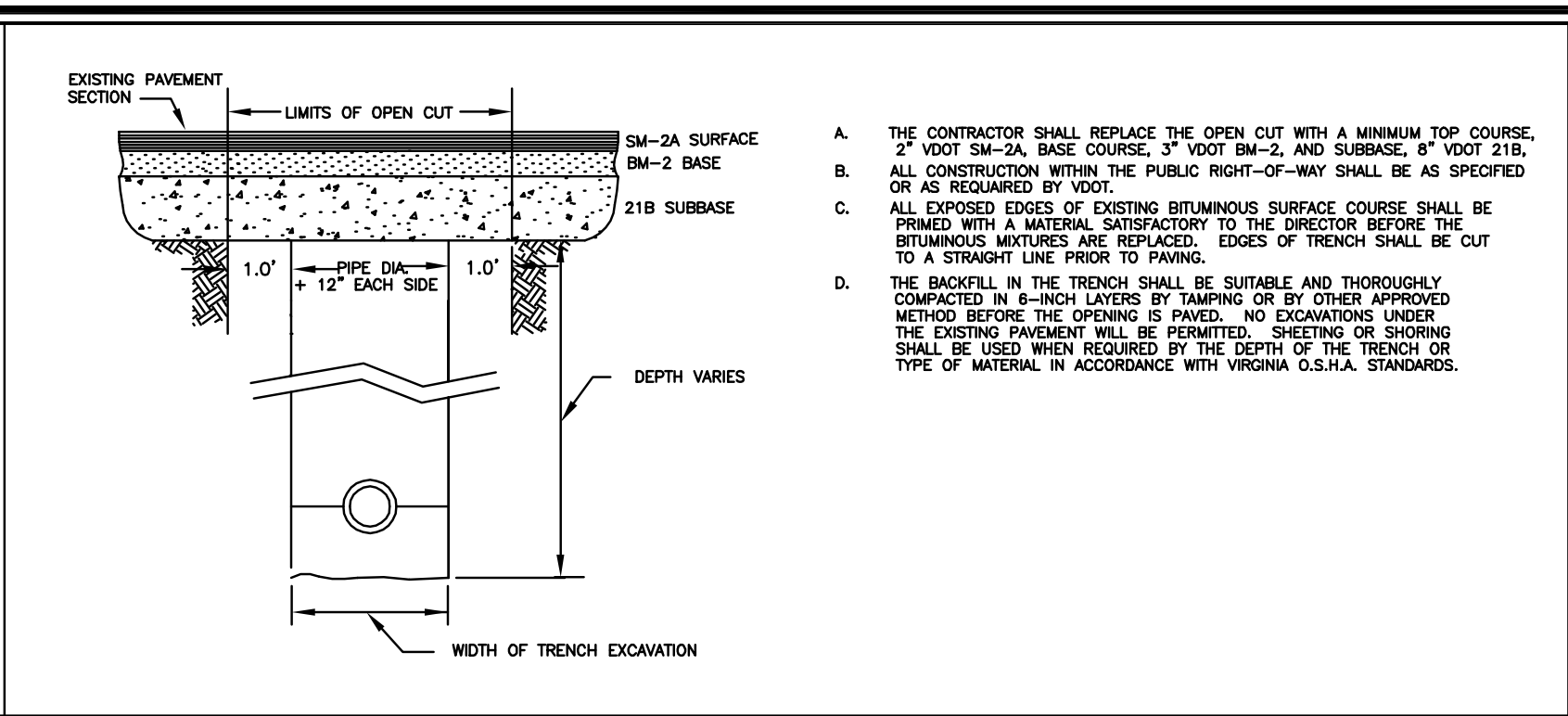
