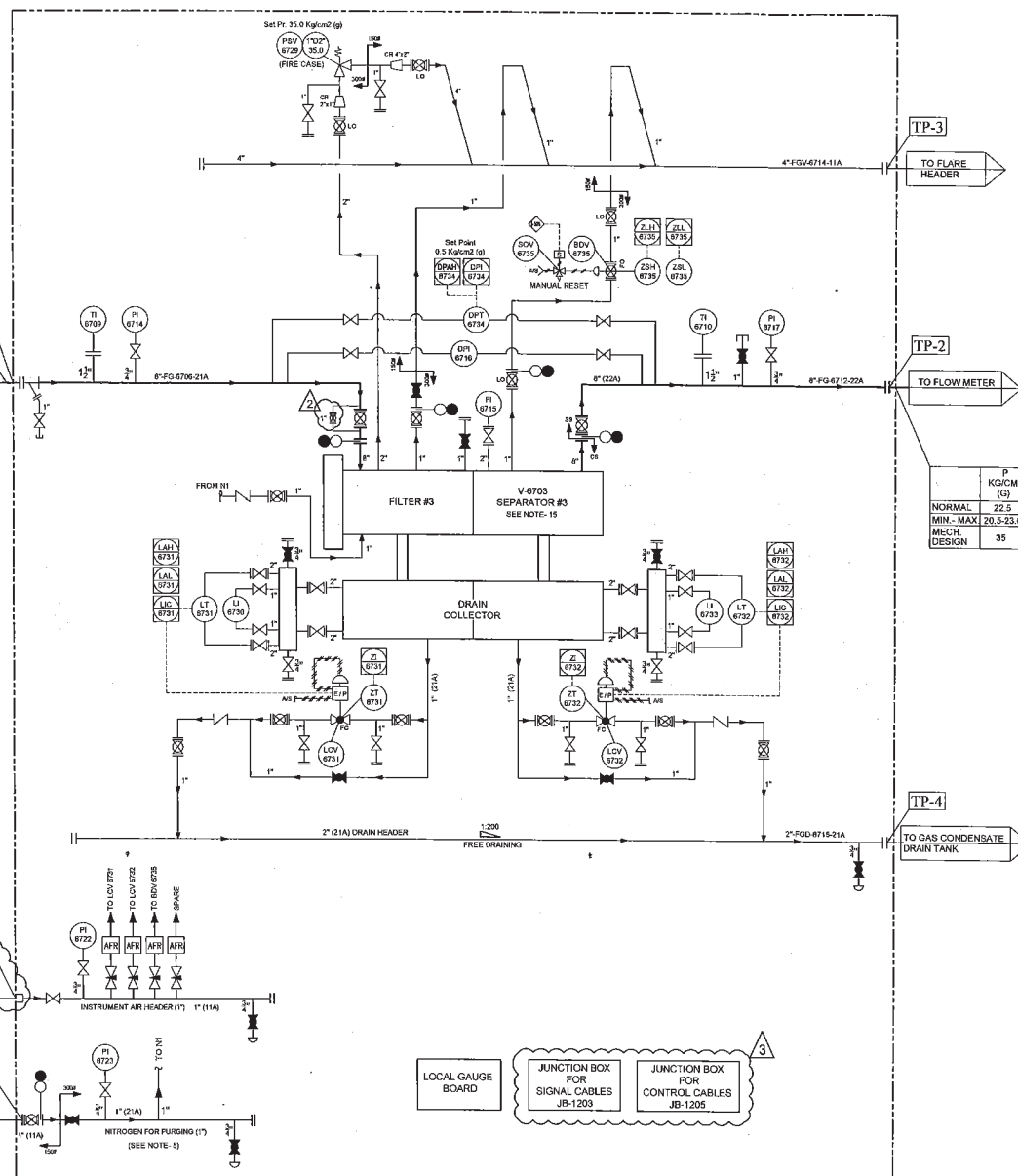


Annexure 20
Technical Details of Fine Filter Skid
(Ramgarh Project)

DO NOT SCALE-- IF IN DOUBT ASK

	P KG/CM ² (G)	TEMP °C	FLOW NM ³ /HR
NORMAL	22.7	50	39191
MIN - MAX	21.0-23.0	50-55	4355-47100
MECH. DESIGN	35	60	47890

TP-1
FROM FINE FILTER SEPARATOR SKID



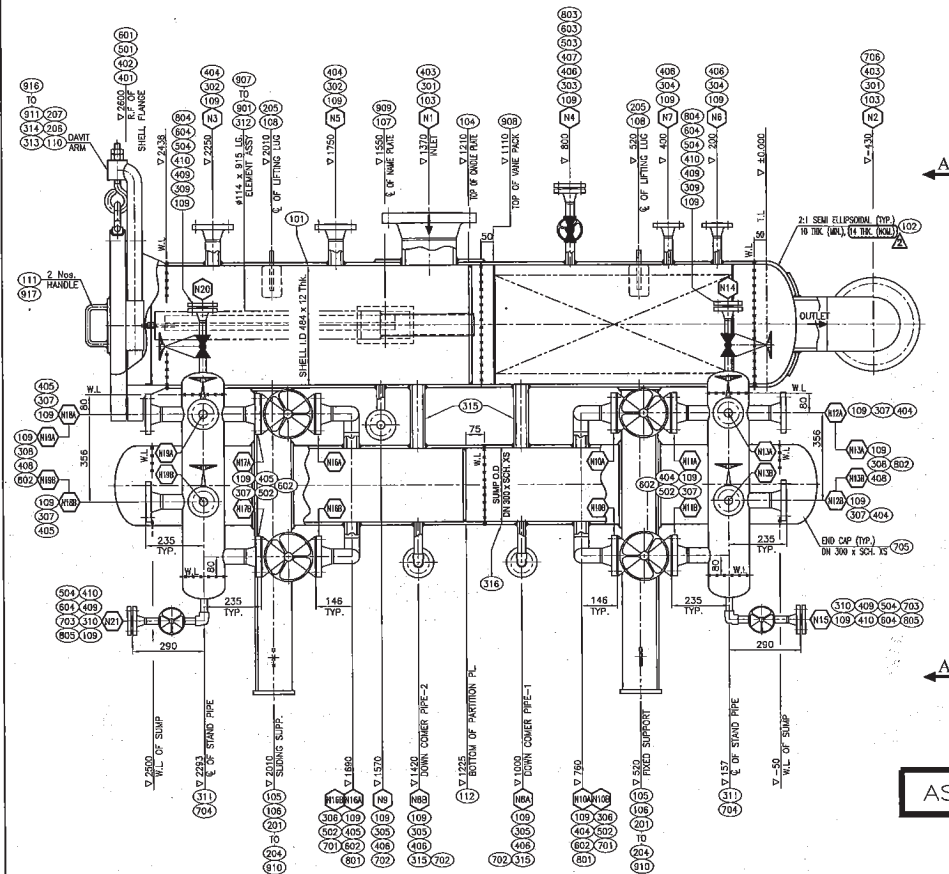
	P KG/CM ² (G)	TEMP °C	FLOW NM ³ /HR
NORMAL	22.5	50	39191
MIN - MAX	20.5-23.0	50-55	4355-47100
MECH. DESIGN	35	60	47890

