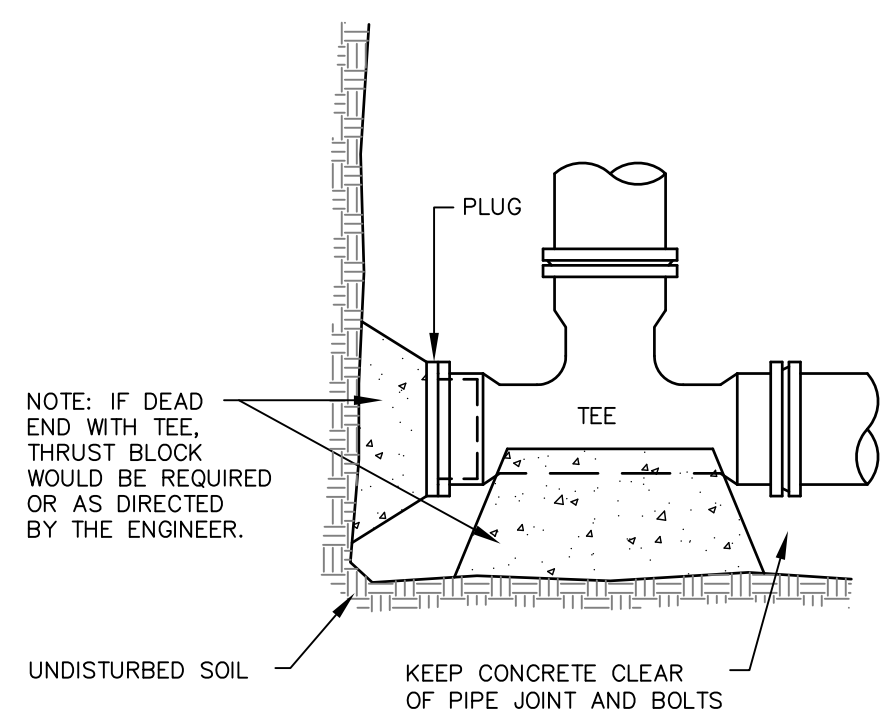
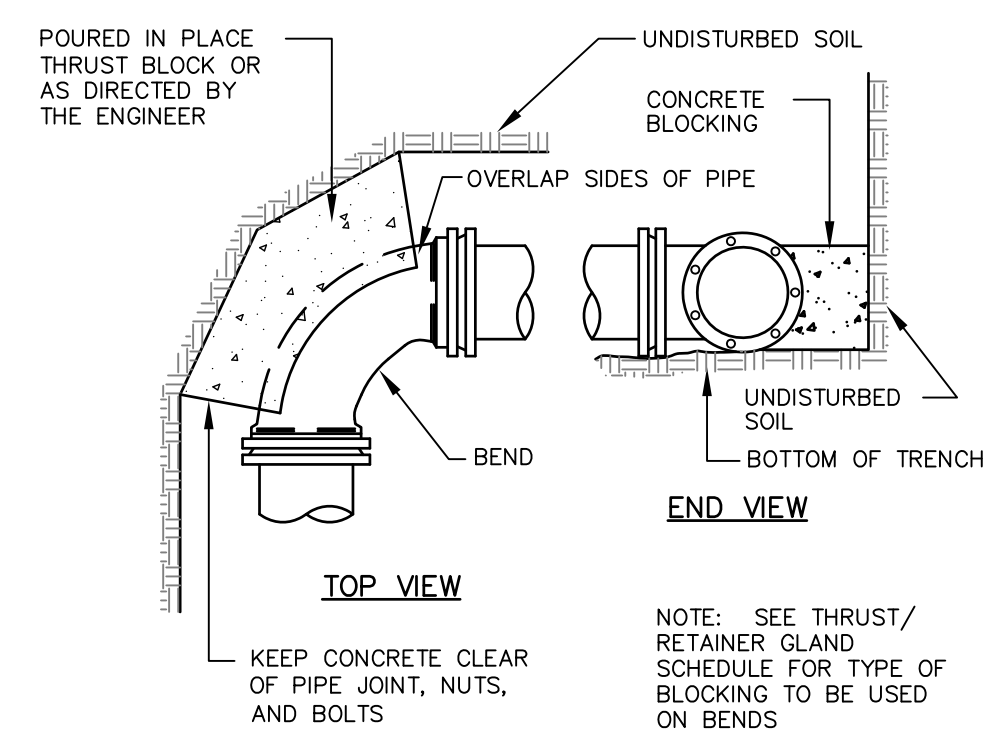


FITTINGS	SQ. FT. OF BEARING ON UNDISTURBED SOIL				TEES AND PLUGS
	90° BENDS	45° BENDS	22.5° BENDS	11.25° BENDS	
PIPE SIZE	4"-6"	9.0	4.5	3.5	1.5
	8"	15.0	8.0	4.0	2.0
	12"	32	18	8.0	4.5



