IMV Projects	DOCUMENT Ref: DS-Horseshoe-H-4000	MR No.: 0127-004-MAT1450.001	PAGE 1 OF 2
	CLIENT	JOB No. 0127-004-MAT1450.001	
	PROJECT Horseshoe - Wellsite	TAG No. H-4000	
LINE HEATER DATA SHEET	LOCATION b - 65- F / 94-B-10	SERVICE: LINE HEATER Package	
		SIZE Seller to Size	

**** SELLER TO SPECIFY - Note 1**

MODEL No. ** TYPE Split Coil - Glycol/Water Bath - Indirect Heater

PROCESS DESIGN (TUBESIDE)		COIL NO.1		COIL NO.2		COIL NO.3	
		IN	OUT	IN	OUT	IN	OUT
PROCESS DUTY	kW	335.1		173.7		219.7	
TYPE OF FLUID		Sour Gas and Liquids		Sour Gas and Liquids		EG/H2O, 50:50 mass basis	
TOTAL FLUID	kg / hr	25010		25010		6156	
TOTAL VAPOUR	kg / hr	24940	24950	24950	24960	0	0
TOTAL LIQUID	kg / hr	66	53	59	49	6156	6156
TOTAL SOLIDS	kg / hr	0	0	0	0	0	0
DRY GAS FLOW RATE	MMSCFd	30		30		0	0
DENSITY (vapour)	kg / m^3	89.88	80.96	62.58	59.01	N/A	N/A
DENSITY (liquid)	kg / m^3	1015	1003	1009	1002	1059	1026
VISCOSITY (vapour)	cP	0.01466	0.01473	0.01356	0.01369	N/A	N/A
VISCOSITY (liquid)	cP	1.014	0.7185	0.8589	0.7185	1.956	0.912
SPECIFIC HEAT (vap/liq)	kJ / kg ^oC	3.05 / 4.30	2.91 / 4.30	2.77 / 4.30	2.72 / 4.30	3.42	3.55
LATENT HEAT	kJ / kg	458.8	460.50	502.7	504.3	N/A	N/A
TEMPERATURE	^oC	19.50	35	26.60	35	40	80
OPERATING PRESSURE	kPag	10500	10400	7988	7888	4330	4230
THERMAL COND (vap/liq)	W / m ^oC	0.0450 / 0.603	0.0450 / 0.625	0.041 / 0.613	0.042 / 0.625	0.533	0.550
MIN. FLUID VELOCITY	m/s	**	**	**	**	**	**
FOULING RESISTANCE	m^2 ^oC/W	0.000528		0.000528		**	
U-VALUE FOR DESIGN	W / m^2 ^oC	**		**		**	
PRESSURE DROP	kPa	100		100		100	

MECHANICAL DESIGN (TUBESIDE)		COIL NO.1	COIL NO.2	COIL NO.3
DESIGN PRESSURE	kPag	36500	13962	13962
DESIGN TEMPERATURE	^oC	100	100	100
MIN. DESIGN TEMP.	^oC	-29	-29	-29
CONNECTIONS (Inlet/Outlet)		6"/6"	6"/6"	2"/2"
TUBE/HEADER MATERIAL		3"/3" SA-3333 Gr-B	SA-333 Gr-6	SA-106 Gr-B
TUBE SIZE/SCHEDULE		**	**	**
NO. PASSES		2	2	22
NO. PARALLEL ROWS		4	1	1
TOTAL NO. TUBES		8	2	22
TUBE LENGTH	m	7468	7315	7214
CORROSION ALLOWANCE	mm	3.2	3.2	1.6
DESIGN CODES		ASME B 31.3 (Latest)	ASME B 31.3 (Latest)	ASME B 31.3 (Latest)
WEIGHT	kg	**	**	**

PROCESS DESIGN (SHELLSIDE)		
BATH FLUID		EG / Water
AVG. TEMPERATURE	^oC	85
DENSITY	kg / m^3	1023
VAPOUR PRESSURE	kPaa	45.57
VISCOSITY	cP	0.8661
SPECIFIC HEAT	kJ / kg ^oC	3.67
FOULING RESISTANCE	m^2 ^oC/W	0.005°F-ft²-hr/BTU
THERMAL COND	W / m ^oC	0.4112
EXTERNAL CIRCULATION RATE	m^3/hr	N/A
COEFFICIENT OF EXPANSION	m^3/kg^oC	**
GAS BLANKET PRESSURE	kPag	N/A
BATH FLOW ARRANGEMENT		N/A

MECHANICAL DESIGN (SHELLSIDE)		
DESIGN PRESSURE	kPag	Atms
DESIGN TEMPERATURE	^oC	100
MIN. DESIGN TEMP.	^oC	-45
CORROSION ALLOWANCE	mm	None
DESIGN CODES		API 12K
BATH RECIRCULATION PUMP CAPACITY:		N/A
BAFFLE ARRANGEMENT		**
EXPANSION TANK SIZE	m^3	1.388
INSULATION/TYPE	mm	38H
SKID MOUNTED (yes/no)		Yes
REMARKS:		

