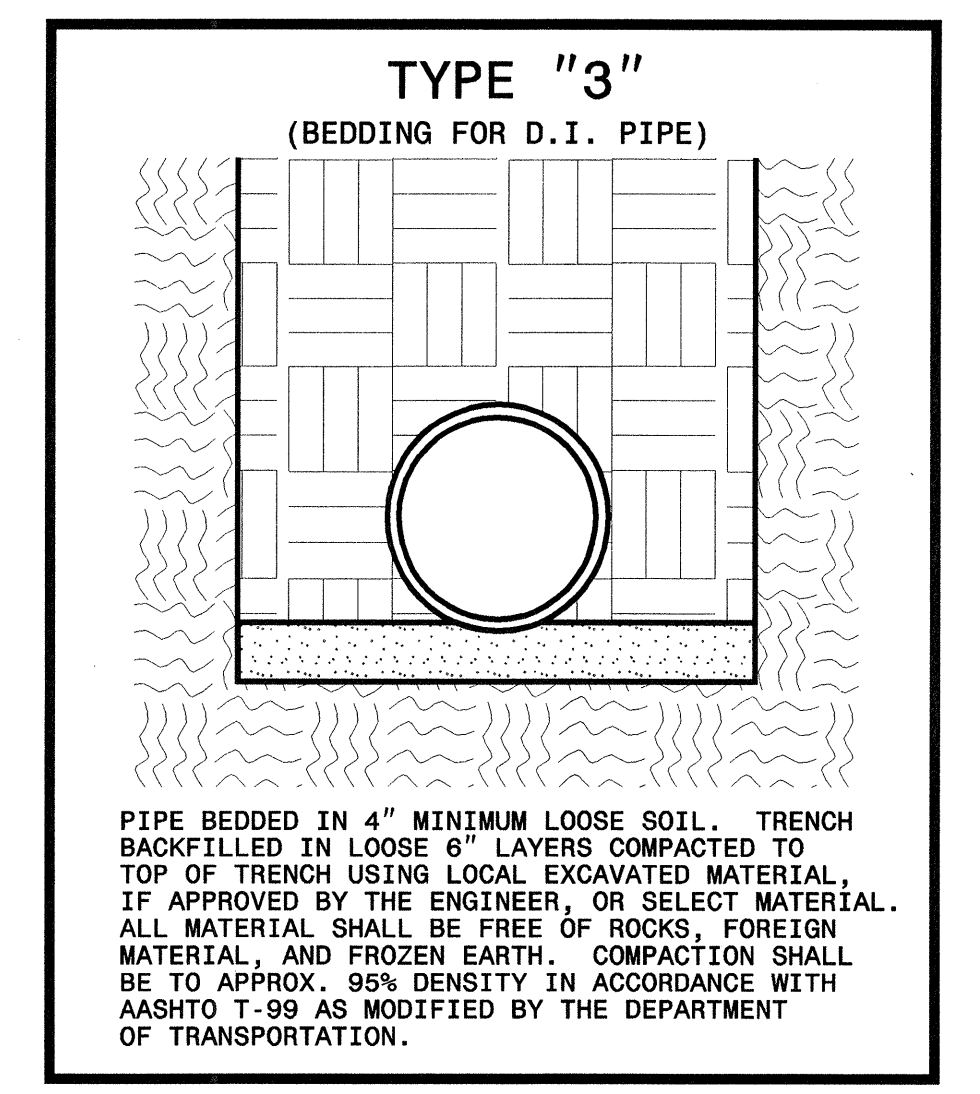
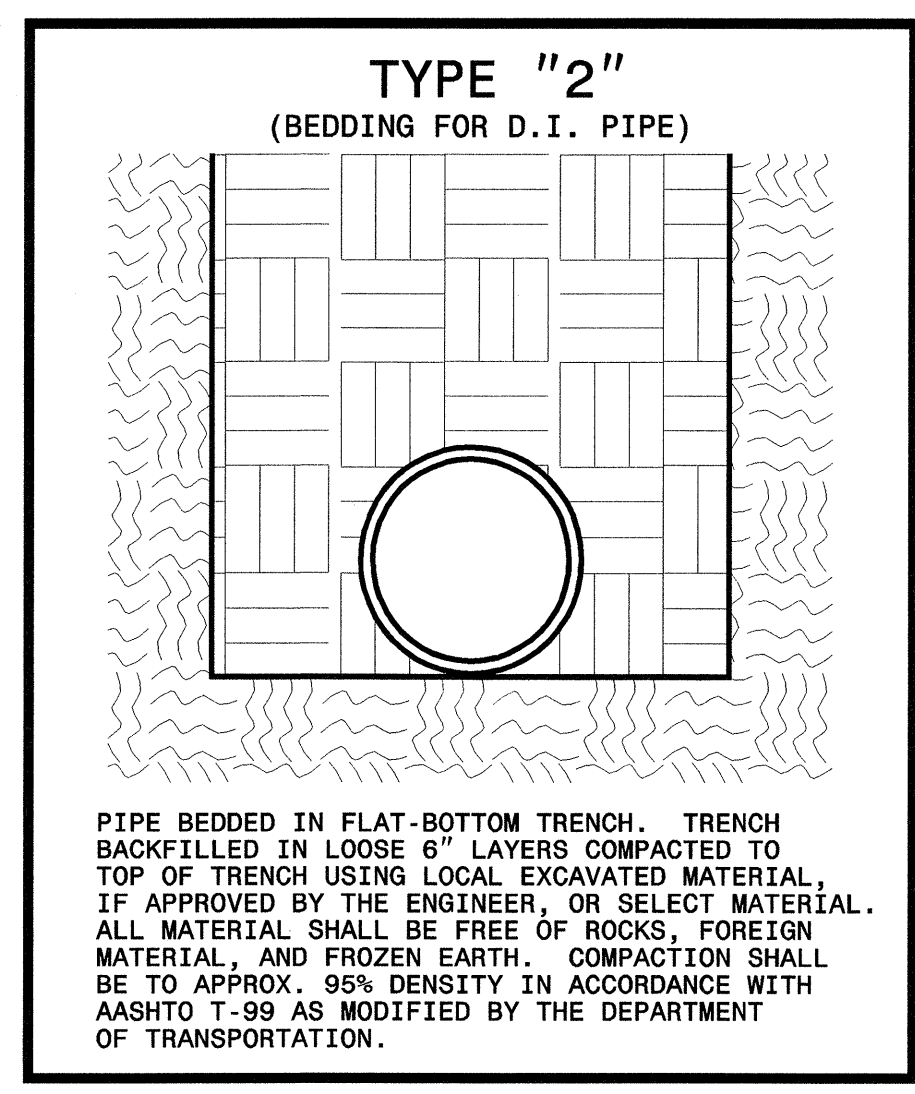
FIRE HYDRANT INSTALLATION DETAIL (UNPAVED AREAS)