9 STANDARD TEE BLOCKING
NOT TO SCALE



10 STANDARD BEND BLOCKING
NOT TO SCALE

**TABLE OF DIMENSIONS
PVC, TRUSS, CMP, & POLYETHYLENE PIPE**

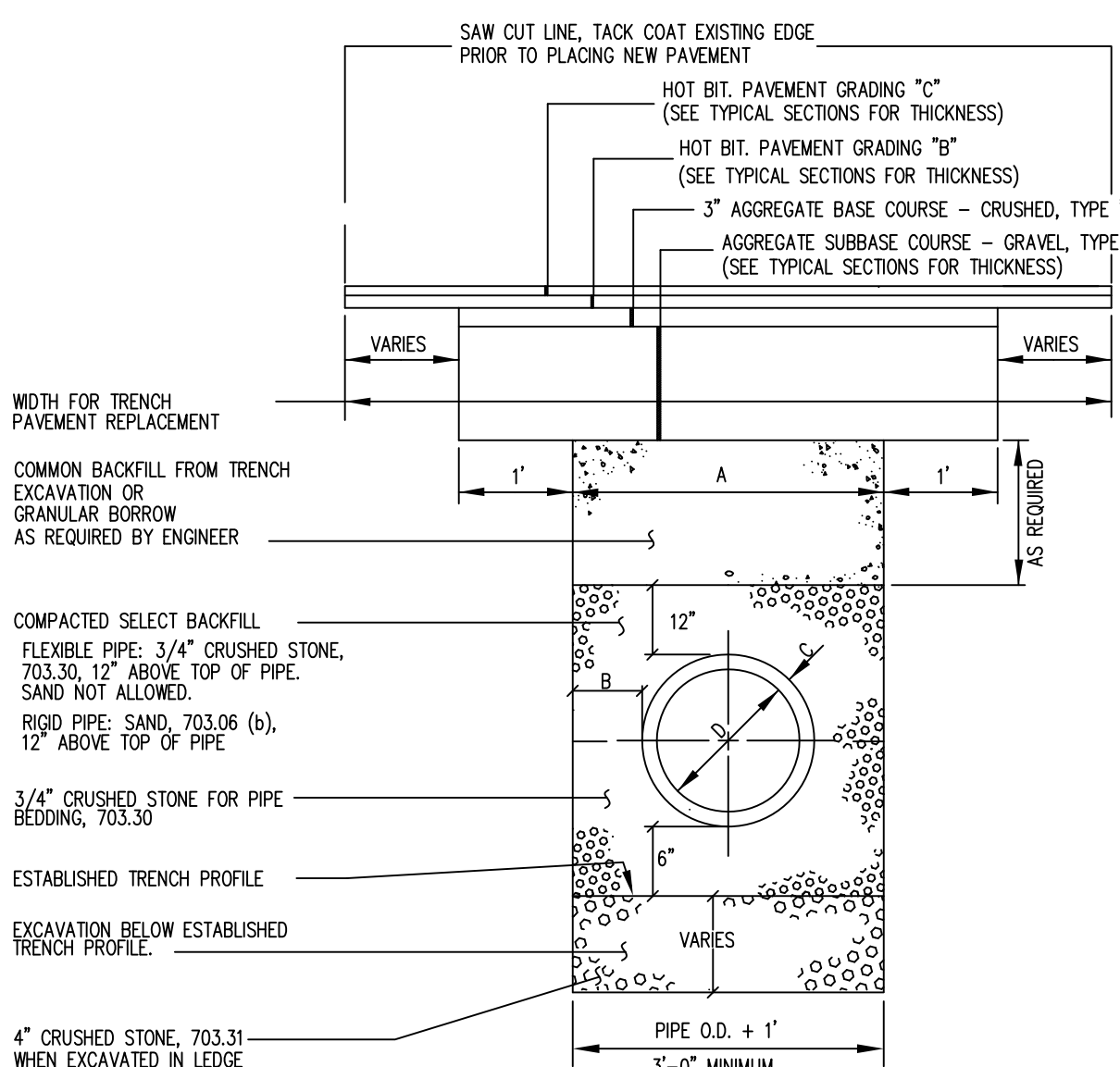
D	A	B	C	VOL. BASE /100'	UNSHAFTED O. D. SOCKET
8"	3'-0"	1'-1 1/2"	0'-1 1/2"	7.558	10.3/8"
10"	3'-0"	1'-0 3/8"	0'-0 5/8"	7.658	12 1/2"
12"	3'-0"	1'-0 3/8"	0'-0 5/8"	7.658	14 1/2"
14"	3'-0"	0'-10 3/8"	0'-0 5/8"	8.178	16 3/4"
16"	3'-0"	0'-9 1/4"	0'-0 3/4"	8.447	18"
18"	3'-0"	0'-8 1/4"	0'-0 3/4"	8.683	21 1/8"
20"	3'-0"	0'-7 3/8"	0'-0 3/4"	8.815	23 3/8"
24"	3'-1 3/4"	0'-6"	0'-0 7/8"	12.659	27 3/4"
28"	3'-1 1/4"	0'-6"	0'-1 1/8"	10.959	31 1/8"
30"	3'-8 1/4"	0'-6"	0'-1 1/8"	12.156	34 1/8"
33"	3'-11 3/4"	0'-6"	0'-1 1/8"	13.213	38 1/2"
36"	4'-2 3/4"	0'-6"	0'-1 3/8"	14.910	42"

