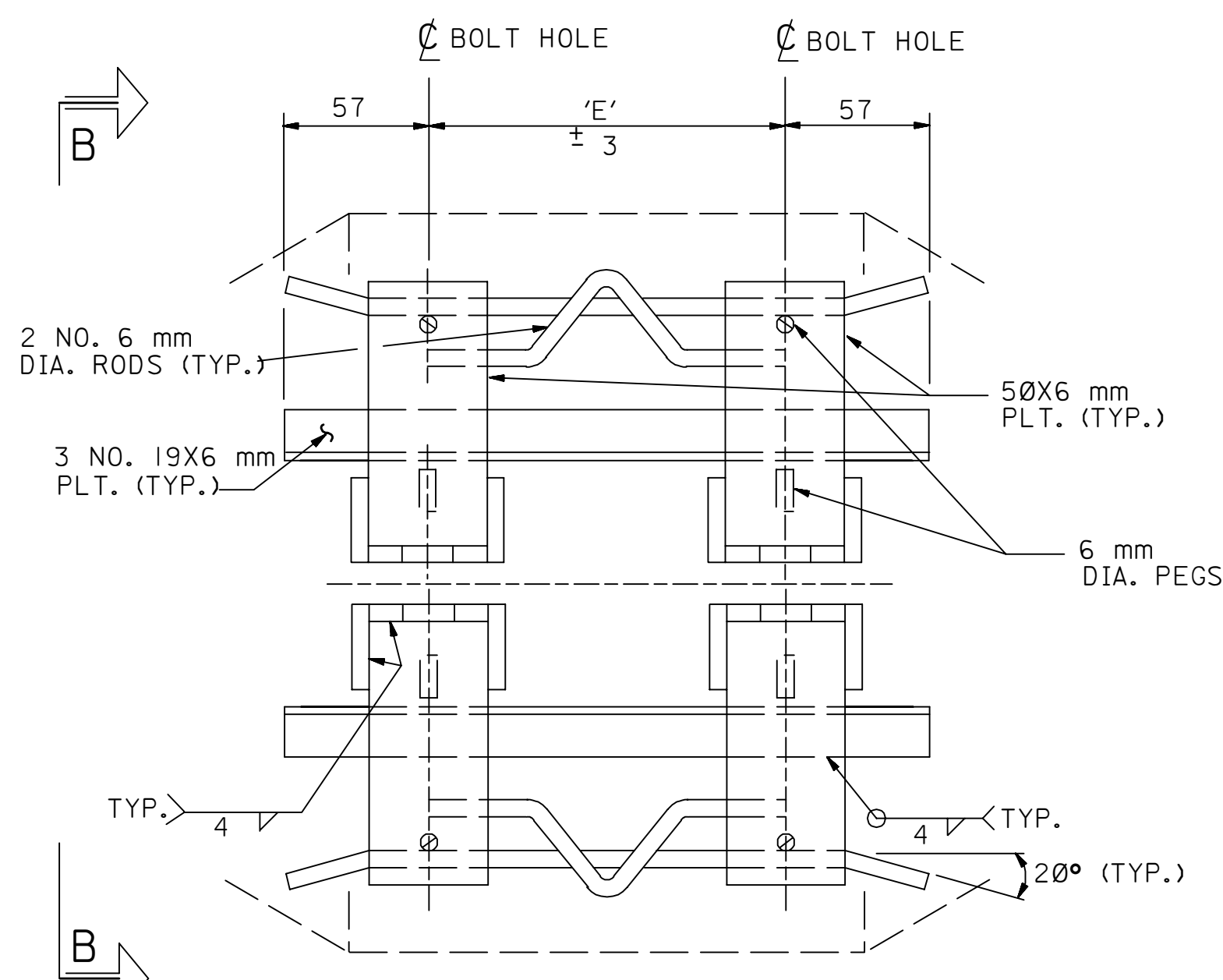
