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sabic

ARABIAN INDUSTRIAL FIBERS COMPANY

IR-II AROMATICS PROJECT

PROJECT NO. 10E0541A01

DOCUMENT TITLE:

CHARGE HEATER DATA SHEET

DOCUMENT NO:

DS-54-BA-501

REV	DESCRIPTION	BY	CHK.	APPR.	DATE
2	Revised as Marked	KWY.	CBC	YSL	11-Aug.-11
1	Issued for Design	KWY	CBC	YSL	27-May-11
0	Issue For Approval	KWY	CBC	YSL	23-Mar.-11

ابن رشد
ibn rushd

ARABIAN INDUSTRIAL FIBERS COMPANY YANBU, KINGDOM OF SAUDI ARABIA

CTCI CORPORATION

CERTIFIED

PROJ.

MGR _____ DATE _____

CLIENT _____ DATE _____

XC33D-54-501

GN-502 84.10

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CONTENTS

ابن رشد
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FLUOR

FIRED HEATER DATA SHEET

Contract:	10E0541A01
Equipment No.:	54-B-01
Revision:	2 Date: 11-Aug.-2011
Unit:	54 - Isomar
P.O. No.:	
Document No.:	DS-54-BA-01
Sheet:	1 of 5

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CTCI CORPORATION

REV

Client: Arabian Industrial Fibers Company (Ibn Rushd) **Vendor:** Existing Born Heater - Revamped for New Service

Service: Charge Heater **Plant:** Isomar **Site:** Yanbu, Saudi Arabia

Type of Heater: Wicket **Vendor:** Existing Born Heater

Total Heater Absorbed Duty: 20.22 MW **Assembly:** Wicket with Deheptanizer Reboiler in Convection Section

PROCESS DESIGN CONDITIONS

* OPERATION CASE		REVAMP EOR	REVAMP EOR		
HEATER SECTION		Radiant	Convection		
SERVICE		Charge	Deheptanizer Reboiler		
HEAT ABSORPTION	MW	14.45	5.77		
FLUID NAME		Hydrocarbon	Hydrocarbon		
FLOW RATE	kg/hr	276,955	185,472		
FLOW RATE	B.P.D.				
PRESSURE DROP - ALLOWABLE (CLEAN / FOULED)	bar				
PRESSURE DROP - CALCULATED (CLEAN / FOULED)	bar	0.31	1.33		
FOULING ALLOWANCE	m²·°C/W				
THERMAL CONDUCTIVITY OF COKE/SCALE	W/m·°C				
COKING ALLOWANCE	mm				
AVG. RADIANT SECTION FLUX DENSITY - ALLOWABLE	W/m²				
AVG. RADIANT SECTION FLUX DENSITY - CALCULATED	W/m²				
MAX. RADIANT SECTION FLUX DENSITY	W/m²				
CONVECTION SECTION FLUX DENSITY, (BARE TUBE)	W/m²				
VELOCITY LIMITATION	m/s				
PROCESS FLUID MASS VELOCITY	kg/s·m²				
MAX. ALLOWABLE / CALCULATED INSIDE FILM TEMPERATURE	°C				
INLET CONDITIONS:					
TEMPERATURE	°C	358	235		
PRESSURE ■ bar (g) □ bar (g)		13.28	8.09		
LIQUID FLOW	kg/hr		185,472		
VAPOR FLOW	kg/hr	276,955			
DENSITY - LIQUID	kg/m³		652.4		
VAPOR MOLECULAR WEIGHT		28.9			
VISCOSITY - (LIQUID / VAPOR)	mPa-s	0.017	0.172		
SPECIFIC HEAT - (LIQUID / VAPOR)	kJ/kg·°C	2.962	2.576		
THERMAL CONDUCTIVITY - (LIQUID / VAPOR)	W/m·°C	0.111	0.098		
OUTLET CONDITIONS:					
TEMPERATURE	°C	420	237		
PRESSURE ■ bar (g) □ bar (g)		12.97	6.76		
LIQUID FLOW	kg/hr		112,619		
VAPOR FLOW	kg/hr	276,955	72,853		
DENSITY - LIQUID	kg/m³		648.8		
VAPOR MOLECULAR WEIGHT		28.9	106.2		
VISCOSITY - (LIQUID / VAPOR)	mPa-s	0.018	0.170 0.011		
SPECIFIC HEAT - (LIQUID / VAPOR)	kJ/kg·°C	3.110	2.587 2.066		
THERMAL CONDUCTIVITY - (LIQUID / VAPOR)	W/m·°C	0.122	0.098 0.027		

REMARKS AND SPECIAL REQUIREMENTS:

DISTILLATION DATA OR FEED COMPOSITION: See Fluid Properties on Sheets 3 and 4

SHORT TERM OPERATING CONDITIONS:

OTHER:

NOTES:

See Notes on Sheet 5

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FLUOR

FIRED HEATER DATA SHEET

Contract:	10E0541A01
Equipment No.:	54-B-01
Revision:	2 Date: 11-Aug.-2011
Unit:	54 - Isomar
P.O. No.:	
Document No.:	DS-54-BA-01
Sheet:	2 of 5

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COMBUSTION DESIGN CONDITIONS

						REV
* OPERATING CASE			REVAMP EOR			
* TYPE OF FUEL			Sales Gas			
* EXCESS AIR		%	15.0			
CALCULATED HEAT RELEASE (LHV)		MW	23.62			
CALCULATED THERMAL EFFICIENCY		% (LHV)				
CALCULATED FUEL EFFICIENCY		% (LHV)	86.0			
* GUARANTEED FUEL EFFICIENCY		% (LHV)				
RADIATION LOSS	% OF HEAT RELEASE (LHV)		2.0			
FLUE GAS TEMPERTURE LEAVING:	RADIANT SECT.	°C	742			
	CONVECTION SECTION	°C	276			
	AIR PREHEATER	°C	n/a			
FLUE GAS ACID DEW POINT TEMPERATURE,		°C	93			
FLUE GAS QUANTITY		kg/hr	35,917			
FLUE GAS MASS VELOCITY THRU CONVECTION SECTION		kg/s·m²				
VOLUMETRIC HEAT RELEASE (LHV)		kW/m³				
DRAFT: Immediately Above Top Convection Row,		mm H2O				
Immediately Below Bottom Convection Row,		mm H2O	2.5			
At Burners,		mm H2O	50.0			
COMBUSTION AIR TEMP.: Leaving Steam/Air Preheater,		°C	-			
At Burners,		°C	15.6			
COMBUSTION AIR QUANTITY		kg/hr	33,819			
AMBIENT AIR TEMPERATURE - EFFICIENCY CALCULATION		°C	15.6			
* AMBIENT AIR TEMPERATURE - STACK DESIGN		°C	50.0			
* ALTITUDE ABOVE SEA LEVEL		m	7.25			

FUEL CHARACTERISTICS

* GAS TYPE	Sales Gas		* GAS TYPE			* LIQUID TYPE			
* LHV	40,512	■ kJ/kg ☐ kJ/Sm³	* LHV		☐ kJ/kg ☐ kJ/Sm³	* LHV		kJ/kg	
* HHV		☐ kJ/kg ☐ kJ/Sm³	* HHV		☐ kJ/kg ☐ kJ/Sm³	* HHV		kJ/kg	
* PRESS. @ BURNER	1.75	bar (g)	* PRESS. @ BURNER		bar (g)	* PRESS. @ BURNER		bar (g)	
* TEMP. @ BURNER	15.6	°C	* TEMP. @ BURNER		°C	* TEMP. @ BURNER		°C	
* MOLECULAR WEIGHT			* MOLECULAR WEIGHT			* VISCOSITY @	°C	SSU	
						* ATOMIZING STEAM TEMP.		°C	
						* ATOMIZING STEAM PRESS.		bar (g)	

COMPOSITION	MOLE %	COMPOSITION	MOLE %
N2	12.0		
C1	82.7		
C2	5.0		
C3	0.3		
H2S	<2.0 wt ppm		
TOTAL	100.0		

COMPOSITION	WT %
* VANADIUM (ppm)	
* SODIUM (ppm)	
* SULFUR	
* ASH	

DATA FOR *EXISTING* BURNERS

MANUFACTURER: SIZE / MODEL: NUMBER: 13

TYPE: LOCATION: ORIENTATION:

HEAT RELEASE PER BURNER: MW DESIGN: 2.38 NORMAL: 1.82 MINIMUM:

PRESSURE DROP ACROSS BURNER @ DESIGN HEAT RELEASE: By Vendor mm H2O

DISTANCE BURNER CENTER LINE TO TUBE CENTER LINE: HORIZONTAL: mm VERTICAL: mm

DISTANCE BURNER CENTER LINE TO UNSHIELDED REFRACTORY: HORIZONTAL: mm VERTICAL: mm

BURNER PILOT: CAPACITY kW FUEL Sales Gas FUEL PRESSURE bar (g)

IGNITION METHOD: Automatic

SPECIAL REQUIREMENTS (FLAME DETECTION DEVICES, SAFETY INTERLOCKS, ETC.):

REQUIRED EMISSIONS: ☐ ppmv(d) (CORRECTED TO 3% O_2) NOx: **Remark 1** CO: **Remark 1** SOx: **Remark 1**

See **REMARK 1** ☐ kg/kJ ☐ (LHV) ☐ (HHV) UHC: **Remark 1** PARTICULATES: **Remark 1**

REMARKS:

1. The Royal Commission for Jubail and Yanbu has issued the "Royal Commission Environmental Regulations (RCER)" to be adopted by industries both in Jubail and Yanbu. Any facility operating or planning to operate on the Royal Commission property shall comply with those regulations.

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FLUOR

FIRED HEATER DATA SHEET

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P.O. No.:	
Document No.:	DS-54-BA-01
Sheet:	3 of 5

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CTCI CORPORATION

REV

FLUID PROPERTIES:

Deheptanizer Reboiler

Thermodynamic condition			Vapor					Liquid					
Pressure bar(a)	Temp °C	Weight fraction vapor	Enthalpy kJ/kg	Density kg/m³	Specific heat kJ/kg-°C	Viscosity mPa-s	Thermal cond. W/m-°C	Enthalpy kJ/kg	Density kg/m³	Specific heat kJ/kg-°C	Viscosity mPa-s	Thermal cond. W/m-°C	Surface tension dyne/cm
7.770	233.33	0.0000	0.00	0.00	0.0000	0.0000	0.0000	457.59	653.55	2.5690	0.1725	0.0981	7.99
7.770	234.47	0.0000	0.00	0.00	0.0000	0.0000	0.0000	460.51	651.95	2.5745	0.1717	0.0980	7.90
7.770	235.60	0.0000	0.00	0.00	0.0000	0.0000	0.0000	463.43	650.35	2.5803	0.1708	0.0978	7.80
7.770	236.72	0.0000	735.90	23.06	2.0645	0.0106	0.0272	466.33	648.75	2.5858	0.1701	0.0976	7.70
7.770	236.74	0.0420	735.93	23.06	2.0649	0.0106	0.0272	466.37	648.75	2.5858	0.1701	0.0976	7.70
7.770	236.75	0.0839	735.97	23.06	2.0649	0.0106	0.0272	466.41	648.91	2.5858	0.1701	0.0976	7.70
7.770	236.76	0.1259	736.01	23.06	2.0649	0.0106	0.0272	466.44	648.91	2.5858	0.1701	0.0976	7.70
7.770	236.78	0.1679	736.04	23.06	2.0649	0.0106	0.0272	466.48	648.91	2.5862	0.1701	0.0976	7.70
7.770	236.79	0.2098	736.08	23.06	2.0649	0.0106	0.0272	466.52	648.91	2.5862	0.1701	0.0976	7.70
7.770	236.81	0.2518	736.12	23.06	2.0649	0.0106	0.0272	466.56	648.91	2.5862	0.1701	0.0976	7.70
7.770	236.82	0.2938	736.15	23.06	2.0649	0.0106	0.0272	466.60	648.91	2.5862	0.1701	0.0976	7.70
7.770	236.83	0.3358	736.19	23.06	2.0653	0.0106	0.0272	466.63	648.91	2.5862	0.1701	0.0976	7.70
7.770	236.84	0.3778	736.23	23.06	2.0653	0.0106	0.0272	466.67	648.91	2.5862	0.1701	0.0976	7.70
7.770	236.86	0.4197	736.27	23.06	2.0653	0.0106	0.0272	466.71	648.91	2.5862	0.1701	0.0976	7.70
7.924	234.44	0.0000	0.00	0.00	0.0000	0.0000	0.0000	460.45	652.11	2.5745	0.1717	0.0980	7.90
7.924	235.60	0.0000	0.00	0.00	0.0000	0.0000	0.0000	463.43	650.51	2.5803	0.1709	0.0978	7.80
7.924	236.76	0.0000	0.00	0.00	0.0000	0.0000	0.0000	466.42	648.91	2.5858	0.1701	0.0976	7.70
7.924	237.90	0.0000	737.86	23.52	2.0704	0.0106	0.0273	469.38	647.31	2.5916	0.1692	0.0974	7.60
7.924	237.91	0.0420	737.90	23.52	2.0704	0.0106	0.0273	469.41	647.31	2.5916	0.1693	0.0974	7.60
7.924	237.92	0.0839	737.94	23.52	2.0704	0.0106	0.0273	469.45	647.31	2.5916	0.1693	0.0974	7.60
7.924	237.94	0.1259	737.97	23.52	2.0704	0.0106	0.0273	469.49	647.31	2.5916	0.1693	0.0974	7.60
7.924	237.95	0.1679	738.01	23.52	2.0704	0.0106	0.0273	469.52	647.31	2.5920	0.1693	0.0974	7.60
7.924	237.97	0.2098	738.04	23.52	2.0704	0.0106	0.0273	469.56	647.31	2.5920	0.1693	0.0974	7.60
7.924	237.98	0.2518	738.08	23.52	2.0704	0.0106	0.0273	469.60	647.31	2.5920	0.1693	0.0974	7.60
7.924	237.99	0.2938	738.12	23.53	2.0708	0.0106	0.0273	469.64	647.31	2.5920	0.1693	0.0974	7.60
7.924	238.01	0.3358	738.15	23.53	2.0708	0.0106	0.0273	469.67	647.31	2.5920	0.1693	0.0974	7.60
7.924	238.02	0.3778	738.19	23.53	2.0708	0.0106	0.0273	469.71	647.31	2.5920	0.1693	0.0974	7.60
7.924	238.03	0.4197	738.23	23.53	2.0708	0.0106	0.0273	469.75	647.31	2.5920	0.1693	0.0974	7.60
8.078	235.56	0.0000	0.00	0.00	0.0000	0.0000	0.0000	463.32	650.67	2.5799	0.1709	0.0978	7.80
8.078	236.73	0.0000	0.00	0.00	0.0000	0.0000	0.0000	466.34	649.07	2.5858	0.1701	0.0976	7.70
8.078	237.90	0.0000	0.00	0.00	0.0000	0.0000	0.0000	469.38	647.31	2.5916	0.1693	0.0974	7.60
8.078	239.06	0.0000	739.80	23.99	2.0758	0.0106	0.0273	472.38	645.70	2.5975	0.1685	0.0973	7.50
8.078	239.07	0.0420	739.84	23.99	2.0758	0.0106	0.0273	472.42	645.70	2.5975	0.1685	0.0973	7.50
8.078	239.08	0.0839	739.87	23.99	2.0758	0.0106	0.0273	472.45	645.70	2.5975	0.1685	0.0973	7.50
8.078	239.09	0.1259	739.91	23.99	2.0758	0.0106	0.0273	472.49	645.70	2.5975	0.1685	0.0973	7.50
8.078	239.11	0.1679	739.94	23.99	2.0758	0.0106	0.0273	472.53	645.70	2.5979	0.1685	0.0973	7.50
8.078	239.12	0.2098	739.98	23.99	2.0758	0.0106	0.0273	472.56	645.70	2.5979	0.1685	0.0973	7.50
8.078	239.13	0.2518	740.01	23.99	2.0758	0.0106	0.0273	472.60	645.70	2.5979	0.1685	0.0973	7.50
8.078	239.15	0.2938	740.05	23.99	2.0762	0.0106	0.0273	472.64	645.70	2.5979	0.1685	0.0973	7.50
8.078	239.16	0.3358	740.09	23.99	2.0762	0.0106	0.0273	472.68	645.70	2.5979	0.1685	0.0973	7.50
8.078	239.18	0.3778	740.13	23.99	2.0762	0.0106	0.0273	472.72	645.70	2.5979	0.1685	0.0973	7.50
8.078	239.19	0.4197	740.17	23.99	2.0762	0.0106	0.0273	472.76	645.70	2.5979	0.1685	0.0973	7.50
8.232	236.39	0.0000	0.00	0.00	0.0000	0.0000	0.0000	465.47	649.55	2.5841	0.1704	0.0976	7.73
8.232	237.66	0.0000	0.00	0.00	0.0000	0.0000	0.0000	468.76	647.79	2.5904	0.1695	0.0974	7.62
8.232	238.93	0.0000	0.00	0.00	0.0000	0.0000	0.0000	472.06	646.02	2.5971	0.1686	0.0973	7.51
8.232	240.19	0.0000	741.71	24.46	2.0813	0.0107	0.0275	475.35	644.26	2.6034	0.1677	0.0971	7.40
8.232	240.21	0.0420	741.74	24.46	2.0813	0.0107	0.0275	475.39	644.26	2.6034	0.1677	0.0971	7.40
8.232	240.22	0.0839	741.78	24.46	2.0813	0.0107	0.0275	475.42	644.26	2.6034	0.1677	0.0971	7.40
8.232	240.24	0.1259	741.82	24.46	2.0813	0.0107	0.0275	475.46	644.26	2.6034	0.1677	0.0971	7.40
8.232	240.25	0.1679	741.85	24.46	2.0813	0.0107	0.0275	475.49	644.26	2.6034	0.1677	0.0971	7.40
8.232	240.26	0.2098	741.89	24.46	2.0813	0.0107	0.0275	475.53	644.26	2.6038	0.1677	0.0971	7.40
8.232	240.28	0.2518	741.92	24.46	2.0813	0.0107	0.0275	475.57	644.26	2.6038	0.1677	0.0971	7.40
8.232	240.29	0.2938	741.96	24.46	2.0813	0.0107	0.0275	475.61	644.26	2.6038	0.1677	0.0971	7.40
8.232	240.30	0.3358	742.00	24.46	2.0817	0.0107	0.0275	475.64	644.26	2.6038	0.1677	0.0971	7.40
8.232	240.32	0.3778	742.03	24.46	2.0817	0.0107	0.0275	475.68	644.26	2.6038	0.1677	0.0971	7.40
8.232	240.33	0.4198	742.07	24.46	2.0817	0.0107	0.0275	475.72	644.26	2.6038	0.1677	0.0971	7.40
8.385	236.39	0.0000	0.00	0.00	0.0000	0.0000	0.0000	465.47	649.71	2.5841	0.1704	0.0976	7.73
8.385	238.04	0.0000	0.00	0.00	0.0000	0.0000	0.0000	469.74	647.31	2.5925	0.1692	0.0974	7.59
8.385	239.69	0.0000	0.00	0.00	0.0000	0.0000	0.0000	474.02	645.06	2.6008	0.1681	0.0973	7.45
8.385	241.32	0.0000	743.59	24.93	2.0863	0.0107	0.0275	478.28	642.66	2.6092	0.1669	0.0969	7.31
8.385	241.33	0.0420	743.62	24.93	2.0863	0.0107	0.0275	478.32	642.66	2.6092	0.1669	0.0969	7.31
8.385	241.35	0.0839	743.66	24.93	2.0867	0.0107	0.0275	478.35	642.66	2.6092	0.1669	0.0969	7.31
8.385	241.36	0.1259	743.69	24.93	2.0867	0.0107	0.0275	478.39	642.66	2.6092	0.1669	0.0969	7.31
8.385	241.37	0.1679	743.73	24.93	2.0867	0.0107	0.0275	478.43	642.66	2.6092	0.1669	0.0969	7.31
8.385	241.39	0.2098	743.77	24.93	2.0867	0.0107	0.0275	478.47	642.66	2.6092	0.1669	0.0969	7.31
8.385	241.40	0.2518	743.80	24.93	2.0867	0.0107	0.0275	478.50	642.66	2.6096	0.1669	0.0969	7.31
8.385	241.41	0.2938	743.84	24.93	2.0867	0.0107	0.0275	478.54	642.66	2.6096	0.1669	0.0969	7.31
8.385	241.43	0.3358	743.88	24.93	2.0867	0.0107	0.0275	478.58	642.66	2.6096	0.1670	0.0969	7.31
8.385	241.44	0.3778	743.91	24.93	2.0867	0.0107	0.0275	478.61	642.66	2.6096	0.1670	0.0969	7.31
8.385	241.46	0.4198	743.95	24.93	2.0871	0.0107	0.0275	478.65	642.66	2.6096	0.1670	0.0969	7.31

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FLUOR

FIRED HEATER DATA SHEET

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P.O. No.:	
Document No.:	DS-54-BA-01
Sheet:	4 of 5

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CTCI CORPORATION

REV

FLUID PROPERTIES:

Deheptanizer Reboiler

Thermodynamic condition			Vapor					Liquid					
Pressure bar(a)	Temp °C	Weight fraction vapor	Enthalpy kJ/kg	Density kg/m³	Specific heat kJ/kg-°C	Viscosity mPa-s	Thermal cond. W/m-°C	Enthalpy kJ/kg	Density kg/m³	Specific heat kJ/kg-°C	Viscosity mPa-s	Thermal cond. W/m-°C	Surface tension dyne/cm
8.539	236.39	0.0000	0.00	0.00	0.0000	0.0000	0.0000	465.47	649.71	2.5841	0.1704	0.0976	7.73
8.539	238.41	0.0000	0.00	0.00	0.0000	0.0000	0.0000	470.69	646.99	2.5941	0.1690	0.0974	7.56
8.539	240.42	0.0000	0.00	0.00	0.0000	0.0000	0.0000	475.93	644.10	2.6046	0.1676	0.0971	7.38
8.539	242.43	0.0000	745.44	25.40	2.0917	0.0107	0.0277	481.18	641.22	2.6151	0.1662	0.0967	7.21
8.539	242.44	0.0420	745.48	25.40	2.0917	0.0107	0.0277	481.22	641.22	2.6151	0.1662	0.0967	7.21
8.539	242.46	0.0839	745.51	25.40	2.0917	0.0107	0.0277	481.25	641.22	2.6151	0.1662	0.0967	7.21
8.539	242.47	0.1259	745.55	25.40	2.0917	0.0107	0.0277	481.29	641.22	2.6151	0.1662	0.0967	7.21
8.539	242.48	0.1679	745.59	25.40	2.0917	0.0107	0.0277	481.33	641.22	2.6151	0.1662	0.0967	7.21
8.539	242.49	0.2098	745.62	25.40	2.0921	0.0107	0.0277	481.36	641.22	2.6151	0.1662	0.0967	7.21
8.539	242.51	0.2518	745.66	25.40	2.0921	0.0107	0.0277	481.40	641.22	2.6151	0.1662	0.0967	7.21
8.539	242.52	0.2938	745.69	25.40	2.0921	0.0107	0.0277	481.44	641.22	2.6151	0.1662	0.0967	7.21
8.539	242.54	0.3358	745.73	25.40	2.0921	0.0107	0.0277	481.48	641.22	2.6155	0.1662	0.0967	7.21
8.539	242.55	0.3778	745.77	25.40	2.0921	0.0107	0.0277	481.51	641.22	2.6155	0.1662	0.0967	7.21
8.539	242.56	0.4198	745.80	25.40	2.0921	0.0107	0.0277	481.55	641.22	2.6155	0.1662	0.0967	7.21
8.693	236.39	0.0000	0.00	0.00	0.0000	0.0000	0.0000	465.47	649.87	2.5841	0.1704	0.0976	7.73
8.693	238.77	0.0000	0.00	0.00	0.0000	0.0000	0.0000	471.64	646.51	2.5962	0.1688	0.0973	7.52
8.693	241.16	0.0000	0.00	0.00	0.0000	0.0000	0.0000	477.85	643.14	2.6084	0.1671	0.0969	7.32
8.693	243.53	0.0000	747.27	25.87	2.0972	0.0107	0.0277	484.05	639.78	2.6205	0.1655	0.0967	7.12
8.693	243.54	0.0420	747.31	25.87	2.0972	0.0107	0.0277	484.08	639.78	2.6205	0.1655	0.0967	7.12
8.693	243.55	0.0839	747.34	25.87	2.0972	0.0107	0.0277	484.12	639.78	2.6205	0.1655	0.0967	7.12
8.693	243.57	0.1259	747.38	25.87	2.0972	0.0107	0.0277	484.15	639.78	2.6205	0.1655	0.0966	7.12
8.693	243.58	0.1679	747.41	25.87	2.0972	0.0107	0.0277	484.19	639.78	2.6209	0.1655	0.0966	7.12
8.693	243.59	0.2098	747.45	25.87	2.0972	0.0107	0.0277	484.23	639.78	2.6209	0.1655	0.0966	7.12
8.693	243.61	0.2518	747.49	25.87	2.0972	0.0107	0.0277	484.27	639.78	2.6209	0.1655	0.0966	7.12
8.693	243.62	0.2938	747.52	25.87	2.0972	0.0107	0.0277	484.30	639.78	2.6209	0.1655	0.0966	7.12
8.693	243.63	0.3358	747.56	25.87	2.0976	0.0107	0.0277	484.34	639.78	2.6209	0.1655	0.0965	7.12
8.693	243.64	0.3778	747.60	25.87	2.0976	0.0107	0.0277	484.38	639.78	2.6209	0.1655	0.0966	7.12
8.693	243.66	0.4198	747.63	25.87	2.0976	0.0107	0.0277	484.42	639.78	2.6209	0.1655	0.0966	7.12
8.847	236.39	0.0000	0.00	0.00	0.0000	0.0000	0.0000	465.47	649.87	2.5841	0.1704	0.0976	7.73
8.847	239.13	0.0000	0.00	0.00	0.0000	0.0000	0.0000	472.58	646.02	2.5979	0.1685	0.0973	7.49
8.847	241.88	0.0000	0.00	0.00	0.0000	0.0000	0.0000	479.73	642.18	2.6121	0.1666	0.0969	7.26
8.847	244.61	0.0000	749.07	26.34	2.1022	0.0107	0.0279	486.88	638.18	2.6264	0.1647	0.0966	7.03
8.847	244.62	0.0420	749.11	26.34	2.1022	0.0107	0.0279	486.92	638.18	2.6264	0.1647	0.0966	7.03
8.847	244.63	0.0839	749.14	26.34	2.1022	0.0107	0.0279	486.95	638.18	2.6264	0.1647	0.0966	7.03
8.847	244.64	0.1259	749.18	26.34	2.1022	0.0107	0.0279	486.99	638.18	2.6264	0.1647	0.0966	7.03
8.847	244.66	0.1679	749.22	26.34	2.1026	0.0107	0.0279	487.02	638.18	2.6264	0.1647	0.0966	7.03
8.847	244.67	0.2098	749.25	26.34	2.1026	0.0107	0.0279	487.06	638.18	2.6264	0.1647	0.0966	7.03
8.847	244.68	0.2518	749.29	26.34	2.1026	0.0107	0.0279	487.10	638.18	2.6268	0.1648	0.0966	7.03
8.847	244.69	0.2938	749.32	26.34	2.1026	0.0107	0.0279	487.13	638.34	2.6268	0.1648	0.0966	7.03
8.847	244.71	0.3358	749.36	26.34	2.1026	0.0107	0.0279	487.17	638.34	2.6268	0.1648	0.0966	7.03
8.847	244.72	0.3778	749.40	26.34	2.1026	0.0107	0.0279	487.21	638.34	2.6268	0.1648	0.0966	7.03
8.847	244.74	0.4198	749.44	26.34	2.1026	0.0107	0.0279	487.25	638.34	2.6268	0.1648	0.0966	7.03
9.000	236.39	0.0000	0.00	0.00	0.0000	0.0000	0.0000	465.47	650.03	2.5841	0.1705	0.0976	7.73
9.000	239.48	0.0000	0.00	0.00	0.0000	0.0000	0.0000	473.49	645.70	2.5996	0.1683	0.0973	7.46
9.000	242.58	0.0000	0.00	0.00	0.0000	0.0000	0.0000	481.56	641.22	2.6155	0.1662	0.0967	7.20
9.000	245.67	0.0000	750.85	26.81	2.1076	0.0108	0.0279	489.68	636.73	2.6318	0.1640	0.0964	6.94
9.000	245.68	0.0420	750.89	26.81	2.1076	0.0108	0.0279	489.72	636.73	2.6318	0.1640	0.0964	6.94
9.000	245.70	0.0839	750.92	26.81	2.1076	0.0108	0.0280	489.76	636.73	2.6322	0.1640	0.0964	6.94
9.000	245.71	0.1259	750.96	26.81	2.1076	0.0108	0.0280	489.79	636.73	2.6322	0.1640	0.0964	6.94
9.000	245.72	0.1679	751.00	26.81	2.1076	0.0108	0.0280	489.83	636.73	2.6322	0.1640	0.0964	6.94
9.000	245.73	0.2098	751.03	26.81	2.1076	0.0108	0.0280	489.86	636.73	2.6322	0.1640	0.0964	6.94
9.000	245.75	0.2518	751.07	26.81	2.1076	0.0108	0.0280	489.90	636.73	2.6322	0.1640	0.0964	6.94
9.000	245.76	0.2938	751.10	26.81	2.1076	0.0108	0.0280	489.94	636.73	2.6322	0.1641	0.0964	6.94
9.000	245.78	0.3358	751.14	26.81	2.1081	0.0108	0.0280	489.97	636.73	2.6322	0.1641	0.0964	6.94
9.000	245.79	0.3778	751.17	26.81	2.1081	0.0108	0.0280	490.01	636.73	2.6322	0.1641	0.0964	6.94
9.000	245.80	0.4198	751.21	26.81	2.1081	0.0108	0.0280	490.05	636.73	2.6322	0.1641	0.0964	6.94
9.154	236.39	0.0000	0.00	0.00	0.0000	0.0000	0.0000	465.47	650.03	2.5841	0.1705	0.0976	7.73
9.154	239.84	0.0000	0.00	0.00	0.0000	0.0000	0.0000	474.42	645.22	2.6017	0.1681	0.0973	7.43
9.154	243.29	0.0000	0.00	0.00	0.0000	0.0000	0.0000	483.42	640.26	2.6193	0.1657	0.0967	7.14
9.154	246.72	0.0000	752.61	27.29	2.1127	0.0108	0.0280	492.46	635.29	2.6377	0.1633	0.0962	6.85
9.154	246.74	0.0420	752.65	27.29	2.1127	0.0108	0.0280	492.49	635.29	2.6377	0.1633	0.0962	6.85
9.154	246.75	0.0839	752.68	27.29	2.1127	0.0108	0.0280	492.53	635.29	2.6377	0.1633	0.0962	6.85
9.154	246.76	0.1259	752.71	27.29	2.1127	0.0108	0.0280	492.56	635.29	2.6377	0.1633	0.0962	6.85
9.154	246.78	0.1679	752.75	27.29	2.1127	0.0108	0.0280	492.60	635.29	2.6377	0.1633	0.0962	6.85
9.154	246.79	0.2098	752.79	27.29	2.1131	0.0108	0.0280	492.64	635.29	2.6377	0.1634	0.0962	6.85
9.154	246.80	0.2518	752.82	27.29	2.1131	0.0108	0.0280	492.67	635.29	2.6377	0.1634	0.0962	6.85
9.154	246.82	0.2938	752.86	27.29	2.1131	0.0108	0.0280	492.71	635.29	2.6381	0.1634	0.0962	6.85
9.154	246.83	0.3358	752.89	27.29	2.1131	0.0108	0.0280	492.75	635.29	2.6381	0.1634	0.0962	6.85
9.154	246.84	0.3778	752.93	27.29	2.1131	0.0108	0.0280	492.78	635.29	2.6381	0.1634	0.0962	6.85
9.154	246.86	0.4198	752.97	27.29	2.1131	0.0108	0.0280	492.82	635.29	2.6381	0.1634	0.0962	6.85

REV

NOTES

MODIFICATIONS

1. The existing Isomar Charge Heater, Equipment No. 54-B-01, has adequate heat transfer surface area for the revamp process conditions.
2. No other modifications except those given below are required for the existing heater as long as it is "fit for service", which shall be determined by the CTCI: (Also, see "Revamp Notes" below). — 2
   a. UOP combustion conditions shown on Sheet 2 of this data sheet are based on 'Sales Gas' composition given in UOP document number 951606 - A.4 "Basic Engineering Design Questionaire, Rev. 3. CTCI/Heater Vendor shall confirm the adequacy of the existing burners and fuel gas supply system for the full range of fuel gas compositions anticipated for the revamp operation as shown in latest revision of Fluor document SP-000-AA-5002 "Basic Engineering Design Data". — 0 / 2

REFERENCE DATA

The UOP analysis of this heater for the revamp process conditions was based upon the following drawings and documents:

1. Born Charge Heater 54B01Fired Heater Data Sheets 1 to 8 - Born Ref. No. BJ2881 - Rev. 7 dated 09/24/96.
2. Born General Arrangement Elevations Drawing - Dwg No. 2881-54-B-01-02A - Rev. 4.
3. Born General Arrangement Plans Drawing - Dwg No. 2881-54-B-01-02B - Rev. 4.
4. Born Convection Coil Drawing - Dwg No. 2881-54-B-01-12B - Rev. 2.
5. Chiyoda Corporation - Piping & Instrumentation Diagram - Dwg No. DR-54-AD-102 - Rev 2.
6. John Zink - Burner Data Sheet - Data Sheet No. D-BU-A17229-812 - Rev 2.
7. Items not explicitly specified herein shall be in strict accordance with UOP Standard Specification 2-12.

REVAMP NOTES

1. The UOP revamp conclusions are based on the assumption that all existing coil components that are to be re-used for the revamp are identical to the vendor's data sheets referenced above, and:
   a. The tubes/fittings have normal original wall thickness.
   b. No significant corrosion or metallurgical damage has occurred.
   c. The tubes/fittings are not severely warped, bulged, nor oxidized.
   d. The tubes/fittings are free of internal and external deposits.

   Changes to this information will require further review of this specification by UOP.

2. CTCI/heater vendor is responsible for the following: — 0
   a. Providing confirmation and guarantee that the existing heater will meet UOP's predicted thermal and hydraulic performance while complying with specified noise and emissions limits.
   b. Conducting a detailed field inspection based upon consultation with the vendors.
   c. Ensuring that the heaters and ancillary equipment are refurbished, as required, to provide for safe operation at the revamp conditions.
   d. Verifying that the structural and mechanical integrity of the heater and ancillary equipment is satisfactory for the revamp conditions.
   e. Ensuring compliance with existing codes and practices, including environmental regulations.
   f. Ensuring that any replacement parts or modifications shall comply with the latest appropriate API/ISO standards. As a minimum, the replacement parts or modifications shall comply with the same standards as the original equipment.

8-1

CLIENT : CHIYODA / ARABIAN INDUSTRIAL FIBERS CO LTD
CHIYODA PO : SAY POE 0002
LOCATION : IBN RUSHD PTA & AROMATICS PLANT PROJECT

EQUIPMENT : 54-B-01 CHARGE HEATER.

REQUISITION NO : 22854-MR-000-B-501

CTCI CORPORATION

RETURNED
DEC 24 1996
CHIYODA
V P C

CHIYODA CORPORATION	
JOB NO. 51046	IBN RUSHD AROMATICS PROJECT
PO NO. SAYPOE0002	
REQ NO. 22854000B501	
IDENT NO. 22854000B501 DC-0129	7
A-NO COMMENTS. PROCEED WITH FABRICATION	SAY TEAM
B-PROCEED WITH FABRICATION COMMENTS TO BE CONSIDERED	PYD
C-DO NOT PROCEED WITH FABRICATION	DATE 19 DEC. '96

PURCHASER'S PERMISSION TO PROCEED OR REVIEW TAKEN ON VENDOR PRINTS SHALL NOT RELIEVE VENDOR FROM ITS RESPONSIBILITIES OR LIABILITIES UNDER PURCHASE ORDER

RECVD
DEC 12 1996
CHIYODA
VPC

REV	INITL	DATE	REVISIONS	CHKD	DATE	APP	DATE
7	JKS	24/9/96	P.J. AS NOTED	MAR	24/9/96		30/9/96
6	JKS	8/8/96	AS NOTED.	MAB.	12/8/96		13/8/96
5	BP	2/4/96	AS PER CLIENT COMMENTS	ETW	22/4/96		22/4/96
4	BP	7/3/96	AS NOTED.	RW	7/3/96		11/3/96

CAT CODE : D1

UNIT: 54-B-01

Born International

TITLE: FIRED HEATER DATA SHEET

SPEC NO: 2881-54B01-ETD 002/A

SHEET 1 OF 9 REV 7

MANUFACTURE AND CONSTRUCTION TO BE CARRIED OUT STRICTLY IN ACCORDANCE WITH THE REQUIREMENTS OF THIS DRAWING SPECIFICATION. NO CHANGES ARE TO BE MADE WITHOUT THE PRIOR AGREEMENT OF THE CHIEF ENGINEER OR THE ORGANISING SECTION WITHIN ENGINEERING DEPARTMENT.

066406

10-4-1

4/7

BORN

WORLD-WIDE MANUFACTURERS OF
DIRECT FIRED HEATERS
SI UNITS

CTCI CORPORATION

Service /Item	Charge Heater 54B01		
Type	rad arbor w/ con sectn.	Plant Location	
		Quantity	1
Owner		Ref. No	
Purchaser	Chiyoda	Ref. No.	
Date	24/09/96	Born Ref No.	BJ 2881
By:	JAS	Page 1 of	8

Deheptaniser reboiler

PROCESS DESIGN CONDITIONS				
1. Total duty heater, MW	16.89	7.55		
2. Heater section	Radiant	Conv.		
3. Service of heater	Charge Heater 54B01			
4. Heat Absorption heater, MW	16.89	7.55		
5. Fluid Name	HC	HC		
6. Flow rate, kg/hr	283340	185472		
7. Flow rate, dm(cube)/s				
8. Press drop (allow, clean/fouled), bar	0.345	3.45		
9. Press drop (calc, clean/fouled), bar	0.316	2.11		
10. Fouling allowance, m(sq)-C(deg)/W				
11. Therm conductivity of coke/scale, WmC(deg)				
12. Avg. radiant flux density (allowable), W/m(sq)	31546			
13. Avg. radiant flux density (calculated), W/m(sq)	31423			
14. Avg. convection flux density (allowable), W/m(sq)				
15. Avg. convection flux density (calculated), W/m(sq)		2538		
16. Max radiant flux density, W/m(sq)	56562			
17. Max convection flux density, W/m(sq)		57085		
18. Velocity limitation, m/sec				
19. Max. Allowable inside film temperature, C(deg)				
INLET CONDITIONS:				
20. Temperature, C(deg)	362	224		
21. Pressure,barg	12.845	8.85		
22. Liquid flow, kg/hr	0	185472		
23. Vapor flow, kg/hr	283340	0		
24. Density of Liquid @ T. P. , S.G		0.668		
25. Vapor, molecular weight	21			
26. Viscosity, liquid, mPa.s		0.18		
27. Viscosity, vapor, mPa.s	0.018			
28. Specific heat, liquid, KJ/kgC(deg)		2.515		
29. Specific heat, vapor, KJ/kgC(deg)	3.255			
30. Thermal conductivity, liquid, W/mC(deg)		0.099		
31. Thermal conductivity, vapor, W/mC(deg)	0.13			
OUTLET CONDITIONS:				
32. Temperature, Degree C	426	227		
33. Pressure, barg	12.50	5.40		
34. Liquid flow, kg/hr	0	92736		
35. Vapor flow, kg/hr	283340	92736		
36. Density of Liquid @ T. P. , Kg/cuM		0.663		
37. Vapor, molecular weight	21	106.2		
38. Viscosity, liquid, mPa*s		0.177		
39. Viscosity, vapor, mPa*s	0.02	0.01		
40. Specific heat, liquid, KJ/kgC(deg)		2.529		
41. Specific heat, vapor, KJ/kgC(deg)	3.410	2.009		
42. Thermal conductivity, liquid, W/mC(deg)		0.099		
43. Thermal conductivity, vapor, W/mC(deg)	0.143	0.026		
REMARKS				
44. Distillation data should be attached for vaporization service				
45. Other				

CK'd MAB 24/9/96
Rev. 7

066407

DATASHT.XLS

10-4-2

55462

BORN

WORLD-WIDE MANUFACTURERS OF
DIRECT FIRED HEATERS
SI UNITS

Service /Item	Charge Heater 54B01		
Unit	rad arbor	Plant Location	
Type	w/ con sectn.	Quantity	1
Owner		Ref. No.	
Purchaser	Chiyoda	Ref. No.	
Date:	24/09/96	Born Ref No.	BJ 2881
By:	JAS	Page 2 of	8

CTCI CORPORATION

Combustion Design Conditions

1. Type of fuel	GAS				
2. Excess air, percent	15				
3. Calc heat release, MW (LHV)	28.00				
4. Calc fuel efficiency, percent (LHV)					
5. Calc thermal efficiency, percent (LHV)	87.3				
6. Guaranteed thermal efficiency, percent (LHV)	86.3				
7. Radiation loss, percent of heat rel (LHV)	2.00				
8. Flue gas temp. leaving radiant section, C(deg)	780				
9. Flue gas temp. leaving conv section, C(deg)	252				
10. Flue gas temp. leaving air heater (uncorrected), C					
11. Flue gas temp. leaving air heater (corrected), C(de					
12. Max flue gas mass vel thru conv sect, kg/s* m(sq)	1.38				
13. Volumetric heat release, W/m(cube) (LHV)					
14. Ambient air temperature, C(deg)	15	combustion design			
15. Air temperature, stack design, C(deg)	50				
16. Air temperature leaving air heater, C(deg)					
17. Altitude above sea level; m					
18. Draft @ Bridgewall,mm wg	3.00				
19. Draft @ Burner, mm wg	10.56				

Fuel Characteristics

20. Type of Fuel	gas				
21. Heating value (LHV), KJ/kg					
22. Heating value (LHV), KJ/Nm(cube)	25100				7
23. sp Gr. @ P, T.	0.306 @15C				
24. H/C ratio (by weight)					
25. Viscosity, @ _____ C(deg), mPa*s					
26. Viscosity, @ _____ C(deg), mPa*s					
27. Total salts, ppm					
28. Vanadium, ppm					
29. Sodium, ppm					
30. Fixed nitrogen, ppm					
31. Sulfur, percent by weight					
32. Hydrogen sulfide, percent by volume					
33. Ash, percent by weight					
34. Liquids: ASTM initial boiling point, C(deg)					
35. ASTM end point, C(deg)					
36. Gases: Molecular weight	9.83				7
37. Composition, mol percent					
38. Temperature at burner, C(deg)	15.6				
39. Fuel pressure (available @ burner), kPa	138				
40. Atomizing air stream pressure, kPa					

Mechanical Design Conditions (General:)

41. Plot limitations _____ Min Stack Ht. _____
42. Tube limitations _____ Noise Limitations _____

Structural Design Data:

1. Wind Velocity, m/s		Wind occurrence		
2. Wind exposure		Seismic Zone		
3. Minimum ambient air temperature C(deg)	0			

Ckd MAB 24/1/96
Rev. 7

066408

10-4-3

55462

BORN

WORLD-WIDE MANUFACTURERS OF
DIRECT FIRED HEATERS
SI UNITS

Service/Item	Charge Heater 54B01		
Unit	rad arbor	Plant Location	
Type	w/ con sectn.	Quantity	1
Owner		Ref. No.	
Purchaser	Chiyoda	Ref. No.	
Date:	24/09/96	Born Ref No.	BJ 2881
By:	JAS	Page 3 of	8

CTCI CORPORATION

Coil Design: (RADIANT)	
4. Design basis of tube wall thk. (code or specs)	API 530
5. Design basis for rupture strength, (min or avg)	
6. Design life, hr	100000
7. Elastic design pressure, bar	14.60
8. Rupture design pressure, bar	12.845
9. Temperature allowance, C(deg)	28
10. Corrosion allowance, mm	1.6
11. Stress relieve (YES or NO)	YES
12. Weld inspection requirements radiography, %	100
13. Hydrostatic test pressure, BARG	33.2
14. Max tube metal temperature (clean) C(deg)	478
15. Design tube metal temperature C(deg)	506
16. Inside film coefficient, W/m C(deg)	1539
Coil Configuration: (RADIANT)	
17. Tubes (vertical or horizontal)	ARBOR
18. No. of flow passes	76
19. Effective tube length, m	25.35
20. Bare tubes, number	76
21. Bare tubes, exposed surface, m(sq)	538.00
22. Bare tubes, total exposed surface, m(sq)	538.00
23. Tubes, inline or staggered	IN LINE
24. Tube spacing, C to C, mm	180.00
Tubes: (RADIANT)	
25. Material (ASTM spec. or grade)	A335 P22
26. Outside diameter,mm	88.9
27. wall thickness , mm or Sch	sch 40aw
28. Overall tube length, m	
29. No. of intermediate welds/pass	2
30. Distance from Center Line of tube to wall, mm	180
Heater Section	Radiant
Plug-Type Headers:	
31. Location (one end or both ends)	None
32. Manufacture and type	
33. Nominal rating	
34. Welded or rolled joint	
Return Bends:	
35. Location (header box or firebox)	
36. Material (ASTM spec and grade)	

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Rev. 7

066409

10-4-4

55462

BORN

WORLD-WIDE MANUFACTURERS OF
DIRECT FIRED HEATERS
SI UNITS

Service/Item	Charge Heater 54B01		
Unit	rad arbor	Plant Location	
Type	w/ con sectn.	Quantity	
Owner		Ref. No.	
Purchaser	Chiyoda	Ref. No.	
Date:	24/09/96	Born Ref No.	BJ 2881
By:	JAS	Page 4 of	8

CTCI CORPORATION

	BARE	EXT.	EXT.	EXT.
Coil Design: (CONVECTION)				
4. Design basis of tube wall thk. (code)	API 530	API 530	API 530	API 530
5. Design basis for rupture strength				
6. Design life, hr.	100,000	100,000	100,000	100,000
7. Elastic design pressure,BAR	11.2	11.2	11.2	11.2
8. Rupture design pressure, BAR				
9. Temperature allowance, C(deg)	28	28	28	28
10. Corrosion allowance, mm	3.0	3.0	3.0	3.0
11. Stress relieve (yes or no)	NO	NO	NO	NO
12. Weld inspection requirements radiography, %	100	100	100	100
13. Hydrostatic test pressure, Barg	19.6	19.6	19.6	19.6
14. Max tube metal temperature (clean), C(deg)	294	309	306	291
15. Design tube metal temperature, C(deg)	322	337	334	319
16. Inside film coefficient, W/m(sq) C(deg)	1709	1675	1630	1561
Coil Configuration: (CONV.)				
17. Tubes (vertical or horizontal)	HORI.	HORI.	HORI.	HORI.
18. No. of flow passes/tubes per row	4 6	4 6	4 6	4 6
19. Effective tube length, m	14.021	14.021	14.021	14.021
20. Bare tubes, number	18	0	0	0
21. Bare tubes, exposed surface, m(sq)	112.04			
22. Ext tubes ,number	0	6	6	30
23. Ext surface tubes, exp. surface, m(sq)		160.54	293.85	2408.00
24. Ext surface tubes, total exp. surface, m(sq)		2862.39		
25. Tubes, staggered/inline	STAGGERED	STAGGERED	STAGGERED	STAGGERED
26. Tube spacing, C to C , mm	254	254	254	254
Tubes: (CONVECTION)				
27. Material (ASTM spec. or grade)	A106 GRB	A106 GRB	A106 GRB	A106 GRB
28. Outside diameter, mm	141.3	141.3	141.3	141.3
29. wall thickness,m m or Sch	sch 40aw	sch 40 aw	sch 40 aw	sch 40 aw
30. Overall tube length, m				
31. No. of intermediate welds	18	6	6	30
32. Distance from tube center line to wall, mm	127	127	127	127
Description of Extended Surface:				
33. Type (studs, serrated fins or solid fins)		SOLID FIN	SOLID FIN	SOLID FIN
34. Material		Car/Stl	Car/Stl	Car/StL
35. Fin Height, mm		12.70	19.10	
36. Fin Thickness, mm		1.30	1.30	1.30
37. Fins Per m		118	157	197
38. Max tip temperature, C(deg)		353	370	354
39. Extension ratio		4.299	7.868	12.897
Heater Section			Convection	
Plug-Type Headers:				
40. Location (one end or both ends)			NONE	
41. Manufacture and type				
42. Nominal rating				
43. Welded or rolled joint				
Return Bends:				
44. Location (header box or firebox)	Header box	Header box	Header box	Header box
45. Material (ASTM spec and grade)	A-234-WPB	A-234-WPB	A-234-WPB	A-234-WPB

Ckd MAB 24/9/96
Rev. 7

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DATASHT.XLS

10-4-5

55462

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WORLD-WIDE MANUFACTURERS OF
DIRECT FIRED HEATERS
SI UNITS

Service/Item	Charge Heater 54B01		
Unit	rad arbor	Plant Location	
Type	w/ con sectn.	Quantity	1
Owner		Ref. No.	
Purchaser	Chiyoda	Ref. No.	
Date:	24/09/96	Born Ref No.	BJ 2881
By:	JAS	Page 5 of	8

CTCI CORPORATION

Heater Section Continued:	Radiant	Convection
Terminals:		
1. Type (welded or flanged)	welded	Flanged
Inlet:		
2. Material (ASTM spec and grade)	A335 P11	A106 GRB
3. Size/rating, schedule or thickness	28" x 9.525 mm AW	6" SCH 40 AW 300#
4. Number of terminals	1	4
Outlet:		
5. Material (ASTM spec and grade)	A335 P11	A105 GRB
6. Size/rating, schedule or thickness	30" x 9.525 mm AW	12" SCH 40AW 300# RFWN
7. Number of terminals	1	1
Manifolds:		
8. Connection to tubes (weld or flanged)	welded	welded
9. Location (internal or external)	external	external
Inlet: Dead End		
10. Material (ASTM spec and grade)	A335 P11	
11. Size/schedule or thickness	28"	
12. Flange/material (ASTM spec and grade)	A182 Gr F11	
13. Flange size and rating	28" 9.525mmAW 300#	
Outlet: Dead End		
14. Material (ASTM spec and grade)	A335 P11	A234-WPB
15. Size schedule or thickness	30"	12"
16. Flange/material (ASTM spec and grade)	A182 Gr F11	Pipe Cap
17. Flange size and rating	30" 9.525mm AW 300#	SCH 40 AW
Crossovers:		
18. Location (internal or external)		
19. Pipe mat'l (ASTM spec and grade)		
20. Pipe size/schedule or thickness		
21. Flange mat'l (ASTM spec and grade)		
22. Flange size and rating		
Tube Supports:		
23. Location (top, bottom, intermediate)		INTER ENDS
24. Material (ASTM spec and grade)		25/20CR NI C.S. PLATE
25. Spacing		approx 3600 mm
26. Coating (type and thickness)		100 mm LW cast
Tube Guides:		
27. Location and spacing (Top/Bottom)	INTER	
28. Material (ASTM spec and grade)	25/20 Cr Ni	
Settings:		
Floor:		
29. Lining: Thickness - Hot face temp. - calc - design	200 780 C	
30. Matl/thk/service temperature	200 MM LW CASTABLE	
31. Anchor (type & matl)		
32. Casing: Thickness - Material - Temperature	6 C.S. plate	
Exposed Vertical Walls:		
33. Lining: Thickness - Hot face temp. - calc - design	150 780 C	
34. Matl/thk/service temperature	50- 128 kg/cum CFNB +100- 96 kg/cum CFNB+3mmstalastic	
35. Anchor (type & matl)	TP 310 SS Studs and Washers	
36. Casing: Thickness - Material - Temperature	6 C.S. PLATE	

Ckd MAB 24/1/96
Rev. 7

056411

10-4-6

55462

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WORLD-WIDE MANUFACTURERS OF
DIRECT FIRED HEATERS
SI UNITS

Service/Item	Charge Heater 54B01		
Unit	rad arbor	Plant Location	
Type	w/ con sectn.	Quantity	1
Owner		Ref. No.	
Purchaser	Chiyoda	Ref. No.	
Date:	24/09/96	Born Ref No.	BJ 2881
By:	JAS	Page 6 of	8

CTCI CORPORATION

Mechanical Design Conditions (continued)
Heater Section (continued):

Shielded Vertical Walls:				
1. Lining: Thickness - Hot face temp. - calc - design	125	629 C	1260 C	
2. Thk/Mat'l/service temperature	50 -128 kg/ cu m CFNB + 75 -96 kg/ cu m CFNB+3mm stalastic			
3. Anchor (type & matl)	TP 310 SS Studs and Washers			
4. Casing: Thickness - Material - Temperature	6	C.S. plate		
Arch:				
5. Lining: Thickness - Hot face temp. - calc - design	150	780 C	1260 C	
6. Thk/Mat'l/service temperature	50 mm 128kg/cu m CFNB + 100 mm 96 kg/ cu m CFNB+3mm stalastic			
7. Anchor (type & matl)	TP 310 SS Studs and Washers			
8. Casing: Thickness - Material - Temperature	6	C.S. plate		
Convection Walls:				
9. Lining: Thickness - Hot face temp. - calc - design	125	516 C	1100 C	
10. Thk/Mat'l/service temperature	125 mm LW castable			r1
11. Anchor (type & matl)	'v' type	304 SS		
12. Casing: Thickness - Material - Temperature	6	C.S. plate		
Breeching:				
13. Lining: Thickness - Hot face temp. - calc - design	75	252 C	1093 C	
14. Thk/Mat'l/service temperature	LW CASTABLE			
15. Anchor (type & matl)	'v' type	CS		
16. Casing: Thickness - Material - Temperature	5			
Flue Gas Ducts:				
17. Location	top of convection section			
18. Lining (internal or external)	internal			
19. Thickness & Material	50 mm LW castable			
20. Anchor, type and material	CS 'V' anchors			
21. Hot face design temperature				
22. Cold face design temperature				
Combustion Air Ducts:				
23. Location	FD fan to burner			
24. Lining (internal or external)				
25. Thickness and Material				
26. Anchor, type and material				
27. Hot face / cold face design temperature, C(deg)				
Header Boxes:				
28. Location	Conv. ends	Hinged doors/bolted		Bolted
29. lining (Thickness & Material)	50 mm LW castable			
30. Anchor (type and material)	'v' type	CS		
31. Door/panel (matl and thickness)		C.S. plate		
Burner Windboxes				
32. Lining (internal or external)	internal	Matl & thk.	mineral wool	
33. Anchor (type and matl)	CS 'v'			
34. Casing: Materials and thk.	CS 5			
35. Hot face design temp., C(deg)		Cold face design temp.,C		

Ckd MAB 24/9/96
Rev. 7

066412

10-4-7

55462

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WORLD-WIDE MANUFACTURERS OF
DIRECT FIRED HEATERS
SI UNITS

Service /Item	Charge Heater 54B01		
Unit	rad arbor	Plant Location	
Type	w/ con sectn.	Quantity	1
Owner		Ref. No.	
Purchaser	Chiyoda	Ref. No.	
Date:	24/09/96	Born Ref No.	BJ 2881
By:	JAS	Page 7 of	8

CTCI CORPORATION

Mechanical Design Conditions (continued)
Heater Section (continued):
Stack:

1. Location	top of heater	Corr Allow	
Inside met. dia.at exit, mm	2012	inside metal dia. at base, mm	3078
2. Min stack height above grade	40 metres	total Stack length, mm	20016
3. Plate, min. thickness, mm	6	Material:	Carbon steel
4. Lining : (Internal or External)	Internal	Extent of lining	To top
5. Thickness and Material, mm	50	LW Castable	
6. Anchor, type and material:	V type	CS	

Bridgewall:

7. Height:, mm	none	
Matl and thickness:		Location

Dampers:

8. Location	Stack	
9. Material of blade	TP304SS	
10. Material of shaft	TP304SS	
11. Bearing type	PILLOW BLOCK	
12. Multiple or single blade	Multiple blade	
13. Desc of provision for operation	actuated	
14. Location and type of operator		

Miscellaneous:
Platforms:

Location/No.	Width	Length/Arc	Access Stairs/Ladder	Gr./Pl/loc.
15. Hearth / One	1100 mm	1 side + 2 ends	1stair/1ladder	GRADE
16. Convection Side(s) /One	1100 mm		1 LADDER	
17. Convection End(s) /Two	1100 mm		2 WALKWAYS	
18. Rad Intermediate /One	1100 mm		1 Ladder	
19. Stack Damper / One	1100 mm	270 DEGREE	1 LADDER	
20. Stack Sample Port				
21. Type of flooring				

Doors:

	Number	Location	Size	Hinged/Bolted
22. Access Doors	2	FLOOR	450 x 600	Hinged
23				
24. Observation Doors	13	RAD SIDE	127 x 406	HINGED(20-std-03)
25				
26				
27. Steam Lance Doors	4	CONV SIDE	600 x 150 bolted (BLS-D-106)	
28				
29 Explosion Door				
30				
31				

Instruments and Aux. connections

	Number	Size	Type
32. Process fluid temperature			
33. Flue gas / combustion air temp.			
34. Flue gas / combustion air pressure	SEE DRAWING No. 2881/403/162DA		
35. Flue gas composition (sample)	2281-51B01-02A & 02B		
36. Snuffing steam	4	2" NPS	3000# CRG with Plug
37. Purge			
38. Vents and drains			
39. Tubeskin thermocouples			

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Rev. 7

DATASHT.XLS

10-4-8

55462

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WORLD-WIDE MANUFACTURERS OF
DIRECT FIRED HEATERS
SI UNITS

Service /Item	Charge Heater 54B01		
Unit	rad arbor	Plant Location	
Type	w/con sectn.	Quantity	1
Owner		Ref. No.	
Purchaser	Chiyoda	Ref. No.	
Date	24/09/96	Born Ref No.	BJ 2881
By:	JAS	Page 8 of	8

CTCI CORPORATION

8-9

Mechanical Design Conditions (continued)
Heater Section (continued):

1. Painting requirements: 22854-SP-000-X-002
   System 2 and Prime Coat Only
2. Galvanizing requirements. Ladders and Platforms
3. Internal coatings (casing, ducts, stack) Stalastic behind ceramic fibre blanket
4. Fireproofing requirements. None

Burner and Auxiliary Equipment:
Burners:

5. Manufacture/type J.Z. PSFG FD gas only Location rad floor
6. Designation/size 12 Number: 13 Fuel: gas
7. Heat rel. (MW per burner) at design excess air (Max\Norm\Min) 2.38 2.16
8. Design press drop across burner 50mm @ max heat release
9. Distance burner centerline to tube centerline or mm
   Distance burner centerline to unshielded refractory: 1100 mm HORIZONTAL
10. Burner pilot:
    Capacity (KW) 20 Fuel: Gas Fuel press
    Fuel Pressure/ Fuel: Type of Ignition: AUTO
11. Special requirements: (flame detection devices, safety interlocks etc.) UV SCANNERS

Sootblowers:

12. Location SPACE FOR FUTURE INSTALLATION
13. Manufacture and type
14. Number
15. Maximum cleaning radius, mm
16. Lane dimensions (min. clearance)
17. Orientation (horizontal or vertical)
18. Cleaning medium
19. Supply pressure/temperature
20. Flow rate per blower , kg/s
21. Materials of construction
22. Driver type (manual, air, or elec.)
23. Control systems type (auto or manual, sequential, local, or remote panel)

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ARABIAN INDUSTRIAL FIBERS COMPANY

IR-II AROMATICS PROJECT

PROJECT NO. 10E0541A01

DOCUMENT TITLE:

XYLENE COLUMN REBOILER DATA SHEET

DOCUMENT NO:

DS-55-BA-501

REV	DESCRIPTION	BY	CHK.	APPR.	DATE
2	Revised As Marked	KCK	CBC	YSL	11-Aug.-11
1	Issued For Design	KCK	CBC	YSL	27-May.-11
0	Issue For Approval	KCK	CBC	YSL	23-Mar.-11

ابن رشد ibn rushd

ARABIAN INDUSTRIAL FIBERS COMPANY YANBU, KINGDOM OF SAUDI ARABIA

CTCI CORPORATION

CERTIFIED

PROJ. _____ _____

MGR _____ DATE _____

CLIENT _____ DATE _____

XC33D-55-501

GN-502 84.10

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CONTENTS

Attachment total 9 page.

55280

ابن رشد
ibn rushd
FLUOR

FIRED HEATER DATA SHEET

Contract:	10E0541A01
Equipment No.:	55-B-01 A/B
Revision:	2 Date: 11-Aug.-2011
Unit:	55 - Xylenes Fractionation
P.O. No.:	
Document No.:	DS-55-BA-01
Sheet:	1 of 5

سابك
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CTCI CORPORATION

REV 1

Client: Arabian Industrial Fibers Company (Ibn Rushd) **Vendor:** Existing Born Heater - Revamped for New Service
Service: Xylene Column Reboiler **Plant:** Xylene Fractionation **Site:** Yanbu, Saudi Arabia
Type of Heater: Vertical Cylindrical **Vendor:** Existing Born Heater
Total Heater Absorbed Duty: 114.44 MW **Assembly:** Twin Vertical Cylindrical with Individual Convection Sections

PROCESS DESIGN CONDITIONS

*	**OPERATION CASE**		REVAMP								
	HEATER SECTION		Radiant/Convec								
	SERVICE		Process								
	HEAT ABSORPTION	MW	114.44								
	FLUID NAME		Hydrocarbon								
	FLOW RATE	kg/hr	1,675,457								
	FLOW RATE	B.P.D.									
	PRESSURE DROP - ALLOWABLE (CLEAN / FOULED)	bar									
	PRESSURE DROP - CALCULATED (CLEAN / FOULED)	bar	2.1								
	FOULING ALLOWANCE	m²·℃/W									
	THERMAL CONDUCTIVITY OF COKE/SCALE	W/m·℃									
	COKING ALLOWANCE	mm									
	AVG. RADIANT SECTION FLUX DENSITY - ALLOWABLE	W/m²									
	AVG. RADIANT SECTION FLUX DENSITY - CALCULATED	W/m²									
	MAX. RADIANT SECTION FLUX DENSITY	W/m²									
	CONVECTION SECTION FLUX DENSITY, (BARE TUBE)	W/m²									
	VELOCITY LIMITATION	m/s									
	PROCESS FLUID MASS VELOCITY	kg/s·m²									
	MAX. ALLOWABLE / CALCULATED INSIDE FILM TEMPERATURE	℃									
	INLET CONDITIONS:										
	TEMPERATURE	℃	267								
	PRESSURE ■ bar (g) ☐ bar (g)		12.27								
	LIQUID FLOW	kg/hr	1,675,457								
	VAPOR FLOW	kg/hr	0								
	DENSITY - LIQUID	kg/m³	634.9								
	VAPOR MOLECULAR WEIGHT										
	VISCOSITY - (LIQUID / VAPOR)	mPa-s	0.177								
	SPECIFIC HEAT - (LIQUID / VAPOR)	kJ/kg·℃	2.733								
	THERMAL CONDUCTIVITY - (LIQUID / VAPOR)	W/m·℃	0.093								
	OUTLET CONDITIONS:										
	TEMPERATURE	℃	299								
	PRESSURE ■ bar (g) ☐ bar (g)		10.17								
	LIQUID FLOW	kg/hr	479,348								
	VAPOR FLOW	kg/hr	1,196,109								
	DENSITY - LIQUID	kg/m³	588.2								
	VAPOR MOLECULAR WEIGHT		124.7								
	VISCOSITY - (LIQUID / VAPOR)	mPa-s	0.155	0.011							
	SPECIFIC HEAT - (LIQUID / VAPOR)	kJ/kg·℃	2.927	2.356							
	THERMAL CONDUCTIVITY - (LIQUID / VAPOR)	W/m·℃	0.089	0.031							

REMARKS AND SPECIAL REQUIREMENTS:

DISTILLATION DATA OR FEED COMPOSITION: See Fluid Properties on Sheets 3 and 4
SHORT TERM OPERATING CONDITIONS:
OTHER:

NOTES:

See Notes on Sheet 5

55280

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FLUOR

FIRED HEATER DATA SHEET

Contract:	10E0541A01
Equipment No.:	55-B-01 A/B
Revision:	2 Date: 11-Aug.-2011
Unit:	55 - Xylenes Fractionation
P.O. No.:	
Document No.:	DS-55-BA-01
Sheet:	2 of 5

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CTCI CORPORATION

COMBUSTION DESIGN CONDITIONS

* OPERATING CASE			Revamp with Air Preheat On-line	Revamp with Air Preheat Off-line			REV
* TYPE OF FUEL			Sales Gas	Sales Gas			
* EXCESS AIR		%	15.0	15.0			
CALCULATED HEAT RELEASE (LHV)		MW	125.69	144.99			
CALCULATED THERMAL EFFICIENCY		% (LHV)					
CALCULATED FUEL EFFICIENCY		% (LHV)	91.0	78.9			
* GUARANTEED FUEL EFFICIENCY		% (LHV)					
RADIATION LOSS	% OF HEAT RELEASE (LHV)		2.5	2.5			
FLUE GAS TEMPERTURE LEAVING:	RADIANT SECT.	℃	831	820			
	CONVECTION SECTION	℃	381	395			
	AIR PREHEATER	℃	145	-			
FLUE GAS QUANTITY		kg/hr	191,314	220,695			
FLUE GAS MASS VELOCITY THRU CONVECTION SECTION		kg/s·m²					
VOLUMETRIC HEAT RELEASE (LHV)		kW/m³					
DRAFT: Immediately Above Top Convection Row,		mm H2O	4.1	4.6			
Immediately Below Bottom Convection Row,		mm H2O	2.5	2.5			
At Burners,		mm H2O	17.0	17.0			
Combustion Air Temp.: Leaving Steam/Air Preheater,		℃					
At Burners,		℃	296	15.6			
COMBUSTION AIR QUANTITY		kg/hr	180,171	207,899			
AMBIENT AIR TEMPERATURE - EFFICIENCY CALCULATION		℃	15.6	15.6			
* AMBIENT AIR TEMPERATURE - STACK DESIGN		℃	50.0	50.0			
* ALTITUDE ABOVE SEA LEVEL		m	7.25	7.25			

FUEL CHARACTERISTICS

* GAS TYPE Sales Gas	* GAS TYPE	* LIQUID TYPE
* LHV 40,512 ■ kJ/kg ☐ kJ/Sm³	* LHV ☐ kJ/kg ☐ kJ/Sm³	* LHV kJ/kg
* HHV ☐ kJ/kg ☐ kJ/Sm³	* HHV ☐ kJ/kg ☐ kJ/Sm³	* HHV kJ/kg
* PRESS. @ BURNER 1.75 bar (g)	* PRESS. @ BURNER bar (g)	* PRESS. @ BURNER bar (g)
* TEMP. @ BURNER 15.6 ℃	* TEMP. @ BURNER ℃	* TEMP. @ BURNER ℃
* MOLECULAR WEIGHT	* MOLECULAR WEIGHT	* VISCOSITY @ ℃ SSU
		* ATOMIZING STEAM TEMP. ℃
		* ATOMIZING STEAM PRESS. bar (g)

COMPOSITION	MOLE %	COMPOSITION	MOLE %
N2	12.0		
C1	82.7		
C2	5.0		
C3	0.3		
H2S	<2.0 wt ppm		
TOTAL	100.0		

COMPOSITION	WT %
* VANADIUM (ppm)	
* SODIUM (ppm)	
* SULFUR	
* ASH	

DATA FOR EXISTING BURNERS

MANUFACTURER: John Zink SIZE / MODEL: PSFG-18 NUMBER: 2 x 12 = 24

TYPE: Forced Draft, Low Nox, Staged Fuel LOCATION: RADIANT FLOOR ORIENTATION: FIRING UP

HEAT RELEASE PER BURNER: MW DESIGN: 6.006 NORMAL: MINIMUM:

PRESSURE DROP ACROSS BURNER @ DESIGN HEAT RELEASE: By Vendor mm H2O

DISTANCE BURNER CENTER LINE TO TUBE CENTER LINE: HORIZONTAL: mm VERTICAL: mm

DISTANCE BURNER CENTER LINE TO UNSHIELDED REFRACTORY: HORIZONTAL: mm VERTICAL: mm

BURNER PILOT: CAPACITY kW FUEL FUEL PRESSURE bar (g)

IGNITION METHOD:

SPECIAL REQUIREMENTS (FLAME DETECTION DEVICES, SAFETY INTERLOCKS, ETC.):

REQUIRED EMISSIONS: ☐ ppmv(d) (CORRECTED TO 3% O_2) NOx: Remark 1 CO: Remark 1 SOx: Remark 1

See REMARK NO. 1 ☐ kg/kJ ☐ (LHV) ☐ (HHV) UHC: Remark 1 PARTICULATES: Remark 1

REMARKS:

1. The Royal Commission for Jubail and Yanbu has issued the "Royal Commission Environmental Regulations (RCER)" to be adopted by industries both in Jubail and Yanbu. Any facility operating or planning to operate on the Royal Commission property shall comply with those regulations.

55280

ابن رشد
ibn rushd
FLUOR

FIRED HEATER DATA SHEET

Contract:	10E0541A01
Equipment No.:	55-B-01 A/B
Revision:	2 Date: 11-Aug.-2011
Unit:	55 - Xylenes Fractionation
P.O. No.:	
Document No.:	DS-55-BA-01
Sheet:	3 of 5

سابك
sabic
CTCI CORPORATION

REV

FLUID PROPERTIES:

PROCESS

Thermodynamic condition			Vapor					Liquid					
Pressure bar(a)	Temp °C	Weight fraction vapor	Enthalpy kJ/kg	Density kg/m³	Specific heat kJ/kg-°C	Viscosity mPa-s	Thermal cond. W/m-°C	Enthalpy kJ/kg	Density kg/m³	Specific heat kJ/kg-°C	Viscosity mPa-s	Thermal cond. W/m-°C	Surface tension dyne/cm
11.218	266.67	0.0000	0.00	0.00	0.0000	0.0000	0.0000	546.33	633.53	2.7323	0.1767	0.0935	6.93
11.218	276.64	0.0000	0.00	0.00	0.0000	0.0000	0.0000	573.87	619.75	2.7880	0.1694	0.0919	6.14
11.218	286.62	0.0000	0.00	0.00	0.0000	0.0000	0.0000	602.00	604.86	2.8491	0.1623	0.0905	5.38
11.218	296.59	0.0000	851.48	37.84	2.3484	0.0108	0.0310	630.74	588.52	2.9174	0.1552	0.0891	4.64
11.218	296.78	0.0710	851.85	37.85	2.3488	0.0108	0.0310	631.21	588.36	2.9182	0.1552	0.0891	4.63
11.218	296.97	0.1420	852.23	37.86	2.3496	0.0108	0.0310	631.70	588.36	2.9195	0.1552	0.0891	4.63
11.218	297.17	0.2132	852.63	37.87	2.3505	0.0108	0.0310	632.19	588.36	2.9203	0.1552	0.0890	4.63
11.218	297.38	0.2844	853.04	37.89	2.3513	0.0108	0.0310	632.70	588.20	2.9216	0.1552	0.0890	4.63
11.218	297.59	0.3558	853.46	37.90	2.3521	0.0108	0.0310	633.23	588.20	2.9224	0.1552	0.0890	4.62
11.218	297.81	0.4273	853.89	37.91	2.3534	0.0108	0.0310	633.78	588.20	2.9236	0.1553	0.0890	4.62
11.218	298.04	0.4989	854.34	37.93	2.3542	0.0108	0.0310	634.34	588.04	2.9249	0.1553	0.0890	4.62
11.218	298.27	0.5706	854.80	37.94	2.3551	0.0108	0.0310	634.92	588.04	2.9262	0.1553	0.0890	4.61
11.218	298.52	0.6424	855.28	37.96	2.3559	0.0108	0.0310	635.52	588.04	2.9274	0.1553	0.0888	4.61
11.218	298.77	0.7144	855.78	37.97	2.3572	0.0108	0.0312	636.14	587.88	2.9287	0.1553	0.0888	4.61
11.601	266.67	0.0000	0.00	0.00	0.0000	0.0000	0.0000	546.33	633.85	2.7323	0.1768	0.0935	6.93
11.601	277.42	0.0000	0.00	0.00	0.0000	0.0000	0.0000	576.03	618.95	2.7926	0.1690	0.0919	6.08
11.601	288.17	0.0000	0.00	0.00	0.0000	0.0000	0.0000	606.41	602.77	2.8592	0.1613	0.0903	5.26
11.601	298.92	0.0000	855.71	39.28	2.3614	0.0108	0.0312	637.55	584.83	2.9345	0.1536	0.0888	4.46
11.601	299.10	0.0710	856.08	39.29	2.3622	0.0108	0.0312	638.02	584.83	2.9358	0.1536	0.0888	4.46
11.601	299.29	0.1421	856.46	39.30	2.3626	0.0108	0.0312	638.50	584.67	2.9366	0.1536	0.0888	4.46
11.601	299.49	0.2132	856.85	39.32	2.3634	0.0108	0.0312	639.00	584.67	2.9379	0.1537	0.0888	4.46
11.601	299.70	0.2845	857.26	39.33	2.3643	0.0108	0.0312	639.51	584.67	2.9387	0.1537	0.0886	4.46
11.601	299.91	0.3558	857.68	39.35	2.3651	0.0108	0.0312	640.03	584.51	2.9400	0.1537	0.0886	4.45
11.601	300.13	0.4273	858.11	39.36	2.3664	0.0108	0.0312	640.57	584.51	2.9412	0.1537	0.0886	4.45
11.601	300.35	0.4989	858.56	39.37	2.3672	0.0108	0.0312	641.13	584.51	2.9425	0.1537	0.0886	4.45
11.601	300.58	0.5706	859.02	39.39	2.3681	0.0108	0.0313	641.71	584.35	2.9433	0.1537	0.0886	4.44
11.601	300.82	0.6425	859.49	39.41	2.3689	0.0108	0.0313	642.30	584.35	2.9446	0.1538	0.0884	4.44
11.601	301.07	0.7144	859.99	39.42	2.3701	0.0108	0.0313	642.92	584.19	2.9463	0.1538	0.0884	4.44
11.984	266.67	0.0000	0.00	0.00	0.0000	0.0000	0.0000	546.33	634.01	2.7323	0.1769	0.0935	6.93
11.984	278.17	0.0000	0.00	0.00	0.0000	0.0000	0.0000	578.14	618.15	2.7972	0.1685	0.0917	6.02
11.984	289.68	0.0000	0.00	0.00	0.0000	0.0000	0.0000	610.74	600.69	2.8692	0.1603	0.0902	5.15
11.984	301.18	0.0000	859.82	40.74	2.3743	0.0108	0.0313	644.23	581.15	2.9521	0.1521	0.0884	4.30
11.984	301.37	0.0710	860.19	40.75	2.3752	0.0108	0.0313	644.69	581.15	2.9530	0.1521	0.0884	4.30
11.984	301.56	0.1421	860.57	40.77	2.3760	0.0108	0.0313	645.17	581.15	2.9542	0.1521	0.0884	4.30
11.984	301.76	0.2132	860.96	40.78	2.3764	0.0108	0.0313	645.67	580.99	2.9555	0.1521	0.0884	4.29
11.984	301.96	0.2845	861.37	40.79	2.3773	0.0108	0.0313	646.18	580.99	2.9563	0.1522	0.0884	4.29
11.984	302.17	0.3559	861.79	40.81	2.3781	0.0108	0.0313	646.70	580.99	2.9576	0.1522	0.0883	4.29
11.984	302.38	0.4274	862.21	40.82	2.3794	0.0108	0.0313	647.24	580.83	2.9588	0.1522	0.0883	4.29
11.984	302.61	0.4989	862.66	40.84	2.3802	0.0108	0.0315	647.80	580.83	2.9597	0.1522	0.0883	4.28
11.984	302.83	0.5707	863.12	40.85	2.3810	0.0108	0.0315	648.37	580.83	2.9609	0.1522	0.0883	4.28
11.984	303.07	0.6425	863.59	40.87	2.3819	0.0108	0.0315	648.96	580.67	2.9622	0.1522	0.0883	4.28
11.984	303.32	0.7145	864.08	40.89	2.3827	0.0108	0.0315	649.57	580.67	2.9638	0.1522	0.0881	4.27
12.368	266.67	0.0000	0.00	0.00	0.0000	0.0000	0.0000	546.33	634.33	2.7323	0.1769	0.0935	6.93
12.368	278.91	0.0000	0.00	0.00	0.0000	0.0000	0.0000	580.21	617.35	2.8014	0.1681	0.0916	5.97
12.368	291.16	0.0000	0.00	0.00	0.0000	0.0000	0.0000	614.99	598.77	2.8793	0.1594	0.0898	5.04
12.368	303.39	0.0000	863.83	42.22	2.3873	0.0109	0.0315	650.78	577.63	2.9697	0.1506	0.0881	4.14
12.368	303.58	0.0710	864.19	42.23	2.3882	0.0109	0.0315	651.25	577.63	2.9710	0.1506	0.0881	4.14
12.368	303.77	0.1421	864.57	42.25	2.3890	0.0109	0.0315	651.73	577.47	2.9718	0.1506	0.0881	4.14
12.368	303.96	0.2133	864.96	42.26	2.3898	0.0109	0.0315	652.22	577.47	2.9730	0.1507	0.0881	4.13
12.368	304.16	0.2845	865.37	42.28	2.3907	0.0109	0.0315	652.72	577.47	2.9739	0.1507	0.0881	4.13
12.368	304.37	0.3559	865.78	42.29	2.3915	0.0109	0.0317	653.25	577.31	2.9751	0.1507	0.0881	4.13
12.368	304.58	0.4274	866.21	42.30	2.3923	0.0109	0.0317	653.78	577.31	2.9764	0.1507	0.0879	4.13
12.368	304.80	0.4990	866.65	42.32	2.3932	0.0109	0.0317	654.34	577.31	2.9777	0.1507	0.0879	4.12
12.368	305.03	0.5707	867.10	42.34	2.3940	0.0109	0.0317	654.91	577.15	2.9789	0.1507	0.0879	4.12
12.368	305.26	0.6425	867.57	42.35	2.3949	0.0109	0.0317	655.49	577.15	2.9802	0.1507	0.0879	4.12
12.368	305.51	0.7145	868.06	42.37	2.3957	0.0109	0.0317	656.10	577.15	2.9814	0.1508	0.0879	4.12
12.751	266.67	0.0000	0.00	0.00	0.0000	0.0000	0.0000	546.33	634.65	2.7323	0.1770	0.0935	6.93
12.751	279.63	0.0000	0.00	0.00	0.0000	0.0000	0.0000	582.23	616.71	2.8060	0.1676	0.0916	5.91
12.751	292.60	0.0000	0.00	0.00	0.0000	0.0000	0.0000	619.15	596.85	2.8889	0.1585	0.0897	4.93
12.751	305.56	0.0000	867.72	43.72	2.4003	0.0109	0.0317	657.22	574.10	2.9877	0.1492	0.0879	3.99
12.751	305.74	0.0710	868.09	43.73	2.4011	0.0109	0.0317	657.68	573.94	2.9885	0.1492	0.0877	3.98
12.751	305.93	0.1421	868.47	43.74	2.4020	0.0109	0.0317	658.16	573.94	2.9898	0.1492	0.0877	3.98
12.751	306.12	0.2133	868.86	43.76	2.4028	0.0109	0.0317	658.65	573.94	2.9906	0.1492	0.0877	3.98
12.751	306.32	0.2846	869.26	43.78	2.4036	0.0109	0.0318	659.16	573.78	2.9919	0.1492	0.0877	3.98
12.751	306.52	0.3559	869.67	43.79	2.4045	0.0109	0.0318	659.68	573.78	2.9931	0.1492	0.0877	3.97
12.751	306.73	0.4274	870.09	43.81	2.4053	0.0109	0.0318	660.21	573.78	2.9944	0.1493	0.0877	3.97
12.751	306.95	0.4990	870.53	43.82	2.4062	0.0109	0.0318	660.76	573.62	2.9957	0.1493	0.0876	3.97
12.751	307.17	0.5707	870.98	43.84	2.4070	0.0109	0.0318	661.33	573.62	2.9969	0.1493	0.0876	3.97
12.751	307.41	0.6426	871.45	43.86	2.4078	0.0109	0.0318	661.91	573.62	2.9982	0.1493	0.0876	3.96
12.751	307.64	0.7145	871.93	43.87	2.4091	0.0109	0.0318	662.51	573.46	2.9994	0.1493	0.0876	3.96

55280

ابن رشد
ibn rushd
FLUOR®

FIRED HEATER DATA SHEET

Contract:	10E0541A01
Equipment No.:	55-B-01 A/B
Revision:	2 Date: 11-Aug.-2011
Unit:	55 - Xylenes Fractionation
P.O. No.:	
Document No.:	DS-55-BA-01
Sheet:	4 of 5

سابك
sabic

CTCI CORPORATION

FLUID PROPERTIES: REV

PROCESS

Thermodynamic condition			Vapor					Liquid					
Pressure bar(a)	Temp °C	Weight fraction vapor	Enthalpy kJ/kg	Density kg/m³	Specific heat kJ/kg-°C	Viscosity mPa-s	Thermal cond. W/m-°C	Enthalpy kJ/kg	Density kg/m³	Specific heat kJ/kg-°C	Viscosity mPa-s	Thermal cond. W/m-°C	Surface tension dyne/cm
13.134	266.67	0.0000	0.00	0.00	0.0000	0.0000	0.0000	546.33	634.81	2.7323	0.1771	0.0935	6.93
13.134	280.33	0.0000	0.00	0.00	0.0000	0.0000	0.0000	584.20	616.07	2.8102	0.1672	0.0914	5.86
13.134	294.00	0.0000	0.00	0.00	0.0000	0.0000	0.0000	623.21	594.93	2.8989	0.1576	0.0895	4.83
13.134	307.67	0.0000	871.52	45.23	2.4137	0.0109	0.0318	663.55	570.58	3.0057	0.1478	0.0876	3.83
13.134	307.85	0.0710	871.89	45.25	2.4145	0.0109	0.0318	664.01	570.42	3.0065	0.1478	0.0876	3.83
13.134	308.03	0.1421	872.26	45.26	2.4154	0.0109	0.0318	664.49	570.42	3.0078	0.1478	0.0876	3.83
13.134	308.22	0.2133	872.65	45.28	2.4162	0.0109	0.0320	664.98	570.42	3.0091	0.1478	0.0874	3.83
13.134	308.42	0.2846	873.05	45.29	2.4166	0.0109	0.0320	665.48	570.26	3.0099	0.1478	0.0874	3.83
13.134	308.62	0.3560	873.46	45.31	2.4175	0.0109	0.0320	666.00	570.26	3.0111	0.1478	0.0874	3.82
13.134	308.83	0.4275	873.88	45.33	2.4183	0.0109	0.0320	666.53	570.26	3.0124	0.1478	0.0874	3.82
13.134	309.04	0.4991	874.32	45.34	2.4191	0.0109	0.0320	667.08	570.10	3.0137	0.1479	0.0874	3.82
13.134	309.27	0.5708	874.76	45.36	2.4204	0.0109	0.0320	667.64	570.10	3.0149	0.1479	0.0874	3.82
13.134	309.49	0.6426	875.23	45.38	2.4212	0.0109	0.0320	668.22	570.10	3.0166	0.1479	0.0872	3.81
13.134	309.73	0.7146	875.71	45.39	2.4221	0.0109	0.0320	668.82	569.94	3.0178	0.1479	0.0872	3.81
13.518	266.67	0.0000	0.00	0.00	0.0000	0.0000	0.0000	546.33	635.13	2.7323	0.1772	0.0935	6.93
13.518	281.02	0.0000	0.00	0.00	0.0000	0.0000	0.0000	586.14	615.27	2.8144	0.1668	0.0914	5.81
13.518	295.38	0.0000	0.00	0.00	0.0000	0.0000	0.0000	627.21	593.00	2.9086	0.1567	0.0893	4.72
13.518	309.73	0.0000	875.22	46.77	2.4271	0.0110	0.0320	669.77	567.05	3.0241	0.1464	0.0872	3.69
13.518	309.91	0.0710	875.58	46.79	2.4279	0.0110	0.0322	670.24	566.89	3.0254	0.1464	0.0872	3.69
13.518	310.09	0.1421	875.96	46.80	2.4288	0.0110	0.0322	670.71	566.89	3.0262	0.1464	0.0872	3.68
13.518	310.28	0.2133	876.34	46.82	2.4292	0.0110	0.0322	671.20	566.89	3.0275	0.1464	0.0872	3.68
13.518	310.48	0.2846	876.74	46.83	2.4300	0.0110	0.0322	671.70	566.73	3.0287	0.1464	0.0872	3.68
13.518	310.68	0.3560	877.15	46.85	2.4309	0.0110	0.0322	672.22	566.73	3.0300	0.1464	0.0871	3.68
13.518	310.88	0.4275	877.57	46.87	2.4317	0.0110	0.0322	672.75	566.73	3.0308	0.1465	0.0871	3.68
13.518	311.10	0.4991	878.00	46.88	2.4325	0.0110	0.0322	673.29	566.57	3.0325	0.1465	0.0871	3.67
13.518	311.32	0.5708	878.45	46.90	2.4334	0.0110	0.0322	673.85	566.57	3.0338	0.1465	0.0871	3.67
13.518	311.54	0.6427	878.91	46.92	2.4342	0.0110	0.0322	674.43	566.57	3.0350	0.1465	0.0871	3.67
13.518	311.78	0.7146	879.38	46.94	2.4355	0.0110	0.0322	675.03	566.41	3.0363	0.1465	0.0871	3.67
13.901	266.67	0.0000	0.00	0.00	0.0000	0.0000	0.0000	546.33	635.29	2.7323	0.1772	0.0935	6.93
13.901	281.70	0.0000	0.00	0.00	0.0000	0.0000	0.0000	588.05	614.63	2.8181	0.1664	0.0912	5.75
13.901	296.73	0.0000	0.00	0.00	0.0000	0.0000	0.0000	631.16	591.24	2.9186	0.1559	0.0891	4.62
13.901	311.75	0.0000	878.83	48.33	2.4405	0.0110	0.0324	675.91	563.53	3.0425	0.1450	0.0871	3.55
13.901	311.93	0.0710	879.19	48.34	2.4413	0.0110	0.0324	676.37	563.53	3.0438	0.1451	0.0869	3.55
13.901	312.11	0.1421	879.56	48.36	2.4422	0.0110	0.0324	676.84	563.37	3.0451	0.1451	0.0869	3.54
13.901	312.30	0.2133	879.95	48.38	2.4430	0.0110	0.0324	677.33	563.37	3.0463	0.1451	0.0869	3.54
13.901	312.49	0.2846	880.34	48.39	2.4438	0.0110	0.0324	677.83	563.21	3.0476	0.1451	0.0869	3.54
13.901	312.69	0.3560	880.75	48.41	2.4443	0.0110	0.0324	678.34	563.21	3.0488	0.1451	0.0869	3.54
13.901	312.89	0.4275	881.17	48.43	2.4451	0.0110	0.0324	678.87	563.21	3.0501	0.1451	0.0869	3.53
13.901	313.11	0.4991	881.60	48.44	2.4459	0.0110	0.0324	679.41	563.05	3.0513	0.1451	0.0867	3.53
13.901	313.32	0.5709	882.04	48.46	2.4468	0.0110	0.0324	679.97	563.05	3.0526	0.1451	0.0867	3.53
13.901	313.54	0.6427	882.50	48.48	2.4480	0.0110	0.0324	680.55	563.05	3.0539	0.1451	0.0867	3.53
13.901	313.78	0.7146	882.97	48.50	2.4489	0.0110	0.0324	681.14	562.89	3.0555	0.1452	0.0867	3.52
14.285	266.67	0.0000	0.00	0.00	0.0000	0.0000	0.0000	546.33	635.61	2.7323	0.1773	0.0935	6.93
14.285	282.36	0.0000	0.00	0.00	0.0000	0.0000	0.0000	589.89	613.99	2.8223	0.1661	0.0912	5.70
14.285	298.04	0.0000	0.00	0.00	0.0000	0.0000	0.0000	635.00	589.48	2.9282	0.1551	0.0890	4.53
14.285	313.73	0.0000	882.34	49.91	2.4543	0.0110	0.0325	681.95	560.01	3.0618	0.1437	0.0867	3.41
14.285	313.91	0.0710	882.71	49.92	2.4551	0.0110	0.0325	682.41	560.01	3.0631	0.1437	0.0867	3.41
14.285	314.09	0.1422	883.08	49.94	2.4560	0.0110	0.0325	682.88	559.85	3.0643	0.1437	0.0867	3.41
14.285	314.27	0.2134	883.46	49.96	2.4564	0.0110	0.0325	683.37	559.85	3.0656	0.1437	0.0865	3.40
14.285	314.47	0.2847	883.85	49.97	2.4572	0.0110	0.0325	683.87	559.85	3.0668	0.1438	0.0865	3.40
14.285	314.66	0.3561	884.26	49.99	2.4581	0.0110	0.0325	684.38	559.68	3.0681	0.1438	0.0865	3.40
14.285	314.86	0.4276	884.67	50.01	2.4589	0.0110	0.0325	684.90	559.68	3.0693	0.1438	0.0865	3.40
14.285	315.07	0.4992	885.10	50.03	2.4597	0.0110	0.0325	685.44	559.68	3.0706	0.1438	0.0865	3.39
14.285	315.28	0.5709	885.54	50.05	2.4606	0.0110	0.0325	686.00	559.52	3.0719	0.1438	0.0865	3.39
14.285	315.51	0.6427	886.00	50.07	2.4614	0.0110	0.0325	686.57	559.52	3.0735	0.1438	0.0864	3.39
14.285	315.73	0.7147	886.46	50.09	2.4623	0.0110	0.0325	687.16	559.36	3.0748	0.1438	0.0864	3.39
14.668	266.67	0.0000	0.00	0.00	0.0000	0.0000	0.0000	546.33	635.93	2.7323	0.1774	0.0935	6.93
14.668	283.01	0.0000	0.00	0.00	0.0000	0.0000	0.0000	591.73	613.35	2.8265	0.1657	0.0910	5.65
14.668	299.34	0.0000	0.00	0.00	0.0000	0.0000	0.0000	638.81	587.72	2.9379	0.1543	0.0888	4.43
14.668	315.67	0.0000	885.78	51.51	2.4681	0.0110	0.0327	687.90	556.48	3.0815	0.1424	0.0864	3.28
14.668	315.84	0.0710	886.14	51.53	2.4690	0.0110	0.0327	688.36	556.48	3.0827	0.1424	0.0864	3.27
14.668	316.02	0.1422	886.51	51.54	2.4698	0.0110	0.0327	688.84	556.32	3.0840	0.1424	0.0864	3.27
14.668	316.21	0.2134	886.89	51.56	2.4706	0.0110	0.0327	689.32	556.32	3.0853	0.1424	0.0864	3.27
14.668	316.39	0.2847	887.28	51.58	2.4711	0.0110	0.0327	689.82	556.32	3.0865	0.1424	0.0864	3.27
14.668	316.59	0.3561	887.68	51.60	2.4719	0.0110	0.0327	690.33	556.16	3.0878	0.1425	0.0864	3.26
14.668	316.79	0.4276	888.10	51.62	2.4727	0.0110	0.0327	690.85	556.16	3.0890	0.1425	0.0862	3.26
14.668	316.99	0.4992	888.52	51.64	2.4736	0.0110	0.0327	691.39	556.16	3.0907	0.1425	0.0862	3.26
14.668	317.21	0.5709	888.96	51.65	2.4744	0.0110	0.0327	691.94	556.00	3.0920	0.1425	0.0862	3.26
14.668	317.43	0.6428	889.41	51.67	2.4752	0.0111	0.0327	692.51	556.00	3.0932	0.1425	0.0862	3.26
14.668	317.66	0.7147	889.88	51.69	2.4761	0.0111	0.0329	693.10	556.00	3.0949	0.1425	0.0862	3.25

55280

REV

NOTES

MODIFICATIONS

1. The existing Xylene Column Reboiler, Equipment No. 55-B-01 A/B, is suitable for the revamp conditions.

2. No other modifications, except those given below are required for the existing heater as long as it is "fit for service", which shall be determined by CTCI : (Also, see "Revamp Notes" below). — 0
   a. UOP combustion conditions shown on Sheet 2 of this data sheet are based on 'Sales Gas' composition given in UOP document number 951606 - A.4 "Basic Engineering Design Questionaire, Rev. 3. CTCI/Heater Vendor shall confirm the adequacy of the existing burners and fuel gas supply system for the full range of fuel gas compositions anticipated for the revamp operation as shown in latest revision of Fluor document **SP-000-AA-5002** "Basic Engineering Design Data". — 0
   b. Due to inadequate data regarding the flue gas/combustioin air heater, UOP has estimated the combustion air temperature at the burners based on heat balance. Heater vendor shall evaluate the adequacy of the entire air preheat system for the revamp operation. — 2

REFERENCE DATA

1. Born Overall Layout & Plot Drawing No. 2881-55B01-01A Rev. 2 dated 7-Mar-96.
4. Born General Arrangement Drawing No. 2881-55B01-02A Rev. 2 dated 7-Mar-96.
5. Born API Fired Heater Data Sheet Rev. 5 dated 7-Mar-96 (8 pages).