FIRE HYDRANT RELOCATION DETAIL

MAXIMUM TRENCH WIDTH AT TOP OF PIPE

NOMINAL PIPE SIZE (INCHES)	TRENCH WIDTH (INCHES)	NOMINAL PIPE SIZE (INCHES)	TRENCH WIDTH (INCHES)
4	28	20	44
6	30	24	48
8	32	30	54
10	34	36	60
12	36	42	66
14	38	48	72
16	40	54	78
18	42		



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

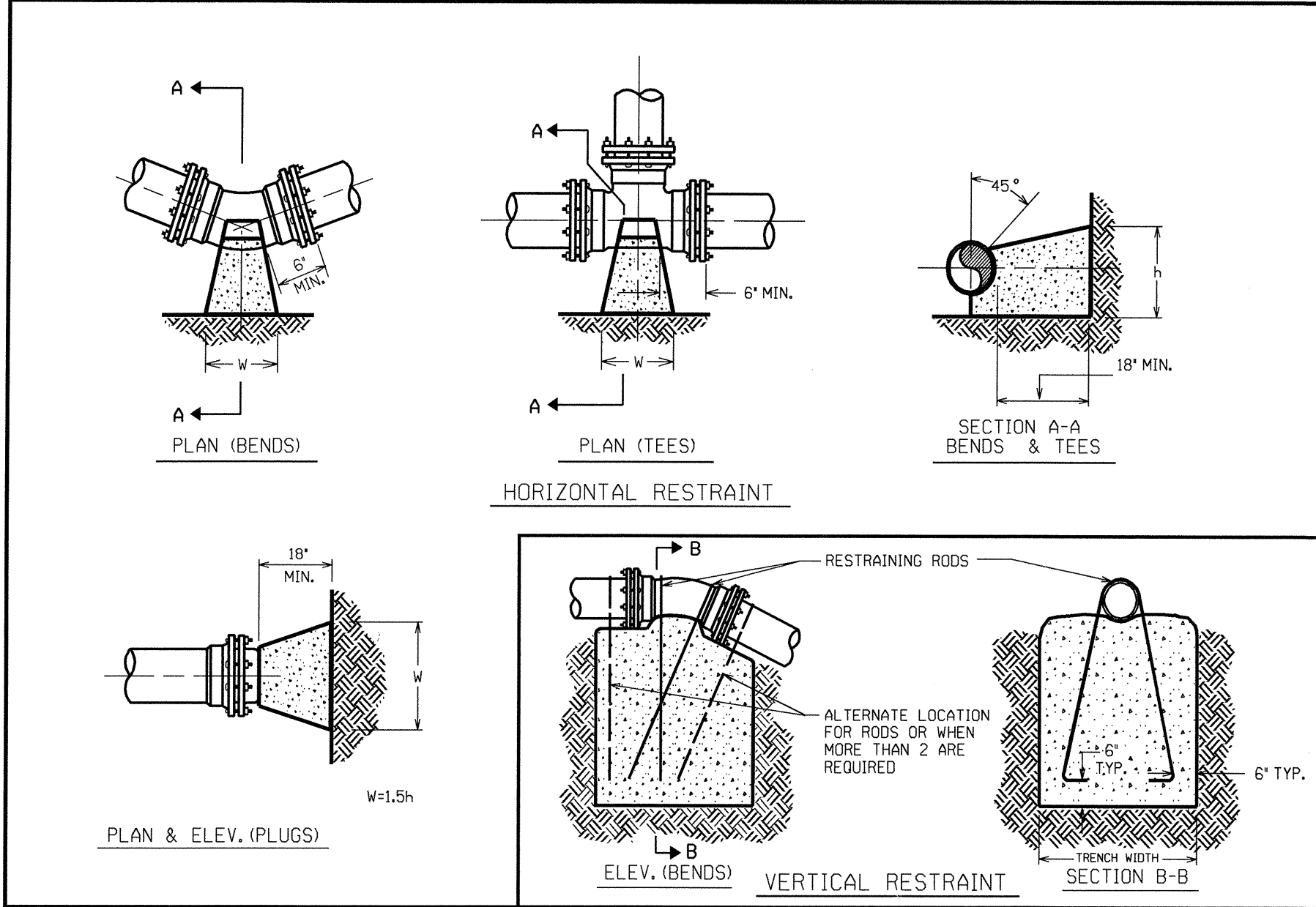
HORIZONTAL RESTRAINT (ALL AREAS GIVEN ARE IN SQUARE FEET)						VERTICAL RESTRAINT (ALL VOLUMES GIVEN ARE IN CUBIC YARDS)**										
PIPE SIZE	DEGREE OF BEND	LBS. STATIC THRUST *	ALLOWABLE SOIL BEARING (PSF)								PIPE SIZE	RESTR. RODS	DEGREE OF BEND			
			1000	2000	3000	4000	5000	6000	7000	8000				NO. REQ'D	DIA.	11-1/4"
4"	11/2"	585									4"	2	1/2"	0.25	0.50	0.75
4"	45°	2,400									6"	2	1/2"	0.50	1.0	1.75
6"	11/2"	1,143									8"	2	5/8"	0.75	1.50	3.0
6"	45°	4,572									10"	2	3/4"	1.25	2.25	4.50
8"	11/2"	485									12"	2	7/8"	1.75	3.25	6.50
8"	45°	1,940									14"	4	5/8"	2.25	4.50	8.75
10"	11/2"	1,143									16"	4	3/4"	3.0	6.0	11.50
10"	45°	4,572														
12"	11/2"	1,143														
12"	45°	4,572														
14"	11/2"	1,143														
14"	45°	4,572														
16"	11/2"	1,143														
16"	45°	4,572														

