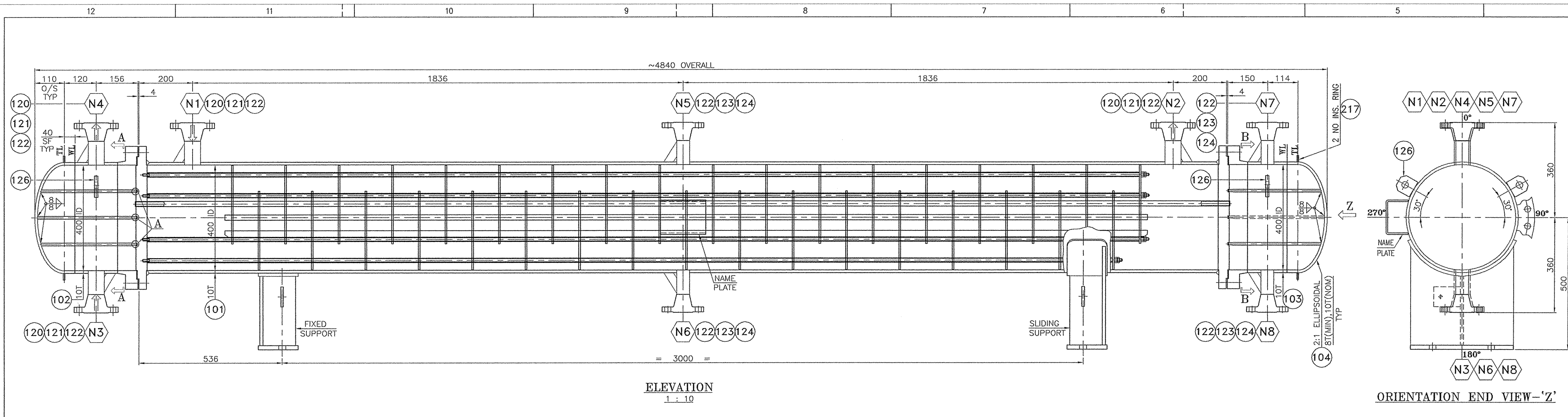
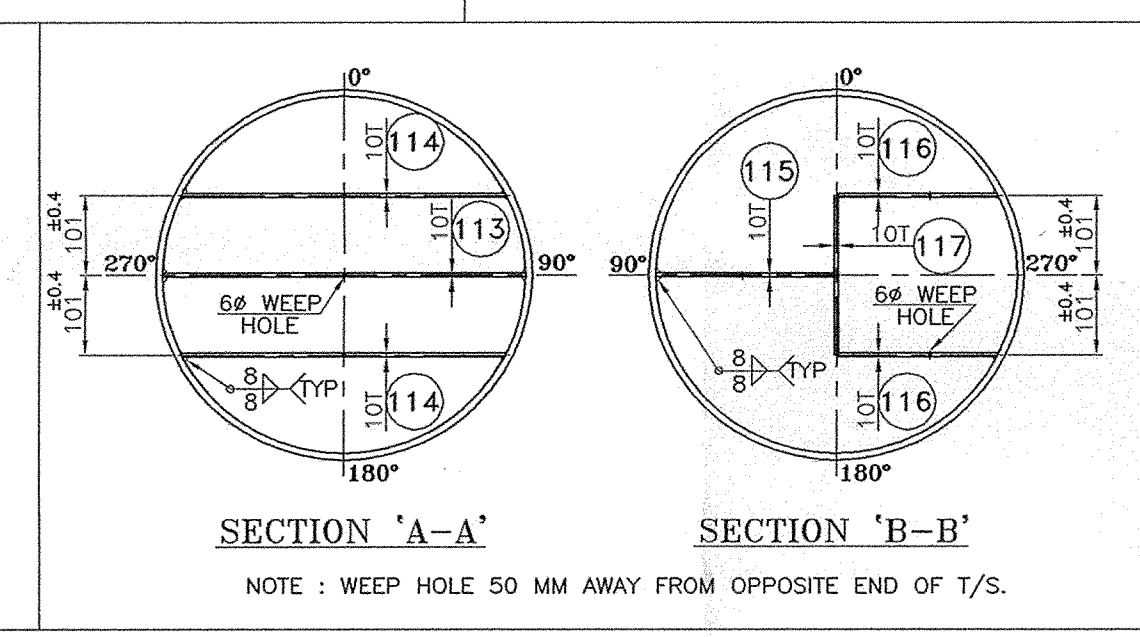
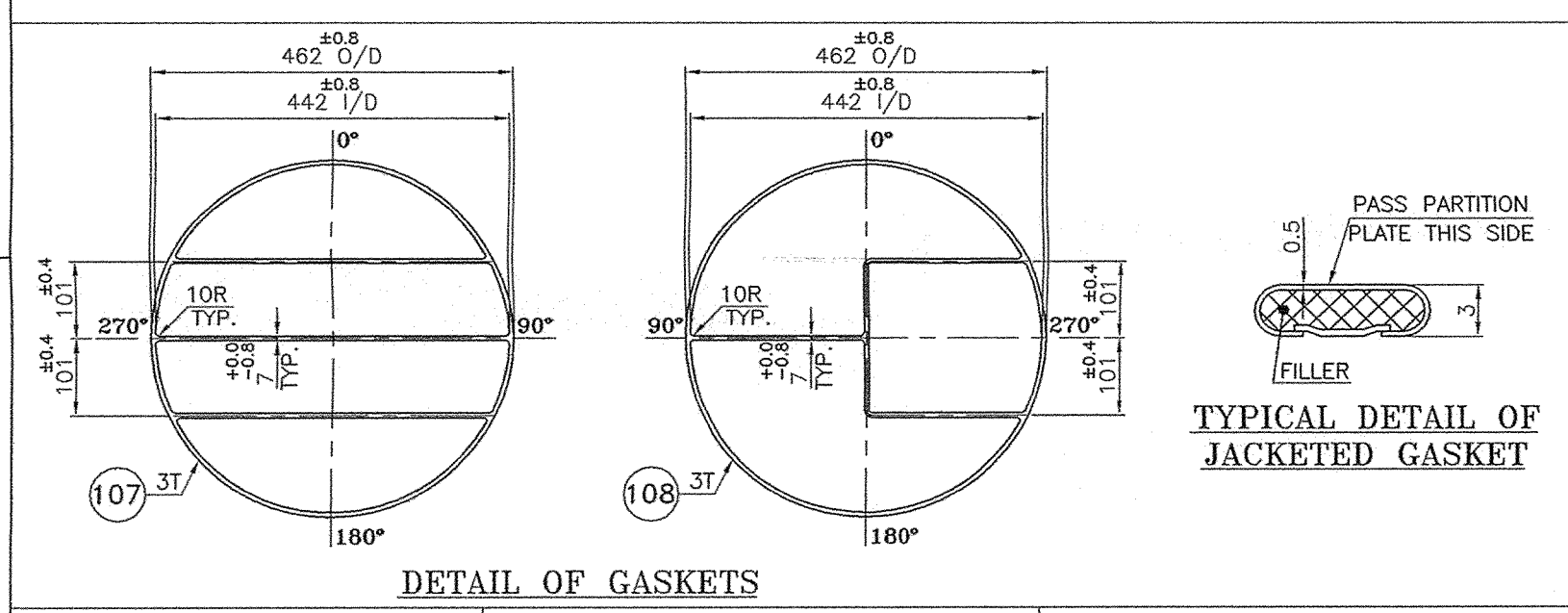
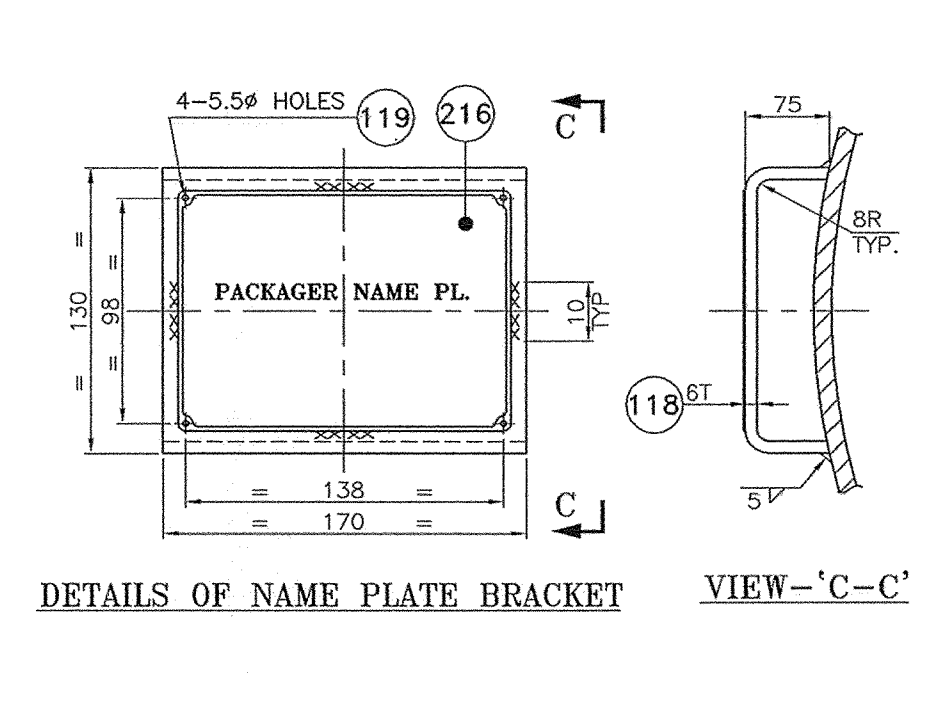
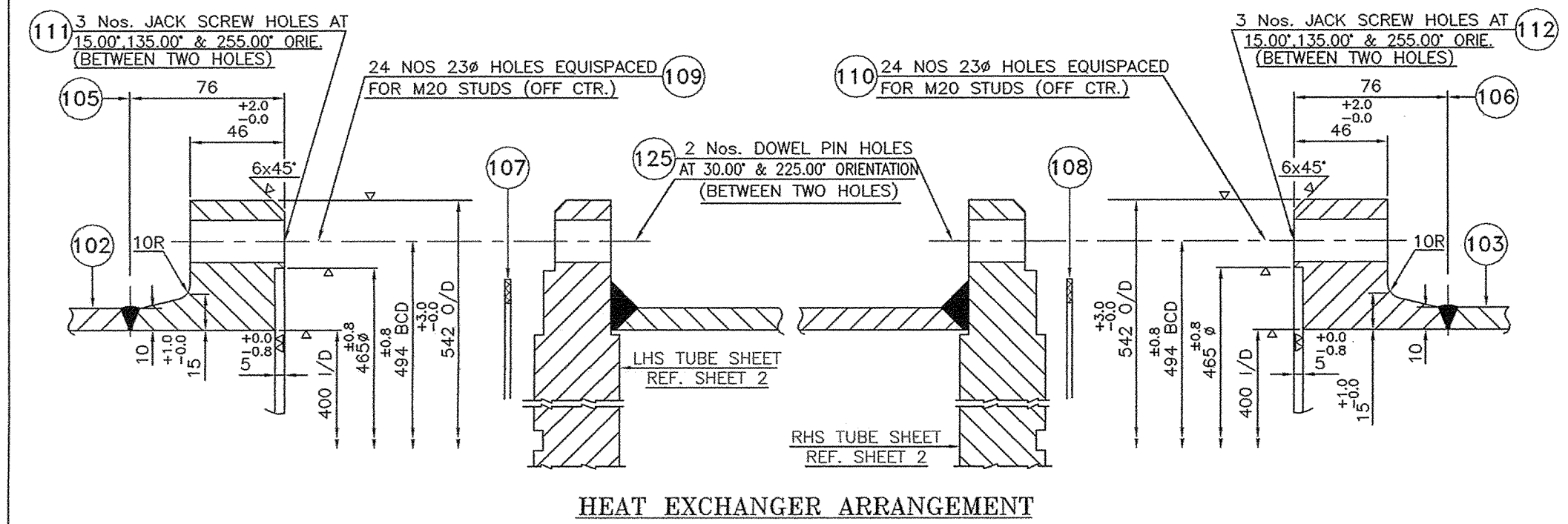