REVAMP NOTES

1. The revamp conclusions are based on the assumption that all existing coil components that are to be re-used for the revamp are identical to the vendor's data sheets referenced above, and:
   a. The tubes/fittings have normal original wall thickness.
   b. No significant corrosion or metallurgical damage has occurred.
   c. The tubes/fittings are not severely warped, bulged, nor oxidized.
   d. The tubes/fittings are free of internal and external deposits.

   Changes to this information will require further review of this specification by UOP.

2. **CTCI**/heater vendor is responsible for the following: — 0
   a. Providing confirmation and guarantee that the existing heater will meet UOP's predicted thermal and hydraulic performance while complying with specified noise and emissions limits. — 0
   b. Conducting a detailed field inspection based upon consultation with the component vendors. — 0
   c. Ensuring that the heaters and ancillary equipment are refurbished, as required, to provide for safe operation at the revamp conditions. — 0
   d. Verifying that the structural and mechanical integrity of the heater and ancillary equipment is satisfactory for the revamp conditions. — 0
   e. Ensuring compliance with existing codes and practices, including environmental regulations. — 0
   f. Ensuring that any replacement parts or midifications shall comply with the latest appropriate API/ISO standards. As a minimum, the replacement parts or modifications shall comply with the same standards as the original equipment.

9-1

CLIENT	:	**CHIYODA / ARABIAN INDUSTRIAL FIBERS CO LTD**
CHIYODA PO	:	**SAY POE 0002**
LOCATION	:	**IBN RUSHD PTA & AROMATICS PLANT PROJECT**
EQUIPMENT	:	55-B-01 XYLENE COLUMN REBOILER
REQUISITION NO :		**22854-MR-000-B-501**

RETURNED
JUL. 19. 1996
CHIYODA
VPC

RECVD
JUL. 1.1996
CHIYODA
VPC

CHIYODA CORPORATION		
JOB NO. 51046	IBN RUSHD AROMATICS PROJECT	
PO NO. SAYPOE0002		
REQ NO. 22854000B501 130		
IDENT NO. 22854000B501 0C0~~127~~		5
A-NO COMMENTS PROCEED WITH FABRICATION	SAY TEAM	
B-PROCEED WITH FABRICATION COMMENTS TO BE CONSIDERED	PYD	[signature]
C-DO NOT PROCEED WITH FABRICATION	DATE July 16 '96	
PURCHASER'S PERMISSION TO PROCEED OR REVIEW TAKEN ON VENDOR PRINTS SHALL NOT RELIVE VENDOR FROM ITS RESPONSIBILITIES OR LIABILITIES UNDER PURCHASE ORDER		

REV	INITL	DATE	REVISIONS	CHKD	DATE	APP	DATE
5	BP	10/5/96	AS CLIENT COMMENTS	EAW	21/5/96	[initials]	21/5/96
4	BP	7/3/96	AS NOTED	RW	7/3/96	[initials]	11/3/96

CAT CODE : D1

UNIT : 55-B-01

069235

TITLE : FIRED HEATER DATA SHEET.

SPEC NO : 2881-55B01-ETD 002/A

SHEET 1 **OF** 9 **REV** 5

Born International

NOTE: THIS DRAWING IS THE PROPERTY OF BORN [illegible]
QA NO [illegible]

MANUFACTURE AND CONSTRUCTION TO BE CARRIED OUT STRICTLY IN ACCORDANCE WITH THE REQUIREMENTS OF THIS DRAWING SPECIFICATION.
NO CHANGES ARE TO BE MADE WITHOUT THE PRIOR AGREEMENT OF THE CHIEF ENGINEER OR THE ORGANISING SECTION WITHIN ENGINEERING DEPARTMENT.

11-5-1

55280

ALTERNATE DESIGN

BORN

WORLD-WIDE MANUFACTURERS OF
DIRECT FIRED HEATERS
SI UNITS

Service /Item	Xylene column Reboiler 55B01		
Type	RAD CON VC	Plant Location	
		Quantity	2
Owner		Ref. No	
Purchaser	Chiyoda	Ref. No.	
Date	07/03/96	Born Ref No.	BJ 2881
By:	BDP	Page 1 of	8

PROCESS DESIGN CONDITIONS

1. Total duty heater, MW	107.82			
2. Heater section	**Radiant**	**Conv.**		
3. Service of heater	Xylene column Reboiler 55B01			
4. Heat Absorption per heater, MW	40.06	13.85		
5. Fluid Name	HC	HC		
6. Flow rate, kg/hr	837728			
7. Flow rate, dm(cube)/s				
8. Press drop (allow, clean/fouled), bar	3.80			
9. Press drop (calc, clean/fouled), bar	2.000			
10. Fouling allowance, m(sq)-C(deg)/W				
11. Therm conductivity of coke/scale, WmC(deg)				
12. Avg. radiant flux density (allowable), W/m(sq)	31546			
(5) 13. Avg. radiant flux density (calculated), W/m(sq)	31528			
14. Avg. convection flux density (allowable), W/m(sq)				
15. Avg. convection flux density (calculated), W/m(sq)		3748		
(5) 16. Max radiant flux density, W/m(sq)	56751			
17. Max convection flux density, W/m(sq)		56833		
18. Velocity limitation, m/sec				
19. Max. Allowable Inside film temperature, C(deg)				
INLET CONDITIONS:				
20. Temperature, C(deg)		281		
21. Pressure,barg		14.60		
22. Liquid flow, kg/hr		837728		
23. Vapor flow, kg/hr		0		
24. Density of Liquid @ T. P. , S.G		0.665		
25. Vapor, molecular weight				
26. Viscosity, liquid, mPa.s		0.174		
27. Viscosity, vapor, mPa.s				
28. Specific heat, liquid, KJ/kgC(deg)		2.729		
29. Specific heat, vapor, KJ/kgC(deg)				
30. Thermal conductivity, liquid, W/mC(deg)		0.091		
31. Thermal conductivity, vapor, W/mC(deg)				
OUTLET CONDITIONS:				
32. Temperature, Degree C	310			
33. Pressure, barg	10.80			
34. Liquid flow, kg/hr	291780.5			
35. Vapor flow, kg/hr	545947.5			
36. Density of Liquid @ T. P. , Kg/cuM	0.639			
37. Vapor, molecular weight	118.7			
38. Viscosity, liquid, mPa*s	0.16			
39. Viscosity, vapor, mPa*s	0.011			
40. Specific heat, liquid, KJ/kgC(deg)	2.862			
41. Specific heat, vapor, KJ/kgC(deg)	2.335			
42. Thermal conductivity, liquid, W/mC(deg)	0.087			
43. Thermal conductivity, vapor, W/mC(deg)	0.033			
REMARKS				
44. Distillation data should be attached for vaporization service				
45. Other				

069236

11-5-7

55280

ALTERNATE DESIGN
service per unit

BORN

WORLD-WIDE MANUFACTURERS OF
DIRECT FIRED HEATERS
SI UNITS

Service /Item	Xylene column Reboiler 55B01		
Unit	RAD CON VC	Plant Location	
Type		Quantity	2
Owner		Ref. No.	
Purchaser	Chiyoda	Ref. No.	
Date:	07/03/96	Born Ref No.	BJ 2881
By:	BDP	Page 2 of	8

Combustion Design Conditions

	with preheat		no preheat	
1. Type of fuel	GAS		gas	
2. Excess air, percent	15		15	
3. Calc heat release, MW (LHV)	59.157		65.50	
4. Calc fuel efficiency, percent (LHV)				
5. Calc thermal efficiency, percent (LHV)	91.1		82.3	
6. Guaranteed thermal efficiency, percent (LHV)	90.1		81.3	
7. Radiation loss, percent of heat rel (LHV)	2.50		2.50	
8. Flue gas temp. leaving radiant section, C(deg)	848		841	
9. Flue gas temp. leaving conv section, C(deg)	332		347	
10. Flue gas temp. leaving air heater (uncorrected), C	145			
11. Flue gas temp. leaving air heater (corrected), C(de				
12. Max flue gas mass vel thru conv sect, kg/s* m(sq)	1.36		1.50	
13. Volumetric heat release, W/m(cube) (LHV)				
14. Ambient air temperature, C(deg)	15	combustion design		
15. Air temperature, stack design, C(deg)	50			
16. Air temperature leaving air heater, C(deg)	224			
17. Altitude above sea level, m	0			
18. Draft @ Bridgewall,mm wg	3.00			
19. Draft @ Burner, mm wg	15.11			

Fuel Characteristics

20. Type of Fuel	gas			
21. Heating value (LHV), KJ/kg				
22. Heating value (LHV), KJ/Nm(cube)	23376			
23. sp Gr. @ P, T.	0.306 @ 15C			
24. H/C ratio (by weight)				
25. Viscosity, @ _____ C(deg), mPa*s				
26. Viscosity, @ _____ C(deg), mPa*s				
27. Total salts, ppm				
28. Vanadium, ppm				
29. Sodium, ppm				
30. Fixed nitrogen, ppm				
31. Sulfur, percent by weight				
32. Hydrogen sulfide, percent by volume				
33. Ash, percent by weight				
34. Liquids: ASTM initial boiling point, C(deg)				
35. ASTM end point, C(deg)				
36. Gases: Molecular weight				
37. Composition, mol percent				
38. Temperature at burner, C(deg)	15.6			
39. Fuel pressure (available @ burner), kPa	138			
40. Atomizing air stream pressure, kPa				

Mechanical Design Conditions (General:)

41. Plot limitations _____ Min Stack Ht. _____ m
42. Tube limitations _____ Noise Limitations _____

Structural Design Data:

1. Wind Velocity, m/s — Wind occurrence
2. Wind exposure — Seismic Zone
3. Minimum ambient air temperature C(deg) 0

069237

Rev. 5 BB' 3/12/96

DSHTB.XLS

11-57

55280

ALTERNATE DESIGN

BORN

WORLD-WIDE MANUFACTURERS OF
DIRECT FIRED HEATERS
SI UNITS

Service/Item	Xylene column Reboiler 55B01		
Unit	RAD CON VC	Plant Location	
Type		Quantity	2
Owner		Ref. No.	
Purchaser	Chiyoda	Ref. No.	
Date:	07/03/96	Born Ref No.	BJ 2881
By:	BDP	Page 3 of	8

				RADIANT SHOCK
Coil Design: (RADIANT)				
4. Design basis of tube wall thk. (code or specs)	API 530			API 530
5. Design basis for rupture strength, (min or avg)				
6. Design life, hr	100000			100000
7. Elastic design pressure, barg	20.65			20.65
8. Rupture design pressure, barg				
9. Temperature allowance, C(deg)	28			28
10. Corrosion allowance, mm	3			3
11. Stress relieve (YES or NO)	no			no
12. Weld inspection requirements radiography, %	100			100
13. Hydrostatic test pressure, BARG	51.0			51.0
14. Max tube metal temperature (clean) C(deg)	408			
15. Design tube metal temperature C(deg)	436			436
16. Inside film coefficient, W/m2 C(deg)	710			1221
Coil Configuration: (RADIANT)				
17. Tubes (vertical or horizontal)	VERT			HORI
18. No. of flow passes	8			8
19. Effective tube length, m	18.059			9.144
20. Bare tubes, number	96			16
21. Bare tubes, exposed surface, m(sq)	1193.24			77.39
22. Bare tubes, total exposed surface, m(sq)	1270.63			
23. Tubes, inline or staggered	IN LINE			STAGGERED
24. Tube spacing, C to C, mm	406.40			304.80
Tubes: (RADIANT)				
25. Material (ASTM spec. or grade)	A106 GRB			A106 GRB
26. Outside diameter,mm	219.1			168.3
27. wall thickness , mm or Sch	sch 40aw			sch 40aw
28. Overall tube length, m				
29. No. of intermediate welds	96			None
30. Distance from Center Line of tube to wall, mm	305			152
Heater Section	**Radiant**			
Plug-Type Headers:				
31. Location (one end or both ends)	None			
32. Manufacture and type				
33. Nominal rating				
34. Welded or rolled joint				
Return Bends:				
35. Location (header box or firebox)	firebox			header box
36. Material (ASTM spec and grade)	A234 WPB			A234 WPB

069238

ALTERNATE DESIGN

BORN

WORLD-WIDE MANUFACTURERS OF
DIRECT FIRED HEATERS
SI UNITS

Service/Item	Xylene column Reboiler 55B01		
Unit	RAD CON VC	Plant Location	
Type		Quantity	2
Owner		Ref. No.	
Purchaser	Chiyoda	Ref. No.	
Date:	07/03/96	Bom Ref No.	BJ 2881
By:	BDP	Page 5 of	8

Heater Section Continued:	Radiant	Convection
Terminals:		
1. Type (welded or flanged)	FLANGED	Flanged
Inlet:		
2. Material (ASTM spec and grade)		A105
3. Size/rating, schedule or thickness		6" SCH 40 300#
4. Number of terminals		8 PER HEATER
Outlet:		
5. Material (ASTM spec and grade)	A105	
6. Size/rating, schedule or thickness	8" SCH 40AW 300#	
7. Number of terminals	8 PER HEATER	
Manifolds:		
8. Connection to tubes (weld or flanged)	Flanged	
9. Location (internal or external)	External	
Inlet:		
10. Material (ASTM spec and grade)	None	
11. Size/schedule or thickness		
12. Flange/material (ASTM spec and grade)		
13. Flange size and rating		
Outlet:		
14. Material (ASTM spec and grade)	A106 GrB	
15. Size schedule or thickness	26 " x STD WT	
16. Flange/material (ASTM spec and grade)	None (Connections to Heater terminals only)	
17. Flange size and rating	26" x STD WT Bevelled	
Crossovers:		
18. Location (internal or external)	EXTERNAL	
19. Pipe mat'l (ASTM spec and grade)	A 106 GRB	
20. Pipe size/schedule or thickness	6" SCH 40AW	
21. Flange mat'l (ASTM spec and grade)		
22. Flange size and rating		
Tube Supports:		
23. Location (top, bottom, intermediate)	TOP	INTER ENDS
24. Material (ASTM spec and grade)	25/20 CR NI	25/20/ CR/NI C.S. PLATE
25. Spacing		4700 mm
26. Coating (type and thickness)		100 mm LW cast
Tube Guides:		
27. Location and spacing (Top/Bottom)	BOTTOM	
28. Material (ASTM spec and grade)	310 SS	
Settings:		
Floor:		
29. Lining: Thickness - Hot face temp. - calc - design	200	827 C
30. Matl/thk/service temperature	200 MM LW CASTABLE	
31. Anchor (type & matl)		
32. Casing: Thickness - Material - Temperature	6mm	C.S. plate
Exposed Vertical Walls:		
33. Lining: Thickness - Hot face temp. - calc - design		
34. Matl/thk/service temperature		
35. Anchor (type & matl)		
36. Casing: Thickness - Material - Temperature		

ALTERNATE DESIGN

BORN

WORLD-WIDE MANUFACTURERS OF
DIRECT FIRED HEATERS
SI UNITS

Service/Item	Xylene column Reboiler 55B01		
Unit	RAD CON VC	Plant Location	
Type		Quantity	2
Owner		Ref. No.	
Purchaser	Chiyoda	Ref. No.	
Date:	07/03/96	Born Ref No.	BJ 2881
By:	BDP	Page 4 of	8

Coil Design: (CONVECTION)	BARE	EXT.	EXT.	EXT.
4. Design basis of tube wall thk. (code)	API 530	API 530	API 530	API 530
5. Design basis for rupture strength				
6. Design life, hr	100,000	100,000	100,000	100,000
7. Elastic design pressure,BARG	20.65	20.65	20.65	20.65
8. Rupture design pressure, BARG				
9. Temperature allowance, C(deg)	28	28	28	28
10. Corrosion allowance, mm	3	3	3	3
11. Stress relieve (yes or no)	NO	NO	NO	NO
12. Weld inspection requirements radiography, %	100	100	100	100
13. Hydrostatic test pressure, Barg	51.0	51	51	51
14. Max tube metal temperature (clean), C(deg)	323	356	334	352
15. Design tube metal temperature, C(deg)	351	384	362	380
16. Inside film coefficient, W/m(sq) C(deg)	1130	1141	1130	1130
Coil Configuration: (CONV.)				
17. Tubes (vertical or horizontal)	HORI.	HORI.	HORI.	HORI.
18. No. of flow passes/tubes per row	8 16	8 16	8 16	8 16
19. Effective tube length, m	9.144	9.144	9.144	9.144
20. Bare tubes, number	32	0	0	0
21. Bare tubes, exposed surface, m(sq)	154.68			
22. Ext tubes ,number	0	16	16	48
23. Ext surface tubes, exp. surface, m(sq)		328.87	328.87	2922.15
24. Ext surface tubes, total exp. surface, m(sq)		3579.89		
25. Tubes, staggered/inline	STAGGERED	STAGGERED	STAGGERED	STAGGERED
26. Tube spacing, C to C , mm	304.8	304.8	304.8	304.8
Tubes: (CONVECTION)				
27. Material (ASTM spec. or grade)	A106 GR B	A106 GR B	A106 GR B	A106 GR B
28. Outside diameter, mm	168.3	168.3	168.3	168.3
29. wall thickness,m m or Sch	sch 40aw	sch 40aw	sch 40aw	sch 40 aw
30. Overall tube length, m				
31. No. of intermediate welds	None	None	None	None
32. Distance from tube center line to wall, mm	152	152	152	152
Description of Extended Surface:				
33. Type (studs, serrated fins or solid fins)		SOLID FIN	SOLID FIN	SOLID FIN
34. Material		CS	CS	Car/StL
35. Fin Height, mm		12.70	12.70	25.40
36. Fin Thickness, mm		1.30	1.30	1.30
37. Fins Per m		118	118	197
38. Max tip temperature, C(deg)		386	355	411
39. Extension ratio		4.252	4.252	12.594
Heater Section			Convection	
Plug-Type Headers:				
40. Location (one end or both ends)			NONE	
41. Manufacture and type				
42. Nominal rating				
43. Welded or rolled joint				
Return Bends:				
44. Location (header box or firebox)	Header box	Header box	Header box	Header box
45. Material (ASTM spec and grade)	A-234-WPB	A-234-WPB	A-234-WPB	A-234-WPB

069239

11-5-6

55280

BORN

WORLD-WIDE MANUFACTURERS OF
DIRECT FIRED HEATERS
SI UNITS

Service/Item	Xylene column Reboiler 55B01		
Unit	RAD CON VC	Plant Location	
Type		Quantity	2
Owner		Ref. No.	
Purchaser	Chiyoda	Ref. No.	
Date:	07/03/96	Bom Ref No.	BJ 2881
By:	BDP	Page 6 of	8

Mechanical Design Conditions (continued)
Heater Section (continued):

Shielded Vertical Walls:				
1. Lining: Thickness - Hot face temp. - calc - design	125	618 C	1260 C	
2. Thk/Mat'l/service temperature	50 -128 kg/ cu m CFNB + 75 -96 kg/ cu m CFNB+3mm stalastic			
3. Anchor (type & matl)	TP 310 SS Studs and Washers			
4. Casing: Thickness - Material - Temperature	6	C.S. plate		
Arch:				
5. Lining: Thickness - Hot face temp. - calc - design	150	827 C	1260 C	
6. Thk/Mat'l/service temperature	50 mm 128kg/cu m CFNB + 100 mm 96 kg/ cu m CFNB+3mm stlasti			
7. Anchor (type & matl)	TP 310 SS Studs and Washers			
8. Casing: Thickness - Material - Temperature	6	C.S. plate		
Convection Walls:				
9. Lining: Thickness - Hot face temp. - calc - design	125	584 C	1100 C	
10. Thk/Mat'l/service temperature	125 mm LW castable			
11. Anchor (type & matl)	v' type	304 SS		r1
12. Casing: Thickness - Material - Temperature	6	C.S. plate		
Breeching:				
13. Lining: Thickness - Hot face temp. - calc - design	75	340 C	1093 C	
14. Thk/Mat'l/service temperature	LW CASTABLE			
15. Anchor (type & matl)	v' type	CS		
16. Casing: Thickness - Material - Temperature	5			

Flue Gas Ducts:

17. Location	TO PREHEATER	FROM PREHEATER
18. Lining (internal or external)	internal	internal
19. Thickness & Material	125 mm LW castable	75 mm LW castable
20. Anchor, type and material	CS 'v' anchors	CS 'v' anchors
21. Hot face design temperature		
22. Cold face design temperature		

Combustion Air Ducts:

23. Location	APH to burners
24. Lining (internal or external)	internal
25. Thickness and Material	50mm LW castable
26. Anchor, type and material	CS
27. Hot face / cold face design temperature, C(deg)	

Header Boxes:

28. Location	Conv. ends	Hinged doors/bolted	Bolted
29. lining (Thickness & Material)	50 mm LW castable		
30. Anchor (type and material)	v' type	CS	
31. Door/panel (matl and thickness)		C.S. plate	

Burner Windboxes

32. Lining (internal or external)	internal	Matl & thk.	mineral wool
33. Anchor (type and matl)	CS ' v '		
34. Casing: Materials and thk.	CS 5		
35. Hot face design temp., C(deg)		Cold face design temp.,C	

ALTERNATE DESIGN

BORN

WORLD-WIDE MANUFACTURERS OF
DIRECT FIRED HEATERS
SI UNITS

Service /Item	Xylene column Reboiler 55B01		
Unit	RAD CON VC	Plant Location	
Type		Quantity	2
Owner		Ref. No.	
Purchaser	Chiyoda	Ref. No.	
Date:	07/03/96	Born Ref No.	BJ 2881
By:	BDP	Page 7 of	8

Mechanical Design Conditions (continued)
Heater Section (continued):
Stack:

1. Location	grade mounted stack common to both heaters		
2. Inside met. dia. at exit , mm	3642	Ht. above grade: mm	80910
Inside met. dia. at base, mm	4176	refer born drwg for layout	
3. Plate, min. thickness, mm	6	Material:	Carbon steel
4. Lining : (Internal or External)	Internal	Extent of lining	To top
5. Thickness and Material, mm	50	LW Castable	
6. Anchor, type and material:	v' type	CS	
Bridgewall:			
7. Height:, mm	none		
Matl and thickness:		Location	
Dampers:			
8. Location	Stack		
9. Material of blade	TP304SS		
10. Material of shaft	TP304SS		
11. Bearing type	PILLOW BLOCK		
12. Multiple or single blade	Multiple blade		
13. Desc of provision for operation	actuated		
14. Location and type of operator			

Miscellaneous:
Platforms:

	Location/No.	Width	Length/Arc	Access Stairs/Ladder	Gr./Pl/loc.
15.	Hearth / One	1100 mm	360 DEGREE	1stair/1ladder	GRADE
16.	Convection Side(s) /One	1100 mm		1 LADDER	
17.	Convection End(s) /Two	1100 mm		2 WALKWAYS	
18.	Rad Intermediate /One	1100 mm		1 Ladder	
19.	Stack Damper / One	1100 mm	270 DEGREE	1 LADDER	
20.	Stack Sample Port				
21.	Type of flooring				

Doors:

		Number	Location	Size	Hinged/Bolted
22.	Access Doors	2	FLOOR	450 x 600	Hinged
23					
24.	Observation Doors	24	RAD SIDE	127 x 406	HINGED(20-std-03)
25					
26					
27.	Steam Lance Doors	4	CONV SIDE	600 x 150 bolted	(BLS-D-106)
28					
29	Explosion Door	1	RAD SIDE	473 x 432	HINGED
30					
31					

Instruments and Aux. connections

	Number	Size	Type
32. Process fluid temperature			
33. Flue gas / combustion air temp.		SEE DRAWING No.	2881/403/162EA
34. Flue gas / combustion air pressure			2881-55B01-02A & 02B
35. Flue gas composition (sample)			
36. Snuffing steam	4	2" NPS	3000# CRG With Plug
37. Purge			
38. Vents and drains			
39. Tubeskin thermocouples			

Rev. 5 BDP 3/4/96

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(9-9)

BORN

WORLD-WIDE MANUFACTURERS OF
DIRECT FIRED HEATERS
SI UNITS

Service /Item	Xylene column Reboiler 55B01		
Unit	RAD CON VC	Plant Location	
Type		Quantity	2
Owner		Ref. No.	
Purchaser	Chiyoda	Ref. No.	
Date	07/03/96	Born Ref No.	BJ 2881
By:	BDP	Page 8 of	8

Mechanical Design Conditions (continued)
Heater Section (continued):

1. Painting requirements:	22854-SP-000-X-002 System 2 to Prime Coat Only
2. Galvanizing requirements.	Ladders and Platforms to ASTM A123
3. Internal coatings (casing, ducts, stack)	Stalastic behind cermic fibre blanket
4. Fireproofing requirements.	None

Burner and Auxiliary Equipment:

Burners:

5. Manufacture/type J.Z. PSFG — FD gas only — Location rad floor
6. Designation/Size 18 — Number: 12 — Fuel: gas
7. Heat rel. (MW per burner) at design excess air (Max\Norm) — 4.93 — with preheated air
   Heat rel. (MW per burner) at design excess air (Max\Norm) — 6.006 — 5.46 — ambient air
8. Design press drop across burner — 50 mm Wg
   Distance burner centerline to unshielded refractory: — 18059 mm
10. Burner pilot: — BCD = 5900 MM
    Capacity (KW) 20 — Fuel: Gas — Fuel press
    Fuel Pressure/ Fuel: — Type of ignition: AUTO
11. Special requirements: (flame detection devices, safety interlocks etc.) — UV SCANNERS

Sootblowers:

12. Location	SPACE FOR FUTURE INSTALLATION		
13. Manufacture and type			
14. Number			
15. Maximum cleaning radius, mm			
16. Lane dimensions (min. clearance)			
17. Orientation (horizontal or vertical)			
18. Cleaning medium			
19. Supply pressure/temperature			
20. Flow rate per blower , kg/s			
21. Materials of construction			
22. Driver type (manual, air, or elec.)			
23. Control systems type (auto or manual, sequential, local, or remote panel)			

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ARABIAN INDUSTRIAL FIBERS COMPANY

IR-II AROMATICS PROJECT

PROJECT NO. 10E0541A01

DOCUMENT TITLE:

XYLENE COLUMN DATA SHEET

DOCUMENT NO:

DS-55-CA-501

REV	DESCRIPTION	BY	CHK.	APPR.	DATE
3	Revised as Marked	KWY.	CBC	YSL	11-Aug.-11
2	Issued for Design	KWY	CBC	YSL	31-Mar-11
1	Revised as Marked	KWY	CBC	YSL	11-Mar-11
0	Issue For Approval	KWY	SYL	YSL	1-Feb-11

ابن رشد

ARABIAN INDUSTRIAL FIBERS COMPANY YANBU, KINGDOM OF SAUDI ARABIA

CTCI CORPORATION

CERTIFIED

PROJ.

MGR _____ DATE _____

CLIENT _____ DATE _____

XC32A-55-501

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CONTENTS

Attachment total 1 page.

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FLUOR

VERTICAL VESSEL DATASHEET

Contract:	10E0541A010
Equip. No.:	55-C-01
Revision:	3 Date: 11-Aug.-2011
Unit:	55 - Xylene Fract
PO No.:	
Document No	DS-55-CA-501
Sheet:	1 of 2

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CTCI CORPORATION

REV

Client: Arabian Industrial Fibers Company

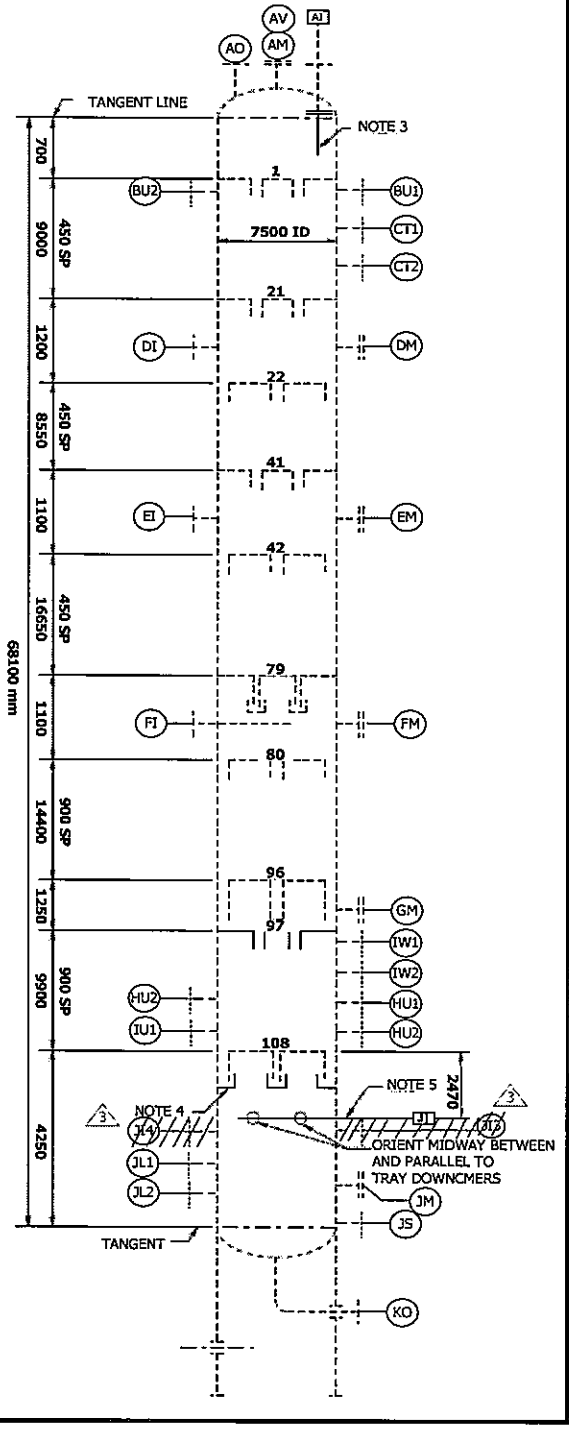
Plant: Xylene Fract

Service: Xylene Column

Site: Yanbu, Kingdom of Saudi Arabia

DESIGN SKETCH

VESSEL DIMENSIONS: ID: 7500 mm T/T: 68100 mm



DESIGN CONDITIONS

Pressure:	16.0	bar(g)	at	348	°C
Vacuum:	FV	bar(g)	at	320	°C
Min. Metal Temp:	9(NOTE16)	°C	at	MAWP	bar(g)
Liquid Level:	Note 11				mm
Specific Gravity of Liquid:	0.597		at	(NOTE15)	°C

OPERATING CONDITIONS

Pressure:	NOTE15	bar(g)	at	Note 10	°C
Vacuum:		bar(g)	at		°C
Low Temperature:		°C	at		°C
Hydrogen Partial Press.		bar (a)	at		°C

INTERNALS & INSULATION

DESCRIPTION	Bulk Density kg/m³	Liquid Holdup vol%	Pressure Drop bar(g)
Packing:			Note 14
Catalyst:			
Mist Eliminator:			
Insulation	90 mm Hot ■	Cold □	
Fire Proofing	75 mm Yes ■	No □	

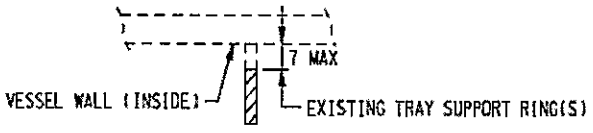
CONSTRUCTION

	Materials	Corrosion Allowance
Shell:	SA-516-70 N	3 mm
Heads	SA-516-70 N	3 mm
Support	SA-516-70 N	1.6 mm

SPECIAL CONDITIONS

Stress Relieve (Process Reason Only):	Yes □	No ■
Vessel in Wet Sour Service:	Yes □	No ■
Steamout Required:	Yes ■	No □

DESIGN SKETCH (CONTINUED)



REMOVE EXISTING TRAY SUPPORT RING(S) IF NOT UTILIZED FOR THE NEW SERVICE

WEIGHTS ARE BASED ON THE VENDOR CERTIFIED DRAWING No. 1-96-B9750-1 REV 4 (1997)	(kg)
EMPTY	901 500
OPERATING	1 367 200
FULL OF WATER	4 237 400

THICKNESS ARE BASED ON THE VENDOR CERTIFIED DRAWING No. 1-96-B9750-01 REV 4 (1997)	(mm)
TOP HEAD	54
SHELL	55-58
BTM HEAD	58
SKIRT	25

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FLUOR

VERTICAL VESSEL DATASHEET

Contract: 10E0541A01
Equip. No.: 55-C-01
Revision : 3 Date : 11-Aug.-2011
Unit : 55 - Xylene Fract
P.O. No. :
Document No. : DS-55-CA-501
Sheet : 2 of 2

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CTCI CORPORATION

REV

NOZZLE SCHEDULE

TAG	QTY	SIZE in	PRESSURE RATING	DESCRIPTION	REV
AI	1	14	300# RFWN	INLET (MODIFIED, SEE NOTE 3)	
AM	1	30	300# RFWN	MANWAY WITH COVER/LIFT.LUG	
AO	1	34	300# RFWN	OUTLET	
AV	1	4	300# RFWN	VENT	
BU1/2	2	1	300# RFWN	TDIC-TI	
CT1/2	2	1 1/2	300# RFWN	ANALYZER	
DI	1	8	300# RFWN	INLET (NOT IN USE)	
DM/EM/FM/GM/JM	5	24	300# RFWN	MANWAY WITH COVER/DAVIT	
EI	1	8	300# RFWN	INLET	
FI	1	6	300# RFWN	INLET	
HU1/2	2	1	300# RFWN	TDIC-TI	
IU1/2	2	1	300# RFWN	TI-TW	
IW1/2	2	1 1/2	300# RFWN	ANALYZER (NOT IN USE)	
JL1/2	2	2	300# RFWN	LEVEL	
JS	1	4	300# RFWN	STEAMOUT (NOTE17)	
KO	1	30	300# RFWN	OUTLET	
JI1/2	2	40	300# RFWN	INLET (NEW, SEE NOTE 5)	
~~JI3/4~~	~~2~~	~~24~~		~~INLET (NOT IN USE)~~	3

NOTES:

1) This vessel tag number 55-C-01 is an existing vessel in the same service. Modifications required are as follows:
2) From Tray #80-138 (existing tray numbering), every 4th tray (ie. 84, 88, 92, 96, 100, 104, 108, 112, 116, 120, 124, 128, 132, and 136) is to be retained. The other trays are to be removed / relocated as required for 900 mm tray spacing. Trays #137and 138 are to be removed.
3) Remove existing distributor at Nozzle "AI" and replace with new distributor with 12-inch outlet per U.O.P. DWG 3-170.
4) Remove existing traps and install new traps below tray #108 per U.O.P. DWG 3-280.
5) Remove existing Inlet Nozzles "JI" and replace with new 40-inch inlet Nozzles "JI", as shown.
6) CTCI to verify the available thickness after evaluating maintenance records and performing UT testing and confirm. The CTCI to provide necessary ASME code documentation for the repair "R" stamp and new nameplate.
7) Dimensions are in millimeter unless otherwise noted.
8) Vessel heads are 2:1 Elliptical
9) For nozzle elevation and orientation refer to vendor certified drawings nos. 1-96-B9750-1 REV 4 (1997) and 1-96-B9750-2 REV 4 (1997).
10) Operating Temperature. Top: 248°C. Bottom: 299°C
11) Normal liquid level (NLL) is 805 mm above bottom tangent line.HLL : 1049 mm. NLL : 561 mm. — 2
12) Applicable specifications: SP-000-AA-5002, 22854-SP-000-A-003, 22854-SP-000-A-004, 22854-SP-000-D-001, 22854-SP-000-W-001, 22854-SP-000-W-002, 22854-SP-000-W-003, P01-E07, T01-S01, 3-11.
13) The following UOP standard drawings are applicable: 3-170, 3-280.
14) Total pressure drop through column internals = 1.056 bar.
15) Operating pressure Top: 8.27 bar(g) Bottom: 9.33 bar(g)
16) The min. design ambient temperature should be 6 °C.
17) Steamout at 150 (232 max) °C and 3.5 (4.1 max) bar (g).

FOR RECORD

PROJECT	PTA & AROMATICS -	APRD					
TITLE	: AROMATICS	CHKD					
JOB NO.	: 51046	MADE					
DOC. NO.	: 05-55-C-001 (1/1)	DATE	May 08 '96	Jun 30 '97			

CTCI CORPORATION

UOP
25 East Algonquin Road • PO Box 5017 • Des Plaines, Illinois 60017-5017 • U.S.A.

VESSELS

PROJECT SPECIFICATION 580693 - 301 - 2. SHEET 3							
REV	DATE	BY	APP'D	REV	DATE	BY	APP'D
0	5-11-95						
1	5-21-95	JWK	JWK				
2	1-0?-95	MR	AJA				

SERVICE ② XYLENE COLUMN — ITEM NO 55-C-01 ~~C-5004~~

(*) BY CONTRACTOR

Design Conditions at Top	INT 16.00 BAR (g)	*348 °C
	EXT FULL VACUUM	*320 °C
	Metal Temperature (Min)	5 °C
Operating Conditions	TOP	253 °C
	BOTTOM	320 °C
Radiograph		MR
Postweld Heat Treat		MR
Joint Efficiency		MR %
Material Specifications		
Heads	SA516-70 ①	
Shell	SA516-70	

Shell	Thickness Required by Code-in.	Corrosion Allowance In. (Min)	
		3	
Heads			
		3	

Vessel Heads	
Top Head	2:1 ELLIPTICAL
Bottom Head	2:1 ELLIPTICAL
Accessories Applied by Fabricator	
Ladder & Platform Clips	AS REQUIRED (*)
Insulation Clips & Rings	YES
Vessel Support	YES

Nozzles and Manways

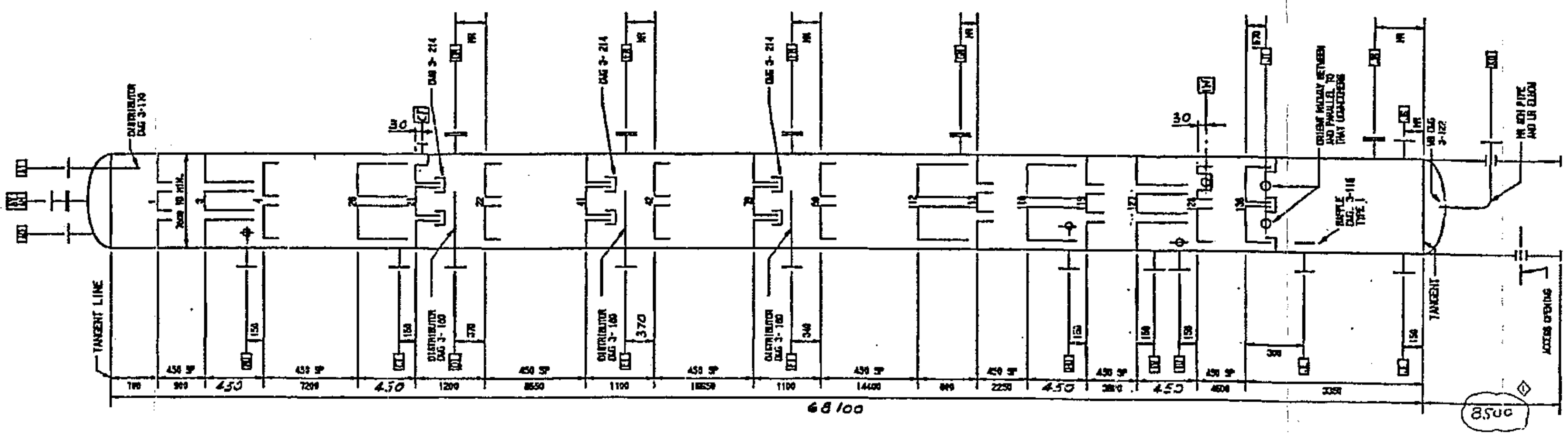
Mark	No	Size Inches	Service
AI	1	14	INLET
AM	1	30	MANWAY
AO	1	34	OUTLET (+)
AV	1	4	VENT
BU	2	1	TDRC-TI, ID
CT	2	1 ½	ANALYZER
DI	1	8	INLET
DM	1	24	MANWAY
EI	1	8	INLET
EM	1	24	MANWAY
FI	1	8	INLET
FM	1	24	MANWAY
GM	1	24	MANWAY
HU	5	1	TI ID
IU	2	1	TDRC-TI, ID
IW	2	1 ½	ANALYZER
JI	2	24	INLET
JL	2	2	LC/LG
JM	1	24	MANWAY
JS	1	4	STEAMOUT

Class - ANSI CL300 (+) SHEET 2-NOTE A

Facing - RAISED FACE

Normal Liquid Level = 805 MM ABOVE BOTTOM TANGENT
Specific Gravity = 0.644
Delta-P Trays (Total) = 1.21 BAR
NOZZLES MUST NOT BE LOCATED IN DOWNCOMERS

Mark	No	Size Inches	Service
KO	1	30	OUTLET (+)



Drawings Referred to in this Specification

3-118-2	3-122-0	3-170-2	3-180-1	3-214-2				

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ARABIAN INDUSTRIAL FIBERS COMPANY

IR-II AROMATICS PROJECT

PROJECT NO. 10E0541A01

DOCUMENT TITLE:

HEAVY AROMATICS COLUMN DATA SHEET

DOCUMENT NO:

DS-55-CA-502

REV	DESCRIPTION	BY	CHK.	APPR.	DATE
3	Revised as Marked	KWY.	CBC	YSL	11-Aug.-11
2	Issued for Design	KWY	CBC	YSL	31-Mar-11
1	Revised as Marked	KWY	CBC	YSL	11-Mar-11
0	Issue For Approval	KWY	SYL	YSL	1-Feb-11

ARABIAN INDUSTRIAL FIBERS COMPANY YANBU, KINGDOM OF SAUDI ARABIA

CTCI CORPORATION

CERTIFIED

PROJ.

MGR _____ DATE _____

CLIENT _____ DATE _____

XC32A-55-502

GN-502 84.10

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CONTENTS

55462

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FLUOR

VERTICAL VESSEL DATASHEET

Contract:	10E0541A01
Equip. No.:	55-C-02 (3)
Revision:	3 Date: 11-Aug.-2011
Unit:	55 - Xylene Fract
PO No.:	
Document No.:	DS-55-CA-502 (3)
Sheet:	1 of 3

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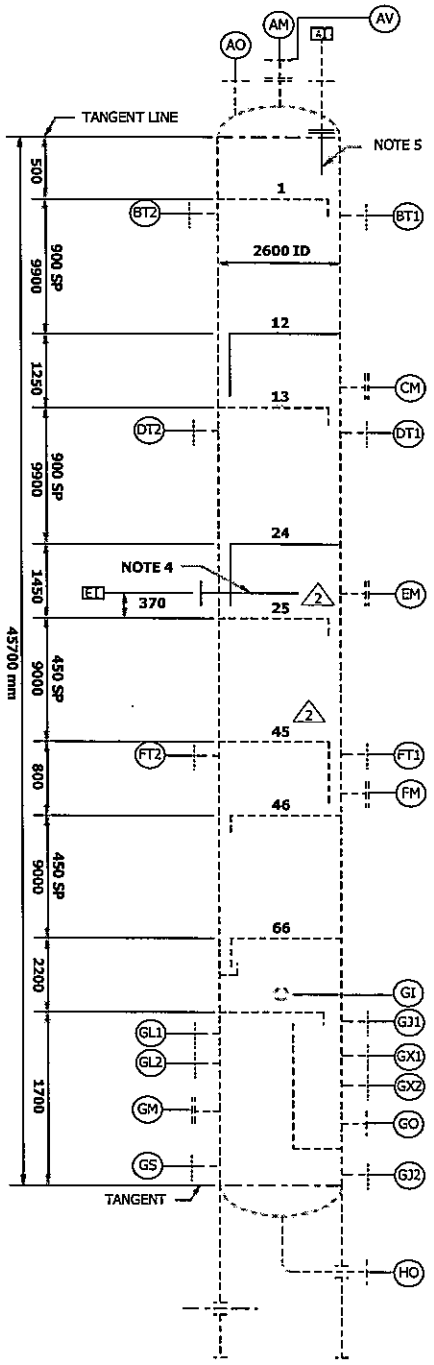
CTCI CORPORATION

REV

Client:	Arabian Industrial Fibers Company
Service:	Heavy Aromatics Column
Plant:	Xylene Fract
Site:	Yanbu, Kingdom of Saudi Arabia

DESIGN SKETCH

VESSEL DIMENSIONS: ID: 2600 mm T/T: 45700 mm



DESIGN CONDITIONS

Pressure:	3.45	bar(g)	at	290	°C
Vacuum:	FV	bar(g)	at	223	°C
Min. Metal Temp:	9(NOTE20)	°C	at	MAWP	bar(g)
Liquid Level:	Note 13				mm
Specific Gravity of Liquid:	0.684		at	(NOTE12)	°C

OPERATING CONDITIONS

Pressure:	Note 19	bar(g)	at	Note 12	°C
Vacuum:		bar(g)	at		°C
Low Temperature:		°C	at		°C
Hydrogen Partial Press.	0	bar(a)	at		°C

INTERNALS & INSULATION

DESCRIPTION	Bulk Density kg/m³	Liquid Holdup vol%	Pressure Drop bar(g)
Packing:			
Catalyst:			
Mist Eliminator:			
Insulation	Note 14 Hot ■	Cold □	
Fire Proofing	75 mm Yes ■	No □	

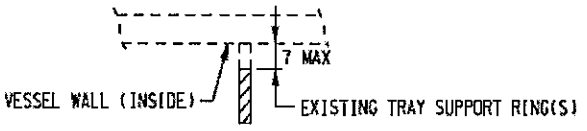
CONSTRUCTION

	Materials	Corrosion Allowance
Shell:	SA-516-70N	3 mm
Heads	SA-516-70N	3 mm
Support	SA-516-70N / A36	1.6 mm

SPECIAL CONDITIONS

Stress Relieve (Process Reason Only):	Yes □	No ■
Vessel in Wet Sour Service:	Yes □	No ■
Steamout Required:	Yes ■	No □

DESIGN SKETCH (CONTINUED)



REMOVE EXISTING TRAY SUPPORT RING(S)
IF NOT UTILIZED FOR THE NEW SERVICE

WEIGHTS ARE BASED ON THE VENDOR CERTIFIED DRAWING No. DA-7033-05-001 REV 3 (1997)	(kg)
EMPTY	
OPERATING	184 500
FULL OF WATER	473 500

THICKNESS ARE BASED ON THE VENDOR CERTIFIED DRAWING No. DA-7033-05-001 REV 3 (1997)	(mm)
TOP HEAD	13
SHELL	13-20
BTM HEAD	20
SKIRT	20

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FLUOR

VERTICAL VESSEL DATASHEET

Contract: 10E0541A01
Equip. No.: 55-C-02 /3\
Revision : 3 Date : 11-Aug.-2011
Unit : 55 - Xylene Fract
P.O. No. :
Document No. : DS-55-CA-502 /3\
Sheet : 2 of 3

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REV

NOZZLE SCHEDULE

TAG	QTY	SIZE in	PRESSURE RATING	DESCRIPTION
AI	1	6	150# RFWN	INLET (MODIFIED, NOTE 5)
AM	1	20	150# RFWN	MANWAY W/ BLIND
AO	1	16	150# RFWN	OUTLET
AV	1	2	150# RFWN	VENT (TOP OF MANWAY AM)
BT1-2	2	1 ID	150# RFLWN	TDI-TI
CM/EM/FM/GM	4	20	150# RFWN	MANWAY W/ DAVIT
DT1-2	2	1 ID	150# RFLWN	TDI-TI
FT1-2	2	1 ID	150# RFLWN	TI-TIC
GI	1	20	150# RFWN	FROM REBOILER
GJ1-2	2	1 1/2	150# RFLWN	LG
GL1-2	2	1 1/2	150# RFLWN	LC
GO	1	10	150# RFWN	TO REBOILER
GS	1	2	150# RFWN	STEAMOUT (NOTE21)
HO	1	6	150# RFWN	OUTLET W/ VORTEX BREAKER
GX1-2	2	1 ID	150# RFLWN	LEVEL
EI	1	12	150# RFWN	INLET (MODIFIED, NOTE 4)

NOTES:

1) This vessel tag number **55-C-02** is an existing column (formerly Othoxylene Column, Item No. 55-C-02) with different design conditions. Modifications required are as follows: — 3
2) Vessel to be Re-Rated based on new design conditions.
3) From Tray #1-48 (existing tray numbering), every 4th tray (ie. 1,5, 9, 13, 17, 21, 25, 29, 33, 37, 41, and 45) is to be retained. The other trays are to be removed / relocated as required for 900 mm tray spacing.
4) Remove existing Inlet Nozzle "EI" and replace with new 12-inch Nozzle "EI", and new distributor per U.O.P. DWG 3-146, as shown.
5) Remove existing distributor at Nozzle "AI" and replace with new distributor with 4-inch outlet per U.O.P. DWG 3-140.
6) CTCI to verify the available thickness after evaluating maintenance records and performing UT testing and confirm. The CTCI to provide necessary ASME code documentation for the repair "R" stamp and new nameplate.
7) CTCI to verify that the structural and mechanical condition of the existing vessel, support, and foundation are satisfactory for continuing operation at the revamp design conditions and under current applicable codes and specifications.
8) CTCI to verify existing dimensions in the field.
9) Dimensions are in millimeter unless otherwise noted.
10) Vessel heads are 2:1 Elliptical
11) For existing vessel details and nozzle elevation and orientation refer to vendor (Belleli Saudi Heavy Industries Ltd.) certified drawing No. DA7033-05-001 REV 3 (1997).
12) Operating Temperature. Top: 192°C. Bottom: 261°C
13) Normal liquid level (NLL) is 805 mm above bottom tangent line. HLL : 1049 mm. NLL : 561 mm. — 2
14) Existing insulation 50 mm thick must be replaced with 75 mm thick only in the bottom section of the column (up to tray #10).
15) Applicable specifications: SP-000-AA-5002, 22854-SP-000-A-003, 22854-SP-000-A-004, 22854-SP-000-D-001, 22854-SP-000-W-001, 22854-SP-000-W-002, 22854-SP-000-W-003, P01-E07, T01-S01, 3-11.
16) The following UOP standard drawings are applicable: 3-140, 3-146.
17) Total pressure drop through column internals = 1.03 bar.
18) Modify platform at elevation +33000 per sketch on sheet 3.
19) Operating Pressure Top: 0.62 bar(g) Bottom: 1.63 bar(g)
20) The min. design ambient temperature should be 6 °C.
21) Steamout at 150 (232 max) °C and 3.5 (4.1 max) bar (g).

ابن رشد
ibn rushd
FLUOR

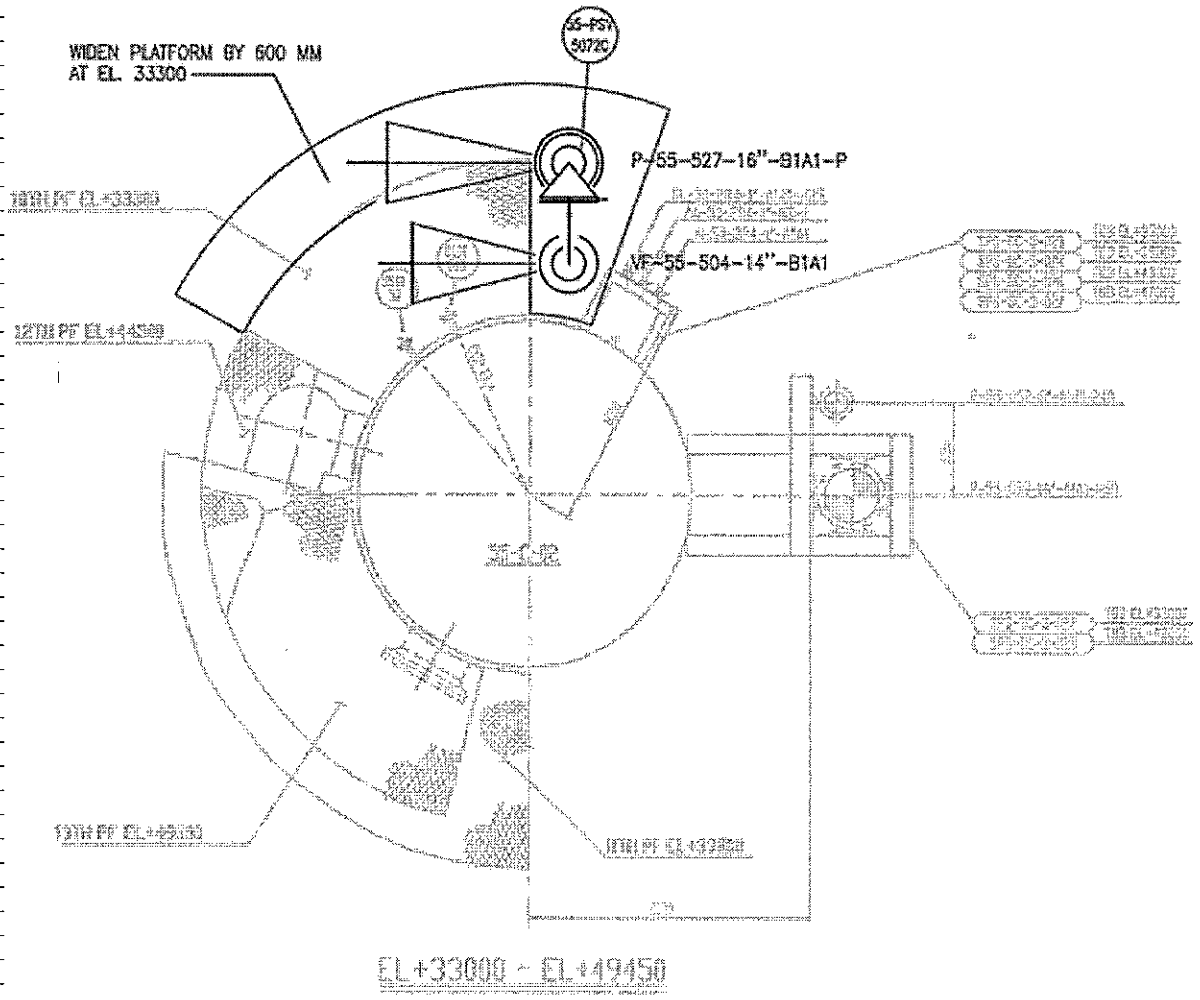
VERTICAL VESSEL DATASHEET

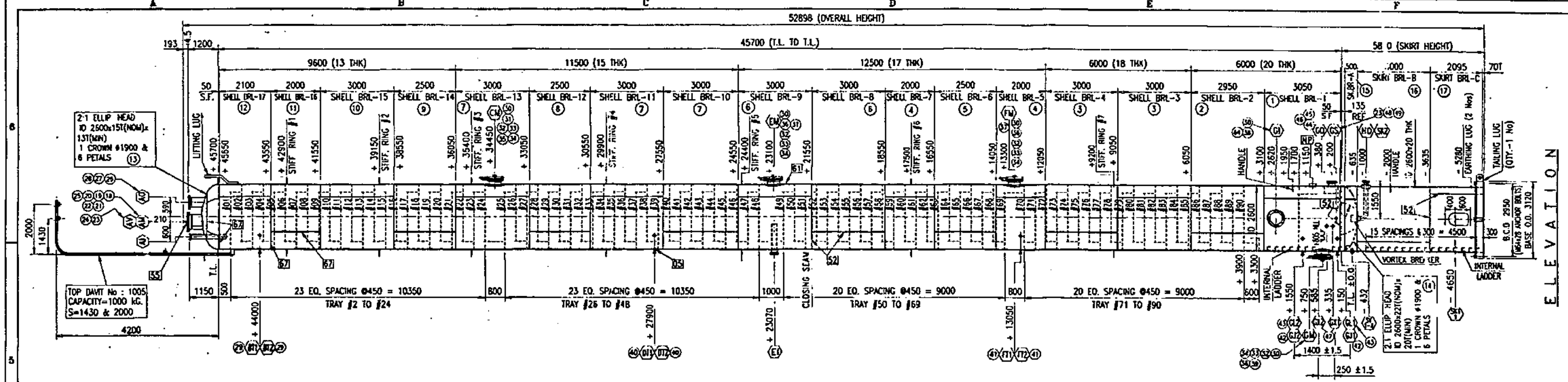
Contract:	10E0541A01
Equip. No.:	55-C-02 /3\
Revision :	3 Date : 11-Aug.-2011
Unit :	55 - Xylene Fract
P.O. No. :	
Document No. :	DS-55-CA-502 /3\
Sheet :	3 of 3

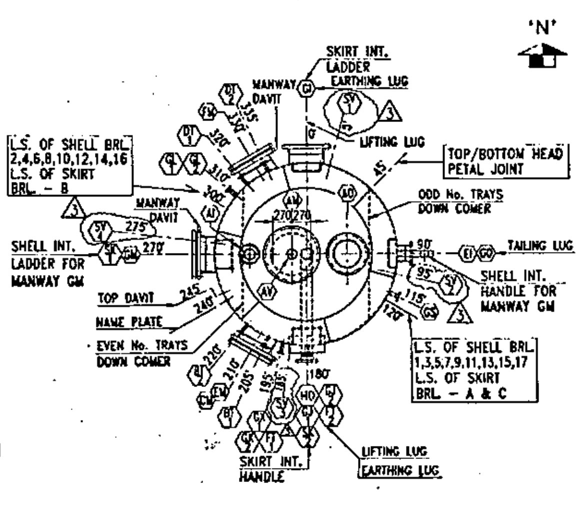
سابك
sabic
CTCI CORPORATION

REV

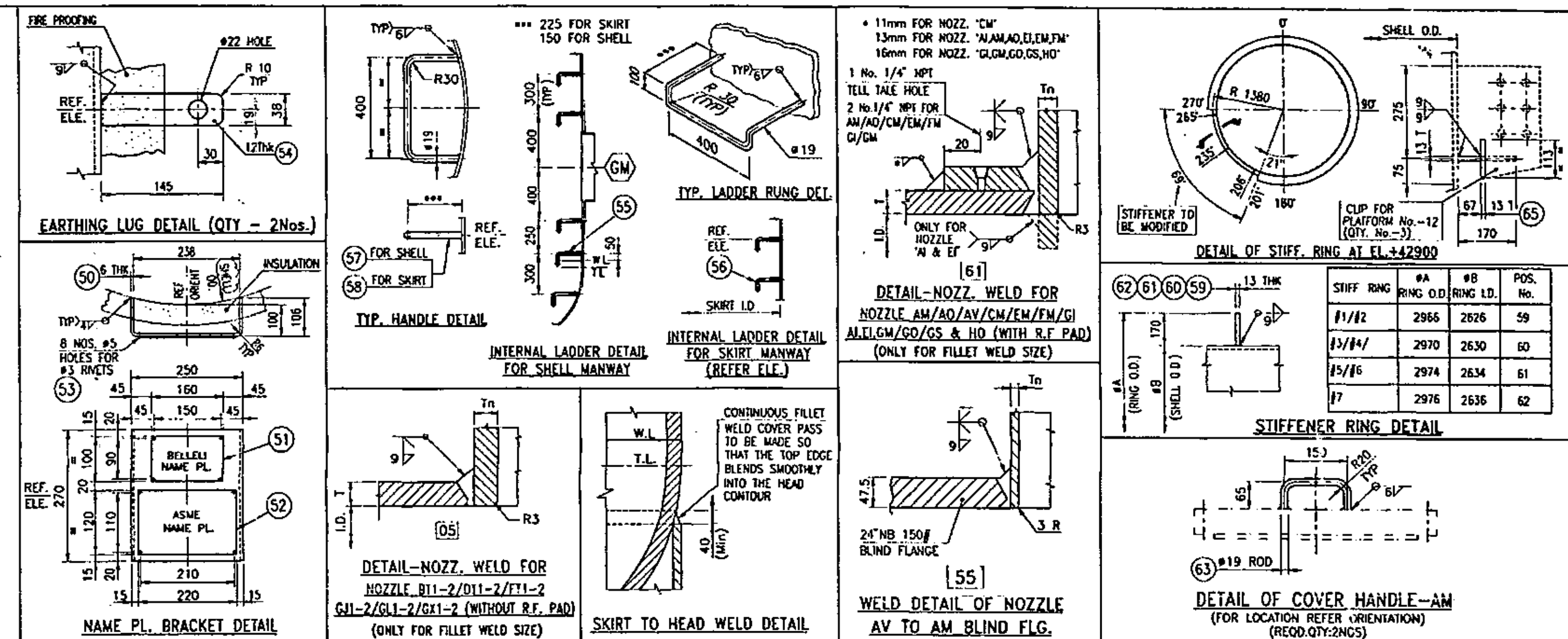
PLATFORM SKETCH







ORIENTATION PLAN
(VIEW FROM TOP)



STIFF RING	#A RING O.D.	#B RING I.D.	POS. No.
11/12	2966	2626	59
13/14	2970	2630	60
15/16	2974	2634	61
17	2976	2636	62

* SA 193 Gr B7/SA 194 Gr 2H
** 4.5mm THK SS 316 SPIRAL WOUND GRAPHITE FILLED WITH SS 316 INNER AND SS/CS OUTER CENTERING RING.

TOTAL WT. = 60508.6 Kgs.

FAM.	ITEM POS.	QTY FOR ONE FAM	DESCRIPTION	LENGTH	WIDTH	THICK	WT. IN Kg. For ONE POS.	WT. IN Kg. For ONE FAM.	MAT'L	MAT'L CODE	RDA. NO.
	65	1	STIFF PLATE	1670	113	13.0	19.3	19.3	SA516GR70N	7033A01L08	703300-001
	64	1	RF 00700x518-GI	0	0	20.0	27.3	27.3	SA516Gr70N	7033A01L23	703300-001
	63	2	HANDLE-#19	255	0	0.0	0.4	0.8	A36	7033A20P01	703300-020
	62	1	ST. 002976/I02636	0	0	13.0	152.9	152.9	SA516GR70N	7033A01L08	703300-001
	61	2	ST. 002974/I02634	0	0	13.0	152.7	305.4	SA516GR70	7033A01L08	703300-001
	60	2	ST. 002970/I02630	0	0	13.0	152.5	305.0	SA516GR70	7033A01L08	703300-001
	59	2	ST. 002966/I02626	0	0	15.0	152.3	304.6	SA516GR70	7033A01L08	703300-001
	58	1	HANDLE-#19	816	0	0.0	1.8	1.8	A36	7033A20P01	703300-020
	57	1	HANDLE-#19	666	0	0.0	1.5	1.5	A36	7033A20P01	703300-020
	56	16	ROD-#19	1016	0	0.0	2.2	35.2	A36	7033A20P01	703300-020
	55	10	ROD-#19	866	0	0.0	1.9	19.0	A36	7033A20P01	703300-020
	54	2	EARTHING LUG	145	38	12.0	0.5	1.0	SS304	2077A16L01	STOCK
	53	8	RIVET #3	20	0	0.0	2.0	16.0	COPPER	7033A21B01	703300-021
	52	1	ASME NAME PL.	220	120	5.0	1.1	1.1	SS304	#00100050122	STOCK
	51	1	BELLELI NAME PL.	160	100	5.0	0.4	0.4	SS304	#00100050122	STOCK
	50	1	NAME PL. BRACKET	448	270	6.0	5.7	5.7	SA516GR70	LP060A5172500800	STOCK
	49	1	RF 00150x70 -GS	0	0	20.0	2.2	2.2	SA516Gr70N	7033A01L23	703300-001
	48	1	PI 2" 160 - GS	107	0	0.0	1.2	1.2	SA106GrB	7033A06T01	703300-006
	47	2	F 1"150# LWNRF GX1/2	170	0	0.0	4.0	8.0	SA105	7033A04F01	703300-004
	46	1	RF 00510x283 GO	0	0	20.0	22.2	22.2	SA516Gr70N	7033A01L23	703300-001
	45	1	PI 10" 80 - GO	125	0	0.0	12.0	12.0	SA106GrB	7033A06T08	703300-006
	44	1	F 10"-80 150# WNRF	0	0	0.0	24.0	24.0	SA105	7033A04F11	703300-004
	43	2	F 1 1/2" 150# LWNRF	171	0	0.0	5.5	11.0	SA105	7033A04F02	703300-004
	42	2	F 1 1/2" 150# LWNRF	171	0	0.0	5.5	11.0	SA105	7033A04F02	703300-004
	41	2	F 1"150# LWNRF FT1/2	170	0	0.0	4.0	8.0	SA105	7033A04F01	703300-004
	40	2	F 1"150# LWNRF DT1/2	165	0	0.0	4.0	8.0	SA105	7033A04F01	703300-004
	39	1	RF 00970x518-GM	0	0	20.0	82.9	82.9	SA516Gr70N	7033A01L23	703300-001
	38	1	NOZZLE NECK GI	1558	147	12.0	21.6	21.6	SA516Gr70N	7033	703300-001
	37	2	RF 00970x518 EM/FM	0	0	17.0	70.5	141.0	SA516Gr70N	7033A01L17	703300-001
	36	3	NOZ. NECK EM/FM/GM	1558	151	12.0	22.2	66.6	SA516Gr70N	7033A01L04	703300-001
	35	1	R.F. 00970x518	0	0	15.0	62.2	62.2	SA516Gr70N	7033A01L15	703300-001
	34	96	ST+2NT 1 1/8" BUN	159	0	0.0	1.3	124.8	*	7033A11B01	703300-011
	33	16	GK 20" 150# RF	0	0	4.5	0.5	8.0	**	7033A12C01	703300-012
	32	4	BF 20" 150# BFRF	0	0	0.0	124.0	496.0	SA105	7033A04F20	703300-004
	31	1	NOZZLE NECK	1558	146	12.0	21.4	21.4	SA516Gr70N	7033A01L04	703300-001
	30	5	F 20"-12 150# WNRF	0	0	0.0	77.1	385.5	SA105	7033A04F16	703300-004
	29	2	F 1"150# LWNRF BT1/2	165	0	0.0	4.0	8.0	SA105	7033A04F01	703300-004
△3	28	1	RF 00581/416	0	0	20.0	13.6	13.6	SA516Gr70N	7033A01L23	703300-001
	27	1	NOZZLE NECK	1238	562	12.0	65.5	65.5	SA516Gr70N	7033A01L04	703300-001
	26	1	F 16"-12 150# WNRF	0	0	0.0	58.0	58.0	SA105	7033A04F14	703300-004
△3	25	1	RF. 00814/620	0	0	20.0	27.6	27.6	SA516Gr70N	7033A01L23	703300-001
	24	1	PI 2" 160	130	0	0.0	1.5	1.5	SA106GrB	7033A06T01	703300-006
	23	2	F 2"-160 150# WNRF	0	0	0.0	3.0	6.0	SA105	7033A04F03	703300-004
	22	24	ST+2NT 1 1/4" BUN	178	0	0.0	1.7	40.8	*	7033A11B02	703300-011
	21	4	GK 24" 150# RF	0	0	4.5	0.5	2.0	**	7033A12C04	703300-012
	20	1	BF 24" 150# BFRF	0	0	0.0	187.0	187.0	SA105	7033A04F21	703300-004
	19	1	NOZZLE NECK	1877	455	12.0	80.5	80.5	SA516Gr70N	7033A01L04	703300-001
	18	1	F 24"-12 150# WNRF	0	0	0.0	118.0	118.0	SA105	7033A04F17	703300-004
	17	1	SKIRT BRL-C	8231	2095	20.0	2707.3	2707.3	A36	7033A01L63	703300-001
	16	1	SKIRT BRL-B	8231	3000	20.0	3876.8	3876.8	A36	7033A01L63	703300-001
	15	1	SKIRT BRL-A	8231	500	20.0	646.2	646.2	SA516Gr70N		
	14	1	EH ID2600x22T(NOM)	0	0	22.0	1395.2	1395.2	SA516Gr70N	7033A01L24	703300-001
	13	1	EH ID2600x15T(NOM)	0	0	15.0	951.3	951.3	SA516Gr70N	7033A01L14	703300-001
	12	1	SHELL BRL-17	8209	2100	13.0	1759.2	1759.2	SA516Gr70N	7033A01L06	703300-001
	11	1	SHELL BRL-16	8209	2000	13.0	1675.5	1675.5	SA516Gr70N	7033A01L06	703300-001
	10	1	SHELL BRL-15	8209	3000	13.0	2513.2	2513.2	SA516Gr70N	7033A01L06	703300-001
	9	1	SHELL BRL-14	8209	2500	13.0	2094.3	2094.3	SA516Gr70N	7033A01L06	703300-001
	8	1	SHELL BRL-12	8215	2500	15.0	2418.3	2418.3	SA516Gr70N	7033A01L14	703300-001
	7	3	SHELL BRL-10/11/13	8215	3000	15.0	2902.0	8706.0	SA516Gr70N	7033A01L14	703300-001
	6	2	SHELL BRL-8/9	8222	3000	17.0	3291.7	6583.4	SA516Gr70N	7033A01L17	703300-001
	5	1	SHELL BRL-6	8222	2500	17.0	2743.0	2743.0	SA516Gr70N	7033A01L18	703300-001
	4	2	SHELL BRL-5/7	8222	2000	17.0	2194.5	4389.0	SA516Gr70N	7033A01L18	703300-001
	3	2	SHELL BRL-3/4	8225	3000	18.0	3486.6	6973.2	SA516Gr70N	7033A01L20	703300-001
	2	1	SHELL BRL-2	8231	2950	20.0	3812.2	3812.2	SA516Gr70N	7033A01L23	703300-001
05-01	1	1	SHELL BRL-1	8231	3050	20.0	3941.4	3941.4	SA516Gr70N	7033A01L22	703300-001

LIST OF MATERIAL

BELLELI REFERENCE DRAWINGS

DRAWING No.	DESCRIPTION
DA-7033-05-002	DETAIL DRAWING
DA-7033-05-003	FORMED HEAD TOP
DA-7033-05-004	FORMED HEAD BOTTOM
DA-7033-05-005	DETAIL OF INTERNALS
DA-7033-05-006	TOP DAVIT
DA-7033-05-007	BELLELI NAME PLATE
DA-7033-05-008	ASME NAME PLATE
DA-7033-05-009	TRAY SUPPORT DETAILS (5 SHEETS)
DA-7033-05-010	CLIPS FOR PLATF. & LAD. (3 SHEETS)
DA-7033-05-011	CLIPS FOR INSUL.,FIRE PROOFING & P.S.
DA-7034-00-001	DAVIT ARRANGEMENT
ST-7033-05-001	FINISH REQUIREMENT
DO-7033-05-001	SHIPPING &, TESTING ARRANGEMENT
UOP STD DWG 3-282 REV-0	BLIND TRAY
UOP STD DWG. 3-280 REV-0	TRAPS
UOP STD DWG. 3-274 REV-1	DRAWOFF WELLS FOR REBOILERS
UOP STD DWG. 3-122 REV-0	VORTEX BREAKERS
UOP STD DWG. 3-146 REV-3	DISTRIBUTORS
UOP STD DWG. 3-140 REV-1	DISTRIBUTORS
22854-SP-000-A-004 REV-1	UNIT OF MEASUREMENT
22854-SP-000-X-001 REV-3	SHOP AND FIELD PAINTING
9-14-1	FIRE PROOF
9-11-1	EXTERNAL THERMAL INSULATION
CHIYODA STD. DR-50-08-018 REV-1	EARTH PIECE
CHIYODA STD. DR-50-08-017 REV-3	NAME PLATE
CHIYODA STD. DR-50-08-013 REV-3	ANSI 150,300 & 600 MANHOLE DAVIT AND HINGE
CHIYODA STD. DR-50-08-011 REV-2	FLANGED NOZZLE
CHIYODA STD. DR-50-08-010 REV-2	INTERNAL LADDER FOR VESSEL
CHIYODA STD. DR-50-08-007 REV-2	DAVIT
CHIYODA STD. DR-50-08-006 REV-2	LIFTING LUG FOR VERTICAL VESSEL
CHIYODA STD. DR-50-08-001 REV-3	SKIRT & BASE BLOCK FOR VERTICAL VESSEL
UOP STD. SPEC. 3-18 REV-5	TRAYS & PACKING
UOP STD SPEC. 3-11 REV-2	PRESSURE VESSELS CARBON STEEL
CHIYODA SPEC SP-50-N-001	HOT SERVICE THERMAL INSULATION
BECHTEL SP. 22854-SP-000-K-001 REV-4	BASIC CIVIL ENGINEERING DESIGN DATA
BECHTEL SP. 22854-SP-000-D-001 REV-1	UNFIRED PRESSURE VESSELS
BECHTEL SP. 22854-SP-000-9-001 REV-1	MATERIAL,WELDING,HDT & CORROSION CONTROL
DS-55-C-002 (1/1) REV.-0	CHIYODA DATA SHEET

CLIENT'S REF. DWGS. & SPECS.

GENERAL NOTES

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
2. ALL FLANGE BOLT HOLES SHALL STRADDLE VERTICAL AND/OR NORTH SOUTH CENTER LINES UNLESS SHOWN OTHERWISE.
3. NOZZLE PROJECTION IS FROM CENTER LINE OF VESSEL TO GASKET FACE OF FLANGE UNLESS SPECIFIED OTHERWISE.
4. NOZZLE POSITIONS ON VESSEL ELEVATIONS ARE CONVENTIONAL. FOR TRUE LOCATION SEE NOZZLE ORIENTATION PLAN.
5. ALL NOZZLES AND MANWAY THAT DO NOT EXTEND INTO THE VESSEL SHALL BE FINISHED FLUSH WITH THE INSIDE & THE INNER EDGE SHALL BE ROUNDED OFF TO A MIN. 3mm RADIUS.
6. WELD SEAMS COMING UNDER MISC. ATTACHMENTS SHALL BE GROUND SMOOTH & RADIOGRAPHED FOR A DISTANCE OF 150mm BEYOND THE ATTACHMENT WELD.
7. LONGITUDINAL SEAM OF FABRICATED NOZZLES FROM PLATE SHALL BE 100% RADIOGRAPHED.
8. ALL REMOVABLE INTERNALS SHALL PASS THROUGH THE NEAREST MANHOLE.
9. THE VESSEL SHALL BE THOROUGHLY CLEANED INSIDE & OUTSIDE AND SHALL BE FREE OF ALL DIRT, WELD ROD STUBS & LOOSE FOREIGN MATERIALS Etc..
10. ALL TRAY ELEVATIONS ARE SHOWN TO TOP OF SUPPORT RINGS.
11. TRAYS WHICH ARE FREE ISSUE SUPPLY AND INSTALLED AT SITE BY CHIYODA.
12. TRAY SUPPORT RINGS CROSSING THE LONG SEAM OF SHELL BARRELS SHALL BE CONTINUOUSLY WELDED ALSO ON THE LONG SEAM AFTER FLUSH GRIND & RADIOGRAPH FOR A DISTANCE OF 150 mm BEYOND THE ATTACHMENT WELD.
13. A PERMANENT REFERENCE WORKLINE FOR VERTICAL VESSELS BOTTOM TAN LINE SHALL BE PUNCHMARKED AROUND THE VESSEL PERIMETER AT 0,90,180 & 270° AND HORIZONTAL VESSELS, CENTER LEVEL SHALL BE PUNCHMARKED ON BOTH SIDE SURFACES OF SHELL NEAR THE HEAD.
14. EACH REINFORCING PAD OR SEGMENT THEREOF SHALL BE PROVIDED WITH ONE No. (TWO Nos. FOR NOZZLES 16"NB AND ABOVE @ 180° APART) 1/4" NPT. TELL TALE HOLE AS PER ANSI B1.20.1, ALL R.F PAD WELDS SHALL BE TESTED TO 15 Psig. MINIMUM WITH AIR & SOAPY BUBBLE TEST.
15. DELETED
16. MINIMUM TEMPERATURE OF HYDROTEST WATER SHALL BE 17°C AND THE TEST PRESSURE SHALL BE HELD FOR HALF AN HOUR PER INCH OF THICKNESS WITH ONE HOUR MINIMUM.
17. DELETED
18. FLANGES UPTO & INCLUDING 24"NB SHALL BE AS PER ANSI B16.5 & THE FLANGE FACE FINISH SHALL BE 3.2 TO 6.3 MICROMETER.
19. ALL BOLTS & NUTS SHALL BE OF UNC SERIES UPTO & INCLUDING 1" SIZE & 8UN ABOVE 1" SIZE.
20. SPARE PARTS:-

ITEMS	COMMISSIONING/STARTUP	OPERATIONAL	SHOP HYD. TEST
GASKETS	200%	100%	100%
FASTENERS	10%(MIN. 2 SETS)	10%(MIN. 2 SETS)	NOT REQUIRED

QTY. OF SPARES FOR GASKETS AND FASTENERS ARE INCLUDED IN LIST OF MATERIALS.

21. SHOP HYD. TEST GASKETS :- (i) BLINDED NOZZLES WILL HAVE JOB GASKETS. (ii) ALL OTHER NOZZLES WILL HAVE CAF GASKET.
22. □ MARK INDICATES THE BSHI WELD STANDARD NUMBER. ○ MARK INDICATES THE POSITION NUMBER WITH REFERENCE TO LIST OF MATERIAL. ⬡ MARK INDICATES THE NOZZLE MARK NUMBER.

NOTES CONT...

23. HEAD SEAMS SHALL BE FULLY RADIOGRAPHED, HEAD TO SHELL SEAM SHALL BE SPOT RADIOGRAPHED PER UW 11(a), 5(b), OTHER SEAMS (INCLUDING SKIRT MAIN SEAMS) SHALL BE SPOT RADIOGRAPHED PER UW 11(b)
24. FABRICATION WEIGHT EXCLUDES WEIGHT OF PLATFORMS, LADDERS, INSULATION, FIRE PROOFING & TRAYS.
25. ERECTION WEIGHT INCLUDES WEIGHT OF PLATFORMS, LADDERS, INSULATION, PIPING AND EXCLUDES FIRE PROOFING, TRAYS & EQUIPMENT 55-E-02 WEIGHT.
26. FOR CARBON AND CARBON MANGANESE STEEL THE CARBON CONTENT SHALL BE LIMITED TO 0.25% MAXIMUM
27. THE LONGITUDINAL WELD SEAMS OF NOZZLES INSTALLED HORIZONTALLY SHALL BE POSITIONED ABOVE CENTER LINE.

NOZZLE SCHEDULE.

MARK	QTY	SIZE	PROJ. FROM CL	SERVICE	NOZZLE NECK O.D.	NOZZLE NECK SCH	NOZZLE NECK THK.	NOZZ. FLANGE TYPE	NOZZ. FLANGE RATING LB	REINF. PAD O.D.	REINF. PAD THK.
SK2	1	ID340	-	SKIRT OPENING FOR 'HO'	358.0	PLT	9.00				
SK1	1	SEE DWG	-	SKIRT ACCESS OPENING	SEE DWG	PLT	9.00				
SV1-4	4	4"	-	SKIRT VENT	114.3	40	6.02				
HO	1	6"	SEE DWG	OUTLET W/VORTEX BREAKER	168.3	120	14.27	WNRF	150#	300	22
GS	1	2"	1470	STEAM OUT	60.3	160	8.74	WNRF	150#	150	20
GX1-2	2	1"ID	1470	LLS	50.8	-	12.70	LWNRF	150#	-	-
GO	1	10"	1520	TO REBOILER	273.1	80	15.09	WNRF	150#	510	20
GM	1	20"	1570	MANWAY W/DAVIT	508.0	PLT	12.00	WNRF	150#	970	20
GL1-2	2	1 1/2"	1470	LC	66.7	-	14.30	LWNRF	150#	-	-
GJ1-2	2	1 1/2"	1470	LG	66.7	-	14.30	LWNRF	150#	-	-
GI	1	20"	1566	FROM REBOILER	508.0	PLT	12.00	WNRF	150#	700	20
FT1-2	2	1"I.D	1470	TI	50.8	-	12.70	LWNRF	150#	-	-
FM	1	20"	1570	MANWAY W/DAVIT	508.0	PLT	12.00	WNRF	150#	970	17
EM	1	20"	1570	MANWAY W/DAVIT	508.0	PLT	12.00	WNRF	150#	970	17
EI	1	8"	1520	INLET	219.1	80	12.70	WNRF	150#	400	17
DT1-2	2	1"I.D.	1465	TDRC-TI	50.8	-	12.70	LWNRF	150#	-	-
CM	1	20"	1565	MANWAY W/DAVIT	508.0	PLT	12.00	WNRF	150#	970	15
BT1-2	2	1"I.D.	1465	TDRC-TI	50.8	-	12.70	LWNRF	150#	-	-
AV	1	2"	SEE DWG	VENT (TOP OF MANWAY AM)	60.3	160	8.74	WNRF	150#	- △3	-
AO	1	16"	SEE DWG	OUTLET	406.0	PLT	12.00	WNRF	150#	581	20
AM	1	24"	SEE DWG	MANWAY	609.6	PLT	12.00	WNRF	150#	814	20
AI	1	6"	SEE DWG	INLET	168.3	80	10.97	WNRF	150#	264	18

DESIGN DATA

No.	DESIGN CONDITIONS	UNITS	VALUES
33.	FABRICATION WEIGHT (SEE NOTE 24)	Kg	73570
32.	FULL OF WATER WEIGHT (INCL 55-E-02)	Kg	473.24
31.	OPERATING WEIGHT (INCL 55-E-02)	Kg	184324
30.	ERECTION WEIGHT (SEE NOTE-25)	Kg	103824
29.	MANUFACTURER'S SERIAL No.	---	2365
28.	MANUFACTURER'S JOB NUMBER	---	7033-05
27.	MANUFACTURER'S NAME	---	BELLELI SAUDI HEAVY INDUSTRIES LTD
26.	CODE STAMP	---	YES (U STAMP)
25	DESIGN CODE	---	ASME SEC VIII DIV.1 1995 EDITION
24.	SERVICE	---	ORTHOXYLENE COLUMN
23.	VOLUME	m^3	249.54
22.	FIREPROOFING	mm	75 (BOTH SIDES OF SKIRT)
21.	INSULATION (BY OTHERS)	mm	50
20.	SPECIFIC GRAVITY	---	0.750
19.	OPERATING FLUID	---	HYDROCARBON
18.	INSPECTION AUTHORITY	---	CLIENT/BSHI/ABS
17.	WIND SPEED/EXPOSURE CATEGORY	km/hr	125/C
16.	EARTHQUAKE DESIGN	---	ASCE 7-88, ZONE-1
15.	MINIMUM DESIGN METAL TEMPERATURE	°C	9
14.	CHARPY IMPACT TEST	---	NO
13.	ULTRASONIC EXAMINATION	---	NO
12.	POST WELD HEAT TREATMENT	---	NO
11.	JOINT EFFICIENCY (SHELL/HEAD)	%	85 / 100
10.	RADIOGRAPHY (SHELL/HEAD)	---	RT4 AS PER UG 116(e)(NOTE-23)
9.	CORROSION ALLOWANCE	mm.	3
8.	M.A.W.P. AT DESIGN TEMPERATURE	barG	7.84 (LIMITED BY SHELL)
7.	M.A.P. (NEW & COLD)	barG	9.395
6.	FIELD HYDROTEST PRESSURE (CORRODED)	barG	5.18 (VERTICAL AT TOP)
5.	SHOP HYDROTEST PRESSURE	barG	13.84 (HORIZONTAL AT TOP)
4.	OPERATING TEMPERATURE (TOP/BTM)	°C	158/223
3.	OPERATING PRESSURE (TOP/BTM)	barG	-
2.	DESIGN TEMPERATURE (INT/EXT)	°C	251/223
1.	DESIGN PRESSURE (INT/EXT)	barG	3.45/FULL VACUUM

BELLELI SAUDI HEAVY INDUSTRIES LTD.
AS BUILT
CERTIFIED BY..........

CHIYODA PETROSTAR LTD.
JOB NO 54001 IBN RUSHD AROMATICS PROJECT
PO NO. SAY-POP0002
REQ NO MR-50-C-003
IDENT NO. 55C02-DW-0001
PURCHASER'S PERMISSION TO PROCEED OR REVIEW TAKEN ON VENDOR PRINTS SHALL NOT RELIEVE VENDOR FROM ITS RESPONSIBILITIES OR LIABILITIES UNDER PURCHASE ORDER.

CTCI CORPORATION

REV.	DATE	DESCRIPTION	DRAWN	CHK'D	APP'D
3	21.05.97	REVISED AS MARKED △3 AND AS-BUILT	MB		
2	04.03.97	REVISED AS PER CLIENT'S COMMENTS AND MARKED △2	RJP	YOGESH	BANERJEE
1	17.10.96	DRAWING GENERALLY REVISED AND ISSUED FOR CONSTRUCTION	RJP	J.Venkatesan DARU	BANERJEE
0	9.6.96	ISSUED FOR APPROVAL	R. VIJI	J.Venkatesan R.S.RAJU	CHATTERJI

No. REQUIRED : 1 UNIT

SCALE: 1 : 100
CLIENT: CHIYODA/IBN RUSHD.
ORDER: SAY-POP0002
APPROVED FOR CONSTRUCTION BY A.K.BANERJEE DATE 19.10.96

BELLELI SAUDI HEAVY INDUSTRIES LTD. بيلليلي السعودية للصناعات الثقيلة المحدودة
AL- JUBAIL, KINGDOM OF SAUDI ARABIA. الجبيل

ARABIAN INDUSTRIAL FIBRES COMPANY (IBN RUSHD.)
PTA & AROMATICS PROJECT-AROMATICS
ORTHOXYLENE COLUMN (55-C-02)
GENERAL ASSEMBLY

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DRAWING NO. DA-7033-05-001 REV. 3

FILE NAME : 70330501

813093

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سابك
sabic

ARABIAN INDUSTRIAL FIBERS COMPANY

IR-II AROMATICS PROJECT

PROJECT NO. 10E0541A01

DOCUMENT TITLE:

HEAVY AROMATICS COLUMN RECEIVER DATA SHEET

DOCUMENT NO:

DS-55-DA-503

REV	DESCRIPTION	BY	CHK.	APPR.	DATE
2	Revised as Marked	KWY	CBC	YSL	11-Aug-11
1	Issued for Design	KWY	CBC	YSL	26-Apr-11
0	Issue For Approval	KWY	CBC	YSL	9-Mar-11

ابن رشد ibn rushd

ARABIAN INDUSTRIAL FIBERS COMPANY YANBU, KINGDOM OF SAUDI ARABIA

CTCI CORPORATION

CERTIFIED

PROJ.

