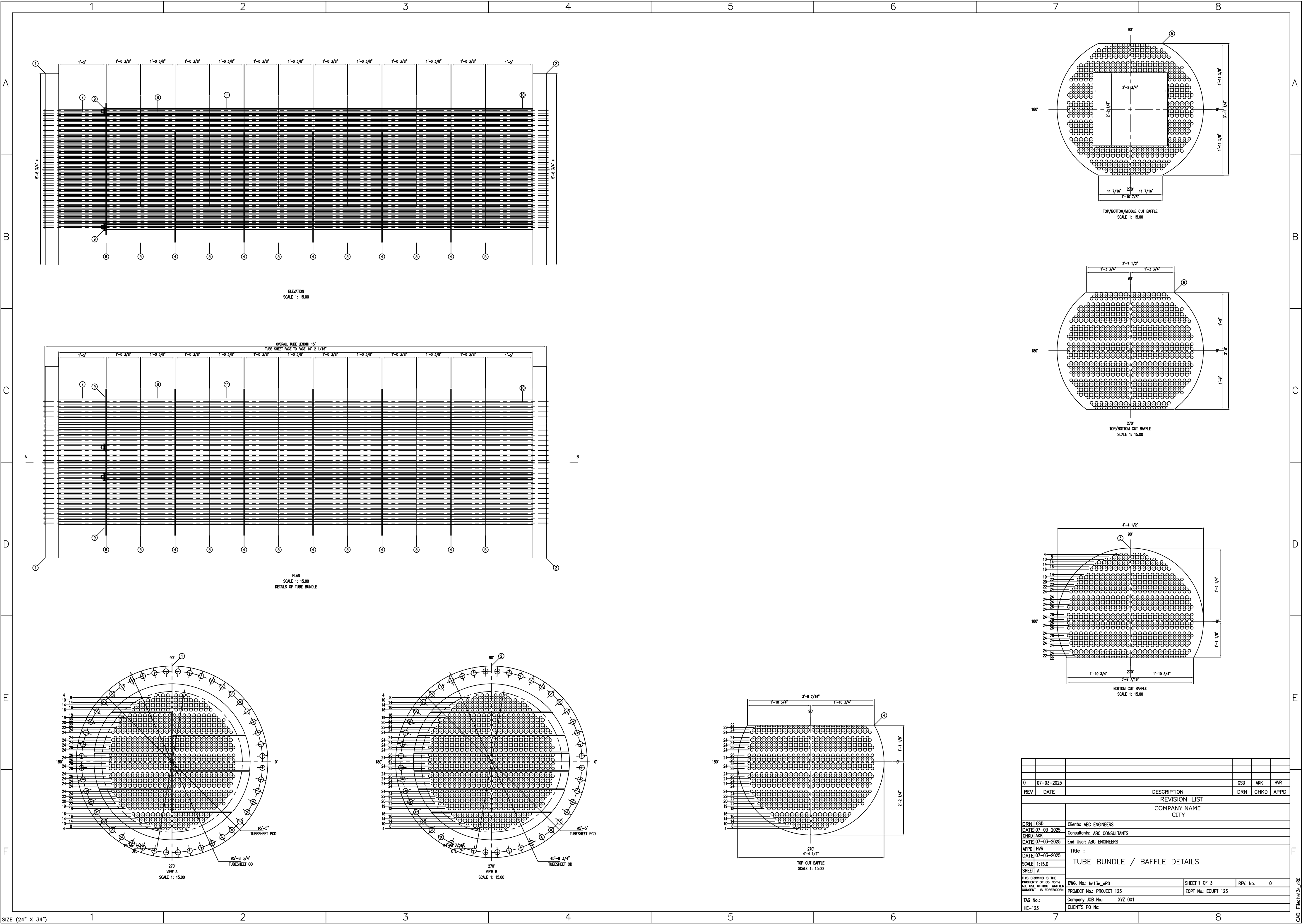
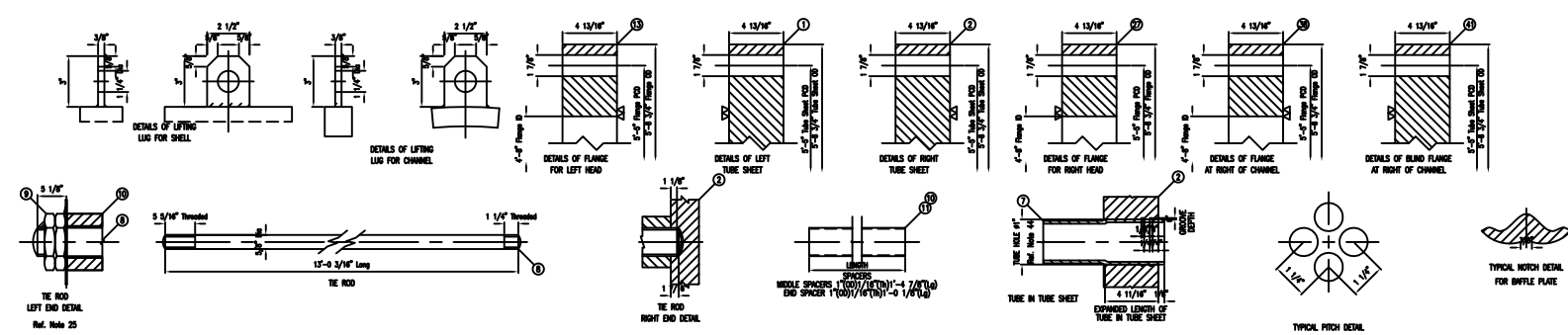
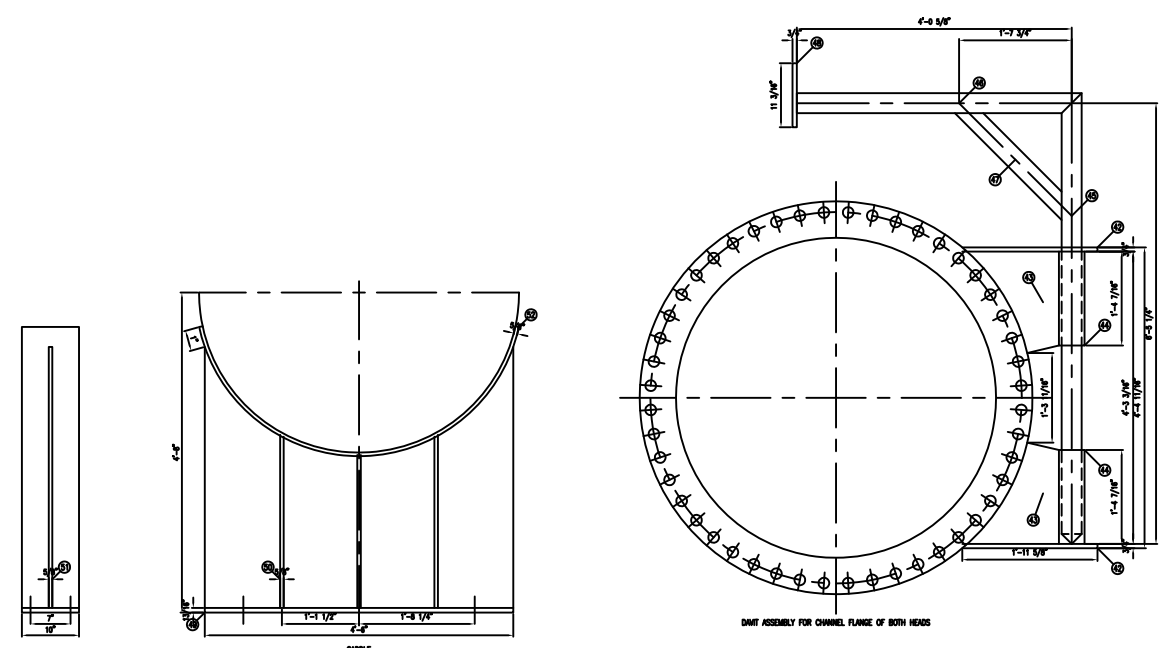
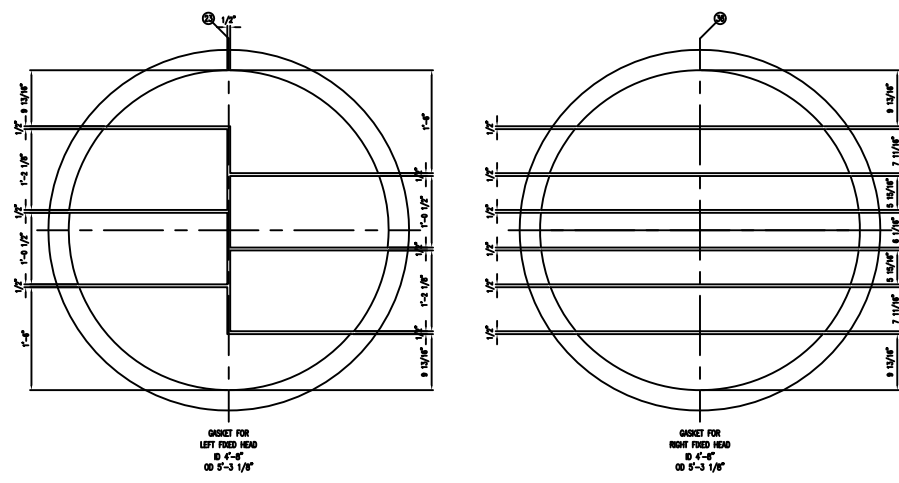
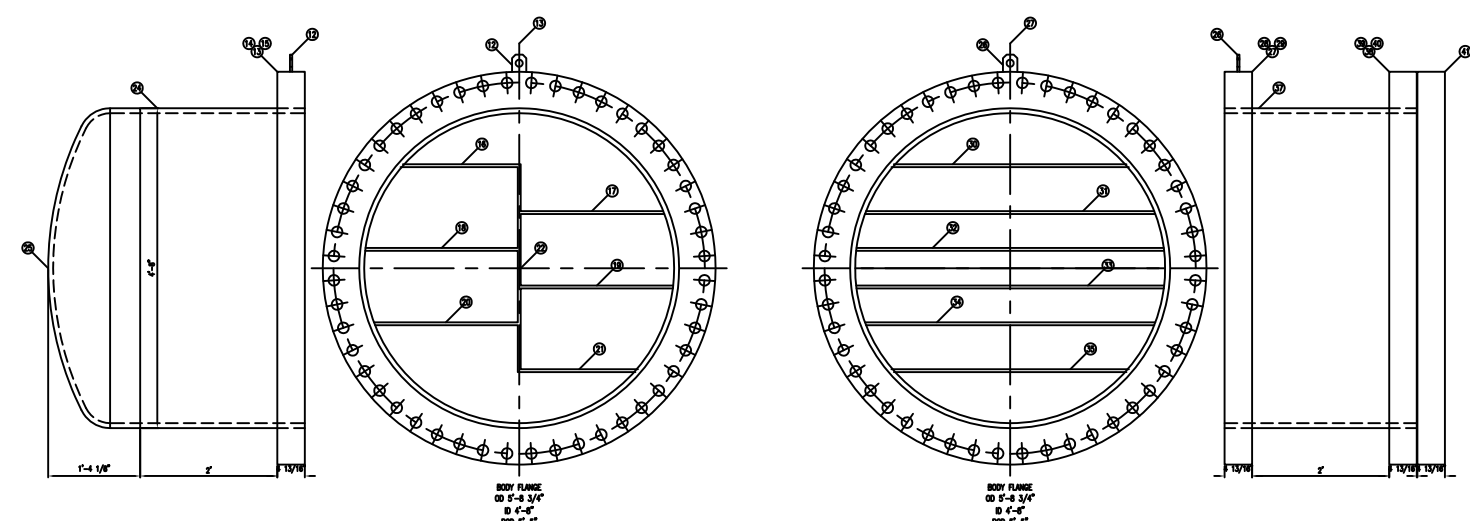