A = WIDTH OF UNSHAFTED TRENCH

**TABLE OF DIMENSIONS
REINFORCED CONCRETE PIPE**

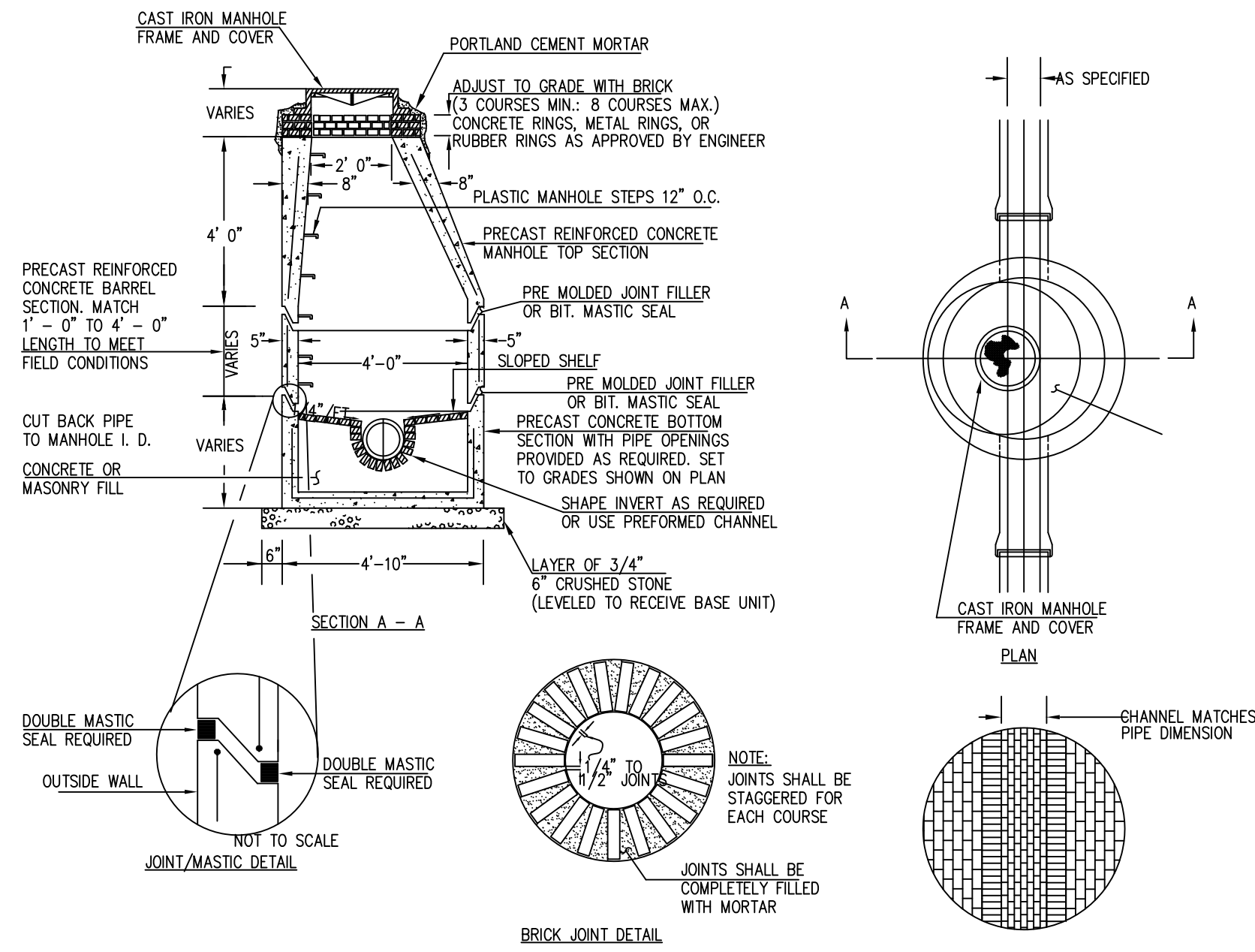
D	A	B	C	VOL. BASE /100'	UNSHAFTED O. D. BELL
12"	3'-0"	0'-10"	0'-2"	8.319	20 3/8"
15"	3'-0"	0'-8 1/4"	0'-2 1/4"	8.626	24 1/8"
18"	3'-0"	0'-8 1/2"	0'-2 1/2"	8.925	28"
21"	3'-0 1/2"	0'-6"	0'-2 3/4"	9.266	31 7/8"
24"	3'-0 1/2"	0'-6"	0'-3 1/4"	11.233	35 3/4"
28"	3'-4 1/2"	0'-6"	0'-3 1/2"	14.120	39 1/2"
33"	4'-4 1/2"	0'-6"	0'-3 3/8"	17.922	43 1/2"
36"	4'-8"	0'-6"	0'-4"	17.358	47 1/2"
42"	5'-10"	0'-6"	0'-4 1/2"	24.226	51 1/2"
48"	6'-10"	0'-6"	0'-5 1/2"	28.404	55 1/2"
60"	7'-0"	0'-6"	0'-6"	32.607	59 1/2"
66"	7'-7"	0'-6"	0'-6 1/2"	37.074	63 1/2"
72"	8'-0"	0'-6"	0'-7 1/2"	41.986	67 1/2"
78"	8'-4"	0'-6"	0'-8"	47.149	71 1/2"
90"	9'-11"	0'-6"	0'-8 1/2"	57.939	75 1/2"
96"	10'-6"	0'-6"	0'-9"	63.552	79 1/2"

