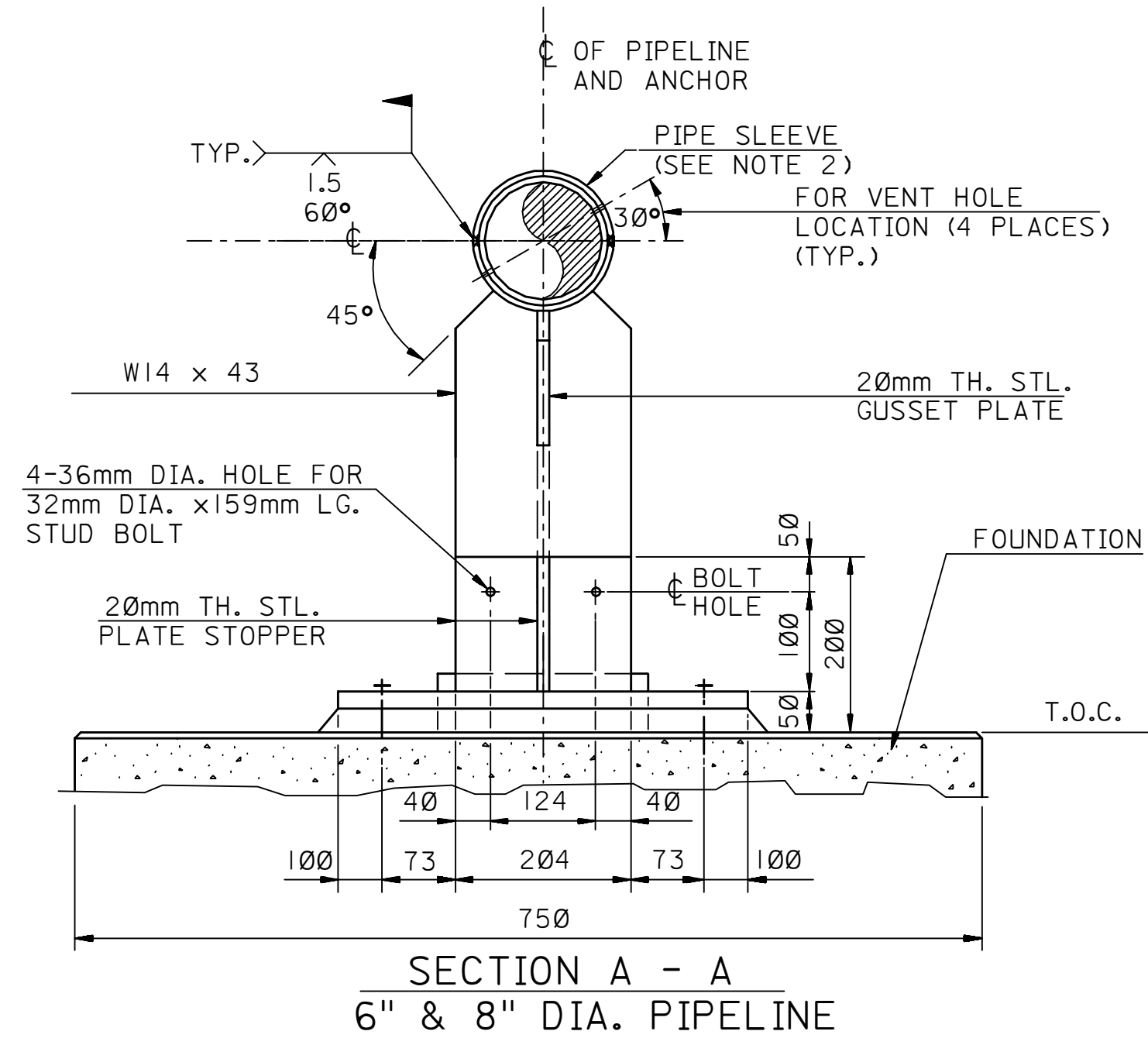