**INCLUDES 1.50 SAFETY FACTOR

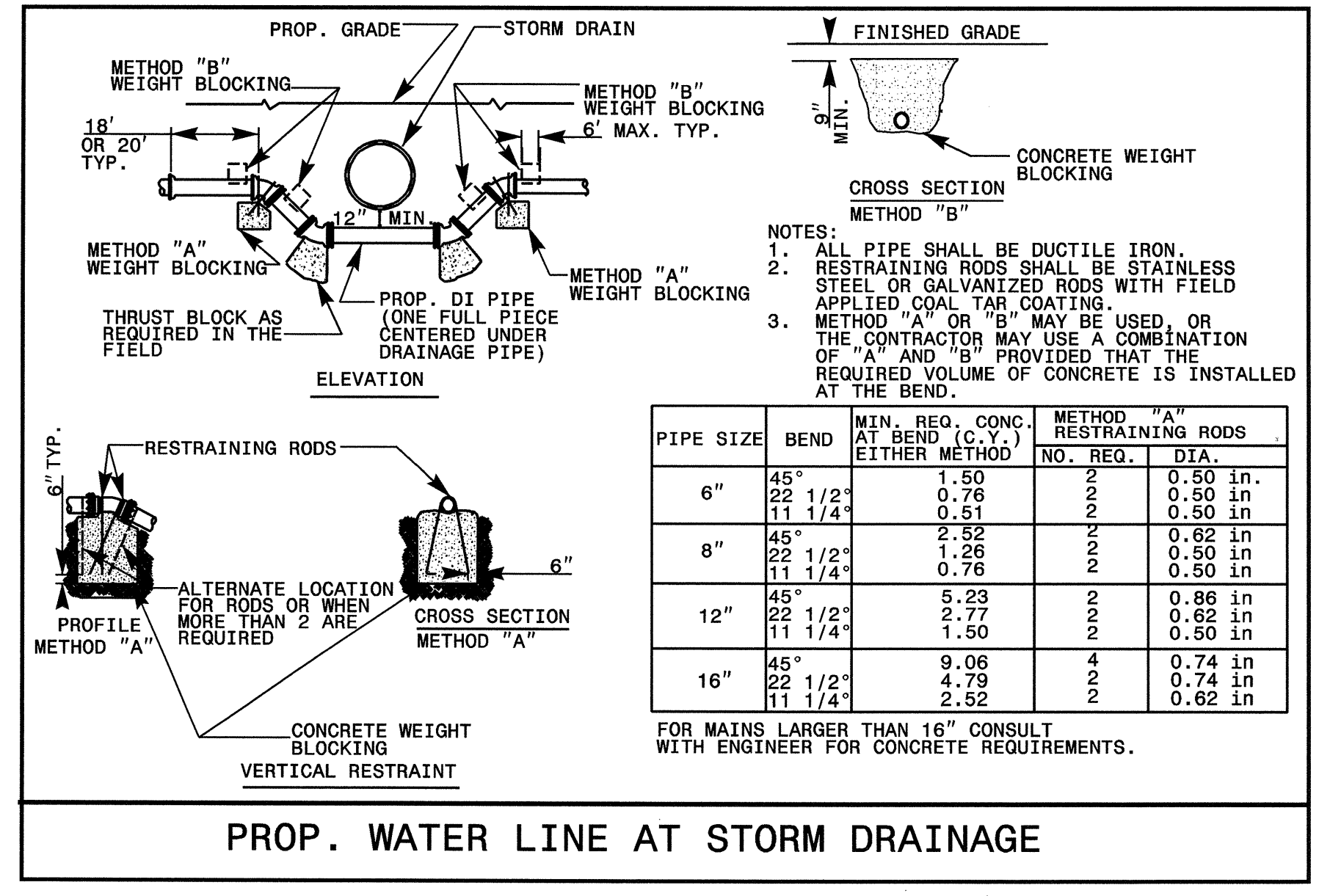
GENERAL NOTES:
 1. CONCRETE SHALL BE CLASS "B".
 2. CONCRETE SHALL NOT CONTACT BOLTS ENDS OF MECHANICAL JOINT FITTINGS.
 3. CONSULT WITH ENGINEER FOR CONCRETE REQUIREMENTS ON MAINS LARGER THAN 16 INCHES. (FOR VERTICAL & HORIZONTAL BENDS)
 4. ALLOWABLE SOIL BEARING SHALL BE DETERMINED BY THE ENGINEER.