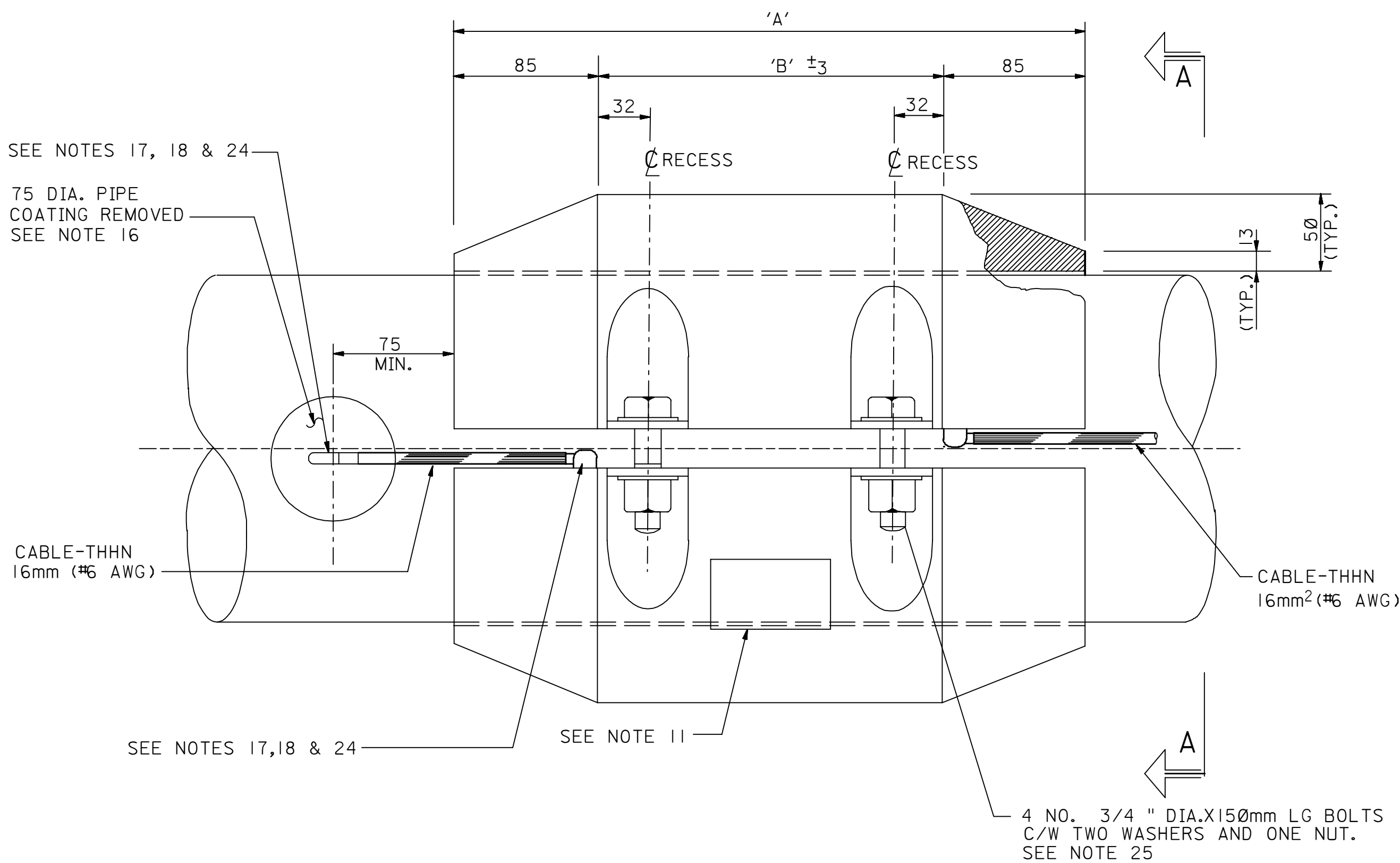