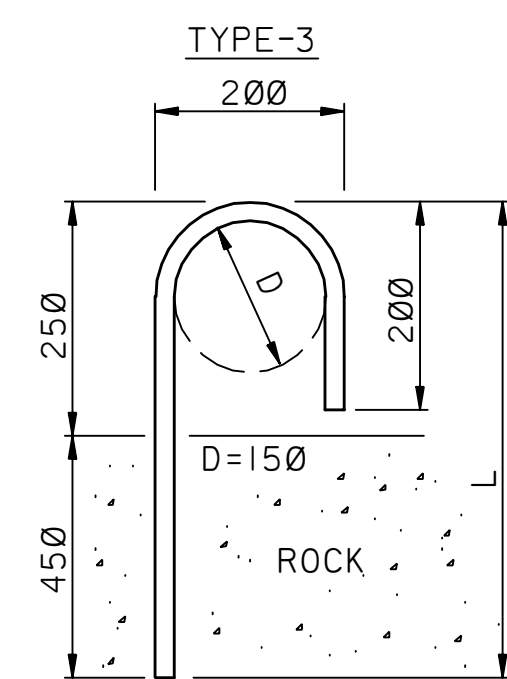
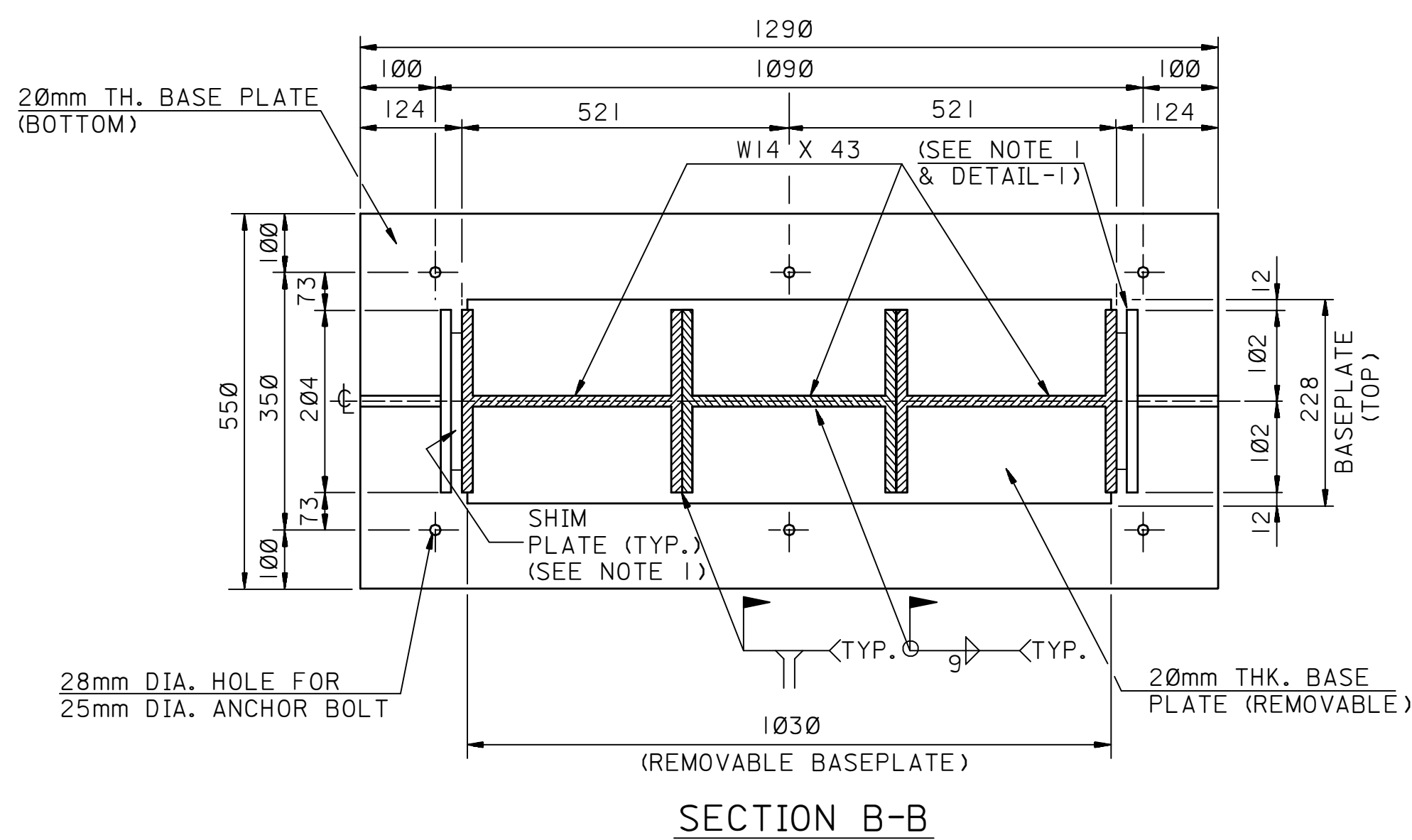