MGR _____ DATE _____

CLIENT _____ DATE _____

XC32B-55-503

GN-502 84.10

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CONTENTS

Attachment total 2 pages

ابن رشد
ibn rushd

HORIZONTAL VESSEL DATA SHEET

Contract:	10E0541A01
Equip. No.:	55-D-03 2
Revision :	2 Date: 11-Aug.-2011
Unit :	55 - Xylene Fractionation
P.O. No.:	
Document No.	DS-55-DA-503 2
Sheet	1 of 2

سابك sabic

CTCI CORPORATION

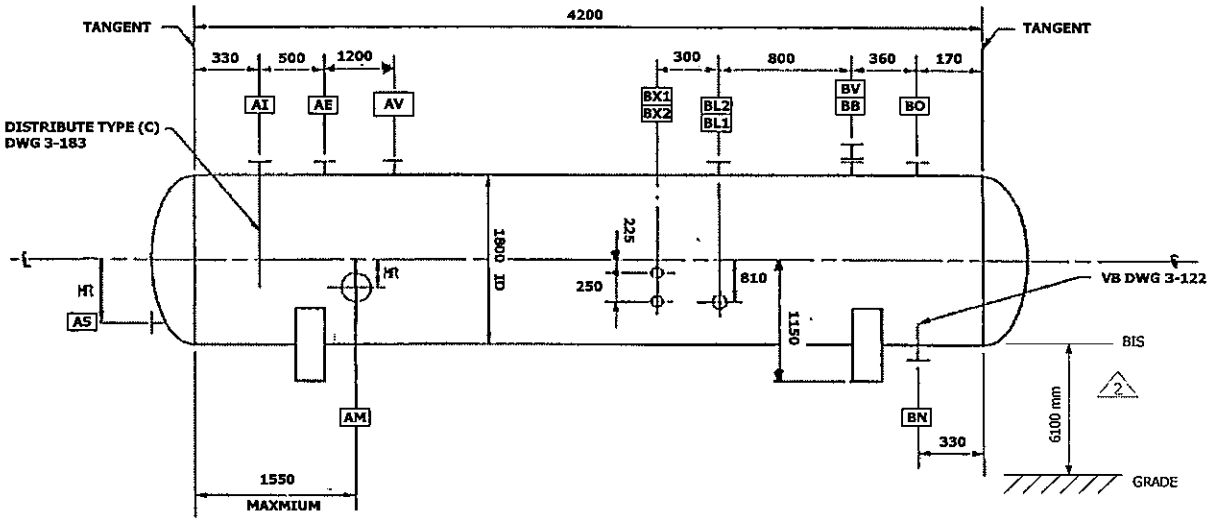
REV

Client: Arabian Industrial Fibers Company (Ibn Rushd) Plant: Xylene Fractionation

Service: Heavy Aromatic Column Receive Site: Yanbu, Kingdom of Saudi Arabia

DESIGN SKETCH

VESSEL DIMENSIONS: ID: 1800 F/T: 4200



DESIGN CONDITIONS

Pressure:	3.79	bar(g)
At:	175	°C
Vacuum:	FV	bar(g)
At:	145.0	°C
Min. Design Metal Temp:	9(NOTE9)	°C
At:	MAWP	bar(g)
Liquid Level:	(Note4)	mm
Specific Gravity of Liquid:	0.739	

OPERATING CONDITIONS

Pressure + :	0.09	bar(g)
At:	165	°C
Vacuum - :		bar(g)
At:		°C
Low Temperature:		°C
At:		bar(g)
Hydrogen Partial Pressure:		bar(g)
At:		°C

INSULATION

Type:	HOT
Req'd Thickness:	40 mm
Fireproofing:	NO

CONSTRUCTION

	MATERIALS	CORROSION ALLOWANCE
Shell:	SA-516-70	3 mm
Head:	SA-516-70	3 mm

0

INTERNALS

DESCRIPTION	BULK DENSITY kg/m³	LIQUID HOLDUP Vol. %	ΔP bar
Packing/Tray:	n/a	n/a	n/a
Catalyst:	n/a	n/a	n/a
Mist Eliminator:	n/a	n/a	n/a

NOTES & SPECIAL CONDITIONS

Stress Relieve (Process Reason):	
Vessel In Special Service:	
Steamout Required:	

ابن رشد
ibn rushd

HORIZONTAL VESSEL DATA SHEET

Contract:	10E0541A01
Equip. No.:	55-D-03 (2)
Revision :	2 **Date :** 11-Aug.-2011
Unit :	55 -Xylene Fractionation
P.O. No. :	
Document No.	DS-55-DA-503 (2)
Sheet :	2 of 2

سابك
sabic
CTCI CORPORATION

REV

NOZZLE SCHEDULE

TAG	QTY	SIZE in	PRESSURE RATING	DESCRIPTION	REV
AE	1	2	150# RFWN	EQUALIZING	
AI	1	8	150# RFWN	INLET	
AM	1	20	150# RFWN	MANWAY	
AS	1	2	150# RFWN	STEAMOUT (NOTE8)	0
AV	1	6	150# RFLWN	RELIEF	
BB	1	6	150# RFWN	VENTILATION	
BL1	1	1 1/2	150# RFLWN	LC/LG	
BL2	1	1 1/2	150# RFLWN	LC/LG	
BN	1	8	150# RFWN	OUTLET W/VORTEX BREAKER	
BO	1	2	150# RFWN	GAS IN/OUT	
BV	1	2	150# RFWN	VENT	
BX1	1	1	150# RFLWN	LLS	
BX2	1	1	150# RFLWN	LLS	

NOTES:

1. Existing, no changes, Formerly Orthoxylene Column Receiver, 55-D-03. Abandon the existing 55-D-04 in place.
2. Dimensions are in millimeter unless otherwise noted.
3. Level nozzles shall be of minimum 300# flange rating.
4. Liquid level: HLL: 1144 mm NLL: 900 mm LLL: 656 mm
5. Vessel heads are 2:1 Elliptical
6. Following UOP standard apply: 3-122-0,3-183-0,3-137-1.
7. ASME code stamp is required.
8. Steamout at 150 (232 max) °C and 3.5 (4.1 max) bar (g). 0
9. The min. design ambient temperature should be 6 °C. 0

THE ESTIMATED MECHANICAL WEIGHTS (kg)		2
FABRICATED		
EMPTY		
OPERATING		
FULL OF WATER		
THE ESTIMATED WALL THICKNESS (mm)		2
SHELL		
HEADS		

CHIYODA CORPORATION

FOR RECORD

CLIENT : IBN RUSHD
PROJECT : PTA & AROMATICS -
TITLE : AROMATICS
JOB NO. : 51046
DOC. NO.: DS-55-D-003 (Y1)

		REVISIONS			
MARK		1	2	3	4
APRD					
CHKD					
MADE					
DATE	Mar.03 '96	Apr.09'96	May 24'96	Oct.18'96	Feb.03'97

UOP

25 East Algonquin Road • PO Box 5017 • Des Plaines, Illinois 60017-5017 • U.S.A.

PROJECT SPECIFICATION
560693 - 301 -1 SHEET 8

REV	DATE	BY	APP'D	REV	DATE	BY	APP'D
0	5-11-95						
1	1-04-95	MR	RSA				

VESSELS

SERVICE: ORTHOXYLENE COLUMN RECEIVER

ITEM NO: ~~D-5509~~ 55-D-03

Design Conditions at Top	INT 3.79 BAR (g)	@175°C (1)
	EXT FULL VACUUM	@145°C (1)
	Metal Temperature (Min)	9°C
Operating Conditions		145°C (1)
		°C
Radiograph		NR
Postweld Heat Treat		NR
Joint Efficiency		NR

Material Specifications

Heads	SA516-70 (4)
Shell	SA516-70

Shell	Thickness Required by Code-mm.	Corrosion Allowance mm. (Min)
		3

Heads		
		3

Vessel Heads

Vessel	2:1 ELLIPTICAL
Drop Leg	

Accessories Applied by Fabricator

Ladder & Platform Clips	BY CONTRACTOR
Insulation Clips & Rings	YES (3)
Vessel Support	YES

Nozzles and Manways

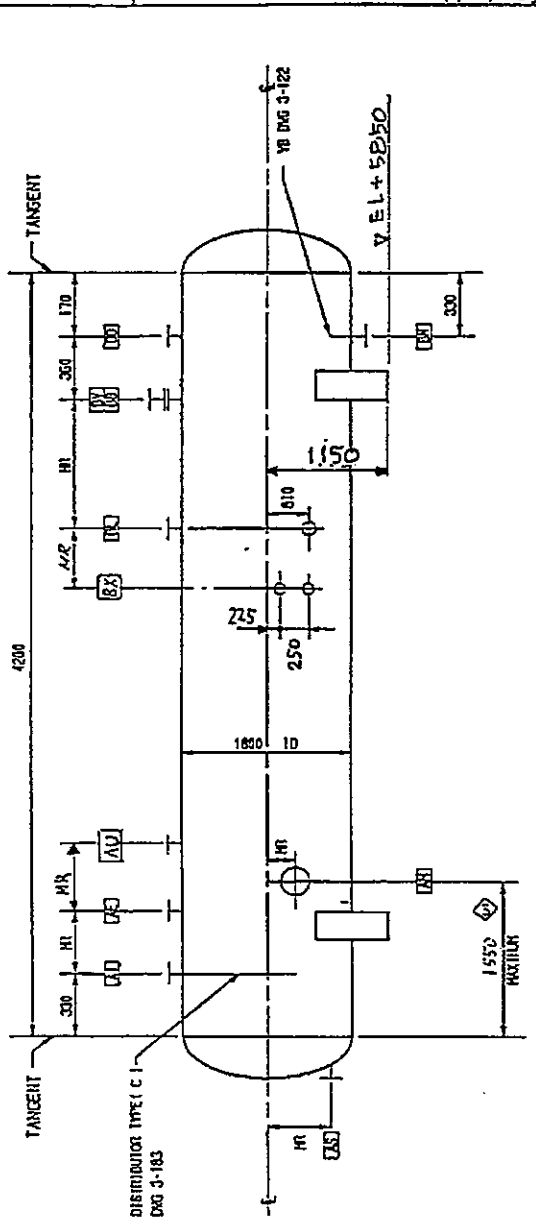
Mark	No	Size Inches	Service
AE	1	2	EQUALIZING
AI	1	8	INLET
AM	1	20" (2)	MANWAY
AS	1	2	STEAMOUT
BB	1	6	VENTILATION
BL	2	1 1/2	LC / LG
BN	1	8	OUTLET
BO	1	2	GAS IN/OUT
BV	1	2	VENT
SX	2	1	LLS
AU	1	4 IN	RELIEF

Class - ANSI CL150

Facing - RAISED FACE

Normal Liquid Level = VESSEL CENTERLINE

Specific Gravity = 0.757



Drawings Referred to in this Specification

3-122-3	3-183-0	3-317-1				

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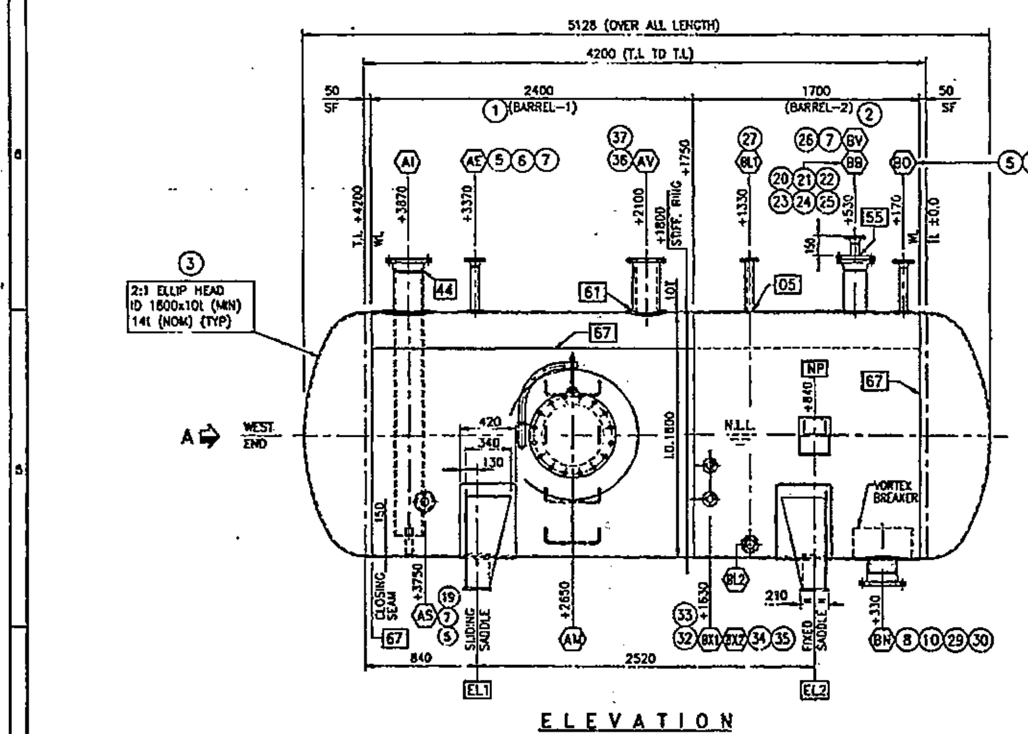
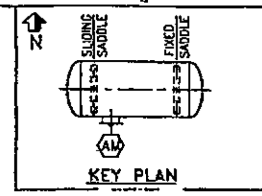
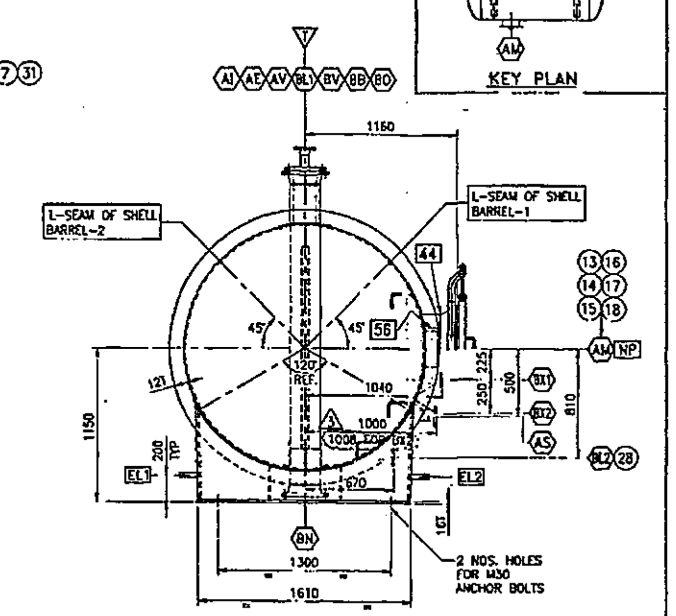


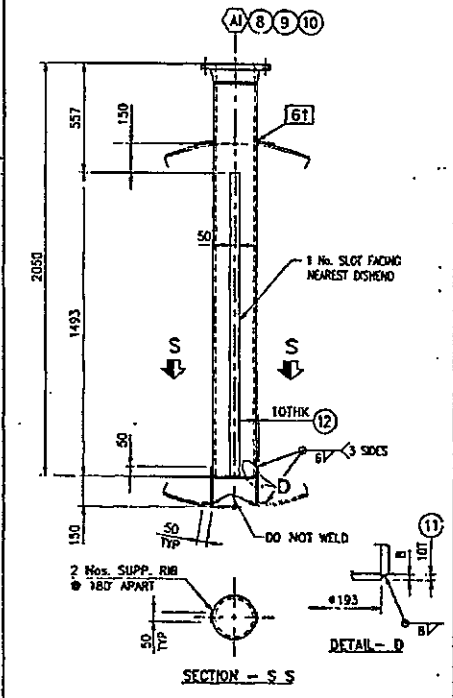
ELEVATION



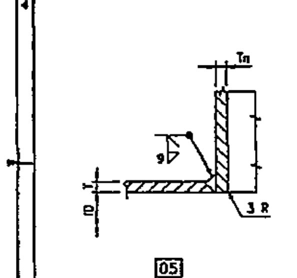
KEY PLAN



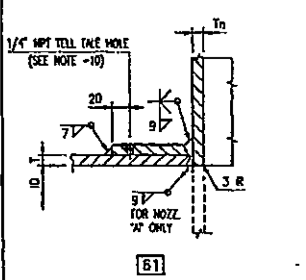
VIEW – A



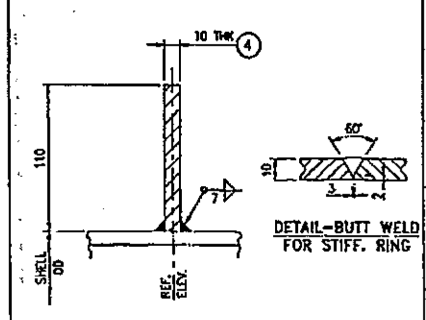
DETAIL–DISTRIBUTOR PIPE



DETAIL–NOZZ. WELD WITHOUT R.F PAD (ONLY FOR FILLET WELD SIZE) (FOR NOZZ. BL1,BL2,BX1&BX2)

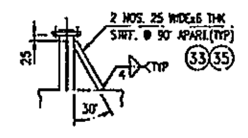


DETAIL–NOZZ. WELD WITH R.F PAD (ONLY FOR FILLET WELD SIZE) (FOR NOZZ. AE,AI,AM,AS,BB,BN,BO&AV)

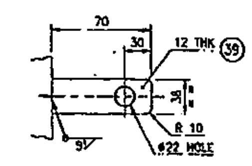


DETAIL–STIFFENER

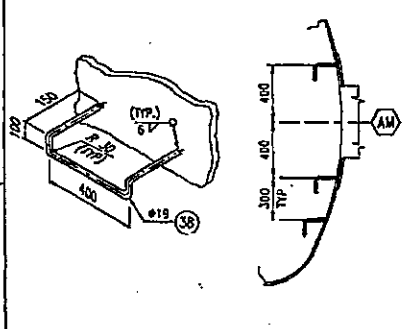
DETAIL–BUTT WELD FOR STIFF. RING



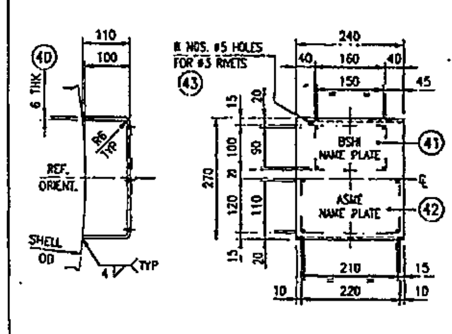
DETAIL–STIFFENER FOR NOZZ. BX1 & BX2



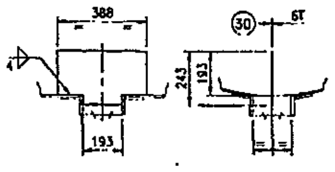
DETAIL–EARTHING LUG EL1/2



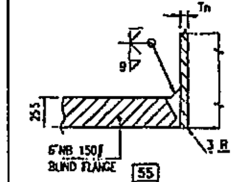
DETAIL–INTERNAL LADDER



DETAIL–NAME PLATE BRKT. NP



DETAIL–VORTEX BREAKER BN



DETAIL–NOZZ. WELD FOR 'BV'

* 4.5mm THK SS 316 SPIRAL WOUND GRAPHITE FILLED W/SS OR CS OUTER CENT. RING

** 4.5mm THK SS 316 SPIRAL WOUND GRAPHITE FILLED WITH SS 316 INNER AND SS/CS OUTER CENTERING RING.

LIST OF MATERIAL

TOTAL WT. = 3432.6 Kgs.

FAM.	ITEM POS.	QTY FOR ONE FAM.	DESCRIPTION	LENGTH	WIDTH	THICK	WT. IN Kg. For ONE POS.	WT. IN Kg. For ONE FAM.	MAT'L	MAT'L CODE	RDA. NO.
	43	8	RIVET #3	20	0	0.0	0.0	0.0	COPPER	7033A21B01	703300-021
	42	1	ASME NAME PLATE	220	120	3.0	0.6	0.6	SS304	800100050122	STOCK
	41	1	BSHI NAME PLATE	160	100	3.0	0.4	0.4	SS304	800100050122	STOCK
	40	1	NAME PLATE BRKT.	470	240	6.0	5.3	5.3	SA516Gr.70	LP060A5172500800	STOCK
	39	2	EARTHING LUG	70	38	12.0	0.5	1.0	SS304	2077A16L01	STOCK
	38	3	LADDER RUNG #19	850	0	0.0	1.9	5.7	SA36	7033A20P01	703300-020
	37	1	F. 6"150# LWNRF-AV	406	0	0.0	46.2	46.2	SA105	7033A04F85	703300-004
	36	1	RP 300/207/10T-AV	0	0	0.0	2.9	2.9	SA516Gr.70	7033A01L28	703300-001
	35	2	STIFF (CUT TO SUIT)	185	25	6.0	0.2	0.4	SA516Gr.70	LP060A5172500800	STOCK
	34	1	F 1"150# LWNRF-BX2	252	0	0.0	3.8	3.8	SA105	7033A04F26	703300-004
	33	2	STIFF.(CUT TO SUIT)	250	25	6.0	0.3	0.6	SA516Gr.70	LP060A5172500800	STOCK
	32	1	F 1"150# LWNRF-BX1	176	0	0.0	2.1	2.1	SA105	7033A04F26	703300-004
	31	1	PI 2" SCH160-BO	338	0	0.0	3.8	3.8	SA106Gr.B	7033A06T01	703300-006
	30	1	VORTEX BR.PLATE	388	243	6.0	4.4	4.4	SA516Gr.70	LP060A5172500800	STOCK
	29	1	PI 8" SCH80-BN	115	0	0.0	7.4	7.4	SA106Gr.B	7033A06T07	703300-006
	28	1	F1 1/2" 150# LWNRF-BL2	356	0	0.0	7.7	7.7	SA105	7033A04F84	703300-004
	27	1	F1 1/2" 150# LWNRF-BL1	401	0	0.0	9.3	9.3	SA105	7033A04F84	703300-004
	26	1	PI 2" SCH160-BV	132	0	0.0	1.8	1.8	SA106Gr.B	7033A06T01	703300-006
	25	12	ST/2NT-5/8"UNC-BB	105	0	0.0	0.3	3.6	[illegible]	7033A11B03	703300-011
	24	4	GK 6"150# RF-BB	0	0	4.5	0.0	0.0	*	7033A12006	703300-012
	23	1	BF 6"150# RF-BB	0	0	0.0	11.8	11.8	SA105	7033A04F67	703300-004
	22	1	F 6"150# WNRF 80-BB	0	0	0.0	10.8	10.8	SA105	7033A04F47	703300-004
	21	1	PI 6" SCH80-BB	335	0	0.0	13.4	13.4	SA106Gr.B	7033A06T05	703300-006
	20	1	RP 300/178/10T-BB	0	0	0.0	3.5	3.5	SA516Gr.70	7033A01L28	703300-001
	19	1	PI 2" SCH160-AS	209	0	0.0	2.3	2.3	SA106Gr.B	7033A06T01	703300-006
	18	24	ST/2NT 1 1/8"UN-AM	160	0	0.0	1.2	28.8	[illegible]	7033A11B01	703300-011
	17	4	GK 20"150# RF-AM	0	0	4.5	0.0	0.0	**	7033A12001	703300-012
	16	1	BF 20"150# RF-AM	0	0	0.0	124.0	124.0	SA105	7033A04F71	703300-004
	15	1	F 20"150# WNRF12T-AM	0	0	0.0	77.1	77.1	SA105	7033A04F61	703300-004
	14	1	MANHOLE NECK-AM	1558	153	12.0	20.7	20.7	SA516Gr.70	7033A01L32	703300-001
	13	1	RP 970/518/10T-AM	0	0	0.0	49.8	49.8	SA516Gr.70	7033A01L28	703300-001
	12	2	SUPP.PLATE -AI	233	50	10.0	0.9	1.8	SA516GR.70	7033A01L28	703300-001
	11	1	END PL. ø193-AI	0	0	10.0	2.3	2.3	SA516GR.70	7033A01L28	703300-001
	10	2	F 8"150# WNRF 80-AI,BN	0	0	0.0	17.7	35.4	SA105	7033A04F49	703300-004
	9	1	PI 8" SCH80-AI	1948	0	0.0	125.8	125.8	SA106Gr.B	7033A06T07	703300-006
	8	2	RP400/229/10T [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	15.2	SA516Gr.70	7033A01L28	703300-001
	7	4	F 2"150# WNRF 160	0	0	0.0	2.7	10.8	SA105	7033A04F35	703300-004
	6	1	PI 2" SCH160-AE	337	0	0.0	3.7	3.7	SA106Gr.B	7033A06T01	703300-006
	5	3	RP 150/70/10T	0	0	0.0	1.1	3.3	SA516Gr.70	7033A01L28	703300-001
	4	1	RNG 0020X0X01820	0	0	10.0	52.4	52.4	SA516Gr.70	7033A01L28	703300-001
	3	2	CHD1800x14T(NOM)	0	0	0.0	458.2	916.4	SA516Gr.70	7033A01L37	703300-001
	2	1	SHELL BRL. 2	5686	1700	10.0	714.2	714.2	SA516Gr.70	7033A01L28	703300-001
34-01	1	1	SHELL BRL. 1	5686	2400	10.0	1115.8	1115.8	SA516Gr.70	7033A01L28	703300-001

CTCI CORPORATION

BELLELI SAUDI HEAVY INDUSTRIES LTD.

AS BUILT

CERTIFIED BY..........

CHIYODA PETROSTAR LTD.
JOB NO. 54001 IBN RUSHD AROMATICS PROJECT
PO NO. SAY-POP0001
REQ NO. MR-50-0-011
IDENT NO. 55003-DN-0001

BELLELI REFERENCE DRAWINGS

DRAWING No.	DESCRIPTION
DA-7034-34-002	DETAIL DRAWING
DA-7034-34-003	FORMED HEAD
DA-7034-34-004	BSHI NAME PLATE
DA-7034-34-005	ASME NAME PLATE
DA-7034-34-006	EXTERNAL CLIPS
DA-7034-00-001	DAVIT ARRANGEMENT
ST-7034-34-001	FINISH REQUIREMENTS
DO-7034-00-001	SHIPPING DRAWING

CLIENT'S REF. DWGS. & SPECS.

DRAWING No.	DESCRIPTION
CHIYODA STD. DR-50-08-017	NAME PLATE
CHIYODA STD. DR-50-08-013	ANSI 150,300 & 600 MANHOLE DAVIT AND HINGE
CHIYODA STD. DR-50-08-011	FLANGED NOZZLE
CHIYODA STD. DR-50-08-010	INTERNAL LADDER FOR VESSEL
CHIYODA STD. DR-50-08-003	SADDLE FOR HORIZONTAL VESSEL
UOP STD. SPEC. 3-11	PRESSURE VESSELS CARBON STEEL
SP-50-N-001	HOT SERVICE THERMAL INSULATION
BECHTEL SP. 2264-SP-000-[illegible]-001	BASIC CIVIL ENGINEERING DESIGN DATA
BECHTEL SP. 2264-SP-000-B-001	UNFIRED PRESSURE VESSELS
BECHTEL SP. 2264-SP-000-[illegible]	MATERIAL,WELDING,NDT & CORROSION CONTROL
05-55-D-003	CLIENT'S DATA SHEET

GENERAL NOTES

22. HEAD SEAMS SHALL BE FULLY RADIOGRAPHED,HEAD TO SHELL SEAMS SHALL BE SPOT RADIOGRAPHED PER UW-11(a)5(b) OTHER SEAMS SHALL BE SPOT RADIOGRAPHED PER UW-11(b).
21. ▽ DENOTES TOP
20. FOR CARBON AND CARBON MAGANESE STEEL THE CARBON CONTENT SHALL BE LIMITED TO 0.25% MAXIMUM
19. THE LONGITUDINAL WELD SEAMS OF NOZZLES INSTALLED HORIZONTALLY SHALL BE POSITIONED ABOVE CENTER LINE
18. THE LONGITUDINAL BUTT WELD OF NOZZLES FABRICATED FROM PLATE SHALL BE 100% RADIOGRAPHED
17. □ MARK INDICATES THE BSHI WELD STANDARD NUMBER
    ○ MARK INDICATES THE POSITION NUMBER WITH REFERENCE TO LIST OF MATERIAL
    ⬡ MARK INDICATES THE NOZZLE MARK NUMBER.
16. SHOP HYD. TEST GASKETS :– (i) BLINDED NOZZLES WILL HAVE JOB GASKETS.
    (ii) ALL OTHER NOZZLES WILL HAVE CAF GASKET.
15. SPARE PARTS:–

ITEMS	COMMISSIONING/STARTUP	OPERATIONAL	SHOP HYD. TEST
GASKETS	200%	100%	100%
FASTENERS	10%(MIN. 2 SETS)	10%(MIN 2 SETS)	NOT REQUIRED

    QTY. OF SPARES FOR GASKETS AND FASTENERS ARE INCLUDING IN LIST OF MATERIALS.
14. ALL BOLTS & NUTS SHALL BE OF UNC SERIES UPTO & INCLUDING 1" SIZE & 8UN ABOVE 1" SIZE
13. FLANGES UPTO & INCLUDING 24"NB SHALL BE AS PER ANSI B16.5 & THE FLANGE FACE FINISH SHALL BE 3.2 TO 6.3 MICROMETER.
12. DELETED
11. MINIMUM TEMPERATURE OF HYDROTEST WATER SHALL BE 17C AND THE TEST PRESSURE SHALL BE HELD FOR HALF AN HOUR PER INCH OF THICKNESS WITH ONE HOUR MINIMUM.
10. EACH REINFORCING PAD OR SEGMENT THEREOF SHALL BE PROVIDED WITH ONE No. (TWO Nos. FOR NOZZLES 16"NB AND ABOVE @ 180° APART) 1/4".NPT, TELL TALE HOLE AS PER ANSI B1.20.1. ALL R.F PAD WELDS SHALL BE TESTED TO 15 Psig. MINIMUM WITH AIR & SOAPY BUBBLE TEST.
9. A PERMANENT REFERENCE WORKLINE FOR VERTICAL VESSELS BOTTOM TAN LINE SHALL BE PUNCHMARKED AROUND THE VESSEL PERIMETER AT 0,90,180 & 270° AND HORIZONTAL VESSELS, CENTER LEVEL SHALL BE PUNCHMARKED ON BOTH SIDE SURFACES OF SHELL NEAR THE HEAD.
8. THE VESSEL SHALL BE THOROUGHLY CLEANED INSIDE & OUTSIDE AND SHALL BE FREE OF ALL DIRT, WELD ROD STUBS & LOOSE FOREIGN MATERIALS Etc.,
7. ALL REMOVABLE INTERNALS SHALL PASS THROUGH THE NEAREST MANHOLE.
6. WELD SEAMS COMING UNDER MISC. ATTACHMENTS SHALL BE GROUND SMOOTH & RADIOGRAPHED FOR A DISTANCE OF 150mm BEYOND THE ATTACHMENT WELD.
5. ALL NOZZLES AND MANWAY THAT DO NOT EXTEND INTO THE VESSEL SHALL BE FINISHED FLUSH WITH THE INSIDE & THE INNER EDGE SHALL BE ROUNDED OFF TO A MIN. 3mm RADIUS.
4. NOZZLE POSITIONS ON VESSEL ELEVATIONS ARE CONVENTIONAL. FOR TRUE LOCATION SEE NOZZLE ORIENTATION PLAN.
3. NOZZLE PROJECTION IS FROM CENTER LINE OF VESSEL TO GASKET FACE OF FLANGE UNLESS SPECIFIED OTHERWISE.
2. ALL FLANGE BOLT HOLES SHALL STRADDLE VERTICAL AND/OR NORTH SOUTH CENTER LINES UNLESS SHOWN OTHERWISE.
1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.

NOZZLE SCHEDULE

MARK	QTY	SIZE	PROJ. FROM CL	SERVICE	NOZZLE NECK O.D.	NOZZLE NECK SCH	NOZZLE NECK THK.	NOZZ. FLANGE TYPE	NOZZ. FLANGE RATING LB	REINF. PAD O.D.	REINF. PAD THK.
AV	1	6"	1300	RELIEF	196.8	–	22.2	LWNRF	150#	300	10
BX2	1	1"	SEE DRG	LLS	50.8	–	12.7	LWNRF	150#	–	–
BX1	1	1"	SEE DRG	LLS	50.8	–	12.7	LWNRF	150#	–	–
BV	1	2"	SEE DRG	VENT	60.3	160	8.74	WNRF	150#	–	–
BO	1	2"	1300	GAS IN/OUT	60.3	160	8.74	WNRF	150#	150	10
BN	1	8"	1110	OUTLET W/VORTEX BREAKER	219.1	80	12.7	WNRF	150#	400	10
BL2	1	1 1/2"	SEE DRG	LC/LG	66.7	–	14.3	LWNRF	150#	–	–
BL1	1	1 1/2"	1300	LC/LG	66.7	–	14.3	LWNRF	150#	–	–
BB	1	6"	1300	VENTILATION W/BLIND FLG.	168.3	80	10.97	WNRF	150#	300	10
AS	1	2"	SEE DRG	STEAMOUT	60.3	160	8.74	WNRF	150#	150	10
AM	1	20"	SEE DRG	MANWAY W/DAVIT +BF	508.0	PLT	12.0	WNRF	150#	970	10
AI	1	8"	1300	INLET W/INT PIPE	219.1	80	12.7	WNRF	150#	400	10
AE	1	2"	1300	EQUALIZING	60.3	160	8.74	WNRF	150#	150	10

DESIGN DATA

No.	DESIGN CONDITIONS	UNITS	VALUES
33.	FABRICATION WEIGHT	Kg	4100
32.	FULL OF WATER WEIGHT	Kg	17800
31.	OPERATING WEIGHT	Kg	10200
30.	ERECTION WEIGHT	Kg	4100
29.	MANUFACTURER'S SERIAL No.	---	2400
28.	MANUFACTURER'S JOB NUMBER	---	7034-34
27.	MANUFACTURER'S NAME	---	BELLELI SAUDI HEAVY IND. LTD.
26.	CODE STAMP	---	YES
25.	DESIGN CODE	---	ASME SEC VIII DIV.1 1995 EDITION
24	SERVICE	---	ORTHOXYLENE COLUMN RECEIVER
23.	VOLUME	m^3	12.22
22.	FIREPROOFING	mm	NO
21.	INSULATION	mm	40–HOT (BY OTHERS)
20.	SPECIFIC GRAVITY	---	0.767
19.	OPERATING FLUID	---	HYDROCARBON
18.	INSPECTION AUTHORITY	---	CLIENT/ABS
17.	WIND SPEED/EXPOSURE CATEGORY	km/hr	125/C
16.	EARTHQUAKE DESIGN	---	ASCE–7–88–ZONE–1
15.	MINIMUM DESIGN METAL TEMPERATURE	°C	9
14.	CHARPY IMPACT TEST	---	NO
13.	ULTRASONIC EXAMINATION	---	NO
12.	POST WELD HEAT TREATMENT	---	NO
11.	JOINT EFFICIENCY (SHELL/HEAD)	%	85/100
10.	RADIOGRAPHY (SHELL/HEAD)	---	RT4 AS PER UG-116(e)(SEE NOTE–22)
9.	CORROSION ALLOWANCE	mm	3.0
8.	M.A.W.P. AT DESIGN TEMPERATURE	barG	7.85 (LIMITED BY SHELL)
7.	M.A.P. (NEW & COLD)	barG	11.32 (LIMITED BY SHELL)
6.	FIELD HYDROTEST PRESSURE (CORRODED)	barG	5.7 (AT TOP)
5.	SHOP HYDROTEST PRESSURE (HOR)	barG	16.8 (AT TOP)
4.	OPERATING TEMPERATURE	°C	145
3.	OPERATING PRESSURE	barG	–
2.	DESIGN TEMPERATURE (INT/EXT)	°C	175/145
1.	DESIGN PRESSURE (INT/EXT)	barG	3.79/FULL VACUUM

REV.	DATE	DESCRIPTION	DRAWN	CHK'D	APP'D
3	30.07.97	REVISED AS MARKED △3 & AS BUILT.	[illegible]	[signature]	[signature]
2	09.03.97	REVISED AS PER CLIENT'S COMMENTS AND MARKED △2	RJP	YOGESH CHAT.	AKB
1	30.10.96	DWG. GENERALLY REVISED & ISSUED FOR CONSTRUCTION.	ANVER	R.ALI R.S.RAJU	AKB
0	12.06.96	ISSUED FOR APPROVAL & INTERNAL COMMENTS	ANVER	R.ALI R.S.RAJU	AKB

NO. REQUIRED: 1 UNIT

SCALE: 1:25

CLIENT: CHIYODA/IBN RUSHD

ORDER: SAY-POP0001

APPROVED FOR CONSTRUCTION BY AKB DATE 04.11.96

BELLELI SAUDI HEAVY INDUSTRIES LTD. AL- JUBAIL, KINGDOM OF SAUDI ARABIA.

بيلليلي السعودية للصناعات الثقيلة المحدودة الجبيل

ARABIAN INDUSTRIAL FIBRES COMPANY (IBN RUSHD)

PTA & AROMATICS PROJECT–AROMATICS

ORTHOXYLENE COLUMN RECEIVER (55–D–03)

GENERAL ASSEMBLY

QUESTO DISEGNO NON PUO ESSERE COPIATO RIPRODOTTO MOSTRATO A TERZI SENZA NOSTRA AUTORIZZAZIONE

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DRAWING NO. DA–7034–34–001 REV. 3

807003

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سابك
sabic

ARABIAN INDUSTRIAL FIBERS COMPANY

IR-II AROMATICS PROJECT

PROJECT NO. 10E0541A01

DOCUMENT TITLE:

TOLUENE/A9+ SURGE TANK DATA SHEET

DOCUMENT NO:

DS-55-DA-507

REV	DESCRIPTION	BY	CHK.	APPR.	DATE
3	Revised as Mareked	KWY	CMW	YSL	27Oct.'11
2	Revised as Mareked	KWY	CBC	YSL	09-Aug-11
1	Issued for Design	KWY	CBC	YSL	22-Apr-11
0	Issue For Approval	KWY	CBC	YSL	23-Mar-11

ابن رشد ibn rushd

ARABIAN INDUSTRIAL FIBERS COMPANY YANBU, KINGDOM OF SAUDI ARABIA

CTCI CORPORATION

CERTIFIED

PROJ.

MGR _____ DATE _____

CLIENT _____ DATE _____

XC32B-55-507

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CONTENTS

ابن رشد
ibn rushd

STORAGE TANK DATA SHEET

Contract:	10E0541A01
Equip. No.:	55-D-07 A/B
Revision :	3 Date: 27-Oct.-2011
Unit :	55 - Xylene Fractionation
P.O. No.:	
Document No.	DS-55-DA-507
Sheet	1 of 2

سابك sabic

CTCI CORPORATION

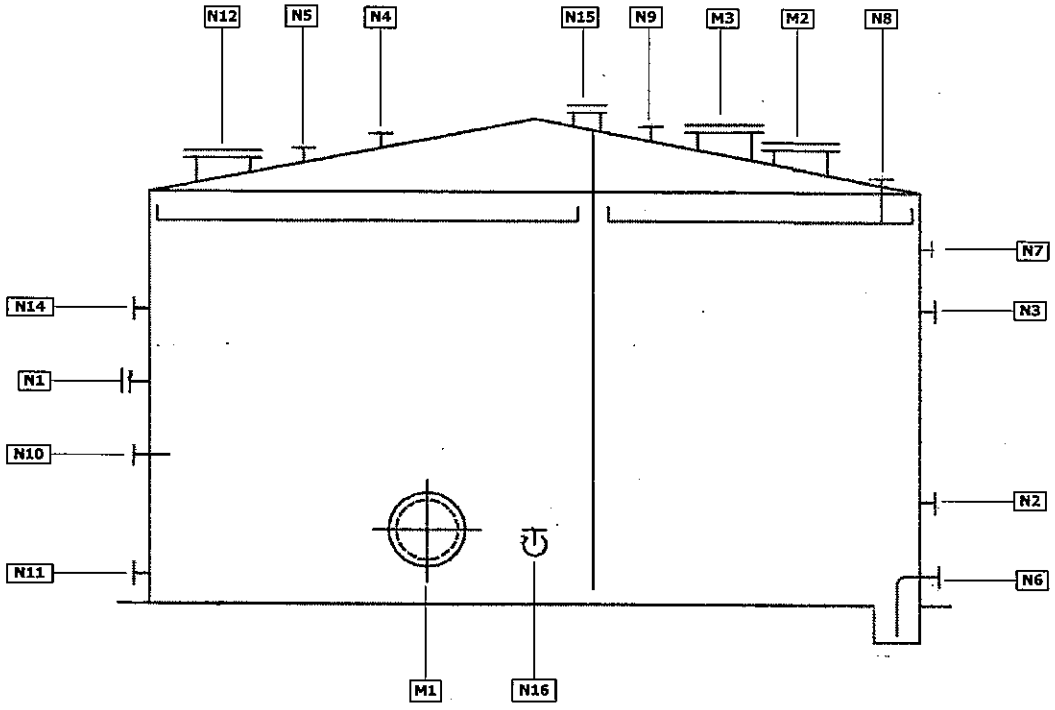
REV

Client: Arabian Industrial Fibers Company (Ibn Rushd) Plant: Xylene Fractionation

Service: TOLUENE/A9+ SURGE TANK Site: Yanbu, Kingdom of Saudi Arabia

DESIGN SKETCH

TANK DIMENSIONS: ID: 7020 HEIGHT 8000



DESIGN CONDITIONS

Pressure:	254	mmH2O(g)
At:	85	°C
Vacuum:	100	mmH2O(g)
At:		°C
Min. Design Metal Temp:	10.6(NOTE 11)	°C
At:		mmH2O(g)
Liquid Level:	(NOTE9)	mm
Specific Gravity of Liquid:	0.873	
At:	15.0	°C

OPERATING CONDITIONS

Fluid:	Toluene/A9+	
Pressure + :	12.7(NOTE6)	mmH2O(g)
At:	44	°C
Vacuum - :		mmH2O(g)
At:		°C
Low Temperature:		°C
At:		mmH2O(g)
Hydrogen Partial Pressure:		mmH2O(g)
At:		°C

INSULATION

Type:	N/A	
Req'd Thickness:	N/A	
Fireproffing:		

CONSTRUCTION

MATERIALS		CORROSION ALLOWANCE		REV
Shell:	A36	1.5	mm	1
Roof :	A36	NONE	mm	1
Structure:	A307-B	NONE	mm	1
Bottom:	A36	1.5	mm	1

NOTES & SPECIAL CONDITIONS

Roof Type:	Cone and Internal Floating Roof	
Stress Relieve (Process Reason Only):	Yes	
Earthquake Design:		
Seismic Zone:	API 650 APP. E ZONE 1	1
Roof Tie Rods:		
Essential Facilities Factor:		
Site Amplification Factor:		
Zone Coefficient:		
		1
		1

ابن رشد
ibn rushd

STORAGE TANK DATA SHEET

Contract:	10E0541A01
Equip. No.:	55-D-07 A/B
Revision :	3 **Date:** 27-Oct.-2011
Unit :	55 -Xylene Fractionation
P.O. No. :	
Document No.	DS-55-DA-507
Sheet :	2 of 2

سابك
sabic
CTCI CORPORATION

REV

NOZZLE SCHEDULE

TAG	QTY	SIZE in	PRESSURE RATING	DESCRIPTION	REV
M1	1	24	EXISITING	SHELL MANHOLE	
M2	1	24	EXISITING	ROOF MANHOLE	
M3	1	36	EXISITING	ROFF MANHOLE	
N1	1	2	EXISITING	SPARE NOZZLE (NOTE4)	
N2	1	6	EXISITING	SUCTION NOZZLE	
N3	1	1	EXISITING	TEMPERATURE INDICATOR	
N4	1	1	EXISITING	GAS BLANKETING NOZZLE	
N5	1	2	EXISITING	GAS BLANKETING NOZZLE	
N6	1	4	EXISITING	DRAIN NOZZLE W/SUMP	
N8	1	1 1/2	EXISITING	LEVEL INDICATOR	
N9	1	4	EXISITING	PRESSURE VACUUM VENT	
N10	1	4	EXISITING	JET MIXER	
N11	1	4	EXISITING	SPILLBACK NOZZLE	
N12	1	20	EXISITING	EMERGENCY VENT	
N14	1	4	EXISITING	FILLING ZOZZLE (NOTE5)	
N15	1	8	EXISITING	GAUGE HATCH W/6" SLOT DIPPING DEVICE	
N16	1	1	EXISITING	LI & TI NOZZLE	
N7	2	2 1/2	EXISITING	FOAM CHAMBER	1

NOTES:

1. Formerly Orthoxylene Tank, 55-D-07A/B.
2. Dimensions are in millimeter unless otherwise noted.
3. Following UOP data sheet 951610-306.
4. Existing filling nozzle to be re-used as spare zozzle.
5. Existing spare nozzle to be re-used as filling zozzle.
6. Tank contents : true vapor pressure 0.04848 bar(a) at 38 °C , Flashing Point 4.4 °C. — 2
7. Pump In Rate = 35.4 (m3/h) & Pump Out Rate = 35.4 (m3/h).
8. Deleted — 1
9. **HHLL : 7200 mm**, HLL : 6400 mm, **LLLL : 1000 mm**, LLL : 1600 mm — 3
10. Deleted — 1
11. The min. design ambient temperature should be 6 degree C. — 1
12. Nominal capacity : 310 m3 Working capacity : **240** m3 — 3
13. Existing design condition : 254 mmH2O(g) at 85 deg. C. New design condition : same as existing condition. — 1

CTCI CORPORATION

UOP
A Honeywell Company

UOP LLC • 25 East Algonquin Road • Des Plaines, Illinois 60017-5017 USA

ATMOSPHERIC STORAGE TANKS

PROJECT SPECIFICATION

951610 - 306 SHEET 2

REV	DATE	BY	APVD	REV	DATE	BY	APVD
0	10-Jul-09	PSK	MEH				

REV

Tank Name		Toluene And A9/A10 Surge Tank
Item Number		55-D-08A/B (Formerly 55-D-07A/B)
Number of Tanks		2
Tank Size	Nominal Capacity	As Existing
	Diameter, ID	As Existing
	Height	As Existing
Working Capacity		As Existing
Design Internal Pressure, pressure above atmospheric		As Existing
Design External Pressure, pressure below atmospheric		As Existing
Design Temperature		As Existing
Minimum Design Metal Temperature		As Existing
Material of Construction		As Existing
Roof Type		Internal Floating Roof
Tank Contents	Material Stored	Toluene & A9/A10 Hydrocarbon
	True Vapor Pressure	.04848 bar [a] @ 38 °C
	Flash Point	4.4 °C
	Specific Gravity @ 60 °F (15 °C)	0.873
Storage Temperature		44 °C
Tank Mixer Type		Jet Mixer (see page 5)
Return Nozzle		As Existing
Sample Connection Nozzle		Not Required
Caustic Filling Nozzle		Not Required
Filling Nozzle		As Existing
Suction Nozzle		As Existing
Temperature Indicator Nozzle		As Existing
Gauging Hatch Connection		As Existing
Pressure / Vacuum Vent Nozzles		As Existing
Level Indicator Nozzles		As Existing
Drain Valve Nozzles		As Existing
Overflow Nozzle		Not Required
LP Steam/Condensate Nozzle (for tank heater)		Not Required / Not Required
Gauge Nozzle		Not Required
Sensing Probe Nozzle (for nitrogen blanketing)		As Existing
Blanketing Pipe Nozzle (for nitrogen blanketing)		As Existing
Air Nozzle		Not Required
Pumpout Nozzle		As Existing
Filling Rate / Pumpout Rate		28.0 m³/h / 28.0 m³/h
Shell Manway(s) Size, ID		As Existing
Notes - See Sheet 4		5,6,22,26

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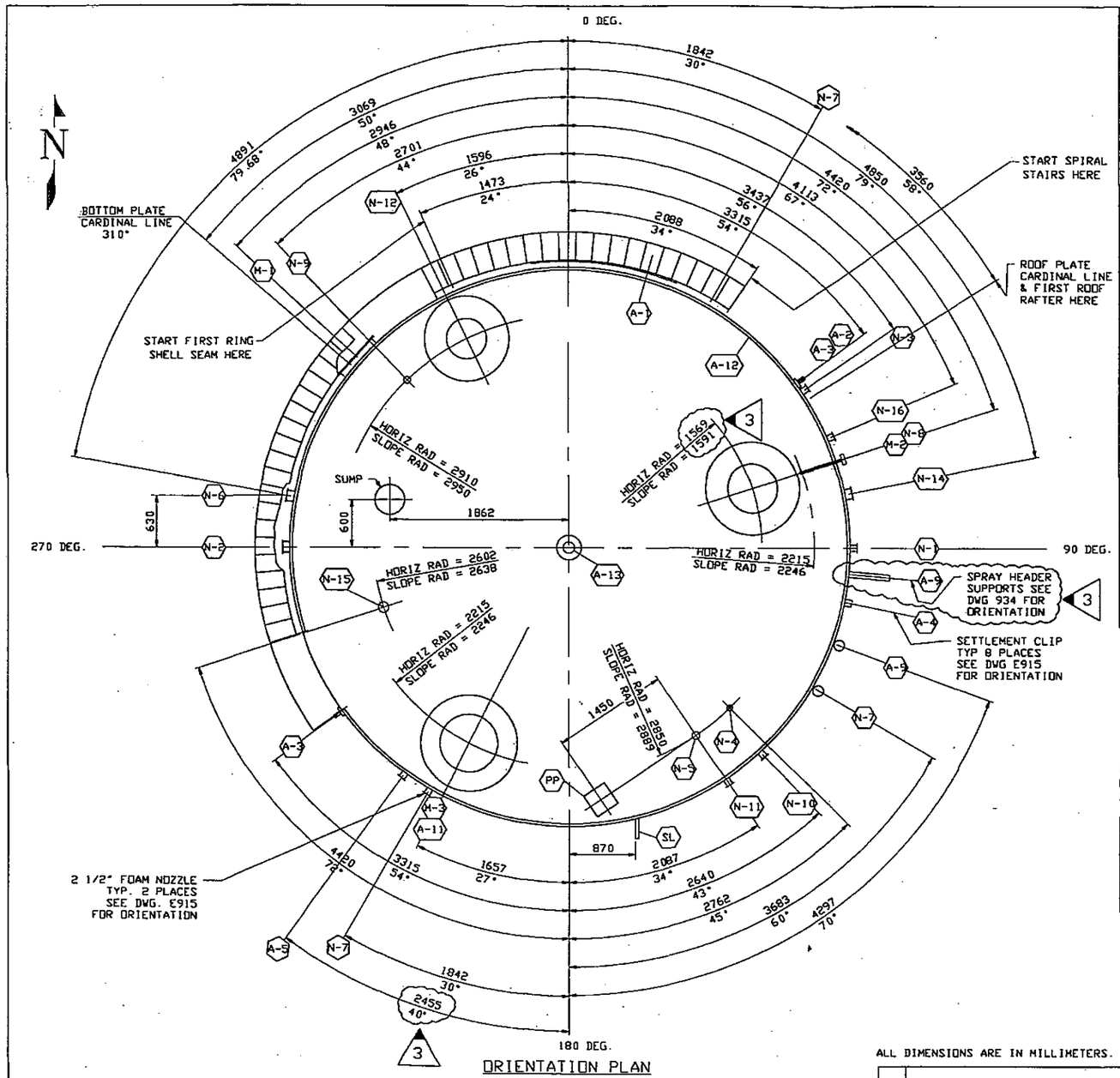
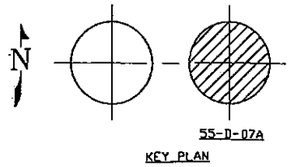


ORIENTATION PLAN
TANK 55-D-07A



KEY PLAN

ACCESSORIES LIST

CUST. MARK	PDM MARK	NO REQD	DESCRIPTION	ELEVATION	PROJECTION
M-1	914-1	1	24" SHELL MANHOLE	762	127
M-2	928-1	1	24" ROOF MANHOLE	ROOF	209
M-3	926-1	1	36" ROOF MANHOLE	ROOF	208
N-1	917-2	1	2" FILLING NOZZLE	178	152
N-2	917-3	1	6" SUCTION NOZZLE	279	203
N-3	917-1	1	1" TEMPERATURE INDICATOR	600	152
N-4	912-2	1	1" GAS BLANKETING NOZZLE	ROOF	152
N-5	912-3	1	2" GAS BLANKETING NOZZLE	ROOF	152
N-6	916-2	1	4" DRAIN NOZZLE W/SUMP	229	178
N-7	933-1	2	2 1/2" FOAM CHAMBER	7840	152
N-8	WB904-12	1	1 1/2" LEVEL INDICATOR	ROOF	25
N-9	923-2	1	4" PRESSURE/VACUUM VENT	ROOF	152
N-10	917-5	1	4" JET MIXER	229	178
N-11	917-4	1	4" SPILLBACK NOZZLE	229	178
N-12	923-1	1	20" EMERGENCY VENT	ROOF	195
N-14	917-4	1	4" SPARE NOZZLE	229	178
N-15	913-9	1	8" GAUGE HATCH W/6" SLOT DIPPING DEVICE	ROOF	X
N-16	917-1	1	1" LI & TI NOZZLE	700	152
A-1	919-1	1	SPIRAL STAIRWAY	SHELL	-----
A-2	915-1	1	NAMEPLATE	SHELL	-----
A-3	918-2	2	EARTH LUG	SHELL	-----
A-4	918-3	8	SETTLEMENT CLIP	SHELL	-----
A-5	918-1	1	CATHODIC PROTECTION LUG	SHELL	-----
A-6	920-1	10	ELECTRICAL CABLE SUPPORT	SHELL	-----
A-7	DWG F901	15	ANCHOR BOLT	SHELL	-----
A-8	X	1	INSTRUMENT CONDUIT SUPPORT	SHELL	-----
A-9	SUB CONTR	1	WATER SPRAY SYSTEM	SHELL	-----
A-11	925-1	1	INNER LADDER (ANTI-ROTATION DEVICE)	SHELL	-----
A-12	935-1	1	PERIMETER HANDRAIL	ROOF	-----
A-13	912-1	1	SCAFFOLD CABLE SUPPORT	ROOF	152
PP	932-2	1	PAD PLATE	ROOF	-----
SL	932-1/R	1	SUPPORT LUG	SHELL	-----

NOTES: ELEVATIONS GIVEN ARE FROM THE TOP OF THE BOTTOM PLATE AT THE SHELL TO CENTERLINE OF FITTING.
PROJECTIONS GIVEN ARE FROM OUTSIDE FACE OF SHELL OR ROOF TO FACE OF FITTINGS.

ARC LENGTHS MEASURED ON OUTSIDE SURFACE OF SHELL.
RING 1. RADIUS = 3517

DEGREES	ARC LENGTH
180	11047
90	5523
10	614
1	61

ALL DIMENSIONS ARE IN MILLIMETERS.

NO	REVISION DESCRIPTION	BY	DATE	CHK	DATE
3	REVISED TO "AS BUILT"	RK	20SEPT97	MJ	18OCT97
2	ADD A-4,A-6 & N-7 MK,A-6 QUAN. & REV. RAFTER LOC.	RAS	01MAY97	AJM	01MAY97
1	ELEV. OF N-16	ARF	01APR97	AJM	01APR97
	DELETE 1 VENT, ADD PDM MKS. TO LIST, ADD FOAM CHAMBER SIZE & QUANTITY, ADD CARDINAL LINES, ADD C.P. LUG A-5				

OPEN HOLES N/A
ERECTION REF. N/A
WELD SPECS. API 650
EIS- N/A

CERTIFIED FOR CONFORMANCE TO PLANS AND SPECIFICATIONS
BY
DATE

CHIYODA PETROSTAR LTD.
JOB NO.54001 | IBN RUSHD AROMATICS PROJECT
PO NO. 54001 T009
REQ NO. SC-50-Q-003
IDENT NO. 55-D-07AB-DV 0003

A-NO COMMENTS PROCEED WITH FABRICATION	SAY TEAM	
B-PROCEED WITH FABRICATION COMMENTS TO BE INCORPORATED		
C-DO NOT PROCEED WITH FABRICATION	DATE	

PURCHASER'S PERMISSION TO PROCEED OR REVIEW TAKEN ON VENDOR PRINTS SHALL NOT RELIEVE VENDOR FROM ITS RESPONSIBILITIES OR LIABILITIES UNDER PURCHASE ORDER

IBN RUSHD PTA &
AROMATICS PROJECT - AROMATICS
ORTHOXYLENE TANKS 55-D-07A & B

PDM Saudi Arabia
ENGINEERS - FABRICATORS - CONTRACTORS
SAUDI ARABIA

IBN RUSHD PTA
(2) 7.02 m DIA X 8 m FBSSCRIFR
YANBU, SAUDI ARABIA
ORIENTATION PLAN

DWG. PREPARED AT	PIT	FABRICATED AT	YANBU
DRAWN: RRS	DATE 25NOV96	DRAWING	E901AD
CHECKED: AJM	07FEB97	CONTRACT	76519-9

MATERIAL SPECIFICATIONS

PLATE :		
BOTTOM	-	A36
ANNULAR RING	-	N/A
SHELL	-	A36
ROOF	-	A36
DECK	-	A36
MISC PLATE	-	TYPE 304 SS
SHAPES	-	A36 (OR EQUAL)
COL. PIPE	-	N/A
PIPE	-	A53-B, A106-B, API 5L-B (OR EQUAL)
FLANGES	-	A105
FITTINGS	-	A234-WPB
BOLTING :		
PIPING	-	A307-B
STRUCTURAL	-	A307-B
GASKETS	-	NON-ASBESTOS COMPRESSED SHEET NITRILE BINDER
FLOATING ROOF SEAL AND SPECIAL GASKETS	-	VITON (BY SEAL SUPPLIER)

DESIGN SPECIFICATIONS

DESIGN SPECIFIC GRAVITY	-	0.883
DESIGN LIQUID LEVEL	-	6770 mm
DESIGN PRESSURE	-	254 mm WC
DESIGN VACUUM	-	100 mm WC (100 kg/sq.m)
DESIGN METAL TEMPERATURE	-	+10.6 DEG. C
MAXIMUM OPERATING TEMPERATURE	-	+85 DEG. C
WIND	-	ASCE 7-93 (34.7 m/s EXP. C)
SEISMIC	-	API 650 APP. E ZONE 1
CORROSION ALLOWANCE :		
ROOF	-	NONE
SHELL	-	1.5 mm
BOTTOM	-	1.5 mm
FRAMING	-	N/A

DECK

CONTENTS SPECIFIC GRAVITY	-	0.883
DESIGN SPECIFIC GRAVITY	-	0.70 - 1.00
DECK DISP. @ 0.70 SP. GR.	-	305 mm
DECK DISP. @ 1.00 SP. GR.	-	210 mm
RIM SPACE	-	200 mm NOMINAL
CORROSION ALLOWANCE :		
DECK PL	-	NONE
OUTER RIM	-	NONE
INNER RIM	-	N/A
COMPARTMENT PL	-	N/A
COVER PL	-	N/A

DRAWING LIST

CPL IDENT NO.	DRAWING	DESCRIPTION	CPL IDENT NO.	DRAWING	DESCRIPTION
55-D-07AB-DW 0002	F901AB	ANCHOR SETTING PLAN -TANK No. 55-D-07A	55-D-07AB-DW 0028	911	ROOF EMERGENCY DRAIN
55-D-07AB-DW 0046	F901B	ANCHOR SETTING PLAN -TANK No. 55-D-07B-	55-D-07AB-DW 0029	912	ROOF NOZZLES
			55-D-07AB-DW 0030	913	SIX INCH GAUGE HATCH
55-D-07AB-DW 0052	FQC901AB	FOUNDATION ELEVATION	55-D-07AB-DW 0031	914	TWENTY FOUR INCH SHELL MANHOLE
55-D-07AB-DW 0053	FQC901B	FOUNDATION ELEVATION	55-D-07AB-DW 0032	915	API 650 NAMEPLATE
			55-D-07AB-DW 0033	916	SHELL NOZZLES
55-D-07AB-DW 0050	G901	DRAWING LIST	55-D-07AB-DW 0034	917	SHELL NOZZLES
55-D-07AB-DW 0001	G902	GENERAL NOTES	55-D-07AB-DW 0035	918	MISC. SHELL ATTACHMENTS
			55-D-07AB-DW 0036	919	SPIRAL STAIRCASE
55-D-07AB-DW 0003	E901AD	ORIENTATION PLAN	55-D-07AB-DW 0037	920	ELECTRICAL BRACKETS
55-D-07AB-DW 0004	E901BD	DECK ORIENTATION PLAN	55-D-07AB-DW 0038	921	TOP PLATFORM
55-D-07AB-DW 0048	E901CD	ORIENTATION PLAN	55-D-07AB-DW 0039	922	HANDRAILS
55-D-07AB-DW 0049	E901D	DECK ORIENTATION PLAN	55-D-07AB-DW 0040	923	ROOF VENT / EMERGENCY VENT
55-D-07AB-DW 0005	E902	SHELL ELEVATION	55-D-07AB-DW 0041	924	LADDER WELL
55-D-07AB-DW 0006	E903	BOTTOM PLATE LAYOUT	55-D-07AB-DW 0042	925	INNER LADDER
55-D-07AB-DW 0007	E904	SPIRAL STAIRCASE	55-D-07AB-DW 0043	926	THIRTY SIX INCH ROOF MANHOLE
55-D-07AB-DW 0008	E905	DECK PLATE LAYOUT	55-D-07AB-DW 0044	927	LEVEL INDICATOR
55-D-07AB-DW 0009	E906	PONTOON PLAN	55-D-07AB-DW 0045	928	TWENTY FOUR INCH ROOF MANHOLE
55-D-07AB-DW 0010	E907AC	FOAM DAM	55-D-07AB-DW 0051	929	DECK GROUND CABLE
55-D-07AB-DW 0011	E907BC	SUPPORT LEG ELEVATION	55-D-07AB-DW 0056	930	FLOAT WELL
55-D-07AB-DW 0057	E907C	FOAM DAM	55-D-07AB-DW 0058	931	INTERMEDIATE PLATFORM
55-D-07AB-DW 0012	E908	INNER LADDER	55-D-07AB-DW 0059	932	PIPE SUPPORTS
55-D-07AB-DW 0013	E909	SPIRAL STAIRCASE	55-D-07AB-DW 0061	933	FOAM NOZZLE DETAILS
55-D-07AB-DW 0014	E910	HANDRAIL	55-D-07AB-DW 0062	934	WATER SPRAY SYSTEM SUPPORTS
55-D-07AB-DW 0015	E911	SPIRAL STAIRCASE	55-D-07AB-DW 0063	935	ROOF HANDRAIL
55-D-07AB-DW 0016	E912	ROOF SEAL			
55-D-07AB-DW 0017	E913	PIPE CONNECTIONS			
55-D-07AB-DW 0047	E914	TWENTY FOUR INCH SHELL MANHOLE			
55-D-07AB-DW 0060	E915	FOAM NOZZLE & SETTLEMENT CLIP ORIENTATION			
55-D-07AB-DW 0054	WQ901AB	WELD QUALITY CONTROL - API 650			
55-D-07AB-DW 0055	WQ901B	WELD QUALITY CONTROL - API 650			
55-D-07AB-DW 0018	901	BOTTOM DETAILS			
55-D-07AB-DW 0019	902	SHELL PLATE, RIM GIRDER & ANCHOR CHAIRS			
55-D-07AB-DW 0020	903	ROOF DETAILS			
55-D-07AB-DW 0021	904	DECK PLATES			
55-D-07AB-DW 0022	905	DECK RIM PLATES			
55-D-07AB-DW 0023	906	DECK			
55-D-07AB-DW 0024	907	DECK SUPPORT LEGS			
55-D-07AB-DW 0025	908	DECK BLEEDER VENT			
55-D-07AB-DW 0026	909	DECK MANHOLE			
55-D-07AB-DW 0027	910	TWENTY INCH INSPECTION HATCH			

CTCI CORPORATION

CHIYODA PETROSTAR LTD.

JOB NO.54001 | IBN RUSHD AROMATICS PROJECT

PO NO. 54001 T009

REQ NO. SC-50-Q-003

IDENT NO. SS-D-07AB-DW 0050

A-NO COMMENTS PROCEED WITH FABRICATION	SAY TEAM	
B-PROCEED WITH FABRICATION COMMENTS TO BE CONSIDERED		
C-DO NOT PROCEED WITH FABRICATION	DATE	

PURCHASER'S PERMISSION TO PROCEED OR REVIEW TAKEN ON VENDOR PRINTS SHALL NOT RELIEVE VENDOR FROM ITS RESPONSIBILITIES OR LIABILITIES UNDER PURCHASE ORDER

IBN RUSHD PTA &
AROMATICS PROJECT - AROMATICS
ORTHOXYLENE TANKS 55-D-07A & B

PDM Saudi Arabia
ENGINEERS - FABRICATORS - CONTRACTORS

IBN RUSHD PTA

(2) 7.02 m DIA X 8 m FBSSCRIFR

YANBU, SAUDI ARABIA

DRAWING LIST

DWG. PREPARED AT	PIT	FABRICATED AT	YANBU
DRAWN: AMW	BY	12FEB97	DATE
CHECKED: RHL	BY	13FEB97	DATE
DRAWING	G901		
CONTRACT	76519-9		

OPEN HOLES N/A
ERECTION REF. N/A
WELD SPECS. API 650
EIS- N/A

CERTIFIED FOR CONFORMANCE TO PLANS AND SPECIFICATIONS
BY
DATE

NO	REVISION DESCRIPTION	BY	DATE	CHK	DATE
2	ISSUED "AS BUILT"	RK	20SEP97	MJ	20OCT97
1	REVISE DRAWING LIST	ARF	31MAR97	AJM	31MAR97

PDM SAUDI ARABIA

GENERAL NOTES

THE STORAGE TANK, MATERIALS, DESIGN, FABRICATION AND ERECTION ARE IN COMPLIANCE WITH THE CUSTOMER'S SPECIFICATIOIS AND API 650 9TH EDITION, INCLUDING APPENDIX A, E, F AND H.

1. GENERAL INFORMATION
   - A. FOUNDATION
     1. DESIGNED BY : OTHERS
     2. CONSTRUCTED BY : OTHERS
   - B. STORAGE TANK
     1. DESIGNED BY : PITT-DES MOINES, INC.
     2. FABRICATED AND ERECTED BY : PDM SAUDI ARABIA
   - C. COATINGS
     1. PAINTING SHALL BE PER PAINTING INSTRUCTIONS (P-1). 2
     2. GALVANIZE PER ASTM A123 REQUIREMENTS.
2. FOUNDATIONS
   - A. WHERE RINGWALLS ARE PROVIDED UNDER THE TANK SHELL, THE TOP OF THE RINGWALL SHALL BE SMOOTH AND LEVEL WITHIN ±3 mm OF ANY 9144 mm OF CIRCUMFERENTIAL LENGTH. NO POINT ON THE CIRCUMFERENCE OF THE RINGWALL SHALL VARY MORE THAN ±6 mm FROM THE ESTABLISHED ELEVATION.
   - B. RECESSES IN THE FOUNDATION SHALL BE PROVIDED FOR FLUSH TYPE CLEANOUTS, DRAW-OFF SUMPS, ETC.
   - C. WHERE RINGWALLS ARE NOT PROVIDED, THE FOUNDATION UNDER THE TANK SHELL SHALL BE LEVEL WITHIN ±3 mm IN ANY 9144 mm OF CIRCUMFERENTIAL LENGTH. NO POINT IN THE CIRCUMFERENCE SHALL VARY MORE THAN ±13 mm FROM THE ESTABLISHED ELEVATION.
   - D. THE ENTIRE FOUNDATION UNDER THE TANK SHALL BE WITHIN ±13 mm OF TRUE ELEVATION.
3. STORAGE TANK
   - A. SHELL
     1. SHELL PLATES SHALL HAVE A COMMON INSIDE DIAMETER.
     2. ALL VERTICAL AND HORIZONTAL SHELL PLATE JOINTS SHALL BE DOUBLE-WELDED COMPLETE PENETRATION (CP) BUTT JOINTS.
   - B. WELDING
     1. ALL TANK WELDS SHALL BE PER A QUALIFIED PROCEDURE AS SPECIFIED ON THE DRAWINGS.
     2. ALL TEMPORARY ATTACHMENTS TO THE TANK SHELL SHALL BE WELDED USING WELD PROCEDURE SM-52.
     3. ALL SHELL OPENING CONNECTIONS WHICH REQUIRE REINFORCING, SUCH AS NOZZLES, MANHOLES, ETC., SHALL BE ATTACHED BY WELDS FULLY PENETRATING THE SHELL UNLESS OTHERWISE SPECIFIED.
   - C. STRESS RELIEVING
     1. STRESS RELIEVE IS NOT REQUIRED.
   - D. WELD INSPECTION
     1. SHELL PLATE TO SHELL PLATE WELDS SHALL BE INSPECTED BY THE RADIOGRAPHIC METHOD AS SPECIFIED IN SECTION 6.1 AND PARAGRAPH A.5.3 OF API 650.
     2. ALL WELDS (INCLUDING PERMANENT AND TEMPORARY ATTACHMENTS) SHALL BE INSPECTED BY VISUAL EXAMINATION.
     3. ALL WELDS ATTACHING SHELL NOZZLES OR MANHOLES SHALL BE EXAMINED BY EITHER THE MAGNETIC PARTICLE METHOD OR THE DYE-PENETRANT METHOD. IF ANY PWHT IS PERFORMED, THE EXAMINATION SHALL BE PERFORMED BEFORE AND AFTER PWHT.
     4. FLUSH CLEANOUTS AND NOZZLES ARE NOT REQUIRED.

GENERAL NOTES (CONTINUED)

- E. TESTING
  1. THE TANK BOTTOM SHALL BE EXAMINED BY THE VACUUM BOX TEST METHOD.
  2. THE TANK SHELL TO BOTTOM WELD SHALL BE TESTED BY THE PENETRATING OIL METHOD AND THE COMPLETED JOINT SHALL BE VISUALLY INSPECTED. THE INSIDE FILLET WELD SHALL BE COMPLETED FIRST AND INSPECTED FOR LEAK TIGHTNESS WITH PENETRATING OIL BEFORE THE OUTSIDE WELD IS STARTED. ALLOW 1 HOUR OF WAITING TIME FOR EACH 3 mm OF SHELL THICKNESS AFTER THE PENETRATING OIL IS APPLIED. THE MINIMUM WAITING TIME SHALL BE 4 HOURS.
  3. REINFORCING PLATES SHALL BE TESTED PRIOR TO THE HYDROSTATIC TEST. APPLY 1.05 ±.07 kg/sq cm AIR PRESSURE USING THE TELLTALE HOLE WHILE UNDER PRESSURE, A SOAP SUDS SOLUTION SHALL BE APPLIED TO ALL ATTACHMENT WELDS FOR DETECTION OF LEAKS.
  4. PDM SAUDI ARABIA SHALL HYDRO-PNEUMATICALLY TEST THE TANK PER API 650 AND PDM-SA PROCEDURE HT-4. PDM-SA SHALL SUPPLY POTABLE WATER FOR HYDROTEST. A LAB ANALYSIS WILL BE PERFORMED TO DETERMINE THE WATER QUALITY. PDM-SA WILL TREAT THE WATER IF NECESSARY BY ADDITION OF A CHEMICAL ADDITIVE. PDM-SA DOES NOT INCLUDE FOR SUPPLY OF SACRIFICAL ANODES OR ANY OTHER CATHODIC PROTECTION SYSTEM. PDM-SA ASSUMES TEST WATER MAY BE DISPOSED OF IN THE VICINITY OF THE TANKS WITHOUT COST TO PDM-SA. PDM-SA INCLUDES ALL EQUIPMENT AND LABOR TO FILL THE TANKS, WATER TRANSFER, MONITORING THE HYDROTEST. SURVEY OF FOUNDATION SETTLEMENT IS REQUIRED DURING HYDROTEST (CPL WILL MONITOR THE FOUNDATION SETTLEMENT.) 2
  5. PENETRATING OIL TEST SHALL BE PERFORMED ON BOTTOM DECK, PENETRATIONS AND OUTER RIM TO DECK JOINT PRIOR TO HYDROTEST.
  6. THE FLOATING ROOF SHALL BE FLOTATION TESTED ON WATER DURING THE HYDROSTATIC TEST. DURING THE TEST THE UPPER SIDE OF THE DECK IN CONTACT WITH LIQUID SHALL BE EXAMINED FOR LEAKS. IN ADDITION ALL WELDS ON THE UPPER SIDE OF THE FLOATING ROOF SHALL BE INSPECTED BY VISUAL EXAMINATION.
- F. FLANGE ORIENTATION
  1. THE FLANGE BOLT HOLES FOR SHELL MANHOLES AND NOZZLES SHALL STRADDLE A VERTICAL CENTERLINE UNLESS OTHERWISE NOTED.
  2. THE FLANGE BOLT HOLES FOR ROOF MANHOLES AND NOZZLES SHALL STRADDLE A RADIAL TANK CENTERLINE UNLESS OTHERWISE NOTED.
- G. MILL TEST REPORTS
  1. MILL TEST REPORTS SHALL BE PROVIDED FOR SHELL, ROOF AND BOTTOM PLATES, REPADS AND NOZZLES/MANHOLES FABRICATED FROM PLATE.
  2. CERTIFICATE OF COMPLIANCE SHALL BE PROVIDED FOR FLANGES, BOLTS, NUTS AND STRUCTURAL COMPONENTS.
- H. AS BUILT DRAWINGS
  SHOP AND FIELD TO FURNISH MARKED-UP DRAWINGS OR A WRITTEN DESCRIPTION TO PDM SAUDI ARABIA REGARDING ANY CHANGES TO THE PROJECT FOR AS BUILT DRAWINGS.
- I. SPECIAL HANDLING REQUIREMENTS ARE NOT REQUIRED.
- J. TANK CALIBRATION IS REQUIRED.
  STRAPPING AND CALIBRATION, INCLUDING GAUGING TABLES.
- 2 K. GRIND ALL SHARP EDGES/CORNERS SMOOTH REMOVE ALL BURRS.

OPEN HOLES: N/A
ERECTION REF.: N/A
WELD SPECS.: API 650
EIS-: N/A

CERTIFIED FOR CONFORMANCE TO PLANS AND SPECIFICATIONS
BY _____
DATE _____

NO	REVISION DESCRIPTION	BY	DATE	CHK	DATE
2	ISSUED "AS BUILT"	RK	20SEPT97	MJ	19OCT97
1	REVISE NOTE 3.E.4	ARF	31MAR97	AJM	31MAR97

PDM SAUDI ARABIA

TCI CORPORATION

CHIYODA PETROSTAR LTD.

JOB NO. 54001	IBN RUSHD AROMATICS PROJECT
PO NO. 54001 T009	
REQ NO. SC-50-Q-003	
IDENT NO. 55-D-07AB-DV 0001	

A-NO COMMENTS PROCEED WITH FABRICATION	SAY TEAM	
B-PROCEED WITH FABRICATION COMMENTS TO BE CONSIDERED		
C-DO NOT PROCEED WITH FABRICATION	DATE	

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IBN RUSHD PTA &
AROMATICS PROJECT - AROMATICS
ORTHOXYLENE TANKS 55-D-07A & B

PDM Saudi Arabia
ENGINEERS - FABRICATORS - CONTRACTORS

IBN RUSHD PTA
(2) 7.02 m DIA X 8 m FBSSCRIFR
YANBU, SAUDI ARABIA
GENERAL NOTES

DWG. PREPARED AT	PIT	FABRICATED AT	YANBU
DRAWN: AMW	13FEB97	DRAWING	G902
CHECKED: RHL	13FEB97	CONTRACT	76519-9

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GN-502 84.10

ARABIAN INDUSTRIAL FIBERS COMPANY

IR-II AROMATICS PROJECT

PROJECT NO. 10E0541A01

DOCUMENT TITLE:

WATER STRIPPER REBOILER DATA SHEET

DOCUMENT NO:

DS-56-EA-517

REV	DESCRIPTION	BY	CHK.	APPR.	DATE
1	Issued for Design	WCC	SYL	YSL	15-Apr-2011
0	Issue For Approval	WCC	SYL	YSL	25-Feb-11

ARABIAN INDUSTRIAL FIBERS COMPANY YANBU, KINGDOM OF SAUDI ARABIA

CTCI CORPORATION

CERTIFIED

PROJ. MGR _____ DATE _____

CLIENT _____ DATE _____

PAGE 1 OF 2

XC33-56-517

55191

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GN-504 84.10

CONTENTS

55191

ابن رشد ibn rushd FLUOR	**SHELL AND TUBE HEAT EXCHANGER DATA SHEET**	**Contract:** 10E0541A01 **Equipment No.** 56-E-17 **Revision:** 1 **Date:** 15-Apr.-2011 **Unit:** 56 - Sulfolane **P.O. No.:** **Document No.:** DS-56-EA-517 **Sheet** 1 of 8	سابك sabic CTCI CORPORATION

Line							REV
1	**Client:** Arabian Industrial Fibers Company (Ibn Rushd)			**Vendor:**			
2	**Service:** Water Stripper Reboiler			**Plant:** Sulfolane		**Site:** Yanbu, Saudi Arabia	
3	**Design Duty:**	5,340,000 x 1.2 W		**TEMA Type/Size:** BKU / 1250/1750 x 4300		**Orientation:** Horizontal	
4	**Transfer Rate Service:**	638.58 W/m²·°C		**Clean:** 1150.23 W/m²·°C		**Mtd (eff):** 21.9 °C	0
5	**Total Surface (Eff.):**	457.5 m²		**Shell/Unit:** 1		**Surface/Shell (Gross):** 467.9 m²	0
6	**Case:**			**Governing Case:**			

Line	PERFORMANCE OF ONE UNIT		SHELL SIDE		TUBE SIDE:		REV
9	**Fluid:**		Water Stripper Bottoms		Lean Sulfolane		
10	Total Flow:	kg/hr	9,377 x 1.2		359,891 x 1.2		
11			**INLET**	**OUTLET**	**INLET**	**OUTLET**	
12	Liquid Flow:	kg/hr	9,377 x 1.2	743 x 1.2	359,891 x 1.2	359,891 x 1.2	
13	Molecular Weight:		18.14	18.14	114.8	114.8	1
14	Density:	kg/m³	915	1,109	1,125	1,152	
15	Thermal Cond.:	W/(m·°C)	0.482	0.195	0.174	0.179	
16	Specific Heat:	kJ/(kg·°C)	4.04	2.09	1.88	1.81	
17	Viscosity:	mPa·s	0.246	0.613	1.043	1.339	
18	Surface Tension:	mN/m					
19							
20	Vapor Flow:	kg/hr		8,634 x 1.2			
21	Molecular Weight:			18.2			
22	Density:	kg/m³	0.8874	0.8730			
23	Thermal Cond.:	W/(m·°C)	0.0258	0.0265			
24	Specific Heat:	kJ/(kg·°C)	1.92	1.91			
25	Viscosity:	mPa·s	0.013	0.013			
26	Latent Heat:	kJ/kg @ °C					
27							
28	Steam Flow:	kg/hr					
29	Water Flow:	kg/hr					
30	Noncondensable Flow:	kg/hr					
31	Temperature:	°C	113.2	134.81	173.9	144.9	1
32	Pressure:	bar (g)	0.6205		18.04		
33	Pressure Drop:	bar	Allow: 0.0828	Calc: 0.014	Allow: 0.689	Calc: 0.604	0
34	Velocity:	m/s			1.46		0
35	Fouling Resistance:	m²·°C/W	0.00035		0.00026		
36							
37	Dew Point:	°C					
38	Bubble Point:	°C					
39	Boiling Range:	°C					
40	Critical Pressure:	bar (a)	218				
41	Critical Temperature:	°C	377				

42 **Remarks:**

43 1 Design for 120% heat duty and flow rates.

44 2 Water Stripper Column, 56-C-07, will be installed on top of the 30" connection nozzle. Vendor shall design this nozzle to take the load . Wall thickness of shell course in that section may need to increase because nozzle reinforcement probably not sufficient. The operating weight for 56-C-07 is approximately 3,000 kg.

47 3 The maximum bundle size is 1200 mm and the maximum bundle weight is 15,000 kg. A waiver will be required due to the 1250 mm bundle size.

ابن رشد ibn rushd FLUOR

SHELL AND TUBE HEAT EXCHANGER DATA SHEET

Contract:	10E0541A01
Equipment No.	**56-E-17**
Revision:	1 **Date:** 15-Apr.-2011
Unit:	56 - Sulfolane
P.O. No.:	
Document No.:	**DS-56-EA-517**
Sheet	**2 of 8**

سابك sabic

CTCI CORPORATION

REV

Case: **Governing Case:**

DESIGN CONDITIONS

		SHELL SIDE:	TUBE SIDE:
Design Pressure:	min / max bar (g)	FV at 122 C / 4.0	FV at 174 C / 27.0
Test Pressure:	bar (g)	Code	Code
Design Temperature:	min / max °C	/ 150	/ 205
Corrosion Allowance:	mm	3	3
Number of Passes:		1	4
Minimum Design Metal Temperature:	°C	6	6
Flow Arrangement:	Parallel / Series	1 / 1	1 / 1

CONSTRUCTION

Shell Dia, I.D.:	1750 / 1250 mm	Baffle Type:	Full Support	Wt Bundle & Shell:	16,010 kg	
No. Tubes/Shell:	830 U's	Crosspasses:	Cut: % Dia.	Wt Bundle:	9,210 kg	
O.D. x Length:	19.05 x 4,300 mm	Spacing Center:	599 mm	Wt Full of Water:	26,760 kg	0
Tube Thickness:	2.11 MW (Note 4) mm	(In/Out)	/ mm	ρV^2 Shell Inlet Nozzle:	kg/m·s²	
Tube Pitch:	25.4 mm Layout: 90 °	Peripheral Seals:	Yes ☐ No ☑	ρV^2 Bundle Entry:	kg/m·s²	
Tube/TS Joint	Expanded and Rolled	Number of Pairs:		ρV^2 Bundle Exit.:	kg/m·s²	
Impingement Protection:	None	Pass Lane Seals:	Yes ☐ No ☑	TEMA Class:	R ☑ C ☐ B ☐	
Expansion Joint:	None	Number:		Code Required.:	ASME Sec VII, Div. 1	
Removable Tube Bundle:	Yes	Diameter:	mm	Code Stamp:	Yes ☑ No ☐	
Stacking:	No	Insulation:	Shell: 40 Chan.: 50 mm	API 660:	Yes ☑ No ☐	
Specification:		Prep & Paint -	Shell: SES-PCS-10 (Note 5)	National Board:	Yes ☐ No ☑	
			Chan.: SES-PCS-10 (Note 5)	Lethal Service:	Yes ☐ No ☑	

Special Services: Wet Sour: ☐ Side: Hydrogen: ☐ Side: Other: ☐ - Side:

MATERIALS

Tubes:	SA-179, Killed	Shell:	SA-516-70
Tubesheet:	SA-266-2 or 4	Shell Cover:	SA-516-70
Baffles/Tube Supports:	SA-36	Shell Flange:	SA-266-2 or 4
Tie Rods and Spacers:	CS	Channel/Bonnet:	SA-516-70
Long Baffle:	N/A	Channel Cover:	N/A
Gasket Shell Side:	DBL JKT Graphite Filled	Channel Flange:	SA-266-2 or 4
Gasket Tube Side:	DBL JKT Graphite Filled	Floating Head Cover:	N/A
Gasket Float. Head Cover:	N/A	Shell Bolting:	SA-193-B7/SA-194-2H
Expansion Joint:	N/A	Channel Bolting:	SA-193-B7/SA-194-2H
Exchanger Supports:	SA-516-70 Pad/SA-36 Saddle	Floating Head Bolting:	N/A

NOZZLES	SHELL SIDE:				TUBE SIDE:					
Description	No.	Size	Rating	Facing	Description	No.	Size	Rating	Facing	
Inlet		(Note 7)			Inlet	1	12"	300#	RFWN	
Vapor Outlet	1	10"	150#	RFWN	Outlet	1	12"	300#	RFWN	
Liquid Oulet	1	3"	150#	RFWN	Interconnecting					
Column Connection	1	30"	150#	RFWN	Vent	1	1"	300#	RFLWN/BLD	
Drain	1	2"	150#	RFLWN	Drain	1	1"	300#	RFLWN/BLD	
Level Control	2	2"	300#	RFLWN	Pressure Gauge *	1	3/4"	6000# CPLG	w/ Plug	
Pump Return	1	1-1/2"	150#	RFLWN	Thermowell *					1
Steam Out	1	2"	150#	RFLWN						
Pressure Gauge*	1	3/4"	6000# CPLG	w/ Plug						
Level Alarm	2	1-1/2"	150#	RFLWN						1
* Each process nozzle.					* Each process nozzle.					

Remarks (cont'd):

4. 2.11 mm (14 gage) minimum wall thickness.
5. Uninsulated protrusions shall be painted per SES-PCS-4.
6. Some of the applicable project specifications for shell and tube heat exchangers are: Z01-G07 (SABIC), 3-11-6 (UOP), 4-11-6 (UOP), 22854-SP-000-D-001 (Bechtel), 22854-SP-000-E-001 (Bechtel), 22854-SP-000-W-001 (Bechtel), 22854-SP-W-002 (Bechtel), 22854-SP-W-003 (Bechtel), T01-S01 (SABIC), SP000X5001 (SABIC), 22854-SP-000-N-001 (Bechtel).
7. Liquid enters the reboiler through the water stripper column connection.

55191

ابن رشد ibn rushd FLUOR	SHELL AND TUBE HEAT EXCHANGER DATA SHEET	Contract: 10E0541A01 Equipment No. 56-E-17 Revision: 1 Date: 15-Apr.-2011 Unit: 56 - Sulfolane P.O. No.: Document No.: DS-56-EA-517 Sheet 3 of 8	سابك sabic CTCI CORPORATION	REV

HOT SIDE PROPERTIES

			VAPOR				TOTAL LIQUID						
Temp. °C	Mass Vapor Frac.	Enthalpy Normalized kJ/kg	Density kg/m³	Visc. mPa.s	Thermal Cond. W/(m.°C)	Specific Heat kJ/(kg.°C)	Density kg/m³	Visc. mPa.s	Thermal Cond. W/(m.°C)	Specific Heat kJ/(kg.°C)	Surface Tension mN/m	Critical Press. bar [a]	Critical Temp °C
173.9	0.0000	53.41					1,125	1.043	.174	1.88	34.5	59.2	569
170.7	0.0000	47.48					1.128	1.068	.174	1.87	34.8	59.2	569
167.6	0.0000	41.54					1.131	1.096	.175	1.86	35.2	59.2	569
164.4	0.0000	35.61					1,134	1.125	.175	1.86	35.5	59.2	569
161.2	0.0000	29.67					1,137	1.155	.176	1.85	35.9	59.2	569
157.9	0.0000	23.74					1,140	1.188	.176	1.84	36.2	59.2	569
154.7	0.0000	17.80					1,143	1.222	.177	1.83	36.6	59.2	569
151.5	0.0000	11.87					1,146	1.259	.178	1.83	36.9	59.2	569
148.2	0.0000	5.934					1,149	1.298	.178	1.82	37.3	59.2	569
144.9	0.0000						1,152	1.339	.179	1.81	37.7	59.2	569

			VAPOR				TOTAL LIQUID						
Temp. °C	Mass Vapor Frac.	Enthalpy Normalized kJ/kg	Density kg/m³	Visc. mPa.s	Thermal Cond. W/(m.°C)	Specific Heat kJ/(kg.°C)	Density kg/m³	Visc. mPa.s	Thermal Cond. W/(m.°C)	Specific Heat kJ/(kg.°C)	Surface Tension mN/m	Critical Press. bar [a]	Critical Temp °C

			VAPOR				TOTAL LIQUID						
Temp. °C	Mass Vapor Frac.	Enthalpy Normalized kJ/kg	Density kg/m³	Visc. mPa.s	Thermal Cond. W/(m.°C)	Specific Heat kJ/(kg.°C)	Density kg/m³	Visc. mPa.s	Thermal Cond. W/(m.°C)	Specific Heat kJ/(kg.°C)	Surface Tension mN/m	Critical Press. bar [a]	Critical Temp °C

55191

COLD SIDE PROPERTIES

Properties at .7022 bar[g]

			VAPOR				TOTAL LIQUID						
Temp. °C	Mass Vapor Frac.	Enthalpy Normalized kJ/kg	Density kg/m³	Visc. mPa.s	Thermal Cond. W/(m.°C)	Specific Heat kJ/(kg.°C)	Density kg/m³	Visc. mPa.s	Thermal Cond. W/(m.°C)	Specific Heat kJ/(kg.°C)	Surface Tension mN/m	Critical Press. bar [a]	Critical Temp °C
87.7	0.0000						942.1	0.325	.484	4.00	60.4	218	377
101.9	0.0000	56.95					927.2	0.277	.483	4.02	57.7	218	377
116.0	0.0000	113.9	.9659	0.013	.0260	1.92	912.0	0.239	.481	4.04	54.9	218	377
116.0	0.1378	419.7	.9659	0.013	.0260	1.92	913.8	0.240	.463	4.01	54.9	218	377
116.1	0.2756	725.6	.9659	0.013	.0260	1.92	916.5	0.242	.441	3.97	54.8	217	378
116.2	0.4135	1,031	.9659	0.013	.0260	1.92	920.5	0.244	.414	3.91	54.7	217	379
116.5	0.5514	1,337	.9659	0.013	.0261	1.92	927.1	0.248	.380	3.81	54.6	215	380
116.9	0.6895	1,643	.9659	0.013	.0261	1.92	940.5	0.256	.334	3.62	54.2	212	384
118.0	0.8278	1,949	.9643	0.013	.0262	1.92	980.4	0.286	.265	3.15	53.2	203	395
152.8	0.9755	2,255	.9243	0.014	.0289	1.90	1,128	0.885	.180	1.91	38.7	86.6	536

Properties at .5792 bar[g]

			VAPOR				TOTAL LIQUID						
Temp. °C	Mass Vapor Frac.	Enthalpy Normalized kJ/kg	Density kg/m³	Visc. mPa.s	Thermal Cond. W/(m.°C)	Specific Heat kJ/(kg.°C)	Density kg/m³	Visc. mPa.s	Thermal Cond. W/(m.°C)	Specific Heat kJ/(kg.°C)	Surface Tension mN/m	Critical Press. bar [a]	Critical Temp °C
87.7	0.0000						942.1	0.325	.484	4.00	60.4	218	377
100.7	0.0000	52.32					928.4	0.281	.483	4.02	57.9	218	377
113.7	0.0000	104.6	.9018	0.013	.0258	1.92	914.4	0.245	.482	4.04	55.4	218	377
113.7	0.1381	411.8	.9018	0.013	.0259	1.92	916.3	0.246	.464	4.01	55.3	218	377
113.8	0.2761	719.0	.9018	0.013	.0259	1.92	919.0	0.247	.442	3.97	55.3	217	378
114.0	0.4142	1,026	.9018	0.013	.0259	1.92	923.0	0.250	.415	3.90	55.2	217	379
114.2	0.5524	1,333	.9018	0.013	.0259	1.92	929.7	0.253	.380	3.80	55.0	215	380
114.6	0.6907	1,640	.9018	0.013	.0259	1.92	943.2	0.262	.334	3.61	54.7	212	384
115.7	0.8292	1,948	.9002	0.013	.0260	1.92	983.8	0.294	.265	3.13	53.6	203	396
151.8	0.9781	2,255	.8618	0.014	.0288	1.90	1,130	0.915	.180	1.90	38.6	84.6	538

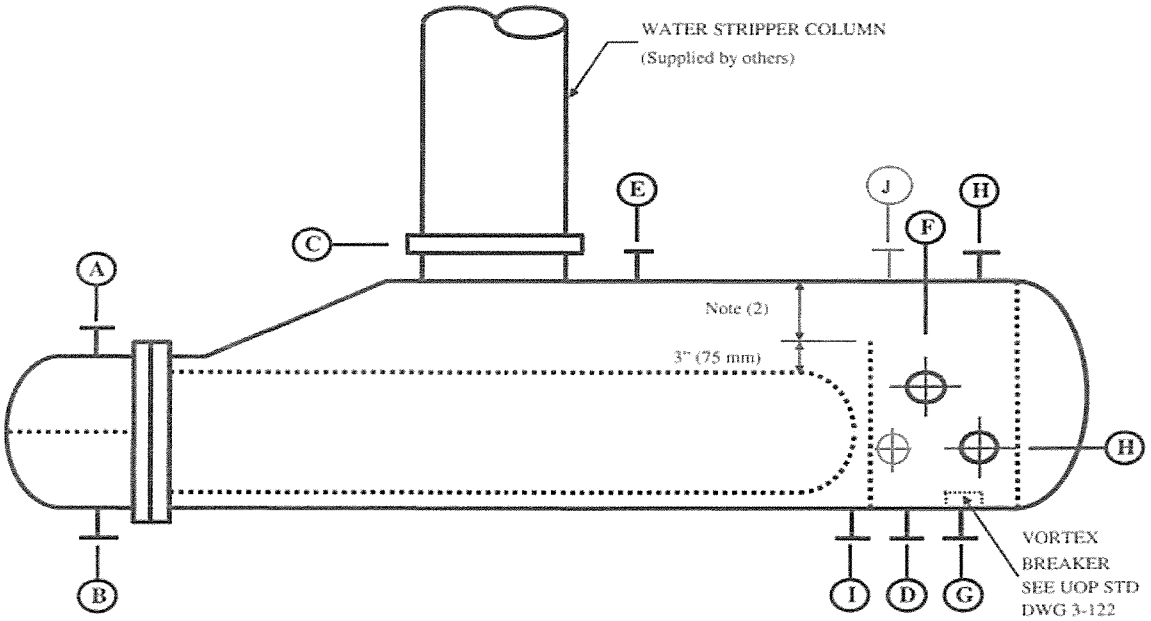
Properties at .4602 bar[g]

			VAPOR				TOTAL LIQUID						
Temp. °C	Mass Vapor Frac.	Enthalpy Normalized kJ/kg	Density kg/m³	Visc. mPa.s	Thermal Cond. W/(m.°C)	Specific Heat kJ/(kg.°C)	Density kg/m³	Visc. mPa.s	Thermal Cond. W/(m.°C)	Specific Heat kJ/(kg.°C)	Surface Tension mN/m	Critical Press. bar [a]	Critical Temp °C
87.7	0.0000						942.1	0.325	.484	4.00	60.4	218	377
99.5	0.0000	47.57					929.7	0.284	.483	4.02	58.1	218	377
111.3	0.0000	95.14	.8394	0.013	.0256	1.92	917.0	0.251	.482	4.04	55.8	218	377
111.4	0.1383	403.7	.8394	0.013	.0257	1.92	918.9	0.252	.464	4.01	55.8	218	377
111.5	0.2766	712.2	.8394	0.013	.0257	1.92	921.6	0.253	.442	3.96	55.7	217	378
111.6	0.4150	1,021	.8394	0.013	.0257	1.92	925.6	0.256	.415	3.90	55.6	217	379
111.8	0.5534	1,329	.8394	0.013	.0257	1.92	932.3	0.260	.380	3.80	55.5	215	380
112.2	0.6919	1,638	.8378	0.013	.0257	1.92	946.0	0.268	.334	3.61	55.1	212	384
113.4	0.8306	1,946	.8378	0.013	.0258	1.92	987.4	0.302	.264	3.12	54.0	202	396
150.7	0.9809	2,255	.8009	0.014	.0287	1.89	1,133	0.946	.180	1.89	38.6	82.7	541

ابن رشد ibn rushd FLUOR	SHELL AND TUBE HEAT EXCHANGER DATA SHEET			سابك sabic / CTCI CORPORATION	REV
		Contract:	10E0541A01		
		Equipment No.	56-E-17		
		Revision:	1 Date: 15-Apr.-2011		
		Unit:	56 - Sulfolane		
		P.O. No.:			
		Document No.:	DS-56-EA-517		
		Sheet	5 of 8		

WATER STRIPPER COLUMN REBOILER TYPICAL ARRANGEMENT

Item No.: 56-E-17



NOTES

(1) Nozzle Requirements

Nozzle	Service	Quantity	Size (NPS)	Rating	Facing
A	Tube Side Inlet	1	12	CL 300	RF
B	Tube Side Outlet	1	12	CL 300	RF
C	Water Stripper Column Welding Neck Flange	1	30	CL 150	RF
D	Steamout	1	2	CL 150	RF
E	Shell Side Vapor Outlet	1	10	CL 150	RF
F	Pump Return	1	1½	CL 150	RF
G	Shell Side Liquid Outlet	1	3	CL 150	RF
H	Level Control - Gauge Glass	2	2	CL 300	RF
I	Drain	1	2	CL 150	RF
J	Level Alarm	2	1-1/2	CL 150	RF

(2) Manufacturer's recommendation, but not less than 1'-6" (460 mm). Shell size shall be sufficient to assure the horizontal vapor velocity (in fpm OR m/s) in the vapor space above the maximum liquid level not to exceed 20 OR 0.1016 times the square root of the ratio of liquid density over vapor density.