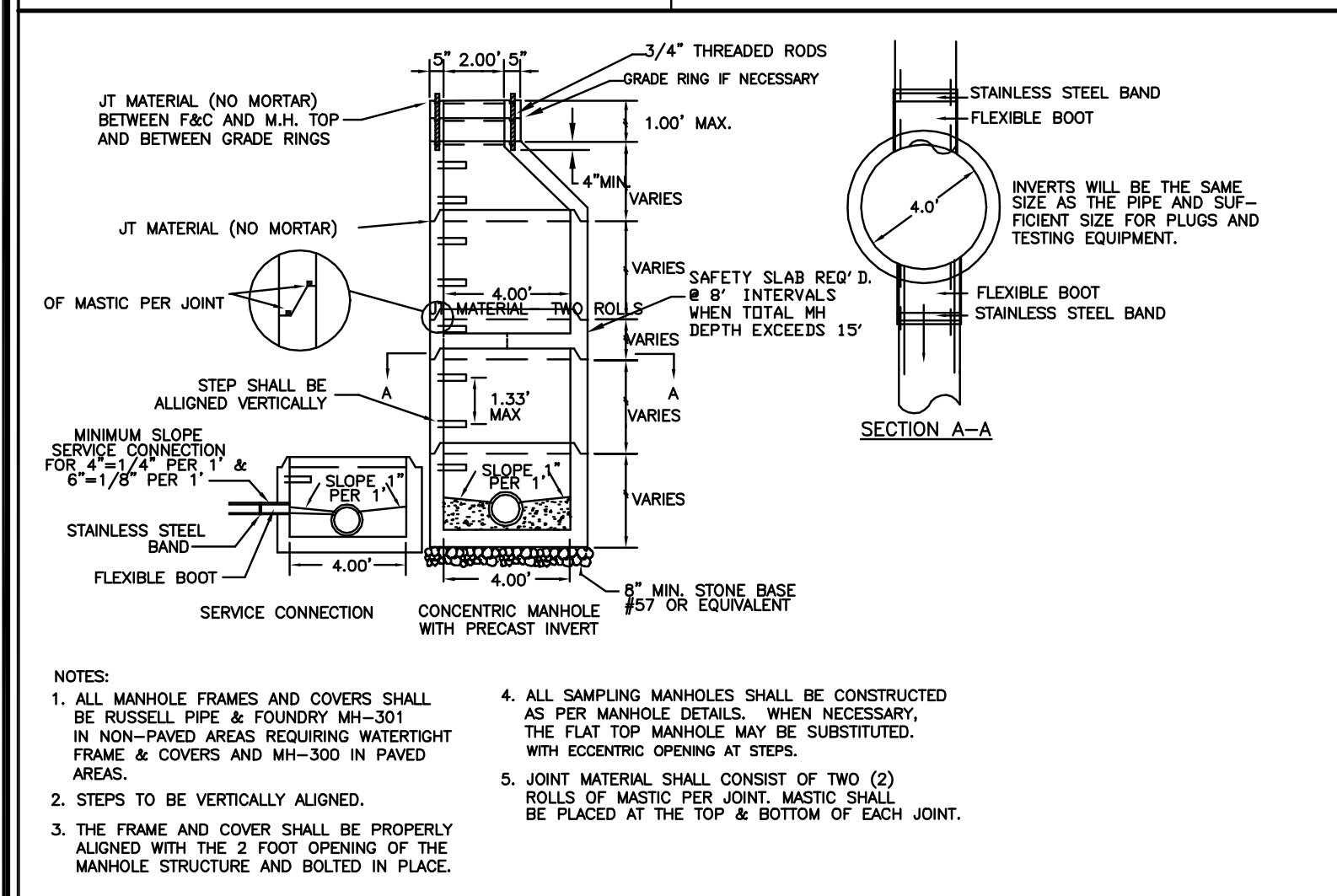


