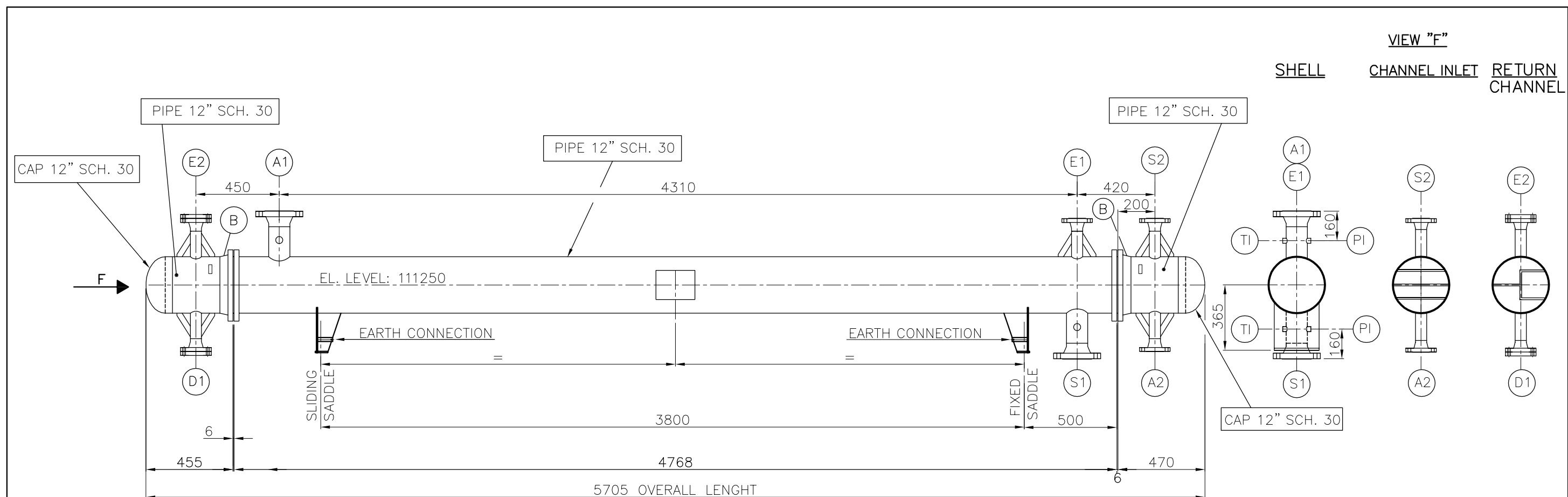
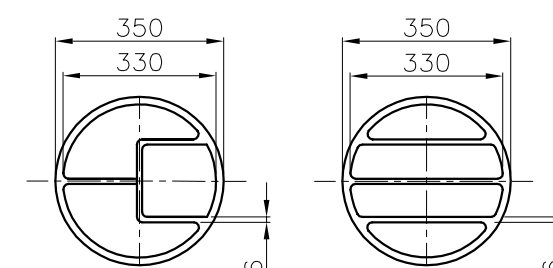


