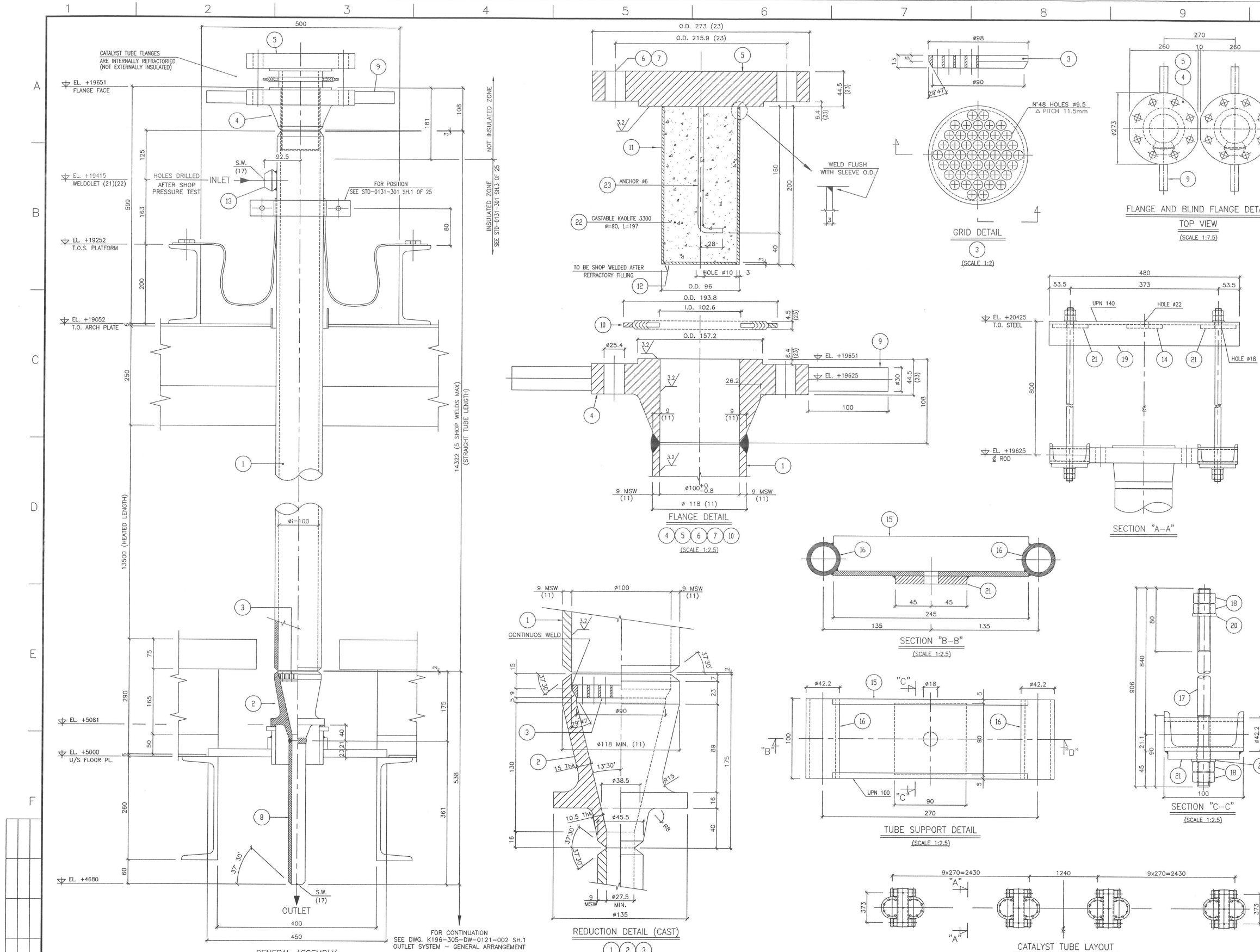




MATERIALS AND SPECIFICATION						
REV.	POS.	Q.ty	DESCRIPTION	BASE MATERIAL	VENDOR SPECIFIC	EN-10204 CERTIFICATION
A	1	40	CENTRICAST TUBE ID #100 THK. 9 (11)MSW L=14322	250V 35N Nb MONOLLOY	-	3.1
A	2	40	CENTRICAST REDUCER TO FIT TUBE I.D.	250V 35N Nb MONOLLOY	-	3.1
A	3	40	GRID PLATE (STATIC CAST)	250V 35N Nb MONOLLOY	-	3.1
B	4	40	SPECIAL FLG 4"-800# ASME B16.5 W.N. RF MACHINED TO FIT TO POS.1	ASTM A 182 F347H	-	3.1
B	5	40	BLIND FLANGE 4"-600# ASME B16.5 RF	ASTM A 182 F347H	-	3.1
A	6	320	STUD BOLT #7/8" THREADED L=152	ASTM A 193 Gr.BB CL 2	-	3.1
A	7	640	HEX.NUT #7/8"	ASTM A 194 Gr.B	-	3.1
B	8	40	PIPE ID #27.5 9 MSW L=361	ASTM B-407 UNS N08811	-	3.1
C	9	80	STEEL ROD #30 L=100	ASTM A479 Gr.304	-	2.2
B	10	40	4" 600# SPIRAL WOUND GASKET Sp. 4.5mm WITH INNER/OUTER RING TP 316	TP 316 + GRAPHITE	-	3.1
C	11	40	PLATE THK.3mm	ASTM A240 Gr.304	-	2.2
D	12	40	PLATE OD 90mm THK.3mm	ASTM A240 Gr.304	-	2.2
A	13	40	WELDLET ID #100 THK 9 (11) MSW x 1 1/4" SCH. 40 (b)(c)(2)(22)	ASTM A182 F347H	-	3.1
B	14	20	SQUARE WASHERS 90x90 THK.10mm	EN 10025-2, Gr S275JR	-	2.2