NOTES:-

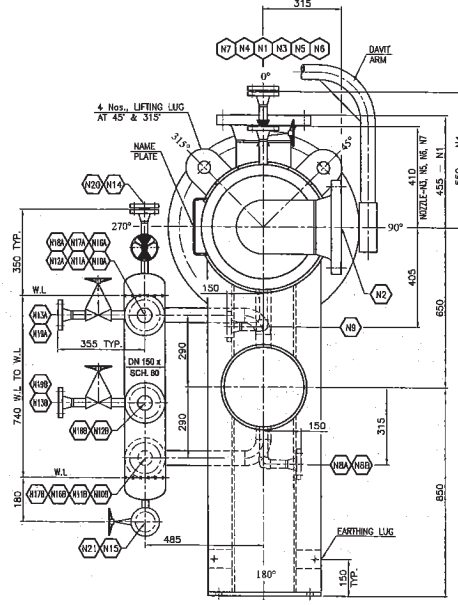
- VENTS/DRAINS ARE SHOWN ONLY TO MEET SYSTEM REQUIREMENTS. ADDITIONAL HIGH POINT VENT AND LOW POINT DRAINS SHALL BE PROVIDED ACCORDING TO FINAL LAYOUT.
- ALL INSTRUMENT ISOLATION VALVES ARE OF GATE TYPE.
- NECESSARY ROOT VALVES, INST. ISOLATION VALVES, VENT/DRAIN VALVES WILL BE PROVIDED FOR PR., DP, FLOW, & LEVEL MEASURING INST.
- FOR MATERIAL SPECIFICATION OF PIPES, FITTINGS ETC., PLEASE REFER TO PIPING MATERIAL SPECIFICATION.
- THIS VALVE ALONG WITH SPECTACLE BLIND SHALL BE OPENED AFTER ENSURING THAT THE NRVs IN THE M2 SYSTEM ARE NOT PASSING ANY READING IN THE PRESSURE GAUGE IS RESULT OF PASSING THROUGH NRVs.
- CUSTOMER SHALL ENSURE INSTRUMENT AIR SUPPLY BEFORE COMMISSIONING OF THE GAS CONDITIONING SKID FOR OPERATION OF THE INSTRUMENTS (LEVEL CONTROL VALVES/SHUTDOWN/BLOWDOWN/SOLENOID VALVES).
- ALL BALL VALVES IN FUEL GAS SYSTEM ARE OF FIRE SAFE DESIGN ONLY.
- INSULATION IS NOT IN THE SCOPE OF GRAND PRIX.
- ALL PIPING & CABLING BEYOND SKID ARE NOT IN GRAND PRIX SCOPE OF SUPPLY.
- LEVEL TRANSMITTER ON KNOCK OUT DRUM, FILTER SEPARATOR & FINE FILTER ARE OF GUIDED WAVE RADAR (CONTACT TYPE) SIDE MOUNTED AND THESE TRANSMITTER ARE MOUNTED AT SAME ELEVATION.
- ALL ELECTRICAL EQUIPMENT AND RELEVANT INSTRUMENTATION IN FUEL GAS SYSTEM ARE DESIGNED TO EXPLOSION PROOF TO ZONE - 2, GROUP IIA, IIB AS PER IS 2148.
- SET POINTS FOR SCRUBBER ARE AS FOLLOWS :
(A) LALL = 75mm (B) LAL = 125mm (C) LAH = 225mm (D) LAHH = 275mm (E) RANGE = 350mm
- SET POINTS FOR FILTER SEPARATOR ARE AS FOLLOWS :
(A) LAL = 125mm (B) LIC = 175mm (C) LAH = 225mm (D) RANGE = 350mm.
- FSVs ARE DESIGN FOR FIRE SAFE CONDITION AS PER API-520 & ASME SECTION VIII.
- THE FSV INDICATION REPRESENTS 1" (INLET) x 2" (OUTLET) VALVE WITH "D" TYPE ORIFICE AND SET PRESSURE OF 35 KG/CM²(G).
- ALL VESSELS (SCRUBBER & FILTER SEPARATOR) SHALL BE DESIGNED AS PER ASME SEC. VIII DIV. 1.
- (i) OUTLET ISOLATION VALVE OF SAFETY VALVE SHALL BE ALWAYS KEPT OPEN.
(ii) OUTLET ISOLATION VALVE OF SAFETY VALVE SHALL BE CLOSED ONLY WHEN THE INLET ISOLATION VALVE OF SAFETY VALVE IS CLOSED AND THE SPACE BETWEEN THE SAFETY VALVE AND INLET ISOLATION VALVE IS ADEQUATELY DEPRESSURIZED THROUGH BLEED VALVE.
(iii) SAFETY VALVE SHALL BE TAKEN FOR MAINTENANCE ONLY AFTER THE SPACE BETWEEN THE INLET VALVE AND SAFETY VALVE SPACE BETWEEN SAFETY VALVE AND OUTLET ISOLATION VALVE ARE SAFELY DEPRESSURIZED THROUGH RESPECTIVE BLEED VALVES.
- PNEUMATICALLY OPERATED BLOW DOWN VALVE (ON/OFF) SHALL BE OF BALL TYPE & CLASS VI LEAKAGE.
- LCVs ON KNOCK OUT DRUM, FILTER SEPARATOR & FINE FILTER SHALL BE OF GLOBE TYPE & CLASS V LEAKAGE.
- ALL TRANSMITTERS SHALL BE OF SMART TYPE EXPLOSION PROOF.
- VOLTAGE RATING OF SOLENOID VALVE = 24 V DC & TYPE OF SOLENOID VALVE SHALL BE - UNIVERSAL TYPE.