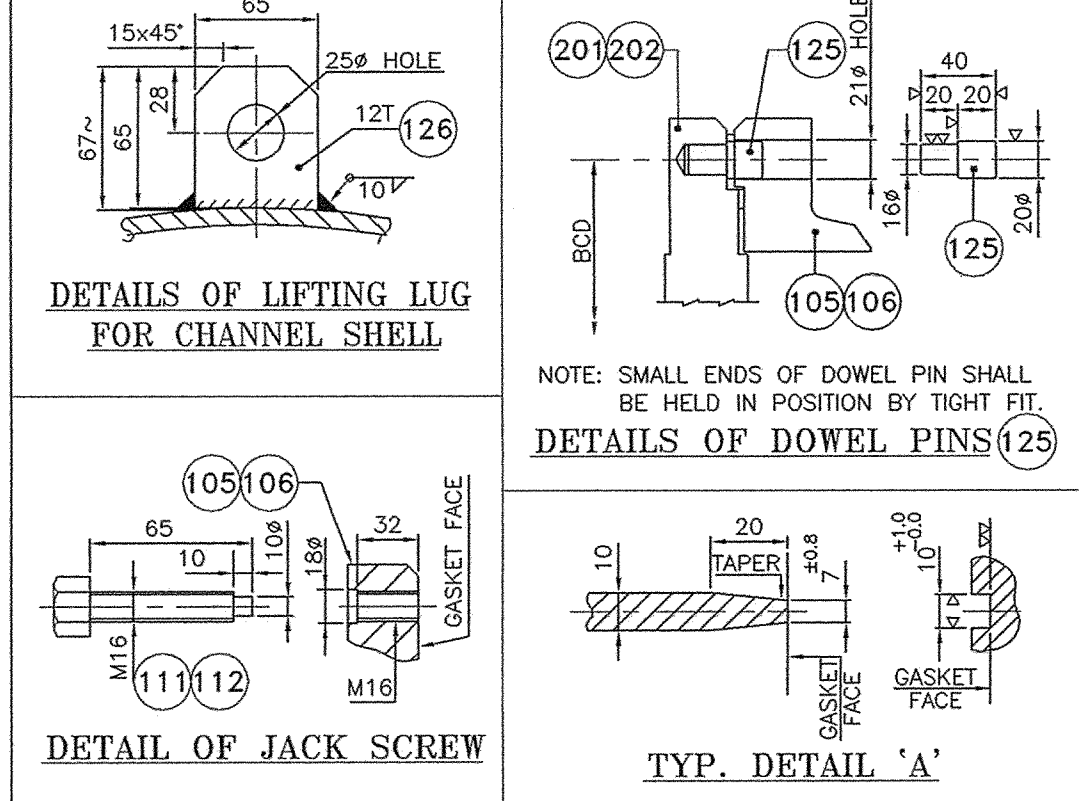
**GENERAL ASSEMBLY & DETAILS
FOR
LUBE OIL COOLER**