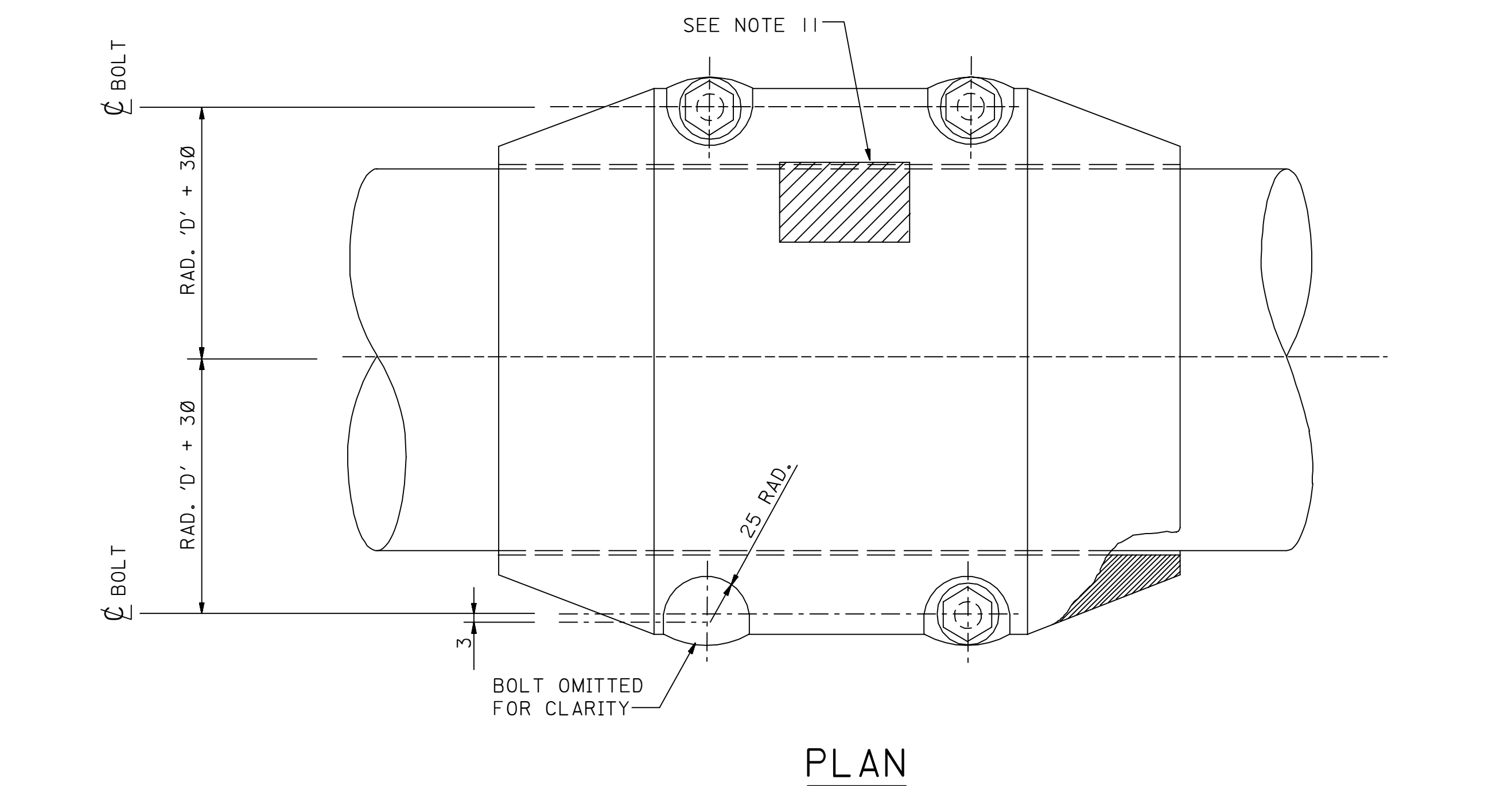
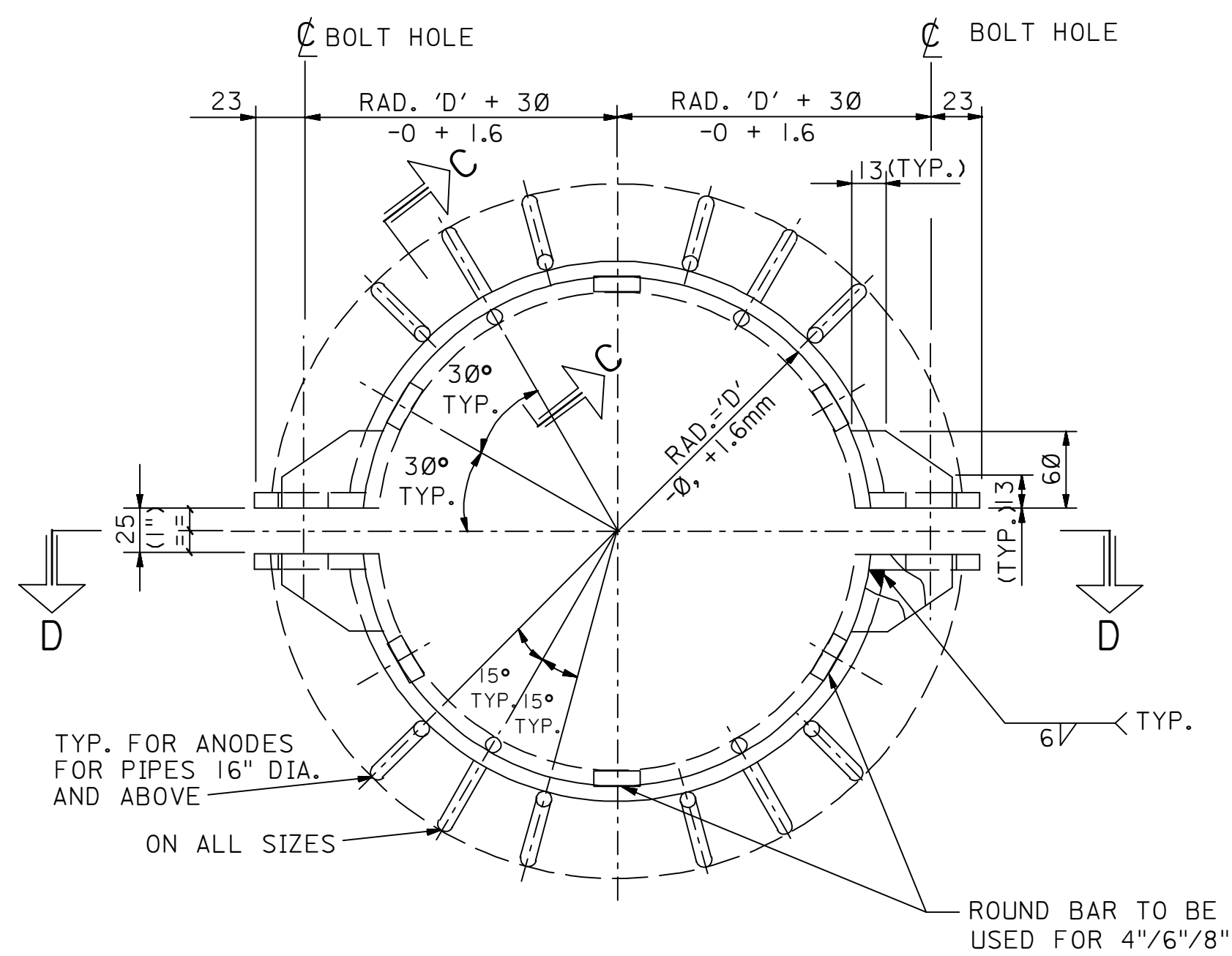