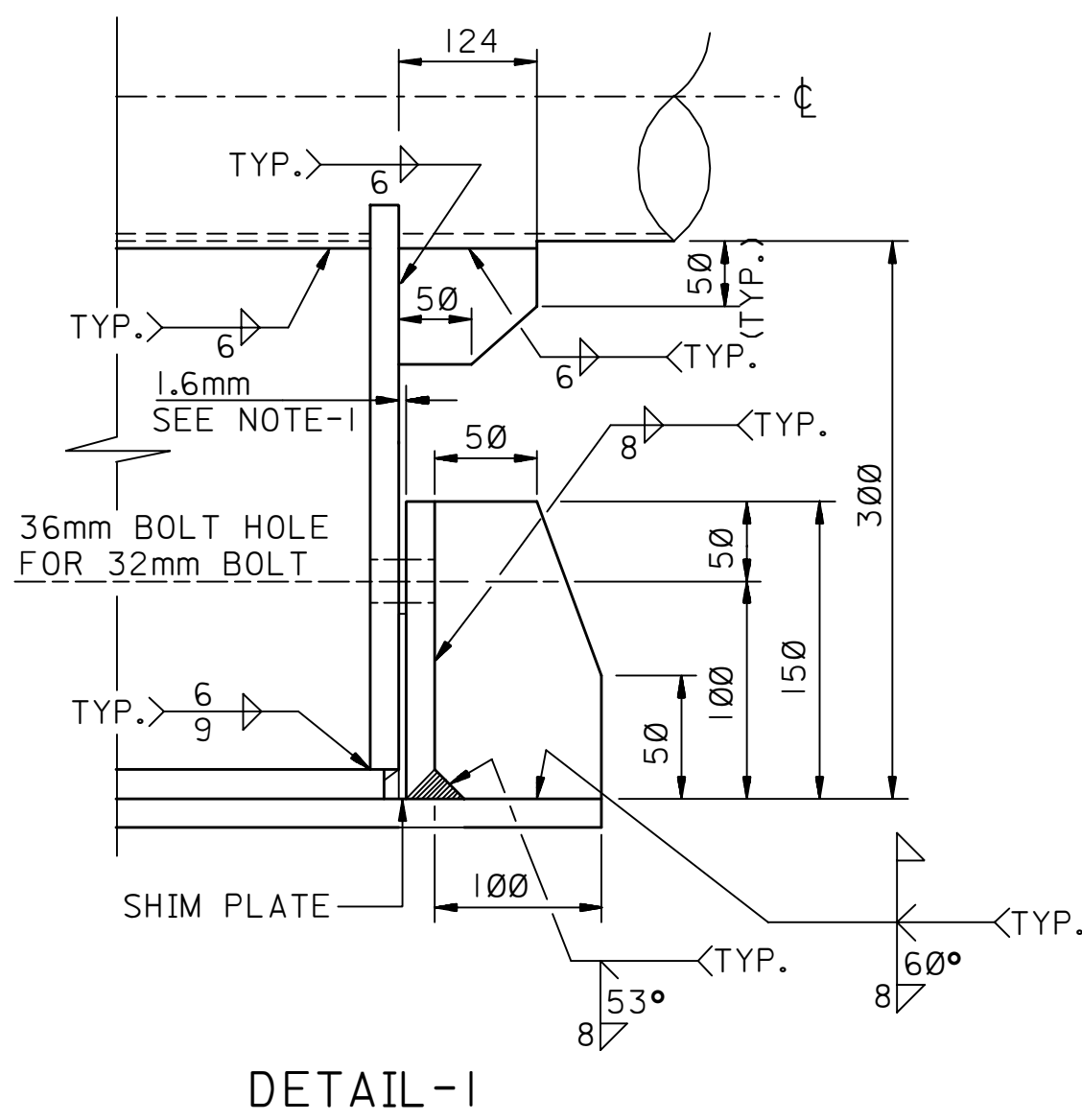