B	15	40	UPN 100 L=245	EN 10025-2, Gr S275JR	-	2.2
B	16	80	PIPE #1-1/4" SCH. 80 L=100	ASTM A 106 Gr. B	-	2.2
B	17	40	ROD BOTH END THREADED M16 L=906	EN 10025-2, Gr S275JR	-	2.2
B	18	160	HEX.NUT M16	ASTM A563M Gr105	-	2.2
B	19	20	UPN 140 L=480	EN 10025-2, Gr S275JR	-	2.2
B	20	80	WASHERS FOR M16	ASTM F436M	-	2.2
B	21	80	SQUARE WASHERS 90x90 THK. 10mm	EN 10025-2, Gr S275JR	-	2.2
A	22	40	REFRACTORY	CASTABLE KAOLITE	-	3.1
C	23	40	ANCHOR ROD #6 L=182	ASTM A240 Gr.304	-	2.2

GENERAL NOTES FOR MATERIAL

REV.

a) 100% P.M.I REQUESTED ON ALLOY STEEL & S.S FOR EACH COMPONENT (MIN. ONE TEST / HEAT)

b) FULL COMPENSATION: TO BE CALCULATED FOR Tdes. = 680°C, Pdes. = 3585 kPa(g), C.A. = 0 mm AND TAKING IN NO CONSIDERATION THE CONTRIBUTE OF THE RUN PIPE. THE FULL AREA REQUIRED FOR COMPENSATION SHALL BE PROVIDED BY WELDLET.

c) WELDLETS SHALL BE SUPPLIED FORGED BUND TO BE DRILLED AFTER HYDROTEST.

d) DESIGN TEMPERATURE OF TERMINAL AND MANFOLD: INLET 680°C, OUTLET 890°C. SEE DWG. NO. K196-305-DW-0121-003 SH.1 AND DWG. NO. K196-305-DW-0121-002 SH.1

e) TUBE SUPPORT STEEL SHALL BE PAINTED ACC. TO SPEC. MATERIAL REQUESTION.