27 in. THROUGH 96 in. INCLUSIVE - TONGUE & GROOVE JOINTS

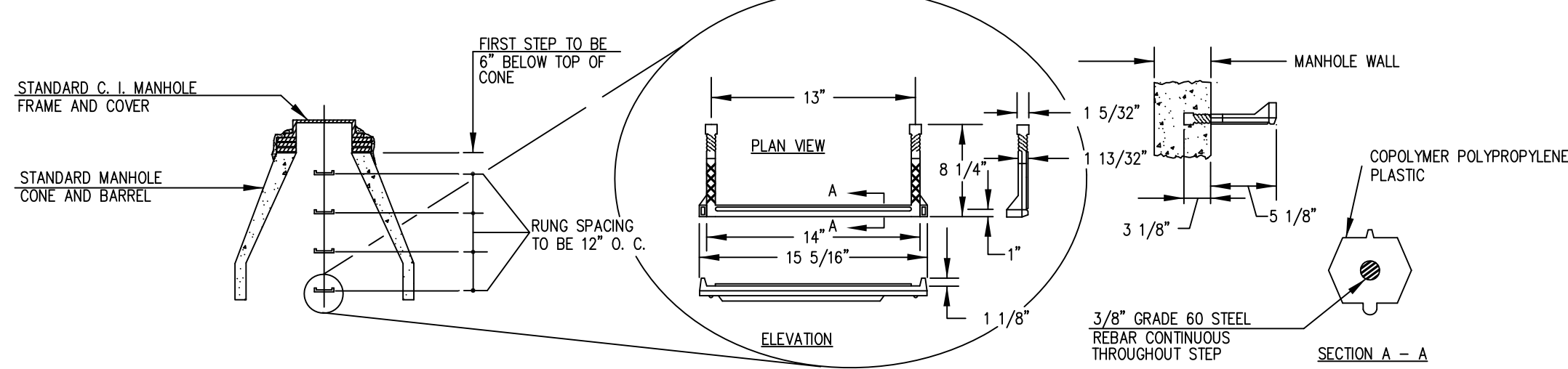


11 TYPICAL PIPE INSTALLATION DETAIL
NOT TO SCALE

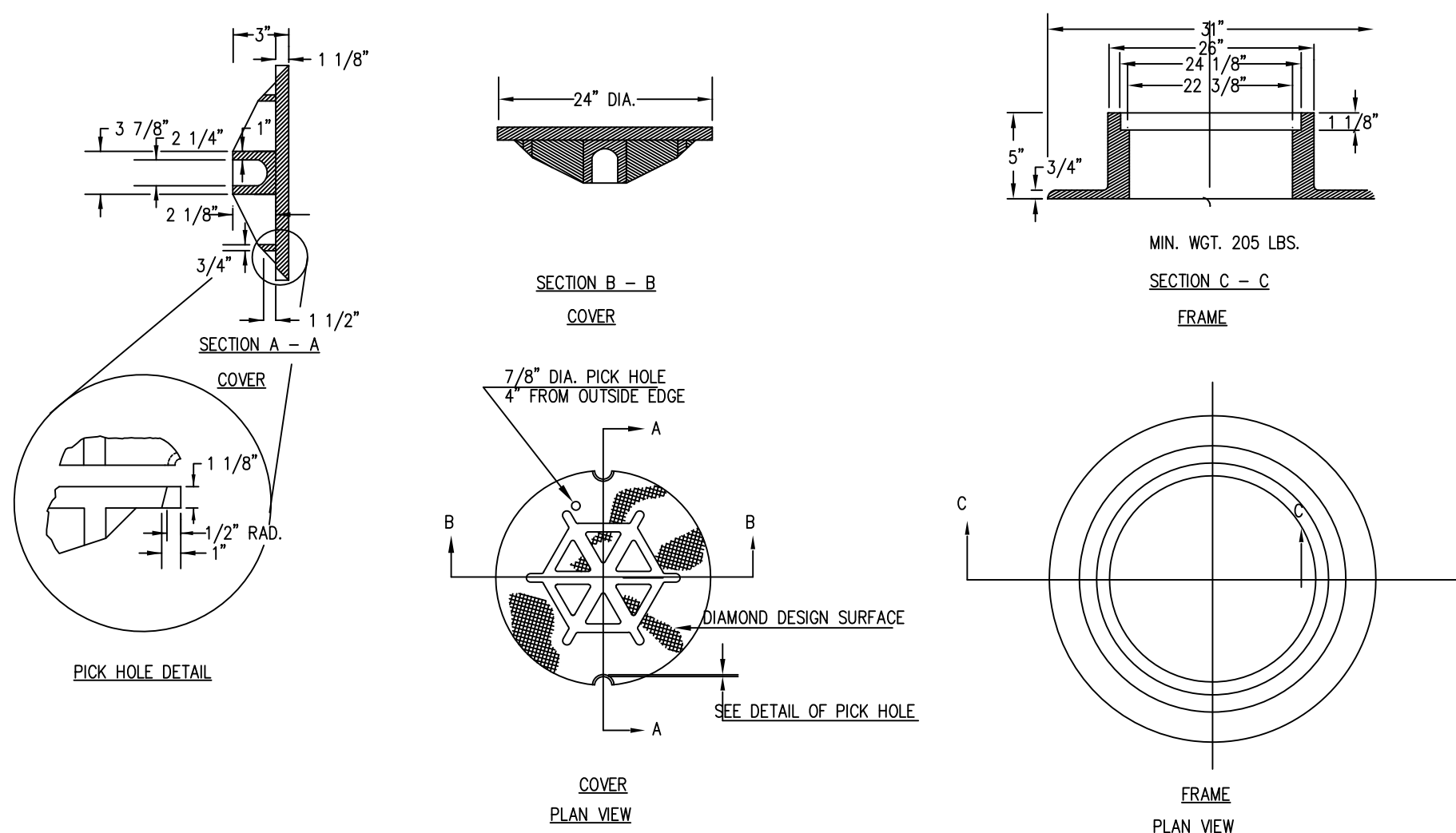
NOTE:
MANHOLE CHANNELS REQUIRING CHANGE OF ALIGNMENT, TO BE BUILT ON SMOOTH RADIUS CHANNEL TO BE SHAPED TO ACCEPT ADDITIONAL INLET PIPES.



14 PRECAST CONCRETE SEWER MANHOLE TYPE "A"
NOT TO SCALE



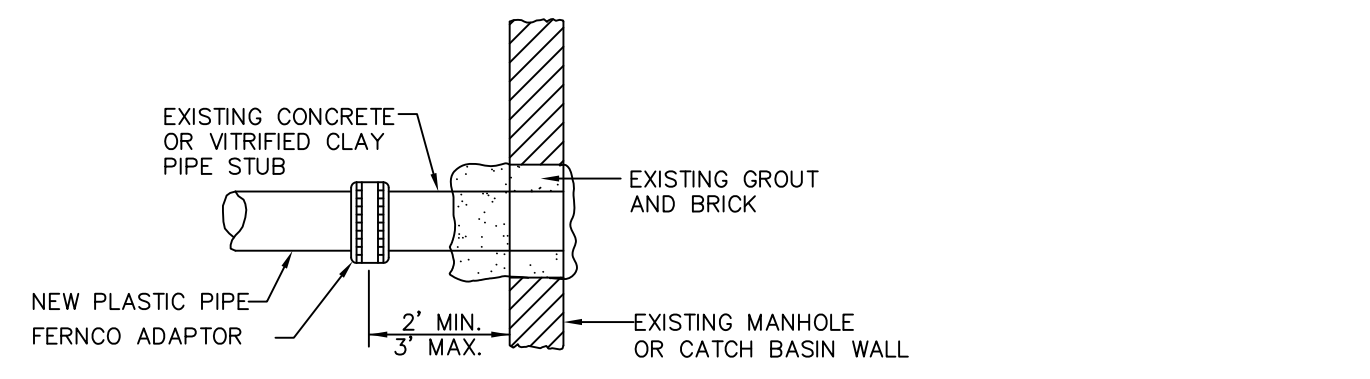
15 PLASTIC MANHOLE STEPS
NOT TO SCALE



16 TYPE "A" CAST IRON MANHOLE COVER AND FRAME
NOT TO SCALE

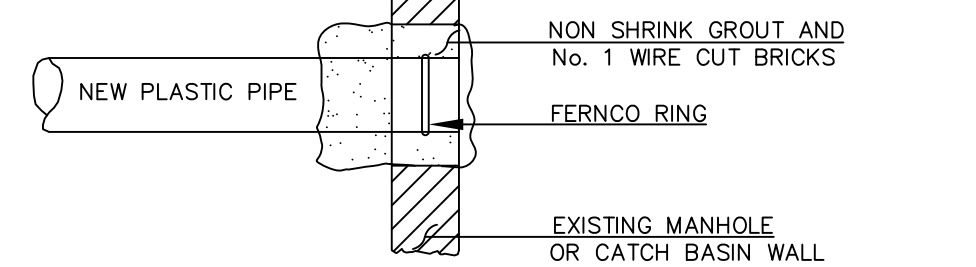
GENERAL NOTES FOR MANHOLES AND CATCH BASINS