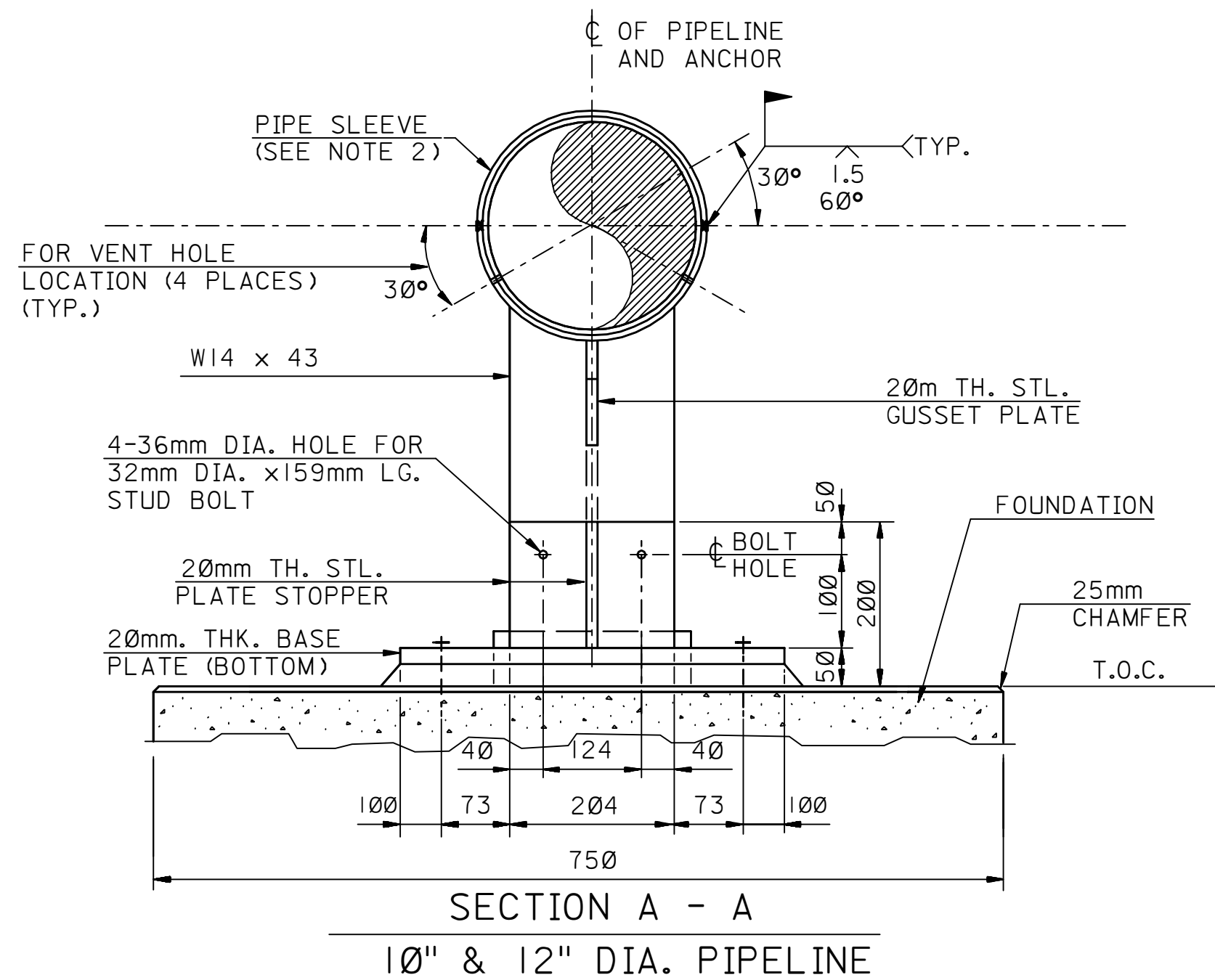