AS BUILT

DO NOT SCALE- IF IN DOUBT ASK



ELEVATION



VIEW FROM A-A

NOZZLE ORIENTATION

AS BUILT

NOTES:

- GENERAL
- ALL DIMENSIONS ARE IN MM. UNLESS OTHERWISE STATED.
- ALL PRESSURE ARE GAUGE (G) PRESSURE UNLESS OTHERWISE SPECIFIED
- STRUCTURAL QUALITY MATERIAL SHALL NOT BE DIRECTLY WELDED TO ANY PRESSURE RETAINING PART.
- ALL SHARP CORNERS SHALL BE ROUNDED OFF TO SMOOTH RADIUS (R) MIN. MIN.
- AS PER UG-99(b), FOOTNOTES-34 THE MAXIMUM ALLOWABLE WORKING PRESSURE IS ASSUMED TO BE THE SAME AS THE DESIGN PRESSURE SINCE CALCULATIONS ARE NOT MADE TO DETERMINE THE MAXIMUM ALLOWABLE WORKING PRESSURE.
- ALL FLANGE BOLT HOLES SHALL BE STRADDLE TO THE MAIN CENTER LINE OF EQUIPMENT.
- ALL MACHINED SURFACES AND THREADED CONNECTION TO BE PROTECTED WITH RUST PREVENTIVE.
- NOZZLE UP TO 50 DN. SIZE IS TO BE STIFFENED WITH 2 Nos. OF 40mm WIDEXMIN THK. FLATS WELDED AT 90° APART.
- PROJECTIONS:
 - FOR NOZZLES ON SHELL, PROJECTIONS ARE REFERRED FROM VESSEL CENTER LINE TO FLANGE CONTACT FACE.
 - FOR NOZZLES ON HEAD, PROJECTIONS ARE REFERRED FROM HEAD T.L. TO FLANGE CONTACT FACE.
 - ALL FLANGE FACE SHALL BE FINISHED TO 125-200 ARHL.
 - THE ROLLING OF PLATE FOR MAKING SHELL SHALL BE LENGTHWISE.
 - EARTHING CLEAT SHALL NOT BE PAINTED.
- MATERIALS:
 - PLATES FOR PRESSURE PARTS SHALL BE IN NORMALIZED CONDITION. STEEL SHALL BE FULLY KILLED AND CONFORMING TO FINE AUSTENITIC GRAIN SIZE AS PER SA 20. PLATE SHALL HAVE C ≤ 0.23% & C.E. ≤ 0.43%.
 - ALL FLANGES SHALL BE PROCURED IN NORMALIZED CONDITION WITH CARBON CONTENT ≤ 0.23% & C.E. ≤ 0.43%, HARDNESS ≤ 187 BHN.
 - ALL NOZZLE PIPES SHALL BE SEAMLESS AND SHALL HAVE CARBON CONTENT C ≤ 0.23% & C.E. ≤ 0.43%. HARDNESS ≤ 200 BHN.
 - MATERIAL CERTIFICATE FOR PRESSURE PARTS SHALL BE EN10204-3.1
- WELDING & HEAT TREATMENT:
 - ALL WELDING JOINTS SURFACES SHALL BE GROUND TO BRIGHT METAL (AFTER FLAME CUTTING) TO REMOVE SURFACE OXIDES AND SHALL BE D.P. EXAMINED FOR INDICATION OF CRACKING OR LAMINATION.
 - ALL BUTT WELD SHALL BE FULL PENETRATION (TYPE-1) AS PER ASME TABLE UW-12, SHALL BE BACK CHIPPED TO SOUND METAL & REWELDED FROM THE SECOND SIDE, IF BACK CHIP TO SOUND METAL IS NOT POSSIBLE THEN ROOT RUN BY GTAW/ALL WELDS TO BE D.P. TESTED.
 - NOZZLE GROOVE WELD ATTACHMENT SHALL BE FULL PENETRATION AS PER ASME UW-16, SHALL BE BACK CHIPPED TO SOUND METAL AND REWELDED FROM THE SECOND SIDE AND IF THE BACK CHIP IS NOT PRACTICAL, THEN ROOT PASS SHALL BY GTAW.
 - FILLET WELD SIZES SHOWN IN THE DRAWING ARE MINIMUM.
 - ANY OFFSET WITHIN THE ALLOWABLE TOLERANCE PROVIDED SHALL BE TAPERED AT A 3:1 TAPER OVER THE WIDTH OF FINISHED WELD.
- INSPECTION & TESTING:
 - ALL NOZZLES TO SHELL WELDS (ROOT RUN & FINAL RUN) SHALL BE D.P. EXAMINED.
 - ALL WELD JOINTS TO BE D.P. TESTED ON ROOT RUN AND AFTER FINAL WELDING AS PER ASME SEC. VII DIV.1 ACCEPTANCE CRITERIA SHALL BE AS PER APPENDIX B OF ASME SEC. VIII DIV.1
 - MAGNETIC PARTICLE/DYE PENETRANT EXAMINATION SHALL BE CARRIED OUT ON THE OUTSIDE AND INSIDE SURFACE INCLUDING EDGES OF ELLIPTICAL HEADS IN KNUCKLE ZONE, AFTER FORMING, FOR DETECTION OF CRACKS.