(3) The reboiler shell must be capable of supporting the Water Stripper Column mounted on the top of the unit as shown above. Contractor shall advise the weight of this column and the moment due to wind load. Column details shall be as required by the 301 specification of this project.

PROPERTIES OF SULFOLANE

PROPERTIES OF PURE SULFOLANE LIQUID

CHEMICAL NAME:	Tetramethylene Sulfone
MOLECULAR WEIGHT:	120
FREEZING POINT:	82°F (27.8°C)
LATENT HEAT AT 350°F (177°C):	207 BTU/lb (115.0 kcal/kg)
ATMOSPHERIC BOILING POINT:	545°F (285°C)

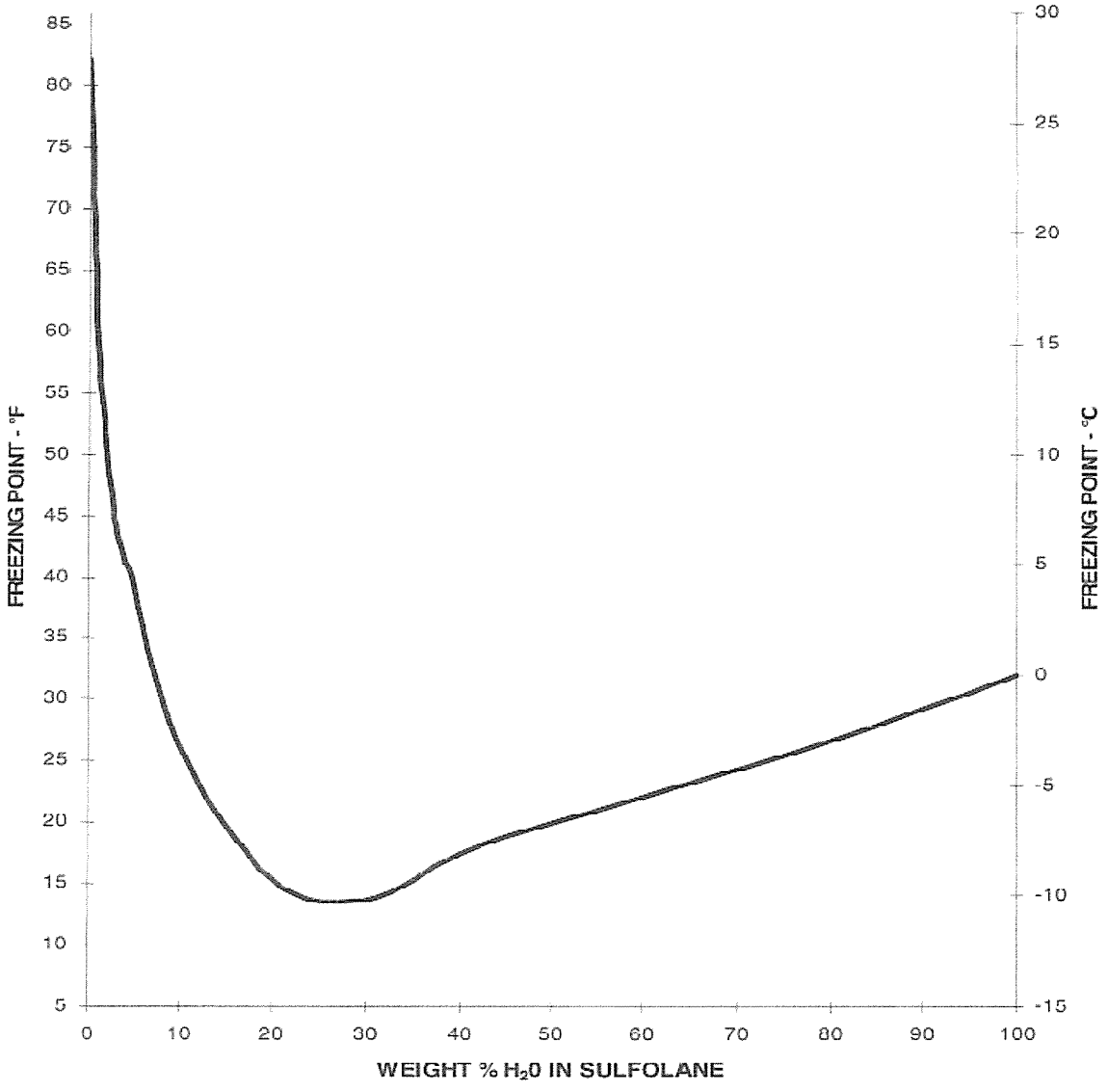
SPECIFIC GRAVITY:			
100°F	(38°C)	1.256	
200°F	(93°C)	1.208	
350°F	(177°C)	1.137	
450°F	(232°C)	1.091	
SPECIFIC HEAT, BTU/lb·°F (or kcal/kg·°C):			
100°F	(38°C)	0.36	
200°F	(93°C)	0.40	
350°F	(177°C)	0.44	
450°F	(232°C)	0.47	
VISCOSITY, CENTIPOISE:			
100°F	(38°C)	8.20	
200°F	(93°C)	2.75	
350°F	(177°C)	1.14	
450°F	(232°C)	0.87	
THERMAL CONDUCTIVITY, BTU/hr·ft·°F (kcal/hr·m·°C)			
100°F	(38°C)	0.091	(0.135)
200°F	(93°C)	0.088	(0.131)
350°F	(177°C)	0.082	(0.122)
450°F	(232°C)	0.079	(0.118)

NOTE: TO AVOID POSSIBLE DECOMPOSITION OF SULFOLANE, ITS FILM TEMPERATURE IN ANY HEAT EXCHANGE SERVICE SHALL BE LIMITED TO 450°F (232°C) MAXIMUM.

Suppliers shall make such calculations as are necessary to ensure that above maximum temperature requirement is met. Such calculations shall be based on the specified heating medium temperature and "clean" tube conditions.

PROPERTIES OF SULFOLANE (CONTINUED)

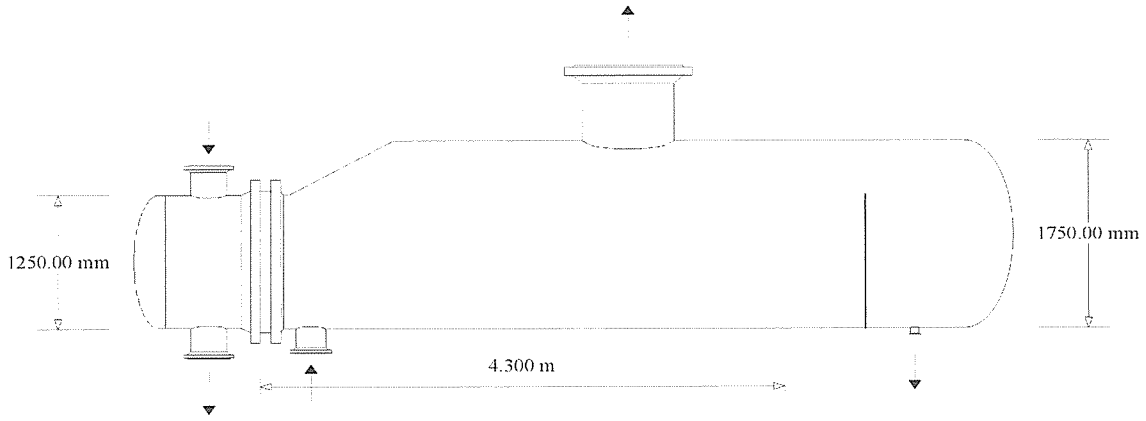
FREEZING POINT OF SULFOLANE - WATER MIXTURES



55191

ابن رشد ibn rushd FLUOR	SHELL AND TUBE HEAT EXCHANGER DATA SHEET	Contract:	10E0541A01	سابك sabic CTCI CORPORATION	REV
		Equipment No:	56-E-17		
		Revision:	1 Date: 15-Apr.-2011		
		Unit:	56 - Sulfolane		
		P.O. No.:			
		Document No.:	DS-56-EA-517		
		Sheet	8 of 8		

HEAT EXCHANGER SKETCH



55191

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ARABIAN INDUSTRIAL FIBERS COMPANY

IR-II AROMATICS PROJECT

PROJECT NO. 10E0541A01

DOCUMENT TITLE:

PLANT INVENTORY STORAGE TANK DATA SHEET

DOCUMENT NO:

DS-56-FA-503

REV	DESCRIPTION	BY	CHK.	APPR.	DATE
2	Revised as Marked	LSH	SYL	YSL	9-Aug-11
1	Issued for Design	LSH	SYL	YSL	22-Apr-11
0	Issue For Approval	LSH	SYL	YSL	23-Mar-11

ابن رشد
Ibn Rushd

ARABIAN INDUSTRIAL FIBERS COMPANY YANBU, KINGDOM OF SAUDI ARABIA

CTCI CORPORATION

CERTIFIED

PROJ. MGR _____ DATE _____

CLIENT _____ DATE _____

PAGE 1 OF 2

XC32C-56-503

GN-502 84.10

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CONTENTS

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API 650 TANK DATA SHEET

Note: This data sheet has been modified from that in the annex of API Standard 650, Eleventh Edition.

Contract:	10E0541A01
Item No:	56-F-03
Revision:	2 Date: 09-Aug-2011
Unit:	56 - Sulfolane
P.O. No.:	
Document No.:	DS-56-FA-503
Sheet	1 of 10

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CTCI CORPORATION

REV

Client: Arabian Industrial Fibers Company - Ibn Rushd Vendor:

Service: Plant Inventory Storage Tank Plant: IBN Rushd Site: Yanbu, Saudi Arabia

Item Name: 56-F-03 P & ID No.: DR-56-AD-135 Vendor Shop Order No: 1

Number Req'd.: 1 Type: ☐ Shop Built ■ Field Erected ☐ Open Top ☐ Dome Roo ☐ Umbrella Roof ■ Cone Roof

Floating Roof: ☐ No ■ Yes - See sheet 8 of 8 for details of design and construction.

Issued for: ■ Proposal ☐ Purchase ☐ As Built Vendor Serial No:

GENERAL:

1 Size Limitation: 9.5 m dia and 9 m height Tank Diameter: 9.5 m Shell Height: 9 m

Capacity: Max: 638 m³ Net Working: 465 m³ Criteria:

2 Products Stored:

Liquid: Sulfolane and Aromatic Hydrocarbon ~~Min.~~ S.G.: 1.261 (Note 23) @ 15 °C / Max. S.G.: @ °C 1

Vapor: Vapor Pressure: 0.758 bar (a) At Maximum Operating Temperature 44 °C

% Aromatic: Suppl. Spec.: H_2S Service: ☐ No ☐ Yes Suppl. Spec.:

Other Special Service Conditions: ☐ No ☐ Yes Suppl. Spec.:

DESIGN CRITERIA

3 Year Built: In accordance with API 650 11th Edition and Addendum

Appl. API 650 Appendices: ☐ A ☐ B ☐ C ☐ D ■ E ■ F ☐ G ■ H ■ I ☐ J ☐ M ☐ O ■ P ☐ S ☐ U ☐ V

Appendix W Sections Waived: ☐ All ■ Other: Appendix R Suppl. Spec.:

4 Max. Operating Temp.: 49 °C Design Metal Temp.: 85 °C Roof Max. Operating Temp.: 85 °C M.D.M.T.: 6 °C

Design Pressure: 14.48 mbar(g) External Pressure: 7.58 mbar(g) Design Liquid Level: 9000 mm

Maximum Fill Rate: 25.6 m³/h Maximum Emptying Rate: 25.6 m³/h

5 Seismic Design: ☐ No ■ Yes Alternate Seismic Criteria: 22854-SP-M-001& SES B51-S01

Site Class: C Vertical Seismic Design: ☐ No ■ Yes Vertical Ground Motion Accelerator A_v: m/sec²

Basis of Lateral Accel. (select one): ■ Mapped Seismic Parameters S_s 0.183 S_1 0.048 S_2 ; ☐ Site-Specific Procedures

MCE Design Required: ☐ No ☐ Yes ☐ Other (Non-ASCE) Methods: Freeboard:

Roof Tie Rods at Outer Ring: ☐ No ☐ Yes Sliding Friction Factor:

6 Wind Velocity: 140 km/h Prevailing Wind Direction: From: To:

Check Overturning Stability: ☐ No ■ Yes Check Buckling in Corroded Condition: ☐ No ■ Yes

Top Wind Girder Style: Dimensions: mm Use Top Wind Girder as Walkway: ■ No ☐ Yes

Intermediate Wind Girders: ☐ No ☐ Yes Intermediate Wind Girder Style: Dimensions: mm

CONSTRUCTION

7 Shell Design: 1-Ft. Method: ☐ No ■ Yes Variable-Design-Point Method: ☐ No ☐ Yes ☐ Alternate

Elastic Analysis Method: ☐ No ☐ Yes ☐ Alternate:

Plate Stacking Criteria: Center-line Stacked: ☐ No ☐ Yes Flush Stacked: ☐ No ■ Yes ■ Inside ☐ Outside

Plate Widths (Shell Course Height) and Thickness (New). Numbers below indicate course number. Dimensions are in: millimeters.

1.	x	2.	x	3.	x	4.	x	5.	x
6.	x	7.	x	8.	x	9.	x	10.	x
11.	x	12.	x	13.	x	14.	x	15.	x

Joint Effeciency: % Shell to Bottom Weld Type: Corner Weld Insp. Mthd.:

8 Open Top & Fixed Roofs: Open Top: ■ No ☐ Yes - See sheet 8 for floating roof details of design and construction.

Fixed Roof Type: ☐ Dome Roo ☐ Umbrella Roof ■ Cone Roof

Roof Structural Columns: ☐ Pipe ☐ Struc. Shape: Dome / Umbrella Rad.: m Cone Slope: mm/m

Weld Joint Type: Seal Weld Underside of Lap Joints: ☐ No ☐ Yes

Seal Weld Underside of Wind Girder Joints: ☐ No ☐ Yes

Gas Tight: ☐ No ■ Yes Joint Effeciency: % Thickness: (mm) Live Load: kPa

Applicable Supplementary Load Specification: Column Lateral Load: N

Normal Venting Devices: Yes Note 11 Emergency Venting Devices: Yes Note 11, 24 2

Frangible Roof to Shell Joint: ■ No ☐ Yes Seal Weld Roof Plates to Top Angle on the Inside: ☐ No ■ Yes

Radial Projection of Horizontal Component Top Angle: ☐ Inward ■ Outward Roof to Shell Detail:

Point Load Required: ☐ No ☐ Yes

55189

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API 650 TANK DATA SHEET

Note: This data sheet has been modified from that in the annex of API Standard 650, Eleventh Edition.

Contract:	10E0541A01
Item No:	56-F-03
Revision:	2 Date: 09-Aug-2011
Unit:	56 - Sulfolane
P.O. No.:	
Document No.:	DS-56-FA-503
Sheet	2 of 10

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CTCI CORPORATION

REV

CONSTRUCTION (Continued)

9 Bottom: (F Thickness: ____ mm Weld Joint Type: ____
Style: ☐ Flat ■ Cone Up - Centered ☐ Cone Down - Center ☐ Cone Down - Off-Center ☐ Tilted Slope: 1:120 mm/m
Provide Drip Flange: ☐ No ■ Yes Alternate Specification: ____
Annular Ring: ☐ No ■ Yes Minimum Width: ____ mm Thickness: ____ mm Sump Required: ☐ No ■ Yes
10 Foundation: Furnished by: ☐ Purchaser ☐ Vendor ■ Other ____ Type: ____
Soil Allowable Bearing Pressure: ____ bar(g) Per Spec.: ____ Anchor Size: ____ mm Qty: ____
Foundation Design Loads: Base Shear Force: Wind: ____ N Seismic: ____ N
See Note 6 Overturning Moment: Wind: ____ N-m Seismic: ____ N-m
Ring Forces: Weight of Roof + Shell: New: ____ kg Corroded: ____ kg Roof Live Load: ____ kPa
Internal Pressure: ____ bar(g) Partial Vacuum: ____ bar(g) Wind: ____ km/h Seismic: ____ N
Bottom Forces: Floor Wt.: New: ____ kg Corroded: ____ kg Product Wt.: ____ kg Water Wt.: ____ kg
Internal Pressure: ____ bar(g) Partial Vacuum: ____ bar(g) Other Foundation Loads: ____
Minimum Projection of Foundation Above Grade: later mm

INSPECTION and TESTING

11 Responsibility for Heating Water, if Required: ☐ Purchaser ■ Vendor ☐ Other: ____
Hydrotest Fill Height: Note 9 Min. Hydrotest Temp.: API 650 °C Extended Duration of Hydrotest: Note 9 hours
Settlement Measurements Required: ☐ No ■ Yes Predicted Settlement Profile is Attached: ■ No ☐ Yes
Responsibility for Setting Water Quality: ☐ Purchaser ■ Vendor Suppl. Test Water Quality Spec.: ____
Test Water Source & Disposal Tie-In Locations: Vendor approved by owner Hydrotest Appendix J Tank: ☐ No ☐ Yes
Post-Pressure-Test Activities Required of the Vendor: ☐ Broom Clean ☐ Potable Water Rinse ■ Dry Interior
■ Other: Note 9
12 Inspection by: ____ in Shop ; Tank Supplier, Company in Field.
Supplemental NDE Responsibility: Tank Supplier Supplemental NDE Spec.: 22854-SP-000-W-002
Positive Material Identification: ■ No ☐ Yes PMI Requirements: ____
Waive Dimensional Tolerances of Section 7.5: ■ No ☐ Yes Max. Plate Thickness for Shearing: Shearing not allowed
Welds Not Exceeding 6 mm Shall Be Multi-Pass: ☐ No ☐ Yes Welds Exceeding 6 mm Shall Be Multi-Pass: ☐ No ■ Yes
Leak Test Method: Roof: ____ Shell: ____ Nozzle/Manhole Repad Plate: ____
Approved Tank supplier procedure Bottom: ____ Floating Roof Components: ____

COATINGS

Internal Coatings by: ■ Not Req'd. ☐ Vendor ☐ Others: ____ Per Spec.: ____
External Coating by: ☐ Not Req'd. ■ Vendor ☐ Others: ____ Per Spec.: T01-S01-SES-PCS-3
Under Bottom Coating by: ☐ Not Req'd. ■ Vendor ☐ Others: ____ Per Spec.: T01-S01-SES-PCS-9

ADDITIONAL INFORMATION

14 Surface Weld Prep.: ■ Internal: Floating Roof Requirements ☐ External: ____ ☐ Roof: ____
NACE Requirements : ■ No ☐ Yes Per Std.: ____
15 Cathodic Protection System: ☐ No ■ Yes ☐ Internal ■ External Per Spec.: Impressed Current per E29-E01, E29-S01
16 Fire Protection: ☐ No ■ Yes Per Spec.: See note 12
17 Leak Detection System: ☐ No ■ Yes Per Spec.: API 650 Appendix I
18 Release Prevevention Barrier: ☐ No ■ Yes Per Spec.: API 650 Appendix I
19 Tank Measurement Sytem Req'd.: ☐ No ■ Yes Remote Capability Req'd.: ☐ No ■ Yes
By: Others Per Spec.: 22854-SP-000-J-019
20 Weight Of Tank: Full of Water: ____ kg Empty: ____ kg Shipping: ____ kg
Brace/Lift Spec.: ____
21 References: ■ API 650 ■ PIP VESTA002 ☐ PIP VESTA003 ■ Other: 22854-SP-000-F-001

REMARKS

22 Remarks:

1. Vent vendor to provide vent with bird and insect screen — 2
2. Deleted. — 2
3. Tank bottom to have cone-up centered configuration to provide for completely emptying the tank during emergency.
4. Pump connection on one side of the tank to be provided with inverted nozzle to facilitate connecting to the portable pump.
5. Vendor can provide different sloping confirguration if economical.
6. Tank Supplier shall design, procure and install foundations in accordance with specifications B51-S01, B52-E01, B52-S01 and E29-E01.
7. Flange bolts and nuts shall have a Xylan* fluoropolymer coating (* Registered Trademark of Whitford Corporation).
8. Gaskets: 1.6 mm thick flexible graphite with 304 or 316 SS corrugated insert.
9. Hydrotesting shall be in accordance with Specification 22854-SP-000-F-001 Section 11.
10. Roof shall have 360 degree hand rails.

55189

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API 650 TANK DATA SHEET

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Item No:	56-F-03
Revision:	2 Date: 09-Aug-2011
Unit:	56 - Sulfolane
P.O. No.:	
Document No.:	DS-56-FA-503
Sheet	3 of 10

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* If box is blank, Vendor shall determine and submit as per Appendix L

Table 1 MATERIALS OF CONSTRUCTION

Component	Material* / Thickness* (mm)	C.A.	Component	Material* / Thickness* (mm)	C.A.	REV
Shell, Course All to	A516 Grade 70 (KCS) /	1.6	Reinforcing Pads	A516 Grade 70 (KCS) /	1.6	1
Shell, Course to	/		Manhole/Nozzle Necks	A516 Grade 70 (KCS), A106 GR B /	1.6	1
Shell, Course to	/		Manhole/Nozzle flanges	A516 Grade 70 (KCS), A105	1.6	1
Shell, Course to	/		Flange Covers	A516 Grade 70 (KCS) /	1.6	1
Shell, Course to	/		Anchor Attachments	A516 Grade 70 (KCS) /	1.6	1
Roof	A516 Grade 70 (KCS) /	1.6	Submerged Piping	A106 Grade B /	1.6	1
Bottom	A516 Grade 70 (KCS) /	1.6	Wetted Structurals +	A36 /	1.6	1
Annular Ring	A516 Grade 70 (KCS) /	1.6	Non-wetted Structurals +	A36 /	1.6	1

\+ C.A. is to apply to each exposed surface: ☐ No ■ Yes

Table 2 BOLTS and ANCHORS

Component	Head Type	Bolt or Anchor Material	Nut Material	Thread Series	C.A. (mm)
Flange Bolting		A193 Grade B7	A194 Grade 2H		1.6
Structural Bolting					
Anchor Bolts		A307 Grade A	A563		1.6

REMARKS (Continued)

22 Remarks (Continued):

11. Vent supplier shall size and supply psv for the floating roof and fixed roof for combined pressure/vacuum relief. Tank pressure/vacuum vent shall be in accordance with API 2000. (REV 2)
12. Tank supplier to provide battery limit, deluge and water spray system in accordance with Sabic Specification (REV 2)
13. Design Temperature = 85℃.
14. CTCI shall confirm PSV nozzle size.
15. Liquid level: HLL: 7500 mm, LLL: 1000 mm.
16. Provide one 4" gas tight gauging and sample device. Include all necessary accessories to permit gauging and sampling without venting gas to atmosphere. (REV 1)
17. Entire tank side wall and roof shall be insulated. (REV 1)
18. Locate filling and suction nozzles 180 degree apart to allow sufficient residence time for water settling and thermal equilibrium. (REV 1)
19. Flash point: -28℃ (REV 1)
20. One level indicator to indicate position of internal roof. One level indicator shall extend into the liquid to indicate interface liquid level. (REV 1)
21. Limit the inlet velocity to 3 ft/s(1 m/s) until inlet pipe is submerged. Add distributor at N1 nozzle as detail A (REV 1)
22. Painting code follows 22854-SP-000-X002. (REV 1)
23. This tank can contain an interface of hydrocarbons and solvents. Specific gravity@44℃ : upper : 0.637 ; lower : 1.240 (REV 1)
24. Set pressure : 14.48 mbar(g) Design Relief Rate : 17737.9 Nm3/hr Air. (REV 2)

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API 650 TANK DATA SHEET

Note: This data sheet has been modified from that in the annex of API Standard 650, Eleventh Edition.

Contract:	10E0541A01
Item No:	56-F-03
Revision:	2 Date: 09-Aug-2011
Unit:	56 - Sulfolane
P.O. No.:	
Document No.:	DS-56-FA-503
Sheet	4 of 10

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Table 3 Tank Nozzle and Manhole Schedule (for Roof, Shell, and Bottom)

MARK	SERVICE	SIZE, NPS OR DIA. (in)	FLANGE TYPE	FLANGE CLASS	PROJ, TO FF OR FROM DATUM LINE (mm)	PLAN ORIENT. DEG.	REMARKS	
N1	Inlet	3	RF	150				
N2-N3	Suction	4	RF	150				
N4	Pump Out	4	RF	150				
N5-N6	Tank Heater Nozzles (See Sheet 9)	4	RF	150			Heater supplied by tank supplier	1
N7	Drain	4	RF	150				2
N8	Nitrogen Blanketing	2	RF	150				2
J1-J2	Level Transmitter	1.5	RF	300			Note 20	1
J3	Level Transmitter	1.5	RF	300				
J4	PSV	2	RF	150			Conservation Vent, Note 14, 11	2
J5	Nitrogen Pressure	1	RF	150			With Davit	
J6	PSV	20"	RF	150			Emergency Pressure Vent, note 11, 24	2
M1	Manway (Roof)	24	RF	150			With Davit	
M2	Manway (Shell)	24	RF	150			With Davit	
M3	Floating Roof	24	RF	150				
N9	Gauging Hatch	8	RF	150			Note 16	1
J7	TI	1	RF	150				

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API 650 TANK DATA SHEET

Note: This data sheet has been modified from that in the annex of API Standard 650, Eleventh Edition.

Contract:	10E0541A01
Item No:	56-F-03
Revision:	2 Date: 09-Aug-2011
Unit:	56 - Sulfolane
P.O. No.:	
Document No.:	DS-56-FA-503
Sheet	5 of 10

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OTHER TANK APPURTENANCES

23 Platform, Stairway and Railing: Galvanizing Req'd.: ☐ No ■ Yes Stairway Style: Helical
Walk Surface Type: Grating Stair and Walkway Clearance Width: 750 mm
National Safety Standards: Arch./Struct. Spec.: Angle to horizontal maximum of 45 degr
Gauger's Platform Req'd.: ☐ No ■ Yes Qty. Req'd: Later Per Specification: Q03-S20, Note 10
24 Jackets and Other Heaters/Coolers: Jacket Req'd: ■ No ☐ Yes Jacket Construction: ☐ Integral ☐ Stand Alone
Type: ☐ Annular Cylinder ☐ Pipe Coil ☐ Half Pipe Helix ☐ Other:
How Attached: ☐ Welded ☐ Bolted
Supplemental Jacket Specification:
Other Heaters/Coolers: ☐ No ■ Yes Type: ■ Internal Coils ☐ Bayonet Exchanger ☐ Below Bottom Piping
☐ Other:
Specification for Other Heaters/Coolers: See Tank Heater Data Sheet DS-56-EA-519
Design Pressure: Internal: bar(g) Partial Vacuum: g Design Temp.: Max. °C Min. °C
25 Mixer/Agitator: Quantity: Size: Per Specification:
26 Insulation: Required: ☐ No ■ Yes Thickness: 40 mm (Note 17) Material: Mineral Wool with Jacket 1
Responsibility for Insulation and Installation: ■ Vendor ☐ Others: Per Spec.: 22854-SP-000-N-001, SN
27 Structural Attachments: Lifting Lugs: ■ No ☐ Yes Description:
Shell Anchorage: ☐ No ■ Yes Type: By Tank Supplier Scaffold Cable Support: ☐ No ☐ Yes
28 Various Other Items: Welded Flush-type: ☐ Shell Connection ☐ Cleanout Fitting Waive Application of Appendix P: ☐ No ☐ Yes
Miscellany #1 Miscellany #2
Miscellany #3 Miscellany #4
Miscellany #5 Miscellany #6

Table 4 OTHER TANK APPURTENANCES

MARK	QTY.	SERVICE OR DESCRIPTION	SIZE	ORIEN.	HEIGHT FROM DATUM (mm)	MATERIAL	REMARKS
PS-xx		Pipe Supports					Later
PG-xx		Pipe Guides					Later

ابن رشد ibn rushd FLUOR	API 650 TANK DATA SHEET Note: This data sheet has been modified from that in the annex of API Standard 650, Eleventh Edition.	Contract: 10E0541A01 Item No: 56-F-03 Revision: 2 Date: 09-Aug-2011 Unit: 56 - Sulfolane P.O. No.: Document No.: DS-56-FA-503 Sheet 6 of 10	سابك sabic CTCI CORPORATION

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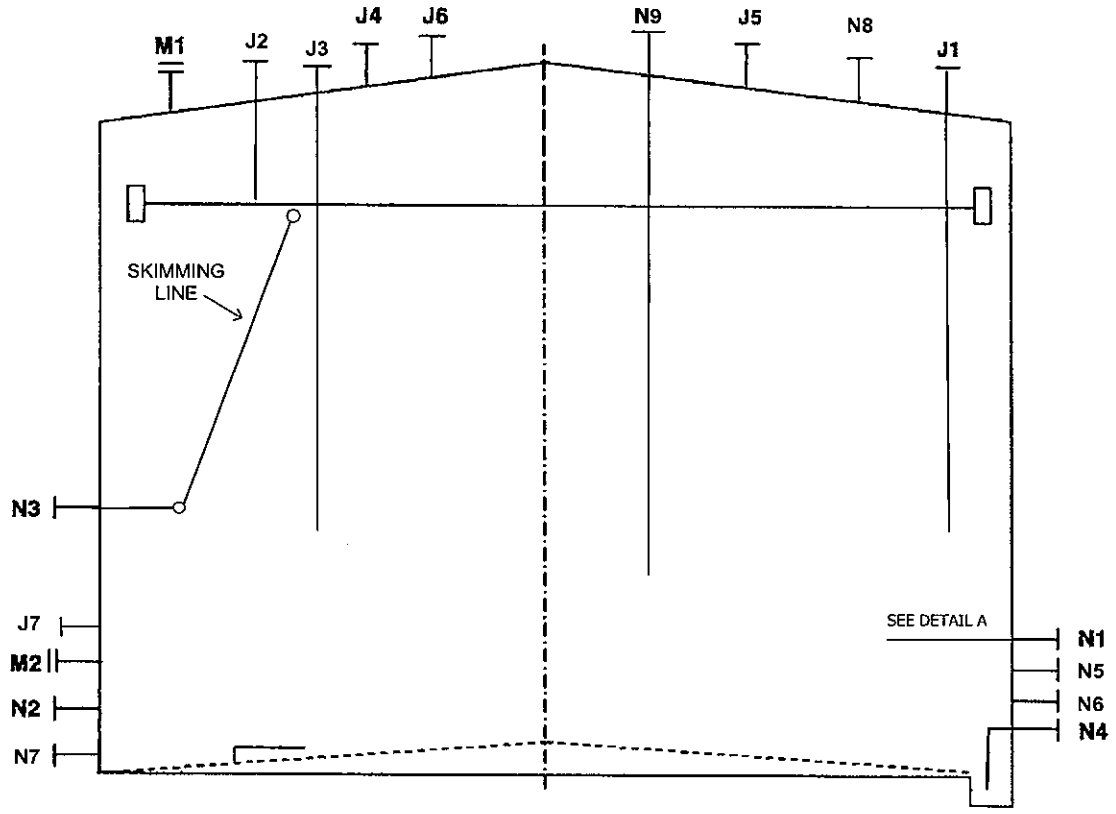
29 Tank Elevation Sketch

VESSEL DIMENSIONS: ID: 9500 mm Height: 9000 mm



Notes:

1. Add a overflow box on nozzle N3
2. Deleted.
3. Deleted.
4. This tank can contain an interface of hydrocarbons and solvents.
   A floating suction system shall be provided to allow pumping the top hydrocarbon layer.

2
1
2

5189

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API 650 TANK DATA SHEET

Note: This data sheet has been modified from that in the annex of API Standard 650, Eleventh Edition.

Contract:	10E0541A01
Item No:	56-F-03
Revision:	2 Date: 09-Aug-2011
Unit:	56 - Sulfolane
P.O. No.:	
Document No.:	DS-56-FA-503
Sheet	7 of 10

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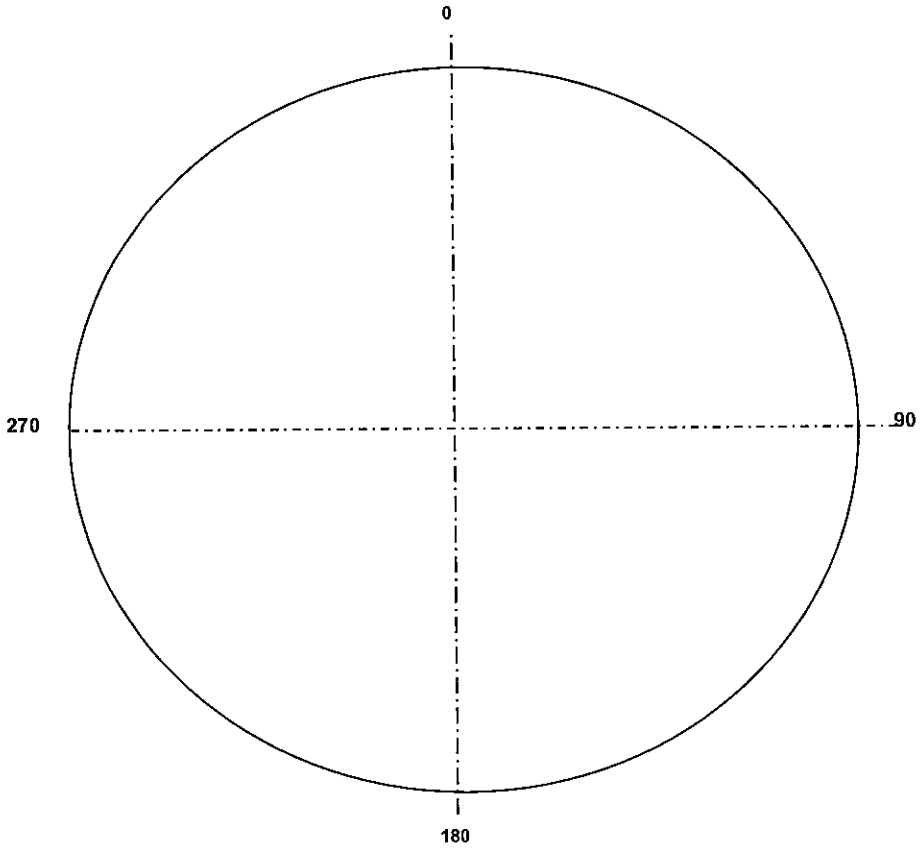
30 Tank Plan/Nozzle Orientation Sketch



Note:
Orientations will be furnished later

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API 650 TANK DATA SHEET

Note: This data sheet has been modified from that in the annex of API Standard 650, Eleventh Edition.

Contract:	10E0541A01
Item No:	56-F-03
Revision:	2 Date: 09-Aug-2011
Unit:	56 - Sulfolane
P.O. No.:	
Document No.:	DS-56-FA-503
Sheet	8 of 10

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FLOATING ROOF DATA

31 Roof Selection: Design Basis: ☐ Appendix C or ■ Appendix H Supplemental Spec.: 22854-SP-000-F-003 Section 8

Type of Roof: External: ☐ Single Deck Pontoon ☐ Double Deck
Internal: ■ Tubular Pontoon ☐ Metallic Sandwich Panel ■ Other: _____ Spec.: _____

32 Seals: Primary Seal: ☐ Shoe ☐ Envelope ☐ Wiper/Compression Plate ☐ Other: _____ Spec.: _____

Shoe Mechanism: ☐ Vendor's Standard ☐ Other: _____

Electrically Isolate Mechanism from Shoes: ☐ No ☐ Yes Wax Scrapers Required: ☐ No ☐ Yes

Minimum Shoe Thickness: _____ mm Carbon Steel Shoes to be Galvanized: ☐ No ☐ Yes

Secondary Seal: ☐ None ☐ Shoe ☐ Envelope ☐ Wiper ☐ Other Supplemental Spec.: _____

33 Data For All Floating Roofs:

Overflow Opening in Shell Acceptable: ■ No ☐ Yes Shell Extension: ☐ No ☐ Yes

Roof Drain Check Valves Required: ☐ No ☐ Yes Roof Drain Isolation Valves Required: ☐ No ☐ Yes

Freeze Protection for Roof Drains Required: ☐ No ☐ Yes Supplemental Requirements: _____

Roof Drain Piping to Ext. Nozzles: ☐ Vendor Std. ☐ Armored Flex. Pipe ☐ Swivils in Rigid Pipe ☐ Other: _____

Minimum Deck Thickness: _____ mm Foam Dam? ☐ No ☐ Yes Suppl. Spec.: _____

Bulkhead Top Edges to be Liquid Tight: ☐ No ■ Yes Seal Weld Underside of roof: ☐ No ☐ Yes

Electrical Bonding: Shunts: ☐ No ☐ Yes Cable: ☐ No ☐ Yes Suppl. Spec.: _____

Quantity of Non-Guide Pole Gauge Wells Required: _____ Quantity of Sample Hatches Required: _____

Guide Pole for Gauging: ☐ No ☐ Yes Datum Plates: ☐ No ☐ Yes

Slots in Guide Pole: ☐ No ☐ Yes Striking Plates: ☐ No ☐ Yes

Guide Pole Emissions Limiting Devices: ☐ Sliding Cover ☐ Pole Wiper ☐ Pole Sleeve ☐ Float ☐ Float Wiper ☐ Pole Cap

Qty. of Roof Manholes: _____ Min. High-Roof Clearance Above Bottom: Operating: 1600 mm Maintenance: 1600 mm

Removable Leg Storage: ☐ No ☐ Yes ☐ Leg Sleeves Or ☐ Fixed Low Legs

34 Additional Data For External Roof: Not Applicable

Weather Shield: ☐ No ☐ Yes Supplemental Specification: _____

Rolling Ladder: ☐ No ☐ Yes Field Adjustable Legs ☐ No ☐ Yes

Design Rainfall Intensity: _____ mm/hr Based on a _____ Minute Duration Associated with the _____ Storm

Design Accumulated 24-Hour Rainfall: _____ mm Based on the _____ Storm

Distortion and Stability Determinations Required: ☐ No ☐ Yes Supplemental Spec.: _____

Landed Live Load: _____ N

35 Additional Data For Internal Roof:

Two Position Leg: ☐ No ■ Yes Cable Supported Roof: ☐ No ☐ Yes Fixed Roof Inspection Hatches: ☐ No ■ Yes

Internal Roof Drain: ■ No ☐ Yes Omit Distribution Pads Supporting Uniform Live Loads: ☐ No ☐ Yes

Corrosion Gauge Rq'd.: ☐ No ☐ Yes Fixed Ladder Rq'd.: ☐ No ☐ Yes Type of Roof Vent: _____

Modified Minimum Point Load: ☐ No ☐ Yes Supplemental Specification: _____

Mfr. To Leak Test: _____ % of Compartments. ☐ In Assembly Yard ☐ In Erected Position ■ Unknown; see separate contract terms.

Roof Erector's Flotation Test: ☐ Not Required ☐ With Tank Hydrotest ☐ at Completion of Roof ■ at Later Date: After Tank Test

Flotation Test Media: ■ Water ☐ Product (see H.6.6.1) Water Quality: ■ Potable ☐ Other Suppl. Spec.: _____

Flotation Test: Duration: _____ hrs Fill Height: _____ mm

Flotation Test Items provided by Purchaser (see H.6.7): ☐ None ☐ List attached

Responsible Party for Inspecting Roof during Initial Fill: ☐ Purchaser ☐ Other:

Table 5 FLOATING ROOF MATERIALS

Component	Material/Thickness (mm)	C.A./Coating	Component	Material/Thickness (mm)	C.A./Coating
Deck Plate	CS /	1.6	Datum Plate	/	
Inner Rim Plate	/		Tubular Pontoon	/	
Outer Rim Plate	/		Pontoon Bulkhead	/	
Foam Dam	/		Submerged Pipe	/	
Sandwich Panel Face Pl.	/		Guide Pole	/	
Sandwich Panel Core	/		Secondary Seal	/	
Gauge Well	/		Secondary Seal Fabric	/	
Drain Sumps	/		Wiper Tip	/	
Opening Sleeves	/		Wax Scrapers Required	/	
Floating Suction Lines	/		Weather Seal	/	
Primary Fabric Seal	/		Envelope Fabric	/	
Foam Log Core	/		Shoe Mechanism	/	
Landing Legs	/		Primary Seal Shoe	/	
Landing Leg Bottom Pad	/		Removable Covers	/	
Manhole Necks	/		Rolling Ladder	/	
Vents	/		Inlet Diffusers	/	

5189

36 Heater Nozzle Sketch

Revision indication

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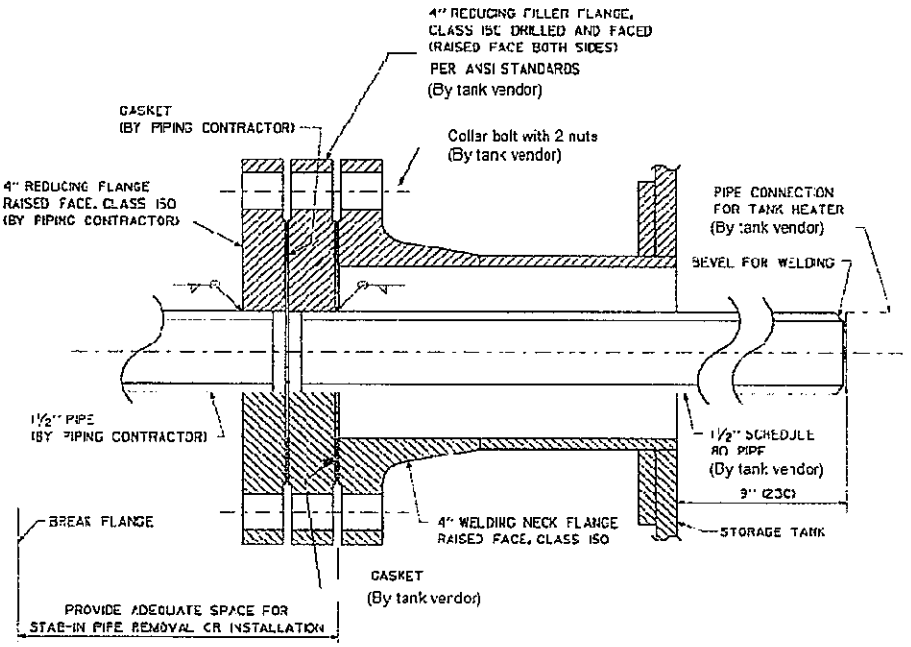
UOP A Honeywell Company

UOP LLC
25 East Algonquin Road
Des Plaines, Illinois 60017-5017, USA

STANDARD DRAWING
3-390-3

STORAGE TANK STEAM AND CONDENSATE NOZZLE

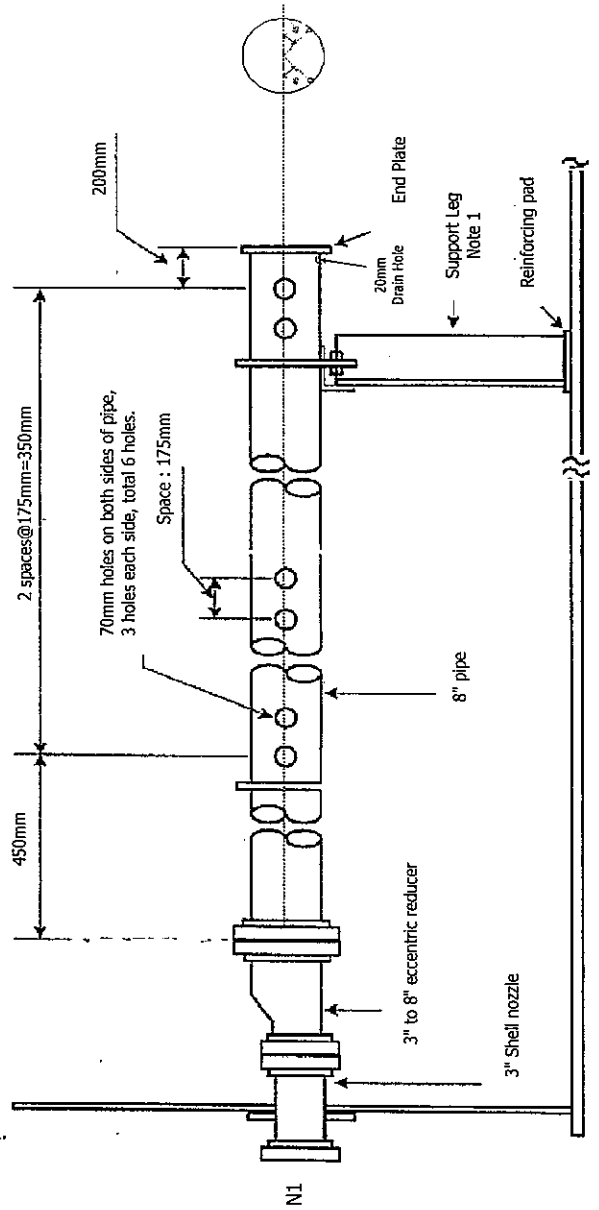
DATE	STATUS	APVD	AUTHD
31DEC08	REVISED	JLS	RQP



NOTES:

1. ALL INTERNAL STEAM AND CONDENSATE PIPING SHALL BE MADE OF KILLED CARBON STEEL, SCHEDULE 80 PIPE. (R)
2. DIMENSIONS SHOWN IN PARENTHESES ARE IN MILLIMETERS.
3. DETAILS, DIMENSIONS, AND NOTES IN UOP PROJECT SPECIFICATION-38-TANK HEATERS TAKE PRECEDENCE OVER THOSE SHOWN HEREON. (R)

DETAIL A



Note :

1. Support shall be confirmed by manufacturer.

2

2

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ARABIAN INDUSTRIAL FIBERS COMPANY

IR-II AROMATICS PROJECT

PROJECT NO. 10E0541A01

DOCUMENT TITLE:

TOLUENE COLUMN DATA SHEET

DOCUMENT NO:

DS-58-CA-502

REV	DESCRIPTION	BY	CHK.	APPR.	DATE
1	Issued For Design	CAG	CMW	YSL	31-Mar-11
0	Issue For Approval	CAG	CMW	YSL	9-Mar-11

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ARABIAN INDUSTRIAL FIBERS COMPANY YANBU, KINGDOM OF SAUDI ARABIA

CTCI CORPORATION

CERTIFIED

PROJ. MGR S P L for DATE 3/31/11

CLIENT _____ DATE _____

PAGE 1 OF 2

XC32A-58-502

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CONTENTS

Attachment total 1 page.

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COLUMN DATASHEET

Contract:	10E0541A01
Equip. No.:	58-C-02
Revision:	1 Date: 31-Mar.-2011
Unit:	58 - BT Fractionation
PO No.:	
Document No.:	DS-58-CA-502
Sheet:	1 of 2

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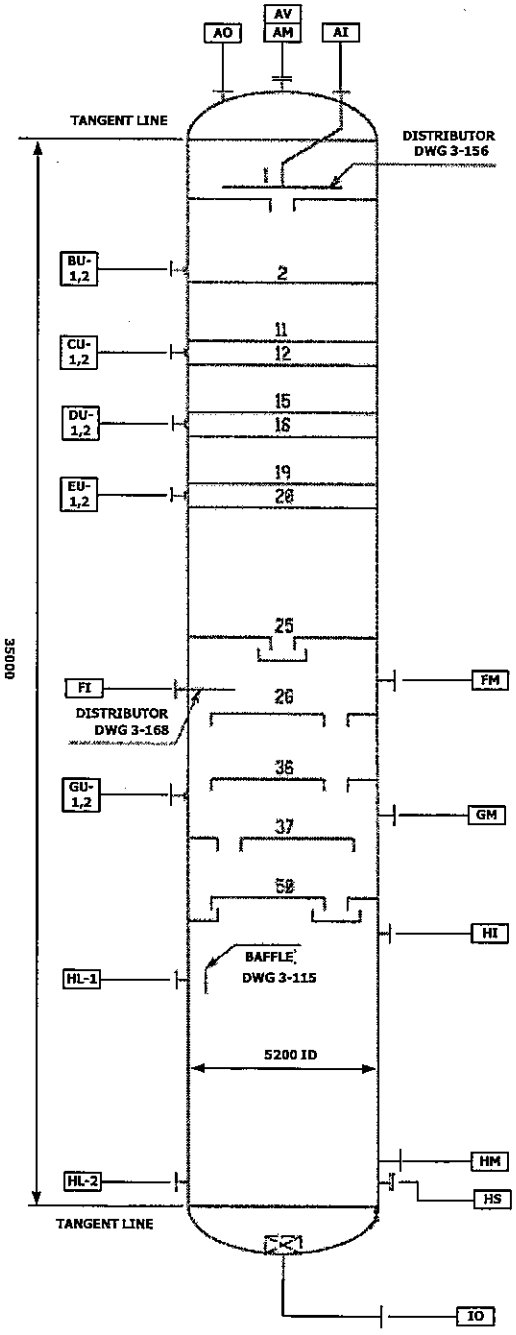
REV

Client: Arabian Industrial Fibers Company
Plant: BT Fractionation
Service: Toluene Column
Site: Yanbu, Kingdom of Saudi Arabia

DESIGN SKETCH

VESSEL DIMENSIONS ID: 5200 mm T/T: 35000 mm



DESIGN CONDITIONS

Pressure:	3.5	bar(g)	at	203	°C
Vacuum:	FV	bar(g)	at	175	°C
Min. Metal Temp:	9	°C	at	MAWP	bar(g)
Liquid Level:	Note1				mm
Specific Gravity of Liquid:	0.742		at		°C

OPERATING CONDITIONS

Pressure:	Note 2	bar(g)	at	Note 2	°C
Vacuum:	-	bar(g)	at	-	°C
Low Temperature:	-	°C	at	-	°C
Hydrogen Partial Press.	-	bar(a)	at	-	°C

INTERNALS & INSULATION

DESCRIPTION	Bulk Density kg/m³	Liquid Holdup vol%	Pressure Drop bar
Packing:			
Catalyst:			
Mist Eliminator:			

Insulation	40/50 mm	Hot ■	Cold ☐	
Fire Proofing	76 mm	Yes ■	No ☐	

CONSTRUCTION

	Materials	Corrosion Allowance
Shell:	SA-516-60	3 mm
Heads	SA-516-60	3 mm
Support		mm

SPECIAL CONDITIONS

Stress Relieve (Process Reason Only):	Yes ☐	No ☐
Vessel in Wet Sour Service:	Yes ☐	No ☐
Steamout Required:	Yes ■	No ☐

(kg)

EMPTY
OPERATING
FULL OF WATER

(mm)

TOP HEAD
SHELL / TRANSITION
BTM HEAD
SKIRT

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COLUMN DATASHEET

Contract:	10E0541A01
Equip. No.:	58-C-02
Revision:	1 Date: 31-Mar.-2011
Unit:	58 - BT Fractionation
PO No.:	
Document No.:	DS-58-CA-502
Sheet:	2 of 2

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NOZZLE SCHEDULE

Tag	Qty.	Size in	Pressure Rating	Description
AI	1	8	150# RFWN	REFLUX
AM	1	24	150# RFWN	MANWAY W/ B.F
AO	1	30	150# RFWN	VAPOR OUT
AV	1	3	150# RFFN	VENT
BU1-2	2	1 ID	150# RFLWN	TDRC-TI
CU 1-2	2	1 ID	150# RFLWN	TDRC-TI
DU 1-2	2	1 ID	150# RFLWN	TDRC-TI
EU 1-2	2	1 ID	150# RFLWN	TDRC-TI
FI	1	10	150# RFWN	FEED
FM	1	24	150# RFWN	MANWAY W/ B.F & DAVIT
GM	1	24	150# RFWN	MANWAY W/ B.F & DAVIT
GU 1-2	2	1 ID	150# RFLWN	TDRC-TI
HI	1	46	150# RFWN	REBOILER IN
HL 1-2	2	2	150# RFWN	LEVEL
HM	1	24	150# RFWN	MANWAY W/ B.F & DAVIT
HS	1	3	150# RFWN	STEAMOUT (Note 9)
IO	1	24	150# RFWN	BTMS OUT W/ VORTEX BREAKER

NOTES:

1. Normal liquid level (NLL) is 970 mm above bottom tangent line. HLL: 1336 mm, LLL: 726 mm.
2. Operating Pressure/Temperature=Top: 0.42 bar(g)/123°C; Bottom: 0.89 bar(g)/176°C.
3. Total pressure drop through column internals = 0.414 bar.
4. Vendor shall follow UOP standard 3-115, 3-122, 3-156, 3-168, 3-200.
5. Ladder & Platform Clips: as required.
6. Insulation Clips & Rings: Yes.
7. Vessel Support: Yes.
8. Vessel Heads=Top: 2:1 Elliptical; Bottom: 2:1 Elliptical.
9. Steamout at 150 (232 max.) °C and 3.5 (4.1 max.) bar (g).
10. Existing column, add blanking strips to existing trays (25% holes upper section / 30% holes lower section), Skirt 8500 mm.

CHIYODA CORPORATION

FOR RECORD

CLIENT	IBN RUSHD
PROJECT	PTA & AROMATICS -
TITLE	AROMATICS
JOB NO.	51046
DOC. NO.	DS-58-C-002 (1/1)

		REVISIONS			
MARK		①	②	③	④
APRD					
CHKD					
MADE	K. Nakashima	K Nak			
DATE	Nov. 26 '96	Jan. 29 '97			

UOP

25 East Algonquin Road • PO Box 5017 • Des Plaines, Illinois 60017-5017 • U.S.A.

VESSELS

PROJECT SPECIFICATION 560696 - 301 - 1 SHEET 4							
REV	DATE	BY	APP'D	REV	DATE	BY	APP'D
0	4/4/95	-					
1	9/21/95	S.MIZ	NK				

SERVICE: TOLUENE COLUMN — ITEM NO: 58-C-02 ~~C-5802~~

Design Conditions at Top	INT 3.5 BAR(g)	#203 °C
	EXT FULL VACUUM	0175 °C
	Metal Temperature(Min)	9 °C
Operating Conditions	TOP	120 °C
	BOTTOM	175 °C
Radiograph		NR
Postweld Heat Treat		NR
Joint Efficiency		NR X

(*) BY CONTRACTOR

Material Specifications

Heads	SA516-60
Shell	SA516-60 ①

	Thickness Required by Code-in.	Corrosion Allowance in. (Min)	
Shell		3	
Heads		3	

Vessel Heads

Top Head	2:1 ELLIPTICAL
Bottom Head	2:1 ELLIPTICAL

Accessories Applied by Fabricator

Ladder & Platform Clips	AS REQUIRED (*)
Insulation Clips & Rings	YES
Vessel Support	YES

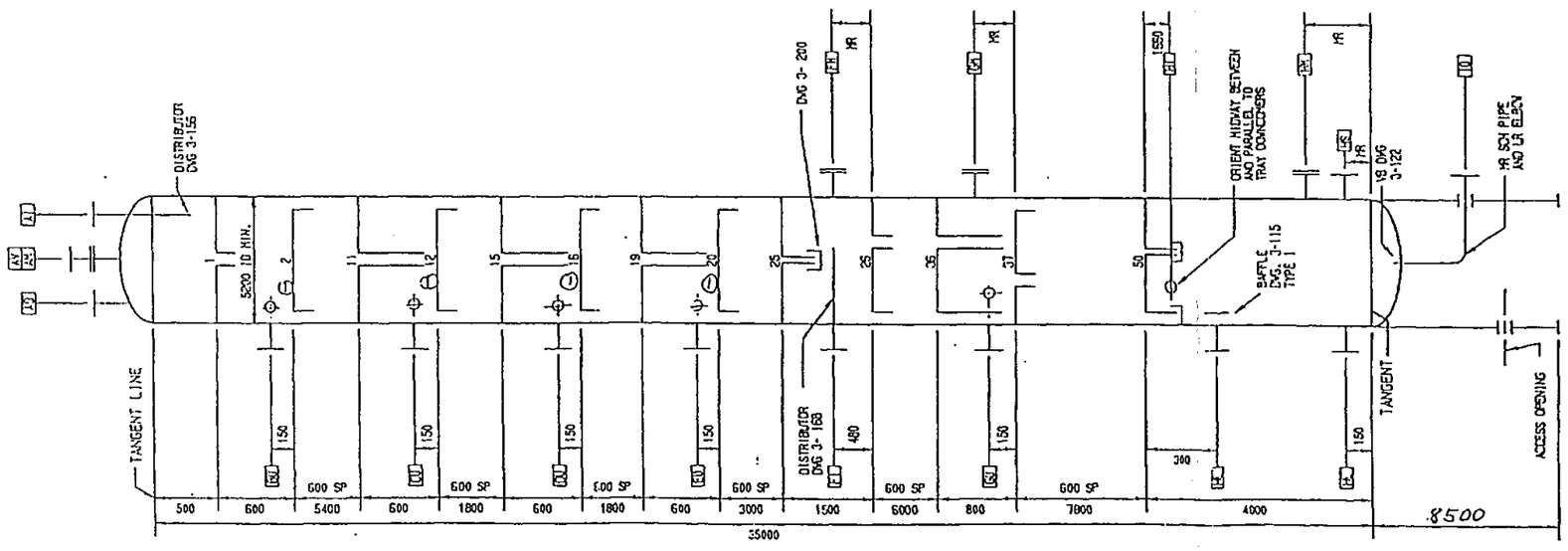
Nozzles and Manways

Mark	No	Size Inches	Service
AI	1	8	REFLUX
AM	1	24	MANWAY
AO	1	30	VAPOR OUT (*)
AV	1	3	VENT
BU	2	1	TORC-TI 10
CU	2	1	TORC-TI 10
DU	2	1	TORC-TI 10
EU	2	1	TORC-TI 10
FI	1	10	FEED
FM	1	24	MANWAY
GM	1	24	MANWAY
GU	2	1	TI 10
HI	1	46	REBOILER IN (*) (C)
IL	2	2	LEVEL
MM	1	24	MANWAY
MS	1	3	STEAMOUT
10	1	20	BTMS OUT

Class - ANSI CL150 (*) SHEET 2-NOTE A

Facing - RAISED FACE
(C) BEVEL FOR WELDING (OPTIONAL)

Normal Liquid Level = 570 MM ABOVE BOTTOM TANGENT
Specific Gravity = 0.742
Delta-P Trays (Total) = 0.41 BAR
NOZZLES MUST NOT BE LOCATED IN DOWNCOMERS



Drawings Referred to in this Specification

3-115-2	3-122-0	3-155-1	3-168-2	3-200-2				

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ARABIAN INDUSTRIAL FIBERS COMPANY

IR-II AROMATICS PROJECT

PROJECT NO. 10E0541A01

DOCUMENT TITLE:

TX OXYGEN STRIPPER RECEIVER

DOCUMENT NO:

DS-58-DA-503

REV	DESCRIPTION	BY	CHK.	APPR.	DATE
3	Revised as Marked	WCC	CMW	YSL	10-Nov-11
2	Revised as Marked	WCC	CMW	YSL	11-Aug-11
1	Issued for Design	WCC	CMW	YSL	26-Apr-11
0	Issue For Approval	WCC	CMW	YSL	9-Mar-11

ابن رشد ibn rushd

ARABIAN INDUSTRIAL FIBERS COMPANY YANBU, KINGDOM OF SAUDI ARABIA

CTCI CORPORATION

CERTIFIED

PROJ. MGR _____ DATE _____

CLIENT _____ DATE _____

PAGE 1 OF 2

XC32B-58-503

GN-502 84.10

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CONTENTS

ابن رشد ibn rushd FLUOR

HORIZONTAL VESSEL DATA SHEET

Contract:	10E0541A01
Equip. No.:	58-D-03
Revision :	3 Date : 14-Nov.-2011
Unit :	58 - Benzene Toulene Fract
P.O. No.:	
Document No.	DS-58-DA-503
Sheet	1 of 2

سابك sabic

CTCI CORPORATION

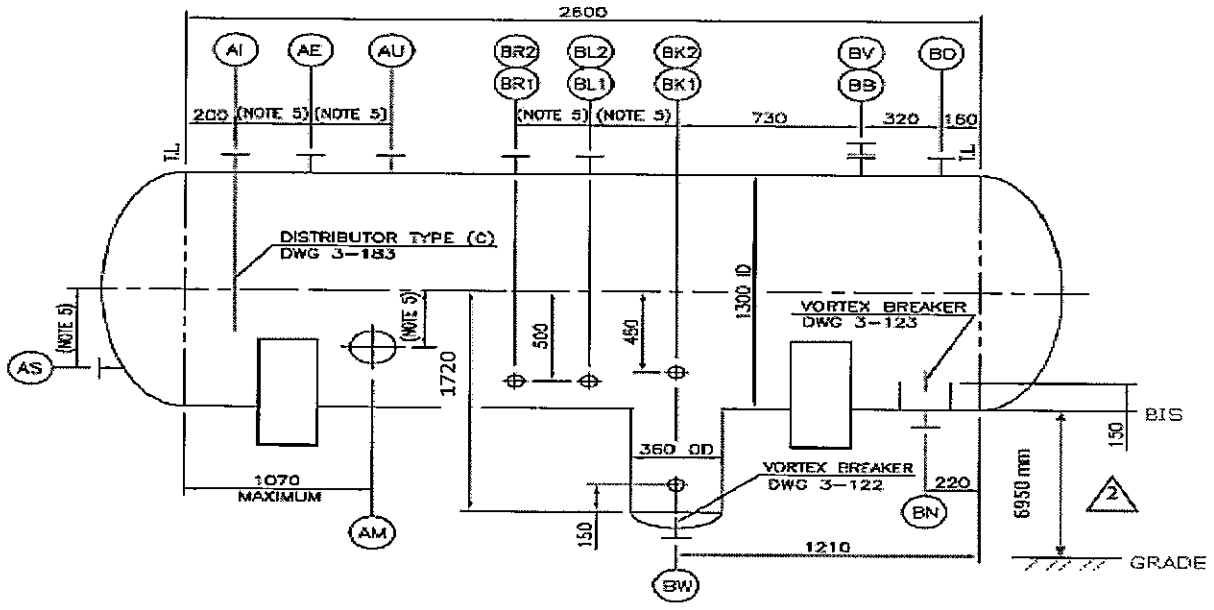
REV

Client: Arabian Industrial Fibers Company (Ibn Rushd) Plant: Benzene Toulene Fract

Service: TX Oxygen Stripper Receiver Site: Yanbu, Kingdom of Saudi Arabia

DESIGN SKETCH

VESSEL DIMENSIONS: ID: 1300 T/T: 2600



DESIGN CONDITIONS

Pressure:	7.0	bar(g)
At:	120	°C
Vacuum:	FV	bar(g)
At:	120	°C
Min. Design Metal Temp:	6	°C
At:	MAWP	bar(g)
Liquid Level:	(Note 4) (Note 14)	mm
Specific Gravity of Liquid:	0.834	

OPERATING CONDITIONS

Pressure + :	3.1(Note 5)	bar(g)
At:	52	°C
Vacuum - :		bar(g)
At:		°C
Low Temperature:		°C
At:		bar(g)
Hydrogen Partial Pressure:		bar(g)
At:		°C

INSULATION

Type:	n/a
Req'd Thickness:	n/a
Fireproofing:	n/a

CONSTRUCTION

MATERIALS		CORROSION ALLOWANCE		REV
Shell:	SA-516-70N(K.C.S)	(Note 7)	mm	3
Internals:	C.S.	n/a	mm	
Lining/Cladding:	n/a	n/a	mm	
Head	SA-516-70N(K.C.S)	(Note 7)	mm	3
Boot	SA-516-70N(K.C.S)	(Note 7)	mm	3

INTERNALS

DESCRIPTION	BULK DENSITY kg/m³	LIQUID HOLDUP Vol. %	ΔP bar	REV
Packing/Tray:	n/a	n/a	n/a	0
Catalyst:	n/a	n/a	n/a	
Mist Eliminator:	n/a	n/a	n/a	

REV 0

NOTES & SPECIAL CONDITIONS

Stress Relieve (Process Reason Only):	No
Vessel In Special Service:	
Steamout Required:	Yes

ابن رشد
ibn rushd
FLUOR

HORIZONTAL VESSEL DATA SHEET

Contract:	10E0541A01
Equip. No.:	58-D-03
Revision :	3 Date : 14-Nov.-2011
Unit :	58 - Benzen Toulene Fract
P.O. No. :	
Document No.	DS-58-DA-503
Sheet :	2 of 2

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CTCI CORPORATION

REV

NOZZLE SCHEDULE

TAG	QTY	SIZE in	PRESSURE RATING	DESCRIPTION	REV
AE	1	1-1/2	150# RFLWN	EQUALIZING	
AI	1	3	150# RFWN	INLET	
AM	1	24	150# RFWN	MANWAY W/ DAVIT	
AS	1	2	150# RFLWN	STEAMOUT(NOTE 12)	0
AU	1	3	300# RFWN	**RELIEF**	3
BB	1	4	150# RFWN	VENTILATION	
BK1	1	2	300# RFLWN	LEVEL	
BK2	1	2	300# RFLWN	LEVEL	
BL1	1	2	300# RFLWN	LEVEL	
BL2	1	2	300# RFLWN	LEVEL	
BN	1	4	150# RFWN	OUTLET	
BR1	1	1-1/2	150# RFLWN	LEVEL ALARM	
BR2	1	1-1/2	150# RFLWN	LEVEL ALARM	
BO	1	2	150# RFLWN	OUTLET	0
BV	1	2	150# RFLWN	VENT	
BW	1	2	150# RFLWN	OUTLET	

NOTES:

1. One vessel required with mark no. 58-D-03. — 0
2. Estimated thicknesses listed below are estimate based on the ASME Code requirements and are meant to be used for quotation purposes only. — 2
3. Dimensions are in millimeter unless otherwise noted.
4. Vessel shall have a Normal Liquid Level (**NLL**) hold-up 20 mm above vessel centerline. HLL : 777 mm, LLL : 563 mm. — 0
5. The process design is to be checked and revised as necessary by CTCI during detailed design before issuing approved for purchase. — 0
6. Applicable specifications: IRII-SP-000-A-K007, 22854-SP-000-A-003, 22854-SP-000-A-004, 22854-SP-000-D-001, 22854-SP-000-W-22854-SP-000-W-002, 22854-SP-000-W-003, P01-E07, T01-S01, 3-11.
7. Corrosion Allowance (**C.A.**) shall be as follows:
   Main shell/head C.A. = 3.0 mm **Boot shell/head C.A. = 6.0 mm**
8. Vessel and boot heads are 2:1 Elliptical. — 0
9. Paint coating shall be in accordance with SES-PCS-3.
10. Following UOP standards apply: 3-122, 3-123 and 3-183.
11. ASME code stamp is required.
12. Steamout at 150(232 max.)℃ and 3.5(4.1max.) bar(g) — 0
13. New vessel, with boot 360 mm OD x 1070 mm. — 0
14. Boot interface liquid level : HLL : 1032 mm, LLL : 748 mm. — 0

THE ESTIMATED MECHANICAL WEIGHTS	(kg)
FABRICATED	2070
EMPTY	2570
OPERATING	4430
FULL OF WATER	6720

— 2

THE ESTIMATED WALL THICKNESS	(mm)
SHELL	9
HEADS	7

— 2

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ARABIAN INDUSTRIAL FIBERS COMPANY

IR-II AROMATICS PROJECT

PROJECT NO. 10E0541A01

DOCUMENT TITLE:

RAFFINATE COLUMN RECEIVER DATA SHEET

DOCUMENT NO:

DS-53-DA-505

REV	DESCRIPTION	BY	CHK.	APPR.	DATE
2	Revised As Marked	KCK	CBC	YSL	11-Aug-11
1	Issued For Design	KCK	CBC	YSL	26-Apr-11
0	Issue For Approval	KCK	CMW	YSL	9-Mar-11

ابن رشد
ibn rushd

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PROJ. MGR _____ DATE _____

CLIENT _____ DATE _____

XC32B-53-505

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CONTENTS

Attachment total 1 page.

55280

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FLUOR.

HORIZONTAL VESSEL

Contract:	10E0541A01
Equip. No.:	53-D-05
Revision :	2 Date : 11-Aug.-2011
Unit :	53 - Parex
P.O. No.:	
Document No.	DS-53-DA-505
Sheet	1 of 2

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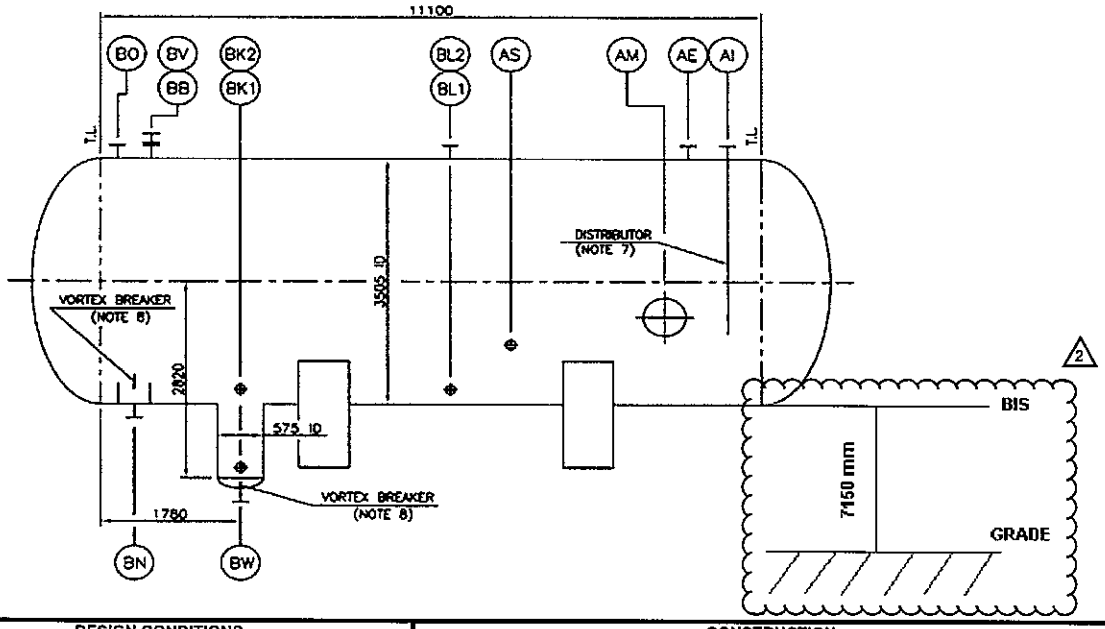
CTCI CORPORATION

REV

Client: Arabian Industrial Fibers Company
Plant: Parex
Service: Raffinate Column Receiver
Site: Yanbu, Kingdom of Saudi Arabia

DESIGN SKETCH

VESSEL DIMENSIONS: ID: 3505 T/T: 11100



DESIGN CONDITIONS

Pressure:	4.5	bar(g)
At:	215	℃
Vacuum:	FV	bar(g)
At:	60	℃
Min. Design Metal Temp:	9 (Note 11)	℃
At:	MAWP	bar(g)
Maximum Liquid Level:	(Note 4, 9)	mm
Specific Gravity of Liquid:	0.826	

OPERATING CONDITIONS

Pressure + :	0.07	bar(g)
At:	66	℃
Vacuum - :		bar(g)
At:		℃
Low Temperature:		℃
At:		bar(g)
Hydrogen Partial Pressure:		bar(a)
At:		℃

INSULATION

Type:	Hot
Req'd Thickness:	40 mm
Fireproofing:	Yes (75 mm)

CONSTRUCTION

MATERIALS		CORROSION ALLOWANCE	
Shell:	SA-516-70	3	mm
Internals:	C.S.	n/a	mm
Lining/Cladding:	n/a	n/a	mm
Head	SA-516-70	3	mm
Boot	SA-516-70	6	mm

REV: 0

INTERNALS

DESCRIPTION	BULK DENSITY kg/m³	LIQUID HOLDUP Vol. %	ΔP bar
Packing/Tray:	n/a	n/a	n/a
Catalyst:	n/a	n/a	n/a
Mist Eliminator:	n/a	n/a	n/a

REV: 0

NOTES & SPECIAL CONDITIONS

Stress Relieve (Process Reason Only):	No
Vessel In Special Service:	
Steamout Required:	Yes (Design for FV)

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FLUOR

HORIZONTAL VESSEL DATA SHEET

Contract:	10E0541A01
Equip. No.:	53-D-05
Revision :	2 **Date :** 11-Aug.-2011
Unit :	53 - Parex
P.O. No. :	
Document No.	DS-53-DA-505
Sheet :	2 of 2

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NOZZLE SCHEDULE

TAG	QTY	SIZE in	PRESSURE RATING	DESCRIPTION	REV
AE	1	3	150# RFWN	EQUALIZING	
AI	1	12	150# RFWN	INLET W/ INLET PIPE	
AM	1	20	150# RFWN	MANWAY W/ DAVIT	
AS	1	2	150# RFWN	STEAMOUT **(Note 10)**	0
BB	1	8	150# RFWN	VENTILATION W/ BLIND	
BK1	1	1-1/2	150# RFLWN	LEVEL	
BK2	1	1-1/2	150# RFLWN	LEVEL	
BL1	1	2	300# RFWN	LEVEL - LLS	
BL2	1	2	300# RFWN	LEVEL - LLS	
BN	1	12	150# RFWN	OUTLET W/ VORTEX BREAKER	
BO	1	4	150# RFWN	VAPOR OUTLET	
BV	1	2	150# RFWN	VENT	
BW	1	2	150# RFWN	OUTLET W/ VORTEX BREAKER	

NOTES:

1) This vessel tag number **53-D-05** is an existing vessel in the same service. The only change is higher design pressure. — 0
   Existing design condition: 3.9 bar(g) @ 215 °C, new design condition: 4.5 bar(g) @ 215 °C. — 0
2) Based on vessel fabricator's calculations and MAWP (MAWP 6.5 bar(g) hot and corroded), the vessel is satisfactory for the higher design pressure. **CTCI** to verify the available thickness after evaluating maintenance records and performing UT testing and confirm. — 0
   CTCI to vessel is satisfactory provide necessary ASME code documentation for the repair "R" stamp and new nameplate. — 0
3) Dimensions are in millimeter unless otherwise noted.
4) Vessel shall have a Normal Liquid Level (NLL) hold-up to vessel centerline. **Liquid level: HLL = 2299 mm, LLL = 1201 mm.** — 0
5) Vessel heads **and boot** are 2:1 Elliptical. — 0
6) For nozzle elevation and orientation refer to vendor certified drawing no. D96-4754101 (Sheet 1 of 8) Rev.4 dated 6/10/97.
7) For details of distributor refer to vendor certified drawing no. D96-4754101 (Sheet 4 of 8) Rev.2 dated 4/2/97.
8) For details of vortex breaker refer to vendor certified drawing no. D96-4754101 (Sheet 2 of 8) Rev.3 dated 6/10/97.
9) **Boot interface liquid level: HLL = 997 mm, LLL = 783 mm.** — 0
10) **Steamout at 150 (232 max.) °C and 3.5 (4.1 max.) bar (g).** — 0
11) **The Min. Design Ambient Temperature should be 6 °C.** — 0

WEIGHTS ARE BASED ON VENDOR CERTIFIED DRAWING No. D96-4754101 (SHT. 3 of 8) REV.4 DATED 4/2/97	**(kg)**
EMPTY	28818
OPERATING	79618
FULL OF WATER	151363

THICKNESS ARE BASED ON VENDOR CERTIFIED DRAWING No. D96-4754101 (SHT. 1 of 8) REV.4 DATED 6/10/97	**(mm)**
SHELL	13
HEADS	13

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CTCI CORPORATION

CHIYODA CORPORATION

CLIENT : IBN RUSHD
PROJECT PTA & AROMATICS -
TITLE : AROMATICS
JOB NO. : 51046
DOC. NO.: D5-53-D-0050 (1)

		REVISIONS			
MARK		①	②	③	④
APRD			T.N.S		
CHKD					
MADE	K. Nakashima	K. Tsuka	K. Tsuka		
DATE	May.09 '96	June 24'96	Feb.03'97		

FOR RECORD

UOP

25 East Algonquin Road • PO Box 5017 • Des Plaines, Illinois 60017-5017 • U.S.A.

VESSELS

PROJECT SPECIFICATION 560691 - 301 - 0 SHEET 9

REV	DATE	BY	APP'D	REV	DATE	BY	APP'D
0	6-16-93						

SERVICE: RAFFINATE COLUMN RECEIVER — ITEM NO: ~~D-5305~~ 53-D-05

Design Conditions at Top	INT 3.9 BAR (g) @215°C	(*) BY CONTRACTOR
	EXT FULL VACUUM @ 60°C	
	Metal Temperature (Min) 9°C	
Operating Conditions	60°C	
	°C	
Radiograph	MR	
Postweld Heat Treat	MR	
Joint Efficiency	MR %	

Material Specifications

Heads	SA516-70 (2)
Shell	SA516-70 (1)
Drop Leg	SA516-70 (1)
D.L. Head	SA516-70 (1)

Shell	Thickness Required by Code-mm.	Corrosion Allowance mm. (Min)	
VESSEL		3	
DROP LEG		6	
Heads			
VESSEL		3	
DROP LEG		6	

Vessel Heads

Vessel	2:1 ELLIPTICAL
Drop Leg	2:1 ELLIPTICAL

Accessories Applied by Fabricator

Ladder & Platform Clips	AS REQUIRED (*)
Insulation Clips & Rings	YES
Vessel Support	YES

Nozzles and Manways

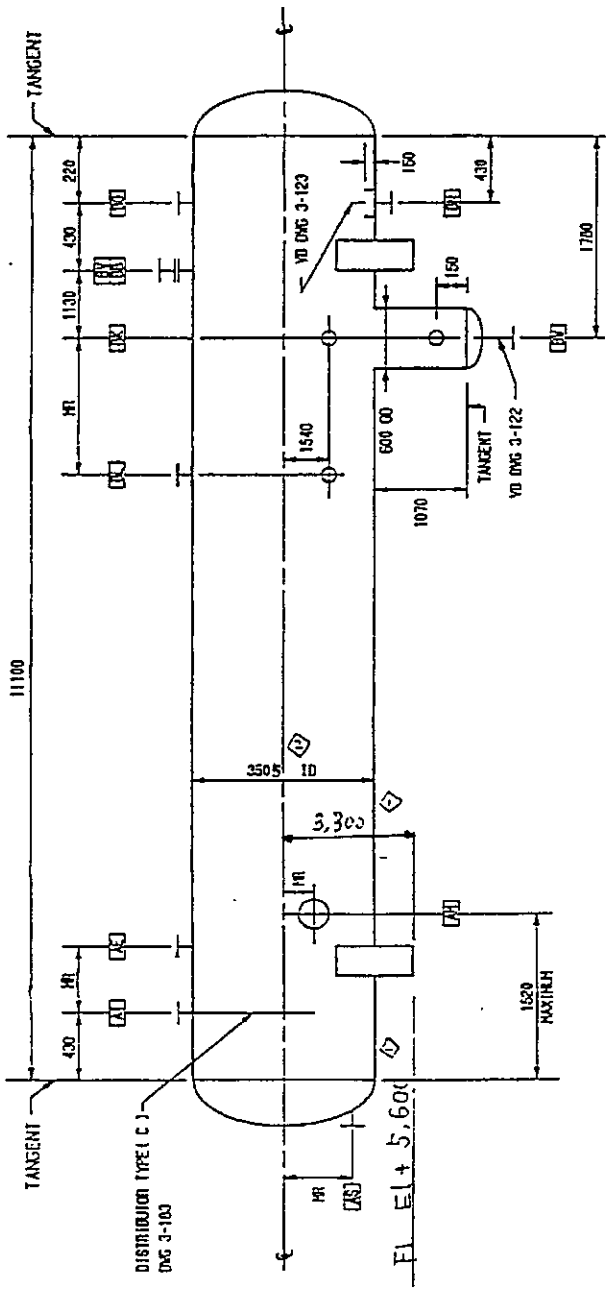
Mark	No	Size Inches	Service	
AE	1	3	EQUALIZING	
AI	1	12	INLET	
AM	1	20 ①	MANWAY	
AS	1	2	STEAMOUT	
BB	1	8	VENTILATION	
BK	2	1 1/2	LEVEL	
BL	2	2	LEVEL-LLS	(2)
BN	1	12	OUTLET	
BO	1	4	VAPOR OUTLET	
BV	1	2	VENT	
BW	1	2	OUTLET	

Class - ANSI CL150
(2) ANSI CL300

Facing - RAISED FACE

Normal Liquid Level = VESSEL CENTERLINE

Specific Gravity = 0.832



Drawings Referred to in this Specification

3-122-0	3-123-0	3-183-0	3-317-1			

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ARABIAN INDUSTRIAL FIBERS COMPANY

IR-II AROMATICS PROJECT

PROJECT NO. 10E0541A01

DOCUMENT TITLE:

EXTRACT COLUMN RECEIVER DATA SHEET

DOCUMENT NO:

DS-53-DA-508

REV	DESCRIPTION	BY	CHK.	APPR.	DATE
2	Revised As Marked	KCK	CBC	YSL	11-Aug-11
1	Issued For Design	KCK	CBC	YSL	28-Apr-11
0	Issue For Approval	KCK	CBC	YSL	9-Mar-11

ابن رشد ibn rushd

ARABIAN INDUSTRIAL FIBERS COMPANY YANBU, KINGDOM OF SAUDI ARABIA

CTCI CORPORATION

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PROJ.

MGR _____ DATE _____

CLIENT _____ DATE _____

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CONTENTS

Attachment total 1 page.