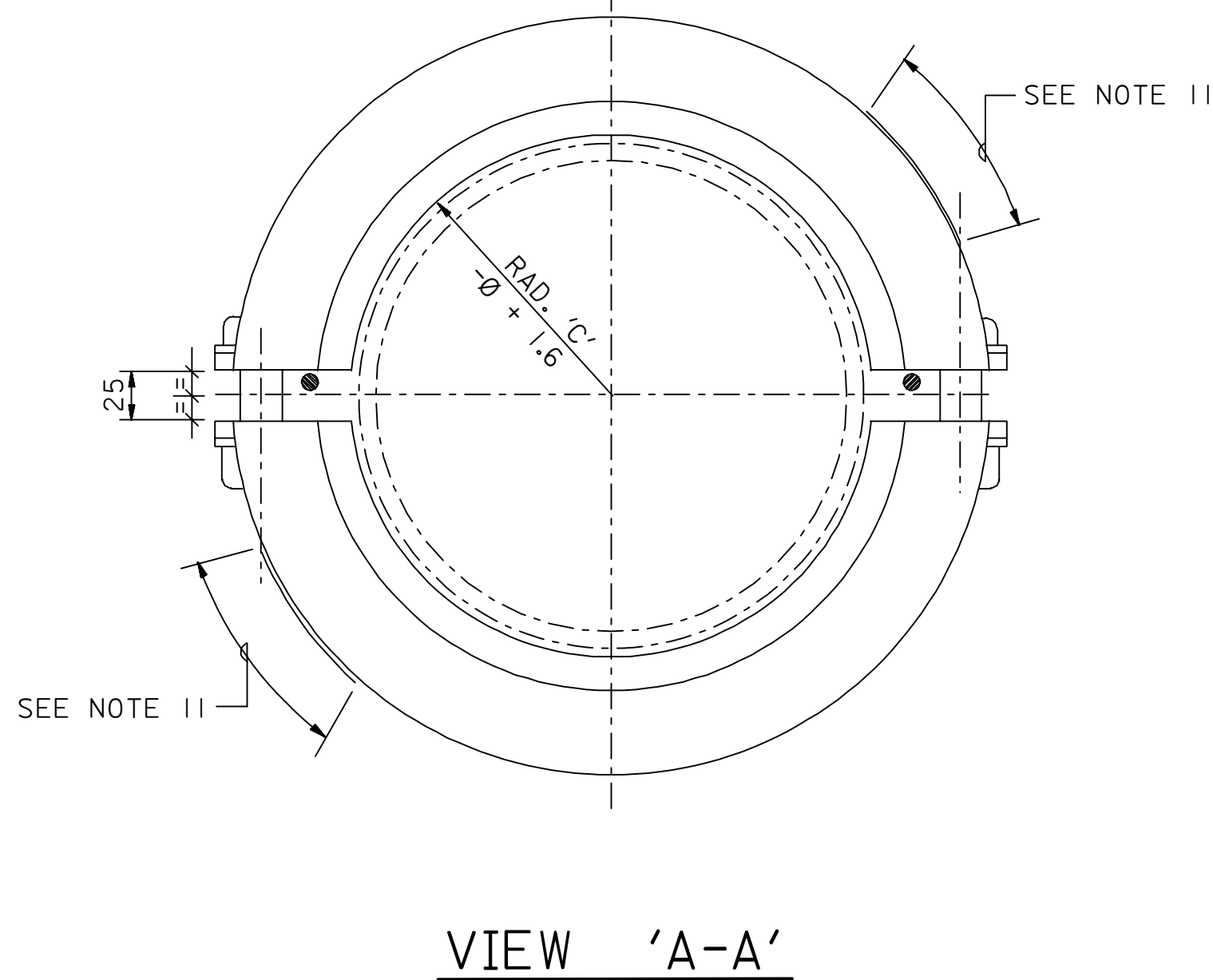