- ALL CONCRETE SHALL BE CLASS "A" AND HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 4000 PSI PER SQ. INCH AT THE END OF 28 DAYS, UNLESS OTHERWISE NOTED.
- PRECAST REINFORCED CONE BARREL MANUFACTURED PER ASTM SPEC. C-478-67
- SEWER BRICK SHALL CONFORM TO ASTM SPEC. DESIGNATE ON C-32-63, GRADE MA AND SA.
- ALL MANHOLES SHALL HAVE A BITUMINOUS WATERPROOFING APPLIED TO THE EXTERIOR SURFACE. IF CONSTRUCTED OF BRICK MASONRY, SURFACE SHALL BE PLASTERED WITH A SMOOTH MORTAR FINISH 3/8" THICK AFTER THE MORTAR HAS SET. THE SURFACE SHALL BE WATERPROOFED AS REQUIRED BY SUPPLEMENTAL SPECIFICATIONS SECTION 604.
- CASTINGS SHALL CONFORM TO ASTM DESIGNATION A48-CLASS 35. ALL PARTS OF CASTINGS, EXCEPT FINISHED SURFACE, SHALL RECEIVE A COAT OF COAL TAR BITUMEN OR ASPHALTUM PAINT WHICH SHALL BE SMOOTH AND TIGHT BUT NOT BRITTLE.
- MANHOLES MAY BE CONSTRUCTED OF MASONRY, PRECAST REINFORCED CONCRETE, OR CAST IN PLACE.
- ALL PRECAST MANHOLES AND CATCH BASINS SHALL BE IDENTIFIED BY STATION AND OFFSETS, PAINTED ON THE SIDE OF THE STRUCTURE BY THE MANUFACTURER.
- STORM AND SEWER MANHOLES SHALL HAVE SOLID COVERS WITH ONE DRILLED PICK HOLE.
- EXISTING MANHOLES, CATCH BASINS, FRAMES, AND COVERS SHALL BE SALVAGED BY THE CONTRACTOR, AND SHALL REMAIN THE PROPERTY OF THE CITY OF PORTLAND.



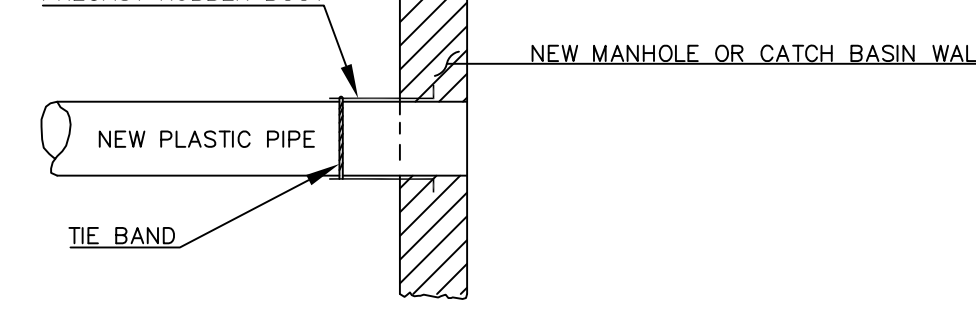
METHOD 4 - NEW PIPE TO EXISTING STRUCTURE STUB

NOTE: EXISTING MANHOLE OR CATCH BASIN SHALL BE CORE DRILLED FOR PIPE INSTALLATION. IF PIPE DIAMETER IS SO LARGE THAT CORE DRILLING IS PROHIBITED, THE CONTRACTOR MAY USE ANY COMBINATION OF JACK HAMMERS AND SAW CUTTING THE STRUCTURE TO CREATE PIPE OPENING. THE NEW OPENING MUST THEN BE SEALED AND WATERTIGHT BOTH INSIDE AND OUTSIDE THE STRUCTURE.



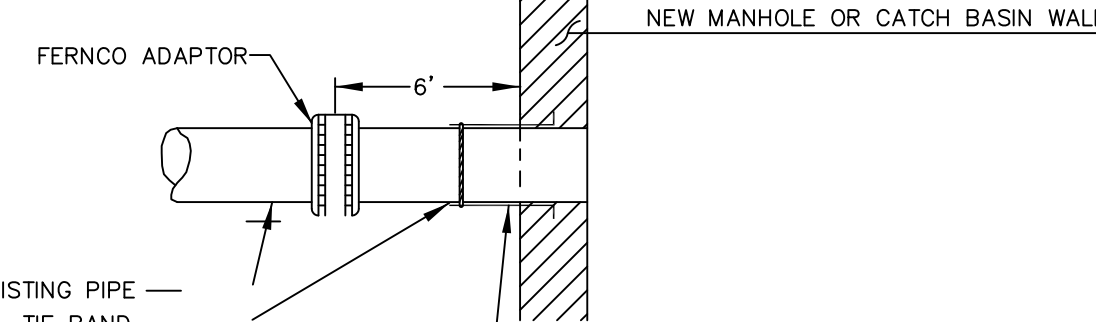
METHOD 3 - NEW PIPE INTO EXISTING STRUCTURE

NOTE: REMOVE WATERPROOFING FROM STRUCTURE BEFORE APPLYING MORTAR. WATERPROOF AGAIN AFTER MORTAR HAS SET.