55280

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HORIZONTAL VESSEL DATA SHEET

Contract:	10E0541A01
Equip. No.:	53-D-08
Revision :	2 Date : 11-Aug.-2011
Unit :	53 - Parex
P.O. No.:	
Document No.	DS-53-DA-508
Sheet	1 of 2

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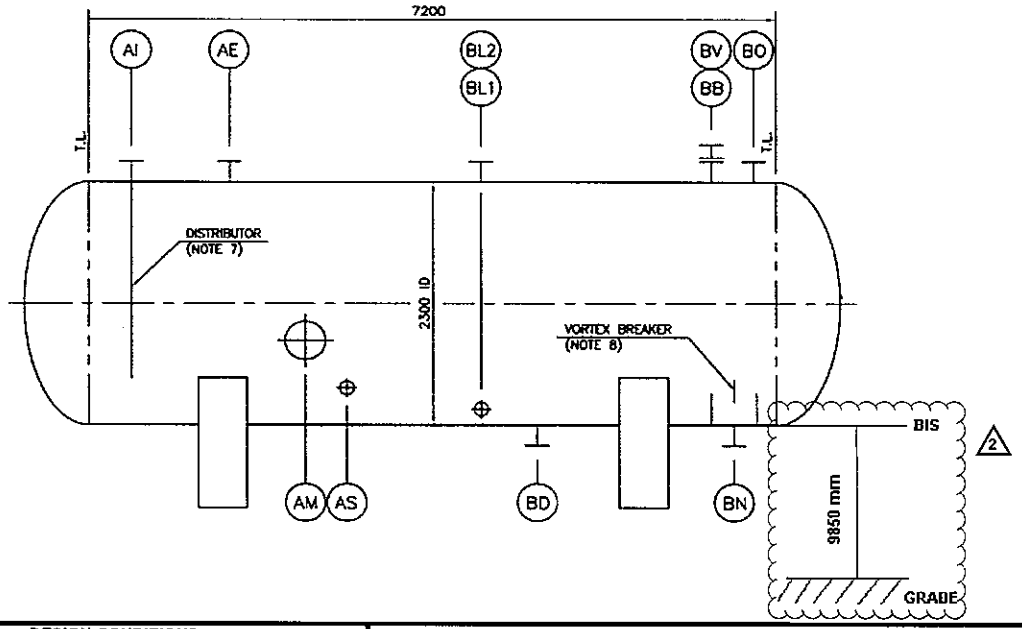
CTCI CORPORATION

REV

Client: Arabian Industrial Fibers Company
Plant: Parex
Service: Extract Column Receiver
Site: Yanbu, Kingdom of Saudi Arabia

DESIGN SKETCH

VESSEL DIMENSIONS: ID: 2300 T/T: 7200



DESIGN CONDITIONS

Pressure:	4.5	bar(g)
At:	215	℃
Vacuum:	FV	bar(g)
At:	121	℃
Min. Design Metal Temp:	9 (Note 10)	℃
At:	MAWP	bar(g)
Maximum Liquid Level:	(Note 4)	mm
Specific Gravity of Liquid:	0.770	

OPERATING CONDITIONS

Pressure + :	0.07	bar(g)
At:	121	℃
Vacuum - :		bar(g)
At:		℃
Low Temperature:		℃
At:		bar(g)
Hydrogen Partial Pressure:		bar(a)
At:		℃

INSULATION

Type:	Hot
Req'd Thickness:	40 mm
Fireproofing:	Yes (75 mm)

CONSTRUCTION

MATERIALS		CORROSION ALLOWANCE	
Shell:	SA-516-70	3	mm
Internals:	C.S.	n/a	mm
Lining/Cladding:	n/a	n/a	mm
Head	SA-516-70	3	mm

0

INTERNALS

DESCRIPTION	BULK DENSITY kg/m³	LIQUID HOLDUP Vol. %	ΔP bar
Packing/Tray:	n/a	n/a	n/a
Catalyst:	n/a	n/a	n/a
Mist Eliminator:	n/a	n/a	n/a

NOTES & SPECIAL CONDITIONS

Stress Relieve (Process Reason Only):	No
Vessel In Special Service:	
Steamout Required:	Yes (Design for FV)

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HORIZONTAL VESSEL DATA SHEET

Contract:	10E0541A01
Equip. No.:	53-D-08
Revision :	2 Date : 11-Aug.-2011
Unit :	53 - Parex
P.O. No. :	
Document No.	DS-53-DA-508
Sheet :	2 of 2

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CTCI CORPORATION

REV

NOZZLE SCHEDULE

TAG	QTY	SIZE in	PRESSURE RATING	DESCRIPTION	REV
AE	1	3	150# RFWN	EQUALIZING	
AI	1	10	150# RFWN	INLET W/ INLET PIPE	
AM	1	20	150# RFWN	MANWAY W/ DAVIT	
AS	1	2	150# RFWN	STEAMOUT (Note 9)	0
BB	1	6	150# RFWN	VENTILATION W/ BLIND	
BD	1	2	150# RFWN	DRAIN	
BL1	1	2	300# RFWN	LEVEL - LLS	
BL2	1	2	300# RFWN	LEVEL - LLS	
BN	1	10	150# RFWN	OUTLET W/ VORTEX BREAKER	
BO	1	3	150# RFWN	OUTLET	
BV	1	2	150# RFWN	VENT	

NOTES:

1) This vessel tag number 53-D-08 is an existing vessel in the same service. The only change is higher design pressure. Existing design condition: 3.9 bar(g) @ 215 °C, new design condition: 4.5 bar(g) @ 215 °C. — REV 0, 0
2) Based on vessel fabricator's calculations and MAWP (MAWP 6.5 bar(g) hot and corroded), the vessel is satisfactory for the higher design pressure. CTCI to verify the available thickness after evaluating maintenance records and performing UT testing and confirm. CTCI to vessel is satisfactory provide necessary ASME code documentation for the repair "R" stamp and new nameplate. — REV 0, 0
3) Dimensions are in millimeter unless otherwise noted.
4) Vessel shall have a Normal Liquid Level (NLL) hold-up to vessel centerline. Liquid Level: HLL = 1516 mm, LLL = 784 mm. — REV 0
5) Vessel heads are 2:1 Elliptical
6) For nozzle elevation and orientation refer to vendor certified drawing no. DA-7034-26-001 Rev.3 dated 7/7/97.
7) For details of distributor refer to vendor certified drawing no. DA-7034-26-001 Rev.3 dated 7/7/97.
8) For details of vortex breaker refer to vendor certified drawing no. DA-7034-26-001 Rev.3 dated 7/7/97.
9) Steamout at 150 (232 max.) °C and 3.5 (4.1 max.) bar (g). — REV 0
10) The Min. Design Ambient Temperature should be 6 °C. — REV 0

WEIGHTS ARE BASED ON VENDOR CERTIFIED DRAWING No. DA-7034-26-001 REV 3 DATED 7/7/97	(kg)
EMPTY	8500
OPERATING	23100
FULL OF WATER	43500
THICKNESS ARE BASED ON VENDOR CERTIFIED DRAWING No. DA-7034-26-001 REV 3 DATED 7/7/97	**(mm)**
SHELL	12
HEADS	15

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55280

CTCI CORPORATION

CHIYODA CORPORATION

FOR RECORD

CLIENT	: IBN RUSHD
PROJECT	PTA & AROMATICS -
TITLE	: AROMATICS
JOB NO.	: 51046
DOC. NO.	: DS-53-D-008 (Y1)

REVISIONS		①	②	③	④
MARK					
APRD	[signature]	[signature]	[signature]		
CHKD	[signature]	[signature]	[signature]		
MADE	K. [signature]	K. [signature]	K. [signature]		
DATE	May 08 '96	May 24 '96	Feb 03 '97		

uop

25 East Algonquin Road • PO Box 5017 • Des Plaines, Illinois 60017-5017 • U.S.A.

VESSELS

PROJECT SPECIFICATION 560891 - 301 - 0 SHEET 12

REV	DATE	BY	APP'D	REV	DATE	BY	APP'D
0	6-16-95						

SERVICE: EXTRACT COLUMN RECEIVER

ITEM NO: ~~D-xxxx~~ 53-D-08

Design Conditions at Top	INT 3.9 BAR (g)	@215 °C
	EXT FULL VACUUM	@121 °C
	Metal Temperature (Min)	9 °C
Operating Conditions		121 °C
		°C
Radiograph		MR
Postweld Heat Treat		MR
Joint Efficiency		MR %

(*) BY CONTRACTOR

Material Specifications	
Heads	SA516-70 ②
Shell	SA516-70

Shell	Thickness Required by Code-mm.	Corrosion Allowance mm. (Min)
		3
Heads		
		3

Vessel Heads	
Vessel	2:1 ELLIPTICAL
Drop Leg	

Accessories Applied by Fabricator	
Ladder & Platform Clips	AS REQUIRED (*)
Insulation Clips & Rings	YES
Vessel Support	YES

Nozzles and Manways

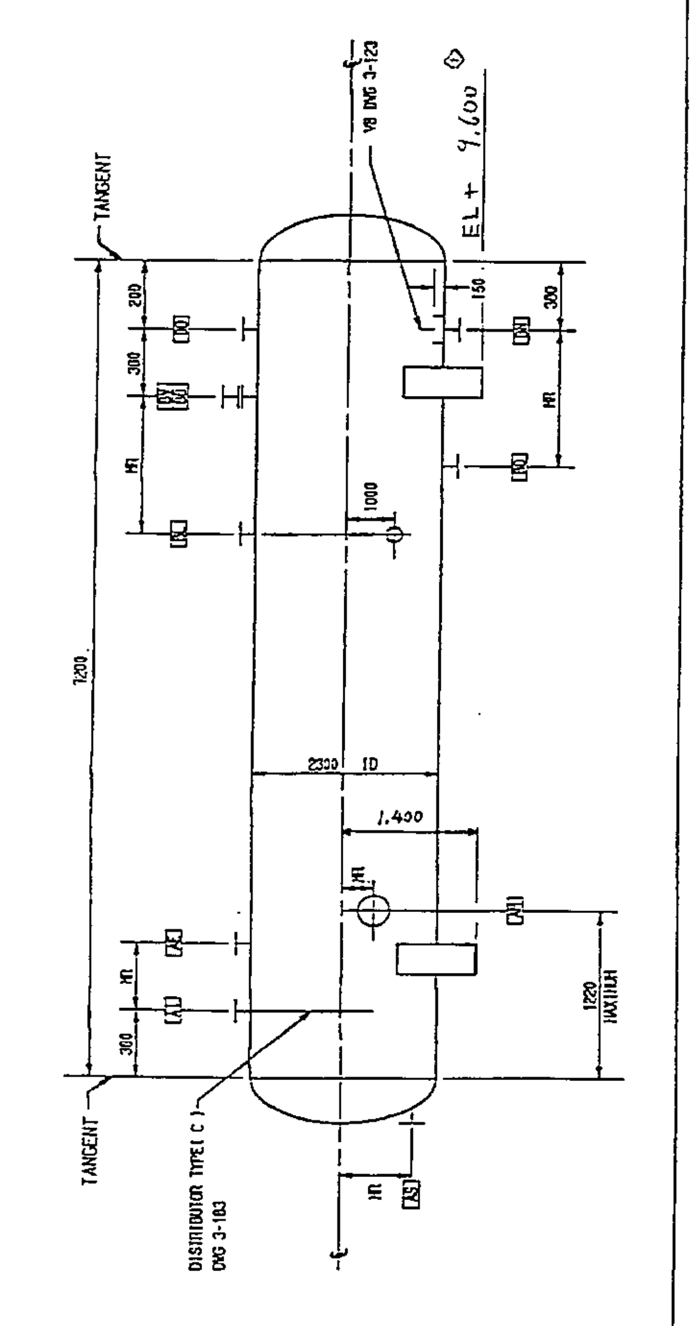
Mark	No	Size Inches	Service
AE	1	3	EQUALIZING
AI	1	10 ①	INLET
AM	1	20	MANWAY
AS	1	2	STEAMOUT
BB	1	6	VENTILATION
BD	1	2	DRAIN
BL	2	2	LEVEL-LLS (2)
BN	1	10	OUTLET
BO	1	3	OUTLET
BV	1	2	VENT

Class - ANSI CL150
(2) ANSI CL300

Facing - RAISED FACE

Normal Liquid Level = VESSEL CENTERLINE

Specific Gravity = 0.769



Drawings Referred to in this Specification

3-123-0	3-163-0	3-317-1				

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سابك
sabic

ARABIAN INDUSTRIAL FIBERS COMPANY

IR-II AROMATICS PROJECT

PROJECT NO. 10E0541A01

DOCUMENT TITLE:

FINISHING COLUMN RECEIVER DATA SHEET

DOCUMENT NO:

DS-53-DA-510

						ابن رشد ibn rushd	ARABIAN INDUSTRIAL FIBERS COMPANY YANBU, KINGDOM OF SAUDI ARABIA	CTCI CORPORATION
						CERTIFIED		
2	Revised As Marked	KCK	CBC	YSL	11-Aug-11	PROJ.		
1	Issued For Design	KCK	CBC	YSL	26-Apr-11	MGR _____ DATE _____		
0	Issue For Approval	KCK	CBC	YSL	9-Mar-11	CLIENT _____ DATE _____		
REV	DESCRIPTION	BY	CHK.	APPR.	DATE	PAGE 1 OF 2		XC32B-53-510

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CONTENTS

Attachment total 1 page.

ابن رشد
ibn rushd
FLUOR.

HORIZONTAL VESSEL

Contract:	10E0541A01
Equip. No.:	53-D-10
Revision :	2 **Date : 11-Aug.-2011**
Unit :	53 - Parex
P.O. No.:	
Document No.	DS-53-DA-510
Sheet	1 of 2

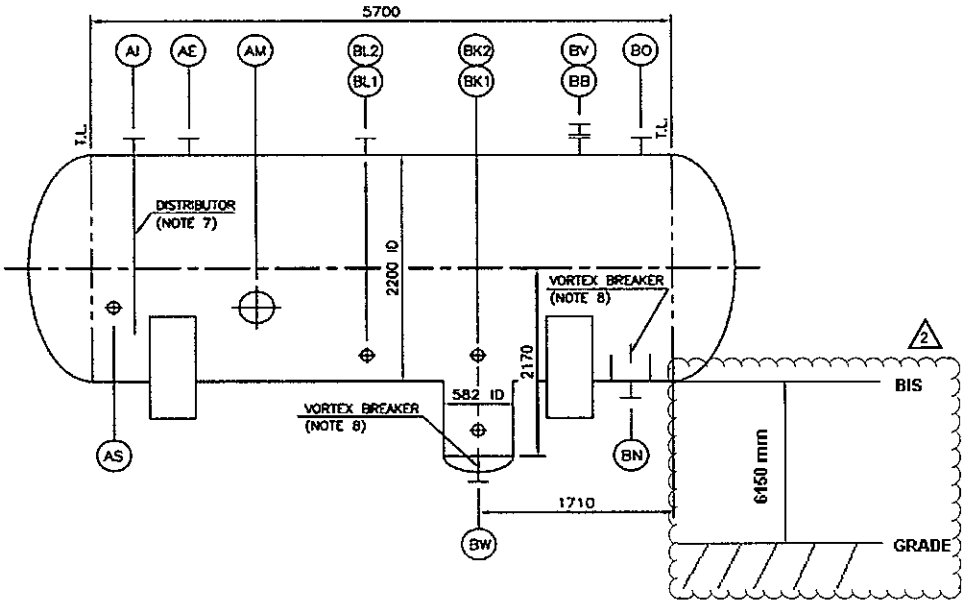
سابك
sabic

REV

Client: Arabian Industrial Fibers Company — Plant: Parex
Service: Finishing Column Receiver — Site: Yanbu, Kingdom of Saudi Arabia

DESIGN SKETCH

VESSEL DIMENSIONS: ID: 2200 T/T: 5700



DESIGN CONDITIONS

Pressure:	4.5	bar(g)
At:	121	℃
Vacuum:	FV	bar(g)
At:	66	℃
Min. Design Metal Temp:	9 (Note 11)	℃
At:	MAWP	bar(g)
Maximum Liquid Level:	(Note 4, 9)	mm
Specific Gravity of Liquid:	0.812	

OPERATING CONDITIONS

Pressure + :	0.07	bar(g)
At:	66	℃
Vacuum - :		bar(g)
At:		℃
Low Temperature:		℃
At:		bar(g)
Hydrogen Partial Pressure:		bar(a)
At:		℃

INSULATION

Type:	Hot
Req'd Thickness:	40 mm
Fireproofing:	Yes (75 mm)

CONSTRUCTION

MATERIALS		CORROSION ALLOWANCE	
Shell:	SA-516-70	3	mm
Internals:	C.S.	n/a	mm
Lining/Cladding:	n/a	n/a	mm
Head:	SA-516-70	3	mm
Boot:	SA-516-70	6	mm

0

INTERNALS

0

DESCRIPTION	BULK DENSITY kg/m³	LIQUID HOLDUP Vol. %	ΔP bar
Packing/Tray:	n/a	n/a	n/a
Catalyst:	n/a	n/a	n/a
Mist Eliminator:	n/a	n/a	n/a

NOTES & SPECIAL CONDITIONS

Stress Relieve (Process Reason Only):	Yes (Boot Head only)
Vessel In Special Service:	
Steamout Required:	Yes (Design for FV)

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ابن رشد
ibn rushd
FLUOR

HORIZONTAL VESSEL DATA SHEET

Contract:	10E0541A01
Equip. No.:	53-D-10
Revision :	2 Date :11-Aug.-2011
Unit :	53 - Parex
P.O. No. :	
Document No.	DS-53-DA-510
Sheet :	2 of 2

سابك
sabic
CTCI CORPORATION

REV

NOZZLE SCHEDULE

TAG	QTY	SIZE in	PRESSURE RATING	DESCRIPTION	REV
AE	1	2	150# RFWN	EQUALIZING	
AI	1	8	150# RFWN	INLET W/ INTERNAL PIPE	
AM	1	20	150# RFWN	MANWAY W/ DAVIT	
AS	1	2	150# RFWN	STEAMOUT **(Note 10)**	0
BB	1	6	150# RFWN	VENTILATION W/ BLIND	
BK1	1	1-1/2	150# RFLWN	LEVEL	
BK2	1	1-1/2	150# RFLWN	LEVEL	
BL1	1	2	300# RFWN	LEVEL - LLS	
BL2	1	2	300# RFWN	LEVEL - LLS	
BN	1	8	150# RFWN	OUTLET W/ VORTEX BREAKER	
BO	1	3	150# RFWN	OUTLET	
BV	1	2	150# RFWN	VENT	
BW	1	2	150# RFWN	OUTLET W/ VORTEX BREAKER	

NOTES:

1) This vessel tag number **53-D-10** is an existing vessel in the same service. The only change is higher design pressure. 0
   Existing design condition: 3.9 bar(g) @ 121 °C, new design condition: 4.5 bar(g) @ 121 °C. 0
2) Based on vessel fabricator's calculations and MAWP (MAWP 6.37 bar(g) hot and corroded), the vessel is satisfactory for the higher design pressure. **CTCI** to verify the available thickness after evaluating maintenance records and performing UT testing and confirm. 0
   CTCI to vessel is satisfactory provide necessary ASME code documentation for the repair "R" stamp and new nameplate. 0
3) Dimensions are in millimeter unless otherwise noted.
4) Vessel shall have a Normal Liquid Level (NLL) hold-up to vessel centerline. **Liquid level: HLL = 1466 mm, LLL = 734 mm.** 0
5) Vessel heads **and boot** are 2:1 Elliptical. 0
6) For nozzle elevation and orientation refer to vendor certified drawing no. DA-7034-28-001 Rev.3 dated 6/30/97.
7) For details of distributor refer to vendor certified drawing no. DA-7034-28-001 Rev.3 dated 6/30/97.
8) For details of vortex breaker refer to vendor certified drawing no. DA-7034-28-001 Rev.3 dated 6/30/97.
9) **Boot interface liquid level: HLL = 997 mm, LLL = 783 mm.** 0
10) **Steamout at 150 (232 max.) °C and 3.5 (4.1 max.) bar (g).** 0
11) **The Min. Design Ambient Temperature should be 6 °C.** 0

WEIGHTS ARE BASED ON VENDOR CERTIFIED DRAWING No. DA-7034-28-001 REV.3 DATED 6/30/97	(kg)
EMPTY	8400
OPERATING	20600
FULL OF WATER	35100

THICKNESS ARE BASED ON VENDOR CERTIFIED DRAWING No. DA-7034-28-001 REV.3 DATED 6/30/97	(mm)
SHELL	12
HEADS	15

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CTCI CORPORATION

CHIYODA CORPORATION

FOR RECORD

CLIENT : IBN RUSHD
PROJECT PTA & AROMATICS -
TITLE : AROMATICS
JOB NO. : 51046
DOC. NO.: AS-53-D-010 (1/1)

		REVISIONS			
MARK		2	3	4	
APRD					
CHKD					
MADE					
DATE	May.09 '96	APR.08'96	May.24'96	Jun.03'96	Feb.03'97

UOP

25 East Algonquin Road - PO Box 5017 - Des Plaines, Illinois 60017-5017 - U.S.A.

VESSELS

PROJECT SPECIFICATION
560691 - 301 - 1 SHEET 14

REV	DATE	BY	APP'D	REV	DATE	BY	APP'D
0	16-16-95						
1	12-15-96	AEW	CMV				

SERVICE FINISHING COLUMN RECEIVER

ITEM NO ~~53-D-10~~ 53-D-10

Design Conditions at Top	INT 3.9 BAR (g) @121 °C	(=) BY CONTRACTOR
	EXT FULL VACUUM @ 65 °C	
	Metal Temperature (Min) 9 °C	
Operating Conditions	66 °C	
	°C	
Radiograph	MR	
Postweld Heat Treat	MR	
Joint Efficiency	MR %	

Material Specifications	
Heads	SA516-70
Shell	SA516-70
Drop Leg	SA516-70
D.L. Head	SA516-70

	Thickness Required by Code-mm.	Corrosion Allowance mm. (Min)	
Shell			
VESSEL		3	
DROP LEG		6	
Heads			
VESSEL		3	
DROP LEG		6	

Vessel Heads	
Vessel	2:1 ELLIPTICAL
Drop Leg	2:1 ELLIPTICAL

Accessories Applied by Fabricator	
Ladder & Platform Clips	AS REQUIRED (=)
Insulation Clips & Rings	YES
Vessel Support	YES

Nozzles and Manways

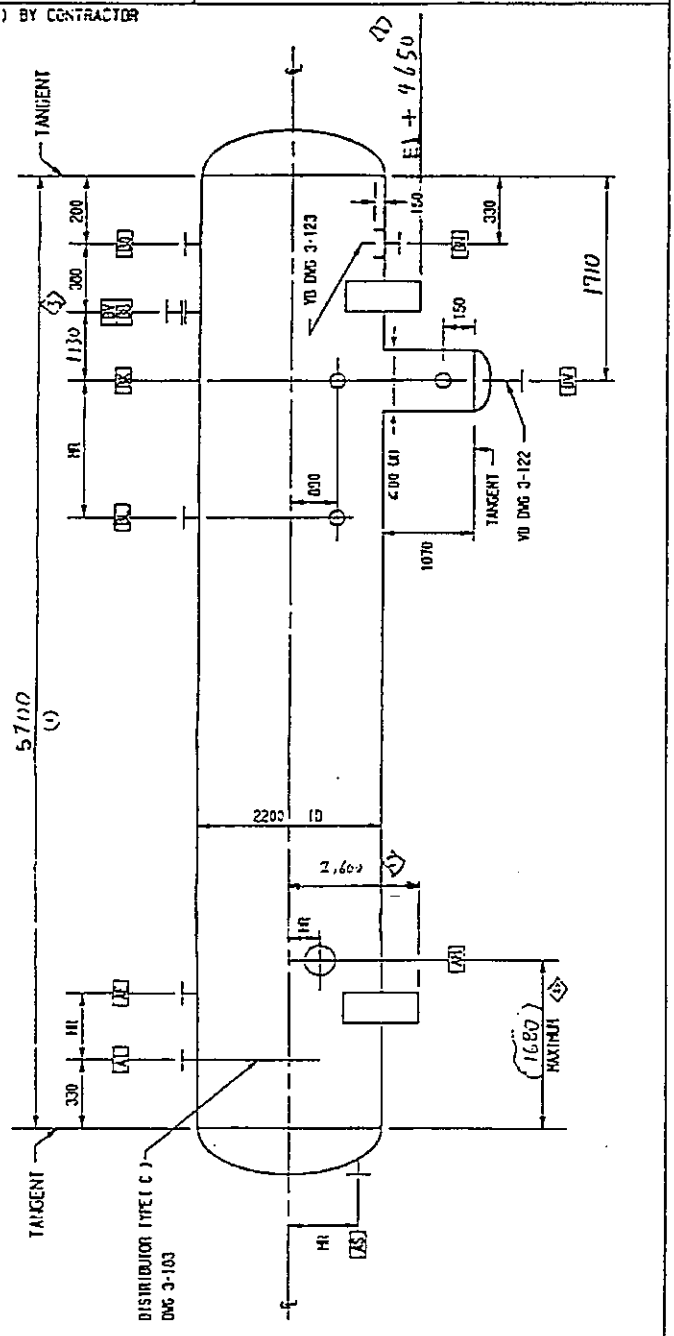
Mark	No	Size Inches	Service	
AE	1	2	EQUALIZING	
AI	1	8	INLET	
AM	1	20	MANWAY	12
AS	1	2	STEAMOUT	
BB	1	6	VENTILATION	
BK	2	1 1/2	LEVEL	
BL	2	2	LEVEL-LLS	(2)
BN	1	8	OUTLET	
BO	1	3	OUTLET	
BV	1	2	VENT	
BW	1	2	OUTLET	

Class - ANSI CL150
(2) ANSI CL300

Facing - RAISED FACE

Normal Liquid Level = VESSEL CENTERLINE

Specific Gravity = 0.824



Drawings Referred to in this Specification

3-122-0	3-123-0	3-183-0	3-317-1			

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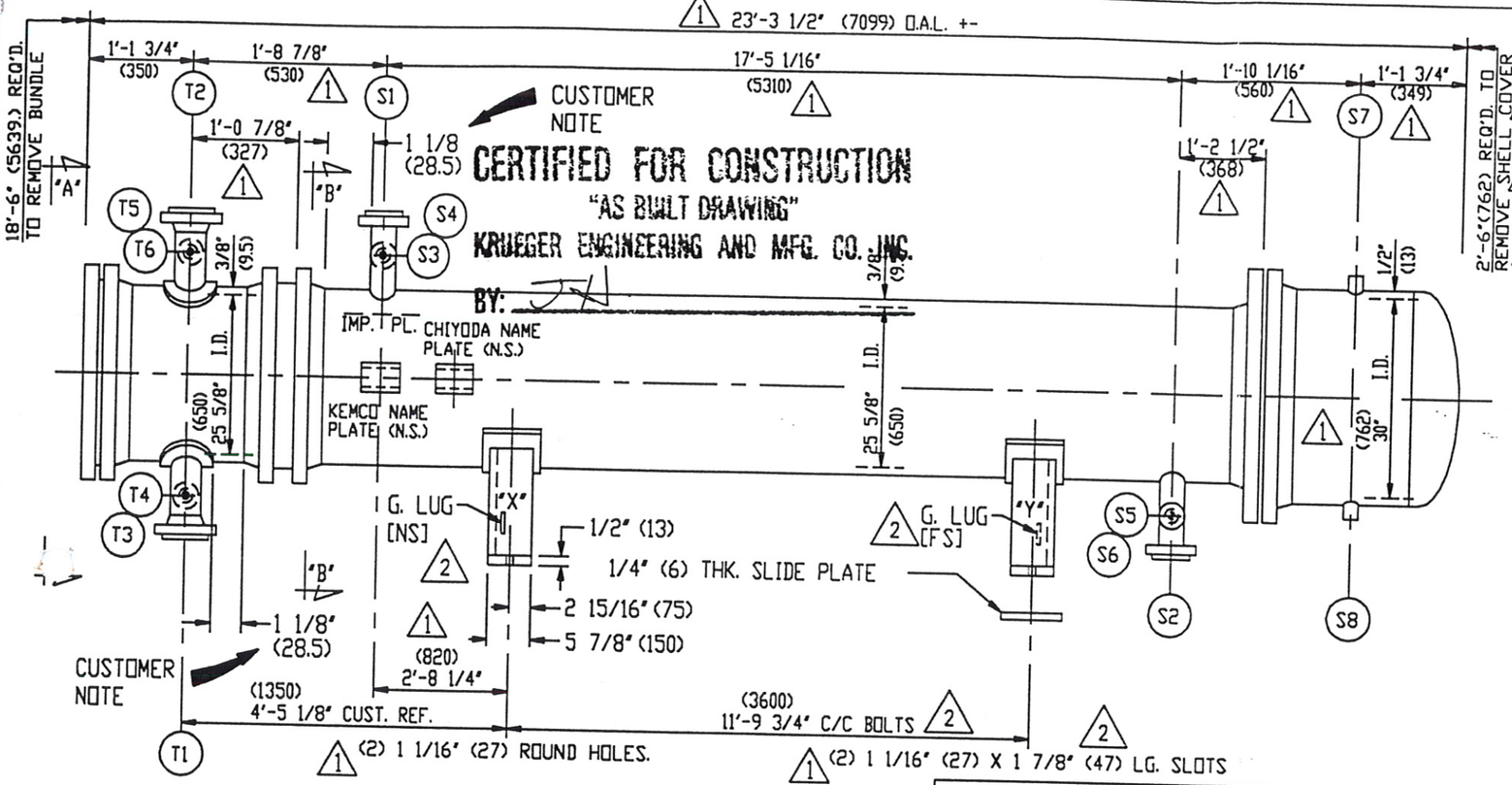
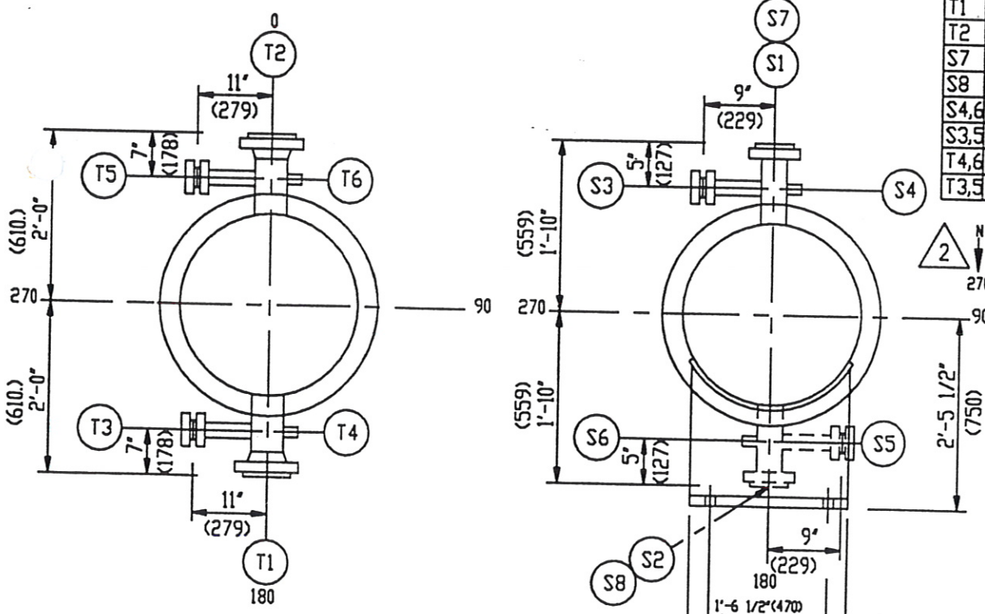
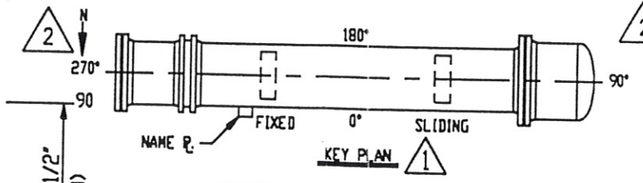


NOZZLE SCHEDULE					
MK	QT	DESCRIPTION		PROCESS	AUXILLARIES
S1	1	4"	150#RF LWN	INLET	
S2	1	4"	150#RF LWN	OUTLET	
T1	1	8"	150#RF WN	INLET	
T2	1	8"	150#RF WN	OUTLET	
S7	1	3/4"	6000#CPLG.	VENT	W/ PLUG
S8	1	3/4"	6000#CPLG.	DRAIN	W/ PLUG
S4,6	2	3/4"	6000#CPLG.	P.I.	W/ PLUG
S3,5	2	1"	150#RF LWN	T.I.	W/ BLIND
T4,6	2	3/4"	6000#CPLG.	P.I.	W/ PLUG
T3,5	2	1"	150#RF LWN	T.I.	W/ BLIND





DESIGN DATA	SHELL	TUBE
DESIGN PRESSURE P.S.I.G.	188. (12.9 Bar g)	160. (11. Bar g)
VACUUM PRESSURE	F.V. @ 351°F (177°C)	
TEST PRESSURE P.S.I.G.	294. (20.27 Bar g)	282. (19.44 Bar g)
DESIGN TEMP. Deg.F.	419. (215.C)	248. (120.C)
MDMT Deg. F.	48. (9.C)	48. (9.C)
OPER. TEMP. IN/OUT °F(°C)	350/122 (177/50)	104/122 (40/50)
CORROSION ALLOWANCE	.1250" (3.2)	.1250" (3.2)
NUMBER OF PASSES	1.	2.
FLUID NAME	HYDROCARBON	COOLING WATER
RADIOGRAPHY	SPOT	SPOT
HEAT TREAT REQUIRED	NO	NO

ESTIMATED WEIGHTS, LBS.

DRY: 13000. (5897.Kg) BUNDLE: 6800. (3085.Kg) WET: 17500. (7938.Kg)

SPECIFICATIONS

ASME CODE SECT. VIII DIV.1, 1995 ED., 1995 ADD. (STAMP YES)
TEMA CLASS R [7 TH. ED.]
NATIONAL BOARD REGISTRATION REQUIRED

MATERIAL

CHANNEL:	SA-516-70	CHAN. FLG.:	SA-105N
SHELL:	SA-516-70	SHELL:	SA-105N
TUBESHEETS:	SA-516-70N	BOLTING:	SA-193-B7/SA-194-2H
BAFFLES:	SA36orEQUAL	FLTG HEAD:	SA-105N/SA-516-70
TUBES:	SA-214		

(516.) 3/4"(19.05) O.D. X .0830"(2.11) [M.W.] X 20'-0"(6096) LG.
TUBE PITCH 15/16" (23.8) SURFACE 1937. SQ.FT. (180.M2)

GENERAL NOTES

ALL BOLT HOLES TO STRADDLE NATURAL CENTER LINES.
TUBE-TUBESHEET JOINT : ROLLED W/ GROOVES.
ALL MATERIALS COMPLY WITH UCS 66 (a),(c) & (d)
INSULATION THK.: SHELL = 2" (50) PP ; CHANNEL = NONE
CARBON CONTENT = 0.25% MAX.
TOLERANCE PER TEMA [7TH. ED.] & UOP STD. SPECS.
FIREPROOFING: 3" (75) REG. CONCRETE.
REF. DESIGN & DWG'S.: DS-53-E-112; SK-53-E-012; SK-54-L-506-12.
ALL DIMENSIONS IN ( ) ARE IN METRIC.
GASKETS: .175" (4.44) THK. 316SS SP. WD. GRAFOIL W/ 316SS INNER RING
RIB: 3/16" (4.76) THK. 316SS DBL. JKT'D. GRAFOIL
2 SETS OF SPARE GASKETS REQUIRED + 10% BOLTS/NUTS. [MIN. 2-SETS]
PAINT: SEE DWG 96-0730-2 FOR PAINT REQUIREMENTS

	SHELL SIDE	TUBE SIDE
MAWP (HOT & CORRODED)	194 PSI (13.37 Bar g) LTD BY BODY FLG.	188 PSI (12.96 Bar g) LTD BY FLTG. HD. FLG.
MAP (NEW & COLD)	196 PSI (13.5 Bar g) LTD BY BODY FLG.	188 PSI (12.96 Bar g) LTD BY FLTG. HD. FLG.

CUST: CHIYODA CORPORATION
(ARABIAN INDUSTRIAL FIBERS CO.)
PROJECT: IBN - RUSHD AROMATICS PROJECT
P.O. NO.: SAYPOH0027
ITEM NO.: 53-E-12
SERVICE : DESORBENT SUMP TANK PUMPOUT COOLER

CHIYODA
JOB NO. 51046 IBN RUSHD AROMATICS PROJECT
PO NO. SAYPOH 0027
REQ NO. MR-30-E-004
IDENT NO. 53-E-12-DW-0001 (2)

1-NO COMMENTS PROCEED WITH FABRICATION	JAY TEAM !	
2-PROCEED WITH FABRICATION COMMENTS TO BE CONSIDERED		
3-DO NOT PROCEED WITH FABRICATION	DATE	

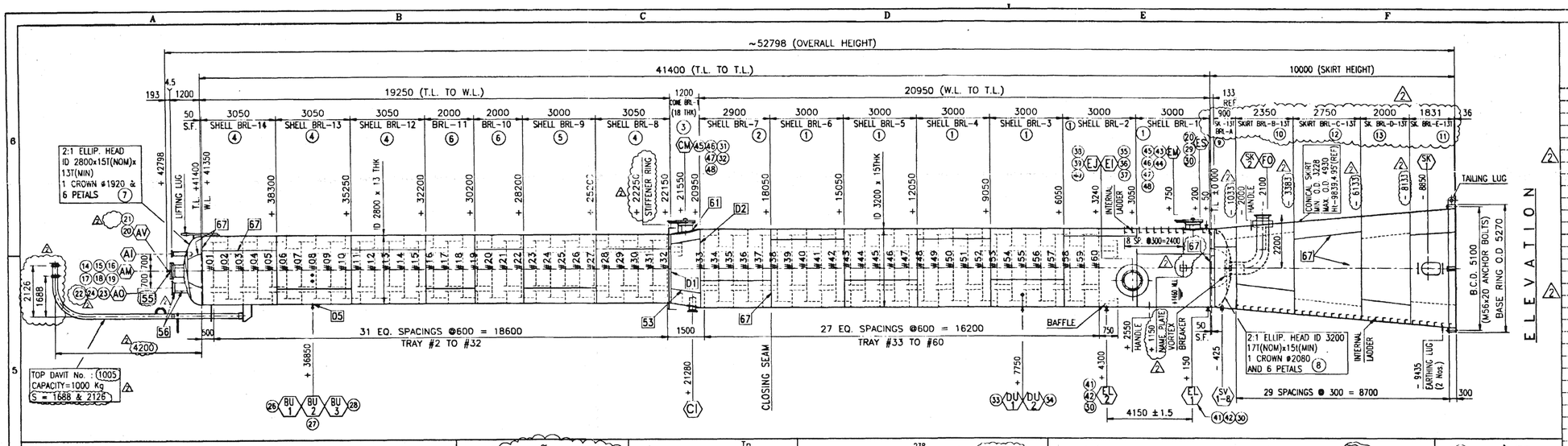
PURCHASER'S PERMISSION TO PROCEED OR REVIEW TAKEN ON VENDOR PRINTS SHALL NOT RELIEVE VENDOR FROM ITS RESPONSIBILITIES OR LIABILITIES UNDER PURCHASE ORDER

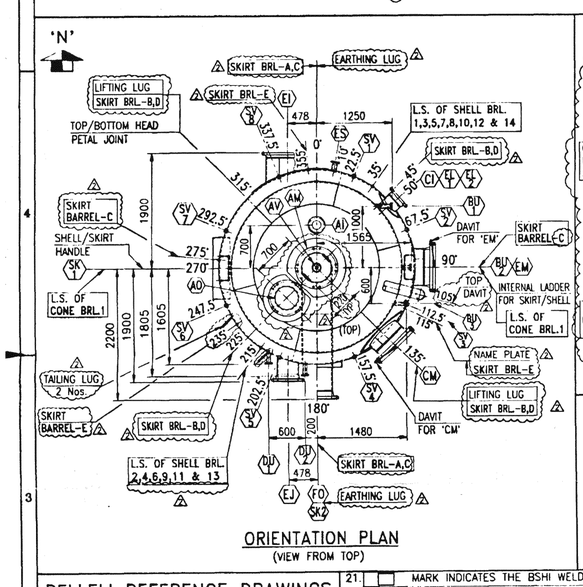
FOR RECORD

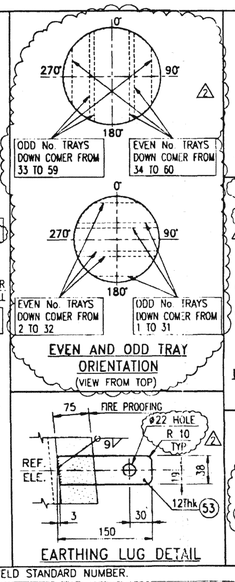
NO.	DATE	REVISIONS
2	1- 3-97	REV. PER CUSTOMER
1	3-23-96	REV. IN ACCORDANCE WITH CUSTOMER COMMENTS.

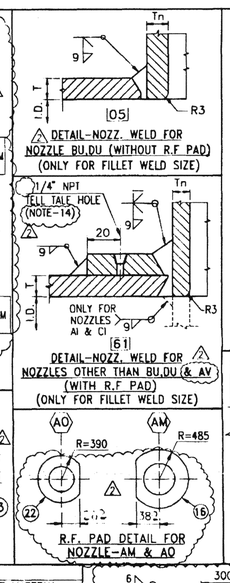
ASSEMBLY AND SPECIFICATIONS FOR
ONE 25.625-240 (650-6096) A E S

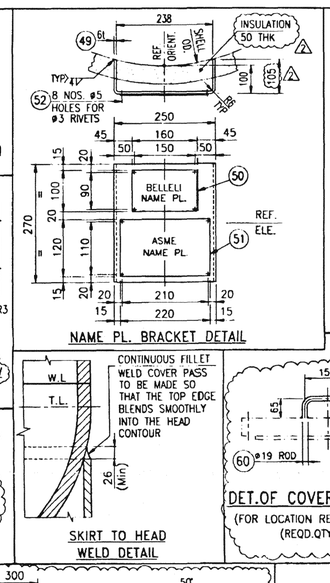
DWN. BY	mrh	KRUEGER ENGR. & MFG. CO. INC	
DATE	7- 3-96	HOUSTON, TEXAS	
CKD. BY	JMH	DWG. NO. 96-0730-1	REV. 2

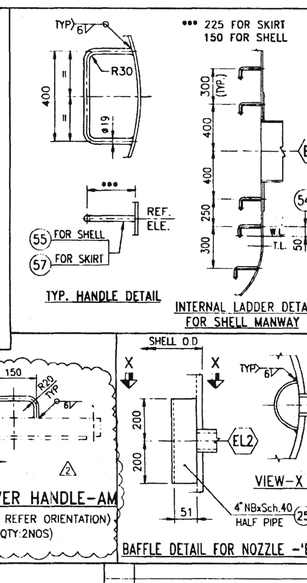


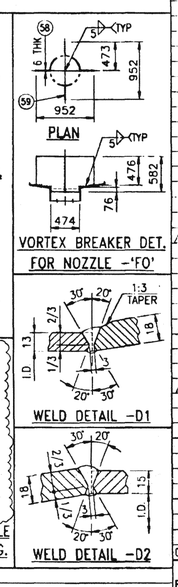


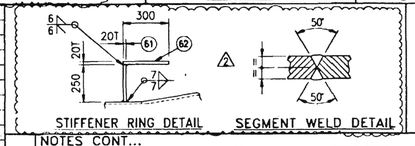


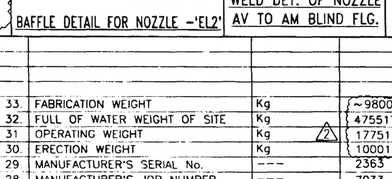


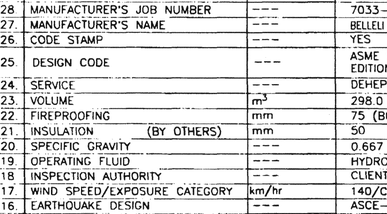












SPARES FOR GASKETS & FASTENERS ARE INCLUDED IN LOM

•• SA 193 Gr B7/SA 194 Gr 2H

• 4.5mm THK SS 316 SPIRAL WOUND GRAPHITE FILLED WITH SS 316 INNER AND SS/CS OUTER CENTERING RING. 2

TOTAL WT. = 62381.8 Kgs. 2

FAM.	ITEM POS	QTY FOR ONE FAM	DESCRIPTION	LENGTH	WIDTH	THICK	WT. IN Kg. For ONE POS.	WT. IN Kg. For ONE FAM.	MAT'L	MAT'L CODE	RDA. NO.	
	62	1	STIFFENER RING	10512	300	20.0	495.0	495.0	SA516Gr70			
	61	1	ST.003326/D2826	0	0	20.0	379.0	379.0	SA516Gr70			
	60	2	HANDLE-ø19	255	0	0.0	0.4	0.8	A36		7033A20P01	
	59	2	VORTEX BREAKER	582	473	6.0	13.0	26.0	A36	LP060A5172500800	STOCK	
	58	1	VORTEX BREAKER	952	582	6.0	26.1	26.1	A36	LP060A5172500800	STOCK	
	57	1	HANDLE-ø19	816	0	0.0	1.8	1.8	A36		7033A20P01	7033-020
	56	30	ROD-ø19	1016	0	0.0	2.3	69.0	A36		7033A20P01	7033-020
	55	1	HANDLE-ø19	666	0	0.0	1.5	1.5	A36		7033A20P01	7033-020
	54	12	ROD-ø19	866	0	0.0	1.9	22.8	A36		7033A20P01	7033-020
	53	2	EARTHING LUG	150	38	12.0	0.5	1.0	SS304		2077A16L01	STOCK
	52	8	RIVET ø3	20	0	0.0	2.0	16.0	COPPER		7033A21B01	7033-021
	51	1	ASME NAME PL.	220	120	5.0	0.6	0.6	SS304		ø00100050122	STOCK
	50	1	BELLELI NAME PL.	160	100	5.0	0.4	0.4	SS304		ø00100050122	STOCK
	49	1	NAME PL. BRACKET	440	270	6.0	6.2	6.2	SA516GR70	LP060A5172500800	STOCK	
	48	48	ST+2NT 1 1/4" 8UN	178	0	0.0	1.7	81.6	**		7033A11B02	7033-011
	47	8	GK 24" 150# RF	0	0	0.0	3.0	24.0	*		7033A12G04	7033-012
	46	2	BF 24" 150# RFFF	0	0	0.0	187.0	374.0	SA105		7033A04F21	7033-004
	45	2	F 24"-12.150# WNRF	0	0	0.0	118.0	236.0	SA105		7033A04F17	7033-004
	44	1	RP OD1150/620/15t	0	0	0.0	122.0	122.0	SA516GR70(N)		7033A01L15	7033-001
	43	1	NOZZLE NECK	1879	192	12.0	34.0	34.0	SA516GR70(N)		7033A01L04	7033-001
	42	2	PI 2"-160	95	0	0.0	1.1	2.2	SA106GrB		7033A06T01	7033-006
	41	2	F 2"-160 300# WNRF	0	0	0.0	4.0	8.0	SA105		7033A04F04	7033-004
	40	1	RP OD680/366/15t	0	0	0.0	30.1	30.1	SA516GR70(N)		7033A01L15	7033-001
	39	1	NOZZLE NECK	1081	314	12.0	32.0	32.0	SA516GR70(N)		7033A01L04	7033-001
	38	1	F 14"-12.150# WNRF	0	0	0.0	46.0	46.0	SA105		7033A04F13	7033-004
	37	1	RP OD1325/721/15t	0	0	0.0	114.2	114.2	SA516GR70(N)		7033A01L15	7033-001
	36	1	NOZZLE NECK	2196	439	12.0	90.8	90.8	SA516GR70(N)		7033A01L04	7033-001
	35	1	F 28"-12.150# WNRF	0	0	0.0	77.0	77.0	SA105		7033A04F24	7033-004
	34	1	F 1" 150# LWNRF	221	0	0.0	6.2	6.2	SA105		7033A04F01	7033-004
	33	1	F 1" 150# LWNRF	234	0	0.0	6.5	6.5	SA105		7033A04F01	7033-004
	32	1	RP OD1150/620/18t	0	0	0.0	104.0	104.0	SA516GR70(N)		7033A01L21	7033-001
	31	1	NOZZLE NECK	1879	274	12.0	48.5	48.5	SA516GR70(N)		7033A01L04	7033-001
	30	3	RP OD1150/70/15t	0	0	0.0	1.6	4.8	SA516GR70(N)		7033A01L15	7033-001
	29	1	PI 2"-160	102	0	0.0	1.2	1.2	SA106GrB		7033A06T01	7033-006
	28	1	F 1" 150# LWNRF	228	0	0.0	8.0	8.0	SA105		7033A04F01	7033-004
	27	1	F 1" 150# LWNRF	165	0	0.0	7.0	7.0	SA105		7033A04F01	7033-004
	26	1	F 1" 150# LWNRF	297	0	0.0	9.0	9.0	SA105		7033A04F01	7033-004
	25	1	PI 6"-40(HALF PIPE)	400	0	0.0	3.2	3.2	SA106GR.B		7033A06T19	7033-006
	24	1	NOZZLE NECK	1239	541	12.0	63.1	63.1	SA516GR70(N)		7033A01L04	7033-001
	23	1	F 16"-12.150# WNRF	0	0	0.0	58.0	58.0	SA105		7033A04F14	7033-004
2	22	1	RP PAD (SEE DET)	0	0	13.0	31.8	31.8	SA516GR70(N)		7033A01L05	7033-001
	21	1	F 2"-160	130	0	0.0	1.5	1.5	SA105		7033A06T01	7033-006
	20	2	F 2"-160 150# WNRF	0	0	0.0	2.8	5.6	SA105		7033A04F03	7033-004
	19	24	ST+2NT 1 1/8" 8UN	159	0	0.0	1.3	31.2	**		7033A11B01	7033-011
	18	4	GK 20" 150# RF	0	0	0.0	0.5	2.0	*		7033A12G01	7033-012
	17	1	BF 20" 150# RFFF	0	0	0.0	124.0	124.0	SA105		7033A04F20	7033-004
2	16	1	RP PAD (SEE DET)	0	0	13.0	49.6	49.6	SA516GR70(N)		7033A01L05	7033-001
	15	1	NOZZLE NECK	1558	389	12.0	54.0	54.0	SA516GR70(N)		7033A01L04	7033-001
	14	1	F 20"-12.150# WNRF	0	0	0.0	77.1	77.1	SA105		7033A04F16	7033-004
2	13	1½	SK.BRL OD 4266/4612	2000	0	13.0	2849.0	2849.0	SA36		7033A01L59	7033-001
2	12	1½	SK.BRL OD 3790/4266	2750	0	13.0	3554.0	3554.0	SA36		7033A01L59	7033-001
	11	1½	SK.BRL OD 4612/4930	1831	0	13.0	2804.0	2804.0	SA36		7033A01L59	7033-001
	10	1½	SK.BRL OD 3383/3790	2350	0	13.0	2703.0	2703.0	SA36		7033A01L59	7033-001
	9	1½	SK.BRL OD 3227/3383	900	0	13.0	954.0	954.0	SA516GR70(N)		7033A01L08	7033-001
	8	1	EH ID3200x17t(NOM)	0	0	17.0	1606.5	1606.5	SA516GR70(N)		7033A01L18	7033-001
	7	1	EH ID2800x15t(NOM)	0	0	15.0	1096.5	1096.5	SA516GR70(N)		7033A01L15	7033-001
	6	2	SH. BRL 10,11	5837	2000	13.0	1894.0	3608.0	SA5.6GR70(N)		7033A01L08	7033-001
	5	1	SHELL BRL-9	8837	3000	13.0	2705.5	2705.5	SA516GR70(N)		7033A01L05	7033-001
	4	4	SH.BR-8,12,13,14	8837	3050	13.0	2750.0	11000.0	SA516GR70(N)		7033A01L05	7033-001
	3	1	CONE BRL ID3200/2800	1200	0	18.0	1629.9	1629.9	SA516GR70(N)		7033A01L21	7033-001
	2	1	SH.BR-7	10100	2900	15.0	3449.0	3449.0	SA516GR70(N)		7033A01L13	7033-001
03-01	1	6	SH.BR-1,2,3,4,5,6	10100	3000	15.0	3568.0	21408.0	SA516GR70(N)		7033A01L13	7033-001

LIST OF MATERIAL

BELLELI REFERENCE DRAWINGS

DRAWING No.	DESCRIPTION
DA-7033-03-002	DETAIL DRAWING
DA-7033-03-003	FORMED HEAD TOP
DA-7033-03-004	FORMED HEAD BOTTOM
DA-7033-03-005	DETAIL OF INTERNALS 1
DA-7033-03-006	TOP DAVIT
DA-7033-03-007	BELLELI NAME PLATE
DA-7033-03-008	ASME NAME PLATE 1
DA-7033-03-009	TRAY SUPPORT DETAILS (6 SHEETS)
DA-7033-03-010	CLIPS FOR PLATF. & LAD.(2 SHEETS)
DA-7033-03-011	CLIPS FOR INSUL.FIRE PROOFING & PIPE SUPP.
ST-7033-03-001	FINISH REQUIREMENT
DO-7033-03-001	SHIPPING & TESTING ARRANGEMENT
DA-7034-00-001	DAVIT ARRANGEMENT 1
UOP STD. DWG. 3-164 REV-1	DISTRIBUTORS
UOP STD. DWG. 3-234 REV-2	DISTRIBUTOR TRAP
UOP STD. DWG. 3-168 REV-2	DISTRIBUTORS
UOP STD. DWG. 3-115 REV-2	BAFFLES
UOP STD. DWG. 3-122 REV-0	VORTEX BREAKER
UOP STD. DWG. 3-280 REV-0	TRAPS
22854-SP-000-A-004 REV-1	UNIT OF MEASUREMENT
22854-SP-000-X-001 REV-3	SHOP AND FIELD PAINTING
9-14-1	FIRE PROOF
9-11-1	EXTERNAL THERMAL INSULATION
CHIYODA STD. DR-50-08-018 REV-1	EARTH PIECE
CHIYODA STD. DR-50-08-017 REV-3	NAME PLATE
CHIYODA STD. DR-50-08-013 REV-2	ANSI 150,300 & 600 MANHOLE DAVIT AND HINGE
CHIYODA STD. DR-50-08-011 REV-2	FLANGED NOZZLE
CHIYODA STD. DR-50-08-010 REV-2	INTERNAL LADDER FOR VESSEL
CHIYODA STD. DR-50-08-007 REV-2	DAVIT
CHIYODA STD. DR-50-08-006 REV-2	LIFTING LUG FOR VERTICAL VESSEL
CHIYODA STD. DR-50-08-001 REV-3	SKIRT & BASE BLOCK FOR VERTICAL VESSEL
UOP STD. SPEC. 3-18 REV-5	TRAYS & PACKING
UOP STD. SPEC. 3-11 REV-2	PRESSURE VESSELS CARBON STEEL 1
CHIYODA SPEC. SP-50-N-001	HOT SERVICE THERMAL INSULATION 1
BECHTEL SP. 22854-SP-000-M-001 REV-4	BASIC CIVIL ENGINEERING DESIGN DATA
BECHTEL SP. 22854-SP-000-D-001 REV-1	UNFIRED PRESSURE VESSELS
BECHTEL SP. 22854-SP-000-W-001 REV-1	MATERIAL,WELDING,NDT & CORROSION CONTROL
DS-54-C-001 SHT-3 REV-0	CHIYODA DATA SHEET

CLIENT'S REF. DWGS. & SPECS.

GENERAL NOTES

21. MARK INDICATES THE BSHI WELD STANDARD NUMBER. MARK INDICATES THE POSITION NUMBER WITH REFERENCE TO LIST OF MATERIAL. MARK INDICATES THE NOZZLE MARK NUMBER.
20. SHOP HYD. TEST GASKETS :- (i) BLINDED NOZZLES WILL HAVE JOB GASKETS. (ii) ALL OTHER NOZZLES WILL HAVE CAF GASKET.
19. SPARE PARTS:-

ITEMS	COMMISSIONING/STARTUP	OPERATIONAL	SHOP HYD. TEST
GASKETS	200%	100%	100%
FASTENERS	10%(MIN. 2 SETS)	10%(MIN. 2 SETS)	100%

18. ALL BOLTS & NUTS SHALL BE OF UNC SERIES UPTO & INCLUDING 1" SIZE & 8UN ABOVE 1" SIZE.
17. FLANGES UPTO & INCLUDING 24"NB SHALL BE AS PER ANSI B16.5 & ABOVE 24"NB SHALL BE AS PER ANSI B16.47 SERIES B.THE FLANGE FACE FINISH SHALL BE 3.2 TO 6.3 MICROMETER.
16. DELETED 1
15. MINIMUM TEMPERATURE OF HYDROTEST WATER SHALL BE 17°C AND THE TEST PRESSURE SHALL BE HELD FOR HALF AN HOUR PER INCH OF THICKNESS WITH ONE HOUR MINIMUM.
14. EACH REINFORCING PAD OR SEGMENT THEREOF SHALL BE PROVIDED WITH ONE No. (TWO Nos. FOR NOZZLES 16"NB AND ABOVE @ 180° APART) 1/4" NPT, TELL TALE HOLE AS PER ANSI B1.20.1, ALL R.F PAD WELDS SHALL BE TESTED TO 15 Psig. MINIMUM WITH AIR & SOAPY BUBBLE TEST.
13. A PERMANENT REFERENCE WORKLINE FOR VERTICAL VESSELS BOTTOM TAN LINE SHALL BE PUNCHMARKED AROUND THE VESSEL PERIMETER AT 0,90,180 & 270° AND HORIZONTAL VESSELS, CENTER LEVEL SHALL BE PUNCHMARKED ON BOTH SIDE SURFACES OF SHELL NEAR THE HEAD.
12. TRAY SUPPORT RINGS CROSSING THE LONG SEAM OF SHELL BARRELS SHALL BE CONTINUOUSLY WELDED ALSO ON THE LONG SEAM AFTER FLUSH GRIND AND RADIOGRAPH FOR A DISTANCE OF 150 mm BEYOND THE ATTACHMENT WELD.
11. TRAYS WHICH ARE FREE ISSUE SUPPLY AND INSTALLED AT SITE BY CHYODA.
10. ALL TRAY ELEVATIONS ARE SHOWN TO TOP OF SUPPORT RINGS.
9. THE VESSEL SHALL BE THOROUGHLY CLEANED INSIDE & OUTSIDE AND SHALL BE FREE OF ALL DIRT, WELD ROD STUBS & LOOSE FOREIGN MATERIALS Etc.,
8. ALL REMOVABLE INTERNALS SHALL PASS THROUGH THE NEAREST MANHOLE.
7. LONGITUDINAL SEAM OF FABRICATED NOZZLES FROM PLATE SHALL BE 100% RADIOGRAPHED
6. WELD SEAMS COMING UNDER MISC. ATTACHMENTS SHALL BE GROUND SMOOTH & RADIOGRAPHED FOR A DISTANCE OF 150mm BEYOND THE ATTACHMENT WELD.
5. ALL NOZZLES AND MANWAY THAT DO NOT EXTEND INTO THE VESSEL SHALL BE FINISHED FLUSH WITH THE INSIDE & THE INNER EDGE SHALL BE ROUNDED OFF TO A MIN. 3mm RADIUS.
4. NOZZLE POSITIONS ON VESSEL ELEVATIONS ARE CONVENTIONAL. FOR TRUE LOCATION SEE NOZZLE ORIENTATION PLAN.
3. NOZZLE PROJECTION IS FROM CENTER LINE OF VESSEL TO GASKET FACE OF FLANGE. UNLESS SPECIFIED OTHERWISE.
2. ALL FLANGE BOLT HOLES SHALL STRADDLE VERTICAL AND/OR NORTH SOUTH CENTER LINES UNLESS SHOWN OTHERWISE.
1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.

NOZZLE SCHEDULE.

MARK	QTY	SIZE	PROJ. FROM CL	SERVICE	NOZZLE NECK O.D	NOZZLE NECK SCH	NOZZLE NECK THK	NOZZ. FLANGE TYPE	NOZZ. FLANGE RATING LB	REINF. PAD O.D	REINF. PAD THK.
SK2	1	ID800	–	SKIRT OPENING FOR 'FO'	818.0	–	9.00				
SK1	1	SEE DWG	–	SKIRT ACCESS OPENING	SEE DWG	PLT	9.00				
SV1-8	8	4"	–	SKIRT VENT	114.3	40	6.02				
FO	1	20"	SEE ORDER	TOTAL BTMS W/VORTEX BREAKER	508.0	PLT	16.00	WNRF	150#	970	17
ES	1	2"	1765	STEAMOUT	60.3	160	8.74	WNRF	150#	150	15
EM	1	24"	1915	MANWAY WITH COVER	609.6	PLT	12.00	WNRF	150#	1150	15
EL1/2	2	2"	1765	LEVEL	60.3	160	8.74	WNRF	300#	150	15
EJ	1	14"	SEE ORDER	FROM HEATER	356.0	PLT	12.00	WNRF	150#	680	15
EI	1	28"	SEE DWG	FROM REBOILER	711.0	PLT	12.00	WNRF	150#	1325	15
DU1/2	2	1" ID	SEE ORDER	TI	50.8	–	12.7	LWNRF	150#	–	–
CM	1	24"	1875	MANWAY WITH COVER	609.6	PLT	12.00	WNRF	150#	1150	18
CI	1	10"	1790	INLET	273.1	80	15.09	WNRF	150#	510	18
BU1-3	3	1" ID	SEE ORDER	TI-TRC	50.8	–	12.7	LWNRF	150#	–	–
AV	1	2"	SEE DWG	VENT (TOP OF CONN.AM)	60.3	160	8.74	WNRF	150# 4	–	–
AO	1	16"	SEE DWG	OUTLET	406.0	PLT	12.00	WNRF	150#	SEE DET.	13
AM	1	20"	SEE DWG	MANWAY	508.0	PLT	12.00	WNRF	150#	SEE DET.	13
Al	1	6"	SEE DWG	INLET	168.3	80	10.97	WNRF	150#	300	13

DESIGN DATA

No.	DESIGN CONDITIONS	UNITS	VALUES
33.	FABRICATION WEIGHT	Kg	(~98000) (SEE NOTE 23)
32.	FULL OF WATER WEIGHT OF SITE	Kg	475517
31.	OPERATING WEIGHT	Kg 2	177517
30.	ERECTION WEIGHT	Kg	100017 (SEE NOTE 24)
29.	MANUFACTURER'S SERIAL No.	---	2363
28.	MANUFACTURER'S JOB NUMBER	---	7033-03
27.	MANUFACTURER'S NAME	---	BELLELI SAUDI HEAVY INDUSTRIES LTD.
26.	CODE STAMP	---	YES
25.	DESIGN CODE	---	ASME SEC VIII DIV.1 1995 EDITION
24.	SERVICE	---	DEHEPTANIZER
23.	VOLUME	m^3	298.0
22.	FIREPROOFING	mm	75 (BOTH SIDES OF SKIRT)
21.	INSULATION (BY OTHERS)	mm	50
20.	SPECIFIC GRAVITY	---	0.667
19.	OPERATING FLUID	---	HYDROCARBON
18.	INSPECTION AUTHORITY	---	CLIENT/BSHI/ABS
17.	WIND SPEED/EXPOSURE CATEGORY	km/hr	140/C
16.	EARTHQUAKE DESIGN	---	ASCE-7-88, ZONE-1
15.	MINIMUM DESIGN METAL TEMPERATURE	°C	9
14.	CHARPY IMPACT TEST	---	NO
13.	ULTRASONIC EXAMINATION	---	NO
12.	POST WELD HEAT TREATMENT	---	NO
11.	JOINT EFFICIENCY (SHELL/HEAD/CONE)	%	85/100/100
10.	RADIOGRAPHY (SHELL/HEAD/CONE)	---	SPOT (RT4)/FULL/FULL
9.	CORROSION ALLOWANCE	mm.	3
8.	M.A.W.P. AT DESIGN TEMPERATURE	barG 2	(6.5) (LIMITED BY TOP SHELL)
7.	M.A.P. (NEW & COLD)	barG	9.47 (LIMITED BY TOP SHELL)
6.	FIELD HYDROTEST PRESSURE (CORRODED)	barG	9.75 (VERTICAL AT TOP)
5.	SHOP HYDROTEST PRESSURE (HOR)	barG	13.89 (AT TOP)
4.	OPERATING TEMPERATURE (TOP/BOT)	°C	152/225
3.	OPERATING PRESSURE (TOP/BTM)	barG	–
2.	DESIGN TEMPERATURE (INT/EXT)	°C	253/–
1.	DESIGN PRESSURE (INT/EXT)	barG	6.5/–

CHIYODA PETROSTAR LTD.
JOB NO. 54001 | BH RUSHD AROMATICS PROJECT
PO NO. SAY-POP0002
REQ NO. MR-50-C-003
IDENT NO 54C01-DW-0001

BELLELI SAUDI HEAVY INDUSTRIES LTD.
AS BUILT

PURCHASER'S RESPONSIBILITY TO PROCEED OR REVISE WITH VENDOR PRINTS SHALL NOT RELIEVE VENDOR FROM ITS RESPONSIBILITIES OR LIABILITIES UNDER PURCHASE ORDER.

REV.	DATE	DESCRIPTION	DRAWN	CHK'D	APP'D
2	24.02.97	REVISED AS PER CLIENT'S COMMENTS AND MARKED 1	RJP		
1	15.10.96	DRAWING GENERALLY REVISED AND ISSUED FOR CONSTRUCTION	RJP	J.Venkatesan DARU	BANERJEE
0	2.06.96	ISSUED FOR APPROVAL	R. VIJI	J.Venkatesan R.S Raju	CHATTERJI

No. REQUIRED : 1 UNIT 1

SCALE: 1 : 100

CLIENT: CHIYODA/IBN RUSHD.

ORDER: SAY-POP0002

APPROVED FOR CONSTRUCTION BY A.K.BANERJEE DATE 30-10-96

BELLELI SAUDI بيلليالي السعودية
HEAVY INDUSTRIES LTD. للصناعات الثقيلة المحدودة
AL- JUBAIL, KINGDOM OF SAUDI ARABIA. الجبيل

ARABIAN INDUSTRIAL FIBRES COMPANY(IBN RUSHD.)
PTA & AROMATICS PROJECT – AROMATICS
DEHEPTANIZER (54-C-01)
GENERAL ASSEMBLY

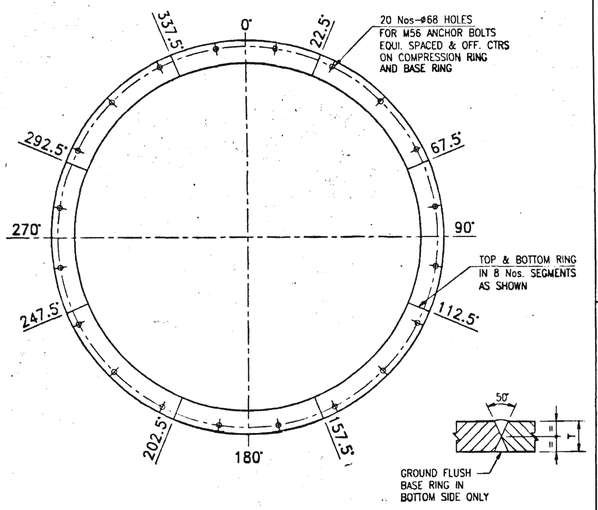
QUESTO DISEGNO NON PUO ESSERE COPIATO RIPRODOTTO MOSTRATO A TERZI SENZA NOSTRA AUTORIZZAZIONE

THIS DRAWING IS NOT TO BE REPRODUCED IN WHOLE OR PART NOR EMPLOYED FOR ANY PURPOSE OTHER THAN SPECIFICALLY PERMITTED IN WRITING BY BELLELI SAUDI HEAVY IND.LTD.

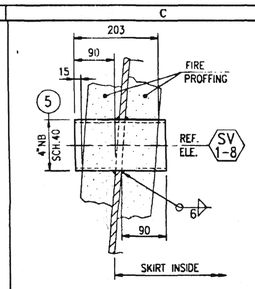
DRAWING NO. DA-7033-03-001 REV. 2

812003

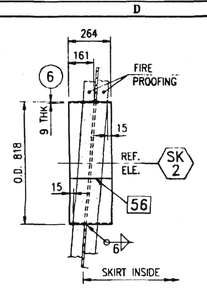
FILE NAME : 70333001



SEGMENT WELD DETAIL
(TYP)

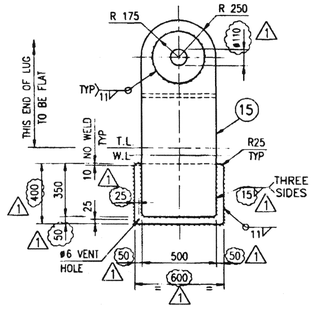


SKIRT VENT DETAIL
(QTY - 8 Nos.)



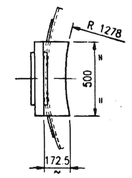
PIPE SLEEVE OPENING DETAIL
FOR NOZZLE -'FO'

** FORM LIFTING LUG TO MATCH CONTOUR OF SHELL O.D.

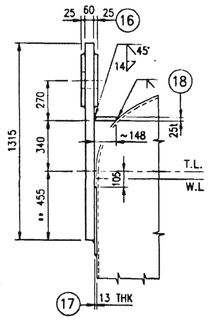


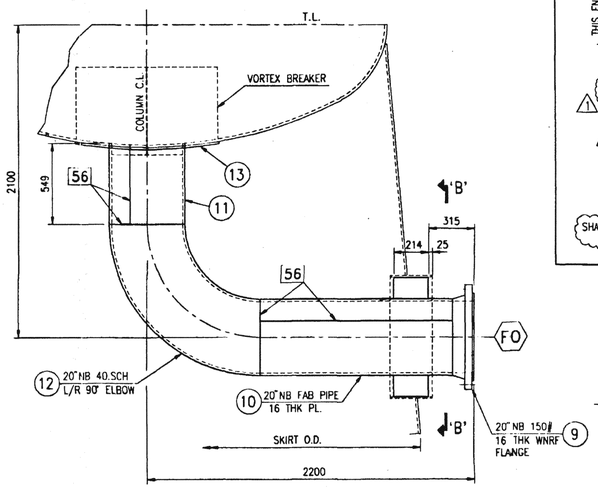
SHACKLE USED - KANSAI KOGYO Co. LTD. SHACKLE ø3 1/2" (1)

LIFTING LUG DETAIL

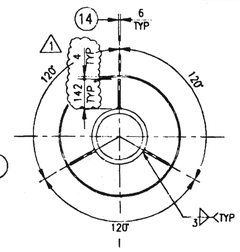


PLAN



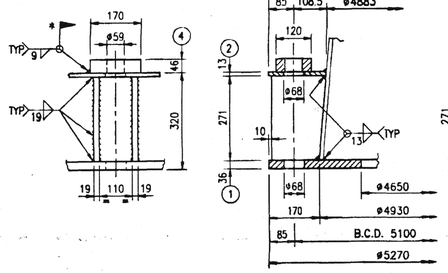


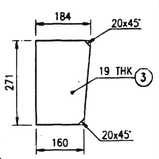
DETAIL OF NOZZLE -'FO'



SECTION 'B-B'

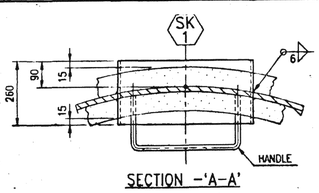
* PLATE WASHER (Pos.4) TO BE SHIPPED LOOSE, WIRE TOGETHER & ATTACH SECURELY TO VESSEL FOR SHIPMENT.



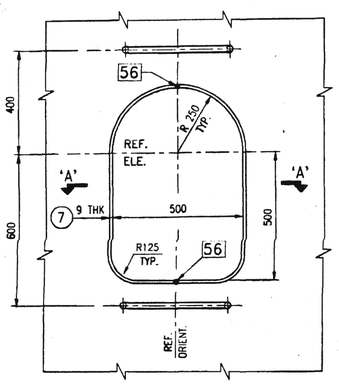


GUSSET DETAIL

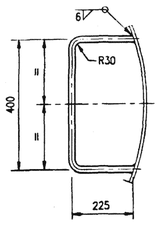
SKIRT AND ANCHOR CHAIR DETAIL



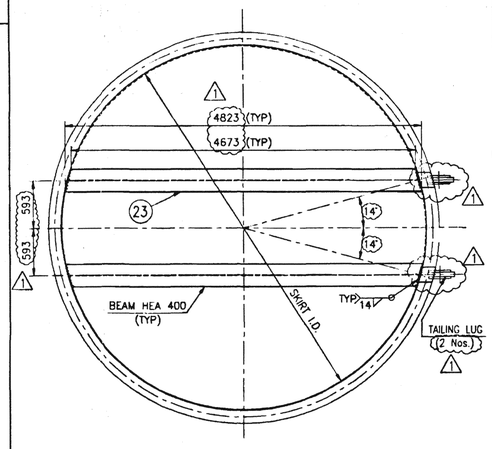
SECTION -'A-A'



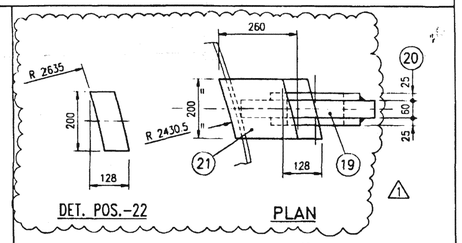
ACCESS OPENING DETAIL



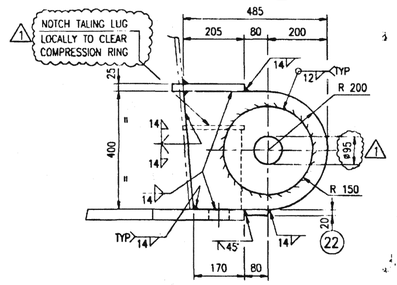
HANDLE DETAIL



BRACING DETAIL (FOR TAILING LUG)
FOR ORIENTATION REFER
DWG. :- DA-7033-03-001



DET. POS.-22 PLAN



TAILING LUG DETAIL

SHACKLE USED - KANSAI KOGYO Co. LTD. SHACKLE ø3" (1)

TOTAL WT. = (1) 5119.5 Kgs.

	ITEM	POS. QTY FOR ONE FAM.	DESCRIPTION	LENGTH	WIDTH	THICK	WT. IN Kg. For ONE POS.	WT. IN Kg. For ONE FAM.	MAT'L	MAT'L CODE	RDA. NO.
(1)	23	2	BEAM HEA 400	4823	0	0.0	602.0	1204.0	A36		
(1)	22	2	STIFFENER (SEE DWG)	200	128	20.0	4.0	8.0	A36	7033A01L63	703300-001
(1)	21	2	STIFFENER (SEE DWG)	260	200	25.0	10.2	20.4	A36	7033A01L64	703300-001
(1)	20	4	RING OD300/ID195	0	0	25.0	12.5	50.0	A36	7033A01L64	703300-001
	19	2	TAILING LUG	485	400	60.0	91.4	182.8	A36	7033A01L69	703300-001
	18	2	STIFFENER	500	173	25.0	17.0	34.0	A516Gr70	7033A01L52	703300-001
(1)	17	2	PAD	600	400	13.0	25.0	50.0	A516Gr70	7033A01L08	703300-001
(1)	16	4	RING OD350/ID310	0	0	25.0	17.0	68.0	A36	7033A01L64	703300-001
(1)	15	2	LIFTING LUG	1315	500	60.0	309.7	619.4	A36	7033A01L69	703300-001
(1)	14	3	STIFFENER	214	142	6.0	1.5	4.5	A516GR.70	LP060A5172500800	STOCK
	13	1	RF PAD OD 970x518	0	0	17.0	70.5	70.5	SA516Gr70	7033A01L18	703300-001
	12	1	EL 20"-40 LR/90°	0	0	0.0	147.0	147.0	SA234GWPB	7033A09C05	703300-090
	11	1	NOZZLE NECK	1546	549	16.0	106.6	106.6	SA516Gr70	7033A01L16	703300-001
	10	1	NOZZLE NECK	1546	1294	16.0	251.2	251.2	SA516Gr70	7033A01L16	703300-001
	9	1	F 20"150# WNRF-16	0	0	0.0	78.0	78.0	SA105	7033A04F23	703300-004
	8	2	HANDLE ø19	816	0	0.0	1.8	3.6	A36	7033A20P01	703300-020
	7	1	ACCESS OPENING	2207	260	9.0	40.5	40.5	A36	629505NT09P06	STOCK
	6	1	PIPE WAY OPENING	2542	264	9.0	47.4	47.4	A36	629505NT09P06	STOCK
	5	8	PI 6"-40	203	0	0.0	3.3	26.4	A106GR.B	7033A06T19	703300-006
	4	20	PLAIN WASHER	170	120	45.0	7.4	148.0	A36	7033A01L67	703300-001
	3	40	GUSSET PLATE	271	184	19.0	7.0	280.0	A36	7033A01L62	703300-001
	2	1	T.R. OD 5270x4883	0	0	13.0	314.8	314.8	A36	7033A01L59	703300-001
03-02	1	1	B.R. OD 5270x4550	0	0	36.0	1364.4	1364.4	A36	7033A01L66	703300-001

LIST OF MATERIAL

CHIYODA PETROSTAR LTD.
JOB NO. 54001 IBN RUSHD AROMATICS PROJECT
PO NO. SAY-POP0002
REQ NO. MR-50-C-003
IDENT NO. 54C01-DW-0002
1. NO COMMENTS
2. PROCEED WITH CORRECTIONS AS NOTED
3. REVISE & RESUBMIT
4. DO NOT PROCEED
PURCHASER'S PERMISSION TO PROCEED OR REVIEW TAKEN ON VENDOR PRINTS SHALL NOT RELIEVE VENDOR FROM ITS RESPONSIBILITIES OR LIABILITIES UNDER PURCHASE ORDER.

BELLELI HEAVY INDUSTRIES LTD. AS BUILT CERTIFIED

REV.	DATE	DESCRIPTION	DRAWN	CHK'D	APP'D
1	01.03.97	REVISED AS PER CLIENT'S COMMENTS AND ISSUED FOR CONSTRUCTION	RJP		
0	10.10.96	ISSUED FOR APPROVAL	RJP	ALI DARU	BANERJEE

SCALE: 1 : 40
CLIENT: CHIYODA/IBN RUSHD.
ORDER: SAY-POP0002
APPROVED FOR CONSTRUCTION
BY A.K.BANERJEE
DATE 17/3/97

BELLELI SAUDI بيلليالي السعودية
HEAVY INDUSTRIES LTD. للصناعات الثقيلة المحدودة
AL- JUBAIL, KINGDOM OF SAUDI ARABIA. الجبيل

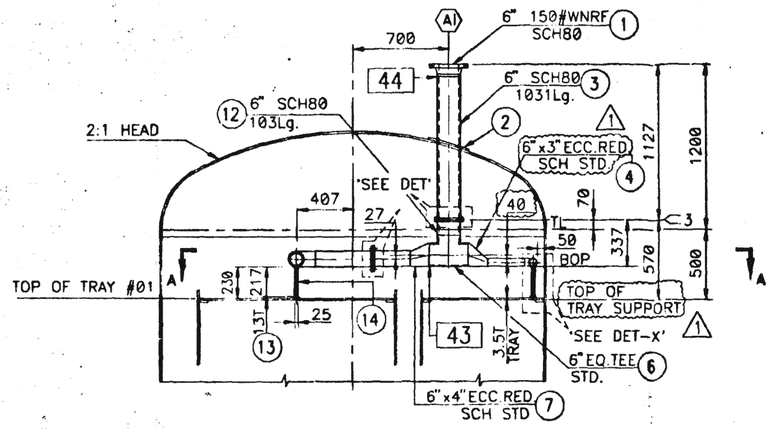
ARABIAN INDUSTRIAL FIBRES COMPANY (IBN RUSHD.)
PTA & AROMATICS PROJECT - AROMATICS
DEHEPTANIZER (54-C-01)
DETAIL DRAWING

DRAWING NO. DA-7033-03-002 REV. 1

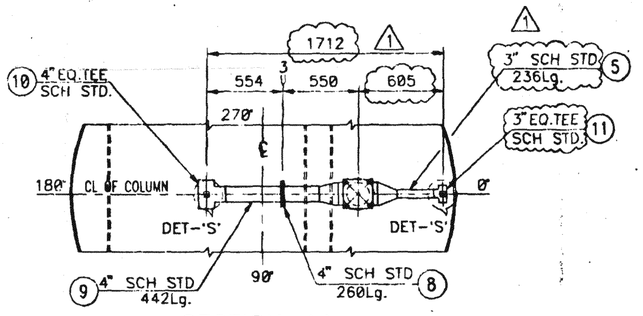
QUESTO DISEGNO NON PUO ESSERE COPIATO RIPRODOTTO MOSTRATO A TERZI SENZA NOSTRA AUTORIZZAZIONE
THIS DRAWING IS NOT TO BE REPRODUCED IN WHOLE OR PART NOR EMPLOYED FOR ANY PURPOSE OTHER THAN SPECIFICALLY PERMITTED IN WRITING BY BELLELI SAUDI HEAVY IND.LTD.

TITLE NAME : 7033.03.002

312004

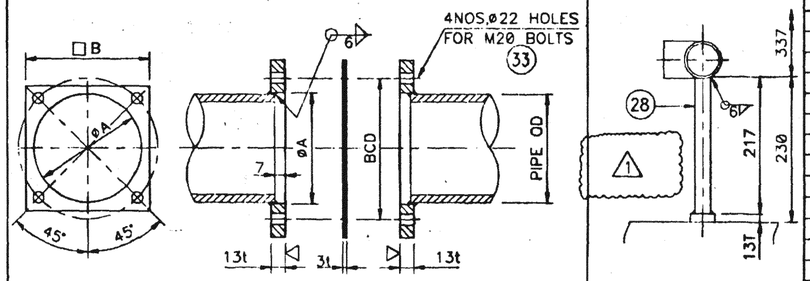


ELEVATION-NOZZLE-AI



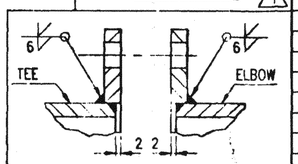
SECTION-AA

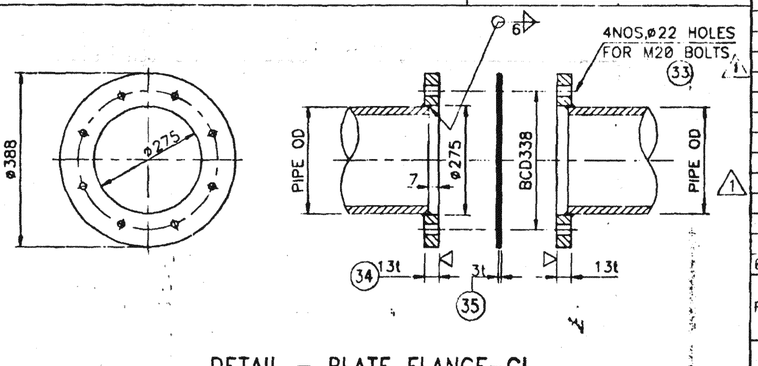
DETAIL-NOZZLE-AI



PIPE SIZE	ØA	□'B'	BCD	POS No.
4"	116	177	179	29 30
6"	170	215	233	31 32

DETAIL - PLATE FLANGE-AI



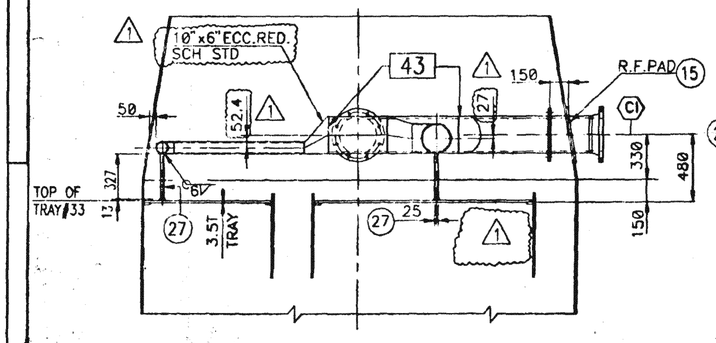


DETAIL - PLATE FLANGE-CI

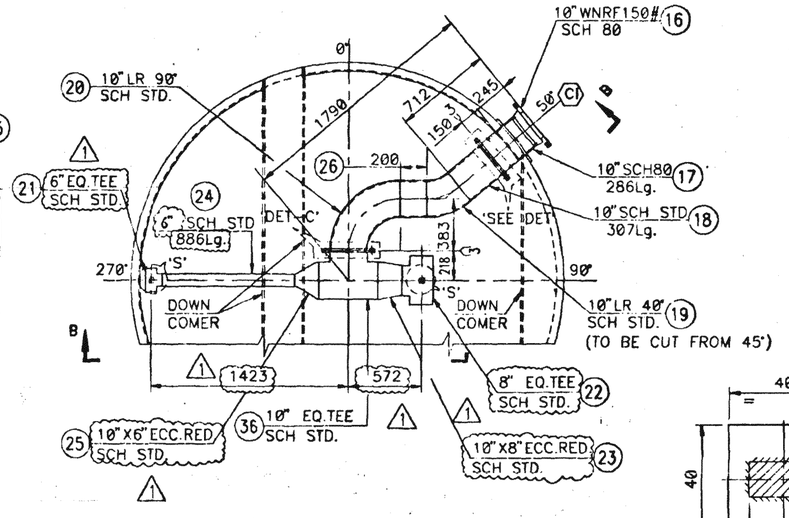
TOTAL WT. = 476.5 Kgs.

FAM.	ITEM POS.	QTY FOR ONE FAM.	DESCRIPTION	LENGTH	WIDTH	THICK	WT. IN Kg. For ONE POS.	WT. IN Kg. For ONE FAM.	MAT'L	MAT'L CODE	RDA. NO.
	36	1	TEE 10" STD	0	0	0.0	41.3	41.3	SA234WPB	7033A09C11	703300-009
	35	2	GK 388/375/3T	0	0	0.0	0.2	0.4	GRAFOIL		
	34	4	RING 388/275/16T	0	0	0.0	6.0	24.0	SA516Gr70	7033A01L16	703300-001
	33	24	B+1NT M20	60	0	0.0	0.1	2.4	SA193B7/SA194H	0605020080	STOCK
	32	1	GK (SEE DWG)	0	0	3.0	0.0	0.0	GRAFOIL		
	31	2	PLATE FLG.-AI	215	215	16.0	6.2	12.4	SA516Gr70	7033A01L16	703300-001
	30	1	GK (SEE DWG)	0	0	3.0	0.0	0.0	GRAFOIL		
	29	2	PLATE FLG.-AI	177	177	16.0	4.4	8.8	SA516Gr70	7033A01L16	703300-001
	28	1	BAR SUPPORT	217	25	13.0	0.5	0.5	SA516Gr70	7033A01L05	703300-001
	27	2	BAR SUPPORT	327	25	13.0	0.8	1.6	SA516Gr70	7033A01L05	703300-001
	26	1	PI 10" STD-CI	200	0	0.0	12.1	12.1	SA106GrB		
	25	1	ER 10/6" STD	0	0	0.0	10.4	10.4	SA234WPB		
	24	1	PI 6" STD-CI	886	0	0.0	25.0	25.0	SA106GrB		
	23	1	ER 10/8" STD	0	0	0.0	10.7	10.7	SA234WPB		
	22	1	TEE 8" STD	0	0	0.0	27.2	27.2	SA234WPB		
	21	1	TEE 6" STD	0	0	0.0	14.9	14.9	SA234WPB		
	20	1	E 10" STD LR90°	0	0	0.0	76.0	76.0	SA234WPB		
	19	1	E 10" STD LR45°	0	0	0.0	38.0	38.0	SA234WPB		
	18	1	PI 10" STD-CI	307	0	0.0	18.0	18.0	SA106GrB		
	17	1	PI 10" 80-CI	286	0	0.0	3.0	3.0	SA106GrB	7033A06T08	703300-006
	16	1	F-10"150#WNRF80	0	0	0.0	25.0	25.0	SA105	7033A04F11	703300-004
	15	1	RP 510/283/16T	0	0	0.0	14.4	14.4	SA516Gr70N	7033A01L16	703300-001
	14	1	BAR SUPPORT	217	25	13.0	0.6	0.6	SA516Gr70	7033A01L05	703300-001
	13	4	WEAR PLATE	40	40	13.0	0.2	0.8	SA516Gr70	7033A01L05	703300-001
	12	1	PI 6" STD-AI	103	0	0.0	2.9	2.9	SA106GrB		
	11	1	TEE 3" STD	0	0	0.0	3.8	3.8	SA234WPB		
	10	1	TEE 4" STD	0	0	0.0	4.1	4.1	SA234WPB		
	9	1	PI 4" STD-AI	442	0	0.0	7.0	7.0	SA106GrB	6355A06T03	STOCK
	8	1	PI 4" STD-AI	260	0	0.0	4.2	4.2	SA106GrB	6355A06T03	STOCK
	7	1	ER 6"/4" -STD	0	0	0.0	4.0	4.0	SA234WPB		
	6	1	TEE 6" STD	0	0	0.0	16.5	16.5	SA234WPB	7033A09C09	703300-009
	5	1	PI 3" STD-AI	236	0	0.0	2.7	2.7	SA106GrB		
	4	1	ER 6"/3" STD	0	0	0.0	3.8	3.8	SA234WPB		
	3	1	PI 6" 80-AI	1031	0	0.0	44.0	44.0	SA106GrB	7033A06T05	703300-006
	2	1	RP 300/178/13T	0	0	0.0	5.0	5.0	SA516Gr70N	7033A01L05	703300-001
03-05	1	1	F-6"150#WNRF80	0	0	0.0	11.0	11.0	SA105	7033A04F08	703300-004

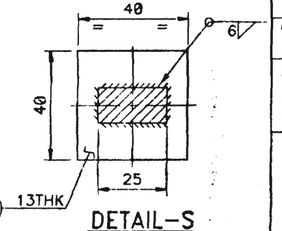
LIST OF MATERIAL



SECTION-BB



DETAIL-NOZZLE-CI



DETAIL-S

CHIYODA PETROSTAR LTD.
JOB NO. 5400 IBN RUSHD AROMATICS PROJECT
PO NO. SAY-POP0002
REQ NO. MR-50-C-003
IDENT NO. 54C01-DW-0005
A NO COMMENTS PROCEED WITH FABRICATION — SAY TEAM
B PROCEED WITH FABRICATION INCORPORATING TO BE CARRIED — VSL
C DO NOT PROCEED WITH FABRICATION — DATE May.08'97
PURCHASER'S PERMISSION TO PROCEED OR REVIEW TAKEN ON VENDOR PRINTS SHALL NOT RELIEVE VENDOR FROM ITS RESPONSIBILITIES OR LIABILITIES UNDER PURCHASE ORDER.

AS BUILT

REV.	DATE	DESCRIPTION	DRAWN	CHK'D	APP'D
1	8.3.97	REVISED AS PER CLIENT'S COMMENTS & ISSUED FOR CONSTRUCTION.	Rama rao	YOGESH HAIDER	AKB
0	19.2.97	ISSUED FOR APPROVAL	Rama rao		

SCALE: 1 : 30
CLIENT: CHIYODA/IBN RUSHD.
ORDER: SAY-POP0002
APPROVED FOR CONSTRUCTION
BY AKB
DATE 9/3/97

BELLELI SAUDI بيـلـيـلـي الـسـعـوديـة
HEAVY INDUSTRIES LTD. للصناعات الثقيلة المحدودة
AL- JUBAIL, KINGDOM OF SAUDI ARABIA. الجبيل

ARABIAN INDUSTRIAL FIBRES COMPANY(IBN RUSHD.)
PTA & AROMATICS PROJECT - AROMATICS
DEHEPTANIZER (54-C-01)
DETAIL OF INTERNALS

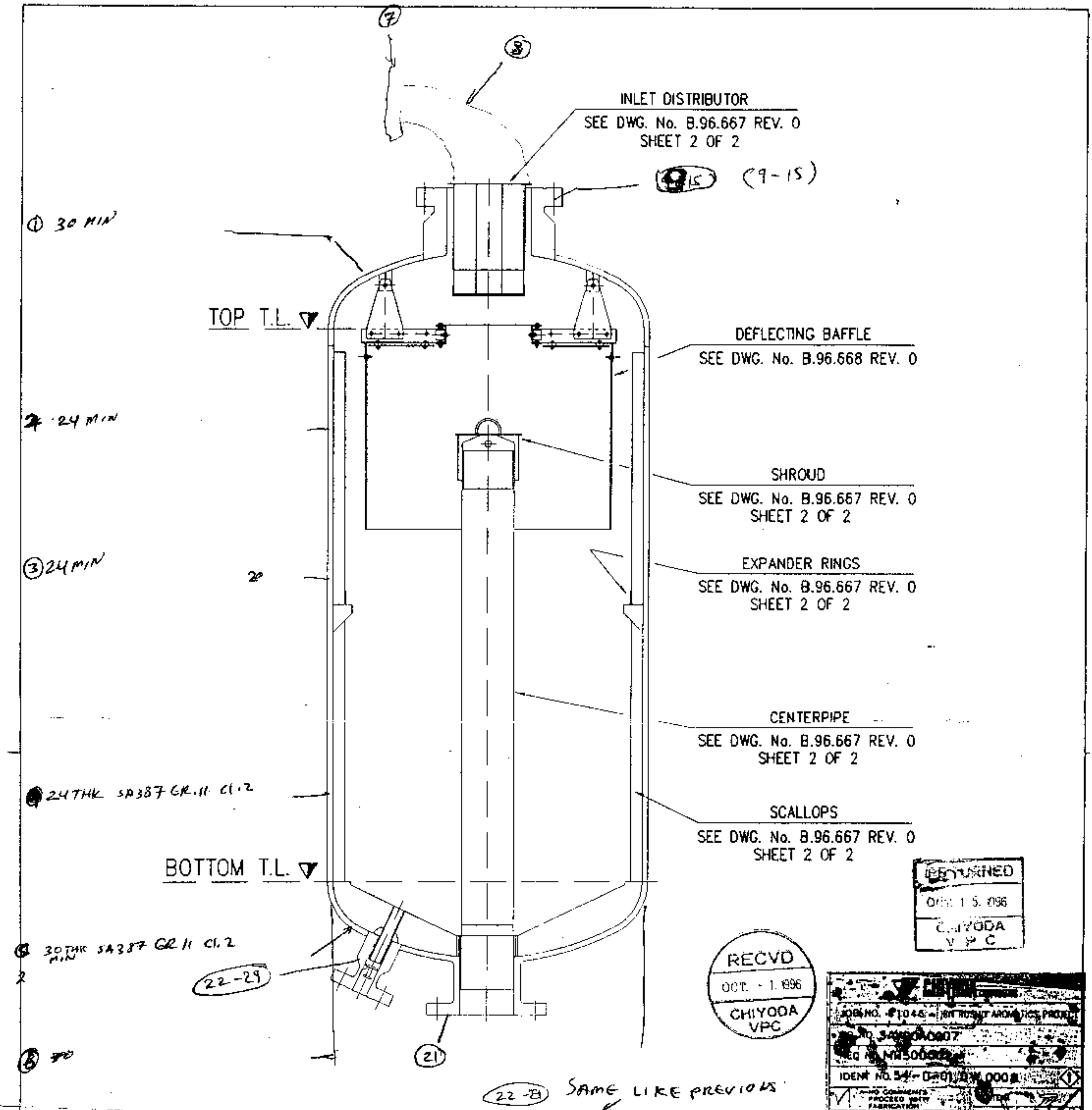
QUESTO DISEGNO NON PUO ESSERE COPIATO RIPRODOTTO MOSTRATO A TERZI SENZA NOSTRA AUTORIZZAZIONE

THIS DRAWING IS NOT TO BE REPRODUCED IN WHOLE OR PART NOR EMPLOYED FOR ANY PURPOSE OTHER THAN SPECIFICALLY PERMITTED IN WRITING BY BELLELI SAUDI HEAVY IND.LTD.