- EACH PAD SHALL HAVE 2 NOS. #3 NPT T.T. HOLE LOCATED AT 45° OFF OF THE LONGITUDINAL AXIS OF THE VESSEL AND TESTED AT 1.05 KG/CM²(G) WITH AIR SOAP SOLUTION AND THE HOLE SHALL BE PLUGGED WITH HEAVY GREASE AFTER TESTING.
- IMPACT TESTING EXEMPTED AS PER (a) UCS-66(C) FOR STD. FLANGES, (b) UCS-68 NOTE (C) FOR FASTENERS (B) AS PER UG-20(C) FOR SHELL/HEAD/RF PADS/NOZZLE NECKS & FOR OTHER ITEMS.
- HYDROSTATIC TEST SHALL BE CONDUCTED AS PER FOLLOWING:
 - VESSEL SHALL BE THOROUGHLY CLEANED INSIDE & OUTSIDE AND SHALL BE FREE OF DIRT, DEBRIS AND ALL LOOSE FOREIGN MATTER.
 - DURING HYDROSTATIC, PRESSURE GAUGE SHALL BE MOUNTED ON TOP OF THE VESSEL.
 - EQUIPMENT SHALL DRIED WITH HOT AIR.
- TOLERANCES:
 - VESSEL TOLERANCES SHALL BE AS PER EN STANDARD 7-12-0091 REV.5.
 - TOLERANCE ON DISH END SHALL BE AS PER UG-81.
 - PERMISSIBLE OUT-OF-ROUNDNESS OF CYLINDRICAL SHELL SHALL BE PER UG-80.
 - TOLERANCES ON FILLET WELD SIZE ±2-0.
 - TOLERANCES ON ROOT GAP & ROOT FACE SHALL BE ±1mm.

S.No.	DESCRIPTION
10	ASME B16.11 (2011) : FORGED RING, SOCKET-WELDING AND HEADS
9	ASME B16.9 (2012) : FACTORY MADE WROUGHT BUTT WELDING FITTINGS
8	ASME B31.10M (2004) : WELDED AND SEAMLESS WROUGHT STEEL PIPE
7	ASME/ANSI B11.1 (2003) : UNIFIED INCH SCREW THREADS
6	ASME B16.2.2 (2010) : SQUARE AND HEX NUTS (WICH SERIES)
5	ASME B16.20 (2012) : METRIC GASKET FOR PIPE FLANGES SPARK WIND
4	ASME B16.5 (2013) : PIPE FLANGES AND FLANGED FITTINGS
3	ASME SEC. II PART D : EDITION 2010, ADD 2011a
2	ASME SEC. II PART A : EDITION 2010, ADD 2011a
1	ASME SEC. VIII DIV. 1 : EDITION 2010, ADD 2011a
S.No.	DESCRIPTION
APPLICABLE CODES AND STANDARD	
4	P.R.10 FOR OFF-BASE FUEL GAS SYSTEM FOR GT 1-38101-05360
3	GENERAL SPECIFICATION OF GAS CONDITIONING SYSTEM GT 57251
2	PIPING MATERIAL SPECIFICATION ANNEXURE-6 OF GT 8996
1	JOB SPECIFICATION FOR GAS COND. SYSTEM GT 57851
S.No.	TITLE SPEC. No.
APPLICABLE PURCHASER'S SPECIFICATION	

NOZZLE SCHEDULE (PER EQUIP.)

MARK	QTY.	DN	INCH	FLG.	STD.	BLADING	TYPE	FACE	SERVICE	PROJECTION	PROJ. HGT. - AS	PAD SIZE
N1	1	200	80	12.70	B16.5	300P	WN	RF	INLET	SEE DRAWING	0.0 440 x 10 223 x 12 TM	
N2	1	200	80	12.70	B16.5	300P	WN	RF	OUTLET	SEE DRAWING	0.0 440 x 10 223 x 12 TM	
N3	1	50	150	6.74	B16.5	300P	WN	RF	PRESSURE GAUGE	SEE DRAWING		
N4	1	25	XKS	0.08	B16.5	300P	WN	RF	VENT+GLOBE VALVE+BLRF	SEE DRAWING		
N5	1	50	150	6.74	B16.5	300P	WN	RF	PSV	SEE DRAWING		
N6	1	25	XKS	0.08	B16.5	300P	WN	RF	VENT TO HEADER	SEE DRAWING		
N7	1	25	XKS	0.08	B16.5	300P	WN	RF	BLRF	SEE DRAWING		
N8A/B	2	25	XKS	0.08	B16.5	300P	WN	RF	DRAIN	SEE DRAWING		
N9	1	25	XKS	0.08	B16.5	300P	WN	RF	PURGING	SEE DRAWING		
N10A/B	2	50	150	6.74	B16.5	300P	WN	RF	STAND PIPE+GATE VALVE	SEE DRAWING		
N11A/B	2	50	150	6.74	B16.5	300P	WN	RF	STAND PIPE	SEE DRAWING		
N12A/B	2	50	150	6.74	B16.5	300P	WN	RF	LT	SEE DRAWING		
N13A/B	2	25	XKS	0.08	B16.5	300P	WN	RF	LH+GATE VALVE	SEE DRAWING		
N14	1	20	XKS	7.62	B16.5	300P	WN	RF	VENT+GLOBE VALVE+BLRF	SEE DRAWING		
N15	1	20	XKS	7.62	B16.5	300P	WN	RF	DRAIN+GATE VALVE+BLRF	SEE DRAWING		
N16A/B	2	50	150	6.74	B16.5	300P	WN	RF	STAND PIPE+GATE VALVE	SEE DRAWING		
N17A/B	2	50	150	6.74	B16.5	300P	WN	RF	STAND PIPE	SEE DRAWING		
N18A/B	2	50	150	6.74	B16.5	300P	WN	RF	LT	SEE DRAWING		
N19A/B	2	25	XKS	0.08	B16.5	300P	WN	RF	LH+GATE VALVE	SEE DRAWING		
N20	1	20	XKS	7.62	B16.5	300P	WN	RF	VENT+GLOBE VALVE+BLRF	SEE DRAWING		
N21	1	20	XKS	7.62	B16.5	300P	WN	RF	DRAIN+GATE VALVE+BLRF	SEE DRAWING		