REV	DESCRIPTION	DATE	PROC	ME	CHKR	PE/PM	Data Sheet Number	Rev
0	Issue for Purchase	28/05/08	DN	KL	MN	RS	DS-Horseshoe-H-4000	0

DWV Projects	DOCUMENT Ref:	DS-Horseshoe-H-4000	MR No.:	BC0127-004-MAT1450.001	PAGE 2 OF 2
	CLIENT		JOB No.	BC0127-004-MAT1450.001	
	PROJECT	Horseshoe - Wellsite	TAG No.	H-4000	
LINE HEATER DATA SHEET	LOCATION	b - 65- F / 94-B-10	SERVICE	LINE HEATER Package	
			SIZE	Seller to Size	

**** SELLER TO SPECIFY - Note 1**

			AVAILABLE FUEL GAS PRESSURE	kPag	689
FUEL		Natural Gas	FUEL GAS PRESSURE AT BURNER	kPag	**
SWEET OR SOUR	°C	SOUR *	GAS TEMP. AT INL (max/min)	°C	35 / -45
LOWER HEATING VALUE	kJ / Sm^3	33900	NO. OF BURNERS		**
AVG. FIRETUBE FLUX	kW/m^2	**	NO. OF PASSES		**
STACK TEMPERATURE	°C	**	TUBE MATERIAL		**
SITE ELEVATION	m	Note 4	STACK MATERIAL		**
TUBE AREA	m^2	**	STACK HEIGHT	m	**
EFFICIENCY (based on LHV)		**	CORROSION ALLOWANCE	mm	**
% LIQUIDS IN FUEL		0	DESIGN CODES		**
			BURNER(S):		**

REMARKS:

* 0 PPM < H2S < 20 PPM

INSTRUMENTATION & CONTROLS (Refer to Applicable Data Sheets) -- SELLER TO SPECIFY

TAG NO.	DESIGNATION	DESCRIPTION	SPECIFICATION

NOTES:

1. COIL AND SHELL NAMEPLATES TO BE AFFIXED AS PER **6.1 API 12K.**
2. ALL COMPONENTS IN CONTACT WITH THE PRODUCED SOUR GAS SHALL COMPLY WITH THE LATEST EDITION OF **NACE MR0175 / ISO15156** STANDARDS.
3. PLEASE REFER SITE DATA # **DS-HORSESHOE-SITE DATA**
4. PRODUCED GAS IS EXPECTED TO CONTAIN ABOUT **1.5 % CO2** AND **150 ppm H2S** AND **0.5 BBL/MMSCF** OF FREE WATER.
5. **ALL INSTRUMENTS ARE TO BE CSA APPROVED, SHALL HAVE SECONDARY PROCESS SEAL AND HAVE CRN NUMBER**
6. ALL INSTRUMENT TUBING & FITTINGS ARE TO BE 316 SST, SWAGELOK, NO EQUAL
7. NO YELLOW METALS ALLOWED
8. START-UP CONDITIONS REQUIRE A PROCESS ABSORBED DUTY OF 728.5 KW (capable of Heating 12MMSCFD at 35MPag)

Remarks:

REV	DESCRIPTION	DATE	PROC	ME	CHKR	PE/PM	Data Sheet Number	Rev
0	Issue for Purchase	08/05/26	DN	KL	MN	RS	DS-Horseshoe-H-4000	0

IMV Projects	DOCUMENT REF.: DS-Horseshoe-BU-4100	MR No. BC0127.004-MAT1450.001	Page 1 OF 1
	CLIENT:	JOB No. BC0127-004	
	PROJECT: HORSESHOE - Wellsite	TAG No. BU-4100	
BUILDING DATA SHEET	PLANT LOCATION: b - 65 - F / 94-B-10	SERVICE Line Heater Building	

** Seller to Specify - Note 4

FABRICATION SPEC: | QUANTITY One(1)

MANUFACTURER:

BUILDING TYPE

- ☐ SELF FRAMING - SHED ROOF
- ☑ SELF FRAMING - GABLE ROOF
- ☐ RIGID FRAME
- ☐ OTHER

BUILDING CONSTRUCTION

- ☑ STEEL SKID MOUNTED
- ☐ CONCRETE FOUNDATION MOUNTED
- ☑ NEW CONSTRUCTION
- ☐ ANNEX TO EXISTING BUILDING

DESIGN DATA

SPAN (m)	**	ROOF SNOW LOAD (kPag)	Note 1
LENGTH (m)	6.096 * 4.115	WIND LOAD (kPag)	Note 1
EAVE HEIGHT (m)	**	RAIN LOAD (kPag)	Note 1
ROOF SLOPE	4:12	EARTHQUAKE ZONE	Note 1
OTHER		OTHER	