DESIGN DATA			
1	DESIGN & MANUFACTURING CODE	ASME SEC. VIII DIV.-1 EDITION 2007 + ADD 2009	
2	TEMA TYPE	TEMA (NINTH EDITION) CLASS R	
3	CODE STAMP	HORIZONTAL - BEM	
4	LETHAL SERVICE	NO	
		SHELL SIDE	CHANNEL SIDE
5	PROCESS FLUID	LUBE OIL	WATER
6	DESIGN PRESSURE INTERNAL	Kg/cm ² g	25.70
7	DESIGN PRESSURE EXTERNAL	Kg/cm ² g	20.60
8	DESIGN TEMPERATURE	°C	-45 / 130
9	OPERATING PRESSURE INTERNAL	Kg/cm ² g	25.169
10	OPERATING PRESSURE EXTERNAL	Kg/cm ² g	20.60
11	OPERATING TEMPERATURE (IN / OUT)	°C	100.28 / 50.00
12	PRESSURE DROP (ALLOWED / ACTUAL)	Kg/cm ² g	0.300 / 0.168
13	MDMT	°C	-45
14	MEAN METAL TEMPERATURE	°C	68.57
15	RADIOGRAPHY (SHELL / D'END)	100%	100%
16	JOINT EFFICIENCY (SHELL / D'END)	1.00 / 1.00	1.00 / 1.00
17	CORROSION ALLOWANCE	mm	3.0
18	NO. OF PASSES	g	1
19	HYDRO TEST PRESSURE (AT TOP)	Kg/cm ² g	26.78
20	PNEUMATIC TEST PRESSURE	Kg/cm ² g	29.37
21	TEST TEMPERATURE (MIN)	°C	20
22	POST WELD HEAT TREATMENT	NO	20
23	POST FORMING HEAT TREATMENT	NO	YES, SR FOR D'END
24	IMPACT TESTING REQUIRED	YES (NOTE-16)	YES (NOTE-16)
25	DENSITY (IN / OUT)	Kg/M ³	934.5 / 961.4
26	INSULATION THICKNESS	mm	25 (MINERAL WOOL)
27	SURFACE AREA PER UNIT (GROSS / EFFECTIVE)	M ²	39.67 / 39.08
28	HEAT DUTY	kCal/Hr	219853
29	EMPTY WEIGHT	Kg	~1890
30	TEST WEIGHT	Kg	~1971
31	TUBE BUNDLE WEIGHT	Kg	~940
32	OPERATING WEIGHT	Kg	~2340
33	INSPECTION	AS PER APPROVED OAP, BY TPI	



FINAL "AS BUILT" DRAWING.



APPLICABLE EIL SPECIFICATIONS				
NO.	STD. NO.	DESCRIPTION	REV	
1	6-36-0014	STANDARD SPECIFICATION FOR REFRIGERATION PLANT	3	
2	6-81-0001	STANDARD SPECIFICATION FOR PMI AT SUPPLIER'S WORKS	1	
3	6-81-0011	INSPECTION AND TEST PLAN FOR PRESSURE VESSELS/COLUMNS CARBON STEEL	1	
4	6907-0642-PT-107	UTILITY AND SITE DATA	B	
5	6907-0642-PT-107	JOB SPECIFICATION FOR SHOP & FIELD PAINTING FOR BCP, ASSAM	0	
6	15-0001	GENERAL SPECIFICATION FOR HEAT EXCHANGERS	3	
7	6-15-0003	STANDARD SPEC. FOR WELDED TUBE TO TUBESHEET JOINTS	2	
8	6-15-0021	STANDARD SPECIFICATION FOR VENDOR DESIGNED S&T HEAT EXCHANGERS	3	
9	6-12-0011	STANDARD SPECIFICATION FOR BOILER QUALITY CS PLATES	5	
10	6-15-0091	STANDARD SPECIFICATION FOR HARDNESS REQUIREMENT	1	
11	7-15-0001	PART DETAILS	2	
12	7-15-0002	TYPES OF NON STD. GASKETS	2	
13	7-15-0009	METHODS OF FASTENING NUTS TO THE RODS	2	
14	7-15-0010	JACK SCREW TAPPING AND ARRANGEMENT	2	
15	7-15-0011	FIXING DETAIL OF DOWEL PINS	2	
16	7-15-0013	LIFTING LUG DETAIL	2	
17	7-15-0016	EARTHING LUG	2	
18	7-15-0017	NAME PLATE (S&T TYPE EXCH.)	2	
19	7-15-0019	TOLERANCES FOR SHELL & TUBE HEAT EXCHANGERS	2	
20				

EXTERNAL LOADS ON NOZZLES				
LOAD	UNIT	N1,N2	N3,N4	
F _A	KG	135	135	
F _C	KG	200	200	
F _L	KG	200	200	
M ₀	KG-M	30	30	
M ₁	KG-M	40	40	
M ₂	KG-M	50	50	

- ### GENERAL NOTES
- ALL DIMENSIONS ARE IN MM EXCEPT OTHERWISE STATED.
 - WELD SEAMS OF FORMED HEADS SHALL BE 100% RADIOGRAPHED AFTER FORMING AND HEAT TREATMENT, IF ANY.
 - ALL NOZZLE NECKS FABRICATED FROM PLATE SHALL BE 100% RADIOGRAPHED.
 - FOR NOZZLE ON SHELL, PROJECTIONS ARE MEASURED FROM EQUIPMENT C.L. AND FOR NOZZLES ON D'END PROJECTIONS ARE MEASURED FROM T.L. TO FLANGE CONTACT FACE, UNLESS OTHERWISE SPECIFIED.
 - ALL REINFORCING PADS SHALL BE AIR TESTED AT PRESSURE OF 1.25 Kg/cm² g WITH SOAP SOLUTION.
 - TELL TALE HOLES IN THE REINFORCING PADS SHALL BE PLUGGED WITH HARD GREASE AFTER TESTING.
 - THREADS ON EXTERNAL BOLTING, PLUGS ETC. SHALL BE COATED WITH ANTI-GALLING AGENT BEFORE INSTALLATION.
 - ALL SHARP EDGES & CORNERS OF NOZZLES, FITTINGS ETC. SHALL BE ROUNDED OFF INSIDE THE SHELL/DISH ENDS.
 - ALL BOLT HOLES TO STRADDLE MAIN C.L. OF EQUIPMENT UNLESS OTHERWISE SHOWN.
 - ALL WELDS ON PRESSURE PARTS NOT SUBJECTED TO RADIOGRAPHY SHALL BE D.P. TESTED.
 - ALL WELDS ACCESSIBLE FROM SECOND SIDE SHALL BE GROUND/CHIPPED BACK TO SOUND METAL & THEN WELDED.
 - ALL SINGLE SIDE WELDS TO BE INITIATED WITH T.I.G. USING INERT GAS PURGING.
 - NOZZLE FLANGE GASKET SEATING FACE SHALL HAVE SMOOTH FINISH TO 125 TO 250 ARH.
 - ALL NOZZLES OF SIZE 50 NB & BELOW SHALL BE STIFFENED WITH FLAT (2 NOS.) 6 THK x 30 W. @ 90° APART.
 - SURFACE PREPARATION & PAINTING :
 - SURFACE PREPARATION : BLAST CLEAN TO SSPC-SP-10.
 - PRIMER : ONE COAT OF INORGANIC ZINC SILICATE COATING - TWO PACK AIR DRYING SELF CURING SOLVENT BASED INORGANIC ZINC SILICATE COATING WITH MINIMUM 80% ZINC CONTENT ON DRY FILM. THE FINAL CURE OF THE DRY FILM SHALL PASS THE MEK RUB TEST. @65 TO 75 MICRONS DFT/COAT.
 - FINISH PAINT : TWO COATS OF POLYAMINE CURED COAL TAR EPOXY - SPECIALLY FORMULATED CURED COAL TAR EPOXY SUITABLE FOR APPLICATION UNDER INSULATION. @125 MICRONS DFT/COAT = 2x125 = 250 MICRONS DFT.OR
THREE COATS OF TWO COMPONENT EPOXY PHENOLIC COATING CURED WITH POLYAMINE ADDUCT HARDENER SYSTEM - TWO PACK AMBIENT TEMPERATURE CURING EPOXY PHENOLIC COATING SYSTEM SUITABLE FOR APPLICATION UNDER INSULATION OF CS/SS PIPING @80 MICRONS DFT/COAT = 3x80 = 240 MICRONS DFT.
TOTAL : 315 TO 325 MICRONS DFT OR 305 TO 315 MICRONS DFT.
 - R.F. PADS, INTERNALS, TRAYS, SUPPORT RINGS, CLEATS ETC. SHALL PREFERABLY BE AWAY FROM MAIN SEAMS, IN CASE, IT IS UNAVOIDABLE THE MAIN SEAM PORTION COMING UNDER THE ATTACHMENT PLUS 150 MM LENGTH ON BOTH SIDES SHALL BE GROUND FLUSH, FULLY RADIOGRAPHED & D.P. EXAMINED BEFORE WELDING OF ANY SUCH ATTACHMENT.
 - ALL LTCS MATERIAL SHALL BE IMPACT TESTED AT MDMT AS PER SA 20 OF ASME.
 - CARBON CONTENT SHALL BE LIMITED TO 0.23% MAX.
 - EQUIPMENT SHALL BE FILLED WITH N2 AT 0.25 Kg/cm² g BEFORE DESPATCH.
 - "I" DENOTES MATCH MARK FOR ASSEMBLY & SHALL BE PUNCHED ON ALL MATCHING PARTS.
 - TUBE SHEET PADS SHALL BE FLAT WITHIN ±1.5mm (CAMBER).
 - 100% RADIOGRAPHY REQUIRED FOR ALL BUTT WELDED JOINTS.
 - READ "SA 516 GR 70" AS "LTCS SA 516 GR 70".