SEWER BEDDING DETAIL  
NOT TO SCALE

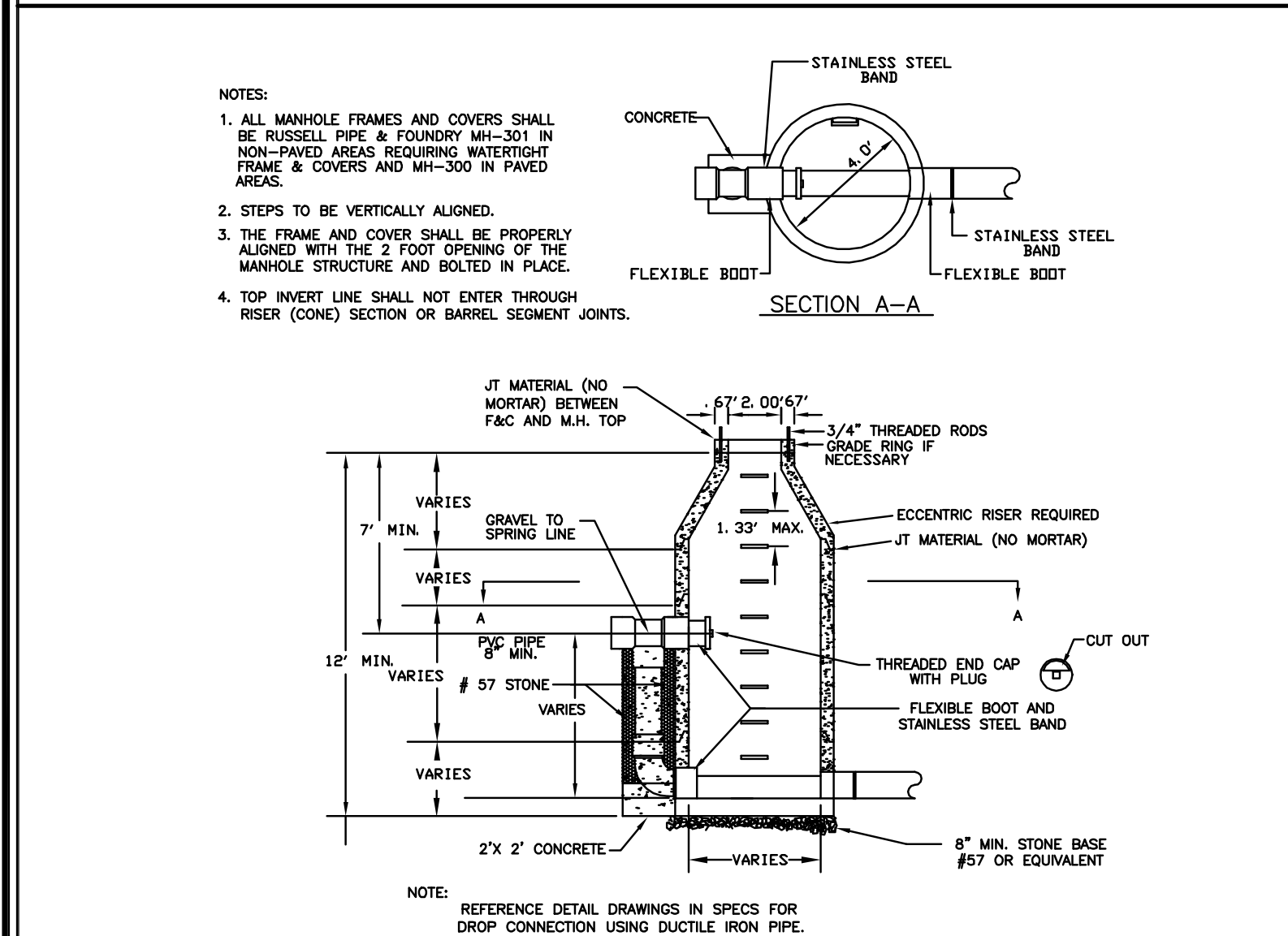
CONCRETE ENCASED PIPE  