SIZE (24" X 34")

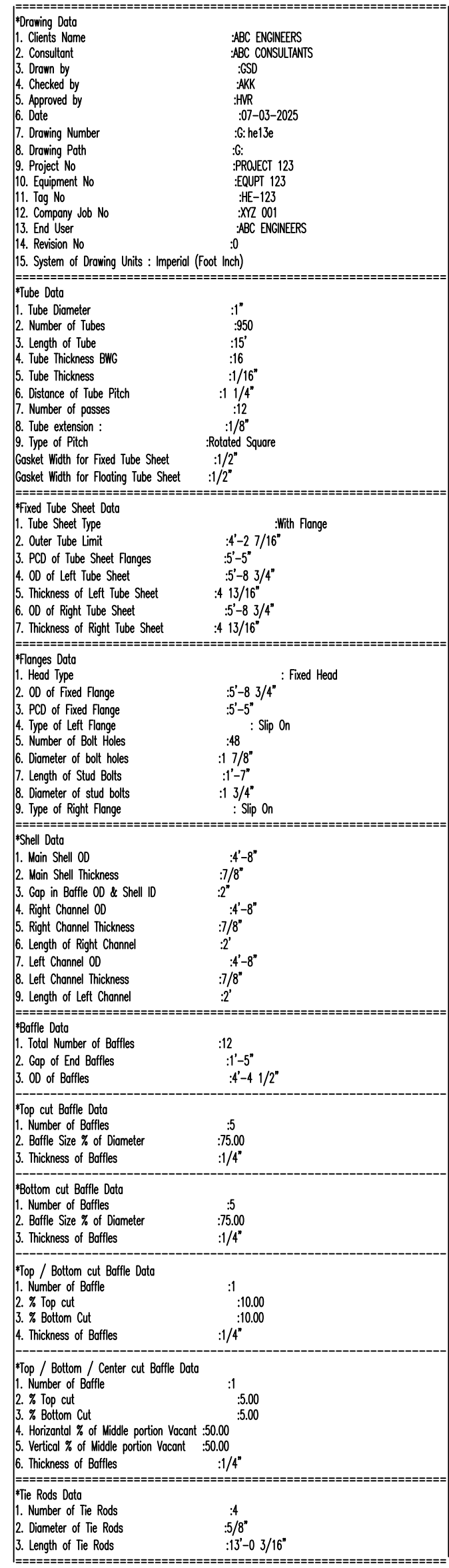
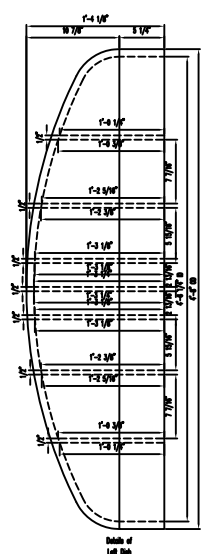
0	07-03-2025			SSD	AKK
REV	DATE			DRN	CHKD
REVISION LIST					
COMPANY NAME					
CITY					
Client: ABC ENGINEERS					
Consultant: ABC CONSULTANTS					
End User: ABC ENGINEERS					
Title :					
TUBE BUNDLE / BAFFLE DETAILS					
This drawing is the property of ABC ENGINEERS. All use without written consent is prohibited.					
DWG. No: TBC-123		PROJECT No: PROJECT 123		SHEET 1 OF 3	
TAG No: HE-123		Company Job No: XYZ 001		EQUIP No: EQUIP 123	
		CLIENT'S PO No:		REV. No: 0	

END FILE: TBC-123.DWG