MATERIALS AND FINISH

		EXTERIOR SHEATHING		INTERIOR LINER
ROOF	MATERIAL	**	ROOF	**
	THICKNESS (ga)	**		**
	COLOR	Note 3		**
WALL	MATERIAL	Steel		**
	THICKNESS (ga)	**	WALL	Aluminum
	COLOR	Note 3		**
TRIM COLOR		**		White
INSULATION	ROOF (R value)	R20		**
	WALLS (R value)	R12 c/w 6.0mm thick vapour barrier		R20/R12 C/W mm Thick VB
			LINER	☐ FLAT ☑ FLUTED

EAVES TROUGH	(Yes)	QTY **	SIZE **	LENGTH (m) **			
DOWN SPOUTS	(Yes)	QTY **	SIZE **	LENGTH (m) **			
ANCHOR BOLTS	(N/A)	QTY N/A	SIZE N/A	SUPPLIED BY			
ICE RAKES		☑ YES ☐ NO	LOCATION Note 1	OTHER			

ACCESS AND OPENINGS

MANDOORS	SINGLE	QTY 1	SIZE **	MATERIAL **	FRAME (ga) **	INSULATION (R) **	
	DOUBLE	QTY 1	SIZE **	MATERIAL **	FRAME (ga) **	INSULATION (R) **	
	CUSTOM	QTY	SIZE	MATERIAL	FRAME (ga)	INSULATION (R)	
		☑ IWG WINDOW	☑ LOCKSET	☑ PANIC HARDWARE	☑ HYDRAULIC CLOSURE		
		☑ WEATHER STRIP	☑ THRESH HOLD	☑ CHECK CHAIN	☑ CANOPY		
EQUIPMENT DOORS		QTY	SIZE	MATERIAL	☐ MANUAL	☐ POWER	
		☐ SLIDING	☐ ROLL UP	☐ OVER HEAD	☐ INSULATION		
REMOVABLE PANELS		QTY	SIZE	MATERIAL			
EQUIPMENT OPENINGS		QTY	SIZE	QTY SIZE	QTY SIZE		
WINDOWS		QTY 2	SIZE **	QTY SIZE	GLAZING Double		
		☑ HORIZONTAL	☐ VERTICAL	☑ BUG SCREEN	☐ IWG		
TRANSLUCENT PANELS		☐ END WALLS (% of wall area)		COLOR			
		☐ SIDE WALLS (% of wall area)		COLOR			
REMARKS		Windows to be double glazed and to come with half screens					

HEATING, VENTILATION AND CRANES

HEATING	☐ STEAM	☐ GLYCOL	☐ ELECTRIC	☑ CATADYNE ** (Note 2)	
RIDGE VENTILATOR	A/C per HOUR	LENGTH (m)	THROAT SIZE (mm)	BIRD SCREEN	
LOUVRES	A/C per HOUR **	SIZE (mm x mm) **	QTY 2	TYPE	
	☐ AUTOMATIC	☑ MANUAL	☐ STORM HOOD	☐ FILTER	☑ BIRD SCREEN
EXHAUST FANS	A/C per HOUR 12	QTY **	POWER (hp)	As Requir VOLT / PH / Hz	120 / 1 / 60
	☐ INTAKE	☑ EXHAUST	☑ REVERSIBLE	☐ ONE WAY	☐ TWO SPEED
	☑ EXP PROOF	☐ TEFC	☑ WALL MOUNT	☑ ROOF MOUNT	☐ OTHER
CRANE	TYPE	MFG	CAPACITY (ton)		
	HOIST	TROLLEY	BRIDGE		
	HOIST SPEED	TROLLEY SPEED	AREA CLASSIFICATION		
			MIN HOOK HEIGHT (m)		

REMARKS

1. Refer to Site Data Sheet (DS-Horseshoe-Site Data)
2. Building heater sized by Seller to maintain 10°C inside temperature with an outdoor temperature of -45°C. Heater to include 12VDC Starter c/w 25' of cable and truck clamp, reducing valve, thermostat, and fume hood. Fuel source to be Natural Gas w/ H2S < 20 ppm
3. Painting of equipment and structural steel will be as follows;
   Structural Steel - primed and painted black, Process piping - light machine gray where exposed, Buildings – tan with dark brown trim
4. Seller has to provide all informaiton on submitted drawings

REV	DESCRIPTION	DATE	MECH	CHKR	PE/PM	DATA SHEET NUMBER	REV
A	Issue for Quotation	08/04/08	MN	MN	RS		
0	Issue for Purchase	08/05/28	KL	MN	RS	DS-Horseshoe-BU-4100	0

Lineheater Design Conditions (Duty: 2.5 MM BTU/hr)

Gas Flowrate	Flowing Wellhead Pressure	Temperature at				Pressure at Lineheater Outlet
		Preheat Coil Inlet	Preheat Coil Outlet	Reheat Coil Inlet	Reheat Coil Outlet	
MMscfd	kPag	°C	°C *	°C*	°C*	kPag*
2	35000	28.5	73	40	66	10500
8	30000	28.5	57.9	26.8	44.2	10500
18	20000	28.5	47.8	27.4	38.3	10500
21	15000	28.5	46.4	35.6	43.9	10500

*	**<u>These Information have been quoted by seller</u>**	**Rev 0**