NOT TO SCALE



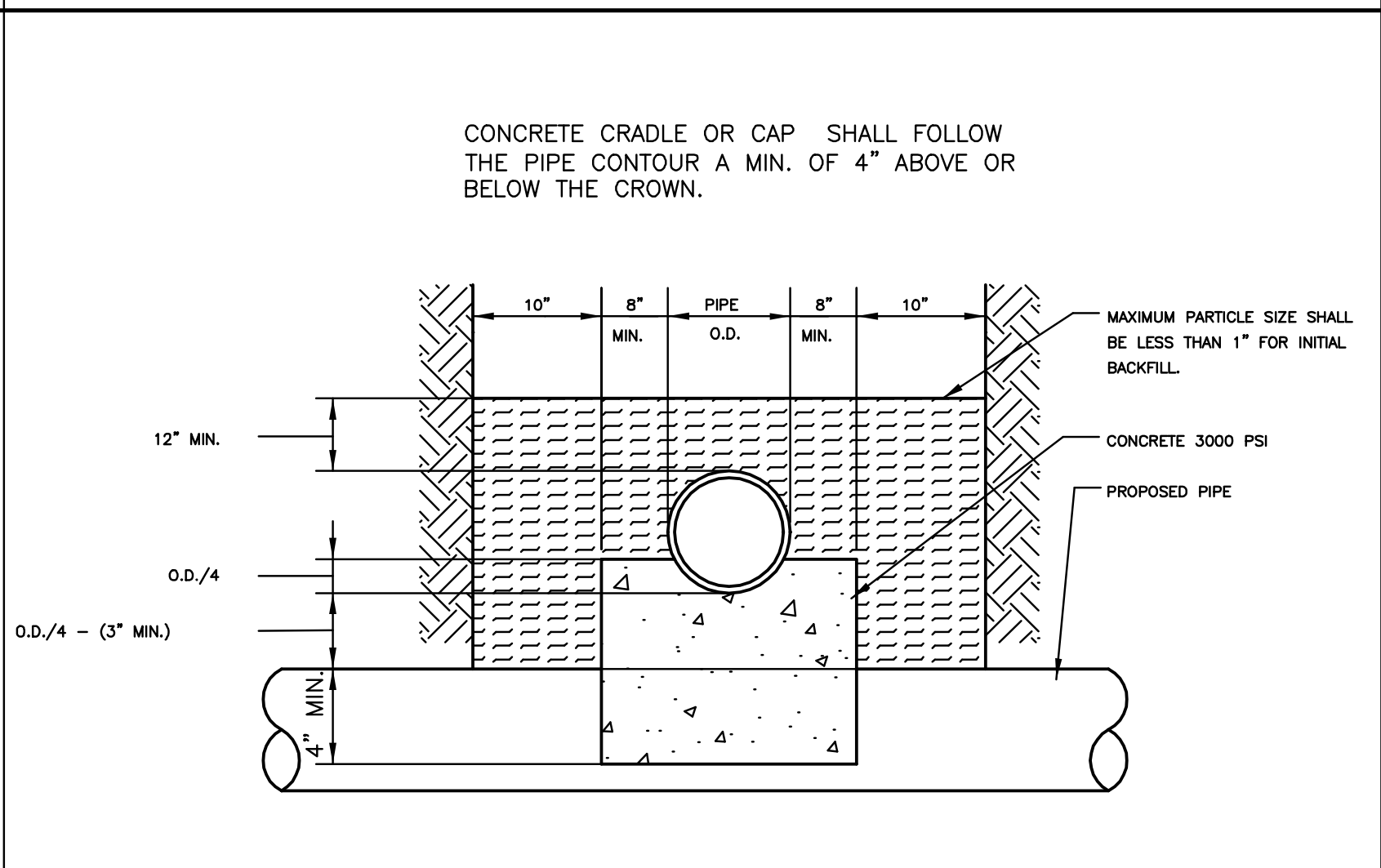
PAVEMENT REPLACEMENT OPEN CUT ROADWAY  
NOT TO SCALE