NO. DATE REVISIONS DESCRIPTION

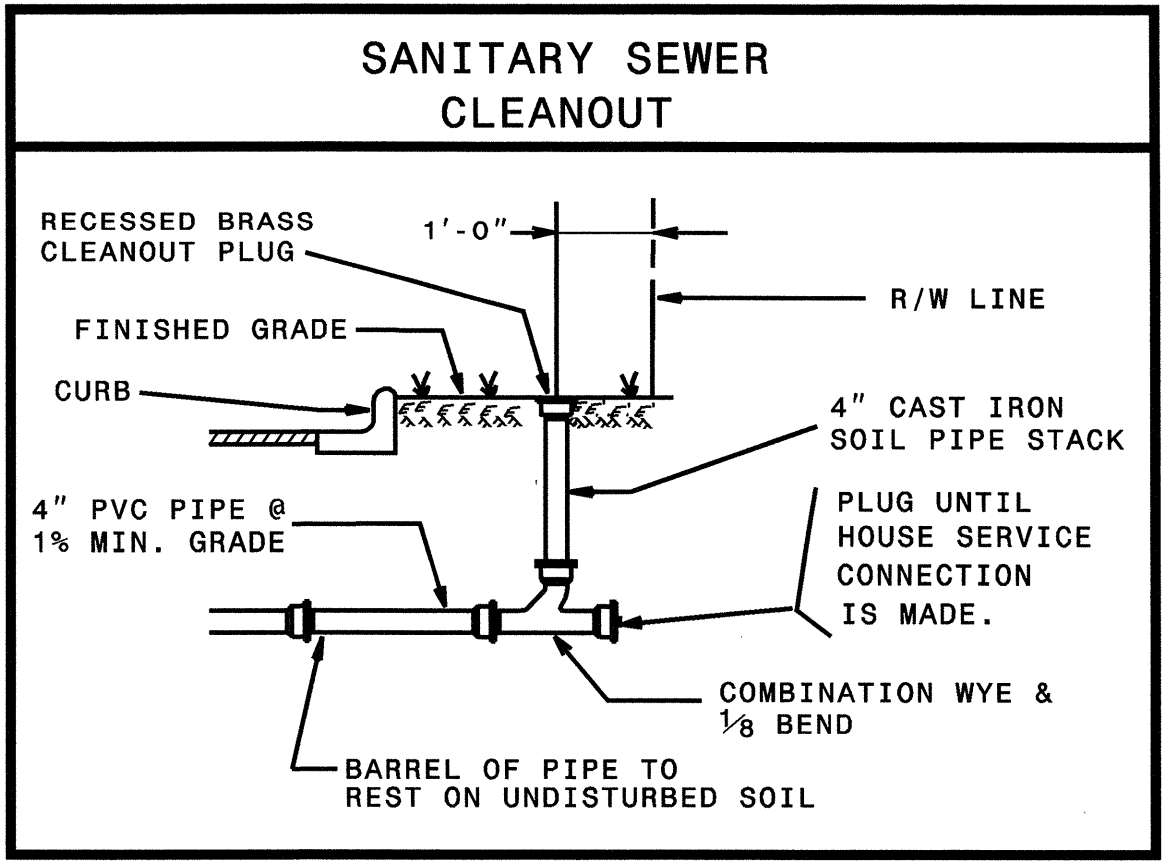
THRUST RESTRAINT FOR WATER MAINS
 STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS
 RALEIGH, N.C.



THRUST RESTRAINT FOR PIPE LINES



PROP. WATER LINE AT STORM DRAINAGE



UTILITY CONSTRUCTION PLANS DESIGNED BY:
 DAVIS-MARTIN-POWELL & ASSOC., INC.
 ENGINEERING-LAND PLANNING-SURVEYING
 HIGH POINT, NORTH CAROLINA