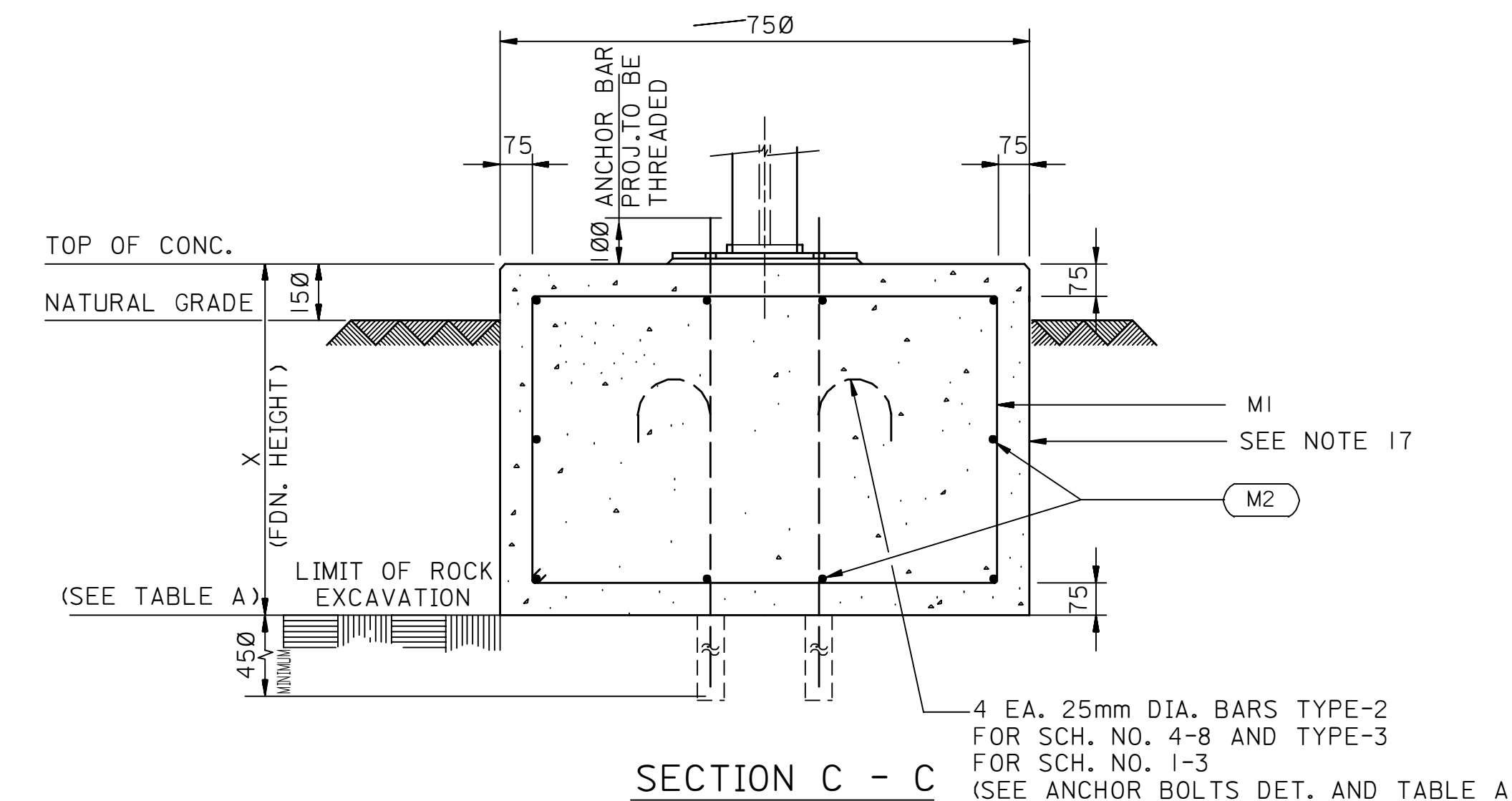
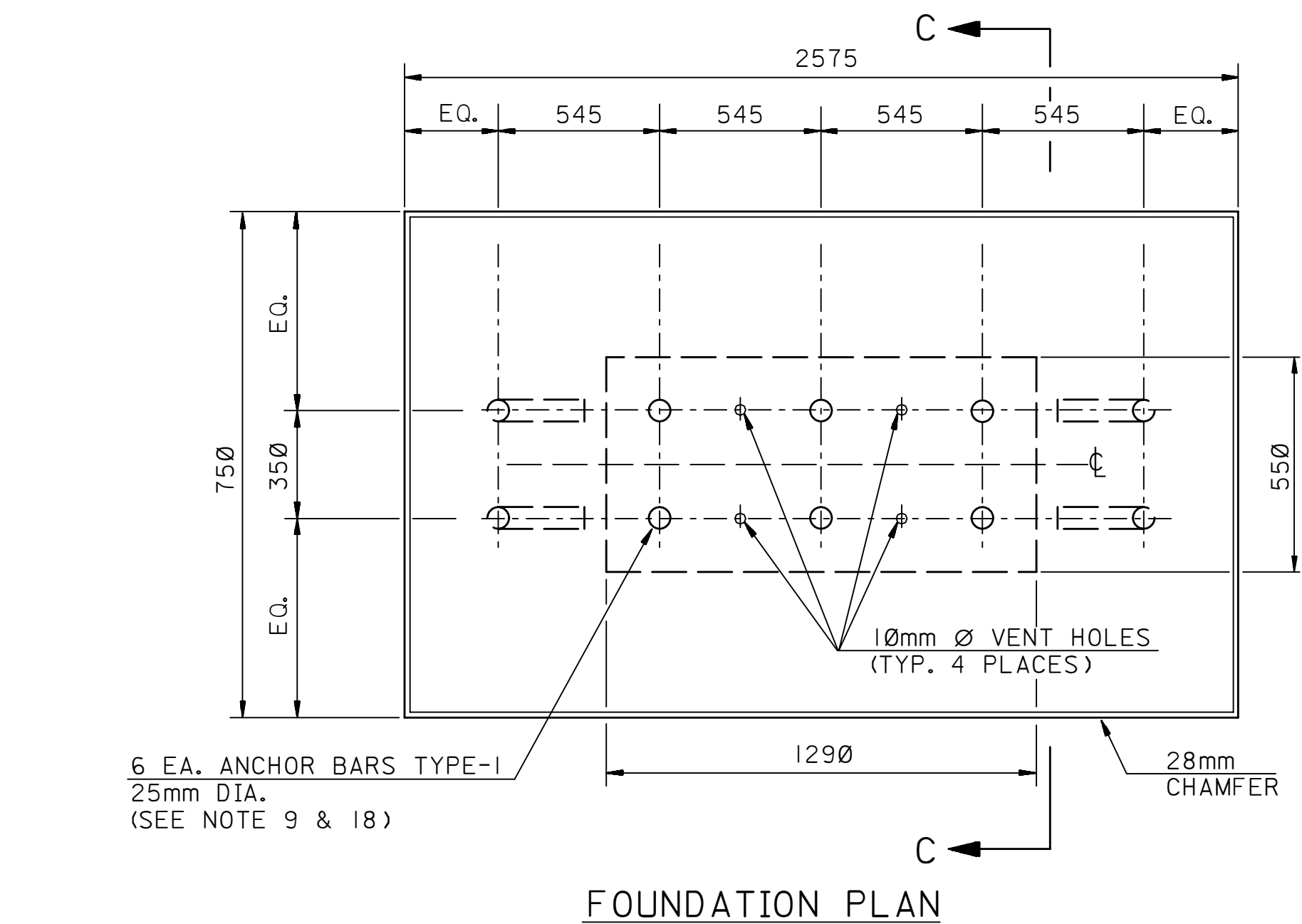