STANDARD MANHOLE DETAIL  
NOT TO SCALE



OUTSIDE DROP MANHOLE  
NOT TO SCALE

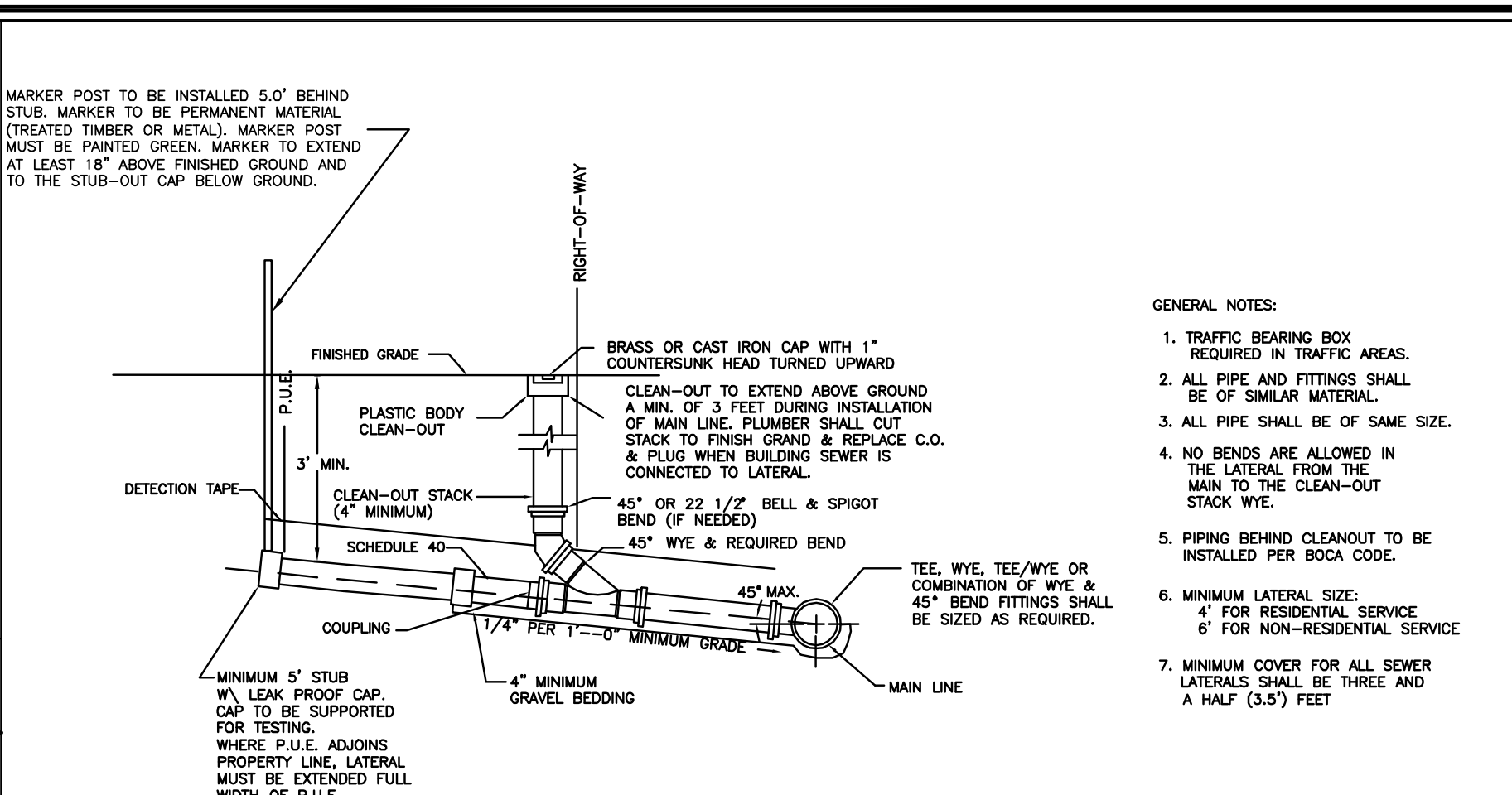


CONCRETE CRADLE  
NOT TO SCALE

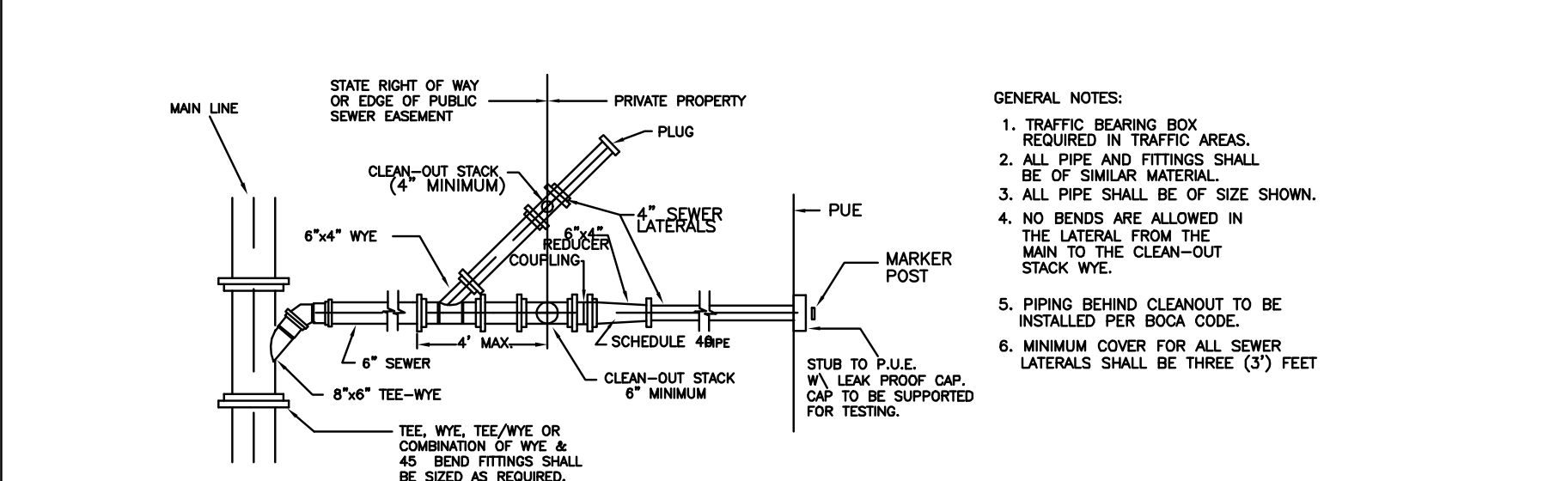
Pipe Diameter (in.)	Min. Time (min:sec)	Length for Min. Time (ft)	Time for Longer Length (sec)	Specified Time for Length (L) Shown (min:sec)							
				100 ft	150 ft	200 ft	250 ft	300 ft	350 ft	400 ft	450 ft
4	3:48	597	380 L	3:48	3:48	3:46	3:46	3:46	3:46	3:48	3:48
6	5:40	398	854 L	5:40	5:40	5:40	5:40	5:40	5:40	5:42	6:24
8	7:34	298	1,520 L	7:34	7:34	7:34	7:34	7:36	8:52	10:08	11:24
10	9:28	239	2,374 L	9:28	9:28	9:28	9:53	11:52	13:51	15:49	17:48
12	11:20	199	3,418 L	11:20	11:20	11:24	14:15	17:05	19:56	22:47	25:38
15	14:10	159	5,342 L	14:10	14:10	17:48	22:15	26:42	31:09	35:36	40:04
18	17:00	133	7,692 L	17:00	19:13	25:38	32:03	38:27	44:52	51:16	57:41
21	19:50	114	10,470 L	19:50	26:10	34:54	43:37	52:21	61:00	69:48	78:31
24	22:40	99	13,674 L	22:47	34:11	45:34	56:58	68:22	79:46	91:10	102:33
27	25:30	88	17,306 L	28:51	43:16	57:41	72:07	86:32	100:57	115:22	129:48
30	28:20	80	21,366 L	35:37	53:25	71:13	89:02	106:50	124:38	142:26	160:15
33	31:10	72	25,852 L	43:05	64:38	86:10	107:43	129:16	150:43	172:21	193:53
36	34:00	66	30,768 L	51:17	76:55	102:34	128:12	153:50	179:29	205:07	230:46

MINIMUM SPECIFIED TIME REQUIRED FOR A 1.0 PSIG PRESSURE DROP FOR SIZE AND LENGTH OF PIPE INDICATED FOR Q = 0.0015.