DRAWING NO. DA-7033-03-005 REV. 1

FILE NAME: 7033A305

81200



MAT
BUFFLE PLT SA 240 TP 321 AU PLT
ALL NUTS A 194 GR 3
ALL SCREW A193 B16

MAT. ⑧-ELBOW
①②③④⑤⑥ SA 387 GR 11, Cl.2 PLT ALPLT
⑥ SA182 F 11 Cl,3 FLG
⑳⑨ SA336 F 11 Cl.3 FLG
(9-15) GASKT SS 304 NON ASBESTOS WITH SS 304
BOLT SA 193 B16
NUT SA 194 GR4
INLET DIST (LATER).

FULL VACUUM, 43
MAWP = 13.1
DESIGN P = 24.3
CORROSION AL: 3

Rev	Data / Date	Descrizione / Description	Dis. / Dr.	Contr. / Ck.
1	AUG. 96	MODIFIED AS MARKED ⚠1	R.F.	
0	JULY 96	ISSUED FOR JOB No. 983/605028/0/96	C.M.	

Committente - Customer: OFFICINE LUIGI RESTA S.p.A.
JOB - 11/96/I
NF - 4839
P.O. No. SAYP0A0007 ⚠1
Cod. Anag. 1146200
Pos. Arch 0667300
Vs Ordine N. / Your order No.: F 696/96 DTD 10/06/96
Destinazione / Destination: YANBU - KINGDOM OF SAUDI ARABIA

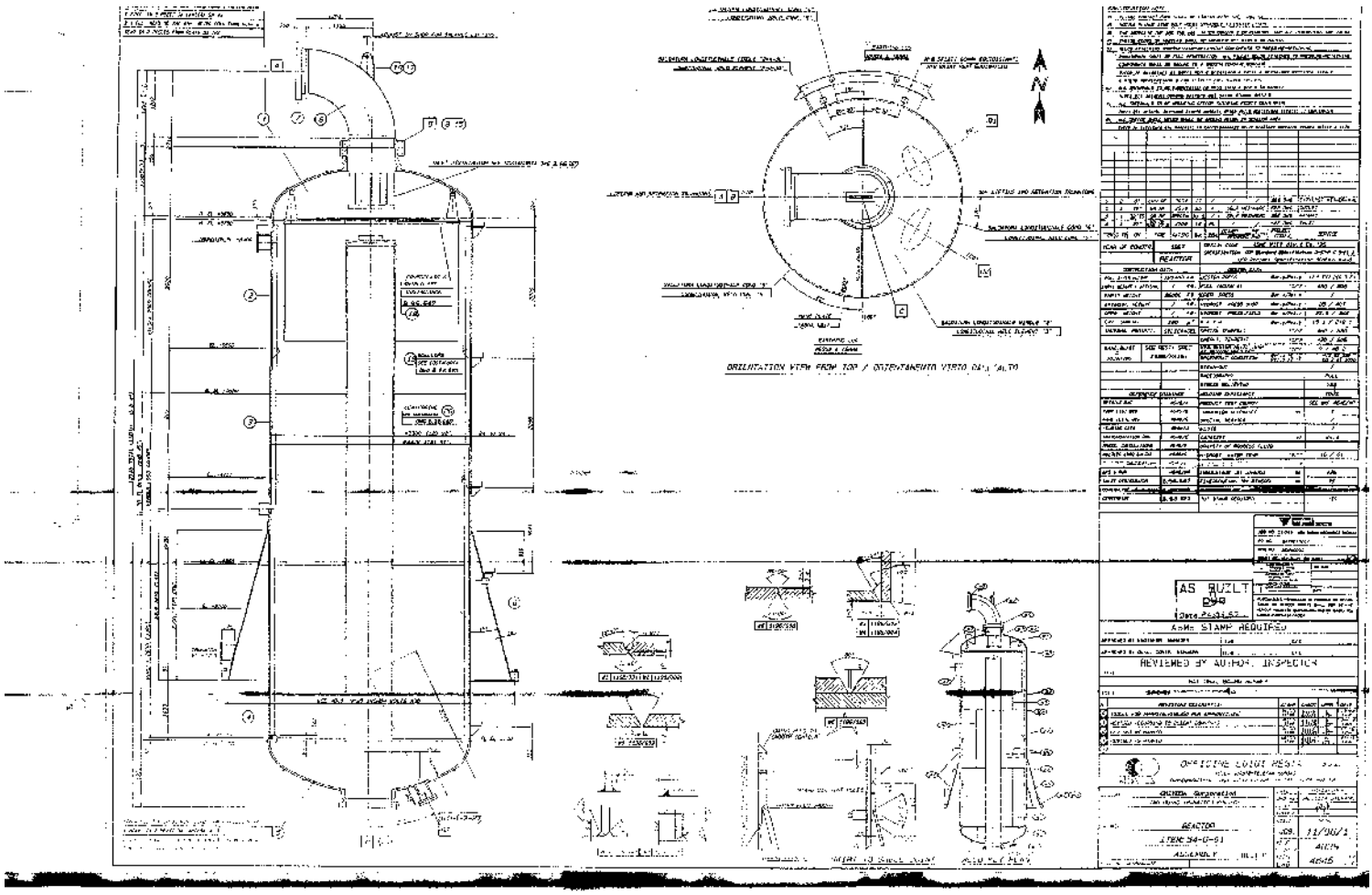
VICO costacurta
MILANO - ITALY
Via Grazioli, 30
tel. (02) 66.20.20.66 (centr.)
telex 331262 VICO I-Milano
facsimile (02) 66.20.20.99

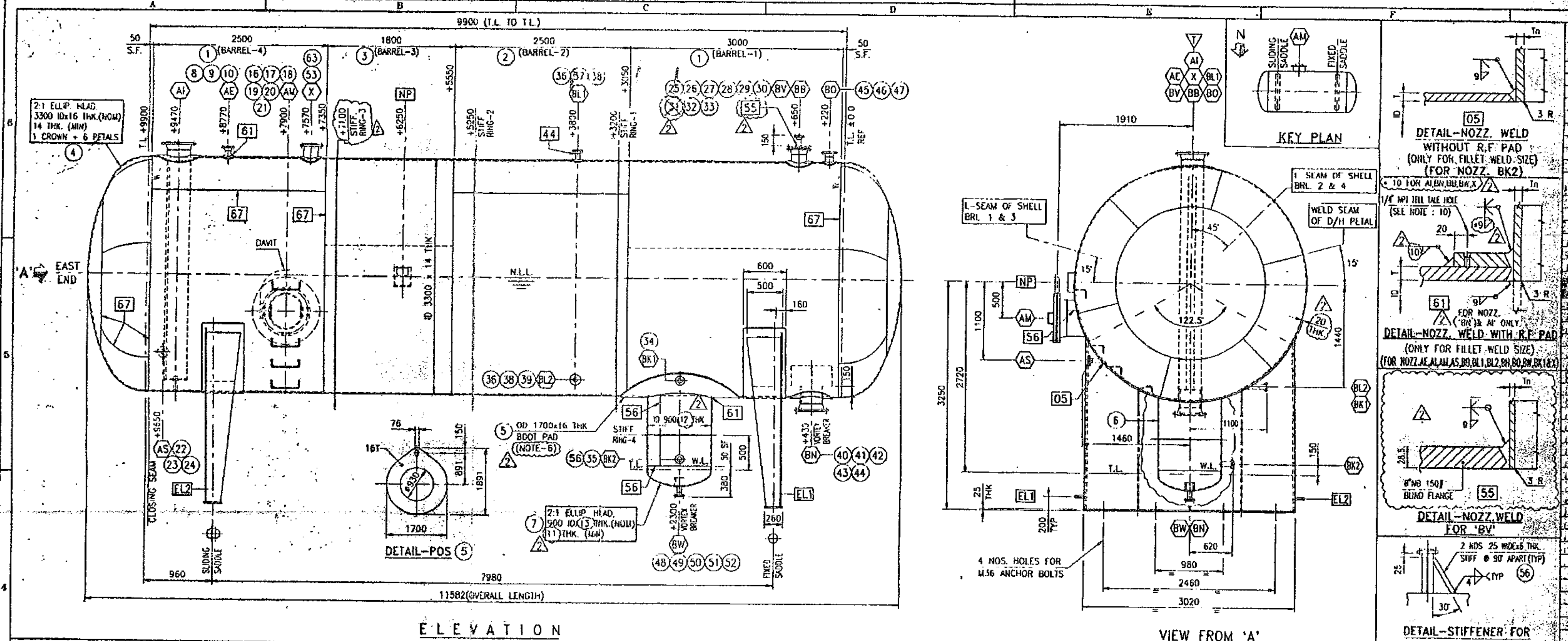
Scala - Scale: -/-
Dis. - Dr.: C.M.
Contr. - Ck.
Data - Date

KEY FOR DRAWINGS FOR ISOMAR REACTOR
⚠1 ITEM 54-D-01

Comm. VICO N. - VICO Job No. 983/605028/0/96
Cod.
Dis. N. - Dwg No. B.96.667 Rev. 1
Foglio / Sheet 1 di / of 2

Formato UNI A3 - 420x297

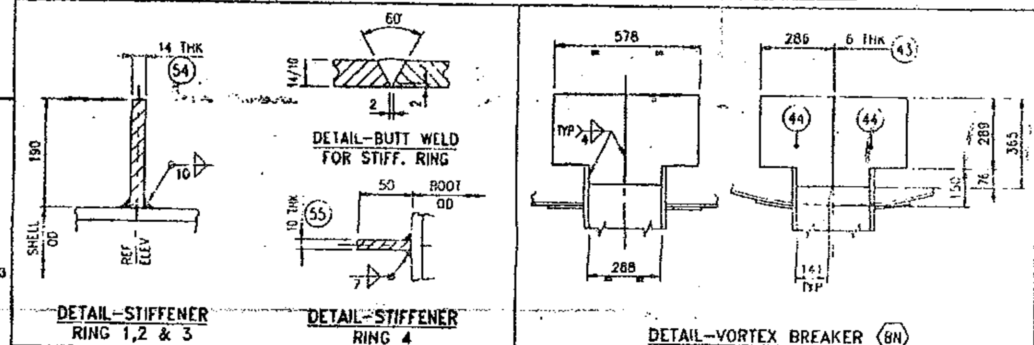

ORIENTATION VIEW FROM TOP / ORIENTAMENTO VISTO DALL'ALTO
AS BUILT
ASME STAMP REQUIRED
REVIEWED BY AUTHO. INSPECTOR
REACTOR



ELEVATION

VIEW FROM 'A'

KEY PLAN

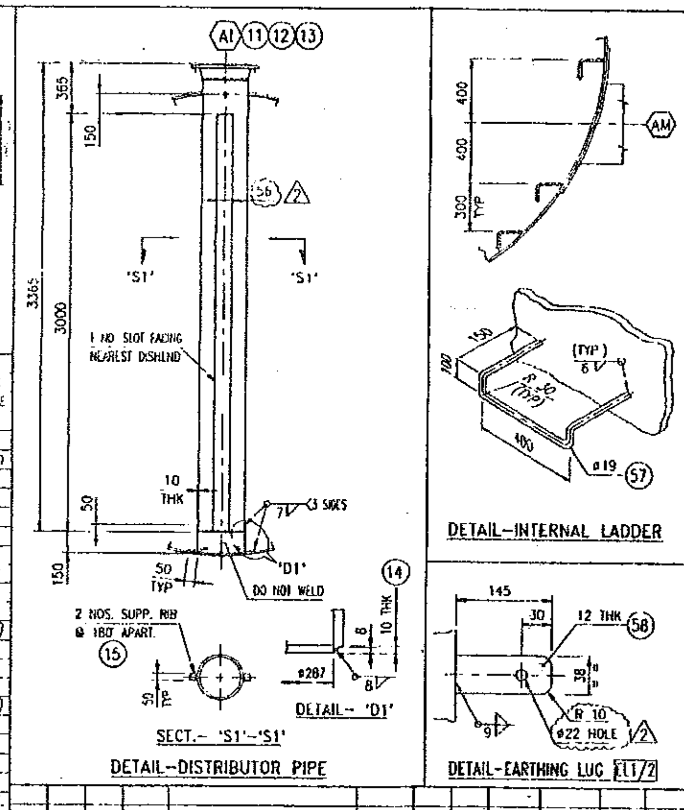


DETAIL-STIFFENER RING 1,2 & 3

DETAIL-BUTT WELD FOR STIFF. RING

DETAIL-STIFFENER RING 4

DETAIL-VORTEX BREAKER (BN)



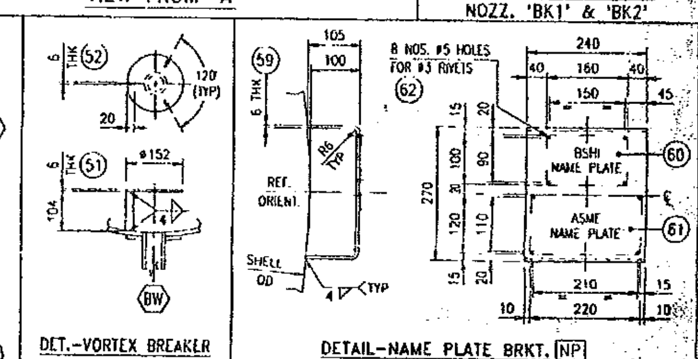
SECT.- 'S1'-'S1'

DETAIL- 'D1'

DETAIL-DISTRIBUTOR PIPE

DETAIL-INTERNAL LADDER

DETAIL-EARTHING LUG EL1/2



DET.-VORTEX BREAKER

DETAIL-NAME PLATE BRKT. NP

LIST OF MATERIAL

△2 • 4.5mm THK SS 316 SPIRAL WOUND GRAPHITE FILLED WITH SS 316 INNER AND SS/CS OUTER CENTERING RING

TOTAL WT. = 17004.9 Kgs. △2

FAM.	ITEM POS.	QTY FOR ONE FAM.	DESCRIPTION	LENGTH	WIDTH	THICK	WT. IN Kg. For ONE POS.	WT. IN Kg. For ONE FAM.	MAT'L	MAT'L CODE	RDA. NO.
	63	1	RP 300/2 6/14T-X	0	0	0.0	3.8	3.8	SA516Gr70	7033A01L35	703300-001
	62	8	RIVET #3	15	0	0.0	0.0	0.0	COPPER	7033A21B01	703300-021
	61	1	ASME NAME PLATE	220	120	3.0	0.6	0.6	SS304	800100050122	STOCK
	60	1	BSHI NAME PLATE	160	100	3.0	0.4	0.4	SS304	800100050122	STOCK
	59	1	NAME PLA BRKT.	472	240	6.0	5.3	5.3	SA516Gr70	LP060A5172500800	STOCK
	58	2	EARTHING LUG	145	38	12.0	0.5	1.0	SS304	20717A16L01	STOCK
	57	4	LADDER RUNG #19	850	0	0.0	1.9	7.6	SA36	7033A20P01	703300-020
	56	4	STIFF.(CUT TO SUIT)	0	0	6.0	0.2	0.8	SA516Gr70	LP060A5172500800	STOCK
	55	1	RING 3010 0/10920	0	0	10.0	12.0	12.0	SA516Gr70	7033A01L28	703300-001
	54	3	RING 003 8/103328	0	0	14.0	230.8	692.4	SA516Gr70	7033A01L35	703300-001
	53	1	F6" 300/LI RF-X	218	0	0.0	46.2	46.2	SA105	7033A04F36	703300-004
	52	3	PLATE	104	20	6.0	0.1	0.3	SA516Gr70	LP060A5172500800	STOCK
	51	1	VB PLATE 152	0	0	6.0	0.9	0.9	SA516Gr70	LP060A5172500800	STOCK
	50	1	F2" 150/W FXXS-BW	0	0	0.0	2.7	2.7	SA105	7033A04F86	703300-004
	49	1	PI 2" XXS BW	93	0	0.0	1.2	1.2	SA106GrB	7033A06T12	703300-006
	48	1	RP 150/7 /10T-BW	0	0	0.0	1.1	1.1	SA516Gr70	7033A01L28	703300-001
	47	1	F4" 150/W F120-BO	0	0	0.0	6.8	6.8	SA105	7033A04F87	703300-004
	46	1	PI 4" 120 BO	90	0	0.0	2.5	2.5	SA106GrB	7033A06T03	703300-006
	45	1	RP 210/1 /14T-BO	0	0	0.0	2.5	2.5	SA516Gr70	7033A01L35	703300-001
	44	2	VB PLATE BN	365	286	6.0	4.9	9.8	SA516Gr70	LP060A5172500800	STOCK
	43	1	VB PLATE BN	578	365	6.0	9.9	9.9	SA516Gr70	LP060A5172500800	STOCK
	42	1	F12" 150/ RF80-BN	0	0	0.0	36.3	36.3	SA105	7033A04F55	703300-004
	41	1	PI 12" 80 BN	251	0	0.0	33.1	33.1	SA106GrB	7033A06T18	703300-006
	40	1	RP 610/ 4/14T-BN	0	0	0.0	22.5	22.5	SA516Gr70	7033A01L35	703300-001
	39	1	PI 2" 160 BL2	288	0	0.0	3.2	3.2	SA106GrB	7033A06T01	703300-006
	38	2	F2" 150/R RF160-BL1/2	0	0	0.0	2.7	5.4	SA105	7033A04F39	703300-004
	37	1	PI 2" 160 BL1	102	0	0.0	1.1	1.1	SA106GrB	7033A06T01	703300-006
	36	2	RP 150/ /14T-BL1/2	0	0	0.0	1.5	3.0	SA516Gr70	7033A01L35	703300-001
	35	1	F1 1/2" 1x0/LWNRF-BK2	171	0	0.0	4.0	4.0	SA105	7033A04F30	703300-004
	34	1	F1 1/2" 1 0/LWNRF-BK	358	0	0.0	8.3	8.3	SA105	7033A04F84	703300-004
	33	1	F2" 150/R RF160-BV	0	0	0.0	2.7	2.7	SA105	7033A04F39	703300-004
	32	1	PI 2" 160-BV	115	0	0.0	1.3	1.3	SA106GrB	7033A06T01	703300-006
△2	31	0	DELETED	0	0	0.0	0.0	0.0			
	30	12	ST/2NT 3 "UNC-BB	110	0	0.0	0.4	4.8	SA193B7/SA194-2H	7033A11B03	703300-011
	29	4	GK 8" 15 RF-BB	0	0	4.5	0.0	0.0	•	7033A12G07	703300-012
	28	1	BF 8" 15 RF-BB	0	0	0.0	20.4	20.4	SA105	7033A04F68	703300-004
	27	1	F8" 150/W RF80-BB	0	0	0.0	17.7	17.7	SA105	7033A04F49	703300-004
	26	1	PI 8" 80 BB	117	0	0.0	7.6	7.6	SA106GrB	7033A06T07	703300-006
	25	1	RP 400/ 9/14T-BB	0	0	0.0	9.3	9.3	SA516Gr70	7033A01L35	703300-001
	24	1	F2" 150/R RF160-AS	0	0	0.0	2.7	2.7	SA105	7033A04F39	703300-004
	23	1	PI 2" 160 AS	195	0	0.0	2.2	2.2	SA106GrB	7033A06T01	703300-006
	22	1	RP 150/ /14T-AS	0	0	0.0	1.5	1.5	SA516Gr70	7033A01L35	703300-001
	21	24	ST/2NT 1 1/8" 8UN-AM	160	0	0.0	1.2	28.8	SA193B7/SA194-2H	7033A11B01	703300-011
	20	4	GK 20" 1 RF-AM	0	0	4.5	0.0	0.0	•	7033A12G01	703300-012
	19	1	BF 20" 1 RF-AM	0	0	0.0	124.0	124.0	SA105	7033A04F95	703300-004
	18	1	F 20" 150 WNRF 12T-AM	0	0	0.0	77.1	77.1	SA105	7033A04F90	703300-004
	17	1	MANHOLE NECK-AM	1558	298	12.0	43.7	43.7	SA516Gr70	7033A01L32	703300-001
	16	1	RP 970/ 8/14T-AM	0	0	0.0	58.0	58.0	SA516Gr70	7033A01L35	703300-001
	15	2	SUPPORT PLATE-AI	245	50	10.0	1.0	2.0	SA516Gr70	7033A01L28	703300-001
	14	1	COVER PL T@287-AI	0	0	10.0	5.0	5.0	SA516Gr70	7033A01L28	703300-001
	13	1	F12" 150/ RF80-AI	0	0	0.0	36.3	36.3	SA105	7033A04F55	703300-004
	12	1	PI 12" 80 AI	3243	0	0.0	428.3	428.3	SA106GrB	7033A06T18	703300-006
	11	1	RP 610/ 4/14T-AI	0	0	0.0	22.5	22.5	SA516Gr70	7033A01L35	703300-001
	10	1	F3" 150/R RF160-AE	0	0	0.0	4.5	4.5	SA105	7033A04F42	703300-004
	9	1	PI 3" 160 AE	96	0	0.0	2.0	2.0	SA106GrB	7033A06T02	703300-006
	8	1	RP 180/ /14T-AE	0	0	0.0	2.0	2.0	SA516Gr70	7033A01L35	703300-001
△2	7	1	EH ID900 3T(NOM)	0	0	0.0	113.5	113.5	SA516Gr70	7033A01L35	703300-001
△2	6	1	BOOT SHELL BRL.	2855	1085	12.0	293.0	293.0	SA516Gr70		
	5	1	BOOT PAD	1891	1700	16.0	318.5	318.5	SA516Gr70	7033A01L40	703300-001
	4	2	EH ID3300 16T(NOM)	0	0	0.0	1619.0	3238.0	SA516Gr70	7033A01L40	703300-001
	3	1	SHELL BRL -3	10411	1800	14.0	2059.5	2059.5	SA516Gr70	7033A01L35	703300-001
	2	2	SHELL BRL -2 & 4	10411	2500	14.0	2860.4	5720.8	SA516Gr70	7033A01L35	703300-001
42-01	1	1	SHELL BRL -1	10411	3000	14.0	3432.5	3432.5	SA516Gr70	7033A01L34	703300-001

BELLELI REFERENCE DRAWINGS

DRAWING No.	DESCRIPTION
DA-7034-42-002	DETAILS DRAWING
DA-7034-42-003	FORMED HEAD - SHELL
DA-7034-42-004	FORMED HEAD - BOOT
DA-7034-42-005	BSHI NAME PLATE
DA-7034-42-006	ASME NAME PLATE
DA-7034-42-007	EXTERNAL CLIPS
DA-7034-00-001	DAVIT ARRANGEMENT
ST-7034-42-001	FINISH REQUIREMENTS
DO-7034-42-001	SHIPPING DRAWING
CHIYODA STD. DR-50B-0-017	NAME PLATE
CHIYODA STD DR-50-0B-013	ANSI 150,300 & 600 MANHOLE DAVIT AND HINGE
CHIYODA STD DR-50B-0-012	FLANGED NOZZLE
CHIYODA STD DR-50 0B-010	INTERNAL LADDER FOR VESSEL
CHIYODA STD DR-50-0B-003	SADDLE FOR HORIZONTAL VESSEL
UOP STD SPEC 3-11	PRESSURE VESSELS CARBON STEEL
SP-50-N-001	HOT SERVICE THERMAL INSULATION
BECHTEL SP 22854-SP-000-M-001	BASIC CIVIL ENGINEERING DESIGN DATA
BECHTEL SP 22854-SP-000-D-001	UNFIRED PRESSURE VESSELS
BECHTEL SP 22854-SP-000-M-001	MATERIAL WELDING,NDT & CORROSION CONTROL
DS-58-D-001	CLIENT'S DATA SHEET

CLIENT'S REF. DWGS. & SPECS

GENERAL NOTES

22. ▽ -- DENOTES TOP
21. FOR CARBON AND CARBON MAGANESE STEEL THE CARBON CONTENT SHALL BE LIMITED TO 0.25% MAXIMUM
20. THE LONGITUDINAL WELD SEAMS OF NOZZLES INSTALLED HORIZONTALLY SHALL BE POSITIONED ABOVE CENTER LINE
19. HEAD SEAMS SHALL BE FULLY RADIOGRAPHED, HEAD TO SHELL SEAM SHALL BE SPOT RADIOGRAPHED PER UW-11(a)5(b), OTHER SEAMS SHALL BE SPOT RADIOGRAPHED PER UW-11(b).
18. THE LONGITUDINAL BUTT WELD OF NOZZLES FABRICATED FROM PLATE SHALL BE 100% RADIOGRAPHED
17. □ MARK INDICATES THE BSHI WELD STANDARD NUMBER
    ○ MARK INDICATES THE POSITION NUMBER WITH REFERENCE TO LIST OF MATERIAL
    ⬡ MARK INDICATES THE NOZZLE MARK NUMBER.
16. SHOP HYD. TEST GASKETS :- (i) BLINDED NOZZLES WILL HAVE JOB GASKETS. (ii) ALL OTHER NOZZLES WILL HAVE CAF GASKET.
15. SPARE PARTS:-

ITEMS	COMMISSIONING/STARTUP	OPERATIONAL	SHOP HYD. TEST
GASKETS	200%	100%	100%
FASTENERS	10%(MIN. 2 SETS)	10%(MIN. 2 SETS)	NOT REQUIRED

△2 QTY. OF SPARES FOR GASKETS AND FASTENERS ARE INCLUDED IN LIST OF MATERIALS

14. ALL BOLTS & NUTS SHALL BE OF UNC SERIES UPTO & INCLUDING 1" SIZE & 8UN ABOVE 1" SIZE
13. FLANGES UPTO & INCLUDING 24"NB SHALL BE AS PER ANSI B16.5 & THE FLANGE FACE FINISH SHALL BE 3.2 TO 6.3 MICROMETER
12. △2 DELETED
11. MINIMUM TEMPERATURE OF HYDROTEST WATER SHALL BE 17C AND THE TEST PRESSURE SHALL BE HELD FOR HALF AN HOUR PER INCH OF THICKNESS WITH ONE HOUR MINIMUM.
10. EACH REINFORCING PAD OR SEGMENT THEREOF SHALL BE PROVIDED WITH ONE No. (TWO Nos. FOR NOZZLES 16"NB AND ABOVE @ 180° APART) 1/4" NPT. TELL TALE HOLE AS PER ANSI B1.20.1. ALL R.F PAD WELDS SHALL BE TESTED TO 15 Psig MINIMUM WITH AIR & SOAPY BUBBLE TEST.
9. A PERMANENT REFERENCE WORKLINE FOR VERTICAL VESSELS BOTTOM TAN LINE SHALL BE PUNCHMARKED AROUND THE VESSEL PERIMETER AT 0,90,180 & 270 AND HORIZONTAL VESSELS CENTER LEVEL SHALL BE PUNCHMARKED ON BOTH SIDE SURFACES OF SHELL NEAR THE HEAD.
8. THE VESSEL SHALL BE THOROUGHLY CLEANED INSIDE & OUTSIDE AND SHALL BE FREE OF ALL DIRT, WELD ROD STUBS & LOOSE FOREIGN MATERIALS Etc.
7. ALL REMOVABLE INTERNALS SHALL PASS THROUGH THE NEAREST MANHOLE.
6. WELD SEAMS COMING UNDER MISC. ATTACHMENTS SHALL BE GROUND SMOOTH & RADIOGRAPHED FOR A DISTANCE OF 150mm BEYOND THE ATTACHMENT WELD.
5. ALL NOZZLES AND MANWAY THAT DO NOT EXTEND INTO THE VESSEL SHALL BE FINISHED FLUSH WITH THE INSIDE & THE INNER EDGE SHALL BE ROUNDED OFF TO A MIN. 3mm RADIUS.
4. NOZZLE POSITIONS ON VESSEL ELEVATIONS ARE CONVENTIONAL. FOR TRUE LOCATION SEE NOZZLE ORIENTATION PLAN.
3. NOZZLE PROJECTION IS FROM CENTER LINE OF VESSEL TO GASKET FACE OF FLANGE UNLESS SPECIFIED OTHERWISE.
2. ALL FLANGE BOLT HOLES SHALL STRADDLE VERTICAL AND/OR NORTH SOUTH CENTER LINES UNLESS SHOWN OTHERWISE.
1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.

NOZZLE SCHEDULE

MARK	QTY	SIZE	PROJ. FROM CL	SERVICE	NOZZLE NECK O.D.	NOZZLE NECK SCH.	NOZZLE NECK THK.	NOZZ. FLANGE TYPE	NOZZ. FLANGE RATING LB	REINF. PAD O.D	REINF. PAD THK
X	1	6"	1865	RELIEF	206.4	-	27.0	LWNRF	300#	300	14
BW	1	2"	SEE DRG.	DRAIN W/VB	60.3	XXS	11.07	WNRF	150#	150	10
BV	1	2"	SEE DRG.	VENT △2	60.3	160	8.74	WNRF	150#	-	-
BO	1	4"	1815	BLANKETING	114.3	120	11.13	WNRF	150#	210	14
BN	1	12"	1865	OUTLET W/VB	323.9	80	17.48	WNRF	150#	610	14
BL2	1	2"	SEE DRG.	LEVEL	60.3	160	8.74	WNRF	150#	150	14
BL1	1	2"	1815	LEVEL	60.3	160	8.74	WNRF	150#	150	14
BK2	1	1 1/2"	SEE DRG.	LEVEL	66.7	-	14.3	LWNRF	150#	-	-
BK1	1	1 1/2"	SEE DRG.	LEVEL	66.7	-	14.3	LWNRF	150#	SEE DWG.	
BB	1	8"	1865	VENTILATION W/BF	219.1	80	12.7	WNRF	150#	400	14
AS	1	2"	SEE DRG.	STEAMOUT	60.3	160	8.74	WNRF	150#	150	14
AM	1	20"	SEE DRG.	MANWAY W/BF + DAVIT	508.0	PLT	12	WNRF	150#	970	14
AI	1	12"	1865	INLET W/INT. DISTR. PIPE	323.9	80	17.48	WNRF	150#	610	14
AE	1	3"	1815	EQUALIZING	88.9	160	11.13	WNRF	150#	180	14

HEAT TREATMENT

Part	Procedure	Holding Temp. °C	Heating rate °c/h	Holding time mn	Cooling rate °C/h	Temperature measured furnace/part Qty of Sensors
BOOT HEAD	STRESS RELIEVING	630 ± 10°C	205°C / HR ABOVE 427°C	60 Minutes	260°C / HR UPTO 427°C	AS PER BELLELI STD. PROCEDURE PR-HTT-001

DESIGN DATA

No.	DESIGN CONDITIONS	UNITS	VALUES
33.	FABRICATION WEIGHT	Kg	21000
32.	FULL OF WATER WEIGHT	Kg	120800
31.	OPERATING WEIGHT	Kg	64900
30	ERECTION WEIGHT	Kg	21000
29.	MANUFACTURER'S SERIAL No.	---	2408
28.	MANUFACTURER'S JOB NUMBER	---	7034-42
27	MANUFACTURER'S NAME	---	BELLELI SAUDI HEAVY IND. LTD.
26.	CODE STAMP	---	YES
25	DESIGN CODE	---	ASME SEC VIII. DIV.1 1995 EDITION
24.	SERVICE	---	BENZENE COLUMN RECEIVER
23	VOLUME	m^3	94.69
22.	FIREPROOFING	mm	75-AROUND SADDLES (BY OTHERS)
21	INSULATION	mm	40-HOT ON BOOT ONLY (BY OTHERS)
20.	SPECIFIC GRAVITY	---	0.816
19.	OPERATING FLUID	---	HYDROCARBON
18	INSPECTION AUTHORITY	---	CLIENT/ABS
17.	WIND SPEED/EXPOSURE CATEGORY	km/hr	125/C
16.	EARTHQUAKE DESIGN	---	ASCE 7-88 ZONE 1
15.	MINIMUM DESIGN METAL TEMPERATURE	°C	9.0
14.	CHARPY IMPACT TEST	---	NO
13.	ULTRASONIC EXAMINATION	---	NO
12	POST WELD HEAT TREATMENT	---	NO
11	JOINT EFFICIENCY (SHELL/HEAD)	%	85/100
10	RADIOGRAPHY (SHELL/HEAD)	---	RT4 AS PER UG-116(e) SEE NOTE 19
9.	CORROSION ALLOWANCE	mm	3.0 (6.0 FOR BOOT)
8.	M.A.W.P. AT DESIGN TEMPERATURE	barg	6.67 (LIMITED BY SHELL)
7.	M.A.P. (NEW & COLD)	barg	8.66 (LIMITED BY SHELL)
6	FIELD HYDROTEST PRESSURE (CORRODED)	barg	10.0
5.	SHOP HYDROTEST PRESSURE (HOR)	barg	12.54 (AT TOP)
4.	OPERATING TEMPERATURE	°C	82.0
3.	OPERATING PRESSURE	barg	-
2.	DESIGN TEMPERATURE (INT/EXT)	°C	121.0/82.0
1.	DESIGN PRESSURE (INT/EXT)	barg	3.8/FV

BELLELI SAUDI HEAVY INDUSTRIES LTD. — AS BUILT

CHIYODA PETROSTAR LTD.
JOB NO. 54001 IBN RUSHD AROMATICS PROJECT
PO NO. SAY-POP0001
REQ NO. MR-50-D-011
IDENT NO. 58001-DK-0001

PURCHASER'S PERMISSION TO PROCEED OR REVIEW TAKEN ON VENDOR PRINTS SHALL NOT RELIEVE VENDOR FROM ITS RESPONSIBILITIES OR LIABILITIES UNDER PURCHASE ORDER

REV.	DATE	DESCRIPTION	DRAWN	CHK'D	APP'D
2	12.03.97	REVISED AS PER CLIENT'S COMMENTS AND MARKED △2	RJP		
1	02.11.96	DWG. GENERALLY REVISED & ISSUED FOR CONSTRUCTION	DERECK	ALI/HAIDER	AKB
0	20.06.96	ISSUED FOR APPROVAL & INTERNAL COMMENTS	DERECK	ALI/HAIDER	AKB

NO. REQUIRED: UNIT

SCALE: 1 : 3

CLIENT: CHIYODA/IBN RUSHD

ORDER: SAY-POP000

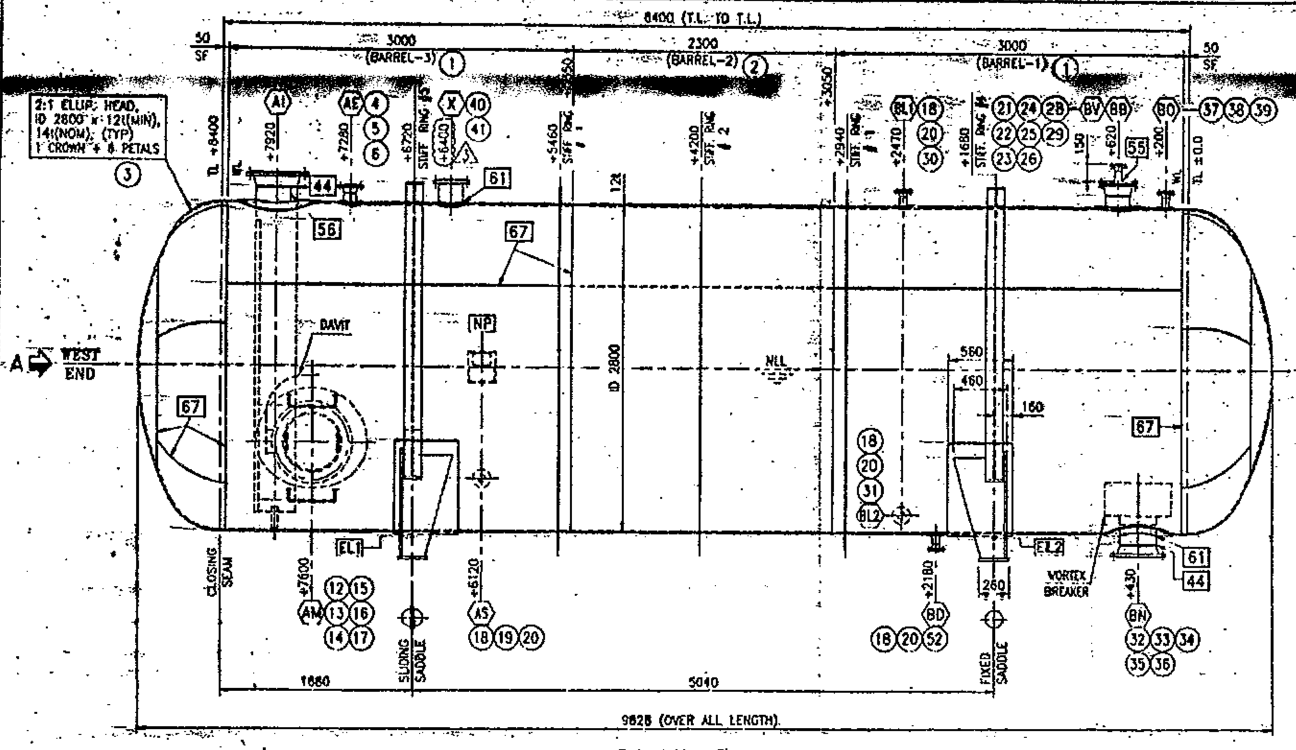
APPROVED FOR CONSTRUCTION BY: AKB DATE: 04.11.96

BELLELI SAUDI HEAVY INDUSTRIES LTD. بيلليلي السعودية للصناعات الثقيلة المحدودة
AL- JUBAIL, KINGDOM OF SAUDI ARABIA. الجبيل

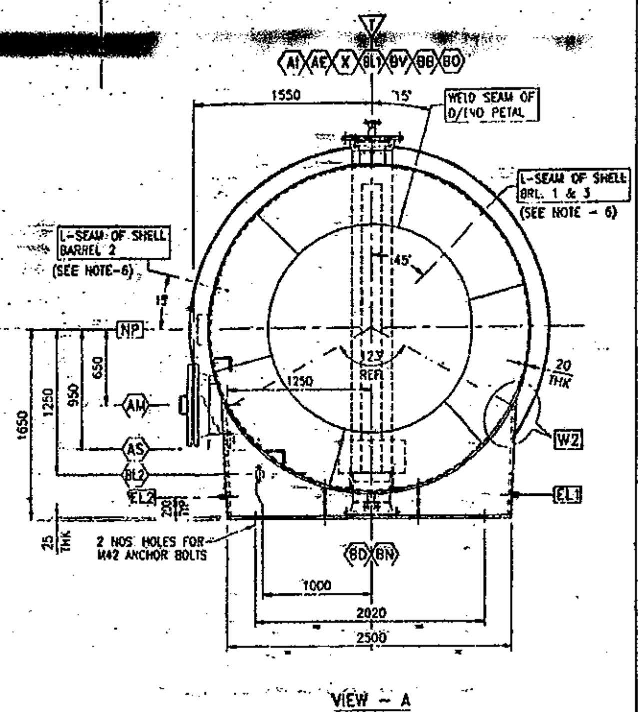
ARABIAN INDUSTRIAL FIBRES COMPANY (IBN RUSHD)
PTA & AROMATICS PROJECT - AROMATICS
BENZENE COLUMN RECEIVER (58-D-01)
GENERAL ASSEMBLY

QUESTO DISEGNO NON PUO ESSERE COPIATO RIPRODOTTO MOSTRATO A TERZI SENZA NOSTRA AUTORIZZAZIONE
THIS DRAWING IS NOT TO BE REPRODUCED IN WHOLE OR PART NOR EMPLOYED FOR ANY PURPOSE OTHER THAN SPECIFICALLY PERMITTED IN WRITING BY BELLELI SAUDI HEAVY IND.LTD.

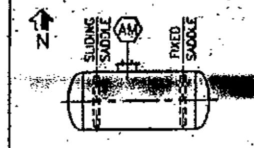
DRAWING NO. DA-7034-42-001 REV. 2



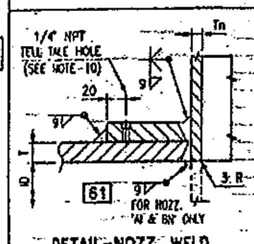
ELEVATION



VIEW - A

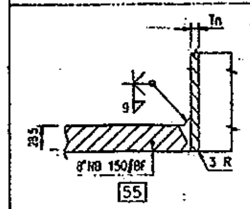


KEY PLAN

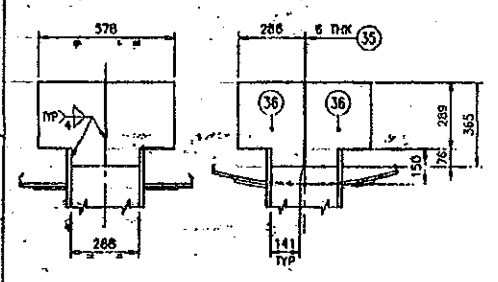


DETAIL-NOZZ. WELD WITH R.F PAD (ONLY FOR FILLET WELD SIZE)

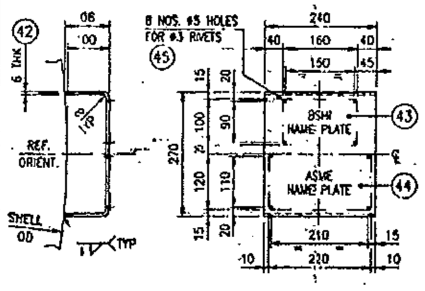
(FOR NOZZ. AE,AI,AM,AS,BB, BD,BL1,BL2,BN,BO,&X).



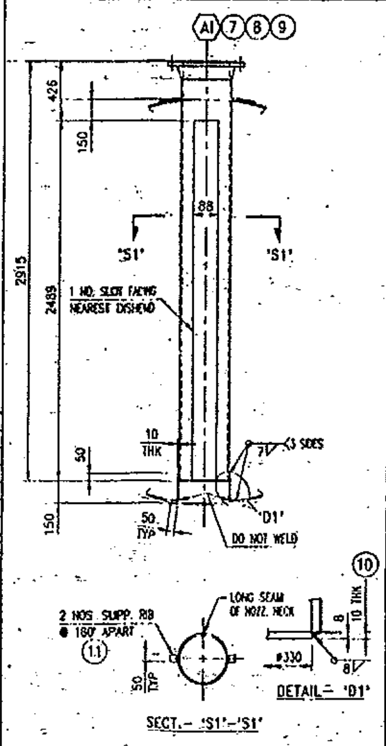
DETAIL-NOZZ. WELD FOR 'BV'



DETAIL-VORTEX BREAKER (BN)



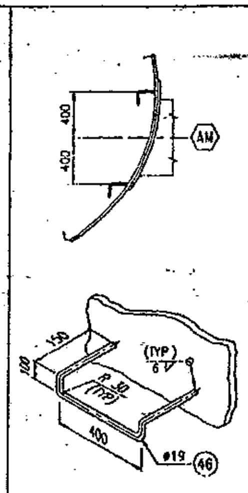
DETAIL-NAME PLATE BRKT. [NP]



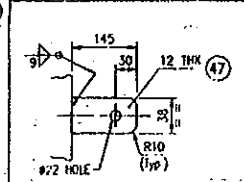
SECT.- 'S1'-'S1'

DETAIL- 'D1'

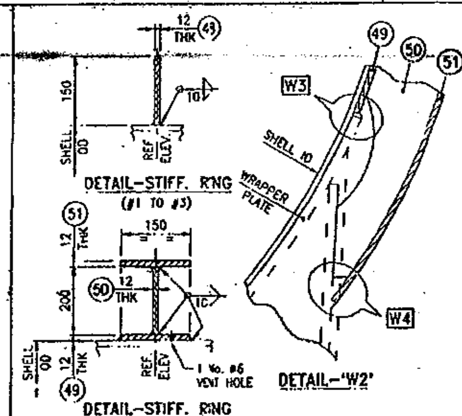
DETAIL-DISTRIBUTOR PIPE



DETAIL-INTERNAL LADDER



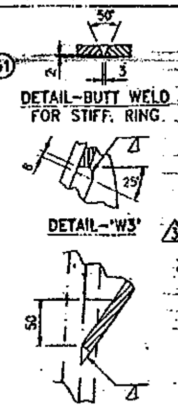
DETAIL-EARTHING LUG [EL1/2]



DETAIL-STIFF. RING (#1 TO #3)

DETAIL-STIFF. RING (#4 & #5)

DETAIL-'W2'



DETAIL-BUTT WELD FOR STIFF. RING.

DETAIL-'W3'

DETAIL-'W4'

2" x 4.5" [illegible] ROUND [illegible] CS/SS OUTER CENTERING RING.

TOTAL WT. = 10928.2 Kgs.

FAM.	ITEM POS	QTY FOR ONE FAM	DESCRIPTION	LENGTH	WIDTH	THICK	WT. IN Kg. For ONE POS.	WT. IN Kg. For ONE FAM.	MAT'L	MAT'L CODE	RDA. NO.
	52	1	PI 2" 160 - BD	102	0	0.0	1.1	1.1	SA106GrB	7033A06T01	703300-006
	51	2	PLATE	2397	150	12.0	104.8	209.2	SA516Gr70	7033A01L32	703300-001
	50	2	RING 3248/2848-260	0	0	12.0	130.5	260.8	SA516Gr70	7033A01L32	703300-001
	49	2	PAD PLATE	5800	150	12.0	81.9	163.8	SA516Gr70	7033A01L32	703300-001
	48	3	RING 3124/2824/12T	0	0	0.0	132.0	396.0	SA516Gr70	7033A01L32	703300-001
	47	2	EARTHING LUG	145	38	12.0	0.6	1.2	SS304	2077A08L01	STOCK
	46	2	LADDER RUNG #19	850	0	0.0	1.9	3.8	SA36	7033A20P01	703300-020
	45	8	RIVET #3	15	0	0.0	0.0	0.0	COPPER	7033A21B01	703300-021
	44	1	ASME NAME PLATE	220	120	3.0	0.6	0.6	SS304	800100050122	STOCK
	43	1	BSH NAME PLATE	180	100	3.0	0.4	0.4	SS304	800100050122	STOCK
	42	1	NAME PLATE BRKT	474	240	6.0	5.3	5.3	SA516Gr70	LP060M5172500800	STOCK
	41	1	F6"300# LWNRF-X	254	0	0.0	53.8	53.8	SA105	7033A04F35	703300-004
	40	1	RP 300/216/12T-X	0	0	0.0	3.2	3.2	SA516Gr70	7033A01L29	703300-001
	39	1	F3"150# WNRF160-BO	0	0	0.0	4.5	4.5	SA105	7033A04F42	703300-004
	38	1	PI 3" 160-BO	181	0	0.0	3.7	3.7	SA106GrB	7033A06T02	703300-006
	37	1	RP 180/89/12T-BO	0	0	0.0	1.7	1.7	SA516Gr70	7033A01L29	703300-001
	36	2	VB PLATE-BN	365	288	6.0	4.9	9.8	SA516Gr70	LP060M5172500800	STOCK
	35	1	VB PLATE-BN	578	365	6.0	9.9	9.9	SA516Gr70	LP060M5172500800	STOCK
	34	1	F12"150#WNRF80-BN	0	0	0.0	36.3	36.3	SA105	7033A04F55	703300-004
	33	1	PI 12" 80-BN	110	0	0.0	14.5	14.5	SA106GrB	7033A06T18	703300-006
	32	1	RP 610/334/12T-BN	0	0	0.0	19.3	19.3	SA516Gr70	7033A01L29	703300-001
	31	1	PI 2" 160-BL2	370	0	0.0	4.1	4.1	SA106GrB	7033A06T01	703300-006
	30	1	PI 2" 160 - BL1	187	0	0.0	2.1	2.1	SA106GrB	7033A06T01	703300-006
	29	1	F2"150#WNRF160-BV	0	0	0.0	2.7	2.7	SA105	7033A0459	703300-004
	28	1	PI 2" 160-BV	115	0	0.0	1.3	1.3	SA106GrB	7033A06T01	703300-006
	27	0	- DELETED -	0	0	0.0	0.0	0.0			
	26	12	ST/2HT 3/4"UNC-BB	110	0	0.0	0.4	4.8	SA193B7/SA194-2H	7033A11B05	703300-011
	25	4	GK 8" 150# RF-BB	0	0	4.5	0.0	0.0		7033A12G07	703300-012
	24	1	BF 8" 150# RF-BB	0	0	0.0	20.4	20.4	SA105	7033A04F68	703300-004
	23	1	F8"150#WNRF80-BB	0	0	0.0	17.7	17.7	SA105	7033A04F49	703300-004
	22	1	PI 8" 80-BB	152	0	0.0	9.8	9.8	SA106GrB	7033A06T07	703300-006
	21	1	RP 400/229/12T-BB	0	0	0.0	8.0	8.0	SA516Gr70	7033A01L29	703300-001
	20	4	F2"150#WNRF160	0	0	0.0	2.7	10.8	SA105	7033A04F39	703300-004
	19	1	PI 2" 160-AS	187	0	0.0	2.1	2.1	SA106GrB	7033A06T01	703300-006
	18	4	RP 150/70/12T	0	0	0.0	1.3	5.2	SA516Gr70	7033A01L29	703300-001
	17	24	ST/2HT 1-1/8"8UN-AM	160	0	0.0	1.2	28.8	SA193B7/SA194-2H	7033A11B01	703300-011
	16	4	GK 20" 150# RF-AM	0	0	4.5	0.0	0.0		7033A12G01	703300-012
	15	1	BF 20" 150# RF-AM	0	0	0.0	124.0	124.0	SA105	7033A04F71	703300-004
	14	1	F 20"150#WNRF12T-AM	0	0	0.0	87.0	87.0	SA105	7033A04F61	703300-004
	13	1	MANHOLE NECK-AM	1558	337	12.0	49.5	49.5	SA516Gr70	7033A01L32	703300-001
	12	1	RP 970/518/12T-AM	0	0	0.0	49.8	49.8	SA516Gr70	7033A01L29	703300-001
	11	2	SUPPORT PLATE-AI	235	50	10.0	0.9	1.8	SA516Gr70	7033A01L28	703300-001
	10	1	COVER PLATE#330-AI	0	0	10.0	6.7	6.7	SA516Gr70	7033A01L28	703300-001
	9	1	F14"150#WNRF-12T-AI	0	0	0.0	46.3	46.3	SA105	7033A04F89	703300-004
	8	1	NOZZLE NECK-AI	2773	1079	12.0	282.6	282.6	SA516Gr70	7033A01L32	703300-001
	7	1	RP 680/366/12T-AI	0	0	0.0	24.3	24.3	SA516Gr70	7033A01L29	703300-001
	6	1	F4"150# WNRF(120)AE	0	0	0.0	6.8	6.8	SA105	7033A04F87	703300-004
	5	1	PI 4" 120-AE	175	0	0.0	3.8	3.8	SA106GrB	7033A06T03	703300-006
	4	1	RP 210/124/12T-AE	0	0	0.0	2.1	2.1	SA516Gr70	7033A01L29	703300-001
	3	2	CH 02800x14T(NOM)	0	0	0.0	1010.0	2020.0	SA516Gr70	7033A01L37	703300-001
	2	1	SHELL BRL.-2	8836	2300	12.0	1914.0	1914.0	SA516Gr70	7033A01L29	703300-001
43-01	1	2	SHELL BRL-1 & 3	8834	3000	12.0	2498.5	4995.0	SA516Gr70	7033A01L29	703300-001

LIST OF MATERIAL

BELLELI SAUDI HEAVY INDUSTRIES LTD.
AS BUILT
CERTIFIED BY........

CHIYODA PETROSTAR LTD.

JOB NO. 54001	IBN RUSD AROMATICS PROJECT
PO NO.	SAY-POP0001
REQ NO.	MR-50-0-011
IDENT NO.	58002-DW-0001

PURCHASER'S PERMISSION TO PROCEED OR REVIEW TAKEN ON VENDOR PRINTS SHALL NOT RELIEVE VENDOR FROM ITS RESPONSIBILITIES OR LIABILITIES UNDER PURCHASE ORDER

BELLELI REFERENCE DRAWINGS

DRAWING No.	DESCRIPTION
DA-7034-43-002	DETAIL DRAWING
DA-7034-43-003	FORMED HEAD
DA-7034-43-004	BSHI NAME PLATE
DA-7034-43-005	ASME NAME PLATE
DA-7034-43-006	EXTERNAL CLIPS
DA-7034-00-001	DAVIT ARRANGEMENT
ST-7034-43-001	FINISH REQUIREMENTS
00-7034-00-001	SHIPPING DRAWING
CHIYODA STD DR-50-D8-017	NAME PLATE
CHIYODA STD DR-50-D8-013	ANSI 150,300 & 600 MANHOLE DAVIT AND HINGE
CHIYODA STD DR-50-D8-011	FLANGED NOZZLE
CHIYODA STD DR-50-D8-010	INTERNAL LADDER FOR VESSEL
CHIYODA STD DR-50-D8-007	DAVIT
CHIYODA STD DR-50-D8-003	SADDLE FOR HORIZONTAL VESSEL
UOP STD SPEC 3-11	PRESSURE VESSELS CARBON STEEL
CHIYODA SPEC SP-50-N-001	HOT SERVICE THERMAL INSULATION
JGC SP 2264-SP-00 X-001	BASIC CIVIL ENGINEERING DESIGN DATA
JGC SP 2264-SP-00-D-003	UNFIRED PRESSURE VESSELS
JGC SP 2264-SP-00 X 001	MATERIAL, WELDING, NDE & CORROSION CONTROL
DS-58-D-002	CLIENT'S DATA SHEET

CLIENT'S REF. DWGS. & SPECS

GENERAL NOTES

22. ▽ — DENOTES TOP
21. FOR CARBON AND CARBON MAGANESE STEEL THE CARBON CONTENT SHALL BE LIMITED TO 0.25% MAXIMUM
20. THE LONGITUDINAL WELD SEAMS OF NOZZLES INSTALLED HORIZONTALLY SHALL BE POSITIONED ABOVE CENTER LINE
19. HEAD SEAMS SHALL BE FULLY RADIOGRAPHED. HEAD TO SHELL SEAMS SHALL BE SPOT RADIOGRAPHED PER UW-11(a)5(b) OTHER SEAMS SHALL BE SPOT RADIOGRAPHED PER UW-11(b).
18. THE LONGITUDINAL BUTT WELD OF NOZZLES FABRICATED FROM PLATE SHALL BE 100% RADIOGRAPHED
17. ☐ MARK INDICATES THE BSH WELD STANDARD NUMBER
○ MARK INDICATES THE POSITION NUMBER WITH REFERENCE TO LIST OF MATERIAL
⬡ MARK INDICATES THE NOZZLE MARK NUMBER
16. SHOP HYD. TEST GASKETS :- (i) BLINDED NOZZLES WILL HAVE JOB GASKETS.
(ii) ALL OTHER NOZZLES WILL HAVE CAF GASKET.
15. SPARE PARTS:-

ITEMS	COMMISSIONING/STARTUP	OPERATIONAL	SHOP HYD. TEST
GASKETS	200%	100%	100%
FASTENERS	10%(MIN. 2 SETS)	10%(MIN. 2 SETS)	NOT REQUIRED

QTY OF SPARES FOR GASKETS AND FASTERNERS ARE INCLUDED IN LIST OF MATERIALS.
14. ALL BOLTS & NUTS SHALL BE OF UNC SERIES UPTO & INCLUDING 1" SIZE & 8UN ABOVE 1" SIZE
13. FLANGES UPTO & INCLUDING 24" NB SHALL BE AS PER ANSI B18.5 & THE FLANGE FACE FINISH SHALL BE 3.2 TO 6.3 MICROMETER.
12. - DELETED -
11. MINIMUM TEMPERATURE OF HYDROTEST WATER SHALL BE 17C AND THE TEST PRESSURE SHALL BE HELD FOR HALF AN HOUR PER INCH OF THICKNESS WITH ONE HOUR MINIMUM.
10. EACH REINFORCING PAD OR SEGMENT THEREOF SHALL BE PROVIDED WITH ONE No (TWO Nos. FOR NOZZLES 16"NB AND ABOVE @ 180° APART) 1/4" NPT, TELL TALL HOLE AS PER ANSI B1.20.1. ALL R.F PAD WELDS SHALL BE TESTET TO 15 Psig. MINIMUM WITH AIR & SOAPY BUBBLE TEST.
9. A PERMANENT REFERENCE WORKLINE FOR VERTICAL VESSELS BOTTOM TAN LINE SHALL BE PUNCHMARKED AROUND THE VESSE. PERIMETER AT 0,90,180 & 270° AND HORIZONTAL VESSELS, CENTER LEVEL SHALL BE PUNCHMARKED ON BOTH SIDE SURFACES OF SHELL NEAR THE HEAD.
8. THE VESSEL SHALL BE THOROUGHLY CLEANED INSIDE & OUTSIDE AND SHALL BE FREE OF ALL DIRT, WELD ROD STUBS & LOOSE FOREIGN MATERIALS ETC.
7. ALL REMOVABLE INTERNALS SHALL PASS THROUGH THE NEAREST MANHOLE
6. WELD SEAMS COMING UNDER MISC ATTACHMENTS SHALL BE GROUND SMOOTH & RADIOGRAPHED FOR A DISTANCE OF 150mm BEYOND THE ATTACHMENT WELD
5. ALL NOZZLES AND MANWAY THAT DO NOT EXTEND INTO THE VESSEL SHALL BE FINISHED FLUSH WITH THE INSIDE & THE INNER EDGE SHALL BE ROUNDED OFF TO A MIN 3mm RADIUS.
4. NOZZLE POSITIONS ON VESSEL ELEVATIONS ARE CONVENTIONAL FOR TRUE LOCATION SEE NOZZLE ORIENTATION PLAN
3. NOZZLE PROJECTION IS FROM CENTER LINE OF VESSEL TO GASKET FACE OF FLANGE UNLESS SPECIFIED OTHERWISE
2. ALL FLANGE BOLT HOLES SHALL STRADDLE VERTICAL AND/OR NORTH SOUTH CENTER LINES UNLESS SHOWN OTHERWISE
1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED

NOZZLE SCHEDULE

MARK	QTY	SIZE	PROJ FROM CL	SERVICE	NOZZLE NECK O.D.	NOZZLE NECK SCH	NOZZLE NECK THK	NOZZ. FLANGE TYPE	NOZZ. FLANGE RATING	REINF. PAD O.D.	REINF. PAD THK
X	1	6"I.D.	1850	RELIEF	206.4	-	27.0	LWNRF	300#	300	12
BV	1	2"	SEE DRG	VENT	60.3	160	8.74	WNRF	150#	--	--
BO	1	3"	1650	BLANKETING	88.9	160	11.13	WNRF	150#	180	12
BN	1	12"	1615	OUTLET W/VB	323.9	80	17.48	WNRF	150#	610	12
BL2	1	2"	SEE DRG	LEVEL	60.3	160	8.74	WNRF	150#	150	12
BL1	1	2"	1650	LEVEL	60.3	160	8.74	WNRF	150#	150	12
BD	1	2"	1565	DRAIN	60.3	160	8.74	WNRF	150#	150	12
BB	1	8"	1650	VENTILATION W/BLIND FLG	219.1	80	12.7	WNRF	150#	400	12
AS	1	2"	SEE DRG	STEAMOUT	60.3	160	8.74	WNRF	150#	150	12
AM	1	20"	SEE DRG	MANWAY W/BLIND FLANGE+DAVIT	508.0	PLT	12.00	WNRF	150#	970	12
AI	1	14"	1650	INLET W/INT PIPE	355.6	PLT	12.00	WNRF	150#	680	12
AE	1	4"	1650	EQUALIZING	114.3	120	11.13	WNRF	150#	210	12

DESIGN DATA

No.	DESIGN CONDITIONS	UNITS	VALUES
33.	FABRICATION WEIGHT	Kg	12700
32.	FULL OF WATER WEIGHT	Kg	73200
31.	OPERATING WEIGHT	Kg	38?00
30.	ERECTION WEIGHT	Kg	12700
29.	MANUFACTURER'S SERIAL No.	---	2409
28	MANUFACTURER'S JOB NUMBER	---	7034-43
27.	MANUFACTURER'S NAME	---	BELLELI SAUDI HEAVY IND. LTD.
26.	CODE STAMP	---	YES
25.	DESIGN CODE	---	ASME SEC VIII DIV.1 1995 EDITION
24.	SERVICE	---	TOLUENE COLUMN RECEIVER
23.	VOLUME	m^3	57.50
22	FIREPROOFING	mm	NO
21.	INSULATION	mm	40-HOT (BY OTHERS)
20.	SPECIFIC GRAVITY	---	0.779
19.	OPERATING FLUID	---	HYDROCARBON
18	INSPECTION AUTHORITY	---	CLENT/ABS
17.	WIND SPEED/EXPOSURE CATEGORY	km/hr	125/C
16.	EARTHQUAKE DESIGN	---	ASCE-7-88 ZONE 1
15	MINIMUM DESIGN METAL TEMPERATURE	°C	9
14.	CHARPY IMPACT TEST	---	NO
13.	ULTRASONIC EXAMINATION	---	NO
12.	POST WELD HEAT TREATMENT	---	NO
11.	JOINT EFFICIENCY (SHELL/HEAD)	%	85/100
10.	RADIOGRAPHY (SHELL/HEAD)	---	R14 AS PER UG-116(e) SEE NOTE #19
9.	CORROSION ALLOWANCE	mm	3.?
8.	M.A.W.P. AT DESIGN TEMPERATURE	barG	6.50 (LIMITED BY SHELL)
7	M.A.P. (NEW & COLD)	barG	8.?5 (LIMITED BY SHELL)
6	FIELD HYDROTEST PRESSURE (CORRODED)	barG	5.?0
5.	SHOP HYDROTEST PRESSURE (HOR)	barG	12.94 (AT TOP)
4	OPERATING TEMPERATURE	°C	113
3.	OPERATING PRESSURE	barG	0.?7
2.	DESIGN TEMPERATURE (INT/EXT)	°C	138/113
1.	DESIGN PRESSURE (INT/EXT)	barG	3.8/FULL VACUUM

REV.	DATE	DESCRIPTION	DRAWN	CHK'D	APP'D
3	03.07.97	REVISED AS MARKED ⚠3 & AS BUILT.	R.Ali		
2	15 Mar '97	REVISED AS MARKED ⚠2 AS PER CLIENT'S COMMENTS	Arun	YOGESH CHAT	AKB
1	11.11.96	DWG. GENERALLY REVISED & ISSUED FOR CONSTRUCTION	DERECK	R.ALI HAIDER	AKB
0	05.06.96	ISSUED FOR APPROVAL & INTERNAL COMMENTS	SURFRAZ	R.ALI R.SRAJU	NATH

No. REQUIRED : 1 UNIT

SCALE 1:30

CLIENT. CHIYODA/IBN RUSHD

ORDER SAY-POP0001

APPROVED FOR CONSTRUCTION BY AK RAHERKE DATE 18 Nov '96

BELLELI SAUDI بيلليلي السعودية
HEAVY INDUSTRIES LTD. للصناعات الثقيلة المحدودة
AL- JUBAIL, KINGDOM OF SAUDI ARABIA. الجبيل

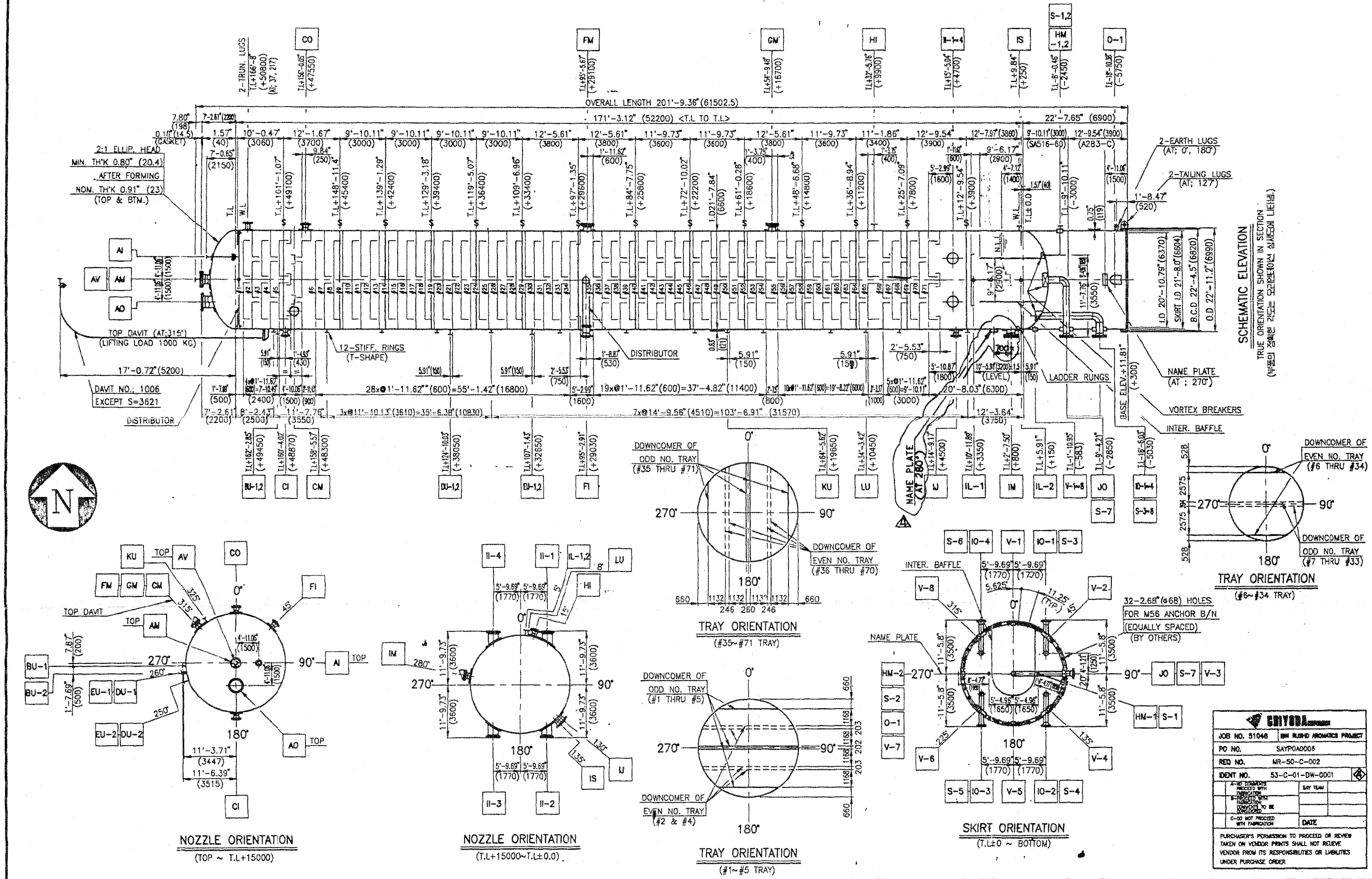
ARABIAN INDUSTRIAL FIBRES COMPANY (IBN RUSHD)
PTA & AROMATICS PROJECT-AROMATICS
TOLUENE COLUMN RECEIVER (58-D-02)
GENERAL ASSEMBLY

QUESTO DISEGNO NON PUO ESSERE COPIATO RIPRODOTTO MOSTRATO A TERZI SENZA NOSTRA AUTORIZZAZIONE

THIS DRAWING IS NOT TO BE REPRODUCED IN WHOLE OR PART NOR EMPLOYED FOR ANY PURPOSE OTHER THAN SPECIFICALLY PERMITTED IN WRITING BY BELLELI SAUDI HEAVY IND LTD

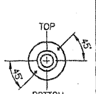
DRAWING NO. DA-7034-43-001 REV. 3

809164



GENERAL NOTES

1. ALL DIMENSIONS ARE IN FEET-INCH UNIT WITH METRIC UNIT IN PARENTHESES UNLESS OTHERWISE NOTED. <EXCEPT NOZZLE LIST> METRIC UNIT SHALL BE USED FOR FABRICATION.
   본 도면의 모든 치수는 FT-INCH이며 ( )안은 mm임. <NOZZLE LIST는 제외함.> 제작은 ( )치수 mm로 적용할것.
2. NOZZLE PROJECTIONS ON SHELL ARE REFERRED FROM CENTER LINE OF VESSEL TO RAISED FACE OF FLANGE.
   동체에 부착된 노즐의 돌출거리는 용기의 중심에서 프랜지의 돌출면 까지임.
3. ALL BOLT HOLES SHALL BE STRADDLED TO VERTICAL OR 0'-180', 90'-270' CENTER LINE OF VESSEL.
   모든 볼트 구멍은 용기의 중심선에 대칭이어야함. 또는 용기 중심선의 0'-180', 90'-270'에 대칭이어야함.
4. ALL SHARP CORNERS SHALL BE GROUND FINISHED RADIUS 2-3mm UNLESS OTHERWISE NOTED. (EXCEPT INSIDE EDGE OF NOZZLE SPECIFIED IN DETAIL DWG.)
   별도로 지정하지 않는 모든 모서리는 2-3mm반경으로 연마하여 마무리 해야함
   (단 노즐 안쪽면은 제외함. 노즐도면 참고 할것)
5. THE GASKET CONTACT SURFACE OF ALL FLANGE THAT REQUIRE SPIRAL-WOUND GASKETS SHALL BE MACHINED FINISH 125 Ra~250 Ra.
   나선 권개형 가스켓을 요구하는 모든 프랜지의 가스켓면은 125 Ra ~250 Ra 로 기계가공 해야 함.
6. EACH REINFORCEMENT PAD SHALL BE PROVIDED WITH 1/4 INCH NPT TELL-TALE HOLE DRILLED AND TAPPED WITH ANSI B2.1 TAPERED PIPE THREAD AND PLUGGED AFTER HYDRO. TEST WITH HEAVY GREASE. TELL-TALE HOLE SHALL NOT BE PROVIED ON THE PAD IN LONGITUDINAL DIRECTION OF VESSEL. (SEE DETAIL "A")
   EACH REINFORCING PADS SHALL HAVE A MINIMUM OF ONE TELL TALE HOLE EXCEPT THAT PADS FOR NOZZLES GREATER THAN 16 INCH NPS SHALL HAVE A MINIMUM 2 HOLES AND NOZZLE IN EXCESS OF 36 INCH NPS SHALL HAVE 4 HOLES.
   모든 보강패드는 NPT 1/4인치 시험 구멍을 ANSI B2.1 테이퍼 파이프 나사를 내고 수압 시험후 그리스로 막아야 한다.
   패드의 TELL TALE 홀은 용기의 길이 방향에 위치해서는 안된다. (SEE DETAIL "A")
   각 패드에 설치되는 홀의 수량은 노즐의 호칭 SIZE가 16"이하일 경우 한개, 16"초과 36"이하일 경우 두개, 36"초과할 경우 네개를 설치한다.
7. AIR-SOAP BUBBLE TEST OF REINFORCING PADS SHALL BE TESTED AT 1.0 BAR.G(1.02 KG/CM².G) PRESSURE BEFORE HYDROSTATIC TEST.
   보강패드의 비눗물 시험은 1.0 BAR.G(1.02 KG/CM².G) 압력으로 수압시험 전에 실시.
8. STRUCTURAL ATTACHMENT WELDS SHALL CLEAR SEAM WELDS BY AT LEAST ONE PLATE THICKNESS. IF OVERLAP IS UNAVOIDABLE, COVERED SEAM SHALL BE GROUND FLUSH AND 100% RADIOGRAPHICALLY EXAMINED BEFORE ATTACHMENT IS WELDED ON.
   부착물 용접은 SEAM 으로부터 최소한 판 두께 만큼 떨어져야 한다.
   만약 겹침이 불가피한 경우 용접전에 해당 SEAM 을 편평하게 갈아낸후 100% 래디오그래픽 시험을 해야한다.
9. PAINTING SPECIFICATION NO. ; 22854-SP-000-X-001
10. FOR DETAIL NDE, SEE INSPECTION & TEST PLAN (DOC NO.J-630-6H05-02)
    자세한 비파괴검사는 검사 및 시험계획서 (J-630-6H05-02)를 볼것.
11. TRAY ELEVATIONS ARE TOP OF TRAY SUPPORT RING.
    트레이 높이는 트레이 서포트링 상부까지임.



DETAIL "A"

APPLICABLE SPECIFICATION & STANDARD

NO.	DESCRIPTION	STD. DWG NO.	NO.	DESCRIPTION	STD. DWG NO.
8	NAME PLATE	DR-50-DB-017	16	ACCUMULATOR TRAYS	3-298-1
7	EARTH PIECE	DR-50-DB-018	15	TRAPS	3-280-0
6	ANSI 150, 300 AND 600 MANHOLE DAVIT AND HINGE	DR-50-DB-013	14	DISTRIBUTOR TRAP	3-204-2
5	FLANGED NOZZLE	DR-50-DB-011	13	DRAW OF WELLS FOR REBOILERS	3-274-2
4	INTERNAL LADDER FOR VESSEL	DR-50-DB-010	12	DISTRIBUTORS	3-180-1
3	DAVIT	DR-50-DB-007	11	DISTRIBUTORS	3-176-1
2	LIFTING LUG FOR VERTICAL VESSEL	DR-50-DB-006	10	VORTEX BREAKERS	3-122-0
1	SKIRT AND BASE BLOCK FOR VERTICAL VESSEL	DR-50-DB-001	9	BAFFLES	3-115-2

DESIGN DATA

ERECTION W.T LB (KG): 615741 (279300)	EMPTY W.T LB (KG): 1120370 (508200)	OPERATING W.T LB (KG): 1928571 (874800)	HYDRO-TEST W.T LB (KG): 5535494 (2510900)
IMPACT TEST: NO	PRODUCTION TEST: NO	P.W.H.T: NO	PROCESS FLUID: HYDROCARBON
HARDNESS TEST: NO	SPECIFIC GRAVITY: 0.695	CAPACITY: 65763.3 FT3 (1861.1 M³)	FIRE PROOFING (BOTH SIDE): 3 INCH (76.2 MM) BY OTHERS
WIND SPEED: 77.68 MPH (34.723 M/S)	INSULATION (BY OTHERS): HOT 1.97 INCH (50 MM)	EARTHQUAKE FACTOR: ASCE7-88,1990 ZONE 1	
RADIOGRAPHIC TEST: SHELL TO SHELL SPOT; HEAD TO HEAD FULL; SHELL TO HEAD SPOT	JOINT EFFICIENCY: SHELL 0.85; HEAD 1.0	CORROSION ALLOWANCE: SHELL & HEAD/NOZZLE & MANHOLE 0.12 INCH (3.0 MM); INTERNAL NON REM. 0.12 INCH (3.0 MM); REM. 0.06 INCH (1.5 MM); SKIRT 0.063 INCH (1.6 MM)	HYDRO-TEST PRESSURE: CORR'D (AT FIELD) 88.76 PSI.G (6.12 BAR.G); NEW (AT SHOP) 106.11 PSI.G (7.318 BAR.G)
M.A.W.P (CORR'D) LIMIT. BY SHELL: 59.17 PSI.G (4.080 BAR.G)	PRESSURE: EXTERNAL (F.V) 14.65 PSI.G (1.01 BAR.G); INT. DESIGN 50.76 PSI.G (3.5 BAR.G); INT. OPER 6.38~15.08 PSI.G TOP~BOTTOM (0.44~1.04 BAR.G)	TEMPERATURE: EXTERNAL 422.6 °F (217 °C); INT. DESIGN 473 °F (245 °C); INT. OPER (TOP/BTM.) 312.8/422.6 °F (156/217 °C); MIN. DESIGN METAL TEMP. 48.2 °F (9 °C)	SPEC.: 22854-SP-000-D-001; CODE STAMP: YES; CODE: ASME SEC. VIII DIV.1 1995 ED.

MARK	DATE	REASON FOR REVISION	DWN	CHK	APP
1	'96,7,2	REVISED AS MARKED	D.C.KWAG	G.Y.SHIN	D.H.WON
2	'96,8,19	REVISED AS MARKED	D.C.KWAG	G.Y.SHIN	D.H.WON
3	'96.11.21	REVISED ~~AS MARKED~~	[illegible]	[illegible]	[illegible]
4	'97.1.6	REVISED AS MARKED	[illegible]	[illegible]	[illegible]

(*) ; INTEGRAL SELF-REINFORCING FLANGE.

MARK	Q'TY PER 1 SET	SIZE	SCH.	RATING	TYPE	SERVICE	PROJ.	REINF. PAD TH'K	REINF. PAD O.D	REMARK
V-1~8	8	4"	40	-	-	SKIRT VENT	-	-	-	
S-7	1	1'-9.85" (L0550)	0.43" (t11)	-	-	SKIRT SLEEVE	-	-	-	
S-3~6	4	2'-5.53" (L0750)	0.43" (t11)	-	-	SKIRT SLEEVE	-	-	-	
S-1,2	2	12"	80	-	-	SKIRT SLEEVE	-	-	-	
O-1	1	7-17/42-3	0.43" (t11)	-	-	SKIRT ACCESS	-	-	-	
KU/LU	2	1" I.D	0.5" (t12.7)	ANSI 150#	LWN-RF	TI/TI	3471	-	-	
JO	1	12"	80	ANSI 150#	WN-RF	OUTLET-BTMS	SEE DWG.	21	610	
IS	1	4"	120	ANSI 150#		STEAMOUT	3471	21	210	
IO-1~4	4	18"	0.47" (t12)	ANSI 150#		OUTLET	SEE DWG.	21	800	
IM	1	24"	0.47" (t12)	ANSI 150#		MANHOLE (W/B.F & DAVIT)	3621	21	1150	
IL-1,2	2	2"	160	ANSI 300#		LEVEL-LLS	3471	21	130	
IJ	1	12"	80	ANSI 150#		RELIEF-IN	3521	21	610	
II-1~4	4	30"	0.47" (t12)	SEE REMARK		INLET	SEE DWG.	21	1200	ASME/ANSI B16.47 SERIES: B 150#
HM-1,2	2	4"	120	ANSI 150#		DRAIN	SEE DWG.	21	210	
HI	1	8"	80			INLET	3521	21	400	
GM	1	24"	0.47" (t12)			MANHOLE (W/B.F & DAVIT)	3621	21	1150	
FM	1	24"	0.47" (t12)			MANHOLE (W/B.F & DAVIT)	3621	21	900	
FI	1	14"	0.47" (t12)		WN-RF	INLET-FEED	3551	21	680	4
EU-1,2	2	1" I.D	0.5" (t12.7)		LWN-RF	TI-TW	3471	-	-	
DU-1,2	2	1" I.D	0.5" (t12.7)		LWN-RF	TI-TRC	3471	-	-	
CO	1	10"	80		WN-RF	OUTLET	3521	21	510	
CM	1	24"	0.47" (t12)		WN-RF	MANHOLE (W/B.F & DAVIT)	3621	21	1150	
CI	1	10"	80		WN-RF	BALANCE	3521	21	510	
BU-1,2	2	1" I.D	0.5" (t12.7)		LWN-RF	TI-TRC	SEE DWG.	-	-	
AV	1	4"	80	ANSI 150#	FN-RF	VENT	SEE DWG.	-	-	(*)
AO	1	30"	0.47" (t12)	SEE REMARK	WN-RF	OUTLET-VAPOR	SEE DWG.	21	1200	ASME/ANSI B16.47 SERIES: B 150#
AM	1	24"	0.47" (t12)	ANSI 150#	WN-RF	MANHOLE (W/B.F)	SEE DWG.	21	1150	
AI	1	8"	80	ANSI 150#	WN-RF	REFLUX	SEE DWG.	21	400	

NOZZLE LIST

* ; SPIRAL WOUND 316 S.S W/GRAPHITE FILLER 316 S.S I.R & C.S O.R.

MATERIAL SPECIFICATION

SHELL	SA516-60	HEAD	SA516-60
INSULATION SUPPORT	SA516-60/A283-C	SKIRT	SA516-60/A283-C
TRUNNION LUG / PAD	A283-C/SA516-60	VORTEX BREAKER	SA516-60
EXTERNAL: FITTING	SA234-WPB	INTERNAL: FITTING	A234-WPB
EXTERNAL: FLANGE	SA105	INTERNAL: FLANGE	A283-C
EXTERNAL: NOZZLE NECK	SA106-B/SA516-60/SA105	INTERNAL: PIPE	SA106-B
EXTERNAL: CLIP & SUPPORT	SA516-60	INTERNAL: CLIP & SUPPORT	SA516-60
EXTERNAL: BOLT/NUT	SA193-B7/SA194-2H	INTERNAL: BOLT/NUT	A193-B8/A194-8
EXTERNAL: GASKET	*	INTERNAL: GASKET	CERAMIC FIBER SHEET
TRAY SUPPORT	SA516-60	MANHOLE NECK	SA516-60
NAME PLATE/BRACKET	304 S.S/A283-C	EARTH LUG	304 S.S
INTERNAL RUNG	A36	ANCHOR BOLT/NUT	A307-B/A563-A

AS BUILT

JOB NO.	51046	CUSTOMER	ARABIAN INDUSTRIAL FIBERS CO., LTD.
P/O NO.	SAYPOA0006	SET(S)	1
MFG. SER. NO.	PV-97-037		
DWN	D.C.KWAG '96,5,7	PROJECT	IBN RUSHD PTA & AROMATICS PROJECT-AROMATICS
DES.	Y.S.JUNG '96,5,9	TITLE	RAFFINATE COLUMN 53-C-01 ASSEMBLY
CHK	G.Y.SHIN '96,5,11	REF. DWG. NO.	-
APP	D.H.WON '96,5,14	DWG NO.	6T068-0501
THIRD ANGLE PROJECTION	SCALE 1/150	REV.	4, 3, 2, 1, 0

ISSUE 1997. 3. 17 PROCESS EQUIP. DESIGN DEP'T

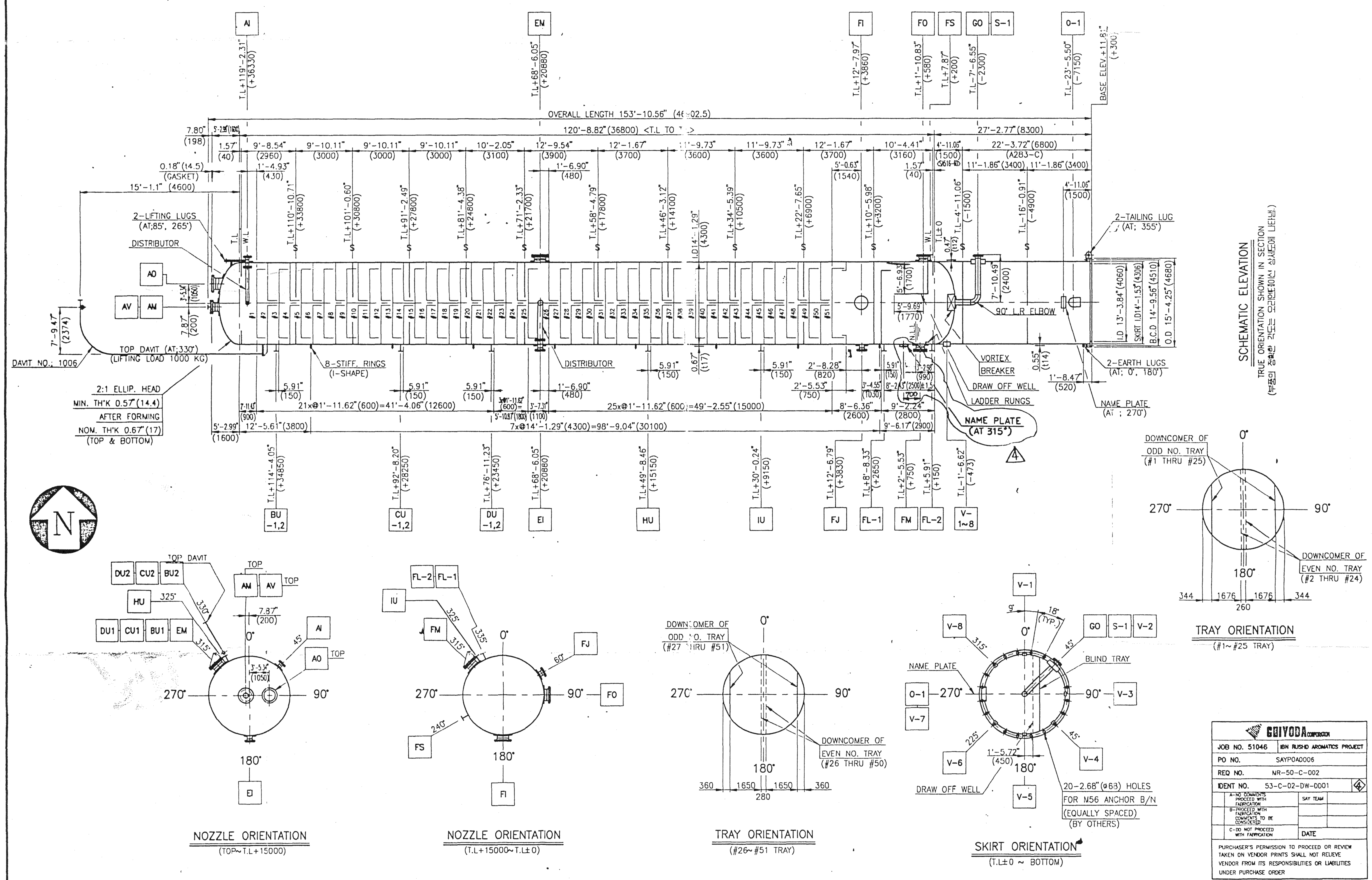
INDUSTRIAL PLANT DIVISION ULSAN KOREA

HYUNDAI HEAVY INDUSTRIES CO., LTD.

현대중공업주식회사 프랜트 사업본부

014107

M'K	DATE	REASON FOR REVISION	DWN	CHK	APP
1	'96.7.2	REVISED AS MARKED	D.C.KWAG	G.Y.SHIN	D.H.WON
2	'96.8.19	REVISED AS MARKED	D.C.KWAG	G.Y.SHIN	D.H.WON
3	'96 11/21	REVISED AS MARKED			
4	'97 1/28	REVISED AS MARKED			



(•) ; INTEGRAL SELF-REINFORCING FLANGE.

MARK	Q'TY PER 1 SET	SIZE	SCH.	RATING	TYPE	SERVICE	PROJ.	REINF. PAD TH'K	REINF. PAD O.D	REMARK
V-1~8	8	4"	40	–	–	SKIRT VENT	–	–	–	
S-1	1	1'-6.5" (I.D470)	0.43" (t11)	–	–	SKIRT SLEEVE	–	–	–	
O-1	1	1'-7.7"×2'-5.5" (I.D500×750)	0.43" (t11)	–	–	SKIRT ACCESS	–	–	–	
HU/IU	2	1" I.D	0.5" (t12.9)	ANSI 150#	LWN-RF	TI/TI	2317	–	–	
GO	1	10"	80	ANSI 150#	WN-RF	OUTLET	SEE DWG.	17	510	
FS	1	2"	160	ANSI 150#	WN-RF	STEAMOUT	2317	17	150	
FO	1	18"	0.47" (t12)	ANSI 150#	WN-RF	OUTLET	2417	17	870	
FM	1	24"	0.47" (t12)	ANSI 150#	WN-RF	MANHOLE (W/B.F & DAVIT)	2467	17	1150	
FL-1,2	2	2"	160	ANSI 300#	WN-RF	LEVEL- LLS	2317	17	130	
FJ	1	10"	80	ANSI 150#	WN-RF	EQUALIZING	2367	17	510	
FI	1	34"	0.47" (t12)	SEE REMARK	WN-RF	INLET	2467	17	1300	ASME/ANSI B16.47 SERIES; B 150#
EM	1	24"	0.47" (t12)	ANSI 150#	WN-RF	MANHOLE (W/B.F & DAVIT)	2467	17	1150	
EI	1	10"	80	ANSI 150#	WN-RF	INLET	2367	17	510	
DU-1,2	2	1" I.D	0.5" (t12.7)	ANSI 150#	LWN-RF	TI-TW	2317	–	–	
CU-1,2	2	1" I.D	0.5" (t12.7)	ANSI 150#	LWN-RF	TI-TRC	2317	–	–	
BU-1,2	2	1" I.D	0.5" (t12.7)	ANSI 150#	LWN-RF	TI-TRC	2317	–	–	
AV	1	2"	160	ANSI 150#	FN-RF	VENT	SEE DWG.	–	–	(•)
AO	1	24"	0.47" (t12)	ANSI 150#	WN-RF	OUTLET	SEE DWG.	17	1150	
AM	1	24"	0.47" (t12)	ANSI 150#	WN-RF	MANHOLE (W/B.F)	SEE DWG.	17	1150	
AI	1	6"	80	ANSI 150#	WN-RF	INLET	2367	17	300	

NOZZLE LIST

• ; SPIRAL WOUND 316 S.S W/GRAPHITE FILLER 316 S.S I.R & C.S O.R.