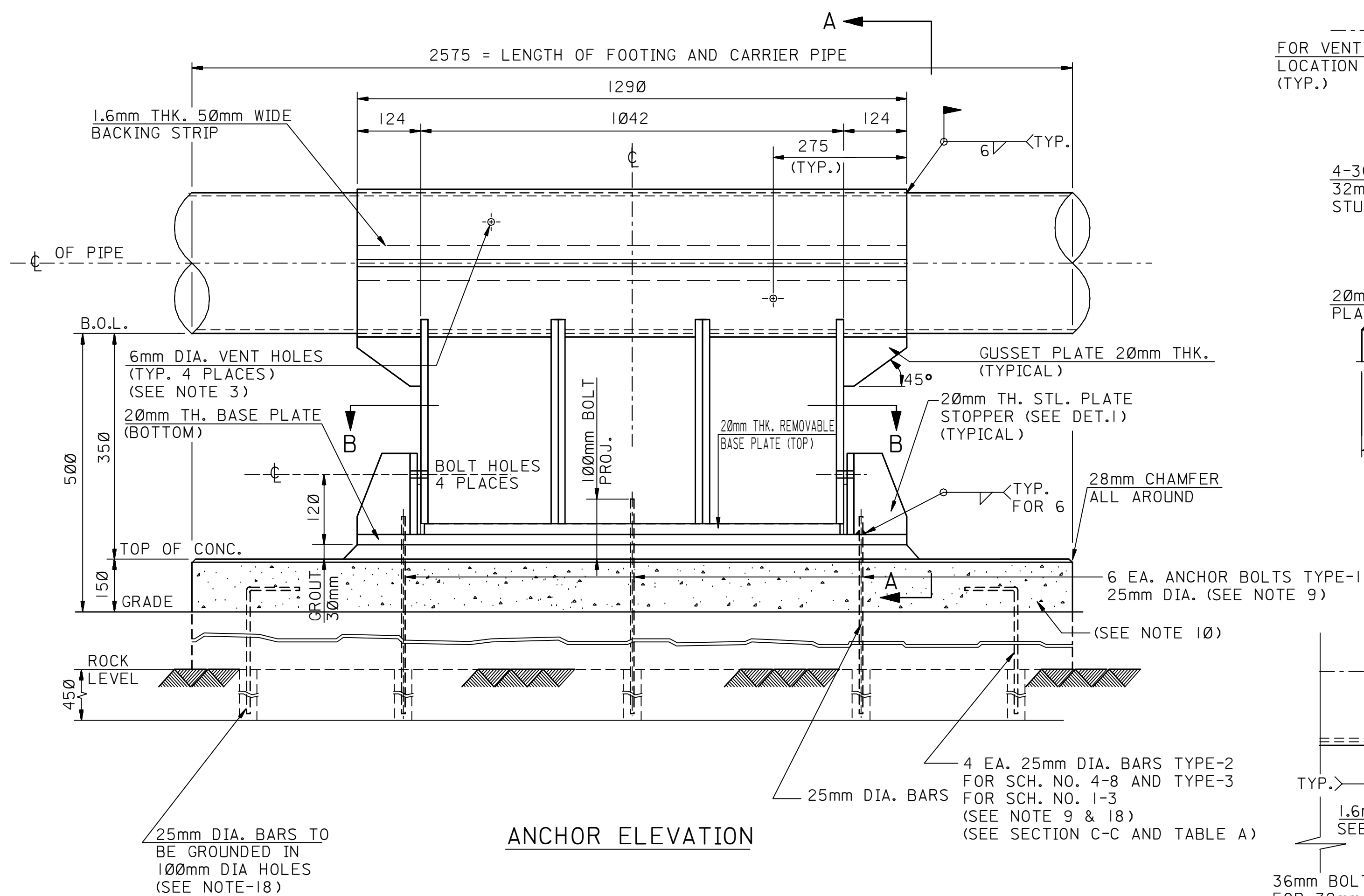