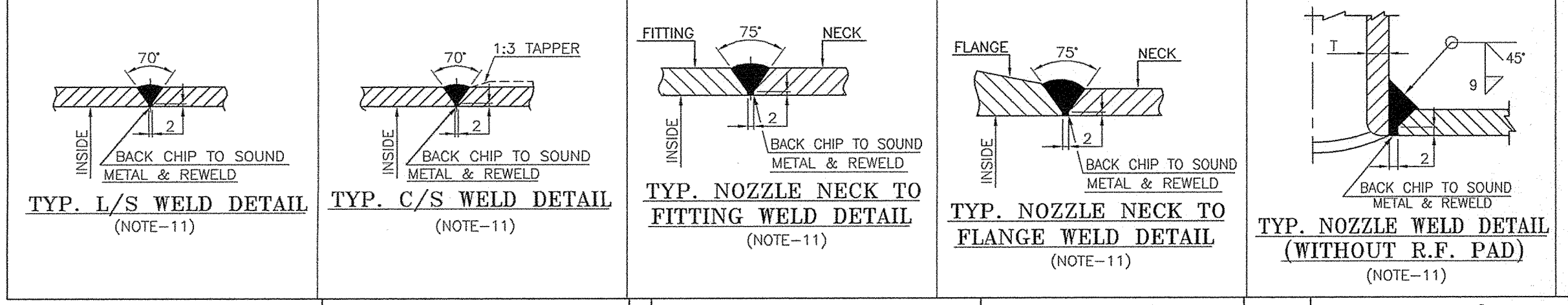
SS316 JACKETED GRAPHITE FILLED					
NO.	DESCRIPTION	QTY	MATERIAL	SIZE	REMARKS
127	LIFTING LUG	4	SA 516 GR 70	12T x 65 W x 67 L	2
125	DOWEL PIN	4	MS	20# x 40 L	FINISH SIZE
124	FLANGE	N5,N6,N7,N8	SA 350 GR LF2 CL1	40 NB x SCH 160 x 300# WNR	13 ASME B16.5
123	NOZZLE NECK	N5,N6,N7,N8	SA 333 GR 6	40 NB x SCH 160 x 105 L	3
122	STIFFENERS	N1 TO N8	SA 516 GR 70	6T x 30 W x 'L' AS REQD.	8
121	FLANGE	N1,N2,N3,N4	SA 350 GR LF2 CL1	50 NB x SCH 160 x 300# WNR	15 ASME B16.5
120	NOZZLE NECK	N1,N2,N3,N4	SA 333 GR 6	50 NB x SCH 160 x 105 L	5
119	RIVET	4	ALUMINUM	5# x 20 L	
118	NAME PLATE BRACKET	1	SA 516 GR 70	6T x 282 DEV.L x 170 W	2
117	PARTITION PLATE	1	SA 516 GR 70	10T x 202 W x 359 L	6
116	PARTITION PLATE	2	SA 516 GR 70	10T x 165 W x 344 L	9
115	PARTITION PLATE	1	SA 516 GR 70	10T x 195 W x 359 L	5
114	PARTITION PLATE	2	SA 516 GR 70	10T x 339 W x 356 L	19
113	PARTITION PLATE	1	SA 516 GR 70	10T x 400 W x 371 L	12
112	JACK SCREW (RHS)	3	SA 320 GR L7	M16 x 65 L	SEE DETAIL
111	JACK SCREW (LHS)	3	SA 320 GR L7	M16 x 65 L	SEE DETAIL
110	STUDS+2 NUTS (RHS)	24	SA 320 GR L7/SA 194 GR 7	M20 x 140 L	12 FULL THRD.
109	STUDS+2 NUTS (LHS)	24	SA 320 GR L7/SA 194 GR 7	M20 x 140 L	12 FULL THRD.
108	GASKET (RHS)	1	##	3T x AS PER DETAIL	
107	GASKET (LHS)	1	##	3T x AS PER DETAIL	
106	CHANNEL FLANGE (RHS)	1	SA 350 GR LF2 CL1	AS PER DETAIL	42
105	CHANNEL FLANGE (LHS)	1	SA 350 GR LF2 CL1	AS PER DETAIL	42
104	CHANNEL D'END	2	SA 516 GR 70	10T x 570 BD	40
103	CHANNEL SHELL (RHS)	1	SA 516 GR 70	10T x 1288 DEV.L x 148 W	15
102	CHANNEL SHELL (LHS)	1	SA 516 GR 70	10T x 1288 DEV.L x 160 W	16
101	MAIN SHELL	1	SA 516 GR 70	10T x 1288 DEV.L x 4014 W	406