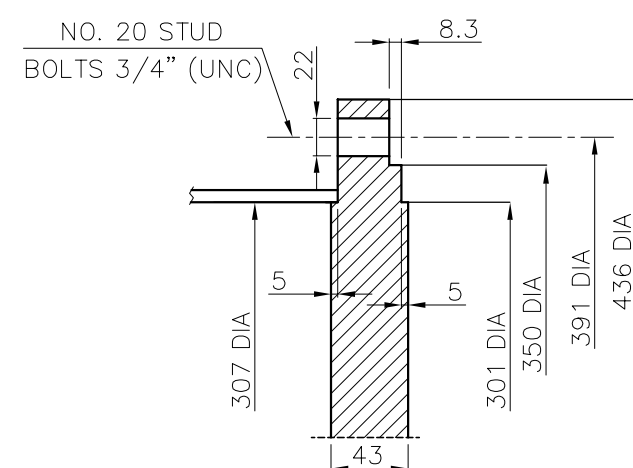
NOZZLE LIST											MATERIALS				DESIGN DATA				
MARK	NB	DESIGNATION	STAND OUT	PIPES/NECKS		FLANGES			REINF.		NOTE	SHELL		SERVICE		RECYCLE PREHEATER (NORMAL CASE)			
				ND/BD	THK/SCH	TYPE	RAT.	FACE	THK.	WIDTH									
A1	1	SHELL INLET	400	6"	– /80	W.N.	300	R.F.	10	50	(6)	BARREL	A106 GR B		DESIGN CODE	ASME VIII DIV.1, TEMA R			
S1	1	SHELL OUTLET	400	6"	– /80	W.N.	300	R.F.	10	50	(6)	FLANGES	–		INSPECTION AUTHORITY (STAMP)	NO			
E1	1	SHELL VENT	360	2"	– /160	W.N.	300	R.F.	–	–	(6)	NOZZLE FROM PIPE/PLATE	A333 GR 6/A516 GR 60		TYPE ACC. TO TEMA	BEM			
A2	1	CHANNEL INLET	360	2"	– /160	W.N.	300	R.F.	–	–	(6)	NOZZLE FLANGES/COUPLINGS	A350 LF2		ORIENTATION/QUANTITY	HORIZONTAL/1			
S2	1	CHANNEL OUTLET	360	2"	– /160	W.N.	300	R.F.	–	–	(6)	NOZZLE REINFORCEMENT PAD	A516 GR 60		SHELL IN SERIES/PARALLEL	1/1			
E2	1	CHANNEL VENT	360	2"	– /160	W.N.	300	R.F.	–	–	(6,22,24)	SADDLES/BASE PLATE	A516 GR 60/A285 GR C		FLUID	SHELL SIDE	TUBE SIDE		
D2	1	CHANNEL DRAIN	360	2"	– /160	W.N.	300	R.F.	–	–	(6,22,24)	SADDLES WEAR PLATES	–			HEAT TRANSFER OIL	STYRENE + ETHYLBENZENE		
												EXPANSION JOINT	–		DENSITY IN/OUT	803.4/806.4	910/820		
												SHELL COVER		OPERATING TEMPERATURE IN/OUT	°C	120/116.7	15/115		
MARK	DESIGNATION		DN	RATING		LOCATED ON					BARREL	–		OPERATING PRESSURE	barg	3	3.3		
PI	PRESSURE CONNECTION		3/4" NPT	6000 #		NOZZLES A1–S1					COVER	–		DESIGN TEMPERATURE	°C	280	280/280		
TI	TEMPERATURE CONNECTION		1" NPT	6000 #		NOZZLES A1–S1					FLANGES	–		DESIGN PRESSURE	barg	6.7	11.5/F.V.		
												CHANNEL		M.D.M.T.	°C	–27	–27		
												BARREL	A106 GR B		SHOP TEST PRESSURE	barg	8.7	15	
												FLANGES	A266 CL.4		INSULATION TYPE/THICKNESS	mm	P.P./70	P.P./70	
												COVER	A234 WP B		CORROSION ALLOWANCE	mm	3.2	3.2	
												FLAT COVER	–		IMPACT TEST	AS PER CODE		AS PER CODE	
												NOZZLE FROM PIPE/PLATE	A333 GR 6/A516 GR 60		JOINT EFFICIENCY	0.85		0.85	
												NOZZLE FLANGES/COPLINGS	A350 LF2		RADIOGRAPHY	SPOT		SPOT	
												NOZZLE REINFORCEMENT PAD	A516 GR 60		STRESS RELIEVING	NO		NO	
												PARTITION PLATE	A516 GR 60		BASIC WIND SPEED (Km/h)/EXPOSURE/IW	160@10m/D/1			
												TUBE BUNDLE		EARTHQUAKE/SOIL TYPE/I	ZONE 4/Sd/1.25				
												TUBES	A179		EQUIPMENT PAINTING	(8)			
												TUBESHEET	A266 CL.4		FIREPROOFING FOR SUPPORT/ THICKNESS	NO			
												BAFFLES/SUPPORTS/IMPINGMENT PLATE	A516 GR 60						
												TIE RODS/SPACER	C.S./A179						
												BOLTS AND NUTS							
												SHELL/COVER	–		LOADING DATA AT BASE (12)				
												SHELL/CHANNEL	A193 GR B7/A194 GR 2H		WEIGHT (KN)	13.8	14.9	13.8	–
												CHANNEL/COVER	–		SHEARING LOAD (KN)	6.7	0.4	6.7	2
												GASKETS		MOMENT (KN.m)	2.5	0.15	2.5	0.75	
												SHELL/COVER	–		REFERENCE SPECIFICATIONS		REFERENCE DOCUMENTS		
												SHELL/TUBESHEET	–		NUMBER		NUMBER		
												CHANNEL/TUBESHEET	(11)		☒ 1705–41–SP–ENG–901		☒ 1705–41–DT–ENG–832		
												CHANNEL/COVER	–		☒ 1705–41–RP–ENG–907				
												SUPPLIED BY MANUFACTURER		☒ 1705–41–SP–ENG–302					
												PAINTING	☒ YES	☐ NO	☒ 1705–41–SP–ENG–303				
												INSULATION SUPPORTS	☒ YES	☐ NO	☒ 1705–41–SP–ENG–304				
												FIREPROOFING SUPPORTS	☒ YES	☒ NO	☐ 1705–41–SP–ENG–305				