HEIGHT SCHEDULE		VOL. OF CONCRETE (CU. M.)	ANCHOR BAR LENGTHS (L)			TOTAL BAR LENGTH (M)
SCH NO.	X FOUNDATION HEIGHT (MM)		TYPE 1 (6 PCS.) mm	TYPE 2 (4 PCS.) mm	TYPE 3 (4 PCS.) mm	
1	380	0.75	930		700	10
2	460	0.90	1010		700	11
3	535	1.05	1085		700	11
4	610	1.20	1160	950		12
5	685	1.35	1235	950		13
6	760	1.50	1310	950		13
7	840	1.65	1390	950		13
8	915	1.80	1465	950		14



SCH. NO.	MARK NO.		SIZE OF BAR	NO. REQ.	DIMENSION		CUTTING LENGTH (mm)	NO. x CUTTING LENGTH = TOTAL LENGTH (METERS)	QTY (MTRS.)
					A	B			
1	M1	1602	16	7	568	198	1826	12.8	37.10
	M2	1601	16	10	2425	—	2425	24.25	
2	M1	1602	16	7	568	278	1986	13.9	38.15
	M2	1601	16	10	2425	—	2425	24.25	
3	M1	1602	16	7	568	353	2136	15.00	39.25
	M2	1601	16	10	2425	—	2425	24.25	
4	M1	1602	16	8	568	428	2286	18.3	42.55
	M2	1601	16	10	2425	—	2425	24.25	
5	M1	1602	16	9	568	503	2436	22.0	46.25
	M2	1601	16	10	2425	—	2425	24.25	
6	M1	1602	16	10	568	578	2586	25.90	50.15
	M2	1601	16	10	2425	—	2425	24.25	
7	M1	1602	16	11	568	658	2746	30.2	54.25
	M2	1601	16	10	2425	—	2425	24.25	
8	M1	1602	16	12	568	733	2896	34.8	59.10
	M2	1601	16	10	2425	—	2425	24.25	