DESIGN DATA				
PART	UNITS	FLANGES POS. 4/5	CAST TUBE POS.8	OUTLET ZONE POS.8
DESIGN PRESSURE	kPa (g)	3585	3070	3070
DESIGN TEMPERATURE	°C	585 (27)	930	890
CORROSION ALLOWANCE	mm	0	0	0
HYDRO-TEST-PRESSURE (MANUFACTURER SHOP) (20)	kPa (g)		14900	
HYDRO-TEST-PRESSURE (SHOP, AFTER MODULARIZATION) (20)	kPa (g)		14900	
PNEUMATIC-TEST-PRESSURE (FIELD)	kPa (g)		(19)	
ERECTION WEIGHT (EACH)	kg		450	
OPERATING WEIGHT (EACH)	kg		450	
WEIGHT FULL OF WATER (EACH)	kg		600	
TOTAL VOLUME (EACH)	m³		0.15	
CATALYST TOTAL VOLUME (FOR NO.40 TUBES)	m³		4.5	
POST WELD HEAT - TREATMENT			N.A.	
RADIOGRAPHING SHOP WELD PERC.	%		100	
RADIOGRAPHING FIELD PERC.	%		100	
DYE PENETRANT	%		100	
MAGNETIC EXAMINATION	%		-	
ULTRASONIC EXAMINATION	%		100	
HARDNESS	HB		-	
POSITIVE MATERIAL IDENTIFICATION	%		100	
DESIGN AS PER			API 530/ASME B31.3	
CONSTRUCTION AS PER			API 530/ASME B31.3	
INSPECTION BY			KT/CLIENT	

REFERENCE DRAWINGS	
- KT DWG. NO. K196-305-DW-0121-002 SH.1	OUTLET SYSTEM - GENERAL ARRANGEMENT
- KT DWG. NO. K196-305-DW-0121-002 SH.2	OUTLET SYSTEM DETAILS
- KT DWG. NO. K196-305-DW-0121-003 SH.1	INLET SYSTEM - ELEVATION
- KT DWG. NO. K196-305-DW-0121-003 SH.2	REFORMER GENERAL ARRANGEMENT - CROSS SECTION
- KT DWG. NO. K196-305-DW-0121-003 SH.3	REFORMER GENERAL ARRANGEMENT - LONGITUDINAL SECTION
- KT DWG. NO. K196-305-DW-0131-005	GENERAL NOTES AND INFORMATION
- KT DOC. NO. K196-305-CN-0121-001	MECHANICAL CALCULATION CATALYST TUBE REFORMER HEATER

HOLD LIST	
1	OUTLET SYSTEM - GENERAL ARRANGEMENT
2	OUTLET SYSTEM DETAILS
3	INLET SYSTEM - ELEVATION
4	REFORMER GENERAL ARRANGEMENT - CROSS SECTION
5	REFORMER GENERAL ARRANGEMENT - LONGITUDINAL SECTION
6	GENERAL NOTES AND INFORMATION
7	MECHANICAL CALCULATION CATALYST TUBE REFORMER HEATER