DESIGN DATA :

- CODE OF CONSTRUCTION : ASME SEC. VII DIV.-1, ED. 2010 ADD. 2011a
- ASME CERTIFICATION MARK : NO
- NATIONAL BOARD REQS : NO
- APPLICABLE LOADING : Only clause a, b, d, f and j of UG-22
- DESIGN PRESSURE (INTERNAL) : 35 Kg/CM² (g)
- DESIGN PRESSURE (EXTERNAL) : NIL
- WARP (INTERNAL) : 35 Kg/CM² (g) (SEE NOTE - A5)
- HYDROSTATIC TEST PRESSURE : 45.50 Kg/CM² (g)
- HYDROSTATIC TEST TEMP. : 180°C (AT TYP)
- DESIGN TEMPERATURE : 60 °C
- W.M.T. : 2 °C (AMBIENT) AT 35 Kg/CM² (g)
- HYDROSTATIC TEST TEMPERATURE : > 17 °C NOT TO EXCEED 48 °C
- SEISMIC : NATURAL GAS (NOW LETHAL)
- CORROSION ALLOWANCE : 3mm.
- RADIOGRAPHY (RT) : 100% (RT-1) - ALL BUTT WELDS
- JOINT EFFICIENCY : 1
- PAINT - VESSEL : NIL (AS PER CODE)
- PAINT - DISH END : SH AFTER OXID FORMING (SEE TABLE-A)
- IMPACT TESTING REQ. : NO (SEE NOTE - 05)
- WIND SPECIFICATION : AS PER IS 8953 PART-4 (ZONE-III)
- SDS/MC : AS PER IS 8953 PART-4 (ZONE-III)
- INSULATION : NO
- INSULATION CLEATS : NA
- FIRE PROOFING : NO

PROCESS DATA :

- OPERATING MEDIUM : NATURAL GAS
- FLOW RATE (MM/HR/MS) : 4355/3819/47109 Nm³/hr.
- PRESSURE DROP (BAR/MPa) : 0.194 / 0.5 Kg/CM² (g)
- SEPARATION EFFICIENCY : 100% FOR 8 MICRON & LARGER
- LIQUID REMOVAL : 99.5% FOR 0.5 TO 1 MICRON
- SOLID REMOVAL : 100% FOR 3 MICRON & LARGER
- 99.5% FOR 0.5 TO 1 MICRON
- TURNDOWN : 100%
- OPERATING DATA :
 - OPERATING PR. (MM/HR/MS) : 21/22/7/23 Kg/CM² (g)
 - OPERATING TEMP. : 55 °C
 - RETENTION CAPACITY : 177 LITERS
 - EMPTY WEIGHT : 2303 Kgm. (APPROX.)
 - OPERATING WEIGHT : 2303 Kgm. (APPROX.)
 - TEST WEIGHT (SHIP) : 3023 Kgm. (APPROX.)
- ELEMENT DATA :
 - TYPE OF ELEMENT : COALESCENT TYPE (CARTRIDGE)
 - ELEMENT SIZE : #14 x 915 Lg.
 - ELEMENT MATERIAL : FIBER GLASS
 - ELEMENT MAKE : JONAL
 - ELEMENT WEIGHT (No.) : 1.6 Kg (APPROX.)
 - NO OF ELEMENT : 08 Nos.
 - COLLAPSING PR. DROP : 2.0 Kg/CM² (g)

SURFACE PREPARATION & PAINTING

SURFACE FINISH

- BURST CLEANING TO SA 2 1/2.

PAINTING

- PRIMER : ONE COAT OF INORGANIC ZINC SILICATE PRIMER @ 65-75 μ DFT / COAT
- INTERMEDIATE PAINT : TWO COAT OF EPOXY HIGH BUILD PAINT @ 100 μ DFT/COAT.
- FINISH PAINT : TWO COATS OF ACRYLIC POLY URETHANE PAINT @ 40 μ DFT / COAT. TOTAL DFT 355 μ DFT (MIN.)
- FINISH PAINT COLOUR SHADE : CANNERY YELLOW RAL No. : 1018