SANITARY SEWER AIR PRESSURE TEST  
NOT TO SCALE



SANITARY SEWER LATERAL

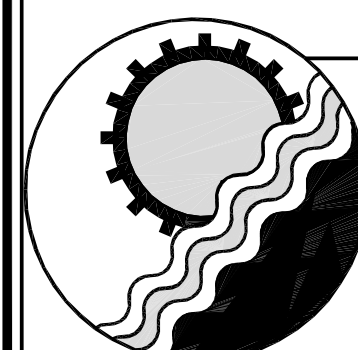
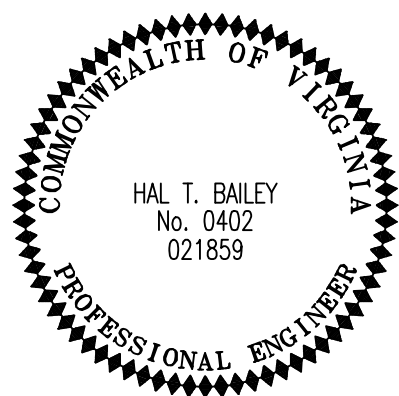


COMBINED 6" BY TWO 4" LATERALS

SANITARY SEWER LATERALS  
NOT TO SCALE

SANITARY SEWER NOTES:

- ALL CONSTRUCTION SHALL COMPLY WITH THE CURRENT EDITION OF THE BOTETOURT COUNTY WATER AND SEWER STANDARDS.
- DEFLECTION TESTING: ALL PIPE SHALL BE TESTED FOR DEFLECTION. DEFLECTION TESTS SHALL BE PERFORMED NO SOONER THAN 30 DAYS AFTER FINAL FULL BACKFILL HAS BEEN PLACED. THE CONTRACTOR SHALL TEST THE PIPE BY MEANS OF A GO-NO-GO MANDREL TO ASSURE THAT A DEFLECTION OF 5 PERCENT HAS NOT BEEN EXCEEDED. THE MANDREL, ONE FOR EACH PIPE SIZE, SHALL BE A NINE ARM MANDREL, WITH PROVING RING SIZED AT 5 PERCENT LESS THAN THE ASTM DIMENSION FOR THE PIPE AND A LENGTH EQUAL TO THE NOMINAL DIAMETER OF THE PIPE BEING TESTED. THE MANDREL SHALL BE PULLED THROUGH THE SEWER LINE MANUALLY. ANY SEWER NOT PASSING THE MANDREL TEST SHALL BE CORRECTED UNTIL THE TEST IS PASSED.
- ALL SANITARY SEWER TESTS ARE TO BE PERFORMED IN THE PRESENCE OF THE DESIGN ENGINEER AND PROPERLY DOCUMENTED BY THE DESIGN ENGINEER FOR SUBMITTAL WITH RECORD DRAWINGS TO BOTETOURT COUNTY PRIOR TO CONVEYANCE TO BOTETOURT COUNTY. TEST SUBMITTALS DOCUMENTED BY ANYONE OTHER THAN THE DESIGN ENGINEER (I.E. THE CONTRACTOR) WILL NOT BE ACCEPTABLE AS PROOF OF COMPLIANCE.
- BOTETOURT COUNTY SEWER CONNECTION FEES WILL BE BASED UPON THE FEE STRUCTURE IN PLACE AT THE TIME OF SERVICE APPLICATION REQUEST. OWNER / DEVELOPER MUST MAKE APPLICATION AND PAY ALL APPLICABLE CONNECTION FEES PRIOR TO ISSUANCE OF BUILDING PERMITS.
- ALL TESTING OF UTILITIES SHALL BE DOCUMENTED BY THE DESIGN ENGINEER.
- DEVELOPER SHALL PROVIDE A ONE-YEAR WARRANTY FOR ALL LINES PRIOR TO CONVEYANCE TO BOTETOURT COUNTY WITH WARRANTY DATE BEGINNING AT THE DATE OF SYSTEM ACCEPTANCE BY BOTETOURT COUNTY.