1. ALL DIMENSIONS ARE IN FOOT-INCHES.
2. ALL BOLT HOLES TO STRADDLE BOTH NATURAL CENTER LINES.
3. FOR TOLERANCES REEF SHEEL & TIE EXCHANGER 201-175-0019 REV-3.
4. HYDRO TEST SHALL BE DONE IN HORIZONTAL POSITION.
5. UNIT TO BE MOUNTED IN HORIZONTAL POSITION.
6. INDICATED THICKNESSES ARE MINIMUM AFTER CONSTRUCTION.
7. FLANGES UP TO 24" SHALL CONFORM TO ASME B16.5.
8. FLANGES ABOVE 24" SHALL CONFORM TO ASME B16.47.
9. ALL NOZZLES 2" AND BELOW SHALL BE PROVIDED WITH STIFFENER.
10. STIFFENER SIZE: 1/4" x 1/4" AT RIGHT ANGLES.
11. AFTER HYDROTEST, EQUIPMENT SHALL BE COMPLETELY DRIED OUT WITH HOT AIR.
12. BEND FLANGES SHALL BE PROVIDED WHERE MENTIONED.
13. OTHER FLANGES SHALL BE COVERED WITH SUEL COVERS.
14. FINISH OF CRACK SEATING FACE OF NOZZLE FLANGES SHALL BE 125-150 ARMS FOR SPINAL WOUND GASKETS.
15. ALL SHARP CORNERS SHALL BE ROUNDED WITH SMOOTH RADII AND SPREAD OUT SUFFICIENTLY OTHERWISE.
16. ALL PRESSURE BEARING PLATES SHALL BE SUPPLIED IN NORMALIZED CONDITION.
17. THESE PLATES SHALL CONFORM TO SA-20.
18. TOLERANCE ON PLATE THICKNESS SHALL BE SAME AS ON POSITIVE SIDE ONLY.
19. FINAL ROLLING OF THE PLATES SHALL BE LENGTHWISE.
20. ALL FLANGES SHALL BE 100% UT EXAMINED IN ACCORDANCE WITH AS308, SEC 6 & 8, BEFORE ANY DRILLING OPERATION.
21. ALL WELDS SHALL BE PENETRATION WELDS, AFTER BACK CHIPPED TO SOUND METAL.
22. TOP OF SHALL BE REWELED FROM CORROSION AND DREG WITH 80% ABRASIVE OR EQUIVALENTS.
23. THOSE JOINTS THAT ARE NOT ACCESSIBLE FOR BACK CHIPPING, ROOT RUN SHALL BE CARRIED OUT WITH GRIND PROCESS.
24. NON DESTRUCTIVE EXAMINATION:
- 24.1. ALL BUTT WELD JOINTS SHALL BE UT EXAMINED FOR A DISTANCE OF 2 TIMES MATERIAL THICKNESS.
- 24.2. BACKWELD JOINTS AND STRAIGHT FACE OF DISHED HEADS SHALL BE 100% FT EXAMINED, AFTER FORMING.
- 24.3. 100% EXAMINATION OF DISHED HEADS SHALL BE DONE AFTER HEAT TREATMENT.
- 24.4. ALL NOZZLE WELDS SHALL BE UT EXAMINED AFTER ROOT RUN AND FINAL PASS.
- 24.5. EXTERNAL SURFACES OF WELDS WITH THICKNESS MORE THAN 2" SHALL BE BY UT EXAMINATION AFTER HYDROTEST.
- 24.6. ALL WELDING EDGES SHALL BE WELDING FACES TO BE EXAMINED AND DREG WITH 80% ABRASIVE OR EQUIVALENTS.
- 24.7. MP/DP TEST SHALL BE CARRIED OUT ON INSIDE/SURFACE OF DISHED HEADS.
- 24.8. MACHINED SURFACES OF ALL FORINGS SHALL BE EXAMINED FOR SURFACE DEFECTS BY MP/DP TEST.
- 24.9. METHODS FOR FASTENING NUTS TO THE RODS :
- 24.10. METHODS FOR FASTENING NUTS TO THE RODS :
25. WELD SECOND NUT TO THE ROD.
26. WELD BOTH NUTS TO THE ROD.
- 26.1. ALL WELDS TO EXCEED THE LENGTH OF ONE FLAT LENGTH.
- 26.2. TOLERANCE FOR ALL NOZZLES ON TRUE VERTICAL LINE FROM ACTUAL NOZZLE CENTER LINE IS $\pm 1/8"$.
- 26.3. TOLERANCE FOR ALL NOZZLES ON TRUE VERTICAL LINE FROM ACTUAL NOZZLE CENTER LINE IS $\pm 1/8"$.
27. HEAT EXCHANGER SHALL BE HYDRO TESTED WITH CLEAN POTABLE WATER; SEA WATER SHALL NOT BE USED.
28. AFTER HYDROTEST, EQUIPMENT SHALL BE COMPLETELY DRIED OUT WITH HOT AIR.
29. EQUIPMENT SHALL BE PERFECTLY CLEANED, AND FREED FROM ALL FOREIGN MATERIAL.
30. ALL NOZZLES SHALL BE COVERED WITH TEMPORARY COVERS, TO AVOID DAMAGE TO NOZZLE.
31. PAINTING :
- 31.1. ALL EXTERIOR UNMACHINED CS SURFACES SHALL BE PAINTED WITH ONE COAT OF INORGANIC ZINC SULFATE.
- 31.2. PRIMER OF 75 MICRON DFT SHALL BE APPLIED AFTER SHOT BLASTING THE SURFACE TO SA 2 1/2 FINISH.
- 31.3. EXTERIOR LOGS SHALL NOT BE PAINTED OR GALVANIZED.
- 31.4. CLIENT'S NAME, ADDRESS, EPSCO, NO. P.O. NO. SHALL BE PAINTED ON SHELL WITH WHITE PAINT.
- 31.5. ALL FLANGE FLANGES AND OTHER MACHINED SURFACES SHALL BE GREASED AND PROTECTED FROM RUST.