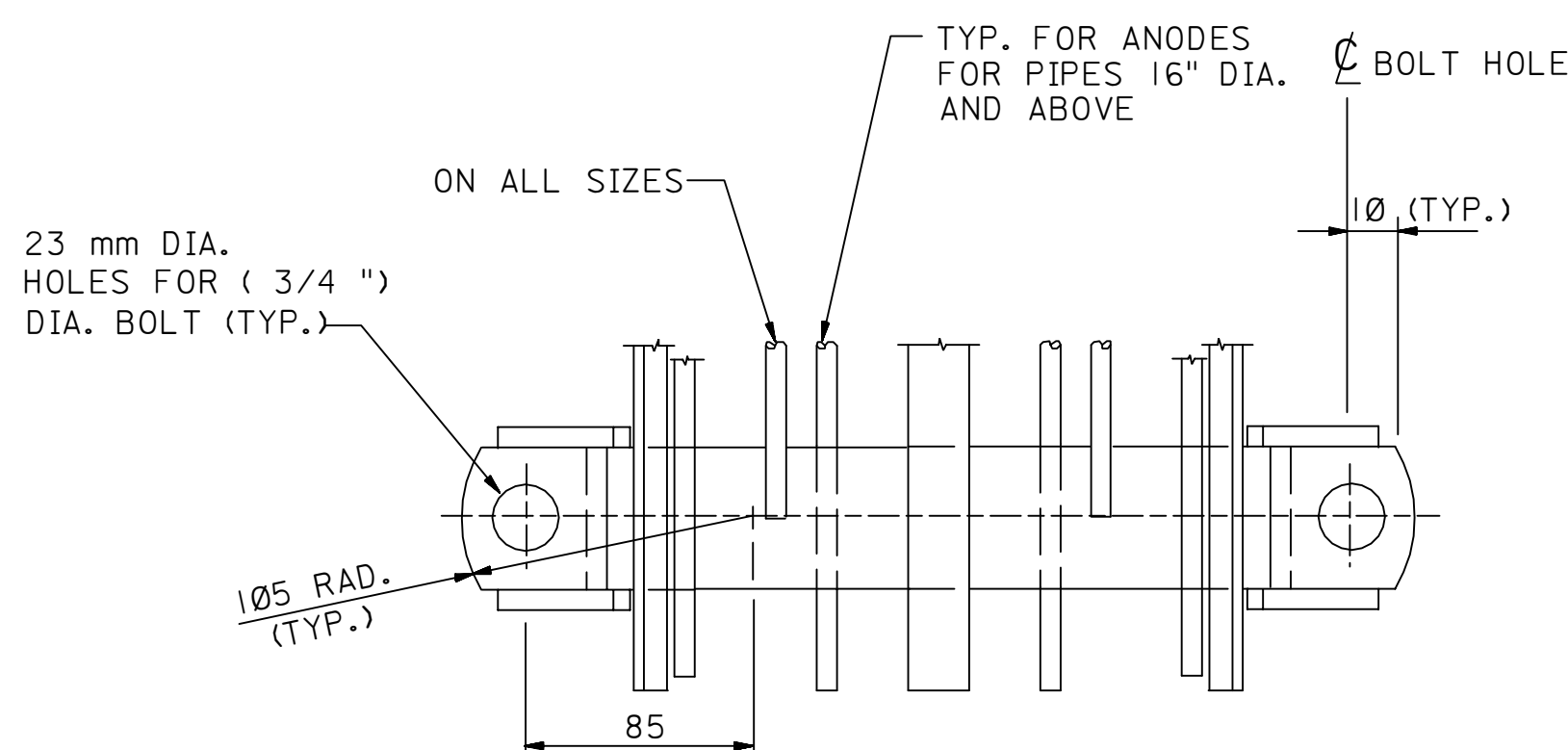