OWNER : BCP, LAPETKATA
PROJECT : BRAHMAPUTRA PETROCHEMICAL COMPLEX PROJECT
UNIT : 220 KTA-LLDPE/HDPE
EIL JOB NO. : 6907

BRAHMAPUTRA CRACKER AND POLYMER LIMITED

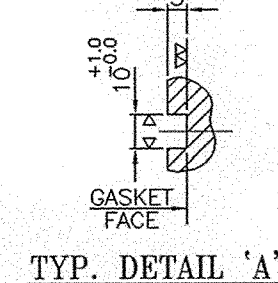
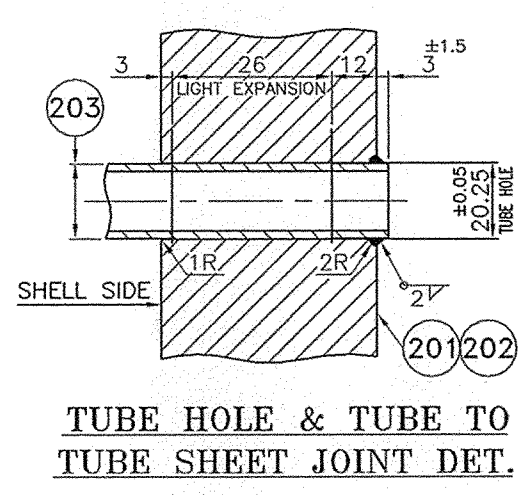
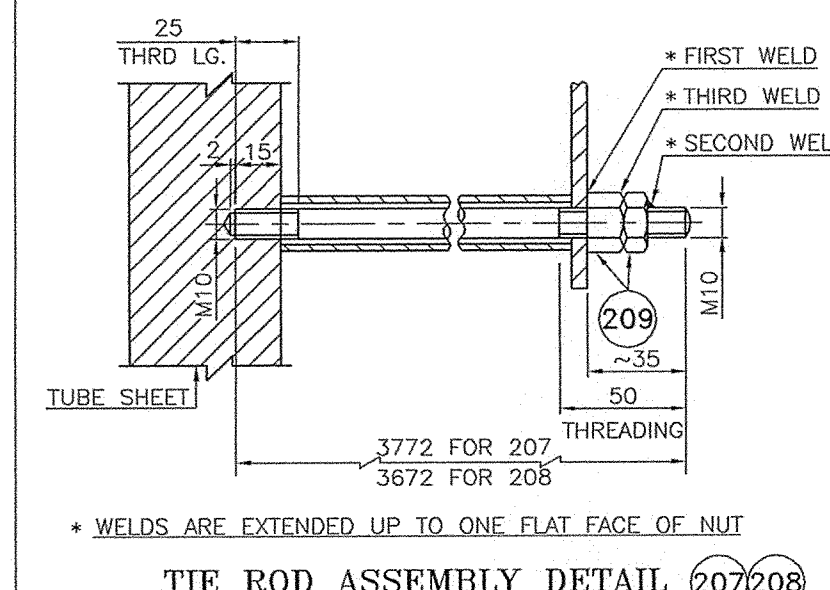