INSPECTION

- BHEL

QUANTITY : 1 No. FOR ITEM No. V-6703

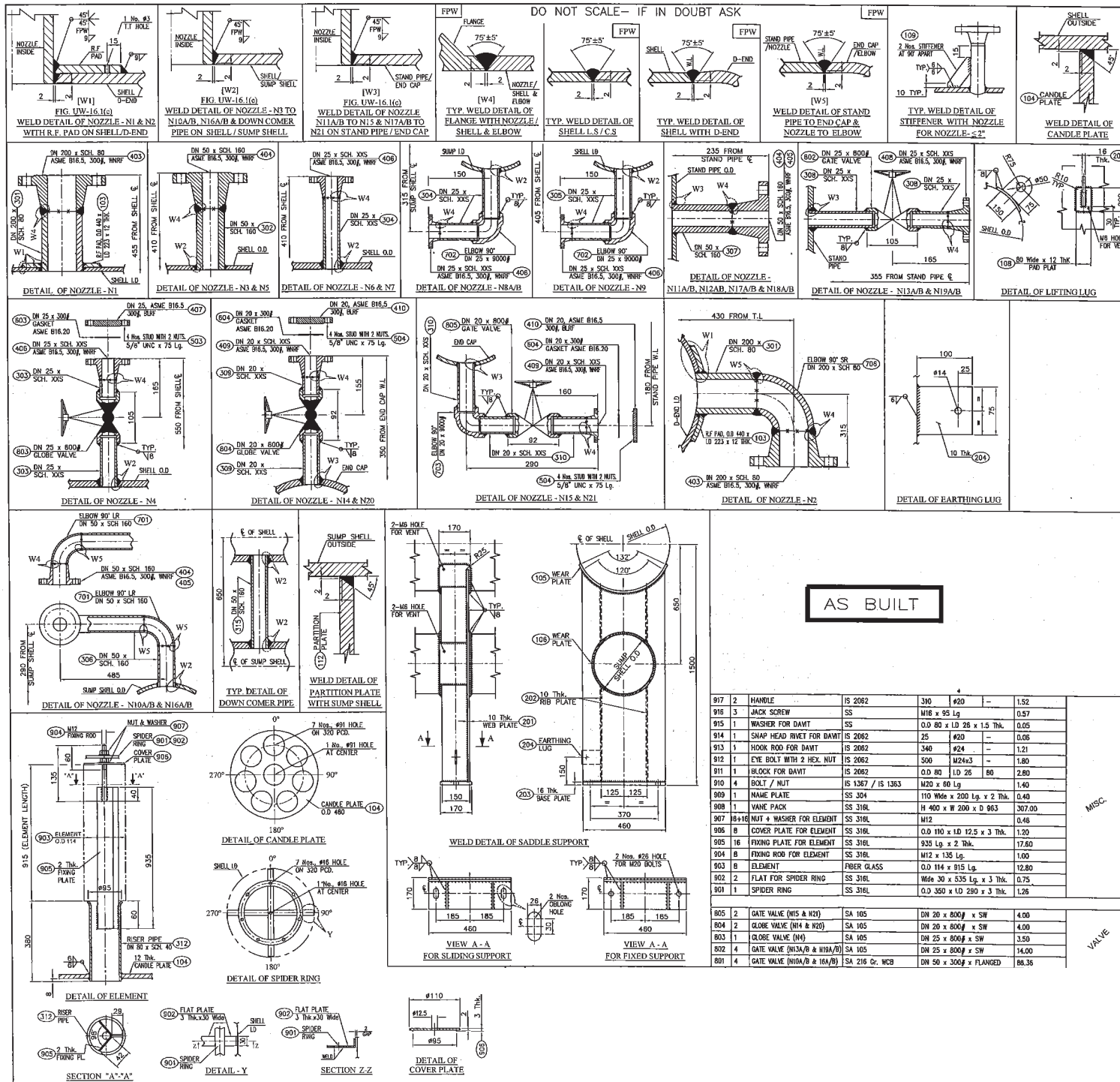
COMMISSIONING SPARES PER EQUIP.		
P.No.	QTY	DESCRIPTION
903	8	ELEMENT

MATERIAL OF CONSTRUCTION

DESCRIPTION	MATERIAL
SHELL/D-END	SA 516 Gr. 70
RF PAD/PLATE	SA 516 Gr. 70
SUPPORT	SA 105 Gr. B
NOZZLE FLANGE	SA 105
GASKETS	SS 304 SPHL. WIND GRAPHITE FILLER WITH CS PLATED OUTER RING & WIND INNER RING
STUD	SA193 Gr. B7
NUTS	SA194 Gr. 2H
CYCLONE	SS 316L
INTERNAL (WELDED)	SA 516 Gr. 70
FITTINGS SW.	SA 105
FITTINGS BW.	SA 234 Gr. 10B

TABLE-A

HEAT TREATMENT CYCLE OF DISHED END	
DESCRIPTION	STRESS RELIEF
RATE OF HEATING (Max.)	120°C/hr.
RATE OF COOLING (Max.)	120°C/hr.
SOAKING TEMP.	610°C ± 10°C
SOAKING TIME (Min.)	35 MINUTES
LOADING/UNLOADING TEMP. (Max.)	300°C