												CLIPS FOR LADDERS & PLATFORMS, PIPE SUPPORTS & GUIDES	☒ YES	☒ NO					
												LIFTING LUGS	☒ YES	☐ NO	DRY WEIGHT = 1080 kg WEIGHT OF TUBE BUNDLE = 440 kg * TO BE CONFIRMED LATER.				
												TEST RINGS	☒ YES	☐ NO					
												NAME PLATE	☒ YES	☐ NO					
												EARTH LUG	☒ YES	☐ NO					
												TEMP.COVER, GASKET AND BOLTING FOR SHIPMENT	☒ YES	☐ NO					
												GENERAL NOTES:							
												(1) DIMENSIONS ARE IN MILLIMETERS, UNLESS OTHERWISE NOTED.							
												(2) ALL THICKNESSES SPECIFIED ON DWG ARE MINIMUM AFTER FORMING AND MACHINING REQUIRED. THE MANUFACTURER SHALL BE RESPONSIBLE FOR DETAIL DESIGN.							
												(3) THICKNESSES, WEIGHTS, AND LOADS ARE INDICATED FOR ESTIMATION PURPOSE ONLY.							
												MANUFACTURER SHALL CONFIRM THICKNESSES, WEIGHTS AND LOADS, HE IS RESPONSIBLE FOR MECHANICAL DESIGN.							
												(4) BOLT HOLES SHALL BE STRADDLE OF MAIN AXIS.							
												(5) NOZZLES STAND OUT IS REFERRED FROM VESSEL CENTER LINE TO FLANGES CONTACT FACE.							
												(6) FLANGE FACING TO BE IN ACCORDANCE WITH ASME B16.5 FOR 24" OR LESS AND B16.47 SERIE B FOR LARGER, SURFACE FINISH: SPIRAL SERRATED FINISH, ROUGHNESS 3.2 TO 6.3 μm.							
												(7) ALLOWABLE STRESS FOR ANCHOR BOLTS TO BE: 110 MPa.							
												(8) PAINTING SHALL BE AS PER SPECIFICATION 1705–41–SP–ENG–304.							
												(9) FLANGE 24" AND BELOW SHALL BE AS PER ASME B16.5 AND FLANGE LARGER THAN 24" SHALL BE AS PER ASME B16.47 SERIES B.							
												(10) ALL WELDED ATTACHMENTS TO THE VESSEL TO BE SUPPLIED BY THE VESSEL MANUFACTURER.							
												(11) GASKET MATERIAL: S.S. DOUBLE METAL JACKETED FIBER FILLED.							
												(12) LOADING DATA AT BASE IS PRIMARY AND WILL BE FINALIZED LATER.							
												(13) DRILLING AND TOLERANCES OF TUBESHEET: SEE TEMA, "CLOSE FIT".							
												(14) DRILLING AND TOLERANCES OF BAFFLES AND SUPPORT PLATES: SEE TEMA.							
												(15) WHERE RADIUS IS NOT DIMENSIONED, R=12 mm.							
												(16) BY–PASS STRIP SHALL BE CONTINUOUSLY WELDED TO BAFFLES.							
												(17) BOTH ENDS OF TIE–RODS SHALL BE I.S.O THREADED FOR 50 mm.							
												(18) THREADED HOLES IN FIXED TUBESHEET SHALL NOT BE COMPLETELY DRILLED.							
												(19) DIAMETER OF HOLES FOR TIE–RODS IN BAFFLES: TIE–ROD DIA.+0.5 mm.							
												(20) EDGES OF HOLES IN BAFFLES SHALL BE ROUNDED (R=2) OR BEVELLED.							
												(21) PROVIDE HOLES 6 DIA. IN PASS PARTITION.							
												(22) GASKET MATERIAL: REINFORCED FLEXIBLE GRAPHITE, 1.5 mm THICK FOR ALL DIAMETERS AS PER ASME B16.21.							
												(23) SUPPORT SADDLES TYPE I–13" (SEE 1705–41–ST–ENG–901–53).							
												(24) WITH BLIND FLANGE, BOLTING AND GASKET.							
												(25) ALL NOZZLES SIZE 2" SHALL BE PROVIDED WITH 2 STIFFENERS (SECTION: 6x30) EACH AT 90° APART.							
NOZZLES EXT. ATTACHMENTS; LOADS & REQUIREMENTS*																			
1 NOZZLE'S LOAD WILL BE AS PER SPEC. (OR MR)												☒ YES	☐ NO						
2 NOZZLE'S LOAD WILL BE AS PER TABLE ON NEXT SHEET(S).												☒ YES	☐ NO						
3 PIPE CLIPS REQ'D.												☒ YES	☐ NO						
4 PLATFORMS AND LADDERS REQ'D.												☒ YES	☐ NO						
5 LADDERS REQ'D.												☒ YES	☐ NO						
												</							