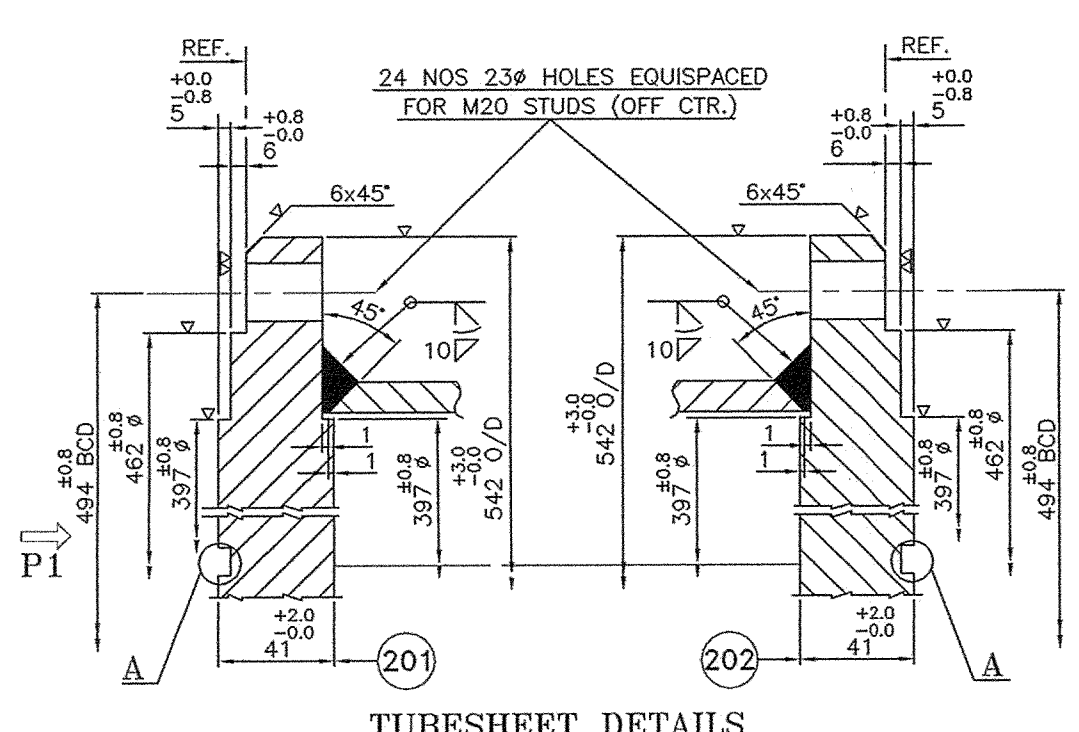
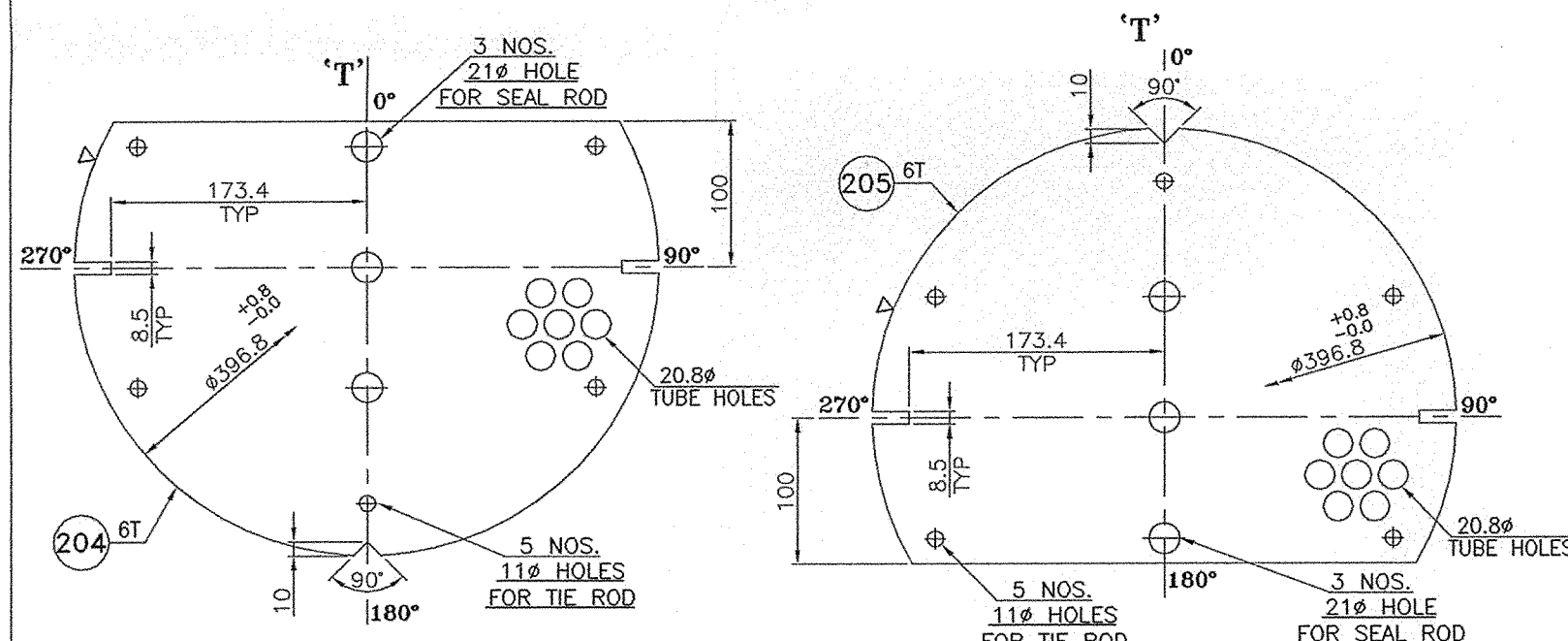
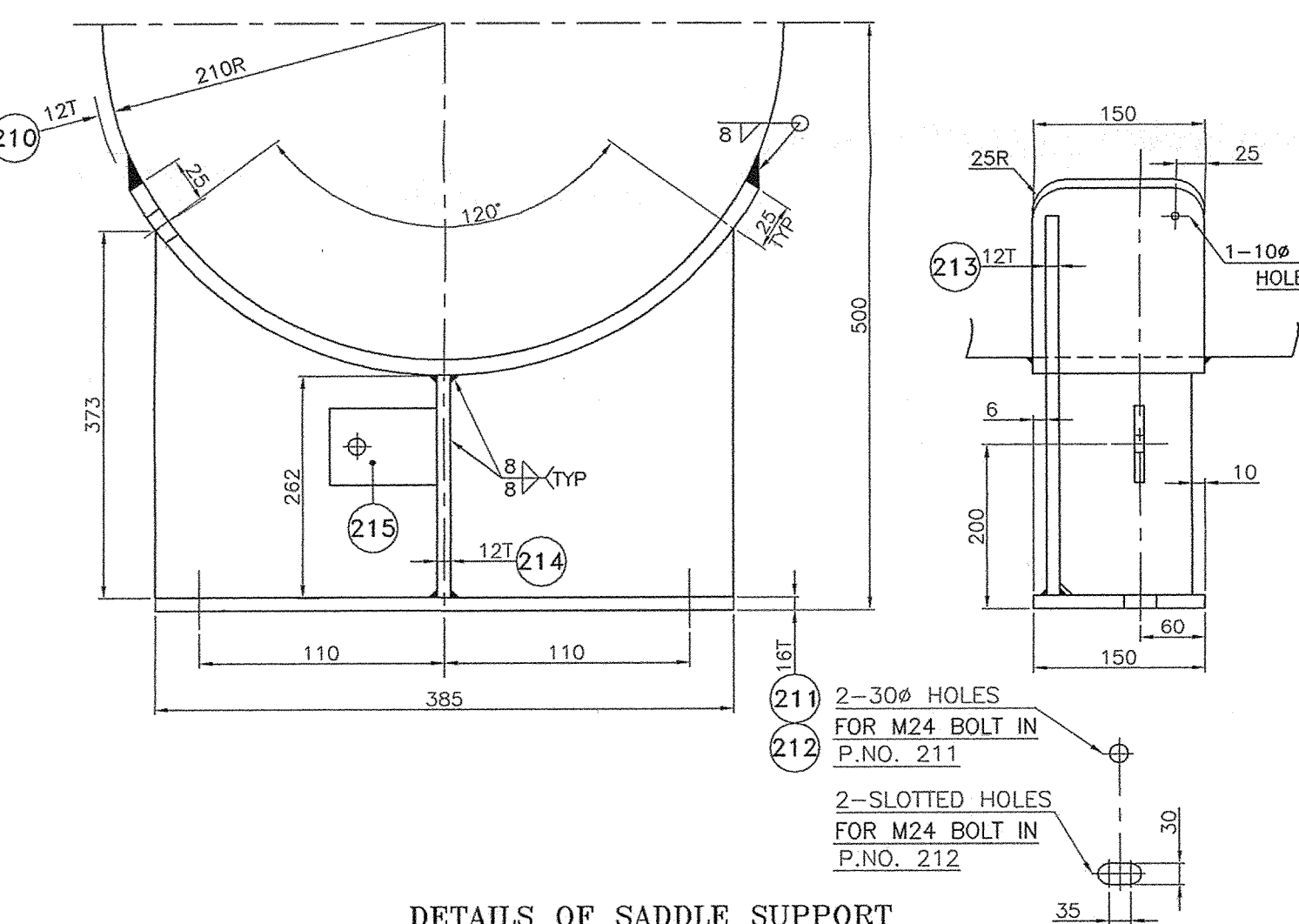
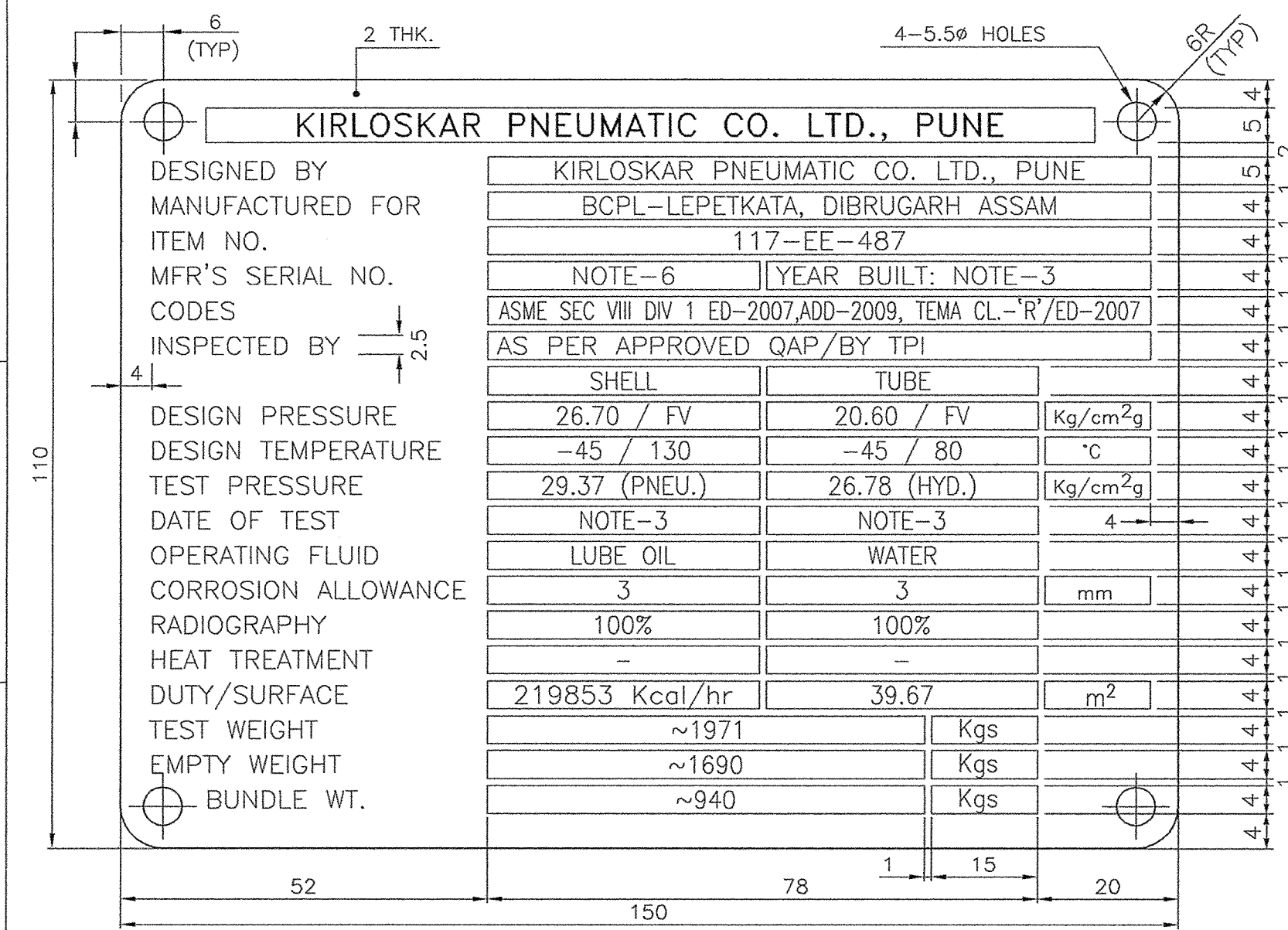
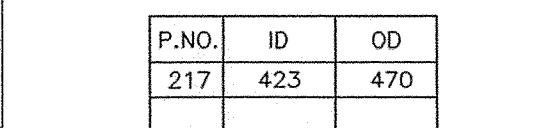
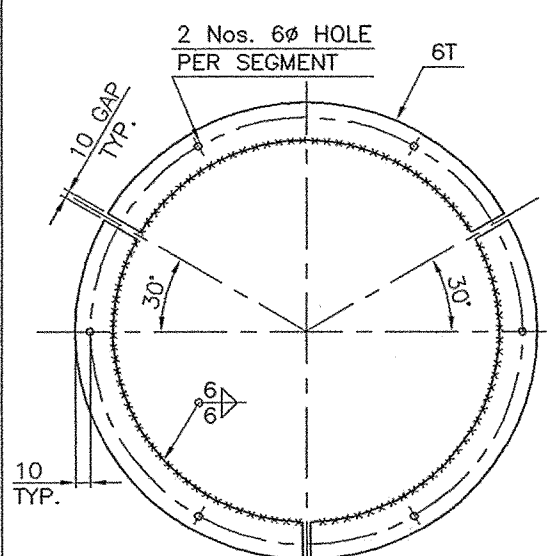
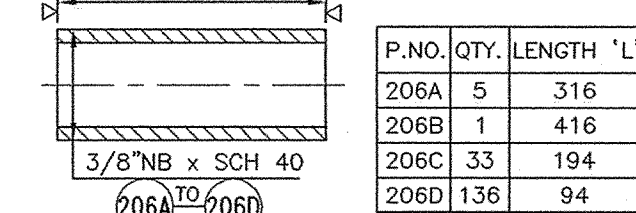