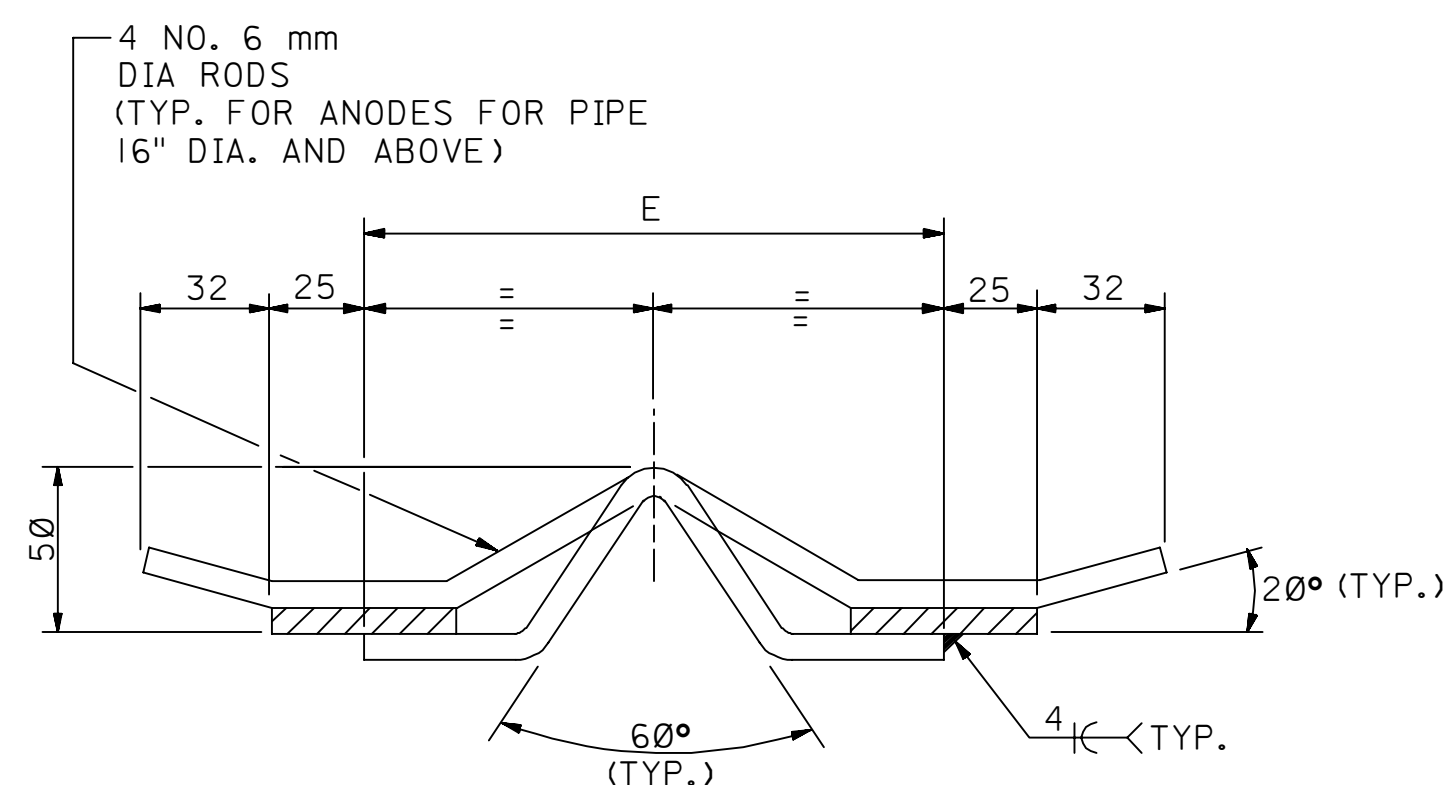
ELEVATION ON INTERNAL CAGE
SEE NOTES 5 AND 12



