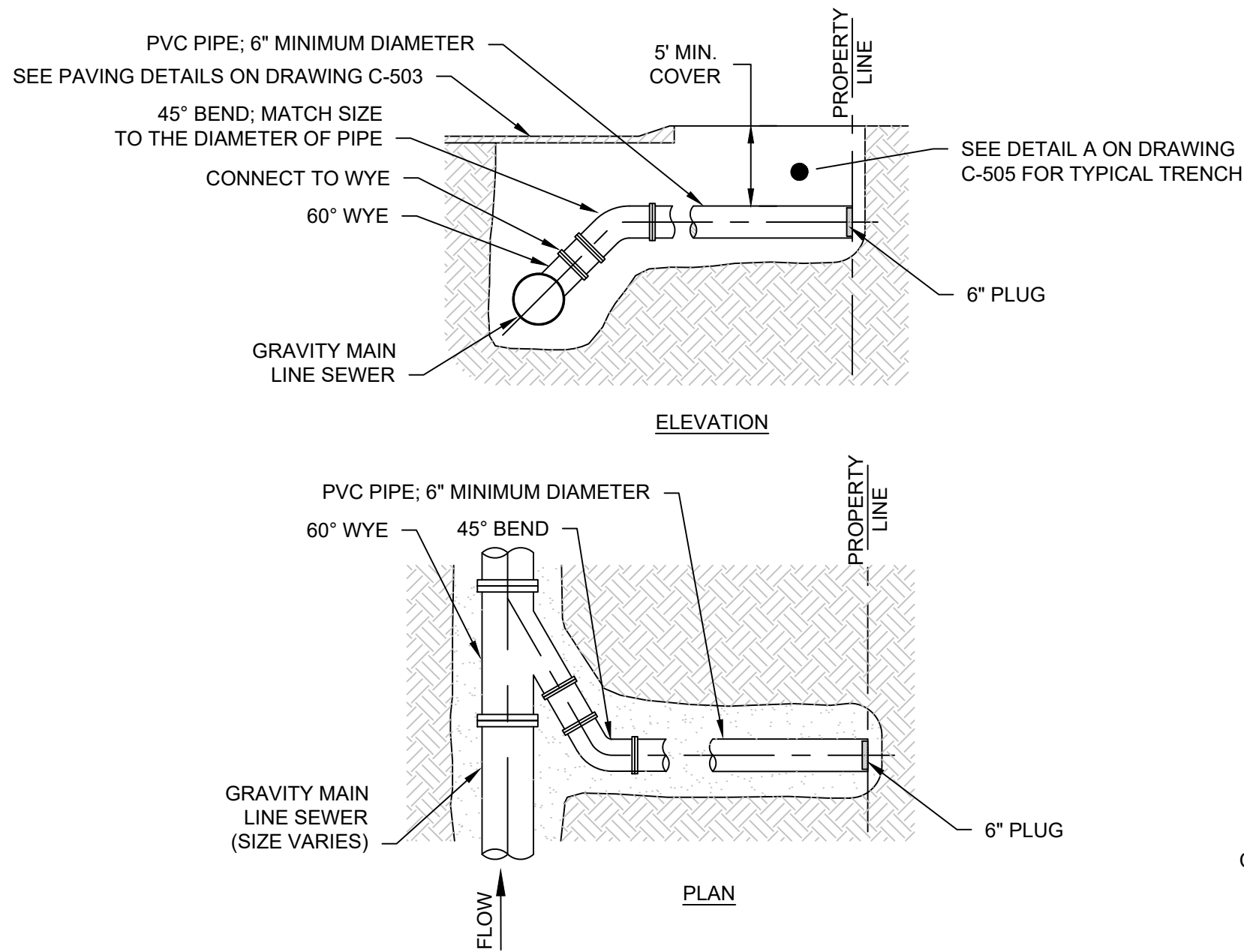