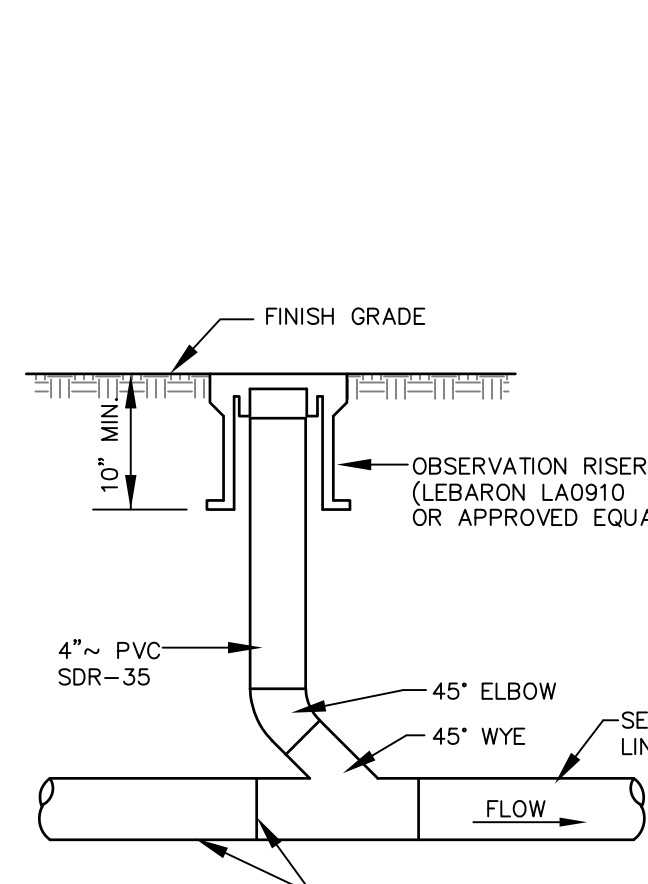
METHOD 2 - NEW CONSTRUCTION

NOTE: REMOVE WATERPROOFING FROM STRUCTURE BEFORE APPLYING MORTAR. WATERPROOF AGAIN AFTER MORTAR HAS SET.