- 31.6. BOLT TRENDS SHALL BE LIBERATED.
32. GASKETS :
- 32.1. SERVICE GASKETS SHALL NOT BE USED FOR HYDROTEST.
- 32.2. GASKET MATERIAL FOR HYDROTEST SHALL BE SAME AS SERVICE GASKET.
- 32.3. EQUIPMENT SHALL BE SHIPPED IN AS HYDROTESTED CONDITION, WITHOUT REMOVING GASKETS USED FOR HYDROTEST.
- 32.4. SERVICE GASKETS SHALL BE SENT LOGS, AND ASSEMBLED AT SITE.
- 32.5. GASKET MATERIAL FOR NOZZLE FLANGES SHALL BE SS 316 SPINAL WOUND WITH GRAVEL FILLER AND CS CUTTING RING.
- 32.6. GASKETS SHALL BE IN ACCORDANCE WITH ASME B16.5.
- 32.7. THE M AND Y VALUES OF SPINAL WOUND GASKET SHALL BE GUARANTEED AS PER ASME SEC. VIII, DIV. I.
- 32.8. GASKET CERTIFICATES SHALL INDICATE THE SAME AND SHALL BE PART OF FINAL DOCUMENTATION.
- 32.9. VENT NOZZLES TO BE KEPT OPEN DURING FILLING OF WATER FOR HYDROTEST AND DURING DRAINING.
33. DESIGN TOLERANCES SPECIFIED ARE :
- 33.1. LIFTING LUGS ARE DESIGNED FOR LIFTING IN UPRIGHT POSITION.
- 33.2. HARDNESS OF METAL IN GASKET SHALL BE MINIMUM 15 BHN LOWER THAN FLANGE GASKET SEATING SURFACE METAL.
- 33.3. HARDNESS IN NO CASE SHALL EXCEED 160 BHN.
- 33.4. FILLER IN METAL JACKETED GASKETS SHALL NOT BE OF COMPRESSED TYPE.
- 33.5. ALL GASKETS SHALL BE MADE IN ONE CONTINUOUS PIECE ALL AROUND.
- 33.6. PASS PARTITION RIBS SHALL BE CUT FROM SAME SHEET.
- 33.7. PLATE JACKETED FACE OF THE METAL JACKETED GASKET SHALL BE PARTITION PLATE SIDE.
- 33.8. GASKET FOR GIRTH FLANGES SHALL BE METAL JACKETED ARAMIDE FIBER.
- 33.9. ALL RF PADS SHALL BE PROVIDED 2 NOS. OF 1/4" NPT TIE TAIL HOLES FOR AIR/SO2 SOLUTION TEST.
34. HOLES TO BE PLUGGED WITH HARD GRASS AFTER TESTING.
35. APPROPRIATE COVERS FOR PIPES AND NOZZLES SHALL BE PROVIDED.
36. ASME B16.9 FOR FACTORY MADE WROUGHT BUTT WELD FITTINGS.
37. ASME B16.11 FOR FORGED FITTINGS, SOCKET WELDING AND THREADED JOINTS.
38. HEAT TREATMENT CYCLE FOR DISHED DND :
- 38.1. LOADING TEMPERATURE : 540 DEG F (310 DEG C)
- 38.2. RATE OF HEATING : 100 TO 400 DEG F PER HOUR.
- 38.3. SOAKING TEMPERATURE : 1100 +/- 18 DEG F
- 38.4. SOAKING TIME : 30 TO 150 MIN.
- 38.5. RATE OF COOLING (1000 TO 540 DEG F) : 100 TO 500 DEG F PER HOUR.
- 38.6. METHOD OF COOLING (<540 DEG F) : WATER
39. NAME PLATE OF DISHED DND SHALL BE BRACKET ON ALL FOUR SIDES AND INSIDE TO INVERTS.
40. SLUING STRIPS SHALL BE CONTINUOUS.
41. STRIP EDGES OF BATTLE PLATES SHALL BE WELDED BACK AFTER WELDING SEALING SURFACES.
42. TOP PORTION OF BATTLE TO BE CUT TO ACCOMMODATE MOUNTING PLATE.
43. TUBE HOLE EDGES IN TUBE SHEET AND BATTLE SHALL BE CHAMFERED TO 1X45 DEG ON BOTH SIDES.
44. FOLLOWING PARTS SHALL BE SUPPLIED AS SPARES :
- 44.1. 400K GASKETS FOR GIRTH JOINTS AND NOZZLES WITH BUND FLANGES.