SHELL	SA516-60	HEAD: SA516-60	INSULATION SUPPORT: SA516-60/A283-C
SKIRT	SA516-60/A283-C	LIFTING LUG / PAD: A283-C/SA516-60	VORTEX BREAKER: SA516-60
EXTERNAL	FITTING: SA234-WPB	INTERNAL FITTING: A234-WPB	TRAY SUPPORT: SA516-60
EXTERNAL	FLANGE: SA105	INTERNAL FLANGE: A283-C	MANHOLE NECK: SA516-60
EXTERNAL	NOZZLE NECK: SA106-B/SA516-60/SA105	INTERNAL PIPE: SA106-B	NAME PLATE/BRACKET: 304 S.S/A283-C
EXTERNAL	CLIP & SUPPORT: SA516-60	INTERNAL CLIP & SUPPORT: SA516-60	EARTH LUG: 304 S.S
EXTERNAL	BOLT/NUT: SA193-B7/SA194-2H	INTERNAL BOLT/NUT: A193-B8/A194-8	INTERNAL RUNG: A36
EXTERNAL	GASKET: •	INTERNAL GASKET: CERAMIC FIBER SHEET	ANCHOR BOLT/NUT: A307-B/A563-A

MATERIAL SPECIFICATION

GENERAL NOTES

1. ALL DIMENSIONS ARE IN FEET-INCH UNIT WITH METRIC UNIT IN PARENTHESES UNLESS OTHERWISE NOTED. <EXCEPT NOZZLE LIST> METRIC UNIT SHALL BE USED FOR FABRICATION.
   본 도면의 모든 치수는 FT-IN이며 ( )안은 mm임. <NOZZLE LIST는 제외할것.> 제작은 ( )치수 mm로 적용할것.
2. NOZZLE PROJECTIONS ON SHELL ARE REFERRED FROM CENTER LINE OF VESSEL TO RAISED FACE OF FLANGE.
   동체에 부착된 노즐의 돌출길이는 용기의 중심에서 프랜지의 돌출면 까지임.
3. ALL BOLT HOLES SHALL BE STRADDLED TO VERTICAL OR 0°-180°, 90°-270° CENTER LINE OF VESSEL.
   모든 볼트 구멍은 용기의 중심선에 대칭이어야함 또는 용기 중심선의 0°-180°, 90°-270°에 대칭이어야함.
4. ALL SHARP CORNERS SHALL BE GROUND FINISHED RADIUS 2-3mm UNLESS OTHERWISE NOTED. (EXCEPT INSIDE EDGE OF NOZZLE SPECIFIED IN DETAIL DWG.)
   별도로 지정하지 않는 모든 모서리는 2-3mm반경으로 연마하여 마무리 해야함.
   (단 노즐 안쪽면은 제외함. 노즐도면 참고 할것.)
5. THE GASKET CONTACT SURFACE OF ALL FLANGE THAT REQUIRE SPIRAL-WOUND GASKETS SHALL BE MACHINED FINISH 125 Ra~250 Ra.
   나선 감개형 가스켓을 요구하는 모든 프랜지의 가스켓면은 125 Ra ~250 Ra 로 기계가공 해야 함.
6. EACH REINFORCEMENT PAD SHALL BE PROVIDED WITH 1/4 INCH NPT TELL-TALE HOLE DRILLED AND TAPPED WITH ANSI B2.1 TAPERED PIPE THREAD AND PLUGGED AFTER HYDRO TEST WITH HEAVY GREASE. TELL TALE HOLE SHALL NOT BE PROVIDED ON THE PAD IN LONGITUDINAL DIRECTION OF VESSEL. (SEE DETAIL "A")
   EACH REINFORCING PADS SHALL HAVE A MINIMUM OF ONE TELL TALE HOLE EXCEPT THAT PADS FOR NOZZLES GREATER THAN 16 INCH NPS SHALL HAVE A MINIMUM 2 HOLES AND NOZZLE IN EXCESS OF 36 INCH NPS SHALL HAVE 4 HOLES.
   모든 보강판은 1/4인치 시험 구멍을 ANSI B2.1 테이퍼 파이프 나사를 내고 수압 시험후 그리스로 막아야 한다.
   패드의 TELL TALE 홀은 용기의 길이 방향에 위치해서는 안된다. (SEE DETAIL "A")
   각 패드에 설치되는 홀의 수량은 노즐의 호칭 SIZE가 16" 이하일 경우 한개, 16"초과 36" 이하일 경우 두개, 36" 초과일 경우 네개를 설치한다.
7. AIR-SOAP BUBBLE TEST OF REINFORCING PADS SHALL BE TESTED AT 1.0 BAR.G(1.02 KG/CM².G) PRESSURE BEFORE HYDROSTATIC TEST.
   보강패드의 비눗물 시험은 1.0 BAR.G(1.02 KG/CM².G) 압력으로 수압시험 전에 실시.
8. STRUCTURAL ATTACHMENT WELDS SHALL CLEAR SEAM WELDS BY AT LEAST ONE PLATE THICKNESS. IF OVERLAP IS UNAVOIDABLE, COVERED SEAM SHALL BE GROUND FLUSH AND 100% RADIOGRAPHICALLY EXAMINED BEFORE ATTACHMENT IS WELDED ON.
   부착물 용접은 SEAM 으로부터 최소한 판 두께 만큼 떨어져야 한다.
   만약 겹침이 불가피한 경우 용접전에 해당 SEAM 을 편평하게 갈아낸후 100% 래디오그래픽 시험을 해야한다.
9. PAINTING SPECIFICATION NO. ; 22854-SP-000-X-001
10. FOR DETAIL NDE, SEE INSPECTION & TEST PLAN (DOC NO.J-631-6H05-02)
    자세한 비파괴검사는 검사 및 시험계획서 (J-630-6H05-02)를 볼것.
11. TRAY ELEVATIONS ARE TOP OF TRAY SUPPORT RING.
    트레이 높이는 트레이 서포트링 상부까지임.

NO.	DESCRIPTION	STD. DWG NO.	NO.	DESCRIPTION	STD. DWG NO.
7	EARTH PIECE	DR-50-DB-018			
6	ANSI 150, 300 AND 600 MANHOLE DAVIT AND HINGE	DR-50-DB-013	13	TRAPS	3-280-0
5	FLANGED NOZZLE	DR-50-DB-011	12	DISTRIBUTORS	3-150-3
4	INTERNAL LADDER FOR VESSEL	DR-50-DB-010	11	DRAW OF WELLS FOR REBOILERS	3-274-1
3	DAVIT	DR-50-DB-007	10	DISTRIBUTORS	3-162-1
2	LIFTING LUG FOR VERTICAL VESSEL	DR-50-DB-006	9	VORTEX BREAKERS	3-122-0
1	SKIRT AND BASE BLOCK FOR VERTICAL VESSEL	DR-50-DB-001	8	NAME PLATE	DR-50-DB-017

APPLICABLE SPECIFICATION & STANDARD

Item	Value
ERECTION W.T LB (KG)	239859 (108800)
EMPTY W.T LB (KG)	452601 (205300)
OPERATING W.T LB (KG)	714065 (323900)
HYDRO-TEST W.T LB (KG)	1791887 (812800)
CAPACITY	19618.4 FT3 (555.2 M³)
FIRE PROOFING (BOTH SIDE)	BY OTHERS 3 INCH (76.2 MM)
WIND SPEED	77.68 MPH (34.723 M/S)
INSULATION (BY OTHERS)	HOT 1.97 INCH (50 MM)
EARTHQUAKE FACTOR	ASCE7-88,1990 ZONE 1
RADIOGRAPHIC TEST – [illegible]	SPOT
RADIOGRAPHIC TEST – HEAD TO HEAD	FULL
RADIOGRAPHIC TEST – SHELL TO HEAD	SPOT
JOINT EFFICIENCY – SHELL	0.85
JOINT EFFICIENCY – HEAD	1.0
CORROSION ALLOWANCE – SHELL & HEAD/NOZZLE & MANHOLE	0.12 INCH (3.0 MM)
CORROSION ALLOWANCE – INTERNAL – [illegible]	[illegible] (3.0 MM)
CORROSION ALLOWANCE – INTERNAL – REM.	0.06 INCH (1.5 MM)
CORROSION ALLOWANCE – SKIRT	0.063 INCH (1.6 MM)
HYDRO-TEST PRESSURE – CORR'D (AT FIELD)	105.15 PSI.G (7.25 BAR.G)
HYDRO-TEST PRESSURE – NEW (AT SHOP)	136.62 PSI.G (9.42 BAR.G)
IMPACT TEST	NO
PRODUCTION TEST	NO
P.W.H.T	NO
M.A.W.P(CORR'D) LIMIT. BY BTM. HEAD	70.07 PSI.G (4.831 BAR.G)
PRESSURE – EXTERNAL	[illegible]
PRESSURE – INT. DESIGN	50.76 PSI.G (3.5 BAR.G)
PRESSURE – INT. OPER TOP/BOTTOM	6.38/12.62 PSI.G (0.44/0.87 BAR.G)
SPEC.	22854-SP-000-D-001
CODE STAMP	YES
CODE	ASME SEC. VIII DIV.1 1995 ED.
PROCESS FLUID	HYDROCARBON
HARDNESS TEST	NO
SPECIFIC GRAVITY	0.699
TEMPERATURE – EXTERNAL	[illegible]
TEMPERATURE – INT. DESIGN	464 °F (240 °C)
TEMPERATURE – INT. OPER (TOP/BTM.)	307.4/413.6 °F (153/212 °C)
MIN. DESIGN METAL TEMP.	48.2 °F (9 °C)

DESIGN DATA

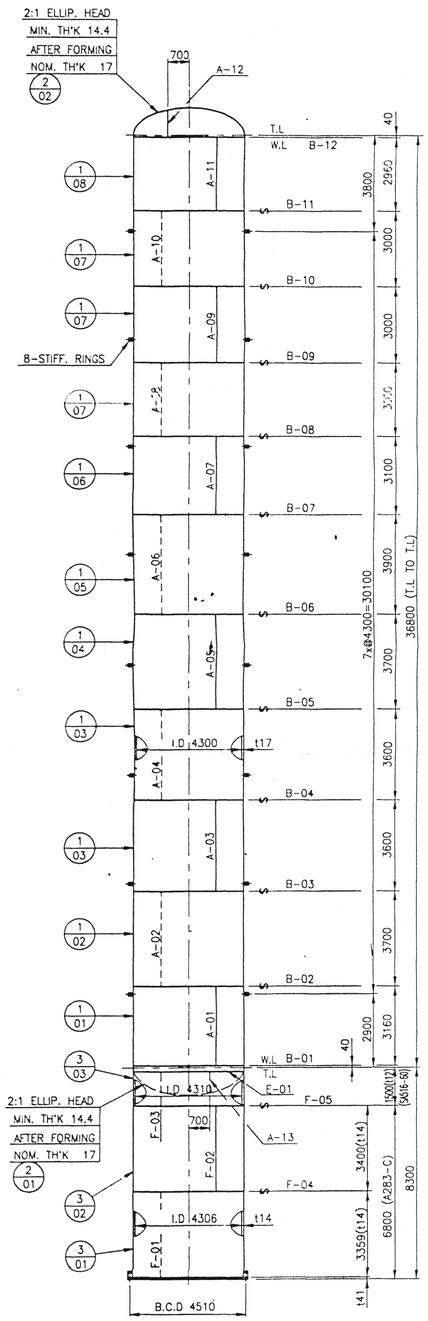
JOB NO.	51046	CUSTOMER	SET(S)
P/O NO.	SAYPOA0006	ARABIAN INDUSTRIAL FIBERS CO., LTD.	1
MFG. SER. NO.	PV-97-038		
DWN	D.C.KWAG '96,5,7	PROJECT: IBN RUSHD PTA & AROMATICS PROJECT-AROMATICS	4
DES	Y.S.JUNG '96,5,9	TITLE: EXTRACT COLUMN 53-C-02 ASSEMBLY	3
CHK	G.Y.SHIN '96,5,11		2
APP	D.H.WON '96,5,14		1
THIRD ANGLE PROJECTION	SCALE 1/120	REF. DWG. NO – / DWG NO. 6T069-0501	0 REV

INDUSTRIAL PLANT DIVISION
ULSAN KOREA

HYUNDAI HEAVY INDUSTRIES CO., LTD.

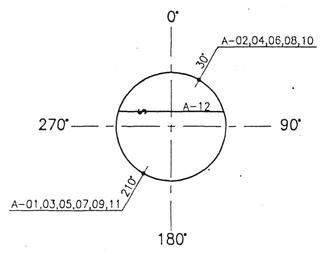
현대중공업주식회사 프랜트 사업본부

015002

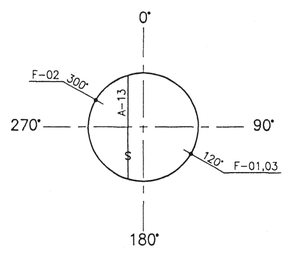


SCHEMATIC ELEVATION

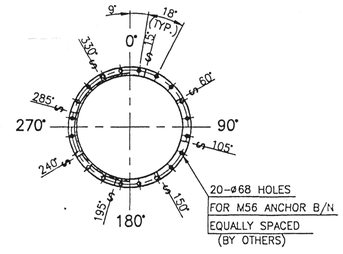
TRUE ORIENTATION SHOWN IN SECTION
(부품은 정확한 각도는 오리엔테이션 상세도에 나타남.)



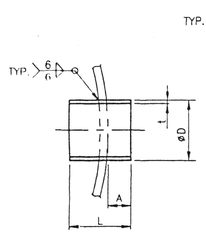
SEAM ORIENTATION
(TOP HEAD & SHELL)



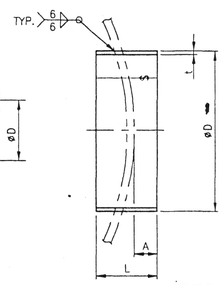
SEAM ORIENTATION
(BOTTOM HEAD & SKIRT)



COMP. RING & BASE ORIENTATION



TYPE I



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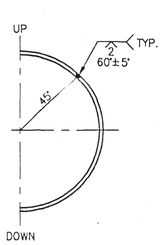

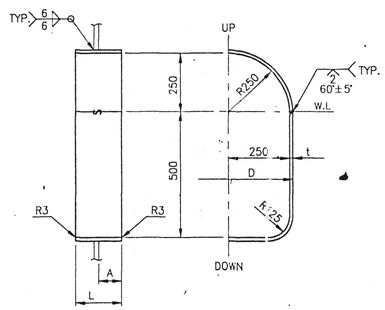

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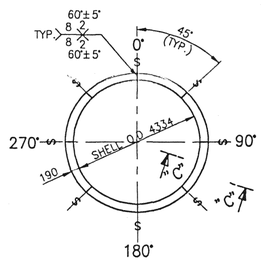
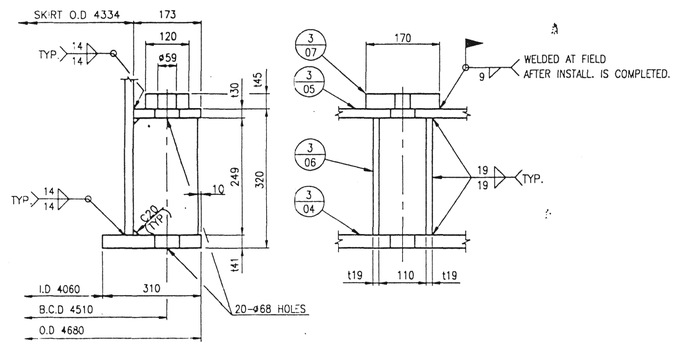
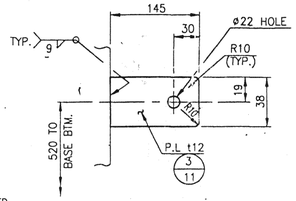


STIFF. RING

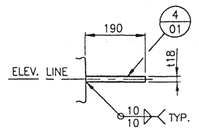
MARK	PART NO.		PART NAME	DIMENSIONS				TYPE	Q'TY	REMARKS
				øD	t	A	L			
V-1~8	3	08	SKIRT VENT	114.3,	6.0	90	193	I	8	4"xS/40
O-1	3	09	SKIRT ACCESS	522	11	90	210	III	1	
S-1	3	10	SKIRT SLEEVE	492	11	90	208	II	1	



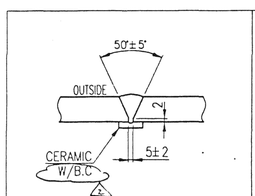
ANCHOR CHAIR



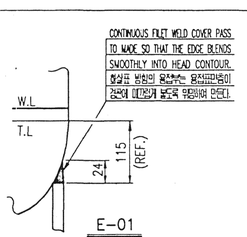
EARTH LUG



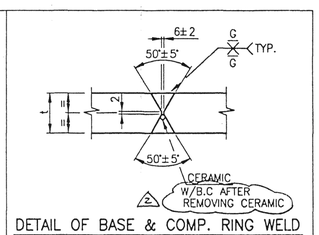
SECTION "C"-"C"



A-01~13/B-01~12/F-01~05



E-01



DETAIL OF BASE & COMP. RING WELD

M'K	DATE	REASON FOR REVISION	DWN	CHK	APP
1	'96,7,18	REVISED AS MARKED	D.C.KWAG	G.Y.SHIN	D.H.WON
2	'96,9,20	REVISED AS MARKED			
△					

T.W = 89500 KG

4	.01	STIFF. RING	SA516-60	t18xI.D4334xO.D4714	8	3053	8 SEG'T
3	11	EARTH LUG	304 S.S	t12x38x145	2	1	
	10	SKIRT SLEEVE	A283-C	t11x208x1511	1	28	
	09	SKIRT ACCESS	A283-C	t11x210x2213	1	41	
	08	SKIRT VENT	A53-B	4"xS/40-193L	8	25	
	07	WASHER PLATE	A283-C	t45x120x170	20	144	
	06	GUSSET PLATE	A283-C	t19x163x249	40	242	
	05	COMP. RING PLATE	A283-C	t30xI.D4334xO.D4680	1	577	8 SEG'T
	04	BASE RING PLATE	A283-C	t41xI.D4060xO.D4680	1	1370	8 SEG'T
	03	SKIRT PLATE	SA516-60	t12x1385x13578	1	1772	
	02	SKIRT PLATE	A283-C	t14x3400x13572	1	5072	
3	01	SKIRT PLATE	A283-C	t14x3359x13572	1	5010	
2	02	2:1 ELLIP. HEAD	SA516-60	t17xI.D4300, SF40	1	2853	2 SEG'T
2	01	2:1 ELLIP. HEAD	SA516-60	t17xI.D4300, SF40	1	2853	2 SEG'T
1	08	SHELL PLATE	SA516-60	t17x2960x13562	1	5357	
	07			t17x3000x13562	3	16289	
	06			t17x3100x13562	1	5611	
	05			t17x3900x13562	1	7059	
	04			t17x3700x13562	1	6696	
	03			t17x3600x13562	2	13031	
	02			t17x3700x13562	1	6696	
1	01	SHELL PLATE	SA516-60	t17x3160x13562	1	5720	
PART NO.		PART NAME	MATERIALS	DIMENSIONS	QTY PER 1SET	WEIGHT (KG)	REMARKS

BILL OF MATERIALS

JOB NO.	51046	CUSTOMER	SET(S)
P/O NO.	SAYPOA0006	ARABIAN INDUSTRIAL FIBERS CO., LTD.	1
MFG. SER. NO.	PV-97-038		
DWN D.C.KWAG '96,5,21	PROJECT: IBN RUSHD PTA & AROMATICS PROJECT-AROMATICS		
DES Y.S.JUNG '96,5,23	TITLE: EXTRACT COLUMN 53-C-02 DETAIL OF BODY		
CHK G.Y.SHIN '96,5,27			2
APP D.H.WON '96,5,28			1
THIRD ANGLE PROJECTION	SCALE: NONE	REF. DWG. NO.: -	DWG NO.: 6T069-0502	REV. 0

CHIYODA CORPORATION

JOB NO. 51046	IBN RUSHD AROMATICS PROJECT
PO NO. SAYPOA0006	
REQ NO. MR-50-C-002	
IDENT NO. 53-C-02-DW-0002	2

A-NO COMMENTS PROCEED WITH FABRICATION	SAY TEAM
B-PROCEED WITH FABRICATION COMMENTS TO BE INCORPORATED	
C-DO NOT PROCEED WITH FABRICATION	DATE

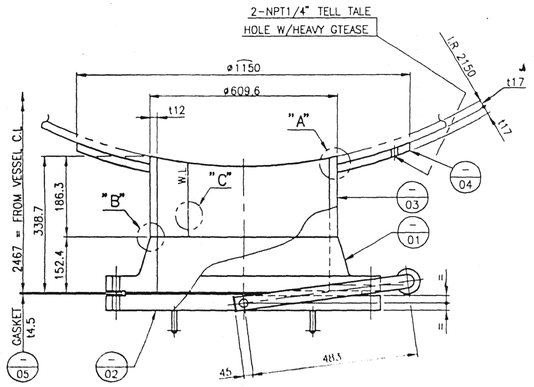
PURCHASER'S PERMISSION TO PROCEED OR REVIEW TAKEN ON VENDOR PRINTS SHALL NOT RELIEVE VENDOR FROM ITS RESPONSIBILITIES OR LIABILITIES UNDER PURCHASE ORDER

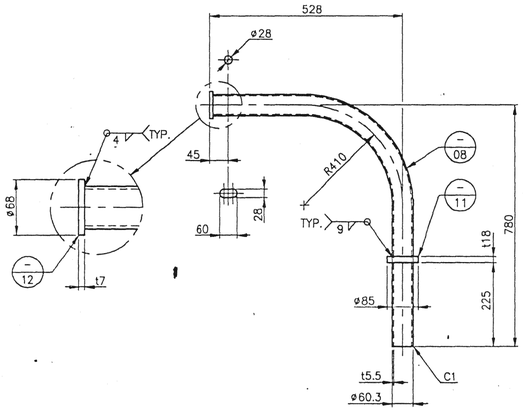
INDUSTRIAL PLANT DIVISION
ULSAN KOREA

HYUNDAI HEAVY INDUSTRIES CO., LTD.

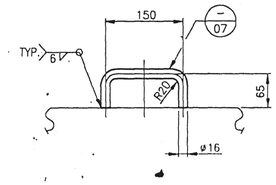
현대중공업주식회사 프랜트 사업본부

015003

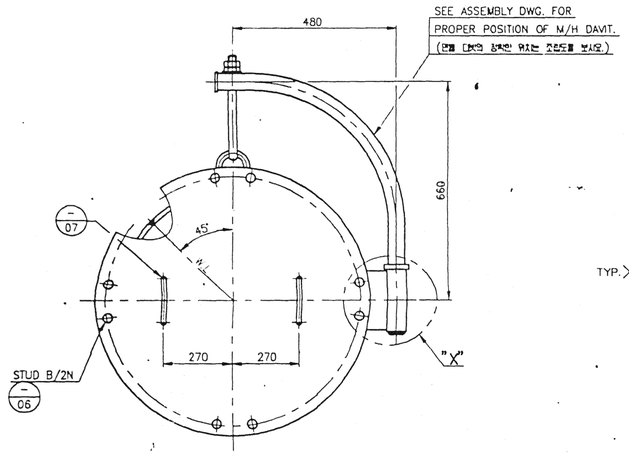




DAVIT

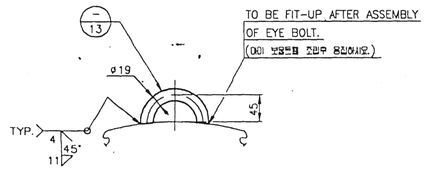


MANHOLE HANDLE

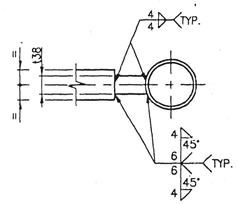


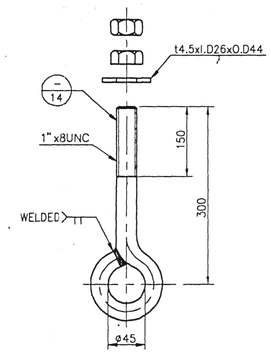
MANHOLE ASSEMBLY

EM	FM
24"	24"

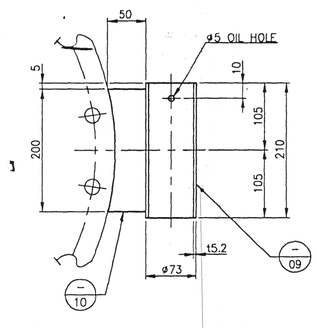


EYE BOLT LUG

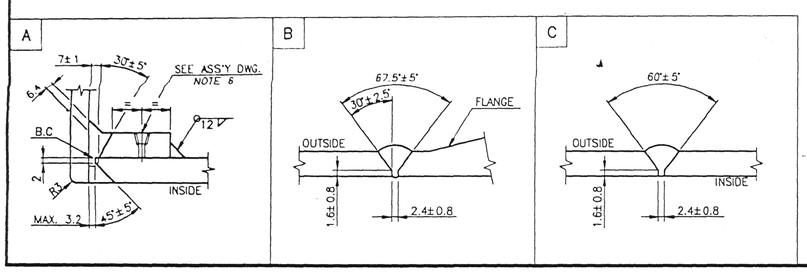




EYE BOLT /2NUT/WASHER



DETAIL "X"



M'K	DATE	REASON FOR REVISION	DWN	CHK	APP
△					
△					
△					

NOTE :

1. GASKET : SPIRAL WOUND 316 S.S W/GRAPHITE FILLER
   316 S.S I.R & C.S O.R.
2. W.P.S NO. F-0101-101 OR F-0101-301 SHALL BE APPLIED TO ALL WELDS EXCEPT A,B & C JOINTS UNLESS OTHERWISE NOTED.
   (특별히 언급하지 않은한 A,B & C JOINT를 제외한 모든용접은 F-0101-101 또는 F-0101-301 임.)

T.W = 983 KG

		PART NO.	PART NAME	MATERIALS	DIMENSIONS	Q'TY PER 1SET	WEIGHT (KG)	REMARKS
EM FM	14	EYE B/2N/W	A193-B7/A194-2H	1"x8UNC-300L	2SET	4		
	13	EYE BOLT LUG	A36	ø19x145L	2	1		
	12	END PLATE	A283-C	t7xø68	2	-		
	11	SUP'T RING PLATE	A283-C	t18xI.D63xO.D85	2	1		
	10	SUPPORT PLATE	A283-C	t38x50x200	2	6		
	09	SLEEVE PIPE	A53-B	2+1/2"xS/40-210L	2	4		
	08	DAVIT PIPE	A53-B	2"xS/80-1126L	2	18		
	07	HANDLE	A36	ø16x280L	4	2		
	06	STUD B/2N	SA193-B7/SA194-2H	1+1/4"x8UN-200L	4QSET	70		
	05	GASKET	SEE NOTE 1	24"xt4.5, 150#	2	6		
	04	REINF. PAD	SA516-60	t17xI.D624xO.D1150	2	196		
	03	NOZZLE NECK	SA516-60	t12x187x1877	2	66		
	02	BLD-RF FLANGE	SA105	24", 150#	2	373	ANSI B16.5	
EM FM	01	WN-RF FLANGE	SA105	24"xI.D585.6, 150#	2	236	ANSI B16.5	

BILL OF MATERIALS

JOB NO.	51046	CUSTOMER	SET(S)
P/D NO.	SAYP0A0006	ARABIAN INDUSTRIAL FIBERS CO., LTD.	1
MFG. SER. NO.	PV-97-038		
DWN D.C. KWAK '96 6/20		PROJECT	IBN RUSHD PTA & AROMATICS PROJECT-AROMATICS
DES '96 6/24		TITLE	EXTRACT COLUMN 53-C-02
CHK G.Y. SHIN '96 6/27			DETAIL OF MANHOLE
APP '96 7/27			
THIRD ANGLE PROJECTION	SCALE NONE	REF. DWG. NO. -	DWG NO. 6T069-0503 REV. 0

ISSUE '97.3.17 PROCESS DEPT. DESIGN DEPT.

JOB NO. 51046	IBN RUSHD AROMATICS PROJECT
PO NO.	SAYP0A0006
REQ NO.	NR-50-C-002
IDENT NO.	53-C-02-DW-0003

A-NO COMMENTS PROCEED WITH FABRICATION	SAY TEAM
B-PROCEED WITH FABRICATION COMMENTS TO BE INCORPORATED	
C-DO NOT PROCEED WITH FABRICATION	DATE

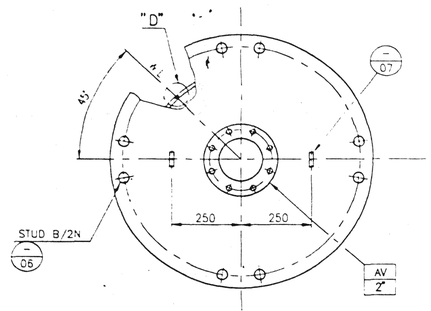
PURCHASER'S PERMISSION TO PROCEED OR REVIEW TAKEN ON VENDOR PRINTS SHALL NOT RELIEVE VENDOR FROM ITS RESPONSIBILITIES OR LIABILITIES UNDER PURCHASE ORDER

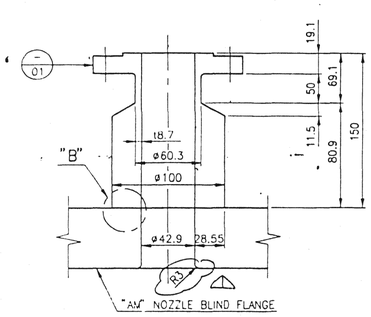
INDUSTRIAL PLANT DIVISION
ULSAN KOREA

HYUNDAI HEAVY INDUSTRIES CO., LTD.

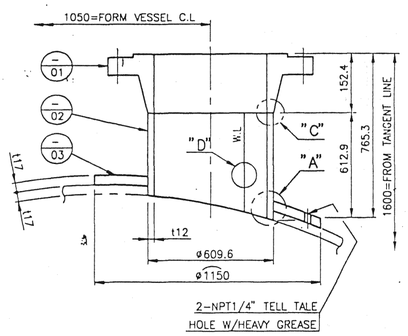
현대중공업주식회사 프랜트 사업본부

015004

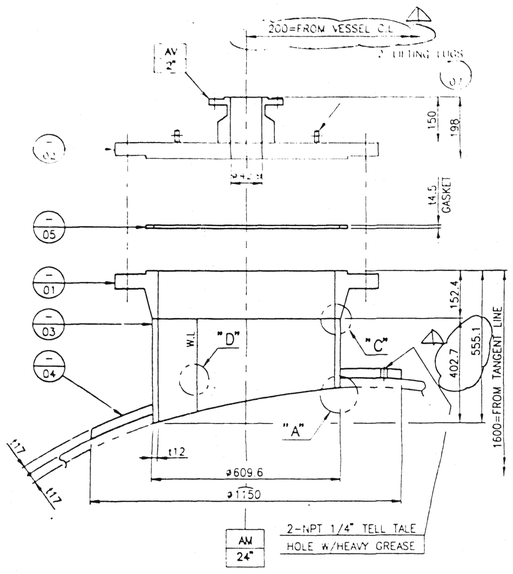




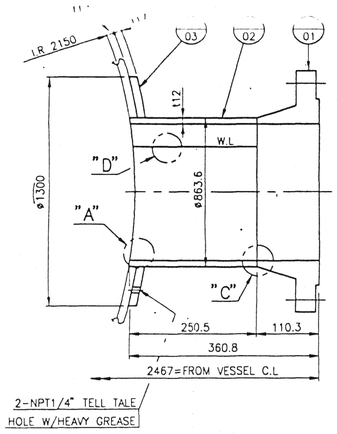
NOZZLE AV 2"



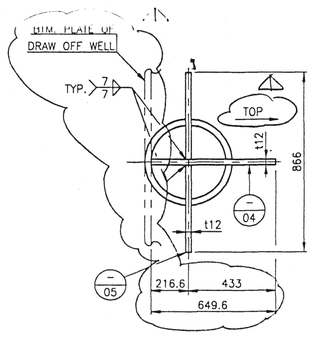
NOZZLE AO 24"

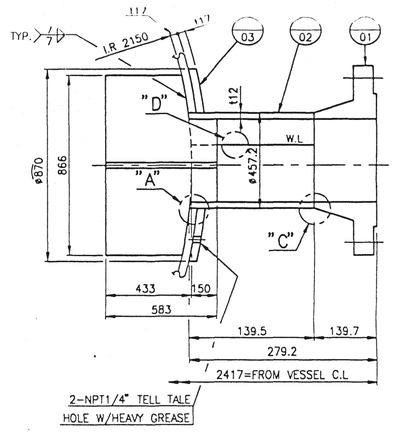


NOZZLE AM 24"

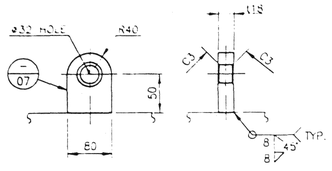


NOZZLE FI 34"

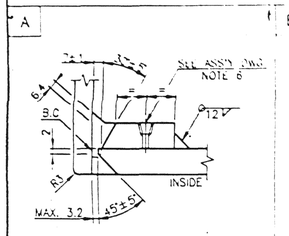


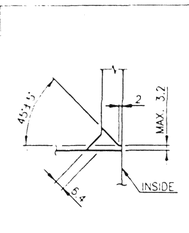


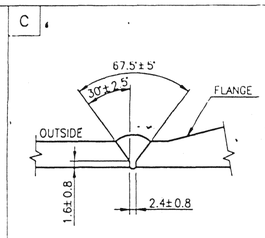
NOZZLE FO 18"

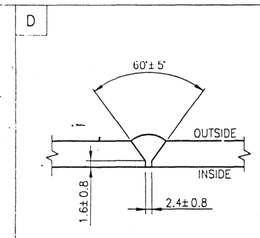


LIFTING LUG









M'K	DATE	REASON FOR REVISION	DWN	CHK	APP
1	'96.8.16	REVISED AS MARKED			
2					
3					

NOTE
1. GASKET MATERIAL ; SPIRAL WOUND 316 S.S W/GRAPHITE FILLER
316 S.S I.R & C.S O.R.

T.W = 1346 KG

FO	05	VORTEX BREAKER	SA516-60	t12x427x583	2	47		
FO	04	VORTEX BREAKER	SA516-60	t12x583x650	1	36		
FO	03	REINF. PAD	SA516-60	t17xI.D471xO.D870	1	56		
FO	02	NOZZLE NECK	SA516-60	t12x140x1399	1	19		
FO	01	WN-RF FLANGE	SA105	18"xI.D433.2, 150#	1	71		ANSI B16.5
FI	03	REINF. PAD	SA516-60	t17xI.D878xO.D1300	1	97		
FI	02	NOZZLE NECK	SA516-60	t12x251x2675	1	64		
FI	01	WN-RF FLANGE	SA105	34"xI.D839.6, 150#	1	116		ANSI B16.5
AV	01	FN-RF FLANGE	SA105	2"xI.D42.9xO.D100-150L, 150#	1	7		ANSI B16.5
AO	03	REINF. PAD	SA516-60	t17xI.D624xO.D1150	1	98		
AO	02	NECK PLATE	SA516-60	t12x613x1877	1	108		
AO	01	WN-RF FLANGE	SA105	24"xI.D585.6, 150#	1	118		ANSI B16.5
AM	07	LIFTING LUG	SA516-60	t18x80x90	2	2		
	06	STUD B/2N	SA193-B7/SA194-2H	1+1/4"x8UN-200L	2SET	33		
	05	GASKET	SEE NOTE 1	24"x14.5, 150# RF	1	–		
	04	REINF. PAD	SA516-60	t17xI.D624xO.D1150	1	98		
	03	NOZZLE NECK	SA516-60	t12x403x1877	1	71		
	02	BLD-RF FLANGE	SA105	24", 150#	1	187		ANSI B16.5
AM	01	WN-RF FLANGE	SA105	24"xI.D585.6, 150#	1	118		ANSI B16.5
PART NO.		PART NAME	MATERIALS	DIMENSIONS	Q'TY PER 1SET	WEIGHT (KG)		REMARKS

BILL OF MATERIALS

JOB NO.	51046	CUSTOMER	SET(S)
P/O NO.	SAYPOA0006	ARABIAN INDUSTRIAL FIBERS CO., LTD.	1
MFG. SER. NO.	PV-97-038		
DWN D.C.KWAG '96,7,5	PROJECT	IBN RUSHD PTA & AROMATICS PROJECT-AROMATICS	
DES Y.S.JUNG '96,7,8	TITLE	EXTRACT COLUMN 53-C-02	
CHK G.Y.SHIN '96,7,9			
APP D.H.WON '96,7,10		DETAIL OF NOZZLE (1/2)	1
THIRD ANGLE PROJECTION	SCALE NONE	REF. DWG. NO. –	DWG NO. 6T069-0505 REV. 0

CHIYODA CORPORATION

JOB NO. 51046	IBN RUSHD AROMATICS PROJECT
PO NO.	SAYPOA0006
REQ NO.	WR-50-C-002
IDENT NO.	53-C-02-DW-0005

A-NO COMMENTS PROCEED WITH FABRICATION
B-PROCEED WITH FABRICATION COMMENTS TO BE CONSIDERED
C-DO NOT PROCEED WITH FABRICATION

SAY TEAM

DATE

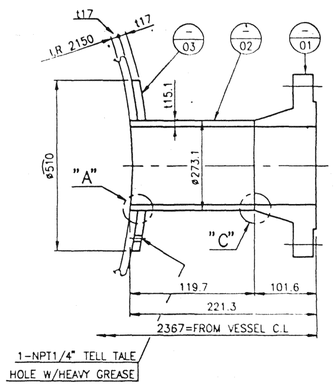
PURCHASER'S PERMISSION TO PROCEED OR REVIEW TAKEN ON VENDOR PRINTS SHALL NOT RELIEVE VENDOR FROM ITS RESPONSIBILITIES OR LIABILITIES UNDER PURCHASE ORDER

INDUSTRIAL PLANT DIVISION
ULSAN KOREA

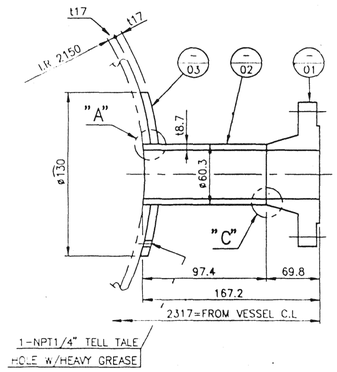
HYUNDAI HEAVY INDUSTRIES CO., LTD.

현대중공업주식회사 프랜트 사업본부

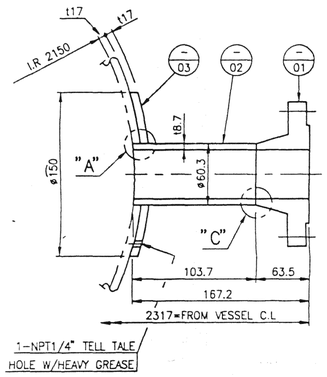
015005



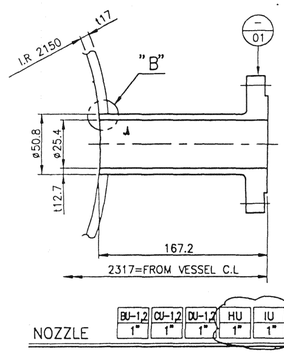
NOZZLE | FJ | 10"



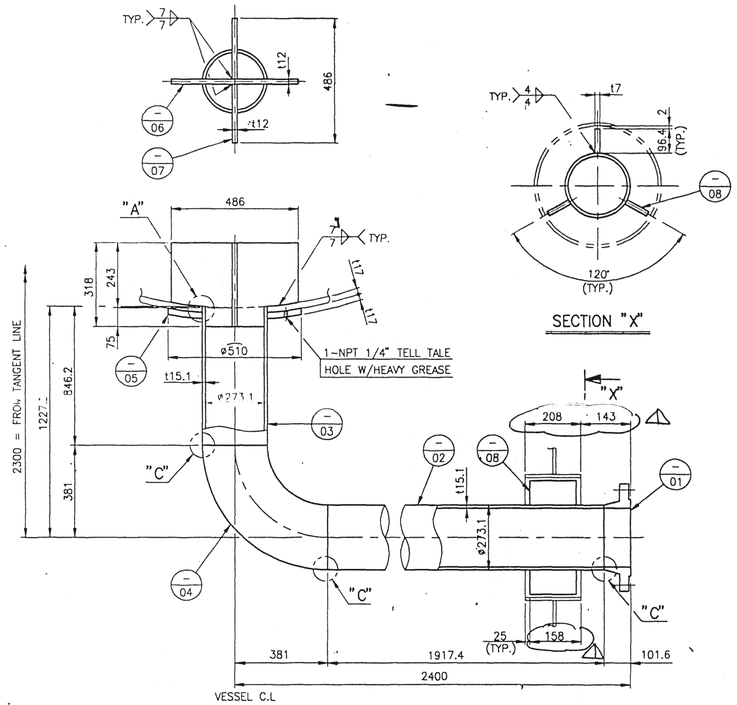
NOZZLE | FL-1 | FL-2 | 2" | 2"



NOZZLE | FS | 2"

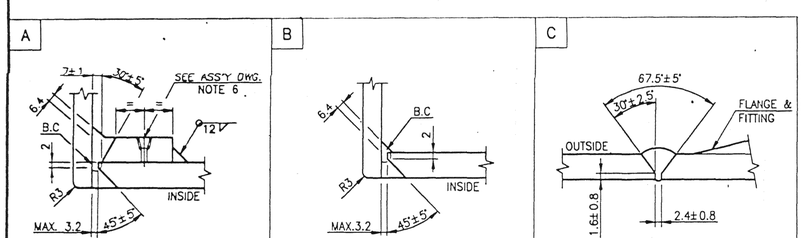


NOZZLE



NOZZLE | GO | 10"

SECTION "X"



M'K	DATE	REASON FOR REVISION	DWN	CHK	APP
1	'96.8.16	REVISED AS MARKED			
2					
3					

T.W = 491 KG

		PART NO.	PART NAME	MATERIALS	DIMENSIONS	QTY PER 1SET	WEIGHT (KG)	REMARKS
FJ	03		REINF. PAD	SA516-60	t17xI.D287x0.D510	1	19	
FJ	02		NOZZLE NECK	SA106-B	10"xS/80-120L	1	12	
FJ	01		WN-RF FLANGE	SA105	10"xS/80, 150#	1	25	ANSI B16.5
GO	08		SUPPORT PLATE	A283-C	t7x97x158	3	3	
	07		VORTEX BRACKER	SA516-60	t12x237x318	2	14	
	06		VORTEX BRACKER	SA516-60	t12x318x486	1	15	
	05		REINF. PAD	SA516-60	t17xI.D287x0.D510	1	19	
	04		90° L.R ELBOW	SA234-WPB	10"xS/80, B.W	1	61	
	03		NOZZLE NECK	SA106-B	10"xS/80-846L	1	81	
	02		NOZZLE NECK	SA106-B	10"xS/80-1917L	1	184	
GO	01		WN-RF FLANGE	SA105	10"xS/80, 150#	1	25	ANSI B16.5
FS	03		REINF. PAD	SA516-60	t17xI.D74x0.D150	1	2	
FS	02		NOZZLE NECK	SA106-B	2"xS/160-104L	1	2	
FS	01		WN-RF FLANGE	SA105	2"xS/160, 150#	1	3	ANSI B16.5
FL-1,2	03		REINF. PAD	SA516-60	t17xI.D74x0.D130	2	3	
FL-1,2	02		NOZZLE NECK	SA106-B	2"xS/160-97L	2	3	
FL-1,2	01		WN-RF FLANGE	SA105	2"xS/160, 300#	2	8	ANSI B16.5
HU, IU, BU-1,2, CU-1,2, DU-1,2	01		LWN-RF FLANGE	SA105	1"xI.D25.4-167L, 150#	8	12	ANSI B16.5

AS BUILT

BILL OF MATERIALS

JOB NO.	51046	CUSTOMER	SET(S)
P/O NO.	SAYPOA0006	ARABIAN INDUSTRIAL FIBERS CO., LTD.	1
MFG. SER. NO.	PV-97-038		
DWN D.C.KWAG '96,7,5	PROJECT	IBN RUSHD PTA & AROMATICS PROJECT-AROMATICS	
DES Y.S.JUNG '96,7,8	TITLE	EXTRACT COLUMN 53-C-02	
CHK G.Y.SHIN '96,7,9		DETAIL OF NOZZLE (2/2)	
APP D.H.WON '96,7,10	THIRD ANGLE PROJECTION	SCALE NONE	REF. DWG. NO. -
	DWG NO.	6T069-0506	REV. 0

ISSUE 1997.3.17 PROCESS EQUIP. ENGRG DEPT. 1

INDUSTRIAL PLANT DIVISION ULSAN KOREA

HYUNDAI HEAVY INDUSTRIES CO., LTD.

현대중공업주식회사 프랜트 사업본부

CHIYODA CORPORATION

JOB NO. 51046	IBN RUSHD AROMATICS PROJECT
PO NO.	SAYPOA0006
REQ NO.	MR-50-C-002
IDENT NO.	53-C-02-DW-0006

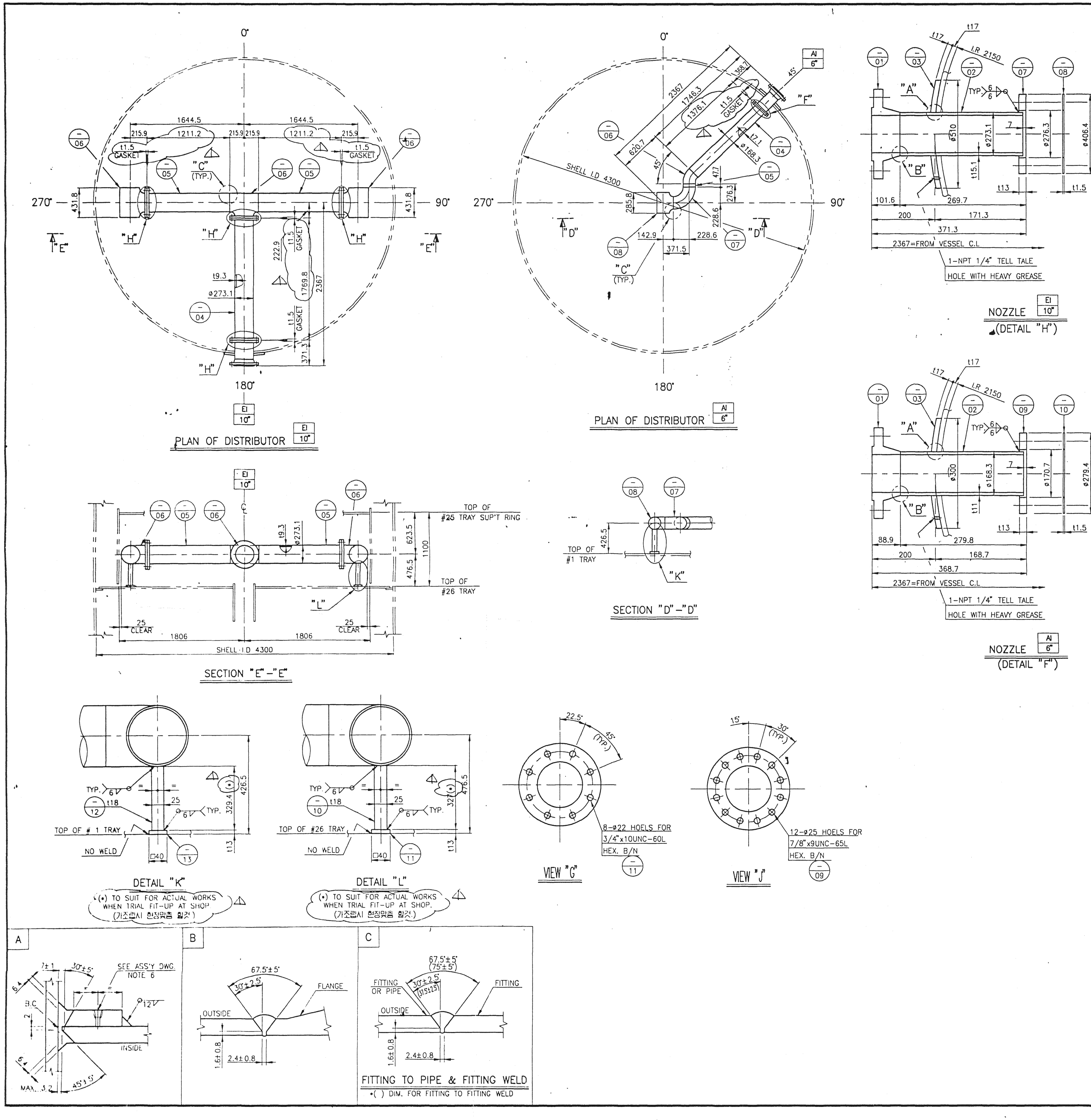
A-NO COMMENTS PROCEED WITH FABRICATION
B-PROCEED WITH CORRECTION INCORPORATION TO BE CONSIDERED
C-DO NOT PROCEED WITH FABRICATION

SAY TEAM

DATE

PURCHASER'S PERMISSION TO PROCEED OR REVIEW TAKEN ON VENDOR PRINTS SHALL NOT RELIEVE VENDOR FROM ITS RESPONSIBILITIES OR LIABILITIES UNDER PURCHASE ORDER

015006



M'K	DATE	REASON FOR REVISION	DWN	CHK	APP
△1	'96.8.30	REVISED AS MARKED			
△					
△					

NOTE :

1. TRIAL FIT-UP AT SHOP WITHOUT TRAY TO SUIT FOR ACTUAL WORKS. (실제 SITE 조립시 정확도를 위하여 SHOP 에서 가조립 실시할것.)

T.W = 640 KG

	PART NO.	PART NAME	MATERIALS	DIMENSIONS	Q'TY PER 1SET	WEIGHT (KG)	REMARKS
EI	11	WEAR PLATE	A283-C	t13x □40	2	1	
	10	SUPPORT PLATE	A283-C	t18x25x327	2	2	ADJUST AT SHOP
	09	HEX. B/N	A193-B8/A194-8	7/8"x9UNC-65L	48SET	23	
	08	GASKET	CERAMIC FIBER SHEET	t1.5xI.D276xO.D406	4	–	
	07	PLATE FLANGE	A283-C	t13xI.D276xO.D406	8	57	
	06	TEE	A234-WPB	10"x10"xS/40,B.W	3	117	
	05	INT. PIPE	SA106-B	10"xS/40-1204L	2	146	
	04	INT. PIPE	SA106-B	10"xS/40-1756L	1	107	
	03	REINF. PAD	SA516-60	t17xI.D287xO.D510	1	19	
	02	NOZZLE NECK	SA106-B	10"xS/80-270L	1	25	
EI	01	WN-RF FLANGE	SA 105	10"xS/80, 150#	1	25	ANSI B16.5
AI	13	WEAR PLATE	A283-C	t13x □40	2	1	
	12	SUPPORT PLATE	A283-C	t18x25x329	2	2	ADJUST AT SHOP
	11	HEX. B/N	A193-B8/A194-8	3/4"x10UNC-60L	8SET	3	
	10	GASKET	CERAMIC FIBER SHEET	t1.5xI.D171xO.D279	1	–	
	09	PLATE FLANGE	A283-C	t13xI.D171xO.D279	2	8	
	08	TEE	A234-WPB	6"x6"xS/40, B.W	1	16	
	07	90° L..R ELBOW	A234-WPB	6"xS/40, B.W	1	12	
	06	45° L..R ELBOW	A234-WPB	6"xS/40, B.W	1	6	
	05	INT. PIPE	SA106-B	6"xS/40-48L	1	2	
	04	INT. PIPE	SA106-B	6"xS/40-1369L	1	39	
	03	REINF. PAD	SA516-60	t17xI.D182xO.D300	1	6	
	02	NOZZLE NECK	SA106-B	6"xS/80-273L	1	12	
AI	01	WN-RF FLANGE	SA 105	6"xS/80, 150#	1	11	ANSI B16.5

BILL OF MATERIALS

JOB NO.	51046	CUSTOMER: ARABIAN INDUSTRIAL FIBERS CO., LTD.	SET(S): 1
P/O NO.	SAYPOA0006		
MFG. SER. NO.	PV-97-038		
DWN	D.C.KWAG '96.7.11	PROJECT: IBN RUSHD PTA & AROMATICS PROJECT-AROMATICS	
DES	Y.S.JUNG '96.7.15	TITLE: EXTRACT COLUMN 53-C-02 DETAIL OF DISTRIBUTOR	
CHK	G.Y.SHIN '96.7.18		
APP	D.H.WON '96.7.18		
THIRD ANGLE PROJECTION	SCALE: NONE	REF. DWG. NO.: –	DWG NO.: 6T069-0507

CHIYODA CORPORATION

JOB NO. 51046	IBN RUSHD AROMATICS PROJECT
PO NO.	SAYPOA0006
REQ NO.	MR-50-C-002
IDENT NO.	53-C-02-DW-0007
A-NO COMMENTS PROCEED WITH FABRICATION; B-PROCEED WITH FABRICATION COMMENTS TO BE CONSIDERED; C-DO NOT PROCEED WITH FABRICATION	DATE

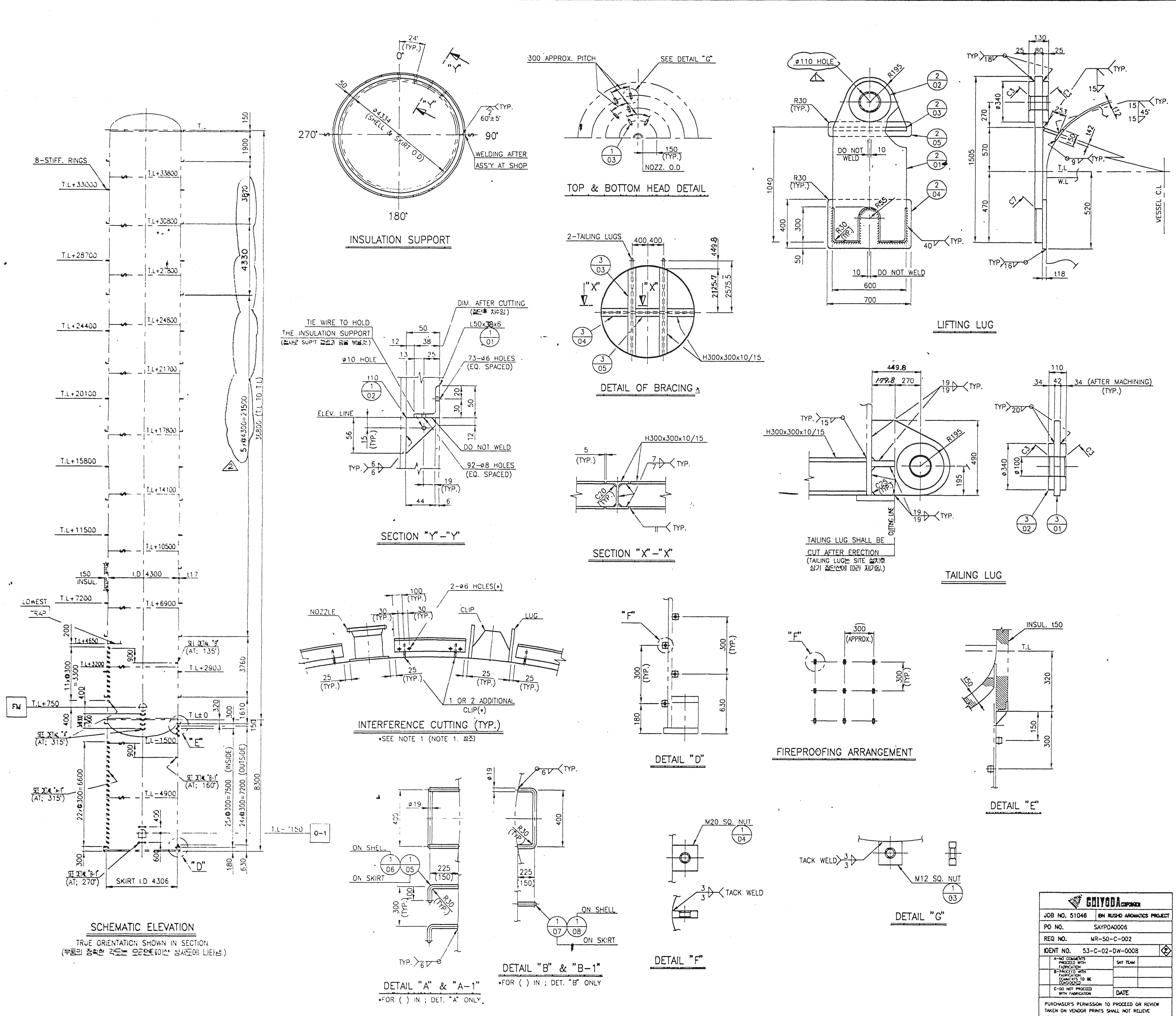
PURCHASER'S PERMISSION TO PROCEED OR REVIEW TAKEN ON VENDOR PRINTS SHALL NOT RELIEVE VENDOR FROM ITS RESPONSIBILITIES OR LIABILITIES UNDER PURCHASE ORDER

INDUSTRIAL PLANT DIVISION ULSAN KOREA

HYUNDAI HEAVY INDUSTRIES CO., LTD.

현대중공업주식회사 프랜트 사업본부

015007



M'K	DATE	REASON FOR REVISION	DWN	CHK	APP
1	'96 10/15	REVISED AS MARKED			
2	'99 1/28	REVISED AS MARKED			

NOTE

1. TIE WIRE TO FASTEN THE ADDITION. CLIP WITH SUPPORT RING FOR INTERFERENCE CUTTING PART.
(간섭으로 절단된 부위의 CLIP 이 부족하여 고정할수 없을때 추가 CLIP(1개 또는 2개)를 부착하고 SUPPORT RING 에 HOLE을 뚫어 철사로 고정할것.)

T.W = 3869 KG

PART NO.		PART NAME	MATERIALS	DIMENSIONS	Q'TY PER 1SET	WEIGHT (KG)	REMARKS
3	05	BRACING	SS400	H300x300x10/15-790L	1	75	
	04	BRACING	SS400	H300x300x10/15-1748L	2	329	
	03	BRACING	SS400	H300x300x10/15-4277L	2	804	
	02	PAD PLATE	A283-C	t34xI.D100xO.D340	4	89	USED t38
3	01	TAILING LUG	A283-C	t42x490x645	2	208	USED t50
2	05	REINF. PAD	SA516-60	t12x150x700	2	20	
	04	REINF. PAD	SA516-60	t18x400x700	2	80	
	03	SUP'T PLATE	A283-C	t42x253x600	2	100	
	02	PAD PLATE	A283-C	t25xI.D110xO.D340	4	64	
2	01	LIFTING LUG	A283-C	t80x600x1505	2	1135	
1	08	HANDLE	A36	ø19x700L	1	2	
	07	HANDLE	A36	ø19x850L	3	6	
	06	LADDER RUNG	A36	ø19x900L	16	32	
	05	LADDER RUNG	A36	ø19x1050L	23	54	
	04	SQ. NUT	SS400	M20	2350	151	
	03	SQ. NUT	SS400	M12	480	9	
	02	INSUL. SUP'T CLIP	SA516-60	t10x44x56	165	32	
1	01	INSUL. SUP'T RING	SS400	L50x38x6-13930L	11	679	

BILL OF MATERIALS

JOB NO.	51046	CUSTOMER: ARABIAN INDUSTRIAL FIBERS CO., LTD.	SET(S): 1
P/O NO.	SAYPOA0006		
MFG. SER. NO.	PV-97-038		
DWN: D.C.KWAG	'96,8,5	PROJECT: IBN RUSHD PTA & AROMATICS PROJECT-AROMATICS	
DES: J.S.LEE	'96,8,7	TITLE: EXTRACT COLUMN 53-C-02	2
CHK: G.Y.SHIN	'96,8,9		
APP: D.H.WON	'96,8,9	DETAIL OF ACCESSORY	1
THIRD ANGLE PROJECTION	SCALE: NONE	REF. DWG. NO.: - / DWG NO.: 6T069-0508	0
			REV.

CHIYODA CORPORATION	
JOB NO. 51046	IBN RUSHD AROMATICS PROJECT
PO NO.	SAYPOA0006
REQ NO.	MR-50-C-002
IDENT NO.	53-C-02-DW-0008 (2)
A-NO COMMENTS PROCEED WITH FABRICATION	SAY TEAM
B-PROCEED WITH FABRICATION COMMENTS TO BE CONSIDERED	
C-DO NOT PROCEED WITH FABRICATION	DATE

PURCHASER'S PERMISSION TO PROCEED OR REVIEW TAKEN ON VENDOR PRINTS SHALL NOT RELIEVE VENDOR FROM ITS RESPONSIBILITIES OR LIABILITIES UNDER PURCHASE ORDER

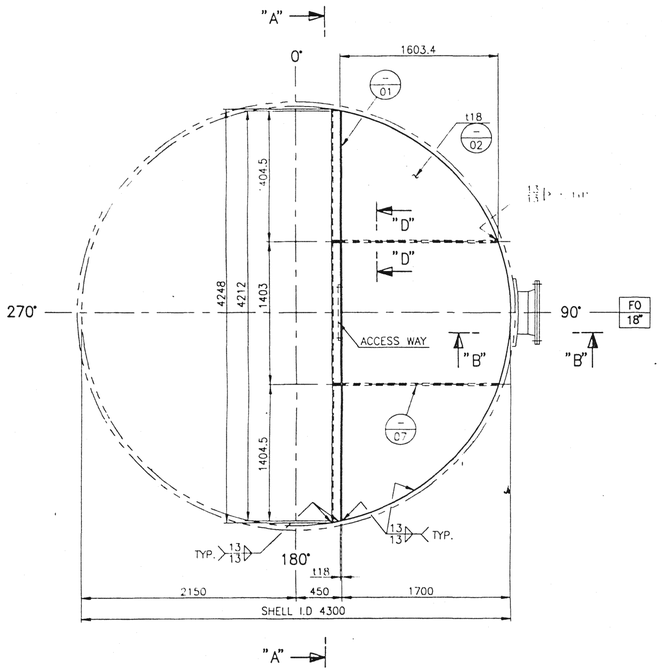
INDUSTRIAL PLANT DIVISION
ULSAN KOREA

HYUNDAI HEAVY INDUSTRIES CO., LTD.

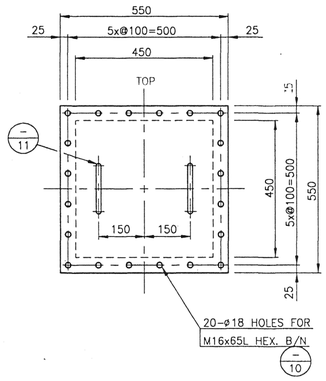
현대중공업주식회사 프랜트 사업본부

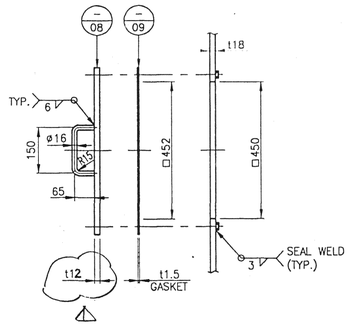
015008

M'K	DATE	REASON FOR REVISION	DWN	CHK	APP
1	'96 9/11	REVISED AS MARKED			

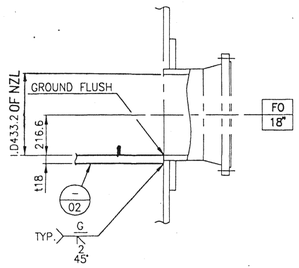


PLAN OF DRAW OFF WELL





ACCESS WAY



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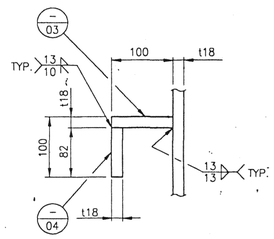
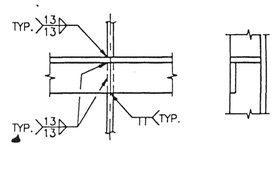
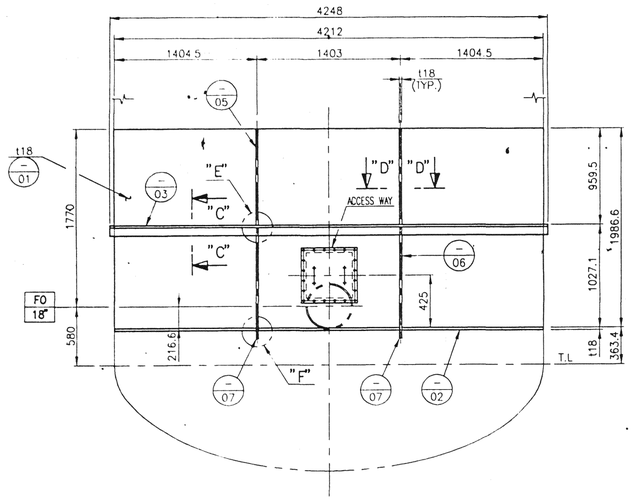


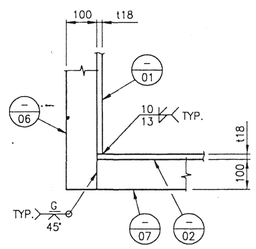
SECTION "C"–"C"



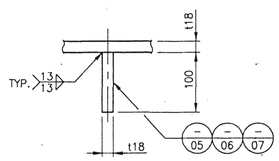
DETAIL "E"



SECTION "A"–"A"



DETAIL "F"



SECTION "D"–"D"

–	11	HANDLE	A36	ø16x280L	2	1
–	10	HEX. B/N	A193-B8/A194-8	M16x65L	20	–
–	09	GASKET	CERAMIC FIBER SHEET	t1.5x □452x □550	1	–
–	08	COVER PLATE	SA516-60	t12 □550	1	29
–	07	STIFF. PLATE		t18x100x1603	2	45
–	06	STIFF. PLATE		t18x100x1127	2	32
–	05	STIFF. PLATE		t18x100x960	2	27
–	04	HORIZON. STIFF. PLATE		t18x82x4248	1	49
–	03	HORIZON. STIFF. PLATE		t18x100x4248	1	60
–	02	BTM. BAFFLE PLATE		t18x1718x4212	1	1023
–	01	INT. BAFFLE PLATE	SA516-60	t18x1987x4212	1	1183
PART NO.		PART NAME	MATERIALS	DIMENSIONS	Q'TY PER SET	WEIGHT (KG)	REMARKS

T.W = 2449 KG

BILL OF MATERIALS

JOB NO.	51046	CUSTOMER	SET(S)
P/O NO.	SAYPOA0006	ARABIAN INDUSTRIAL FIBERS CO., LTD.	1
MFG. SER. NO.	PV-97-038		
DWN Y.S. Jung '96 8/9		PROJECT	IBN RUSHD PTA & AROMATICS PROJECT-AROMATICS
DES	'96 8/12	TITLE	EXTRACT COLUMN 53-C-02 DETAIL OF INTERNAL
CHK G.Y. SHIN	'96 8/14		
APP D.H. WON	'96 8/16		
THIRD ANGLE PROJECTION	SCALE NONE	REF. DWG. NO. –	DWG NO. 6T069-0510 REV. 0

SAIYODA CORPORATION

JOB NO. 51046	IBN RUSHD AROMATICS PROJECT
PO NO.	SAYPOA0006
REQ NO.	MR-50-C-002
IDENT NO.	53-C-02-DW-0010

A=NO COMMENTS PROCEED WITH FABRICATION
B=PROCEED AFTER FABRICATION (COMMENTS TO BE INCORPORATED)
C=DO NOT PROCEED WITH FABRICATION

SAY TEAM | DATE

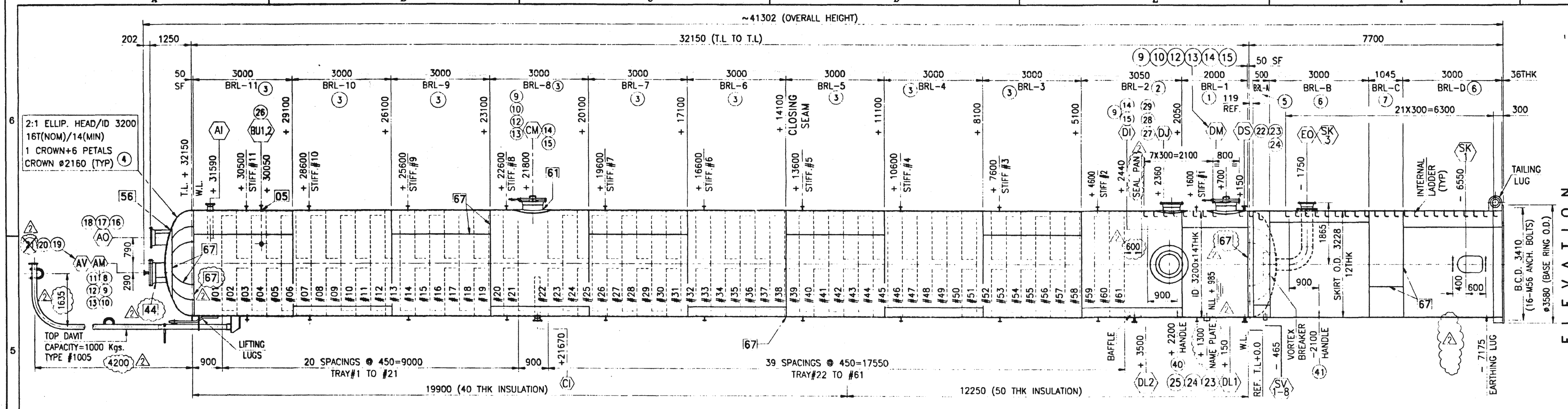
PURCHASER'S PERMISSION TO PROCEED OR REVIEW TAKEN ON VENDOR PRINTS SHALL NOT RELIEVE VENDOR FROM ITS RESPONSIBILITIES OR LIABILITIES UNDER PURCHASE ORDER

INDUSTRIAL PLANT DIVISION
ULSAN KOREA

HYUNDAI HEAVY INDUSTRIES CO., LTD.

현대중공업주식회사 프랜트 사업본부

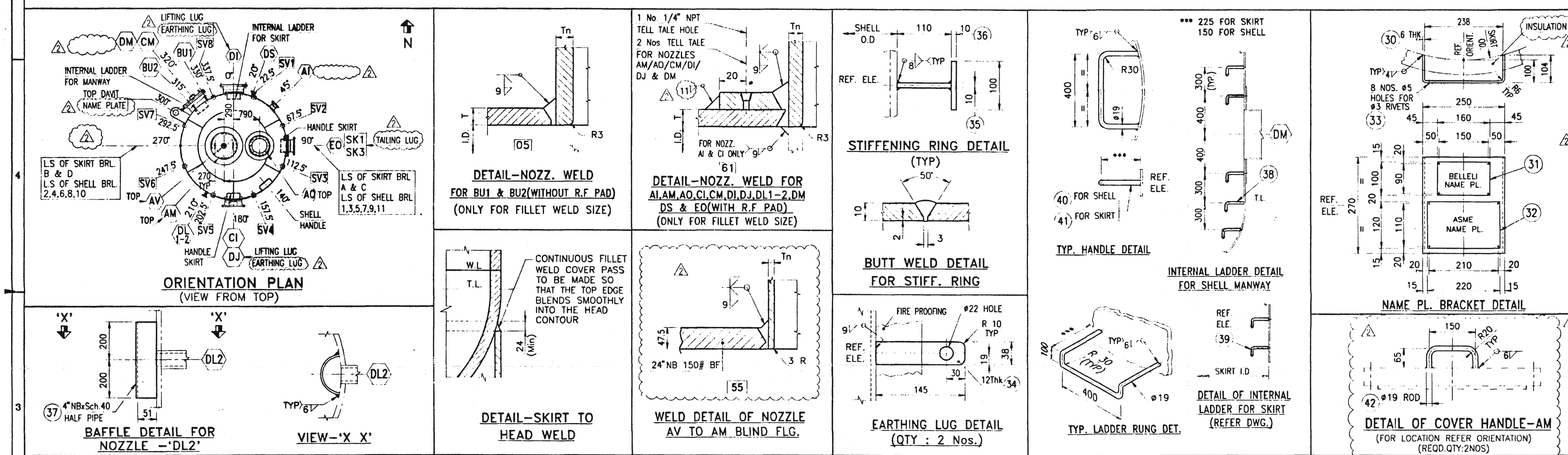
015009



SPARES FOR GASKETS AND STUD/NUTS ARE INCLUDED IN LOM

* SA193 GR.B7/SA194 GR.2H

** 4.5mm THK SS 316 SPIRAL WOUND GRAPHITE FILLED WITH SS 316 INNER AND SS/CS OUTER CENTERING RING.



TOTAL WT. = 49477.3 Kgs.

LIST OF MATERIAL

FAM.	ITEM POS.	QTY FOR ONE FAM.	DESCRIPTION	LENGTH	WIDTH	THICK	WT. IN Kg. For ONE POS.	WT. IN Kg. For ONE FAM.	MAT'L	MAT'L CODE	RDA: NO.
	42	2	HANDLE-ø19	255	0	0.0	0.4	0.8	A36	7033A20P01	703300-020
	41	1	HANDLE-ø19	816	0	0.0	1.8	1.8	A36	7033A20P01	703300-020
	40	1	HANDLE-ø19	666	0	0.0	1.5	1.5	A36	7033A20P01	703300-020
	39	22	ROD-ø19	982	0	0.0	2.3	50.6	A36	7033A20P01	703300-020
	38	11	ROD-ø19	832	0	0.0	1.9	20.9	A36	7033A20P01	703300-020
	37	1	PI 4"-40(HALF PIPE)	400	0	0.0	6.5	6.5	A106GR.B	7033A06T19	703300-001
	36	11	TOP PLATE	10864	100	10.0	85.2	937.2	A283GR.C	7033A01L57	703300-001
	35	11	RING 3448/3228/10T	0	0	0.0	90.6	996.6	A516GR.70	7033A01L28	703300-001
	34	2	EARTHING LUG	145	38	12.0	0.5	1.0	SS304	2077A16L01	STOCK
	33	8	RIVET ø3	20	0	0.0	2.0	16.0	COPPER	7033A21B01	703300-021
	32	1	ASME NAME PL.	220	120	5.0	0.6	0.6	SS304	ø00100050122	STOCK
	31	1	BELLELI NAME PL.	160	100	5.0	0.4	0.4	SS304	ø00100050122	STOCK
	30	1	NAME PL. BRACKET	438	270	6.0	5.6	5.6	SA516GR70	LP060A5172500800	STOCK
	29	1	RP OD970/518/14T	0	0	0.0	58.0	58.0	SA516GR 70	7033A01L12	703300-001
	28	1	F 20"-150#WNRF	0	0	0.0	77.1	77.1	SA105	7033A04F16	703300-004
	27	1	NOZZ NECK-DJ	1558	141	12.0	20.7	20.7	SA516GR 70	7033A01L04	703300-001
	26	2	F 1"-150#LWNRF	165	0	0.0	2.5	5.0	SA105	7033A04F01	703300-004
	25	2	PI 2"-160	102	0	0.0	1.1	2.2	SA106GR.B	7033A06T01	703300-006
	24	3	RP OD150/70/14T	0	0	0.0	1.5	4.5	SA516GR.70	7033A01L12	703300-001
	23	3	F 2"-150#WNRF	0	0	0.0	2.7	8.2	SA105	7033A04F03	703300-004
	22	1	PI 2"-160	102	0	0.0	1.1	1.1	SA106GR.B	7033A06T01	703300-006
	21	0	DELETED	0	0	0.0	0.0	0.0			
	20	1	F 2"-150#WNRF	0	0	0.0	2.7	2.7	SA105	7033A04F03	703300-004
	19	1	PI 2"-160	134	0	0.0	1.5	1.5	SA106GR.B	7033A06T01	703300-006
	18	1	RP OD870/467/16T	0	0	0.0	53.2	53.2	SA516GR.70	7033A01L16	703300-001
	17	1	F 18"-150#WNRF	0	0	0.0	63.6	63.6	SA105	7033A04F15	703300-004
	16	1	NOZZ. NECK-AO	1398	496	12.0	65.4	65.4	SA516GR.70	7033A01L04	703300-001
	15	3	RP OD1150/620/14T	0	0	0.0	81.0	243.0	SA516GR.70	7033A01L12	703300-001
	14	3	NOZZ. NECK-CM,DI,DM	1879	192	12.0	34.0	102.0	SA516GR.70	7033A01L04	703300-001
	13	72	ST+2NT 1 1/4" 8UN	178	0	0.0	1.7	122.4	*	7033A11B02	703300-011
	12	12	GK 24"-150# RF	0	0	0.0	0.0	0.0	**	7033A12G04	703300-012
	11	1	RP OD1150/620/16T	0	0	0.0	92.5	92.5	SA516GR.70	7033A01L16	703300-001
	10	3	BF 24"-150# RF	0	0	0.0	187.0	561.0	SA105	7033A04F21	703300-004
	9	4	F 24"-150#WNRF	0	0	0.0	118.0	472.0	SA105	7033A04F17	703300-004
	8	1	NOZZ. NECK-AM	1879	360	12.0	63.7	63.7	SA516GR.70	7033A01L04	703300-001
	7	1	SKIRT BRL-C	10103	1045	12.0	994.5	994.5	A36	7033A01L58	703300-001
	6	2	SKIRT BRL-B&D	10103	3000	12.0	2855.0	5710.0	A36	7033A01L58	703300-001
	5	1	SKIRT BRL-A	10103	500	12.0	475.9	475.9	SA516GR.70N	7033A01L04	703300-001
	4	2	EH ID3200X16T(NOM)	0	0	0.0	1336.4	2672.8	SA516GR.70N	7033A01L16	703300-001
	3	9	SHELL BRL-3TO11	10097	3000	14.0	3329.0	29961.0	SA516GR.70N	7033A01L09	703300-001
	2	1	SHELL BRL-2	10097	3050	14.0	3384.5	3384.5	SA516GR.70N	7033A01L10	703300-001
01-01	1	1	SHELL BRL-1	10097	2000	14.0	2219.3	2219.3	SA516GR.70N	7033A01L12	703300-001

BELLELI REFERENCE DRAWINGS

DRAWING No.	DESCRIPTION
DA-7033-01-002	DETAILS DRAWING
DA-7033-01-003	FORMED HEAD - TOP & BOTTOM
DA-7033-01-004	DETAIL OF INTERNALS
DA-7034-00-002	DAVIT ARRANGEMENT
DA-7033-01-006	TOP DAVIT
DA-7033-01-007	BELLELI NAME PLATE
DA-7033-01-008	ASME NAME PLATE
DA-7033-01-009	TRAY SUPPORT DETAILS(6 SHEETS)
DA-7033-01-010	CLIPS FOR PLATFORM,LADDERS(2 SHTS.)
DA-7033-01-011	CLIPS FOR INSUL.,FIRE PROOFING & PIPE SUPP.
ST-7033-01-001	FINISH REQUIREMENTS
DO-7033-01-001	SHIPPING&TESTING ARRANGEMENT
UOP STD DWG. 3-115 REV-2	BAFFLES
UOP STD DWG. 3-122 REV-0	VORTEX BREAKER
UOP STD DWG. 3-150 REV-3	DISTRIBUTORS
UOP STD DWG. 3-162 REV-1	DISTRIBUTORS
UOP STD DWG. 3-280 REV-0	TRAPS
9-14-1	FIRE PROOFING
9-11-1	EXTERNAL THERMAL INSULATION
22854-SP-000-A-004 REV-1	UNIT OF MEASUREMENT
22854-SP-000-X-001 REV-3	SHOP AND FIELD PAINTING
DR-50-DB-018 REV-1	EARTH PIECE
CHIYODA STD. DR-50-DB-017 REV-3	NAME PLATE
CHIYODA STD. DR-50-DB-013 REV-3	ANSI 150,300 & 600 MANHOLE DAVIT AND HINGE
CHIYODA STD. DR-50-DB-011 REV-2	FLANGED NOZZLE
CHIYODA STD. DR-50-DB-010 REV-2	INTERNAL LADDER FOR VESSEL
CHIYODA STD. DR-50-DB-007 REV-2	DAVIT
CHIYODA STD. DR-50-DB-006 REV-2	LIFTING LUG FOR VERTICAL VESSEL
CHIYODA STD. DR-50-DB-001 REV-3	SKIRT & BASE BLOCK FOR VERTICAL VESSEL
UOP STD. SPEC. 3-18 REV-5	TRAYS & PACKING
UOP STD. SPEC. 3-11 REV-2	PRESSURE VESSELS CARBON STEEL
CHIYODA SPEC. SP-50-N-001	HOT SERVICE THERMAL INSULATION
BECHTEL SP. 22854-SP-000-M-001 REV-4	BASIC CIVIL ENGINEERING DESIGN DATA
BECHTEL SP. 22854-SP-000-D-001 REV-1	UNFIRED PRESSURE VESSELS
BECHTEL SP. 22854-SP-000-W-001 REV-1	MATERIAL,WELDING,NDT & CORROSION CONTROL
DS-53-C-003 REV-0	CHIYODA DATA SHEET

CLIENT'S REF. DWGS. & SPECS.

GENERAL NOTES

21. ▢ MARK INDICATES THE BSHI WELD STANDARD NUMBER.
◯ MARK INDICATES THE POSITION NUMBER WITH REFERENCE TO LIST OF MATERIAL
⬡ MARK INDICATES THE NOZZLE MARK NUMBER.
20. SHOP HYD. TEST GASKETS :- (i) BLINDED NOZZLES WILL HAVE JOB GASKETS.
(ii) ALL OTHER NOZZLES WILL HAVE CAF GASKET.
19. SPARE PARTS:-

ITEMS	COMMISSIONING/STARTUP	OPERATIONAL	SHOP HYD. TEST
GASKETS	200%	100%	100%
FASTENERS	10%(MIN. 2 SETS)	10%(MIN. 2 SETS)	NOT REQUIRED

18. ALL BOLTS & NUTS SHALL BE OF UNC SERIES UPTO & INCLUDING 1" SIZE & 8UN ABOVE 1" SIZE.
17. FLANGES UPTO & INCLUDING 24"NB SHALL BE AS PER ANSI B16.5 & THE FLANGE FACE FINISH SHALL BE 3.2 TO 6.3 MICROMETER.
16. DELETED
15. MINIMUM TEMPERATURE OF HYDROTEST WATER SHALL BE 17°C AND THE TEST PRESSURE SHALL BE HELD FOR HALF AN HOUR PER INCH OF THICKNESS WITH ONE HOUR MINIMUM.
14. EACH REINFORCING PAD OR SEGMENT THEREOF SHALL BE PROVIDED WITH ONE No. (TWO Nos. FOR NOZZLES 16"NB AND ABOVE @ 180° APART) 1/4" NPT, TELL TALE HOLE AS PER ANSI B1.20.1, ALL R.F PAD WELDS SHALL BE TESTED TO 15 Psig. MINIMUM WITH AIR & SOAPY BUBBLE TEST.
13. A PERMANENT REFERENCE WORKLINE FOR VERTICAL VESSELS BOTTOM TAN LINE SHALL BE PUNCHMARKED AROUND THE VESSEL PERIMETER AT 0,90,180 & 270° AND HORIZONTAL VESSELS, CENTER LEVEL SHALL BE PUNCHMARKED ON BOTH SIDE SURFACES OF SHELL NEAR THE HEAD.
12. TRAY SUPPORT RINGS CROSSING THE LONG SEAM OF SHELL BARRELS SHALL BE CONTINUOUSLY WELDED ALSO ON THE LONG SEAM AFTER FLUSH GRINDING THE PARTICULAR PORTION.
11. TRAYS WHICH ARE FREE ISSUE SUPPLY AND INSTALLED AT SITE BY CHIYODA.
10. ALL TRAY ELEVATIONS ARE SHOWN TO TOP OF SUPPORT RINGS.
9. THE VESSEL SHALL BE THOROUGHLY CLEANED INSIDE & OUTSIDE AND SHALL BE FREE OF ALL DIRT, WELD ROD STUBS & LOOSE FOREIGN MATERIALS Etc,.
8. ALL REMOVABLE INTERNALS SHALL PASS THROUGH THE NEAREST MANHOLE.
7. LONGITUDINAL SEAM OF FABRICATED NOZZLES FROM PLATE SHALL BE 100% RADIOGRAPHED.
6. WELD SEAMS COMING UNDER MISC. ATTACHMENTS SHALL BE GROUND SMOOTH & *RADIOGRAPHED FOR A DISTANCE OF 150mm BEYOND THE ATTACHMENT WELD.*
5. ALL NOZZLES AND MANWAY THAT DO NOT EXTEND INTO THE VESSEL SHALL BE FINISHED FLUSH WITH THE INSIDE & THE INNER EDGE SHALL BE ROUNDED OFF TO A MIN. 3mm RADIUS.
4. NOZZLE POSITIONS ON VESSEL ELEVATIONS ARE CONVENTIONAL. FOR TRUE LOCATION SEE NOZZLE ORIENTATION PLAN.
3. NOZZLE PROJECTION IS FROM CENTER LINE OF VESSEL TO GASKET FACE OF FLANGE UNLESS SPECIFIED OTHERWISE.
2. ALL FLANGE BOLT HOLES SHALL STRADDLE VERTICAL AND/OR NORTH SOUTH CENTER LINES UNLESS SHOWN OTHERWISE.
1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.

NOTES CONTINUOUED :-

22. HEAD SEAMS SHALL BE FULLY RADIOGRAPHED, HEAD TO SHELL SEAM SHALL BE SPOT RADIOGRAPHED PER UW 11 (a) 5(b) OTHER SEAMS (INCLUDING SKIRT MAIN SEAMS) SHALL BE SPOT RADIOGRAPHED PER UW 11(b).
23. FABRICATION WEIGHT EXCLUDES WEIGHT OF PLATFORMS, LADDERS, INSULATION, FIREPROOFING & TRAYS.
24. ERECTION WEIGHT INCLUDES WEIGHT OF PLATFORMS, LADDERS, INSULATION,PIPING AND EXCLUDES THE WEIGHT OF TRAYS, FIREPROOFING.
25. FOR CARBON AND CARBON MANGANESE STEEL THE CARBON CONTENT SHALL BE LIMITED TO 0.25% MAXIMIUM
26. THE LONGITUDINAL WELD SEAMS OF NOZZLES INSTALLED HORIZONTALLY SHALL BE POSITIONED ABOVE CENTER LINE

NOZZLE SCHEDULE

MARK	QTY	SIZE	PROJ. FROM CL	SERVICE	NOZZLE NECK O.D.	NOZZLE NECK SCH.	NOZZLE NECK THK.	NOZZ. FLANGE TYPE	NOZZ. FLANGE RATING LB	REINF. PAD O.D.	REINF. PAD THK.
SK3	1	ID 620	-	SKIRT OPENING - 'EO'	628.0	PLT	9.00				
SK1	1	SEE DWG	-	SKIRT ACCESS OPENING	SEE DWG	PLT	9.00				
SV1-8	8	4"	-	SKIRT VENT	114.3	40	6.02				
EO	1	14"	SEE DWG	OUTLET	356	PLT	12.0	WNRF	150#	680	16
DS	1	2"	1765	STEAM OUT	60.3	160	8.74	WNRF	150#	150	14
DM	1	24"	1915	MANWAY WITH COVER & DAVIT	610.0	PLT	12.0	WNRF	150#	1150	14
DL1,L2	2	2"	1765	LEVEL-LLS	60.3	160	8.74	WNRF	300#	150	14
DJ	1	20"	1865	INLET	508.0	PLT	12.0	WNRF	150#	970	14
DI	1	24"	1915	INLET	610	PLT	12.0	WNRF	150#	1150	14
CM	1	24"	1915	MANWAY WITH COVER & DAVIT	610.0	PLT	12.0	WNRF	150#	1150	14
CI	1	4"	1765	INLET	114.3	120	11.13	WNRF	150#	210	14
BU1,2	2	1" ID	1765	TI-TRC	50.8	-	12.7	LWNRF	150#	-	-
AV	1	2"	SEE DWG	VENT	60.3	160	8.74	WNRF	150#	-	-
AO	1	18"	SEE DWG	OUTLET	457.0	PLT	12.0	WNRF	150#	870	16
AM	1	24"	SEE DWG	MANWAY WITH COVER	610	PLT	12.0	WNRF	150#	1150	16
AI	1	6"	1815	INLET	168.3	80	10.97	WNRF	150#	300	14

DESIGN DATA

No.	DESIGN CONDITIONS	UNITS	VALUES
33.	FABRICATION WEIGHT	Kg	~63100 (SEE NOTE-23)
32.	FULL OF WATER WEIGHT (AT SITE)	Kg	397603
31.	OPERATING WEIGHT	Kg	163603
30.	ERECTION WEIGHT	Kg	77719 (SEE NOTE-24)
29.	MANUFACTURER'S SERIAL No.	---	2361
28.	MANUFACTURER'S JOB NUMBER	---	7033-01
27.	MANUFACTURER'S NAME	---	BELLELI SAUDI HEAVY IND. LTD.
26.	CODE STAMP	---	YES
25.	DESIGN CODE	---	ASME SEC VIII DIV.1 1995 EDITION
24.	SERVICE	---	FINISHING COLUMN
23.	VOLUME	m^3	272
22.	FIREPROOFING (BY OTHERS)	mm	75 (BOTH SIDES OF SKIRT)
21.	INSULATION (BY OTHERS) TOP/BOTTOM	mm	40/50
20.	SPECIFIC GRAVITY	---	0.726
19.	OPERATING FLUID	---	HYDRO CARBON
18.	INSPECTION AUTHORITY	---	CLIENT/BSHI/ABS
17.	WIND SPEED/EXPOSURE CATEGORY	km/hr	125/C
16.	EARTHQUAKE DESIGN	---	ASCE-7.88 ZONE 1
15.	MINIMUM DESIGN METAL TEMPERATURE	°C	9
14.	CHARPY IMPACT TEST	---	NO (EXEMPTED AS PER UG 20f)
13.	ULTRASONIC EXAMINATION	---	NO
12.	POST WELD HEAT TREATMENT	---	NO
11.	JOINT EFFICIENCY (SHELL/HEAD)	%	85 / 100
10.	RADIOGRAPHY (SHELL/HEAD)	---	SPOT (RT4)/FULL (SEE NOTE-22)
9.	CORROSION ALLOWANCE (SUPPORT)	mm	3 (1.6)
8.	M.A.W.P. AT DESIGN TEMPERATURE	barG	7 (LIMITED BY SHELL)
7.	M.A.P. (NEW & COLD)	barG	8.93 (LIMITED BY SHELL)
6.	FIELD HYDROTEST PRESSURE (CORRODED)	barG	5.25 (AT TOP)
5.	SHOP HYDROTEST PRESSURE (HOR)	barG	13.08 (AT TOP)
4.	OPERATING TEMPERATURE (TOP/BTM)	°C	124/166
3.	OPERATING PRESSURE (TOP/BTM)	bar (abs)	-
2.	DESIGN TEMPERATURE (INT/EXT)	°C	194/166
1.	DESIGN PRESSURE (INT/EXT)	barG	3.5/FULL VACUUM

CHIYODA CORPORATION
JOB NO. 51046 IBN RUSHD AROMATICS PROJECT
PO NO. SAY-POP0002
REQ NO. MR-50-C-003
IDENT NO. 53-C-03-DW-0001
A. NO COMMENTS PROCEED WITH FABRICATION ✓
B. PROCEED WITH FABRICATION COMMENTS TO BE CONSIDERED
C. DO NOT PROCEED WITH FABRICATION
SAY TEAM VSL
DATE Mar 05 '97
PURCHASER'S PERMISSION TO PROCEED OR REVIEW TAKEN ON VENDOR PRINTS SHALL NOT RELIEVE VENDOR FROM ITS RESPONSIBILITIES OR LIABILITIES UNDER PURCHASE ORDER

REV.	DATE	DESCRIPTION	DRAWN	CHK'D	APP'D
2	11.02.96	REVISED AS PER CLIENT'S COMMENTS AND MARKED AS △2	RJP		
1	6.10.96	DRAWING GENERALLY REVISED AND ISSUED FOR CONSTRUCTION	RJP	ALI DARU	BANERJEE
0	26.06.96	ISSUED FOR APPROVAL & INTERNAL COMMENTS	V.SURESH KUMAR	J.VENKAT/ R.S.RAJU	BANERJEE

No. REQUIRED : 1 UNIT

SCALE: 1 : 75

CLIENT: CHIYODA/IBN RUSHD.