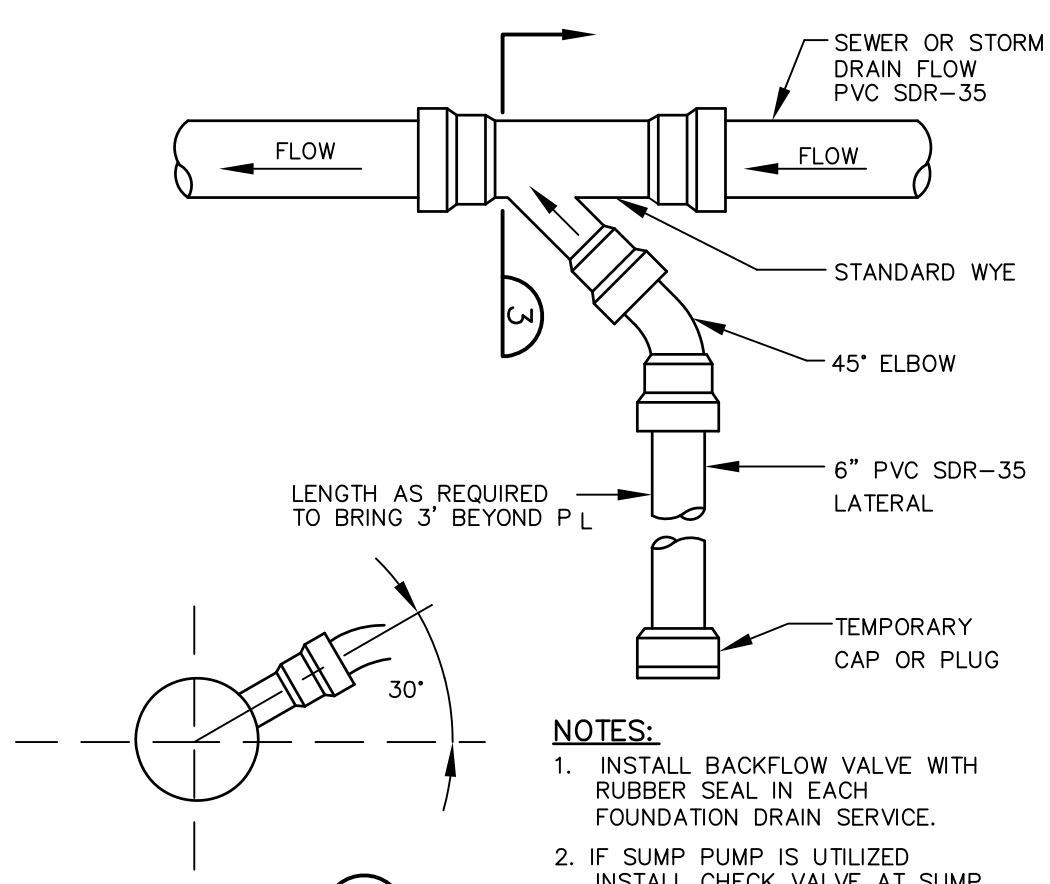


METHOD 1 - EXISTING PIPE INTO NEW STRUCTURE

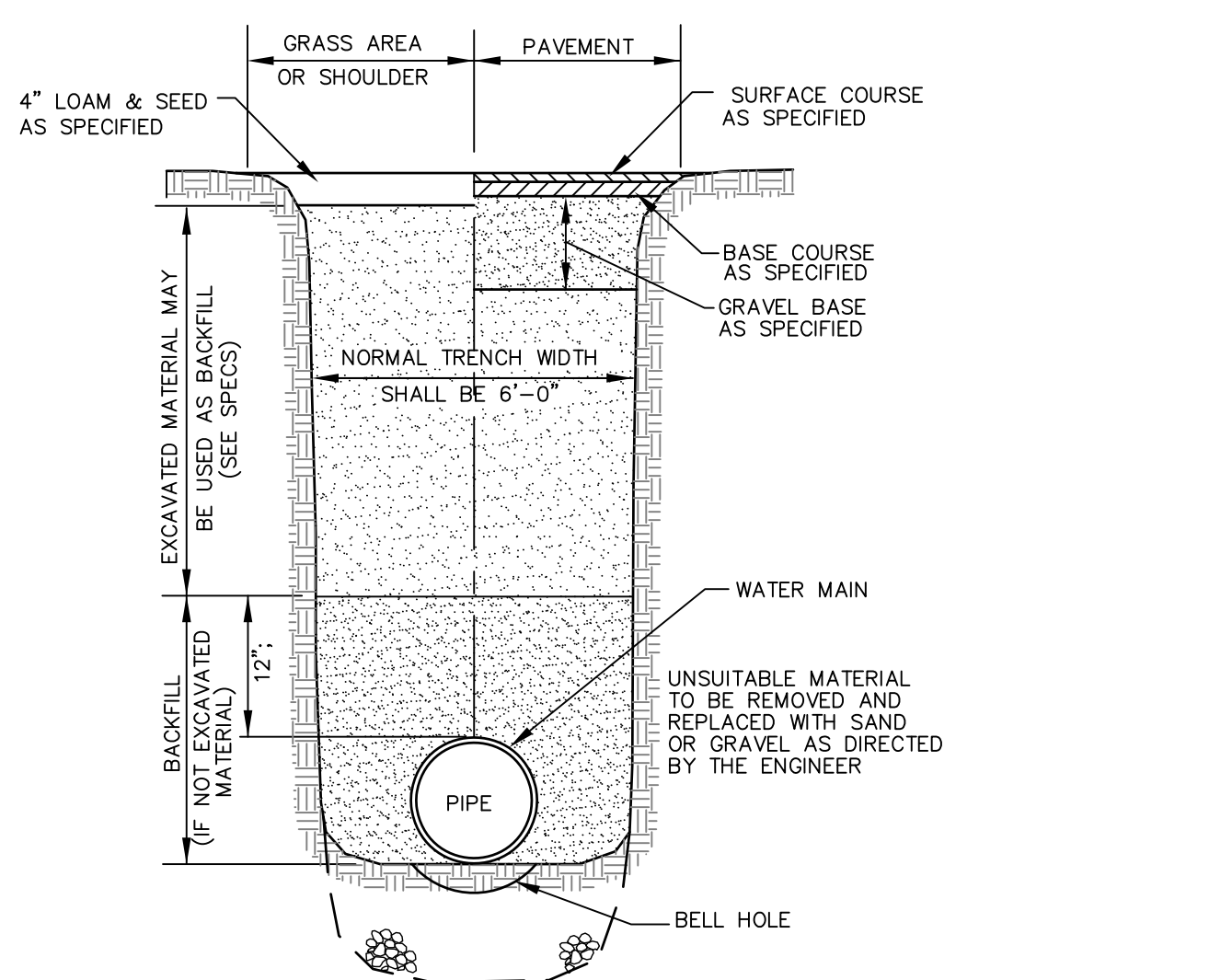
17 PLASTIC PIPE CONNECTION DETAIL
NOT TO SCALE