VIEW 'B-B'



VIEW 'D-D'



SECTION 'C-C'

TABLE-I								
PIPE SIZE	DIM. 'A'	DIM. 'B'	DIM. 'C'	DIM. 'D'	DIM. 'E'	NET WEIGHT	NOMINAL WEIGHT	STOCK NO.
4" NB	370	200	59	65	130	16 kg	24 kg	17-851-085
6" NB	370	200	86	92	130	23 kg	31 kg	17-851-090
8" NB	390	220	111	118	150	30 kg	39 kg	17-851-100
10" NB	390	220	138	144	150	36 kg	46 kg	17-851-110
12" NB	390	220	164	170	150	41 kg	51 kg	17-851-119
14" O.D.	400	230	179	186	165	50 kg	61 kg	17-851-128
16" O.D.	400	230	205	211	165	54 kg	66 kg	17-851-136
18" O.D.	400	230	230	237	165	61 kg	74 kg	17-851-143
20" O.D.	400	230	256	262	165	68 kg	82 kg	17-851-152
22" O.D.	400	230	281	287	165	75 kg	89 kg	17-851-156
24" O.D.	400	230	306	313	165	82 kg	96 kg	17-851-160
26" O.D.	400	230	332	338	165	86 kg	109 kg	17-851-168
28" O.D.	400	230	358	364	165	91 kg	116 kg	17-851-170
30" O.D.	400	230	383	389	165	95 kg	120 kg	17-851-172
32" O.D.	400	230	408	415	165	100 kg	127 kg	17-851-175
34" O.D.	400	230	434	440	165	104 kg	132 kg	17-851-178
36" O.D.	400	230	459	466	165	109 kg	138 kg	17-851-181
42" O.D.	400	230	535	542	165	129 kg	161 kg	17-851-188
46" O.D.	400	230	586	593	165	143 kg	177 kg	17-851-193
48" O.D.	400	230	612	618	165	147 kg	184 kg	17-851-196
52" O.D.	400	230	660	667	165	161 kg	204 kg	17-851-200
60" O.D.	400	230	762	768	165	186 kg	230 kg	17-851-210