BILL OF MATERIAL (PER EQUIPT.)									
P.No.	QTY.	DESCRIPTION	MATERIAL	LENGTH OUTER DIA.	SIZE INNER DIA.	THICKNESS	WEIGHT (Kg)	REMARKS	
101	1	SHELL PLATE	SA 516 Gr. 70	2388	1559	12	350.69	B.O. PLATE	
102	1	DISHED END (2" SEM ELP.)	SA 516 Gr. 70	10 484 x 10 484	10 484	12	42.22		
103	2	PAD FOR NOZZLE (N1 & N2)	SA 516 Gr. 70	60 440 x 10 223	12	21.26			
104	1	CANDLE PLATE	SA 516 Gr. 70	60 480	-	12	12.14		
105	2	WEAR PLATE FOR SHELL	SA 516 Gr. 70	613	170	12	18.20		
106	2	WEAR PLATE FOR SUMP SHELL	SA 516 Gr. 70	1058	170	12	33.82		
107	1	NAME PLATE BRACKET	SA 516 Gr. 70	340	150	6	2.46		
108	4	PAD FOR LIFTING LUG	SA 516 Gr. 70	200	80	12	5.50		
109	56	STIFFENER FOR NOZZLE	SA 516 Gr. 70	-	40	6	12.00		
110	1	PAD FOR HOOK ROD	SA 516 Gr. 70	300	40	12	1.3		
111	2	PAD FOR HANDLE	SA 516 Gr. 70	220	80	12	3.30		
112	1	PARTITION PLATE	SA 516 Gr. 70	0.0 295	-	12	6.43		
201	2	WEB PLATE	IS 2062	1355	450	10	98.00	STR. PLATE	
202	4	RIB PLATE	IS 2062	1305	140	10	57.35		
203	2	BASE PLATE	IS 2062	450	170	16	19.64		
204	2	EARTHING LUG	IS 2062	100	75	10	0.60		
205	4	LIFTING LUG	IS 2062	165	150	16	10.35		
206	1	RIB PLATE FOR DAMT	IS 2062	240	50	10	0.65		
207	2	SUPPORT PLATE FOR DAMT	IS 2062	-	-	10	0.50		
301	2	NOZZLE (N1 & N2)	SA 106 Gr. B	DN 200 x SCH. 80 x 130 & 140 Lg.	17.45		PIPE		
302	2	NOZZLE (N3 & N5)	SA 106 Gr. B	DN 50 x SCH. 160 x 105 Lg.	2.34				
303	1	NOZZLE (N4)	SA 106 Gr. B	DN 25 x SCH. XXS x 165 Lg.	0.90				
304	2	NOZZLE (N6 & N7)	SA 106 Gr. B	DN 25 x SCH. XXS x 110 Lg.	1.20				
305	3	NOZZLE (N8 & N9A/B)	SA 106 Gr. B	DN 25 x SCH. XXS x 235 Lg.	3.84				
306	4	NOZZLE (N10A/B & N18A/B)	SA 106 Gr. B	DN 50 x SCH. 160 x 410 Lg.	14.45				
307	8	NOZZLE (N14A/B & N16A/B)	SA 106 Gr. B	DN 50 x SCH. 160 x 100 Lg.	8.90				
308	4	NOZZLE (N13A/B & N19A/B)	SA 106 Gr. B	DN 25 x SCH. XXS x 135 Lg.	2.96				
309	2	NOZZLE (N15 & N20)	SA 106 Gr. B	DN 20 x SCH. XXS x 200 Lg.	1.10				
310	2	NOZZLE (N15 & N21)	SA 106 Gr. B	DN 20 x SCH. XXS x 200 Lg.	1.46				
311	2	STAND PIPE	SA 106 Gr. B	DN 150 x SCH. 80 x 740 Lg.	63.00				
312	8	RISER PIPE	SA 106 Gr. B	DN 80 x SCH. 40 x 380 Lg.	34.32				
313	1	HOLDING PIPE FOR DAMT	SA 106 Gr. B	DN 65 x SCH. 40 x 200 Lg.	1.75				
314	1	ARM PIPE FOR DAMT	SA 106 Gr. B	DN 50 x SCH. 80 x 1070 Lg.	8.00				
315	2	DOWN COMER PIPE-1/2	SA 106 Gr. B	DN 50 x SCH. 160 x 270 Lg.	6.00				
316	1	SUMP SHELL	SA 106 Gr. B	DN 300 x SCH. XS x 2550 Lg.	248.45				
401	1	FLANGE FOR SHALL	SA 105	DN 500 x 12 Thk. x 300g. WNR	170.62		FORGING		
402	1	BLIND FLANGE FOR SHALL	SA 105	DN 500 x 300g. BLRF	230.00				
403	2	FLANGE (N1 & N2)	SA 105	DN 200 x SCH. 80 x 300g. WNR	66.08				
404	8	FLANGE (N3A/B, N5A/B & N7A/B)	SA 105	DN 50 x SCH. 160 x 300g. WNR	31.12				
405	6	FLANGE (N8A/B, N10A/B & N18A/B)	SA 105	DN 50 x SCH. 160 x 300g. WNR	23.34				
406	6	FLANGE (N14, N16, N18, N20 & N21)	SA 105	DN 25 x SCH. XXS x 300g. WNR	11.10				
407	1	BLIND FLANGE (N4)	SA 105	DN 25 x 300g. WNR	1.40		FASTENER		
408	4	FLANGE (N13A/B & N19A/B)	SA 105	DN 25 x SCH. XXS x 300g. WNR	11.10				
409	4	FLANGE (N15, N20 & N21)	SA 105	DN 20 x SCH. XXS x 300g. WNR	5.52				
410	4	BLIND FLANGE (N14, N15, N20 & N21)	SA 105	DN 20 x 300g. BLRF	5.60				
501	24	STUD WITH 2 NUTS (SHELL FLANGE)	SA 193 Gr. B7/SA 194 Gr. 2H	111/4" UNF x 205 Lg.	45.11				
502	64	STUD WITH 2 NUTS (N1 & N2)	SA 193 Gr. B7/SA 194 Gr. 2H	5/8" UNC x 90 Lg.	12.48				
503	4	STUD WITH 2 NUTS (N4)	SA 193 Gr. B7/SA 194 Gr. 2H	5/8" UNC x 75 Lg.	0.71				
504	16	STUD WITH 2 NUTS (N14, N15, N20 & N21)	SA 193 Gr. B7/SA 194 Gr. 2H	5/8" UNC x 75 Lg.	2.76				
601	1	GASKET (SHELL FLANGE)	SS 304SPW+GRAPHITE FILLER	DN 500 x 300g x 4.5 Thk.	2.87		GASKET		
602	8	GASKET (N1A/B, N3A/B & N7A/B)	SS 304SPW+GRAPHITE FILLER	DN 50 x 300g x 4.5 Thk.	0.88				
603	1	GASKET (N4)	SS 304SPW+GRAPHITE FILLER	DN 25 x 300g x 4.5 Thk.	0.05				
604	4	GASKET (N14, N15, N20 & N21)	SS 304SPW+GRAPHITE FILLER	DN 20 x 300g x 4.5 Thk.	0.16				
701	8	ELBOW 90° (N10A/B & N18A/B)	SA 234 Gr. WPB	DN 50 x SCH. 160	12.00		FITTING		
702	3	ELBOW 90° (N6 & N8A/B)	SA 105	DN 25 x 9000g x SW	3.60				
703	2	ELBOW 90° (N15 & N21)	SA 105	DN 20 x 9000g x SW	1.40				
704	4	END CAP (STAND PIPE)	SA 234 Gr. WPB	DN 150 x Sch. 80	16.00				
705	2	END CAP (SUMP SHELL)	SA 234 Gr. WPB	DN 300 x Sch. XS	44.00				
706	1	ELBOW 90° SR	SA 234 Gr. WPB	DN 200 x Sch. 80	22.50				
805	2	GATE VALVE (N15 & N21)	SA 105	DN 20 x 800g x SW	4.00		VALVE		
804	2	GLOBE VALVE (N1 & N2)	SA 105	DN 20 x 800g x SW	4.00				
803	1	GLOBE VALVE (N4)	SA 105	DN 25 x 800g x SW	3.50				
802	4	GATE VALVE (N13A/B & N19A/B)	SA 105	DN 25 x 800g x SW	14.00				
801	4	GATE VALVE (N10A/B & N18A/B)	SA 216 Gr. WCB	DN 50 x 300g x FLANGED	88.35				
917	2	HANDLE	IS 2062	310	#20	1.52	MISC.		
918	3	JACK SCREW	SS	M18 x 95 Lg.	0.57				
919	1	WASHER FOR DAMT	SS	0.0 80 x LD 26 x 1.5 Thk.	0.05				
914	1	SNAP HEAD RIVET FOR DAMT	IS 2062	25	#20	0.06			
913	1	HOKK ROD FOR DAMT	IS 2062	340	#24	1.21			
912	1	EYE BOLT WITH 2 HDX. NUT	IS 2062	500	M24x3	1.80			
911	1	BLOCK FOR DAMT	IS 2062	0.0 80	LD 26	80	2.80		
910	4	BOLT / NUT	IS 1367 / IS 1363	M20 x 60 Lg.	1.40				
909	1	NAME PLATE	SS 304	110 Wide x 200 Lg. x 2 Thk.	0.40				
908	1	YANE PACK	SS 316L	H 400 x W 200 x D 863	307.00				
907	8+16	NUT & WASHER FOR ELEMENT	SS 316L	M12		0.46			
906	8	COVER PLATE FOR ELEMENT	SS 316L	0.0 110 x LD 12.5 x 3 Thk.	1.20				
905	16	FIXING PLATE FOR ELEMENT	SS 316L	935 Lg. x 2 Thk.	17.60				
904	8	FIXING ROD FOR ELEMENT	SS 316L	M12 x 135 Lg.	1.00				
903	8	ELEMENT	FIBER GLASS	0.0 114 x 815 Lg.	12.80				
902	2	FLAT FOR SPIDER RING	SS 316L	Wide 30 x 535 Lg. x 3 Thk.	0.75				
901	1	SPIDER RING	SS 316L	0.0 350 x LD 290 x 3 Thk.	1.26				