ORDER: SAY-POP0002

APPROVED FOR CONSTRUCTION BY BANERJEE DATE 10.10.96

BELLELI SAUDI HEAVY INDUSTRIES LTD.
AL- JUBAIL, KINGDOM OF SAUDI ARABIA.
بيلليلي السعودية للصناعات الثقيلة المحدودة الجبيل

ARABIAN INDUSTRIAL FIBRES COMPANY (IBN RUSHD.)
PTA & AROMATICS PROJECT-AROMATICS
FINISHING COLUMN (53-C-03)
GENERAL ASSEMBLY

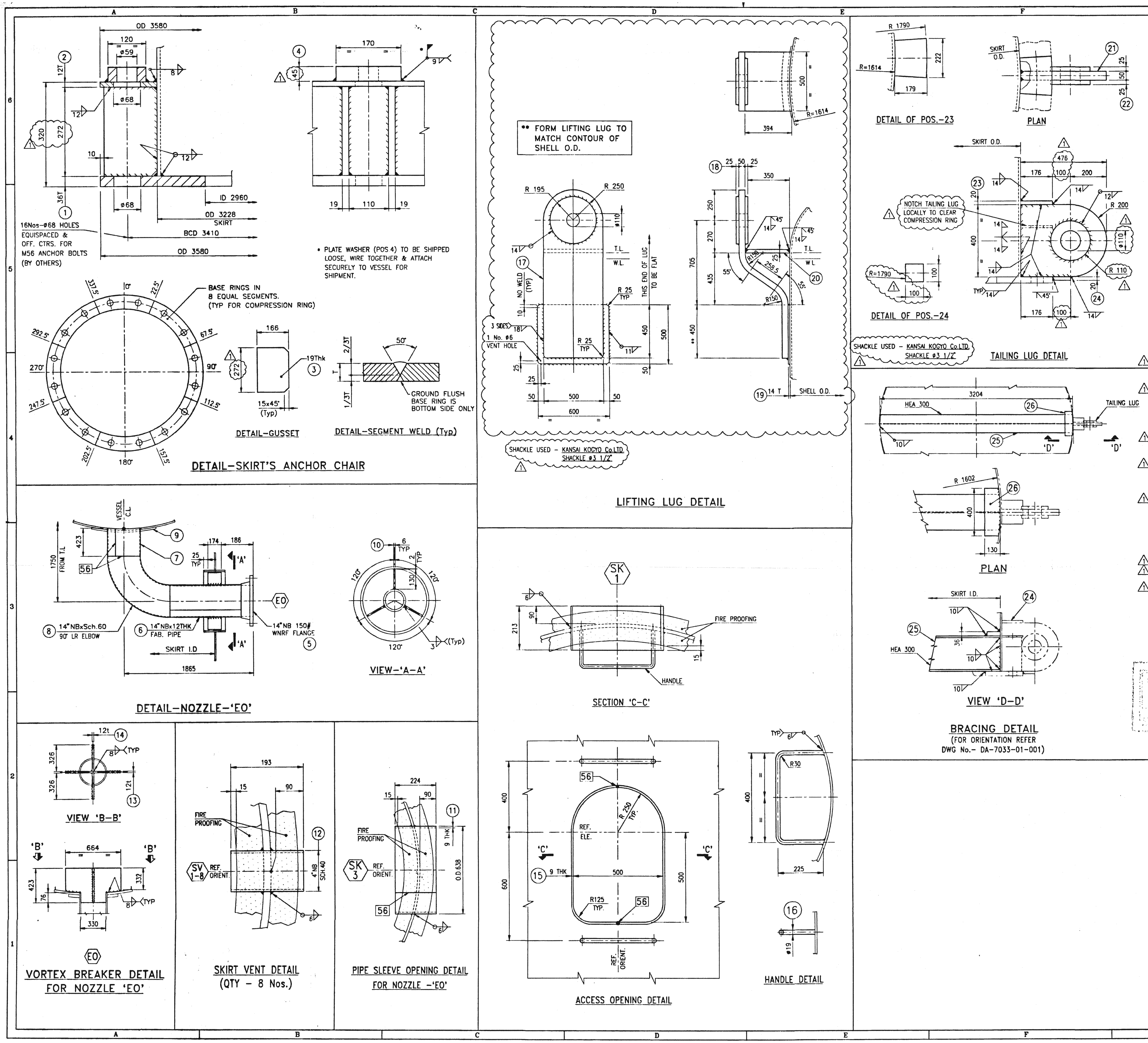
QUESTO DISEGNO NON PUO ESSERE COPIATO RIPRODOTTO MOSTRATO A TERZI SENZA NOSTRA AUTORIZZAZIONE

THIS DRAWING IS NOT TO BE REPRODUCED IN WHOLE OR PART NOR EMPLOYED FOR ANY PURPOSE OTHER THAN SPECIFICALLY PERMITTED IN WRITING BY BELLELI SAUDI HEAVY IND.LTD.

DRAWING NO. DA-7033-01-001 REV. 2

FILE NAME : 70330101

811009



BELLELI SAUDI HEAVY INDUSTRIES LTD.
AS BUILT
CERTIFIED BY

TOTAL WT. = 3105.6 Kgs.

FAM.	ITEM POS.	QTY FOR ONE FAM.	DESCRIPTION	LENGTH	WIDTH	THICK	WT. IN Kg. For ONE POS.	WT. IN Kg. For ONE FAM.	MAT'L	MAT'L CODE	RDA. NO.
	26	1	SUPPORT	400	130	36.0	14.7	14.7	A36	7033A01L66	703300-001
	25	1	BEAM - HEA300	3204	0	0.0	282.9	282.9	A36		
	24	1	STIFFENER (SEE DWG)	100	100	20.0	1.6	1.6	A36	7033A01L63	703300-001
	23	1	STIFFENER (SEE DWG)	222	179	20.0	6.2	6.2	A36	7033A01L63	703300-001
	22	2	RING OD220/ID110	0	0	25.0	5.6	11.2	A36	7033A01L64	703300-001
	21	1	TAILING LUG	476	400	50.0	74.7	74.7	A36	7033A01L68	703300-001
	20	2	STIFF. PLATE	500	394	25.0	38.7	77.4	SA516GR.70	7033A01L52	703300-001
	19	2	LIFTING LUG PAD	600	500	14.0	33.0	66.0	SA516GR.70	7033A01L12	703300-001
	18	4	WASHER 390/110/25T	0	0	0.0	21.6	86.4	A36	7033A01L64	703300-001
	17	2	LIFTING LUG	1565	500	50.0	307.1	614.2	A36	7033A01L68	703300-001
	16	2	HANDLE ø19	816	0	0.0	1.8	3.6	A36	7033A20P01	703300-020
	15	1	ACCESS OPENING	2207	213	9.0	33.2	33.2	A36	629505NT09P06	STOCK
	14	2	PLATE	423	326	12.0	13.0	26.0	SA516GR.70	7033A01L04	703300-001
	13	1	PLATE	664	423	12.0	26.5	26.5	SA516GR.70	7033A01L04	703300-001
	12	8	PI 4"- 40	193	0	0.0	3.0	24.0	SA106GR.B	7033A06T19	703300-006
	11	1	PIPE WAY OPENING	1976	224	9.0	31.3	31.3	A36	629505NT09P06	STOCK
	10	3	STIFFENER	174	130	6.0	1.1	3.3	SA516GR.70	LPOK0A5172500800	STOCK
	9	1	RP 680/366/16T-EO	0	0	0.0	32.4	32.4	SA516GR.70	7033A01L16	703300-001
	8	1	E 14"-60 90°LR-EO	0	0	0.0	71.6	71.6	SA234GR.WPB	7033A09C04	703300-009
	7	1	NOZZ. NECK-EO	1080	423	12.0	43.1	43.1	SA516Gr70	7033A01L04	703300-001
	6	1	NOZZLE NECK-EO	1080	1205	12.0	122.7	122.7	SA516Gr70	7033A01L04	703300-001
	5	1	F 14"150# WNRF-12	0	0	0.0	46.3	46.3	A105	7033A04F13	703300-004
	4	16	PLATE WASHER	170	120	45.0	7.2	115.2	A36	7033A01L57	703300-001
	3	32	GUSSET	272	166	19.0	6.7	214.4	A36	7033A01L62	703300-001
	2	1	RING 3580/3228/12T	0	0	0.0	177.2	177.2	A36	7033A01L58	703300-001
01-02	1	1	RING 3580/2960/36T	0	0	0.0	899.5	899.5	A36	7033A01L66	703300-001

LIST OF MATERIAL

CHIYODA CORPORATION

JOB NO 51046	IBN RUSHD AROMATICS PROJECT
PO NO.	SAY-POP0002
REQ NO.	MR-50-C-003
IDENT NO.	53-C-03-DW-0002

PURCHASER'S PERMISSION TO PROCEED OR REVIEW TAKEN ON VENDOR PRINTS SHALL NOT RELIEVE VENDOR FROM ITS RESPONSIBILITIES OR LIABILITIES UNDER PURCHASE ORDER

REV.	DATE	DESCRIPTION	DRAWN	CHK'D	APP'D
1	10.02.97	REVISED AS PER CLIENT'S COMMENTS AND ISSUED FOR CONSTRUCTION	RJP		
0	08.10.96	ISSUED FOR APPROVAL	V.SURESH KUMAR	J.VENKATESAN DARU	BANERJEE

SCALE: 1 : 30

BELLELI SAUDI HEAVY INDUSTRIES LTD. AL- JUBAIL, KINGDOM OF SAUDI ARABIA.

بيلليلي السعودية للصناعات الثقيلة المحدودة الجبيل

CLIENT: CHIYODA/IBN RUSHD.

ORDER: SAY-POP0002

APPROVED FOR CONSTRUCTION BY A.K.BANERJEE DATE 5/2/97

ARABIAN INDUSTRIAL FIBRES COMPANY (IBN RUSHD.)
PTA & AROMATICS PROJECT - AROMATICS
FINISHING COLUMN (53-C-03)
DETAIL DRAWING

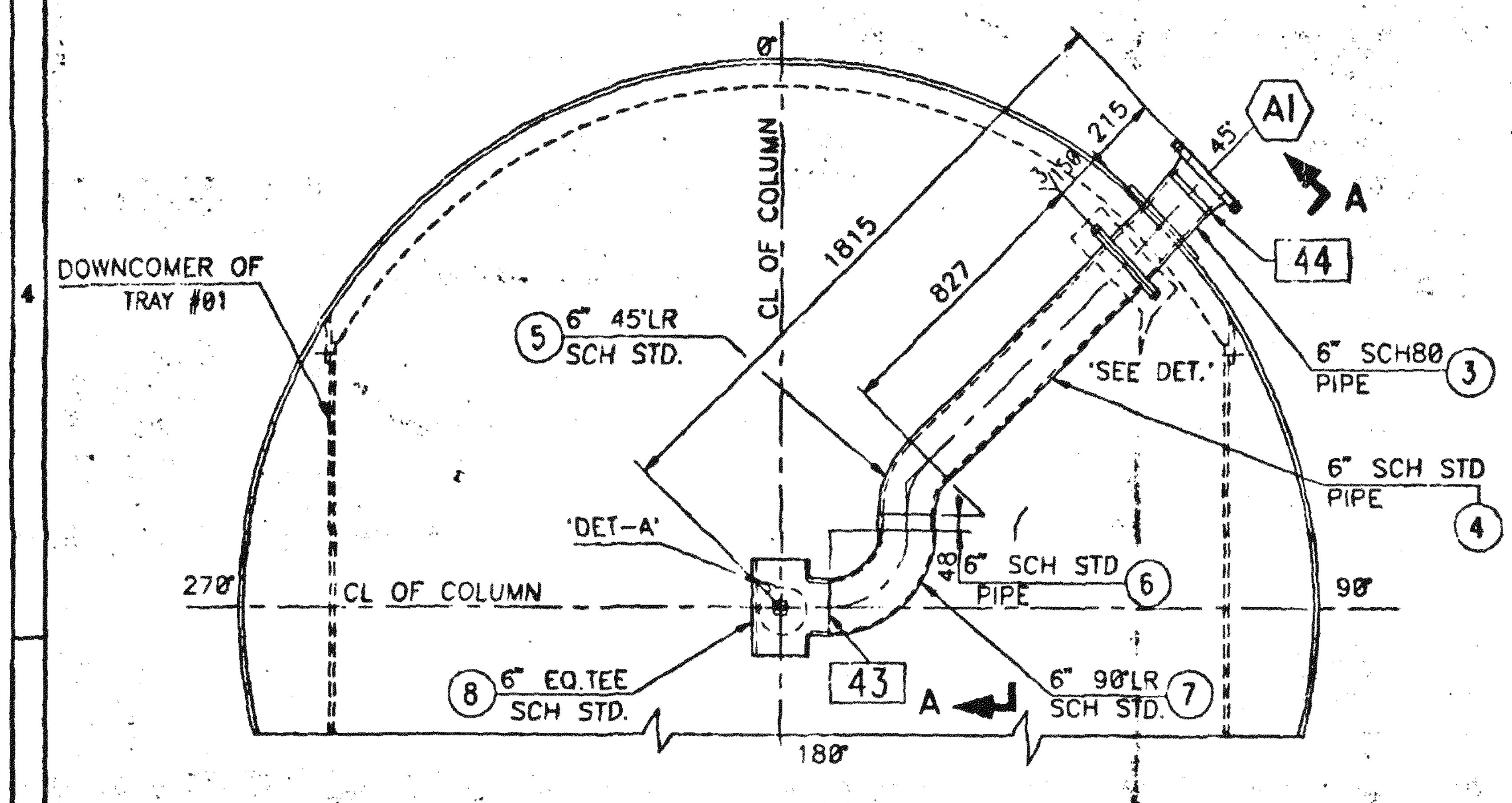
DRAWING NO. DA-7033-01-002 REV. 1

QUESTO DISEGNO NON PUO ESSERE COPIATO RIPRODOTTO MOSTRATO A TERZI SENZA NOSTRA AUTORIZZAZIONE

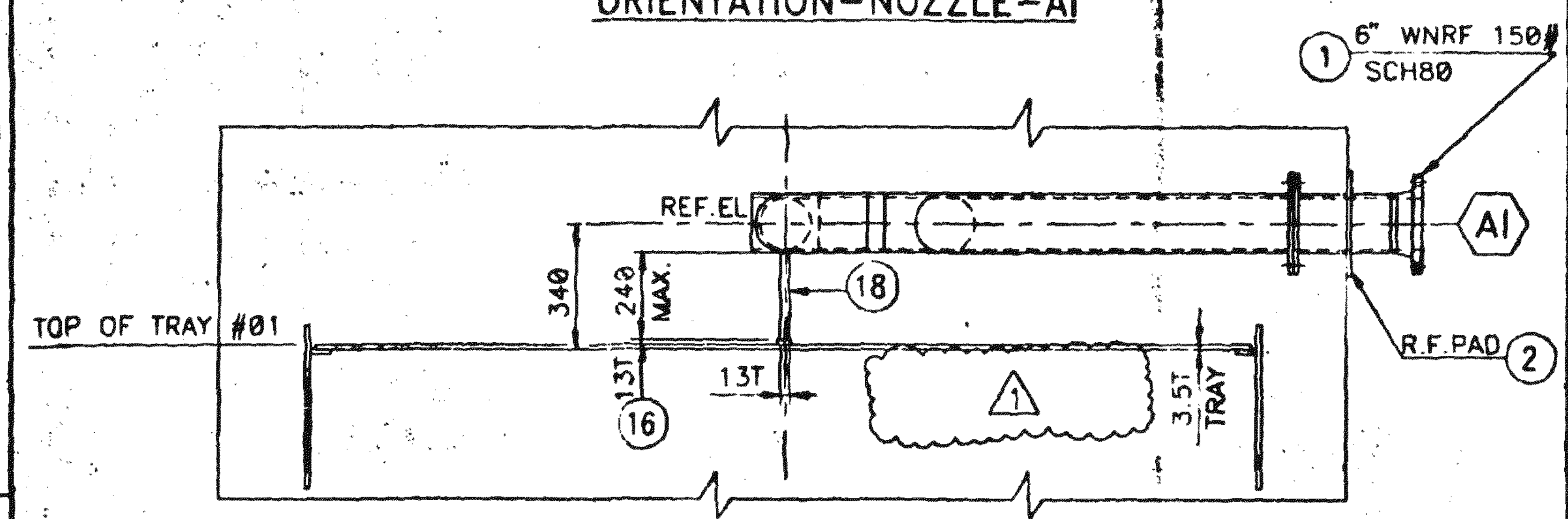
THIS DRAWING IS NOT TO BE REPRODUCED IN WHOLE OR PART NOR EMPLOYED FOR ANY PURPOSE OTHER THAN SPECIFICALLY PERMITTED IN WRITING BY BELLELI SAUDI HEAVY IND.LTD.

FILE NAME : 70330102

811010

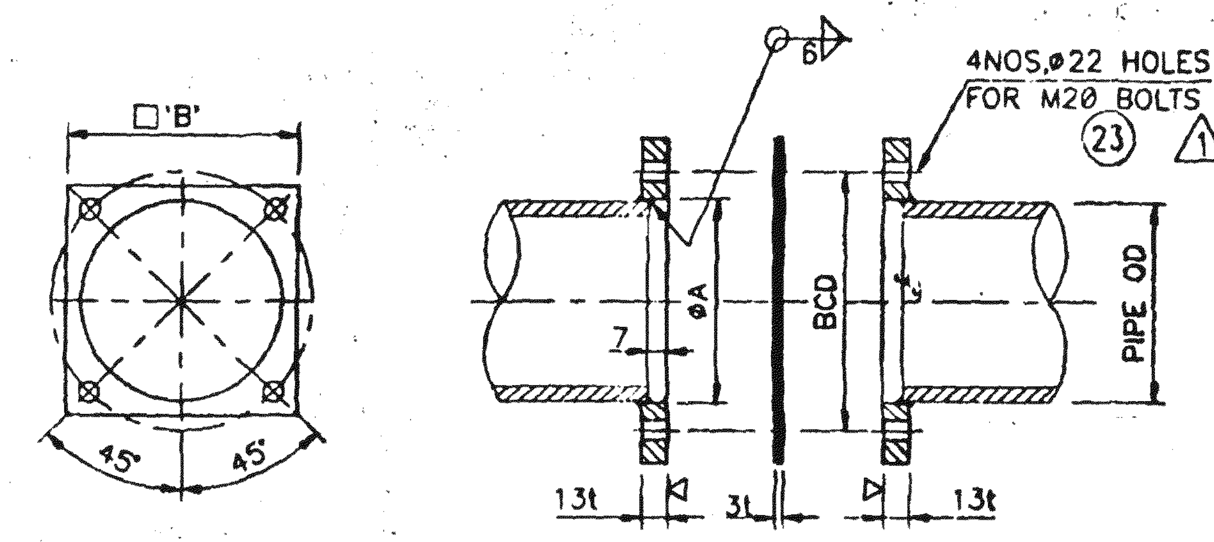


ORIENTATION-NOZZLE-A1



SECTION-A-A

INTERNAL DETAIL - NOZZLE-A1



NOZ.MARK	øA	□'B'	BCD	POS.No.
A1	170	215	233	(19) (20)
C1	116	177	179	(21) (22)

DETAIL - PLATE FLANGE

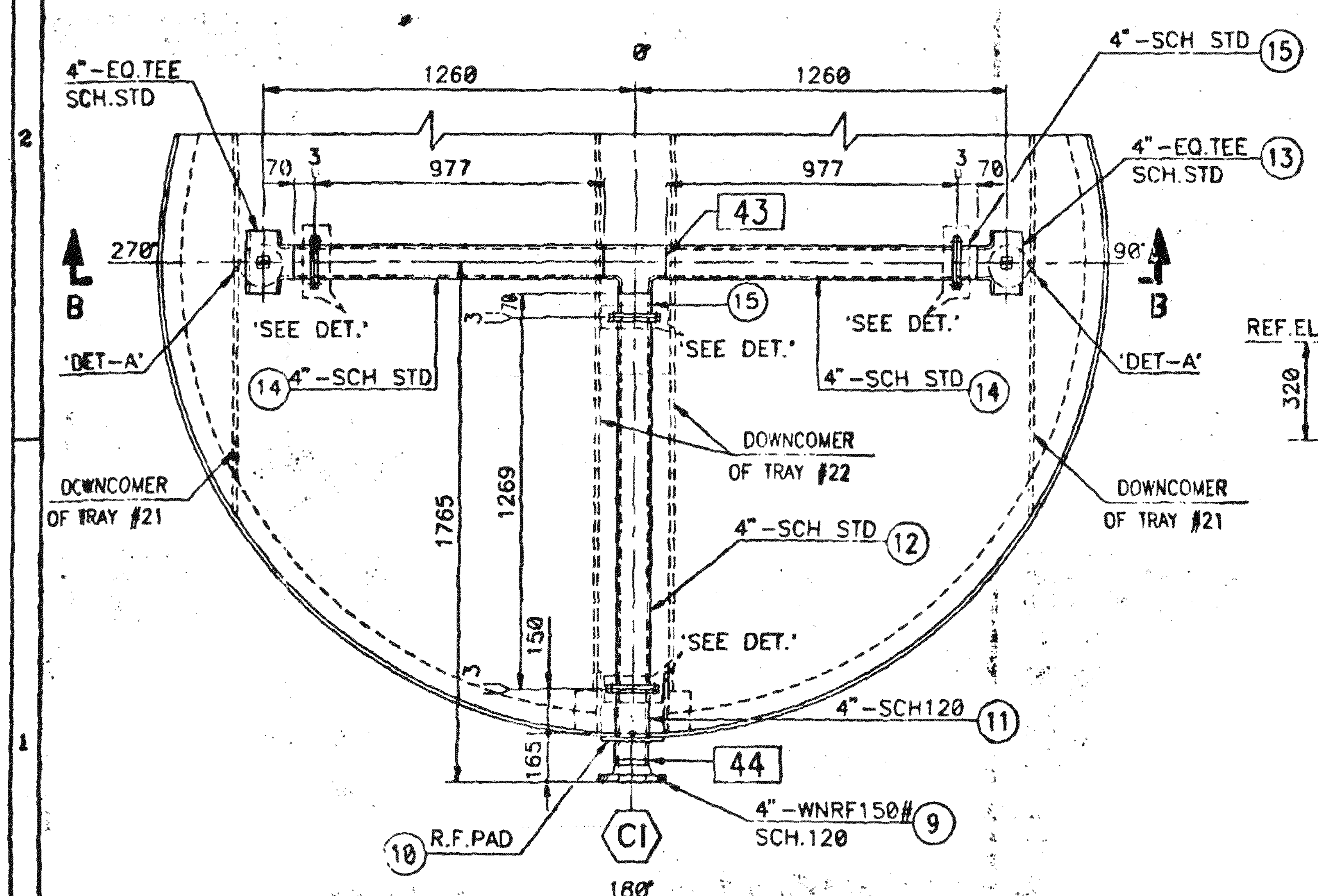
TOTAL WT. = 197.6 Kgs.

FAM.	ITEM POS.	QTY FOR ONE FAM.	DESCRIPTION	LENGTH	WIDTH	THICK	WT. IN Kg. For ONE POS.	WT. IN Kg. For ONE FAM.	MAT'L	MAT'L CODE	RDA. NO.
	23	20	B+1NT M20	60	0	0.0	0.1	2.0	SA193B7/SA194 2H	00502020080	STOCK
	22	4	GK (SEE DWG)-C1	0	0	3.0	0.0	0.0	GRAFOIL		
	21	8	PLATE FLG.-C1	177	177	16.0	2.0	16.0	SA516Gr70	7033A01L16	703300-001
	20	1	GK (SEE DWG)-A1	0	0	3.0	0.0	0.0	GRAFOIL		
	19	2	PLATE FLG.-A1	215	215	16.0	2.3	4.6	SA516Gr70	7033A01L16	703300-001
	18	1	SUPPORT BAR	240	25	13.0	0.6	0.6	SA516Gr70	7033A01L06	703300-001
	17	2	SUPPORT BAR	246	25	13.0	0.6	1.2	SA516Gr70	7033A01L06	703300-001
	16	3	WEAR PLATE	40	40	13.0	0.2	0.6	SA516Gr70	7033A01L06	703300-001
	15	3	PI 4" STD-C1	63	0	0.0	1.0	3.0	SA106GrB	6355A06T03	STOCK
	14	2	PI 4" STD-C1	970	0	0.0	16.0	32.0	SA106GrB	6355A06T03	STOCK
	13	3	4" EQ.TEE STD-C1	0	0	0.0	6.0	18.0	SA234WPB	7033A09C08	703300-009
	12	1	PI 4" STD-C1	1255	0	0.0	20.2	20.2	SA106GrB	6355A06T03	STOCK
	11	1	PI 4" 120-C1	232	0	0.0	2.2	2.2	SA106GrB	7033A06T03	703300-006
	10	1	RP 210/124/14T	0	0	0.0	2.5	2.5	SA516Gr70N	7033A01L12	703300-001
	9	1	F-4"WNRF150#120-C1	0	0	0.0	10.8	10.8	SA105	7033A04F07	703300-004
	8	1	6" EQ.TEE STD-A1	0	0	0.0	15.0	15.0	SA234WPB	7033A09C09	703300-009
	7	1	E 6" 90°LRSTD-A1	0	0	0.0	11.0	11.0	SA234WPB	7033A09C06	703300-009
	6	1	PI 6" STD-A1	48	0	0.0	2.0	2.0	SA106GrB		
	5	1	E 6" 45°LR STD-A1	0	0	0.0	5.5	5.5	SA234WPB		
	4	1	PI 6" STD-A1	820	0	0.0	23.2	23.2	SA106GrB		
	3	1	PI 6" 80-A1	269	0	0.0	11.4	11.4	SA106GrB	7033A06T05	703300-006
	2	1	RP 300/178/14T	0	0	0.0	5.0	5.0	SA516Gr70N	7033A01L12	703300-001
01-04	1	1	F-6"WNRF150#80-A1	0	0	0.0	10.8	10.8	SA105	7033A04F08	703300-004

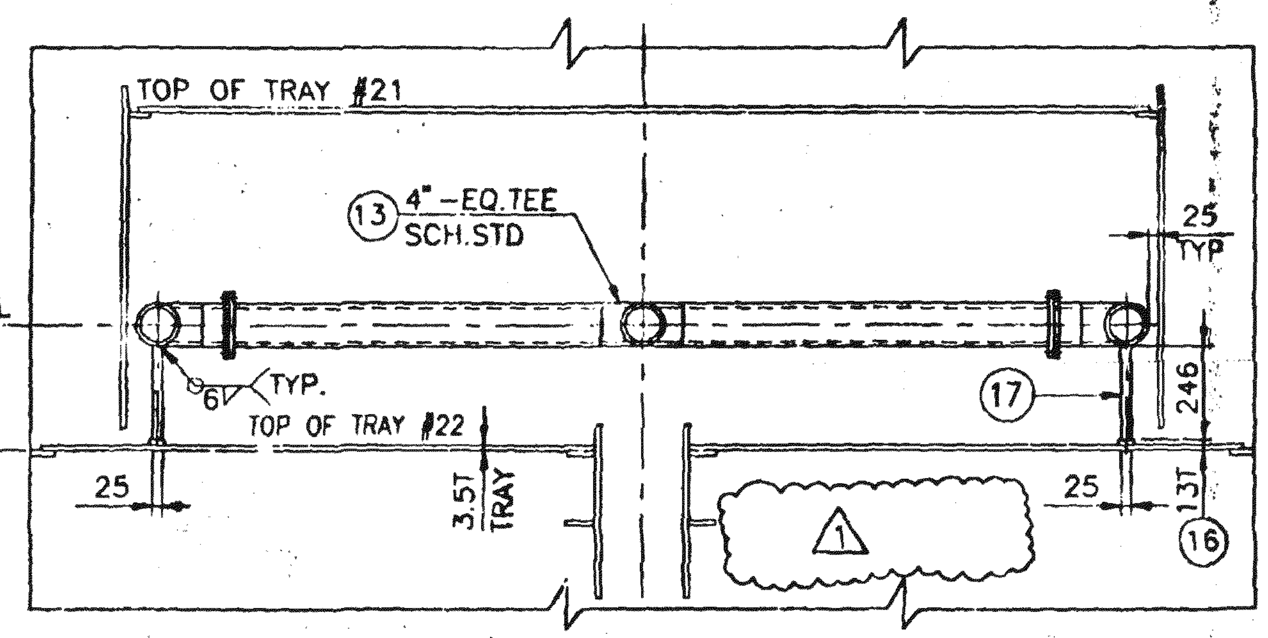
LIST OF MATERIAL

CHIYODA PETROSTAR LTD.
JOB NO. 54001 IBN RUSHD AROMATICS PROJECT
PO NO. SAY-POP0002
REQ NO. MR-50-C-003
IDENT NO. 53C03-DW-0004
PROCEED WITH FABRICATION / PROCEED WITH FABRICATION COMMENTS TO BE CONSIDERED / DO NOT PROCEED WITH FABRICATION
VSL
DATE
PURCHASER'S PERMISSION TO PROCEED OR REVIEW TAKEN ON VENDOR PRINTS SHALL NOT RELIEVE VENDOR FROM ITS RESPONSIBILITIES OR LIABILITIES UNDER PURCHASE ORDER.

BELLELI SAUDI HEAVY INDUSTRIES LTD.
AS BUILT
CERTIFIED BY

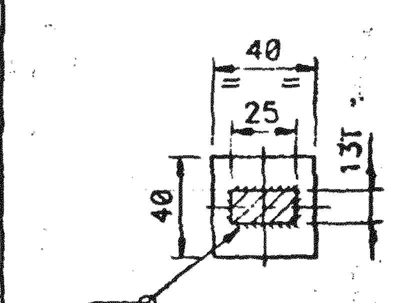


ORIENTATION-NOZZLE



SECTION-B-B

INTERNAL DETAIL - NOZZLE-C1



TYP.DETAIL-A

REV.	DATE	DESCRIPTION	DRAWN	CHK'D	APP'L
1	7.3.97	REVISED AS PER CLIENTS COMMENTS & ISSUED FOR CONSTRUCTION	Rama rao		
0	11.2.97	ISSUED FOR APPROVAL.	Rama rao	YOGESH HAIDER	AKB

SCALE: 1 : 30

CLIENT: CHIYODA/IBN RUSHD.

ORDER: SAY-POP0002

APPROVED FOR CONSTRUCTION
BY.....AKB.........
DATE....

BELLELI SAUDI بيلليلي السعودية
HEAVY INDUSTRIES LTD. للصناعات الثقيلة المحدودة
AL- JUBAIL, KINGDOM OF SAUDI ARABIA. الجبيل

ARABIAN INDUSTRIAL FIBRES COMPANY (IBN RUSHD.)
PTA & AROMATICS PROJECT-AROMATICS
FINISHING COLUMN (53-C-03)
DETAIL OF INTERNALS

DRAWING NO. DA-7033-01-004
REV 1

QUESTO DISEGNO NON PUO ESSERE COPIATO RIPRODOTTO MOSTRATO A TERZI SENZA NOSTRA AUTORIZZAZIONE

THIS DRAWING IS NOT TO BE REPRODUCED IN WHOLE OR PART NOR EMPLOYED FOR ANY PURPOSE OTHER THAN SPECIFICALLY PERMITTED IN WRITING BY BELLELI SAUDI HEAVY IND.LTD.

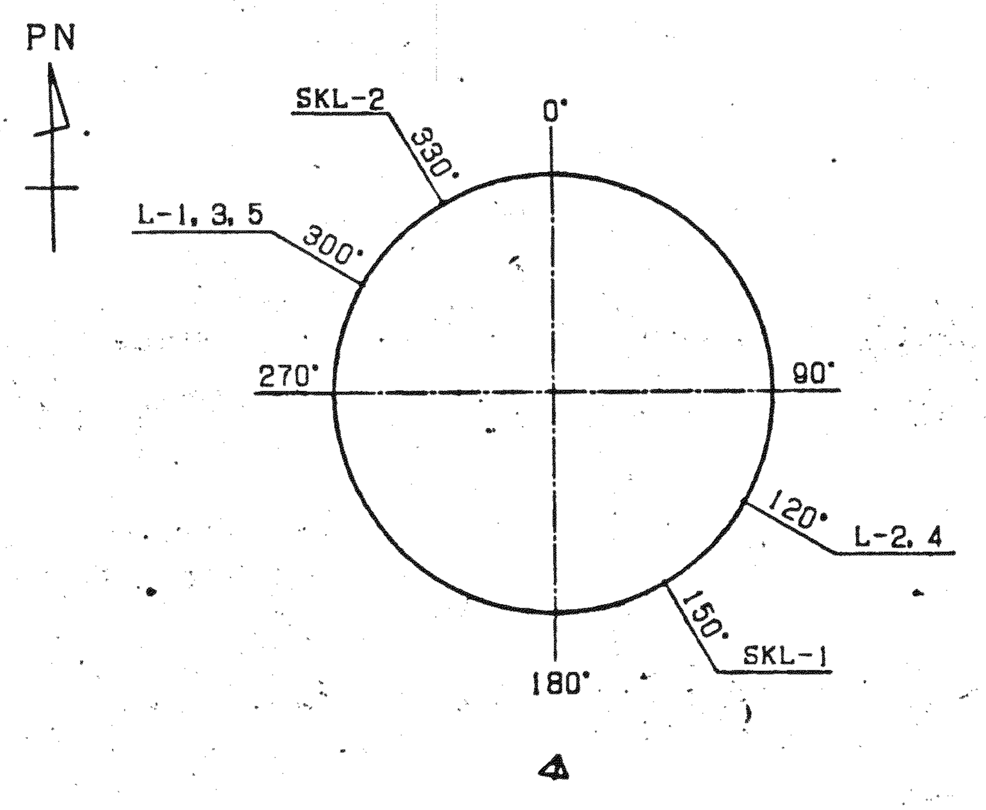
FILE NAME: 703301004

811012

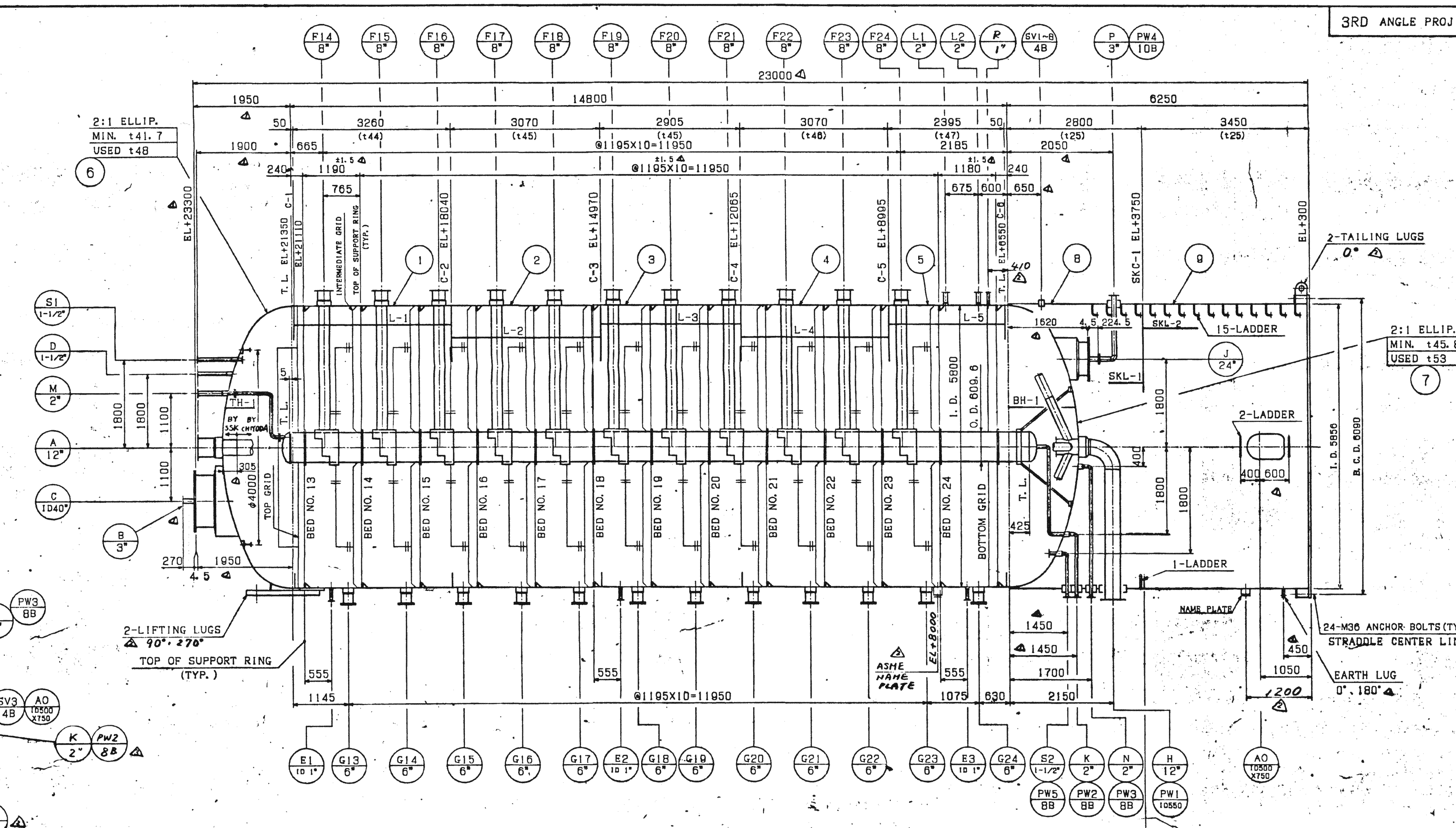
3RD ANGLE PROJ

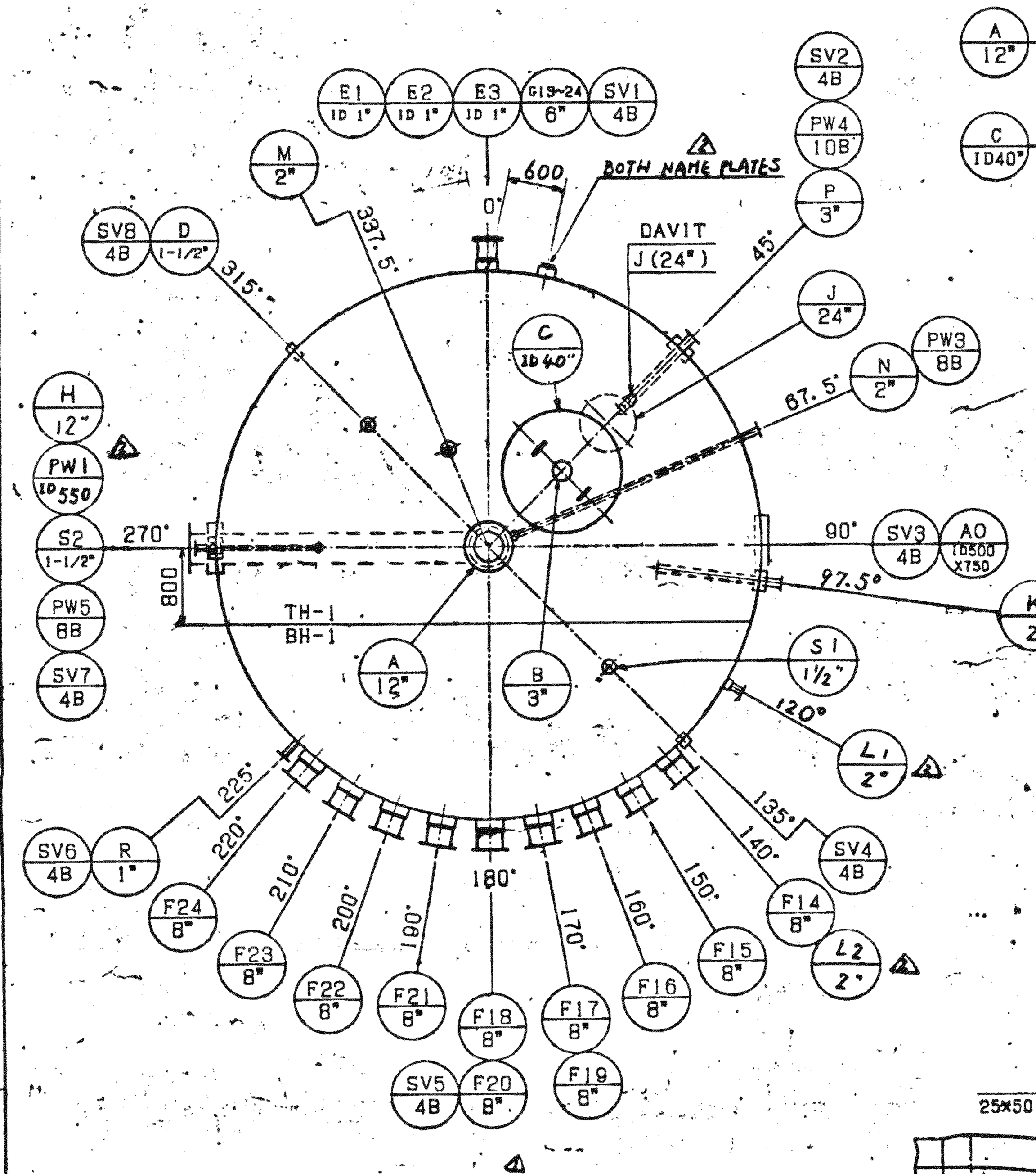
REFERENCE

REV NO.	DATE	BY	DESCRIPTION	D.S.M. APP'D	Q.A.E. REV'ED
A	AUG.21.'96	T.Y	PURCHASER'S REQUEST FOR CONSTRUCTION	S.O	Aug.22'96
B	OCT.21.'96	T.Y	REVISED R/1", H/12", L1,2/2" NOZZLE FITTING POSITION & ETC.	S.O	Oct.21'96
C	NOV.7.'96	T.T	REVISED K/2" NOZZLE ORIENTATION	S.O	NOV.7'96
D	DEC.18.'96	T.Y	REVISED WELDING PROCESS OF SKC-1	S.O	Dec.18'96
E	FEB.5.'97	H.Y	AS BUILT	S.O	Feb.7'97



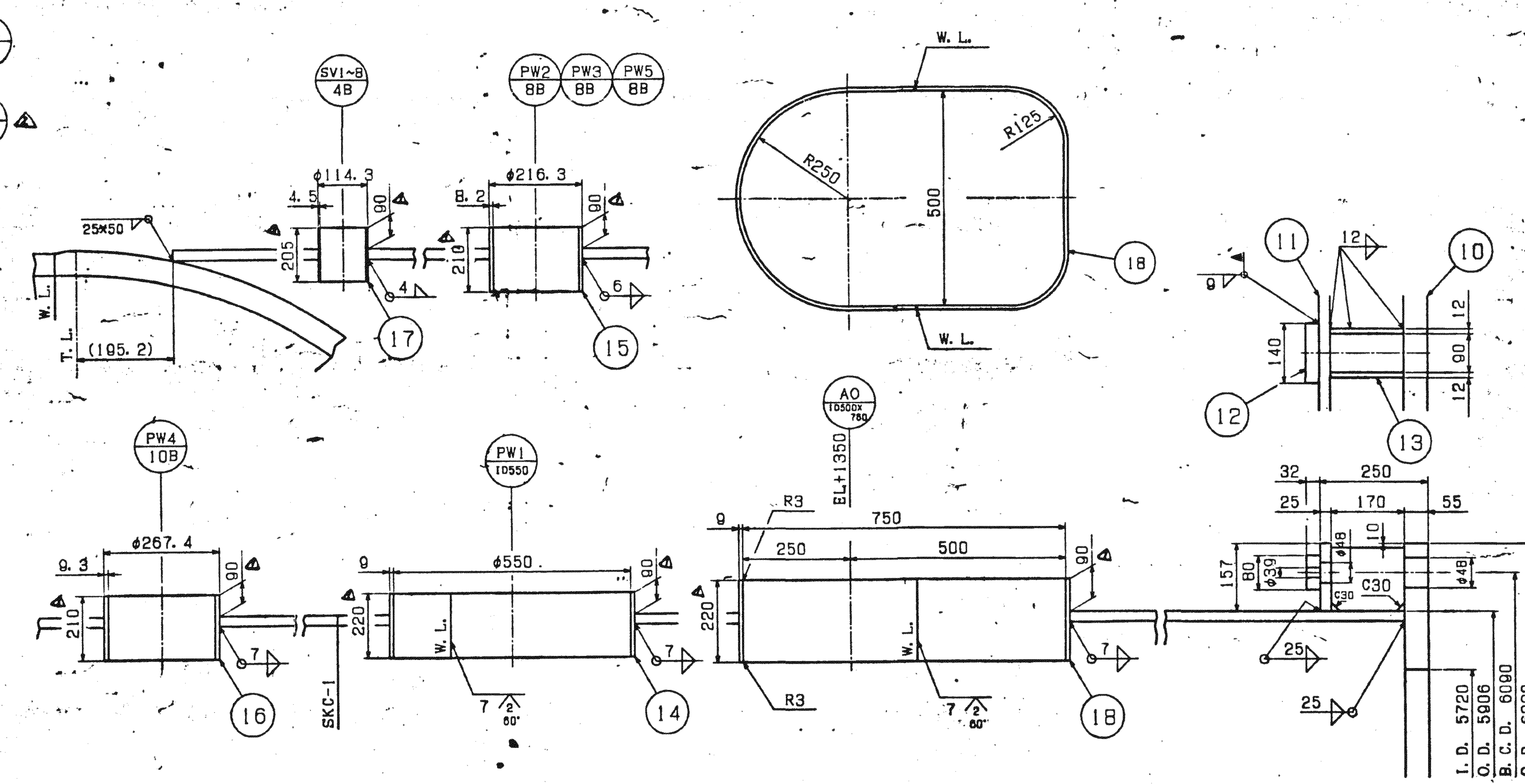
LONGI. SEAM ORIENTATION

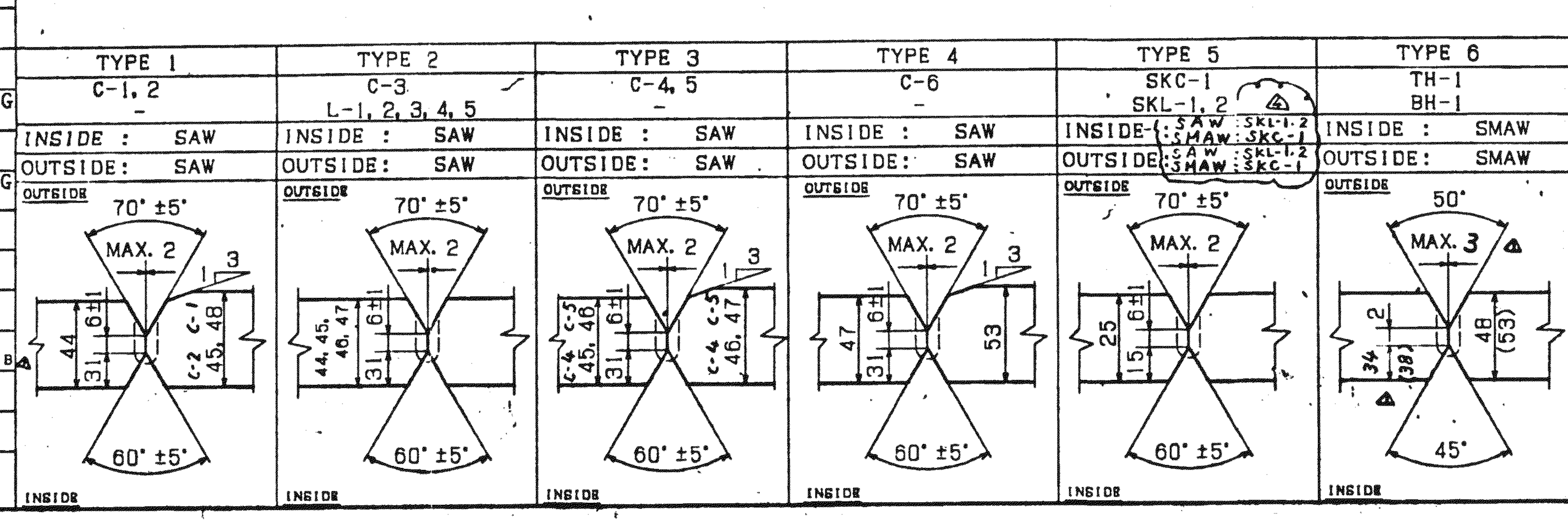




NOZZLE ORIENTATION
(HEAD SEAM ORIENTATION)

符号 MARKS	名称 NAME	呼径 NOM. SIZE	個数 No. REQ'D	肉厚 THICK-NESS	フランジ規格 F. RATING	ノズル高さ PROJECTION (TO SHELL CL)	備考 REMARKS
AO	ACCESS OPENING	ID500 X750	1	t9	-	-	
SV1~SV8	SKIRT VENT	4B	8	t4.5	-	-	-
PW5	PIPEWAY	8B	1	SCH40	-	-	
PW4	PIPEWAY	10B	1	SCH40	-	-	
PW3	PIPEWAY	8B	1	SCH40	-	-	
PW2	PIPEWAY	8B	1	SCH40	-	-	
PW1	PIPEWAY	ID550	1	t9	-	-	
S2	FLUSH OUT	1-1/2"	1	t7.1	ANSI 300 RFWN	3130	
S1	FLUSH OUT	1-1/2"	1	t7.1	ANSI 300 RFWN	SEE DWG	
R	SEAL ANGLE VENT	1"	1	t14.2	ANSI 300 RFLWN	3100	
P	DRAIN/FLUSH IN	3"	1	t11.1 t25.3	ANSI 300 RFWN, LWN	3130	
N	BOTTOM HEAD DRAIN	2"	1	t8.7	ANSI 300 RFWN	3130	
M	VENT (CENTERPIPE)	2"	1	t8.7	ANSI 300 RFWN	SEE DWG	
L1 L2	ADSORBENT SAMPLE	2"	2	t16.6	ANSI 300 RFLWN	3100	
K	DRAIN/VENT (CENTERPIPE)	2"	1	t8.7	ANSI 300 RFWN	3130	
J	MANWAY	24"	1	t46	ANSI 300 RFLWN	SEE DWG	BLIND FL'G DAVIT
H	OUTLET	12"	1	t17.5	ANSI 300 RFWN	3180	
G13~G24	DUMP	6"	12	t26.9	ANSI 300 RFLWN	3150	BLIND FL'G
F14~F24	DISTRIBUTOR	8"	11	t28.85	ANSI 300 RFLWN	3150	
E1~E3	TI AND TR	ID 1"	3	t14.2	ANSI 300 RFLWN	3100	
D	FLUSH IN	1-1/2"	1	t7.1	ANSI 300 RFWN	SEE DWG	
C	MANWAY	ID 40"	1	t25.4	ASME 300 RFLWN	SEE DWG	BLIND FL'G B16.47 SERIES B
B	VENT	3"	1	t20.6	ANSI 300 RFLWN	SEE DWG	
A	INLET	12"	1	t42.9	ANSI 300 RFLWN	SEE DWG	





ASME STAMP YES

DIV. 1 '95
BY ASME SECT VIII
1995 EDITION

REVIEWED BY
Q. A. ENGINEER
DATE Jun. 20 '96

CHIYODA CORPORATION

JOB NO. 51046	IBN RUSHD AROMATICS PROJECT
PO NO.	SAYPOA0021
REQ NO.	MR-50-D-007
IDENT NO.	53-D-02-DW0001

A-NO COMMENTS PROCEED WITH FABRICATION
B-PROCEED WITH FABRICATION COMMENTS TO BE CONSIDERED
C-DO NOT PROCEED WITH FABRICATION
SAY TEAM
DATE

PURCHASER'S PERMISSION TO PROCEED OR REVIEW TAKEN ON VENDOR PRINTS SHALL NOT RELIEVE VENDOR FROM ITS RESPONSIBILITIES OR LIABILITIES UNDER PURCHASE ORDER

関連図面 REFERENCE DWG.	
TITLE タイトル	DWG. NO. 図面番号
DETAIL OF NOZZLE ノズル詳細	B81481-143-01
MANHOLE DAVIT (J) マンホール ダビット	B81481-143-02
DETEIL OF CENTER PIPE センターパイプ詳細	B81481-144-01
INTERNAL FITTING 内部付着品	B81481-144-02
EXTERNAL FITTING (1/2) 外部付着品	B81481-145-01
EXTERNAL FITTING (2/2) 外部付着品	B81481-145-02
LIFTING LUG リフティングラグ	B81481-145-04
DETAIL OF PLATFORM & LADDER CLIP (1/2)	B81481-145-05
DETAIL OF PLATFORM & LADDER CLIP (2/2)	B81481-145-06
NAME PLATE 銘板	B81481-001-80
NAME PLATE (ASME CODE) 銘板 (ASME CODE)	B81481-001-85

設計条件 DESIGN DATA		
製作基数 No. REQUIRED		1
法規・規格 REGULATION & CODE		ASME SECT VIII DIV. 1-1995 (1995 EDITION)
ASME CODE STAMP		YES
FLUID NAME / SPECIFIC GRAVITY / NORMAL LIQUID LEVEL		HYDROCARBON [O-X(21%), M-X(54%), P-X(24%)] / 0.850 / LIQUID FULL
(M.A.W.P. =) DESIGN PRESS.	bar·G	14.8 (214.7PSI)/F.V.
設計温度 DESIGN TEMP.	°C	204 (399°F)/177 (351°F)
MIN. DESIGN METAL TEMPERATURE	°C	2 (35.6°F)
運転圧力 OPER. PRESS.	bar·G	-
運転温度 OPER. TEMP.	°C	177 (351°F)
水圧試験圧力 HYDRO'C TEST PRESS.	bar·G	23.4
水圧試験温度 HYDRO'C TEST TEMP.	°C	MIN.5 (41°F)
真空試験圧力 VACUUM TEST PRESS.	bar·G	-
応力除去 POST WELD HEAT TREATMENT		YES (PER DRAWING)
放射線検査 RADIOGRAPH		FULL
腐れ代 CORR. ALLOWANCE	mm	3.0 (SKIRT 1.6)
溶接効率 JOINT EFFICIENCY		1.0
耐火被覆 FIRE PROOF	mm	75 (BOTH SIDE)
保温 INSULATION	mm	50 (HOT)
容積 VOLUME	m^3	442.1 (15613FT^3)
吊上時重量 ERECTION WEIGHT	Kg	188400
TEST WEIGHT	Kg	924500
運転重量 OPERATING WEIGHT	Kg	894000
CHARPY IMPACT TEST		NO [UCS-66(a)]
塗装 PAINTING		SYSTEM S2-S PER CHIYODA SPEC. SP-50-X-001
NORMALIZING H.T.		HEADS (AFTER HOT FORMING)

NOTES

1. ALL OPENINGS SHALL BE SEALED PRIOR TO SHIPMENT TO FIELD. ALL VESSEL INTERIOR SHALL BE THOROUGHLY CLEANED AND SHOT BLASTED TO REMOVE LOOSE MILL SCALE PRIOR TO SHIPMENT TO FIELD.
2. REMOVE LOOSE MILL SCALE AND INTERNALLY CLEAN DISTRIBUTOR PIPING AND BLANKOFFS PRIOR TO SHIPMENT TO FIELD. TO INSURE THAT PIPING IS THOROUGHLY CLEANED USE A TURBINE DRIVEN WIRE BRUSH IN FIELD AND INSTALL IMMEDIATELY.

NO. REQUIRED	PARTICULARS	MARKS	MATERIAL	TEST MARK	CAL. WT (kg) 1-OFF	CAL. WT (kg) TOTAL	REMARKS	
	TOTAL				150845 kg			
1	ACCESS OPENNING	18	SS400			41	t9	0
8	SKIRT VENT	17	SGP		2.5	20	4BXt4.5	
1	PIPEWAY	16	STPG370			19	10BXSCH40	
3	PIPEWAY	15	STPG370		8.8	26	8BXSCH40	
1	PIPEWAY	14	SS400			28	ID550Xt9	0
48	GUSSET PLATE	13	SS400		2.4	115	t12	0
24	PLATE WASHER	12	SS400		2.8	67	t32	0
1	COMP. RING	11	SS400			588	t25	0
1	BASE PLATE	10	SA36			2024	t55	0
1	SKIRT	9	SA36			12310	t25	0
1	SKIRT	8	SA-516-65			9446	t25	0
1	HEAD	7				15831	t53	0
1	HEAD	6				14313	t48	0
1	SHELL	5				16232	t47	0
1	SHELL	4				20360	t46	0
1	SHELL	3				18844	t45	0
1	SHELL	2				19914	t45	0
1	SHELL	1	SA-516-65			20673	t44	0

SASEBO HEAVY INDUSTRIES Co., LTD
MACHINERY DESIGN DEPT.

CHIYODA CORPORATION

IBN RUSHD PTA&
AROMATICS PROJECT-AROMATICS

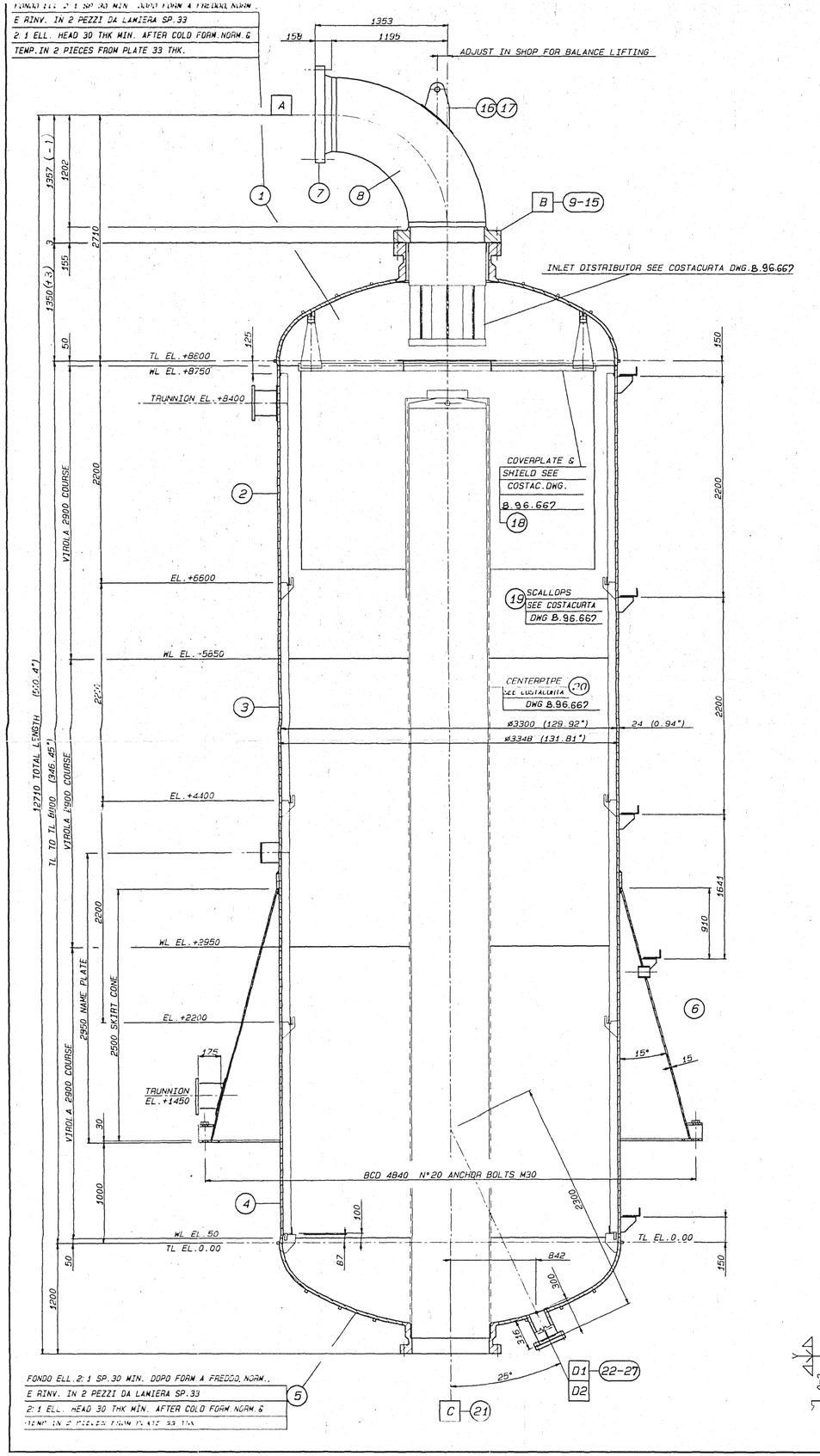
ADSORBENT CHAMBER NO. 2
53-D-02
GENERAL ASSEMBLY DRAWING

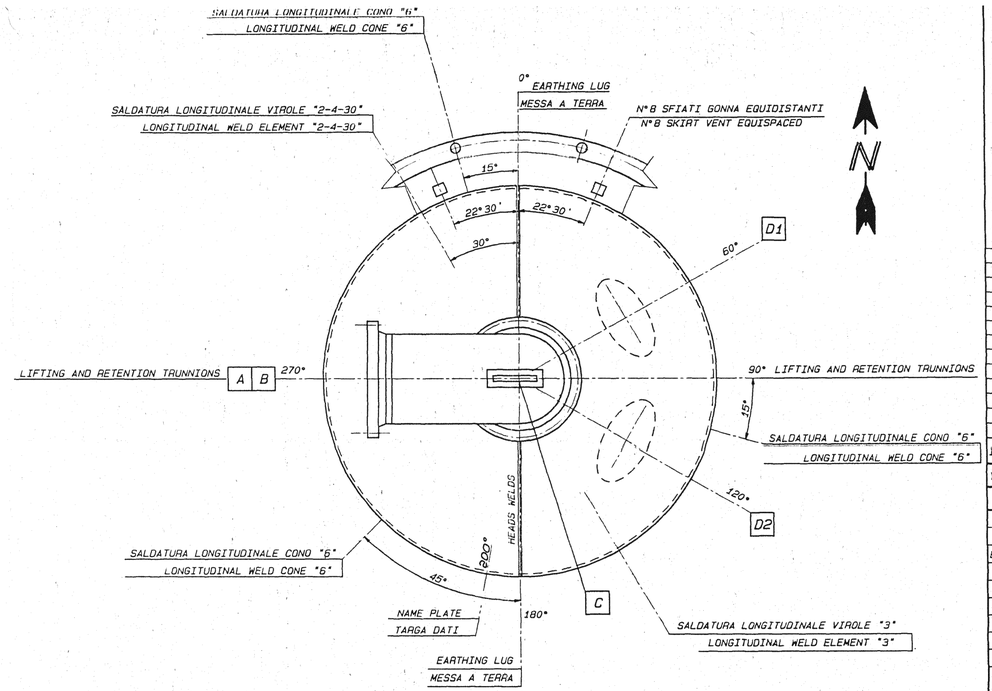
APPROVED BY June 19, '96	CHECKED BY JUN. 19. 1996 T. Yoshinaga	CERTIFICATED BY JUN. 19. 1996 S. Okubo	DRAWN BY T. Tamada
DATE DRAWN JUN. 19. 1996	DATE ISSUED		
WORK No. 43755	CLASS	SCALE 1/60 1/10	DWG. No. B81481-141-01 REV. E

NO. REQUIRED	
SHOWS	1 SET
MAKE FOR	1 SET

SASEBO HEAVY INDUSTRIES CO., LTD

005304





ORIENTATION VIEW FROM TOP / ORIENTAMENTO VISTO DALL'ALTO

CONSTRUCTION NOTE:

1) FLANGE CONTACT FACE SHALL BE FINISH WITH 125 - 250 Ra
2) NOZZLE FLANGE STUD BOLT HOLES STRADDLE TO CENTER LINES
3) THE INDICATE THK ARE THE min. AFTER CONSTR.& OR FORMING AND ALL DIMENSIONS ARE IN mm
4) INSIDE EDGES OF NOZZLES SHALL BE ROUNDED OFF WITH 6 mm RADIUS
5) WELDS ATTACHING NON-PRESSURE-RETAINING COMPONENTS TO PRESSURE-RETAINING COMPONENTS SHALL BE FULL PENETRATION. ALL FILLET WELDS ATTACHED TO PRESSURE-RETAINING COMPONENTS SHALL BE GROUND TO A SMOOTH, CONCAVE CONTOUR
Tutte le saldature di parti non a pressione a parti a pressione dovranno essere a piena penetrazione e con filetto raccordato concavo
6) ALL INTERNALS TO BE FABRICATED TO PASS THRU A ø12.8 IN MANWAY
Tutti gli interni devono passare dal passo d'uomo ø12.8
7) ALL INTERNALS TO BE MOUNTING BEFORE SHIPPING EXCEPT CENTERPIPE
Tutti gli interni dovranno essere montati prima della spedizione eccetto il CENTERPIPE
8) ALL INSIDE SHELL WELDS SHALL BE GROUND FLUSH IN SCALLOP AREA
Tutte le saldature del mantello in corrispondenza delle scallops dovranno essere molate a filo

ITEM	Q.TY	DN.	TYPE	RATING	THK	SCH	DIAMET REINFORC.PAD	THK PROJECT. FROM CL	SERVICE
D	2	6"	LWN RF	300#	27	/	/ /	SEE DWG.	CATALYST WITHDRAWAL
C	1	30"	SA RF	300#	65	/	SELF REINFORC	SEE DWG.	OUTLET
B	1	32"ID	SA RF	SPECIAL	70.5	/	SELF REINFORC	SEE DWG.	MANWAY
A	1	30"	WN RF B16.47 B	300#	16	PL	/ /	SEE DWG.	INLET

YEAR OF CONSTR.	1997	DESIGN CODE:	ASME VIII div.1 Ed.'95
	REACTOR	SPECIFICATION:	UOP Standard Specification 3-12-2 & 9-11-1
			UOP Project Specification 560692-304-0

COSTRUCTION DATA		DESIGN DATA		
FULL WATER WEIGHT	120400 kg.	DESIGN PRESS.	Bar.g/Psi.g	14.5 FV/ 210.3 FV
EMPTY WEIGHT + ATTACHM.	/ kg.	FULL VACUUM at	°C/°F	430 / 806
EMPTY WEIGHT	36000 kg.	OPER. PRESS.	Bar.A/Psi.A	/
ATTACHM. WEIGHT	/ kg.	HYDROST. PRESS.SHOP	Bar.g/Psi.g	28 / 407
OPER. WEIGHT	/ kg.	HYDROST. PRESS.FIELD	Bar.g/Psi.g	23.6 / 342
EXT. SURFACE	180 m^2	M.A.W.P.	Bar.g/Psi.g	15.1 / 219.1
INTERNAL PROTECT.	SILICA-GEL	DESIGN TEMPERAT	°C/°F	460 / 860
		OPERAT. TEMPERAT	°C/°F	430 / 806
SAND.BLAST. & PAINTING	SEE RESTA SPEC. 1196/PAINT	MIN.DESIGN METAL TEMP. AT DESIGN PRESSURE	°C/°F	9 / 48.2
		REGENERAT.CONDITION	Bar.g AT °C Psi.g AT °F	4.5 AT 538 65.2 AT 1000
		STEAM-OUT		/
		RADIOGRAPHY		FULL
		STRESS RELIEVING		YES
REFERENCE DRAWINGS		WELDING EFFICIENCY		100%
DETAILS DWG	4646/A	PRODUCT TEST COUPON		SEE WKF 4646/WP
PART LIST DWG	4646/B	CORROSION ALLOWANCE	mm	3
NAME PLATE DWG	4646/C	SPECIAL SERVICE		/
LOADING DATA	4646/D	FLUID		/
TRANSPORTATION DWG	4646/E	CAPACITY	m^3	84.4
PRESS. CALCULATIONS	4646/F	GRAVITY OF PROCESS FLUID		
NOZZLES LOAD CALCUL.	4646/G	HYDROST. WATER TEMP.	°C/°F	16 / 61
SUPPORTS CALCULATION	4646/H	HYDROSTATIC TIME	H	1
WPS & PQR	4646/WP	INSULATION (BY OTHERS)	mm	125
INLET DISTRIBUTOR	B.96.667	FIREPROOFING (BY OTHERS)	mm	75
COVERPLATE	B.96.667	INSPECTION BY		ASME AUTHORITY
CENTERPIPE	B.96.667	"U" STAMP REQUIRED		YES

CHIYODA

JOB NO. 51046 IBN RUSHD AROMATICS PROJECT
PO NO. SAYPOA0007
REQ NO. MR500002
IDENT NO. 54-D-01 DW 0001

	SAY TEAM
A=NO COMMENTS PROCEED WITH FABRICATION	
B=PROCEED WITH FABRICATION COMMENTS TO BE CONSIDERED	
C=DO NOT PROCEED WITH FABRICATION	DATE

PURCHASER'S PERMISSION TO PROCEED OR REVIEW TAKEN ON VENDOR PRINTS SHALL NOT RELIEVE VENDOR FROM ITS RESPONSIBILITIES OR LIABILITIES UNDER PURCHASE ORDER

AS BUILT DWG
Date 24.03.97.

ASME STAMP REQUIRED

APPROVED BY ENGINEER. MANAGER	SIGNE	DATE
APPROVED BY QUAL. CONTR. MANAGER	SIGNE	DATE

REVIEWED BY AUTHOR. INSPECTOR
DATE

NATIONAL BOARD NUMBER

ITEM: 54-D-01 N°

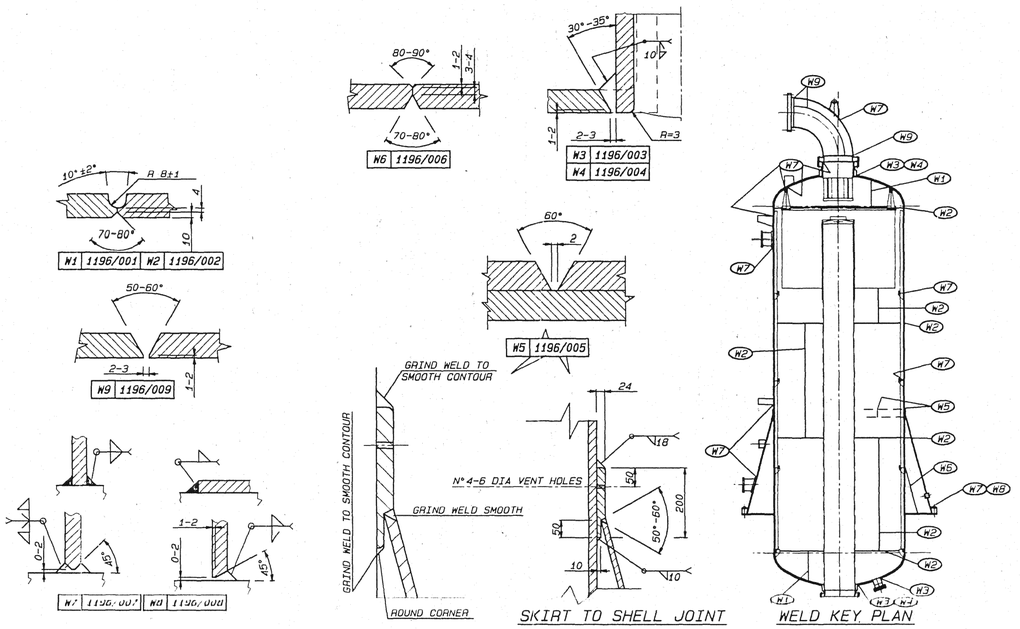
N.	REVISIONS DESCRIPTION	SIGNE	CHECK	APPR.	DATE
0	ISSUED FOR APPROVAL/EMESSO PER APPROVAZIONE	GALLIZIA STEFANO			19-04 1996
1	REVISED ACCORDING TO CLIENT COMMENTS	GALLIZIA STEFANO			09-09 1996
2	REVISED AS MARKED	GALLIZIA STEFANO			17-10 1996
3	REVISED AS MARKED	GALLIZIA STEFANO			17-11 1996

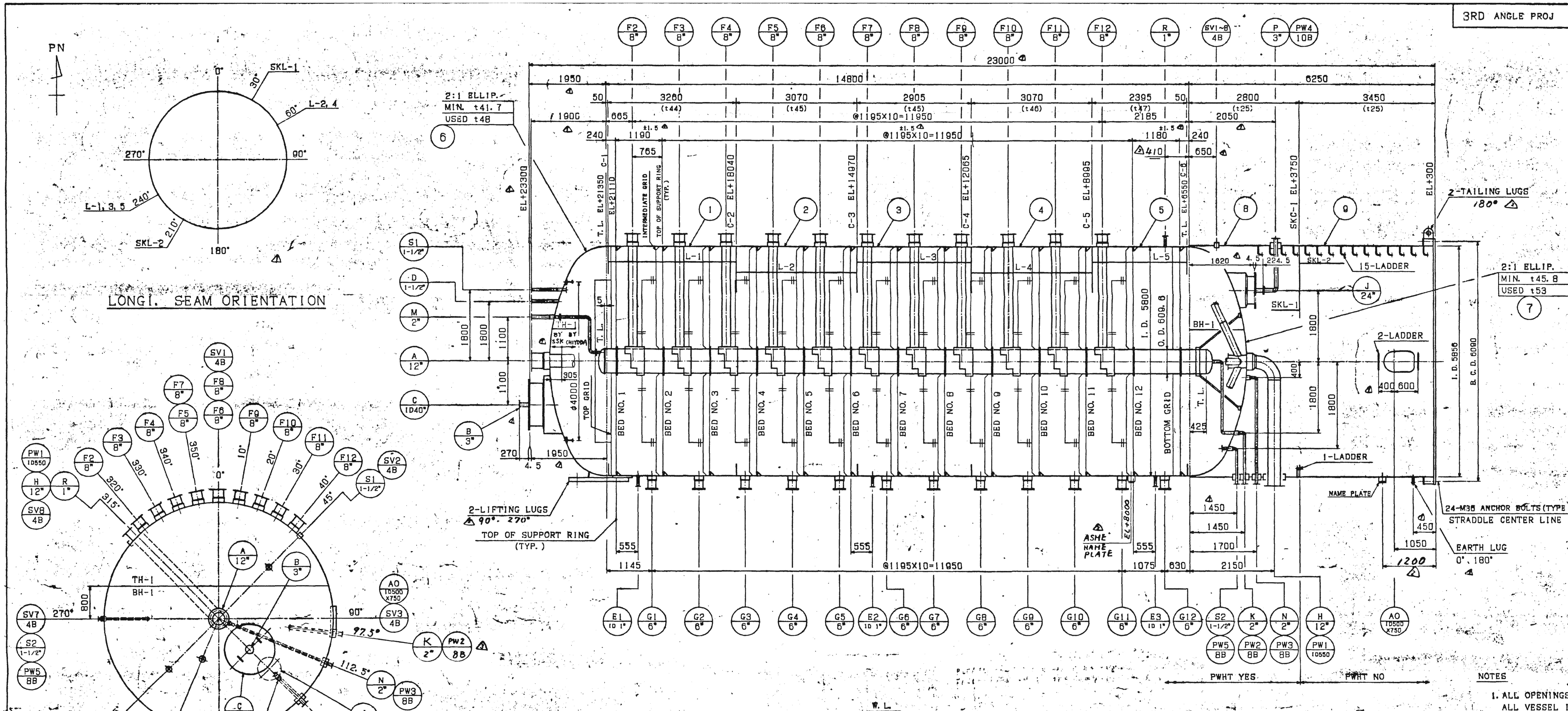
OFFICINE LUIGI RESTA S.p.A.
TELEX 300572-TELEFAX 665340
SCANZOROSCIATE (Bg)-Corso Europa, 49-Tel. (035) 661 130

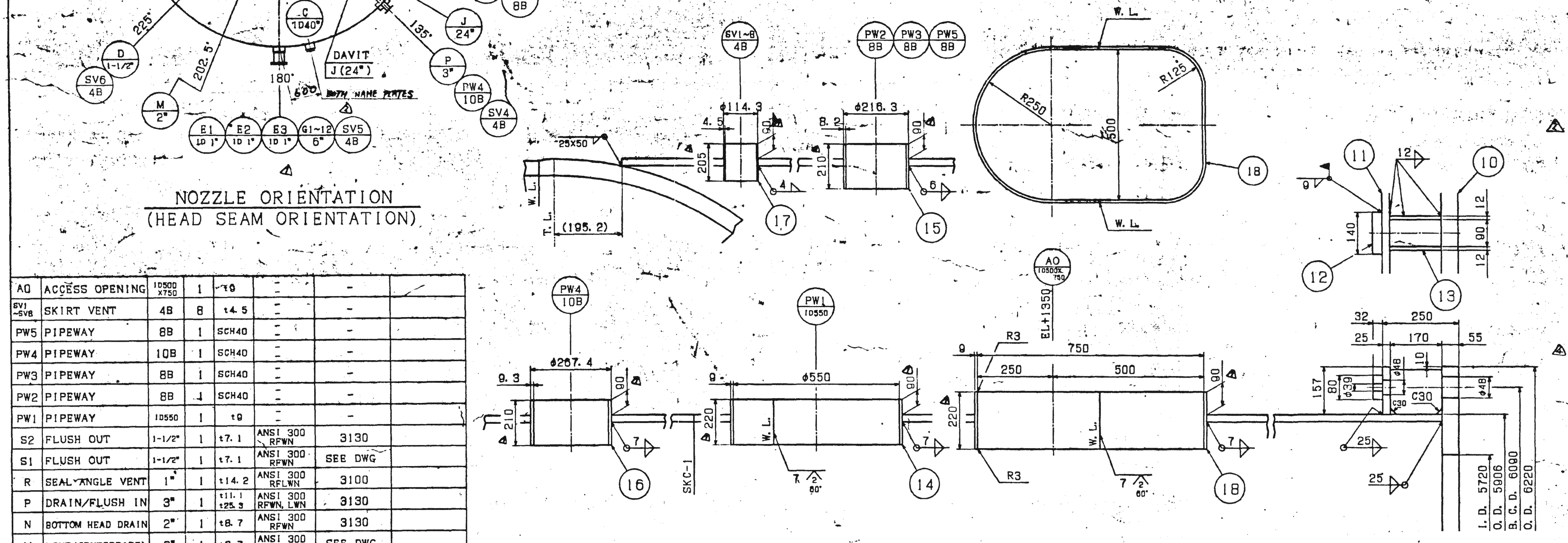
CLIENT:	CHIYODA Corporation
	IBN RUSHD AROMATICS PROJECT
SERVICE:	REACTOR
	ITEM: 54-D-01
	ASSEMBLY

DATE	19-04-1996
DWG.man	GALLIZIA STEFANO
CHECK	
APPROV.	
SCALE	NONE
JOB.	11/96/1
N.F. SHOP N	4839
DIS. DWG.	4646 REV 3

P.O. N°: SAYPOA0007







REV NO.	DATE	BY	DESCRIPTION	O.S.M. APP'D	Q.A.E. REV'ED
A	AUG.21.'96	T.Y	PURCHASER'S REQUEST FOR CONSTRUCTION	S.O	Aug.22'96
B	OCT.21.'96	T.Y	REVISED R/- NOZZLE FITTING POSITION & ETC.	S.O	Oct.21'96
C	NOV.7.'96	T.Y	REVISED K/S- NOZZLE ORIENTATION	S.O	NOV.7'96
D	DEC.18.'96	T.Y	REVISED WELDING PROCESS OF SKC-1	S.O	Dec18'96
E	FEB.5.'97	H.Y	AS BUILT	S.O	Feb7'97

設計条件 DESIGN DATA		
製作基数 No. REQUIRED		1
法規・規格 REGULATION & CODE		ASME SECT VIII DIV. 1-1995 (1995 EDITION)
ASME CODE STAMP		YES
FLUID NAME / SPECIFIC GRAVITY / NORMAL LIQUID LEVEL		HYDROCARBON [O-X(21%), M-X(54%), P-X(24%)] / 0.850 / LIQUID FULL
(M. A. W. P. =) DESIGN PRESS.	bar·G	14.8(214.7PSI)/F. V.
設計温度 DESIGN TEMP.	°C	204(399°F)/177(351°F)
MIN. DESIGN METAL TEMPERATURE	°C	2(35.6°F)
運転圧力 OPER. PRESS.	bar·G	–
運転温度 OPER. TEMP.	°C	177(351°F)
水圧試験圧力 HYDRO'C TEST PRESS.	bar·G	23.4
水圧試験温度 HYDRO'C TEST TEMP.	°C	MIN. 5° (41°F)
真空試験圧力 VACUUM TEST PRESS.	bar·G	–
応力除去 POST WELD HEAT TREATMENT		YES(PER DRAWING)
放射線検査 RADIOGRAPH		FULL
腐れ代 CORR. ALLOWANCE	mm	3.0(SKIRT 1.6)
溶接効率 JOINT EFFICIENCY		1.0
耐火被覆 FIRE PROOF	mm	75(BOTH SIDE)
保温 INSULATION	mm	50(HOT)
容積 VOLUME	m^3	442.1(15613FT^3)
吊上時重量 ERECTION WEIGHT	Kg	188400
TEST WEIGHT	Kg	924500
運転重量 OPERATING WEIGHT	Kg	894000
CHARPY IMPACT TEST		NO [UCS-66(a)]
塗装 PAINTING		SYSTEM S2-S PER CHIYODA SPEC. SP-50-X-001
NORMALIZING H.T.		HEADS (AFTER HOT FORMING)

NOTES

1. ALL OPENINGS SHALL BE SEALED PRIOR TO SHIPMENT TO FIELD. ALL VESSEL INTERIOR SHALL BE THOROUGHLY CLEANED AND SHOT BLASTED TO REMOVE LOOSE MILL SCALE PRIOR TO SHIPMENT TO FIELD.
2. REMOVE LOOSE MILL SCALE AND INTERNALLY CLEAN DISTRIBUTOR PIPING AND BLANKOFFS PRIOR TO SHIPMENT TO FIELD. TO INSURE THAT PIPING IS THOROUGHLY CLEANED USE A TURBINE DRIVEN WIRE BRUSH IN FIELD AND INSTALL IMMEDIATELY.

関連図面 REFERENCE DWG.	
TITLE タイトル	DWG NO. 図面番号
DETAIL OF NOZZLE ノズル詳細	B81481-133-01
MANHOLE DAVIT (J) マンホール ダビット	B81481-133-02
DETEIL OF CENTER PIPE センターパイプ詳細	B81481-134-01
INTERNAL FITTING 内部付着品	B81481-134-02
EXTERNAL FITTING(1/2) 外部付着品	B81481-135-01
EXTERNAL FITTING(2/2) 外部付着品	B81481-135-02
LIFTING LUG リフティングラグ	B81481-135-04
DETAIL OF PLATFORM & LADDER CLIP (1/2)	B81481-135-05
DETAIL OF PLATFORM & LADDER CLIP (2/2)	B81481-135-06
NAME PLATE 銘板	B81481-001-80
NAME PLATE (ASME CODE) 銘板(ASME CODE)	B81481-001-85

符号 MARKS	名称 NAME	呼径 NOM. SIZE	個数 No. REQ'D	肉厚 THICK-NESS	フランジ規格 F. RATING	ノズル高さ PROJECTION (TO SHELL CL)	備考 REMARKS
AO	ACCESS OPENING	ID500 X750	1	t9	–	–	
SV1~SV8	SKIRT VENT	4B	8	t4.5	–	–	
PW5	PIPEWAY	8B	1	SCH40	–	–	
PW4	PIPEWAY	10B	1	SCH40	–	–	
PW3	PIPEWAY	8B	1	SCH40	–	–	
PW2	PIPEWAY	8B	1	SCH40	–	–	
PW1	PIPEWAY	ID550	1	t9	–	–	
S2	FLUSH OUT	1-1/2"	1	t7.1	ANSI 300 RFWN	3130	
S1	FLUSH OUT	1-1/2"	1	t7.1	ANSI 300 RFWN	SEE DWG	
R	SEAL ANGLE VENT	1"	1	t14.2	ANSI 300 RFLWN	3100	
P	DRAIN/FLUSH IN	3"	1	t11.1 t25.3	ANSI 300 RFWN, LWN	3130	
N	BOTTOM HEAD DRAIN	2"	1	t8.7	ANSI 300 RFWN	3130	
M	VENT(CENTERPIPE)	2"	1	t8.7	ANSI 300 RFWN	SEE DWG	
K	DRAIN/VENT (CENTERPIPE)	2"	1	t8.7	ANSI 300 RFWN	3130	
J	MANWAY	24"	1	t46	ANSI 300 RFLWN	SEE DWG	BLIND FL'G DAVIT
H	OUTLET	12"	1	t17.5	ANSI 300 RFWN	3180	
G1~G12	DUMP	6"	12	t26.9	ANSI 300 RFLWN	3150	BLIND FL'G
F2~F12	DISTRIBUTOR	8"	11	t28.85	ANSI 300 RFLWN	3150	
E1~E3	TI AND TR	ID 1"	3	t14.2	ANSI 300 RFLWN	3100	
D	FLUSH IN	1-1/2"	1	t7.1	ANSI 300 RFWN	SEE DWG	
C	MANWAY	ID 40"	1	t25.4	ASME 300 RFLWN	SEE DWG	BLIND FL'G B16.47 SERIES B
B	VENT	3"	1	t20.6	ANSI 300 RFLWN	SEE DWG	
A	INLET	12"	1	t42.9	ANSI 300 RFLWN	SEE DWG	

TYPE 1	TYPE 2	TYPE 3	TYPE 4	TYPE 5	TYPE 6
C-1, 2	C-3 L-1, 2, 3, 4, 5	C-4, 5	C-6	SKC-1 SKL-1, 2	TH-1 BH-1
INSIDE : SAW	INSIDE : SAW	INSIDE : SAW	INSIDE : SAW	INSIDE : SAW / SMAW	INSIDE : SMAW
OUTSIDE : SAW	OUTSIDE : SAW	OUTSIDE : SAW	OUTSIDE : SAW	OUTSIDE : SAW / SMAW	OUTSIDE : SMAW
70° ±5° MAX. 2 / 60° ±5°	70° ±5° MAX. 2 / 60° ±5°	70° ±5° MAX. 2 / 60° ±5°	70° ±5° MAX. 2 / 60° ±5°	70° ±5° MAX. 2 / 60° ±5°	50° MAX. 3 / 45°

ASME STAMP YES

DIV. 1 '95 BY ASME SECT VIII 1995 EDITION

REVIEWED BY Q. A. ENGINEER
Y. Inouye
DATE Jun.20'96

CHIYODA CORPORATION
JOB NO. 51046 IBN RUSHD AROMATICS PROJECT
PO NO. SAYPOA0021
REQ NO. MR-50-D-007
IDENT NO. 53-D-01-DW0001
A-NO COMMENTS PROCEED WITH FABRICATION
B-PROCEED WITH FABRICATION COMMENTS TO BE CONSIDERED
C-DO NOT PROCEED WITH FABRICATION
SAY TEAM
DATE
PURCHASER'S PERMISSION TO PROCEED OR REVIEW TAKEN ON VENDOR PRINTS SHALL NOT RELIEVE VENDOR FROM ITS RESPONSIBILITIES OR LIABILITIES UNDER PURCHASE ORDER

NO. REQUIRED	PARTICULARS	MARKS	MATERIAL	TEST MARK	1-OFF CAL. WT(kg)	TOTAL CAL. WT(kg)	REMARKS	
	TOTAL				150845 kg			
1	ACCESS OPENNING	18	SS400			41	t9	0
8	SKIRT VENT	17	SGP		2.5	20	4BXt4.5	
1	PIPEWAY	16	STPG370			13	10BXSCH40	
3	PIPEWAY	15	STPG370		8.8	26	8BXSCH40	
1	PIPEWAY	14	SS400			28	ID550Xt9	0
48	GUSSET PLATE	13	SS400		2.4	115	t12	0
24	PLATE WASHER	12	SS400		2.8	67	t32	0
1	COMP. RING	11	SS400			588	t25	0
1	BASE PLATE	10	SA36			2024	t55	0
1	SKIRT	9	SA36			12310	t25	0
1	SKIRT	8	SA-516-65			9446	t25	0
1	HEAD	7				15831	t53	0
1	HEAD	6				14313	t48	0
1	SHELL	5				16232	t47	0
1	SHELL	4				20360	t46	0
1	SHELL	3				18844	t45	0
1	SHELL	2				19914	t45	0
1	SHELL	1	SA-516-65			20673	t44	0

SASEBO HEAVY INDUSTRIES Co., LTD
MACHINERY DESIGN DEPT.

CHIYODA CORPORATION

IBN RUSHD PTA& AROMATICS PROJECT-AROMATICS

ADSORBENT CHAMBER NO. 1
53-D-01 005002
GENERAL ASSEMBLY DRAWING

APPROVED BY	CHECKED BY	CERTIFICATED BY	DRAWN BY	DATE DRAWN	DATE ISSUED
June 19, '96	JUN. 19. 1996	JUN. 19. 1996	T. Tamada	JUN. 19. 1996	

NO. REQUIRED	WORK No.	CLASS	SCALE	DWG. No	REV.
SHOWS 1 SET / MAKE FOR 1 SET	43755	–	1/60 1/10	B81481-131-01	E

SASEBO HEAVY INDUSTRIES CO., LTD