NOTES:

1. DO NOT ACCEPT ANODES WITH CRACKS ON THE ANODE SURFACE EXCEEDING 2mm IN WIDTH AND GREATER THAN 15mm IN DEPTH.
2. DO NOT ACCEPT ANODES WITH MAXIMUM CRACK LENGTH IRRESPECTIVE OF WIDTH OR DEPTH EXCEEDING 25% OF DIMENSION "E" OF TABLE-1
3. INSURE THAT THE ANODE MATERIAL HAS GOOD ADHESION TO THE SURFACE OF THE CORE.
4. COAT THE INSIDE FACE OF EACH HALF, TOGETHER WITH ALL EXPOSED BARE STEEL, WITH EPOXY COAT TAR TO A MINIMUM DRY FILM THICKNESS OF 500 MICRONS.
5. USE SA2 COMMERCIAL BLAST, WHERE 2/3 OF EACH ELEMENT OF AREA IN THE WHITE METAL CONDITION. COMPLETELY REMOVE ALL FOREIGN MATTER, EXCEPT FINELY DIVIDED, ALUMINUM ALLOYS ANODES SHALL BE IN ACCORDANCE WITH 17-SAMSS-005.
6. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.
7. THE MANUFACTURER SHALL PROVIDE A SPECIFIED CHEMICAL ANALYSIS AS PART OF THE MATERIAL CERTIFICATE DERIVED FROM QUALITY CONTROL PROCEDURES.
8. ENSURE THAT THE TOLERANCES FOR ALL THE ANODE DIMENSIONS BE +/- 6mm, EXCEPT WHERE NOTED OTHERWISE.
9. ALL WELDING, WELD PEROCEDURES AND TESTING OF THE STEEL FRAMEWORK IS REQUIRED TO BE IN ACCORDANCE WITH THE CURRENT REVISION OF SAUDI ARAMCO STANDARD, SAES-W-001.
10. FABRICATOR SHALL PROVIDE BOLTS, NUTS AND WASHERS PER ANODE HALF.
11. STAMP EACH ANODE HALF WITH THE MANUFACTURERS NAME AND CHARGE NUMBER IN CLEAR LETTERING LOCATED AT A COMMON POINT ON EACH ANODE HALF.
12. CLEAN ALL EXTERNAL FACES OF ANODE HALVES AND ENSURE THAT THEY ARE FREE FORM COATINGS. DO NOT ALTER OR MACHINE THE ANODE EXTERNAL SURFACE IN ANY FORM OR MANNER.
13. AFTER THE FINAL PREPARATION OF THE CORE, PERMIT THE STEELWORK DULLING OF THE BLAST-CLEANED SURFACE. DO NOT PERMIT DISCOLORATION AND VISIBLE SURFACE CONTAMINATION.
14. INSTALL ANODE AT THE CENTER OF THE PIPE JOINT AFTER PIPE COATING AND BEFORE CONCRETE WEIGHING WHEN REQUIRED. HOWEVER, IF WEIGHT COAT IS BY "COMPRESSION COAT" METHOD, INSTALL ANODE AFTER WEIGHT COATING.
15. USE TWO "COME ALONGS" TO MOUNT THE TWO HALVES OF THE ANODE ASSEMBLY AROUND THE PIPE, THEN BOLT THE TWO HALVES TOGETHER.
16. FOR THERMITE WELDING CABLE CONNECTIONS, REMOVE PIPE COATING FROM A 75mm DIAMETER AREA BY SCRAPING AND WIRE BRUSHING SURFACE TO OBTAIN A SA2 FINISH.
17. DURING ANODE INSTALLATION, THERMITE WELD COPPER CABLES TO ANODE STEEL FRAME AND TO PIPELINE.
18. USE APCS-19B TO COAT THE SURFACES OF ALL EXPOSED STEEL AND COPPER.
19. FINISH THE CONCRETE COATING WITHIN 77mm EITHER SIDE OF ANODE. USE MEGGER TESTING TO ENSURE THAT THE ANODE IS ELECTRICALLY ISOLATED FROM THE CONCRETE WIRE MESH REINFORCEMENT.
20. USE TAPERED TYPE BRACELET ANODES ON ALL PIPELINES WITH OR WITHOUT CONCRETE COATING.
21. DURING THE OFFSHORE INSTALLATION, ALLOW A MAXIMUM SPACING OF 150 meter BETWEEN BRACELET ANODES FOR ALL SIZES.
22. LOCATE THE FIRST ANODE NO FURTHER THAN ONE HALF THE SPACING DISTANCE, 75 METERS MAXIMUM FOR THE RISER FLANGE ON EACH PIPELINE, OR FOR THE SHORELINE.
23. FOR PIPES COATED WITH FUSION BONDED EPOXY (FBE) OR POLYETHYLENE, PLACE A 3mm THICK SHEET OF RUBBER BETWEEN THE ANODE AND THE COATED PIPE, OR WRAP THE AREA WITH SERVIRAP TYPE: TWO ONE-HALF LAB LAYERS.
24. TEST ALL CABLES WITH AN IMPACT TEST OF 13.6J (10FT. LBS.) TO ENSURE PROPER ATTACHMENT TO THE ANODE AND PIPE.
25. USE CADMIUM PLATED BOLTS, NUTS AND WASHERS. TACK WELD NUTS TO BOLTS AFTER INSTALLATION.

REFERENCE DRAWINGS

THERMITE WELD INSTALLATION PROCEDURE	AA-036381
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DRAWING RESPONSIBILITY:
CATHODIC PROTECTION STANDARDS COMMITTEE

06	NOV99	EDSD WED	GENERAL REVISION						
05	JULY95	ESSD CAN	REVISED NOTES 17 & 22 AND CHANGED TYPICAL INSTALLATION DRAWING TO MANDATORY DRAINING.			ORIGINAL SIGNED	ORIGINAL SIGNED	ORIGINAL SIGNED	
04	DEC93	ESSD CAN	REVISED NOTES 9,14, 17 & 19 AND ELEVATION DETAIL.			ORIGINAL SIGNED	ORIGINAL SIGNED	ORIGINAL SIGNED	
03	JULY87	ESSD RLO	REVISED, ADDED PIPE SIZE FROM 26" TO 40" AND STOCK NO. ON LIST OF MATERIALS.			ORIGINAL SIGNED	ORIGINAL SIGNED	ORIGINAL SIGNED	
REV. NO.	DATE	BY	JO/EWO	DESCRIPTION			CHKD.	CERT.	APP

SAUDI ARABIAN OIL COMPANY

DRAWN BY HC CHECKED BY _____ SCALE: _____

DATE STARTED _____ DATE COMPLETED _____ DEC. 80

OPR'G. DEPT. _____ ENG. DEPT. _____

APP'D. FOR CONST. _____

THIS DRAWING IS NOT TO BE USED FOR CONSTRUCTION OR FOR ORDERING

CATHODIC PROTECTION
OFFSHORE BRACELET ANODE

STD. DWG.

PLANT NO.	INDEX	DRAWING NUMBER	SHT. NO.	REV. NO.
990	X	AA-036335	001	06