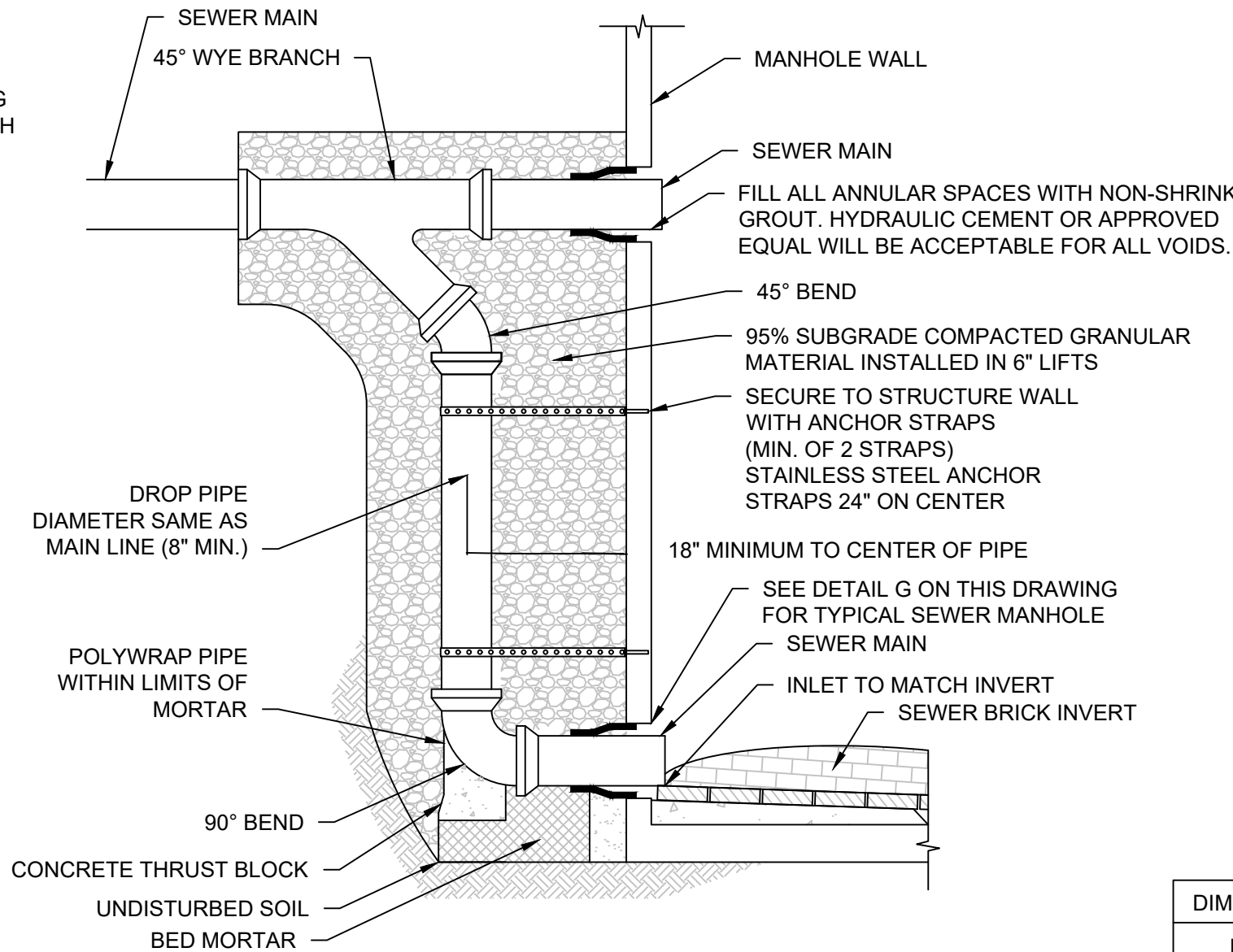