NOTES	
1-	ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE SPECIFIED.
2-	VENDOR EXTENT OF SUPPLY SHALL BE AS SPEC. IN PERTAINING REQUESTION.
3-	ALL REQUIREMENTS AS SPECIFIED IN PERTAINING REQUESTIONS AND SPECIFIC HAVE TO BE MET BY VENDOR.
4-	IN CASE OF CONTRADICTION BETWEEN BILL OF MATERIAL AND DRAWINGS THE DRAWING SHALL GOVERN AND KT SHALL DIRECTLY BE INFORMED.
5-	THE INDICATED GRID SHALL BE WELDED INTO REDUCER TUBE BEFORE WELDING THE CATALYST TUBE.
6-	ALL WELD PREPARATIONS ACCORDING WITH MANUFACTURER STANDARD UNLESS OTHERWISE NOTED AND APPROVED BY KT.
7-	THE INSIDE SURFACE OF CAST TUBES AND FITTINGS SHALL BE 125 RMS OR BETTER.
8-	WPS.POR AND WELDER QUALIFICATION SHALL BE IN ACCORDANCE WITH ASME IX LAST EDITION.
9-	THE ROOT AND FINAL WELD SHALL BOTH BE DYE PENETRANT INSPECTED.
10-	LIQUID PENETRANT SHALL BE PERFORMED AFTER BORING AND BEFORE WELDING ON EACH TUBE SEGMENT TO DETECT EXTERNAL SURFACE DEFECTS
11-	MECHANICAL DIMENSIONAL DESIGN IS A FULL SUPPLIER'S RESPONSABILITY AND SHALL BE DEVELOPED BY TAKING INTO ACCOUNT THE CHARACTERISTICS OF SUPPLIED MATERIAL.
12-	ALL BUTT WELDS SHALL BE 100% RADIOGRAPHED PER ASME BPV CODE SECTION VIII DIVISION 1.
13-	TOLERANCE: WORKING AND PREFABRICATION TOLERANCE AS PER CODE.
14-	U.S. = UNDER STEEL ELEVATION.
15-	T.O.S. = TOP STEEL ELEVATION.
16-	N.A. = NOT APPLICABLE.
17-	S.W. = SHOP WELD (*); TO BE PERFORMED BY STEELWORK PREFABRICATOR VENDOR.
18-	ALL WELDS SHALL BE FULL PENETRATION.
19-	PNEUMATIC TEST IN FIELD WILL BE PERFORMED FOR THE SYSTEM CONNECTION 305-CC02 - INLET SYSTEM CATALYST TUBE - OUTLET SYSTEM - TRANSFERLINE - PCB.
20-	COIL ASSEMBLIES SHALL BE COMPLETELY DRAINED AND DRIED IMMEDIATELY UPON COMPLETION OF HYDROTESTING. IF COIL ASSEMBLIES ARE NOT DRAINABLE, DEMINERALIZED WATER CONTAINING 1% Na CO3 (SODIUM CARBONATE) PLUS 0.5% Na NO2 SHALL BE USED FOR HYDROTESTING. FOR TUBE COILS MANUFACTURE FROM STAINLESS STEEL, THE WATER SHALL BE NOT CONTAIN MORE THAN 25-ppm CHLORIDES.
21-	INLET WELDLET DIMENSION SEE SUPPLIER DRAWING BY VENDOR.
22-	THE WELDLET WILL BE DRILLED AFTER HYDRAULIC TEST ONLY TO STRESS THE WELDING
23-	FLANGE DIMENSIONS AND THICKNESS, BOLTS/NUTS NUMBER, SIZE AND LENGTH, DATA OF TOP FLANGE GASKETS TO BE AS PER DWG. BASED ON FLANGE FITTING WITH TUBE I.D. AND O.D.
24-	CATALYST TUBE ASSEMBLIES TO BE SUPPLIED COMPLETELY SHOP FABRICATED AND TESTED
25-	BOLTING HOLES IN FLANGE TO STRADDLE THE HORIZONTAL AND VERTICAL CENTERLINE, UNLESS OTHERWISE NOTED
26-	WELD REPAIR IS NOT PERMITTED
27-	OPERATING AND DESIGN TEMPERATURE AT THE TUBE INLET (850°C AND 890°C RESPECTIVELY) BUT THE DESIGN TEMPERATURE OF FLANGES AND BOLTING MATERIALS HAS TO BE DEFINED ACCORDING TO THE REQUIREMENTS OF ASTM B31.3, WHICH ALLOWS TO CONSIDER BOX (FOR BOLTING MATERIALS T=520°C) AND BOX (FOR FLANGES T=585°C) OF FLUID OPERATING TEMPERATURE AS DESIGN TEMPERATURE.
28-	DELETED.

CATALYST TUBE LAYOUT	
1	OUTLET SYSTEM - GENERAL ARRANGEMENT
2	OUTLET SYSTEM DETAILS
3	INLET SYSTEM - ELEVATION
4	REFORMER GENERAL ARRANGEMENT - CROSS SECTION
5	REFORMER GENERAL ARRANGEMENT - LONGITUDINAL SECTION
6	GENERAL NOTES AND INFORMATION
7	MECHANICAL CALCULATION CATALYST TUBE REFORMER HEATER