- DEVELOPER SHALL PROVIDE VIDEO CAMERA INSPECTION DOCUMENTATION PRIOR TO CONCLUSION OF ONE YEAR WARRANTY PERIOD. VIDEO CAMERA INSPECTION WORK TO BE PERFORMED NO SOONER THAN SIX MONTHS AND NO LATER THAN EIGHT MONTHS AFTER THE DATE OF SYSTEM ACCEPTANCE BY BOTETOURT COUNTY. ONE (1) COPY OF THE VIDEO TAPE SHALL BE PROVIDED TO BOTETOURT COUNTY. VIDEO CAMERA INSPECTION WORK SHALL BE COORDINATED WITH BOTETOURT COUNTY SUCH THAT COUNTY PERSONNEL CAN BE PRESENT DURING VIDEO INSPECTION OPERATIONS.
- SEWER SHOP DRAWINGS SHALL BE SUBMITTED BY THE CONTRACTOR TO BOTH THE DESIGN ENGINEER AND BOTETOURT COUNTY FOR APPROVAL PRIOR TO INSTALLATION / CONSTRUCTION. BOTETOURT COUNTY WILL REQUIRE THREE (3) COMPLETE SETS OF SHOP DRAWINGS FOR REVIEW.
- THE CONTRACTOR SHALL SCHEDULE A PRE-CONSTRUCTION MEETING TO BE ATTENDED BY THE CONTRACTOR'S SITE SUPERINTENDENT, DESIGN ENGINEER'S FIELD REPRESENTATIVE / INSPECTOR, BOTETOURT COUNTY UTILITY DEPARTMENT, BOTETOURT COUNTY ENGINEERING DEPARTMENT AND ANY MATERIALS SUPPLIERS THE CONTRACTOR FEELS NECESSARY.
- ALL SEWER PIPES (MAINS AND SERVICE LINES) SHALL HAVE BOTH MAGNETICALLY LOCATABLE DETECTION WIRE AND OR TAPE AND WARNING TAPE INSTALLED AT SAME ELEVATION OF SPRING LINE OF PIPE. WARNING TAPE (CAUTION!! BURIED SEWER / WATER PIPE BELOW) SHALL BE INSTALLED NO MORE THAN 18 INCHES ABOVE TOP OF PIPE.
- CONTRACTOR SHALL OBTAIN A COPY OF THE MOST CURRENT EDITION OF THE BOTETOURT COUNTY WATER SEWER CONSTRUCTION STANDARDS AND SPECIFICATIONS AND PROVIDE PROOF (A LETTER) THAT THE CONTRACTOR HAS BEEN AND IS FAMILIAR WITH THE REQUIREMENTS THEREIN.
- PRIOR TO CONVEYANCE OF THE SEWER SYSTEM (MAIN LINES AND ASSOCIATED STRUCTURES) BOTETOURT COUNTY SHALL REQUIRE ONE COMPLETE REPRODUCIBLE (MYLAR) SET, ONE COMPLETE PAPER (BLUELINE) SET AND ONE COMPLETE DIGITAL (AUTOCAD 2000 VERSION) SET OF SEWER AS-BUILTS, PREPARED BY THE DESIGN ENGINEER AND SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE COMMONWEALTH OF VIRGINIA.



ENGINEERING CONCEPTS, INC.

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No.	Revision	By	Appd.	Date	Drawn
1	Botco. San. Rev COMMENTS	WTR	MPC	06/03/03	WTR
2	CO. SANITARY COMMENTS	MSMJ	RHW	7-22-03	WTR
					Checked JDE/PSN
					Approved PSN

SPICKARD TOWNHOMES  
BOTETOURT COUNTY, VIRGINIA

SANITARY SEWER  
STANDARD DETAIL SHEET

SCALE: NONE

JANUARY 2001

PROJECT: 00023

9 of 10