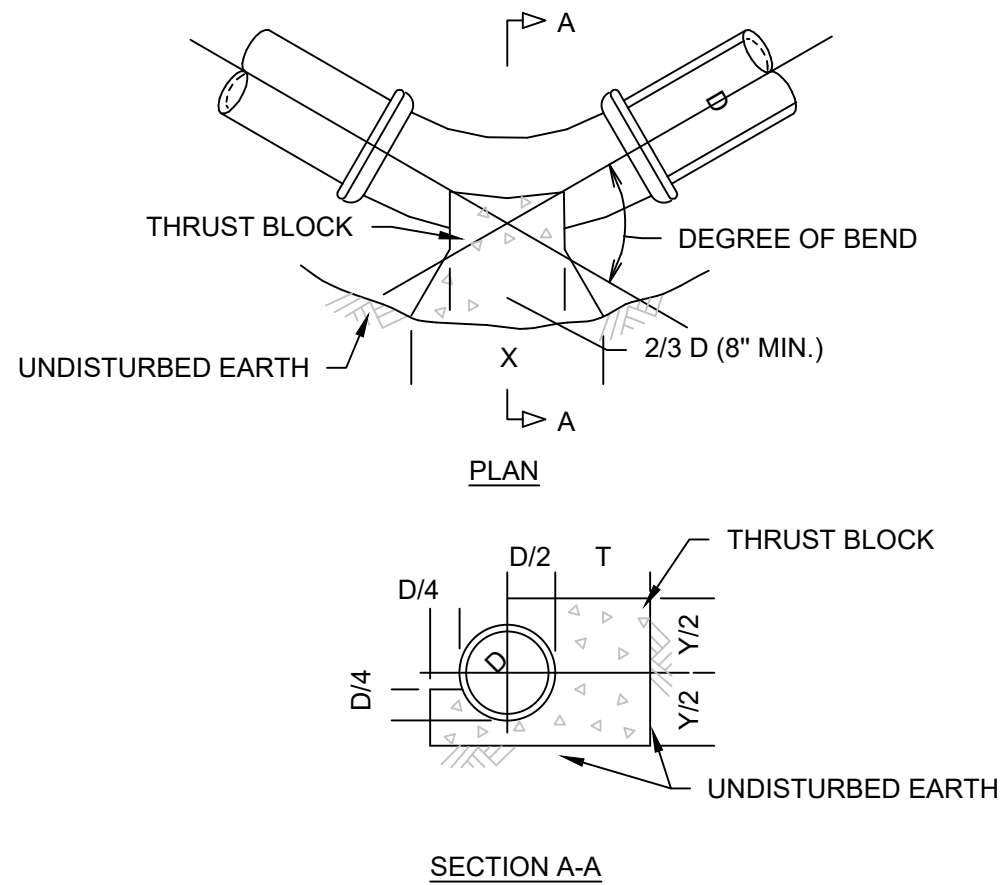