- 44.2. 200 (MINIMUM 4 SETS) OF STUDS AND NUTS FOR GIRTH JOINTS AND NOZZLES WITH BUND FLANGES.
- 44.3. BOTTOM SEALING STRIP SHALL BE CONTINUOUS, AND SHALL EXTEND BETWEEN DND BATTLE.
- 44.4. FULL LENGTH OF MATERIAL REEF SHEET.
- 44.5. SLUING END SHALL BE REPAIRED ON SHELL/TUBE SIDE AT 75 1/8 TO 100 INCH AND AT 300 DEG F.
- 44.6. SLUING END SHALL BE PAINTED WITH "CAUTION : SLUING DND".
45. ALL TUBES SHALL BE COLD DRAIN, SEAMLESS, SINGLE TEMP AND IN ANNEALED CONDITION.
46. ALL TUBE HOLES SHALL HAVE CLOSE FIT AS PER TEMA.
- 47.
- 48.
- 49.
- 50.

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REV	DATE	DESCRIPTION	D/RN	CHKD
		REVISION LIST		APPD
		COMPANY NAME		
		CITY		
D/RN	SSD	Client: ABC ENGINEERS		
DATE	07-03-2025	Consultant: ABC CONSULTANTS		
CHKD	AKK	End User: ABC ENGINEERS		
DATE	07-03-2025			
APPD	H/R	Title :		
DATE	07-03-2025			
SCALE	1/25.0	PART DETAILS		
	SHEET 9			
THIS DRAWING IS THE AS USED TO BE CONSIDER IT FIDELITY		DWG. No.: hsl3c_3RD PROJECT No.: PROJECT 123	SHEET 2 OF 3	REV. No.: 0
TAG: No.		COMPANY JOB No.: XYZ 001	EQUIP No.: EQUIP 123	
EAC-123		CLIENT'S PO No:		



						Total Weight		4157.5		
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111	Shel	Iron	Node	Shel Frame (N6)	18	105	G-2H	4	12700(1724H)	278
112	Shel	Iron	Node	Shel Frame (N6)	18	105	G-2H	4	12700(1724H)	278
113	Shel	Iron	Node	Shel Frame (N6)	18	105	G-2H	4	12700(1724H)	278
114	Shel	Iron	Node	Shel Frame (N6)	18	105	G-2H	4	12700(1724H)	278
115	Shel	Iron	Node	Shel Frame (N6)	18	105	G-2H	4	12700(1724H)	278
116	Shel	Iron	Node	Shel Frame (N6)	18	105	G-2H	4	12700(1724H)	278
117	Shel	Iron	Node	Shel Frame (N6)	18	105	G-2H	4	12700(1724H)	278
118	Shel	Iron	Node	Shel Frame (N6)	18	105	G-2H	4	12700(1724H)	278
119	Shel	Iron	Node	Shel Frame (N6)	18	105	G-2H	4	12700(1724H)	278
120	Shel	Iron	Node	Shel Frame (N6)	18	105	G-2H	4	12700(1724H)	278
121	Shel	Iron	Node	Shel Frame (N6)	18	105	G-2H	4	12700(1724H)	278
122	Shel	Iron	Node	Shel Frame (N6)	18	105	G-2H	4	12700(1724H)	278
123	Shel	Iron	Node	Shel Frame (N6)	18	105	G-2H	4	12700(1724H)	278
124	Shel	Iron	Node	Shel Frame (N6)	18	105	G-2H	4	12700(1724H)	278
125	Shel	Iron	Node	Shel Frame (N6)	18	105	G-2H	4	12700(1724H)	278
126	Shel	Iron	Node	Shel Frame (N6)	18	105	G-2H	4	12700(1724H)	278
127	Shel	Iron	Node	Shel Frame (N6)	18	105	G-2H	4	12700(1724H)	278
128	Shel	Iron	Node	Shel Frame (N6)	18	105	G-2H	4	12700(1724H)	278
129	Shel	Iron	Node	Shel Frame (N6)	18	105	G-2H	4	12700(1724H)	278
130	Shel	Iron	Node	Shel Frame (N6)	18	105	G-2H	4	12700(1724H)	278
131	Shel	Iron	Node	Shel Frame (N6)	18	105	G-2H	4	12700(1724H)	278