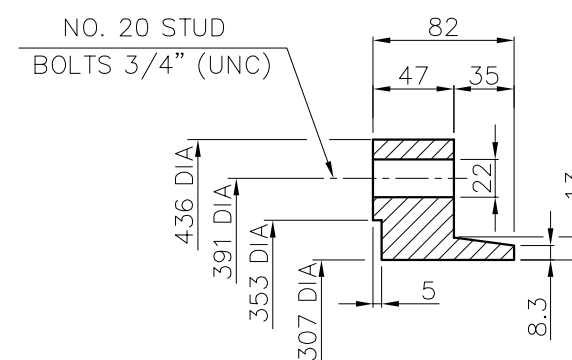
GASKET DETAILS



TUBESHEET DETAIL



FLANGE "B"



2								
1								
0	27/09/05	IFC	M.A.	H.S. AR.N.	A.KH.			
REV.	DATE	DESCRI.	DRWN.	CHK.	APP.	CHK.	APP.	APP.
			SUBCONTRACTOR			CONTRACTOR		OWNER
 TABRIZ PETROCHEMICAL CO.			HIPS II (LINE D) PRODUCTION PLANT TABRIZ PETROCHEMICAL CO.					
 F.I.R.E. Co.			<u>DRAWING TITLE:</u> ENGINEERING DWG. 41-E-203 (RECYCLE PREHEATER(NORMAL CASE))					
UNIT:D		DISC:MEC		SCALE:1: 50		DWG. SIZE: A3		
DWG.NO:1705-41-DT-ENG-942					SH:20F3		REV:0	

Technical drawing of a tube sheet showing dimensions and components. The drawing includes the following labels and dimensions:

- Top Dimension:** DISTANCE BETWEEN TUBESHEETS FACES=4794 (TUBE LENGTH=4800)
- Left Section Line:** A1
- Distance from A1 to First Baffle:** 200
- Distance between Baffles:** $128 \times 31 = 3968$
- Distance from Last Baffle to S1:** 6
- Right Section Line:** S1
- Components:** BAFFLE (1), BAFFLE (2)

[illegible]

A circular diagram divided into five regions. The top region is a semi-circle labeled 12. The bottom region is a semi-circle labeled 11. The middle is divided into four quadrants by a vertical line, each labeled 13.

NO. TUBE HOLES	0	75	TUBES O.D.	mm	19.05	THK.(MIN.)	mm	2.11	LENGTH	mm	4800	TUBE LAYOUT	DEG.	30°
TUBE PITCH	mm	25.4	NO. OF PASSES		6	SURFACE	m ²	21	TUBE TO TUBESHEET JOINT	EXPANDED + 2GROOVES				

Technical drawing of a semi-circular object with a flat base. The object features two small circles inside and four rectangular tabs (two on the left, two on the right). A vertical dashed line indicates the axis of symmetry, and a horizontal dashed line indicates the center. A dimension line on the left shows a height of 80 units.

Technical drawing of a mechanical part, likely a flange or cover plate. The drawing shows a semi-circular shape with a central hole. The outer diameter is 88, and the inner diameter is 25. The central hole has a diameter of 25. The part is symmetrical about a vertical centerline. The bottom edge is a 90-degree angle.

2								
1								
0	27/09/05	IFC	M.A.	H.S. AR.N.	A.KH.			
REV.	DATE	DESCRI.	DRWN.	CHK.	APP.	CHK.	APP.	APP.
			SUBCONTRACTOR			CONTRACTOR		OWNE
 TABRIZ PETROCHEMICAL CO.			HIPS II (LINE D) PRODUCTION PLANT TABRIZ PETROCHEMICAL CO.					
			<u>DRAWING TITLE:</u> ENGINEERING DWG.				 P.I.R.E. Co.	
41-E-203 (RECYCLE PREHEATER (NORMAL CASE))								
UNIT: D			DISC: MEC		SCALE: 1: 50		DWG. SIZE: A3	
DWG.NO: 1705-41-DT-ENG-942					SH: 30F3		REV: 0	