A TYPICAL SEWER SERVICE CONNECTION
- NOT TO SCALE

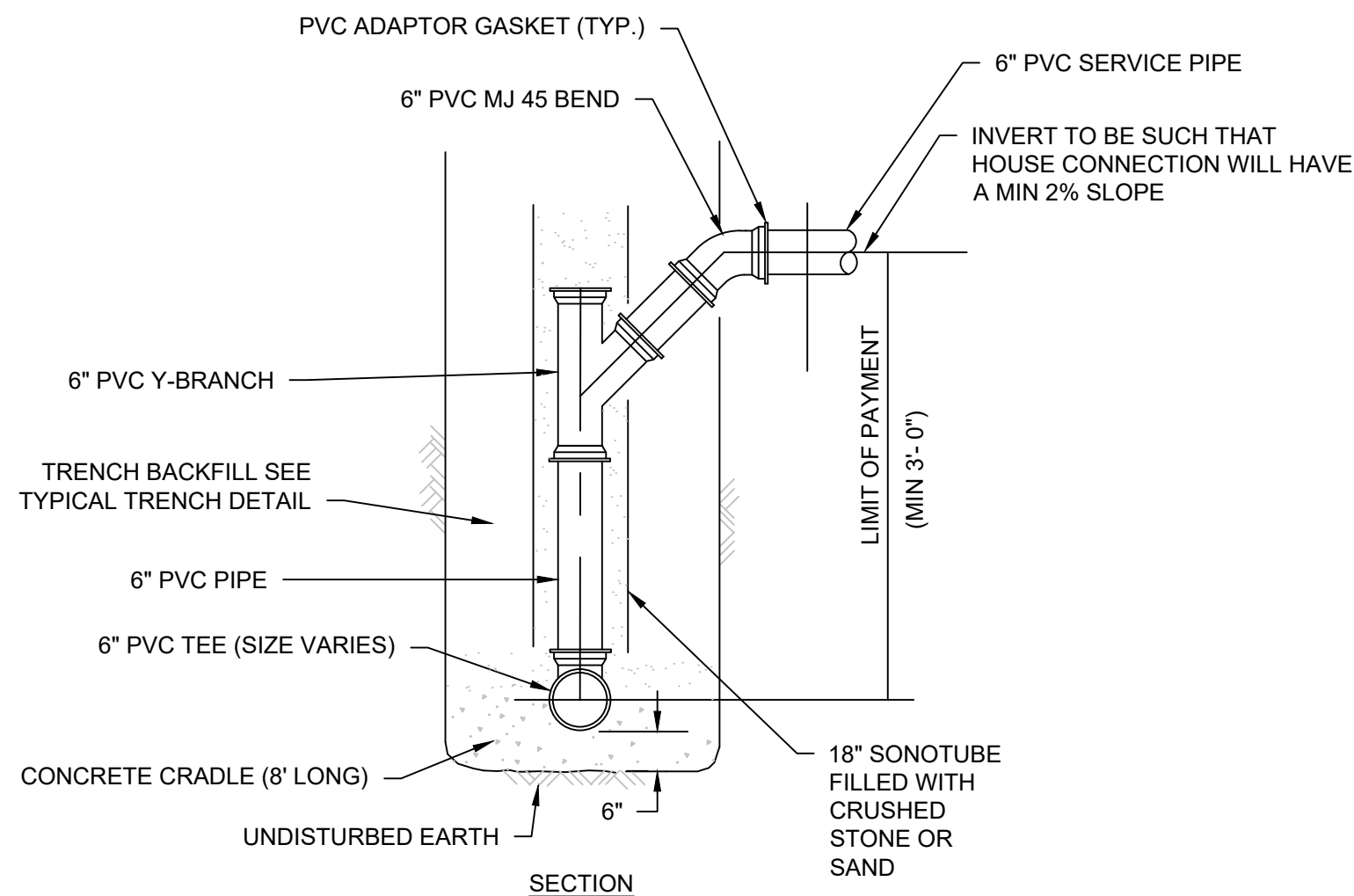


B DROP SEWER MANHOLE DETAIL
- NOT TO SCALE



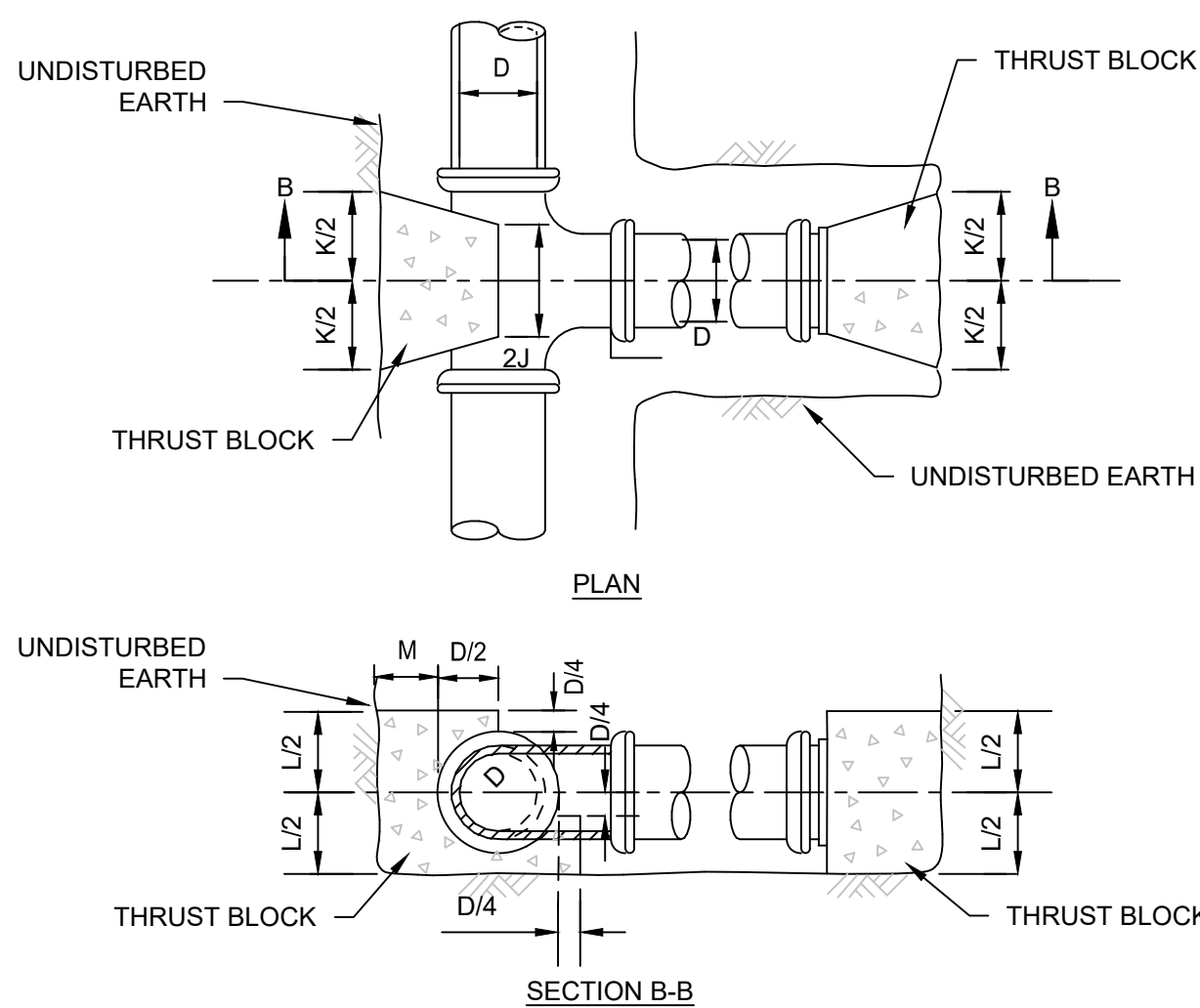
- NOTES
1. ALL CONCRETE SHALL BE 3000 P.S.I. @ 28 DAYS (CLASS "A" CONCRETE)
 2. DIMENSIONS SHOWN ARE MINIMUM AND ARE BASED UPON SOIL PRESSURE OF 1500 P.S.F. AND TOTAL PRESSURE OF 250 P.S.I. TOTAL PRESSURE IS WORKING PRESSURE PLUS SURGE PRESSURE.
 3. THRUST BLOCKS SHALL BEAR AGAINST UNDISTURBED EARTH.

TABLE OF DIMENSIONS															
DIMENSION	90° BEND					45° BEND					22 1/2° BEND				
D (in.)	4	6	8	10	12	14	4	6	8	10	12	14	4	6	8
X (in.)	35	35	50	56	72	80	24	24	35	45	51	60	28	28	30
Y (in.)	20	20	24	32	35	40	16	16	19	21	27	33	13	13	16
T (in.)	11	11	14	16	19	22	11	11	14	16	19	22	11	11	13



D PVC CHIMNEY DETAIL
- NOT TO SCALE

C CONCRETE THRUST BLOCK DETAIL AT BEND
- NOT TO SCALE



- NOTES
1. ALL CONCRETE SHALL BE 3000 PSI @ 28 DAYS (CLASS 'A' CONCRETE).
 2. DIMENSIONS SHOWN ARE MINIMUM AND ARE BASED UPON SOIL PRESSURE OF 1500 PSF AND TOTAL PRESSURE OF 250 PSI. TOTAL PRESSURE IS WORKING PRESSURE PLUS SURGE PRESSURE.
 3. THRUST BLOCKS SHALL BEAR AGAINST UNDISTURBED EARTH.