DO NOT SCALE- IF IN DOUBT ASK

BILL OF MATERIAL (PER EQUIP.)

P.No.	QTY	DESCRIPTION	MATERIAL	SIZE	WEIGHT (Kg)	REMARKS
101	-	BASE FRAME MEMBERS	IS 2082	ISM- 200 x 17800 Lg.	383.50	STEEL Q. STEEL
102	-	BASE FRAME SUPPORT CHANNEL	IS 2082	ISM- 100 x 7700 Lg.	70.85	
103	-	CHEQUERED PLATE	MS	5 THK. x 2600 Wide x 4000 Lg.	490.00	
104	4	LIFTING LUG	IS 2082	20 THK. x 300 Wide x 300 Lg.	45.00	
105	8	GUSSET FOR LIFTING LUG	IS 2082	10 THK. x 49 Wide x 177 Lg.	5.50	
106	2	BASE PLATE	IS 2082	20 THK. x 200 Wide x 400 Lg.	29.00	
107	1	RIB PLATE	IS 2082	20 THK. x 400 O.D.	19.70	EARTHING BOSS
108	1	RIB PLATE	IS 2082	10 THK. x 65 Wide x 400 Lg.	2.67	
109	2	BASE PLATE	IS 2082	10 THK. x 175 Wide x 180 Lg.	5.00	
110	4	GUSSET PLATE	IS 2082	10 THK.	2.14	

201	2	EARTHING BOSS ASSY.	IS 2082	O/D 40 x 30 Lg.	0.40	EARTHING BOSS
202	2	STUD WITH 2 NUTS	SS 304	M 10 x 60 Lg.	0.10	
203	2	SPRING WASHER	SS 304	3 THK.	0.02	
204	4	FLAT WASHER	SS 304	3 THK.	0.04	FASTENER
301	12	ANCHOR BOLT	IS 2082	M 24 x 550 Lg.	36.00	
302	100	BOLT	IS 1367	M 19 x 25 Lg.	-	

REFERENCE DRAWINGS:-

P & I DIAGRAM DRG. NO. : 1-OP1484-2392
 FILTER SEPARATOR DRG. NO. : 1-OP1484-2395
 PIPING G.A. DRAWING : 1-OP1484-2397

WEIGHT:-

EMPTY WEIGHT OF SKID : LATER
 HYDRO TEST WEIGHT OF SKID : LATER
 WEIGHT OF BASE FRAME : 1250 KG. (APPROX)

SUPPLY:-

QUANTITY : 1 No.

NOTE:-

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED.
2. ALL SHARP CORNERS SHALL BE ROUNDED OFF.