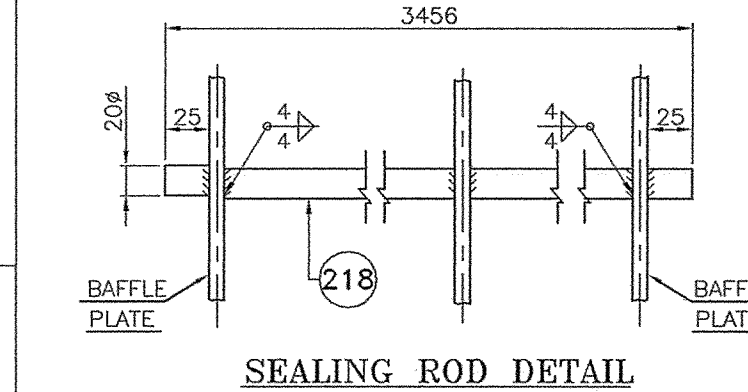
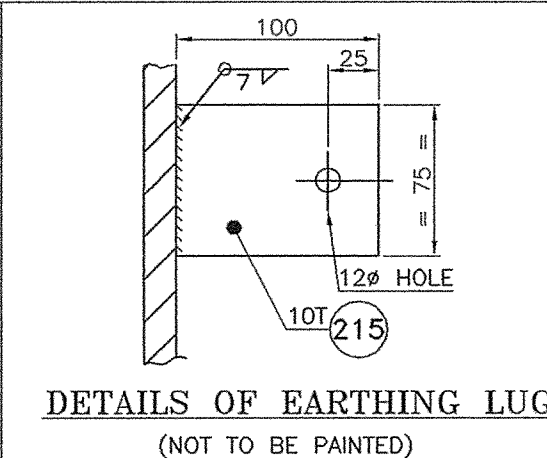
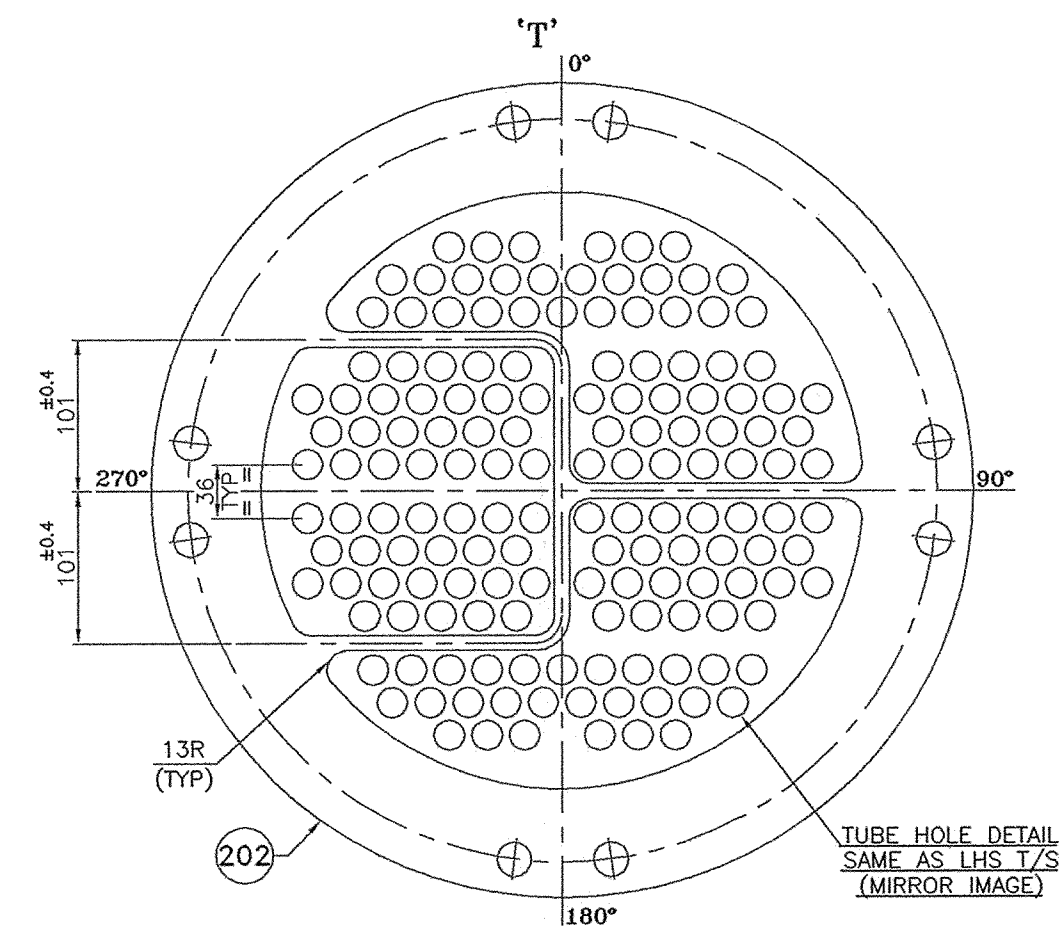
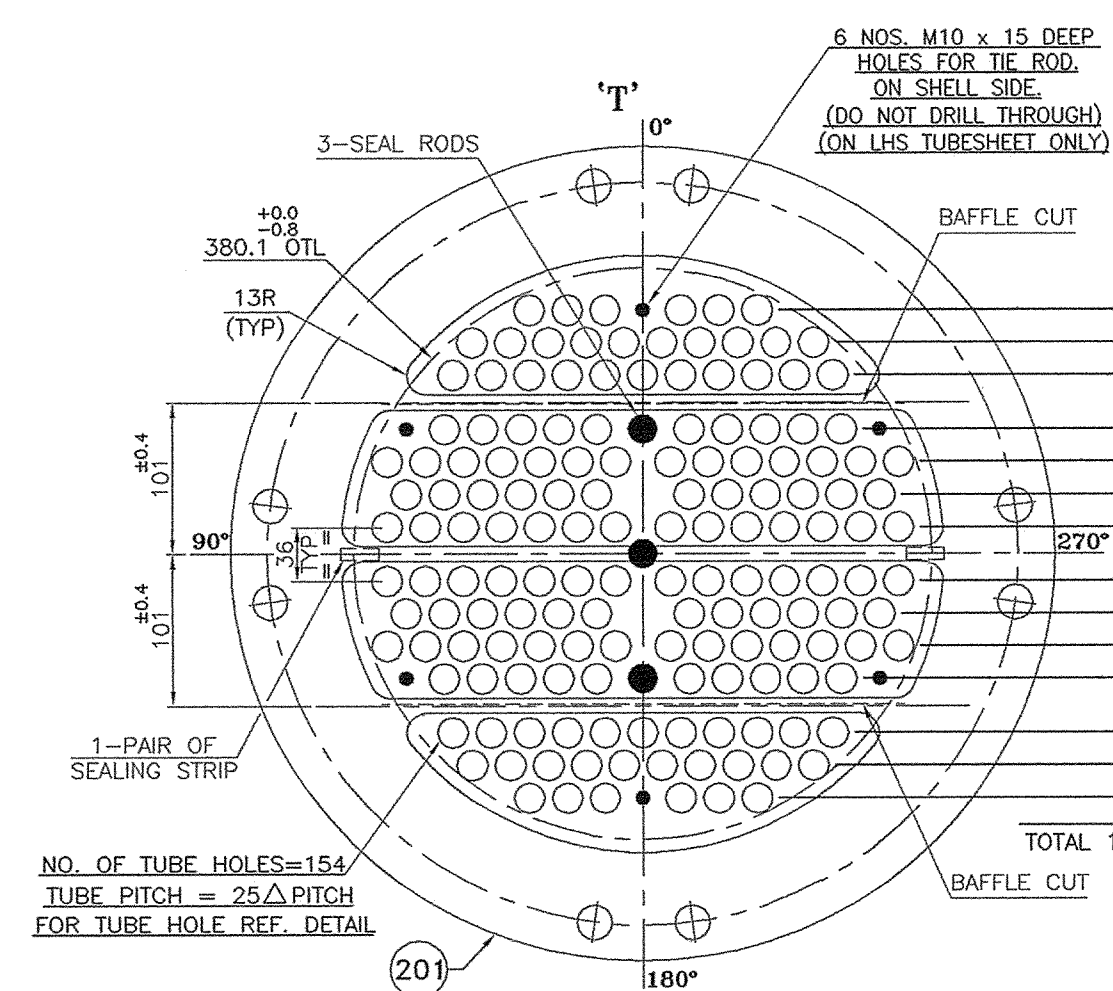
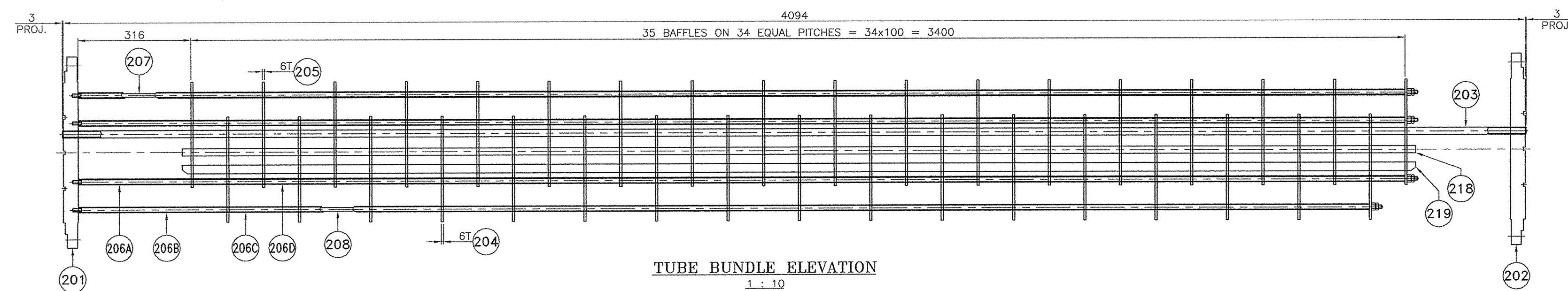
ENGINEERS INDIA LIMITED
(A Govt. of India Undertaking) EIL JOB NO: 6907