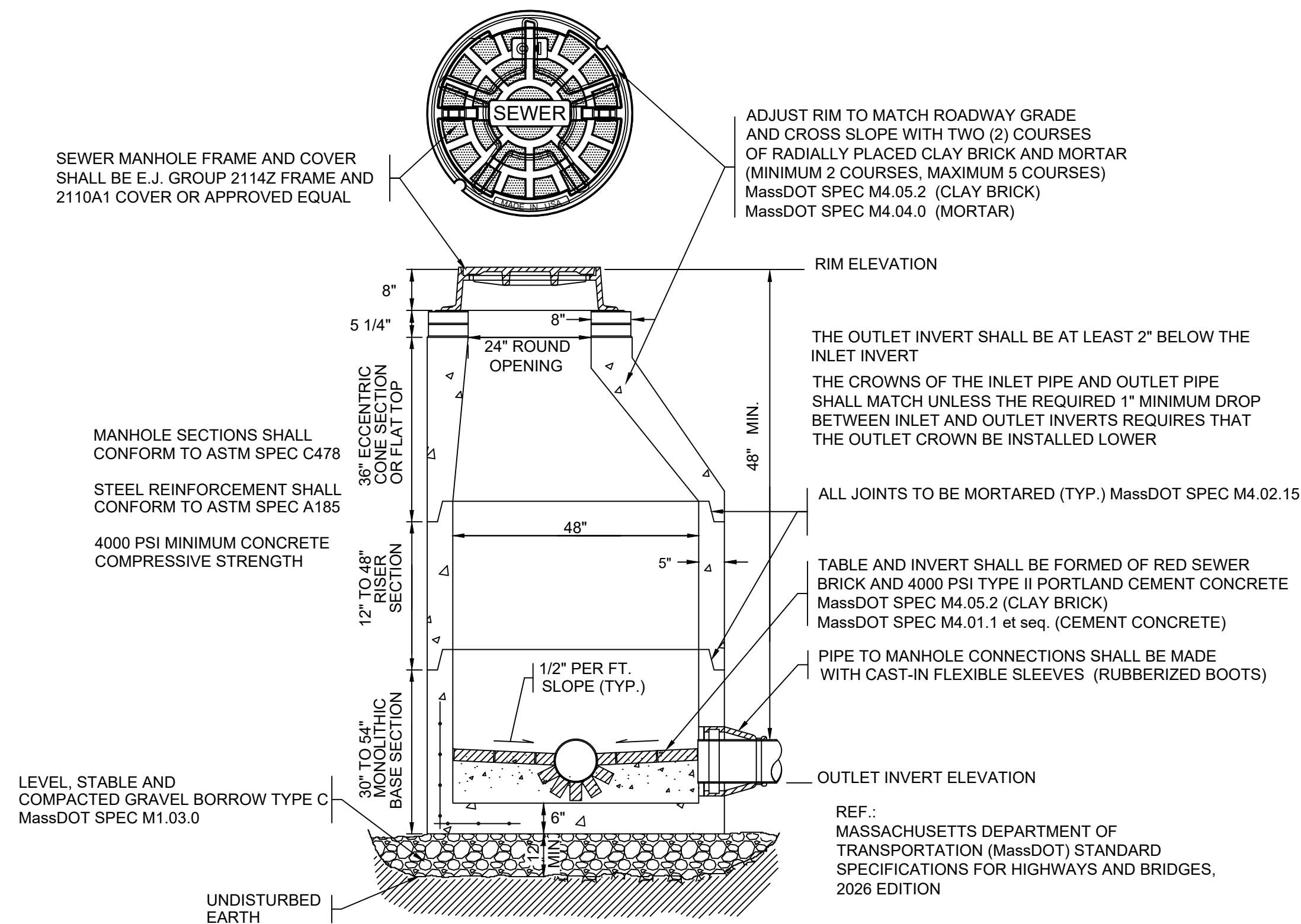
TABLE OF DIMENSIONS						
D (in)	4	6	8	10	12	14
J (in)	6	6	7	9	10	12
K (in)	16	16	20	26	32	36
L (in)	16	16	21	24	29	34
M (in)	11	11	14	16	19	22