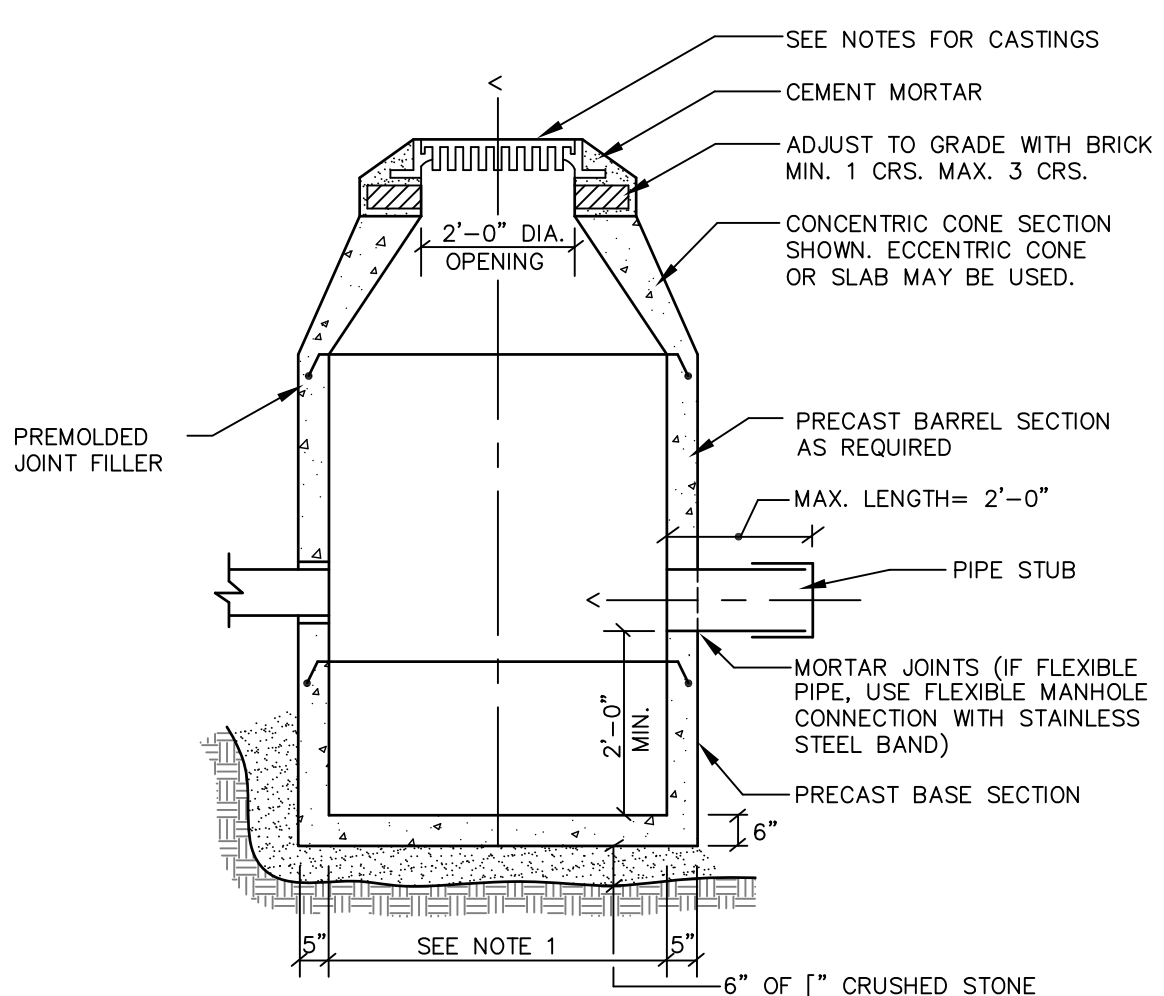
18 SEWER CLEANOUT
NOT TO SCALE



19 SEWER / FOUNDATION DRAIN SERVICE CONNECTION
NOT TO SCALE

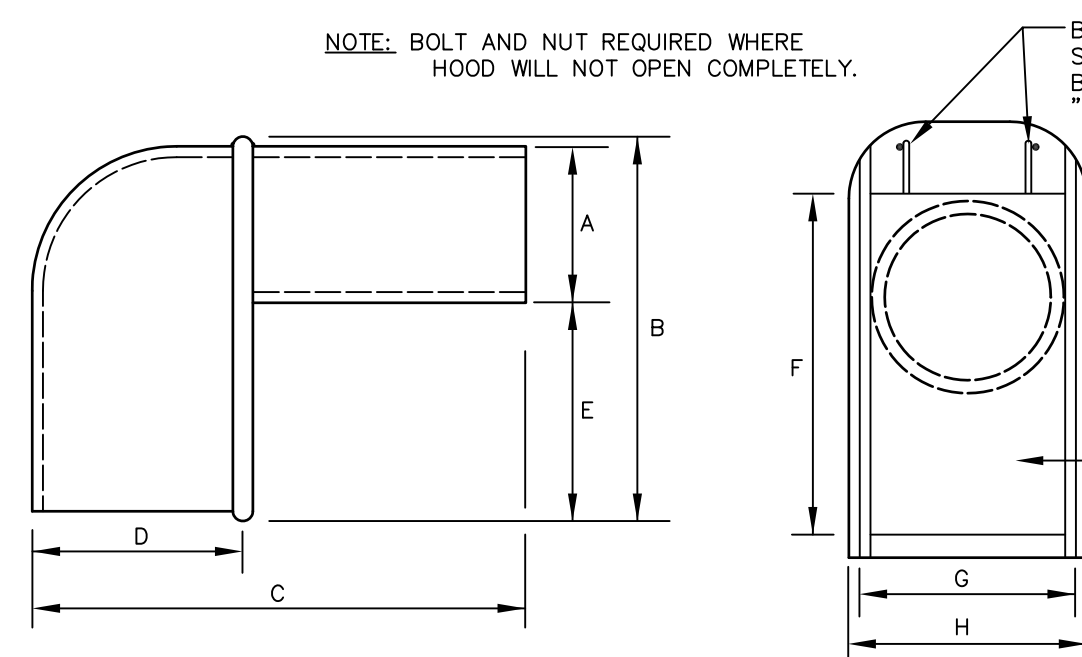


12 WATER LINE SECTION THRU EARTH TRENCH
NOT TO SCALE

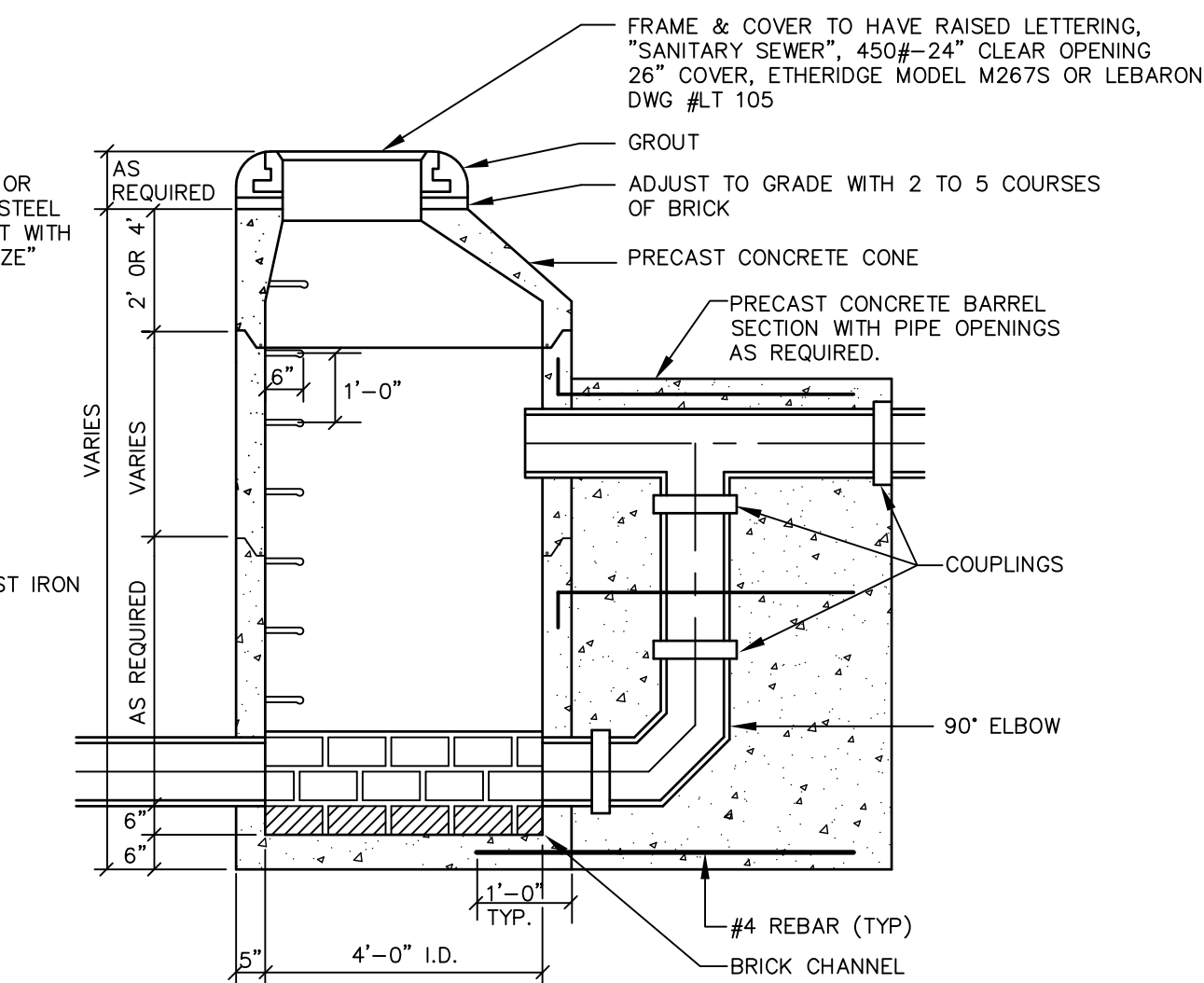


- NOTES:**
- 4'-0\"/>

13 TYPICAL DRAINAGE STRUCTURE
NOT TO SCALE



25 CASCO TRAP
NOT TO SCALE



20 TYPICAL SANITARY DROP MANHOLE (OUTSIDE DROP)
NOT TO SCALE