BRAHMAPUTRA PETROCHEMICAL COMPLEX PROJECT
220 KTA-LLDPE/HDPE UNIT



* NOTE-12									
N8	40	160	1	300#	WNRF	*	CHANNEL SIDE DRAIN	-	-
N7	40	160	1	300#	WNRF	*	CHANNEL SIDE VENT	-	-
N6	40	160	1	300#	WNRF	*	SHELL SIDE DRAIN	-	-
N5	40	160	1	300#	WNRF	*	SHELL SIDE VENT	-	-
N4	50	160	1	300#	WNRF	*	CHANNEL OUTLET	-	-
N3	50	160	1	300#	WNRF	*	CHANNEL INLET	-	-
N2	50	160	1	300#	WNRF	*	SHELL OUTLET	-	-
N1	50	160	1	300#	WNRF	*	SHELL INLET	-	-
NOZZLE MARK	SIZE(NB) MM	SCOT THK.	QTY.	RATING	FLANGE TYPE	FACING	SERVICE	W x T PAD PL.	REMARK
NOZZLE SCHEDULE									

MATERIAL		SCALE		DRG NO		FIRST USE MODEL	
Quantity- ONE		NTS		PRJ/9742/24		ACR PROJ	
APPROD RCS		CHD KK		DATE OF RELEASE 28/02/2010		REV. SHEET SH 52	
DRN PSW		DATE OF PRINT		TITLE		OA 1/2 A1	
SIGN		FINISHED WEIGHT		KIRLOSKAR PNEUMATIC CO. LTD.		GENERAL ASSEMBLY & DETAILS FOR LUBE OIL COOLER (ITEM NO. 117-EE-487)	
ALL DIMENSIONS IN mm.		kgs.		HADAPSAR INDUSTRIAL ESTATE, PUNE 411013, INDIA.			



220							
219	SEALING STRIP	2	SA 516 GR 70	8T x 25 W x 3456 L	11	-	
218	SEAL ROD	3	SA 516 GR 70	20# x 3456 L	26	-	
217	INSULATION RING	2	SA 516 GR 70	6T x 470 OD x 423 ID	3	-	
216	PACKAGER NAME PLATE	1	SS 304	AS PER DETAIL	-	-	
215	EARTHING LUG	2	IS 2062 GR A	10T x 100 L x 75 W	1	-	
214	RIB PLATE	2	SA 516 GR 70	12T x 122 W x 262 L	6	-	
213	WEB PLATE	2	SA 516 GR 70	12T x 385 W x 373 L	27	-	
212	BASE PLATE (SLIDING SADDLE)	1	SA 516 GR 70	16T x 150 W x 385 L	7	-	
211	BASE PLATE (FIXED SADDLE)	1	SA 516 GR 70	16T x 150 W x 385 L	7	-	
210	SUPPORT PAD PLATE	2	SA 516 GR 70	12T x 150 W x 502 DEVL	14	-	
209	HX NUT	12	SA 194 GR 7	M10 x STD	-	-	
208	TIE ROD	1	SA 516 GR 70/SS 304	10# x 3672 L	2	-	
207	TIE ROD	5	SA 516 GR 70/SS 304	10# x 3772 L	11	-	
206A-D	SPACER	SEE TABLE	SA 333 GR 6/SS 304	3/8"NB x SCH 40 x SEE TABLE	18	-	
205	BAFFLE PLATE	17	SA 516 GR 70	6T x AS PER DETAIL	79	-	
204	BAFFLE PLATE	17	SA 516 GR 70	6T x AS PER DETAIL	79	-	
203	TUBES	154	SA 334 GR 1	20 OD x 2T (AVG) x 4100 L	561	-	SEAMLESS
202	TUBE SHEET (RHS)	1	SA 350 GR LF2 CL1	41T x 542#	74	-	FINISH SIZE
201	TUBE SHEET (LHS)	1	SA 350 GR LF2 CL1	41T x 542#	74	-	FINISH SIZE
P.NO.	DESCRIPTION	QTY (UNITS)	MATERIAL	SIZE	WT(KG)		REMARKS

OWNER : BCPL, LAPETKATA PROJECT : BRAHMAPUTRA PETROCHEMICAL COMPLEX PROJECT UNIT : 220 KTA-LLDPE/HDPE EIL JOB NO. : 6907	 BRAHMAPUTRA CRACKER AND POLYMER LIMITED ENGINEERS INDIA LIMITED (A Govt. of India Undertaking) EIL JOB NO: 6907
PROJECT BRAHMAPUTRA PETROCHEMICAL COMPLEX PROJECT 220 KTA-LLDPE/HDPE UNIT	