STEEL BENDING DETAILS

NOTES:

1. PROVIDE 1.6mm OR 1/16 " CLEARANCE BOTH SIDE TO ALLOW SMOOTH REMOVAL AND INSERTION. FILL GAP WITH SHIM PLATES.
2. THE PIPE BEING USED FOR THE SLEEVE SHALL BE EXPANDED AROUND THE CARRIER PIPE AND WELDED, BEFORE THE BASE IS WELDED ON.
3. SLEEVE TO PIPE CONNECTION SHALL BE AIRTIGHT, VENT HOLES TO BE FILLED WITH MASTIC AFTER WELDING.
4. ANCHOR SPOOL SHALL NOT BE WELDED TO PIPELINE UNTIL CONCRETE HAS ATTAINED THE REQUIRED MINIMUM COMPRESSIVE STRENGTH.
5. ALL STRUCTURAL STEEL FABRICATION AND INSTALLATION SHALL BE IN ACCORDANCE WITH AES-M-001 AND 12-AMSS-007.
6. ALL WELDING SHALL BE IN ACCORDANCE WITH AWS-D1.1 AND SAES-W-001 AND SAES-W-012.
7. BACKFILLING AND COMPACTION AROUND CONCRETE SHALL BE IN ACCORDANCE WITH AES-M-100.
8. ALL REINFORCING BARS SHALL BE MILD STEEL DEFORMED BARS WITH A MINIMUM YIELD STRENGTH OF 50 KSI AND COATED PER 09-AMSS-106.
9. ANCHOR BARS SHALL NOT TOUCH THE REINFORCEMENT.
10. CONCRETE SHALL BE MIXED, PLACED AND CURED PER SAES-Q-001 AND 09-AMSS-097. CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 28 MPa AFTER 28 DAYS.
11. GROUT SHALL BE 09-AMSS-092, TYPE II PER SAES-Q-010 AND SHALL BE POURED IN A HIGH FLUIDITY RANGE, PER THE MANUFACTURERS INSTRUCTIONS.
12. MINIMUM CONCRETE COVER FOR REBARS SHALL BE 75mm.
13. ALL STEEL WORK SHALL BE COATED PER SAES-H-101, APCS-26B. GROUT AND BASE PLATE SHALL BE COATED PER SAES-H-101, APCS-1B.
14. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.
15. THE SIDES AND TOP OF THE CONCRETE THAT COMES IN DIRECT CONTACT WITH EARTH SHALL BE COATED WITH TWO COATS COAL TAR OR BITUMEN COATING THAT CONFORMS TO APCS-10 OF SAES-H-101. A PLASTICIZED SHEET VAPOR BARRIER SHALL BE PLACED AROUND THE SIDES OF CONCRETE THAT IS PLACED DIRECTLY INTO EXCAVATION WITHOUT THE USE OF FORMWORK, WHERE BITUMEN CAN NOT BE APPLIED.
16. BEFORE THE INSTALLATION, THE TOP SURFACE OF ROCKY AREA SHOULD BE LEVELED BY SUITABLE CONSTRUCTION EQUIPMENT SUCH AS SCRAPER OR JACK HAMMER. LEVELING BY SAND OR GRAVEL IS NOT ACCEPTABLE BECAUSE OF REDUCTION OF FRICTION COEFFICIENT. CLEAN THE ROCK SURFACE WITH WATER.
17. ROCK IS DEFINED AS HARD MATERIAL WHICH CAN NOT BE EXCAVATED BY USISING NORMAL TECHNIQUES SUCH AS A BACKHOE.
CONTRACTOR SHALL ESTABLISH EXISTING TOP OF ROCK ELEVATION, CALCULATE DEPTH OF STRUCTURAL STEEL, MAINTAINING BOTTOM OF PIPE ELEVATIONS. SELECT A FOUNDATION HEIGHT FROM TABLE 6 WHICH WILL PROVIDE A PROJECTION OF 6" ABOVE NATURAL GRADE. ROCK WILL BE EXCAVATED TO SUIT. FORMWORK WILL BE USED FOR ALL CONCRETE ABOVE THE ROCK ELEVATION. CONCRETE BELOW THIS LEVEL SHALL BE POURED AND KEYED DIRECTLY INTO THE ROCK.
18. ANCHORS SHALL BE GRADE 50 BARS, 25mm DIA. GROUT ANCHORS IN DRILLED HOLES OF 100mm DIA. AND 450mm DEEP. THE ANCHOR BOLTS SHOULD BE INSTALLED IN COMPETENT ROCK AS DEFINED IN NOTE 17 .
19. THESE ANCHORS ARE FOR ABOVE GRADE INSTALLATION AND DESIGNED FOR MAXIMUM FULL THRUST FORCE AND OF 27 KIPS.
20. THIS DESIGN DRAWING SHOULD BE USED ONLY IF EXCAVATION TO DEPTHS REQUIRED BY SHEET NO. I FOR " SANDY AREAS " CAN NOT BE ACHIEVED.

REFERENCE DRAWINGS

SAUDI ARAMCO STANDARD DRAWING	AA-036531
ANCHOR BOLTS DETAIL	AB-036322
MATERIAL TAKE OFF	T/O-09800201

TYPICAL INSTALLATION DRAWING

REV. NO.	DATE	BY	JO/EWO	DESCRIPTION	CHKD.	CERT.	APPD.
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SAUDI ARABIAN OIL COMPANY

DRAWN BY: ESSD/MAQ CHECKED BY: MMD SCALE: NONE

DATE STARTED APR. 95 DATE COMPLETED APR. 95
 ADDR. REPT. _____ ENG. REPT. _____

APP'D. FOR CONST. _____

THIS DRAWING IS NOT TO BE USED FOR CONSTRUCTION OR FOR ORDERING MATERIAL UNTIL CERTIFIED AND DATED

FLOWLINE REMOVABLE ANCHOR
6"-12" PIPE
ROCKY AREAS

PLANT NO.	INDEX	DRAWING NUMBER	SHT. NO.	REV. NO.
990	L	AA-036007	002	00