F CONCRETE THRUST BLOCK DETAIL AT TEE/PLUG/CAP
- NOT TO SCALE

NOTES:

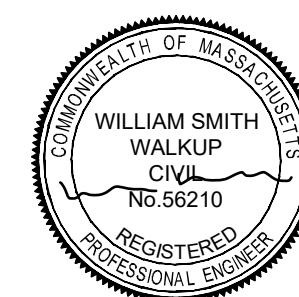
1. SEWERS SHALL BE KEPT REMOTE FROM WATER SUPPLY PIPING AND STRUCTURES. WHEREVER FEASIBLE, SEWERS SHOULD BE LAID AT A MINIMUM HORIZONTAL DISTANCE OF 10 FEET FROM WATER MAINS. IF LOCAL CONDITIONS PREVENT THIS, THE WATER MAIN SHOULD BE LAID IN A SEPARATE TRENCH, AND THE ELEVATIONS OF THE CROWN OF THE SEWER PLACED AT LEAST 18 INCHES BELOW THE INVERT OF THE WATER MAIN.
2. WHENEVER SEWERS MUST CROSS UNDER WATER MAINS, THE CROWN OF THE SEWER SHOULD BE PLACED A MINIMUM OF 18 INCHES BELOW THE INVERT OF THE WATER MAIN. IN ADDITION, THE WATER MAIN MUST BE CONSTRUCTED WITH ONE FULL LENGTH OF PIPE CENTERED ABOVE THE CROSSING. THE WATER PIPE SHALL HAVE MECHANICAL JOINTS FOR A MINIMUM DISTANCE OF 10 FEET ON EACH SIDE OF THE CROSSING.
3. WHEN IT IS IMPOSSIBLE TO OBTAIN HORIZONTAL OR VERTICAL SEPARATION AS STIPULATED ABOVE, BOTH THE WATER AND THE SEWER PIPING SHALL BE CONSTRUCTED SUCH THAT THE PIPE JOINTS ARE PLACED AS FAR AWAY FROM THE CROSSING AS POSSIBLE AND THE PIPE CROSSING SHALL BE ENCASED IN CONTROL DENSITY FILL FOR A DISTANCE OF 10 FEET ON ALL SIDES OF THE CROSSING.
4. ALL METALLIC PIPE CONTACTING CDF SHALL BE INCASED IN POLYETHYLENE WRAP TO PREVENT CORROSION.

E TYPICAL SEWER CROSSING
- NOT TO SCALE



G TYPICAL SEWER MANHOLE
- NOT TO SCALE

BID DOCUMENTS

REFERENCE:					CONTRACT NO. : 8086	CAD FILE NO. : 3-3-C-506		MASSACHUSETTS WATER RESOURCES AUTHORITY	PREPARED BY :  100 SUMMER STREET BOSTON, MA 02110 617-426-7330  BLACK & VEATCH 200 SUMMIT DRIVE, SUITE 340 BURLINGTON, MA 01803 781-656-5800	METROPOLITAN WATER TUNNEL PROGRAM CONTRACT PACKAGE 3.3 NEEDHAM DEWATERING DRAINAGE LINE	DRAWING NO.
					ACCESSION NO. : NOT USED	SECTION NO. :					
					DATE: SEPTEMBER, 2026	DESIGNED BY: ANW					
						DRAWN BY: DB					
						CHECKED BY: KRR					
					SCALE: AS NOTED	APPROVED BY: WSW					
										9-16-2026	
NO.	DATE	BY	CHK'D	REVISION				CIVIL	TOWN OF NEEDHAM DETAILS 3	C-506	
										20 of 41	