

INTRODUCTION

SPECIFICATION	AEC WEST, CLAIRMONT SOUR OIL / GAS BATTERY
THERMO DESIGN ENGINEERING LTD.	INLET SEPARATOR PACKAGE OPERATIONS MANUAL

1. INTRODUCTION

1.1 PROCESS SKIDS

The following Process Description pertains specifically to the **Clairmont Sour Oil / Gas Battery**.

For better understanding of this description it is suggested that the **Piping & Instrumentation Drawing D-97043-F-109** be available for reference:

The **Inlet Separator (V-3101)** dimensions and interconnecting piping sizes were determined by Titan Projects in Calgary. The mechanical design of the vessel, all on-skid piping and structural supports and skid was by Thermo Design Engineering.

The Gas Processing package includes:

- Inlet Separator Vessel
- Separator Package Skid
- Instrumentation, Piping and Valves
- Building, Heating and Ventilation Systems

1.2 DESIGN BASIS

1.2.1 GAS FEED SPECIFICATIONS - NORMAL FLOW

- Service Sour
- Flow 30,550 Sm³/hr
- Pressure 3100 kPag
- Temperature 21°C
- Critical Temperature -46°C
- Critical Pressure 8,117 Kpa(a)
- Specific Heat Ratio 1.22
- Viscosity 0.012 cP
- Molecular Weight 19.7 kg/kmol
- Density 31.4 kg/m³

REFERENCES: JOB NUMBER: 9087-0780	PREPARED BY: JRH	DATE: FEB98	REV 0	
INTRODUCTION PAGE 1 OF 3	CHECKED BY:	DATE:		

SPECIFICATION	AEC WEST, CLAIRMONT SOUR OIL / GAS BATTERY		
THERMO DESIGN ENGINEERING LTD.	INLET SEPARATOR PACKAGE OPERATIONS MANUAL		
1.2.2 HC FEED SPECIFICATIONS - NORMAL FLOW			
• Service	Sour		
• Flow	6 m³/hr		
• Pressure	3100 kPag		
• Temperature	21°C		
• Critical Pressure	6,013 Kpa(a)		
• Vapor Pressure	3100 kPag		
• Density	722 kg/m³		
• Viscosity	0.685 cP		
1.2.3 WATER FEED SPECIFICATIONS - NORMAL FLOW			
• Service	Sour		
• Flow	0.64 m³/hr		
• Pressure	3100 kPag		
• Temperature	21°C		
• Critical Pressure	22,125 Kpa(a)		
• Vapor Pressure	3100 kPag		
• Density	1011 kg/m³		
• Viscosity	0.98 cP		
1.2.4 SITE CONDITIONS			
Not Applicable			
1.2.5 UTILITIES			
• Instrument Air	100 Psig / 50°F		
• Power	Not Applicable		
REFERENCES: JOB NUMBER: 9087-0780	PREPARED BY: JRH	DATE: FEB98	REV 0
INTRODUCTION PAGE 2 OF 3	CHECKED BY:	DATE:	

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1.3 PROCESS DESCRIPTION

1.3.1 SEPARATION

The three gas oil water mixture enters the **Inlet Separator (V-3101)** from the skid edge connection. The mixture is diverted by a deflector against the inlet head to aid in separation of entrained water and hydrocarbons. Further separation of water and hydrocarbon droplets from the gas occurs as the gas mixture travels down the length of the vessel to the outlet nozzle. Further separation in the vessel is possible due to the differences in densities between the gas and liquid phases. The vessel length allows tangential separation of liquid droplets into the liquid zone based on the settling velocity of the liquid droplets and the residence time of the liquid droplets across the separation path. A removable mesh pad at the vessel exit nozzle ensures that no large droplets of liquid leave the vessel.

The liquid zone of the Inlet Separator contains two wave breakers to assist separation of the oil and water phases. The wave breakers reduce turbulent flow through the vessel and enhance a smoother flow direction. A 305mm (12") weir plate is installed at the exit end of the vessel for hydrocarbon spill over. The wave breakers and weir plate are removable. The weir plate is non-adjustable.

The Inlet Separator instrument connections are based on the following design levels:

- HCNLL 406mm (16")
- WNLL 229mm (9")
- LSHH 1168mm (46")
- LSLl 330mm (13")

1.3.2 MEASUREMENT

The Inlet Separator Package contains measurement devices for gas, water and hydrocarbon products from the vessel. Gas measurement is achieved using a Daniel Senior Meter Tube. Liquid measurements are made by Rosemount Smart Vortex Meters. Due to the small flow rate of water and the minimum flow requirement for the Rosemount Vortex Meters, the water control valve on the Inlet Separator is snap acting.

REFERENCES: JOB NUMBER: 9087-0780	PREPARED BY: JRH	DATE: FEB98	REV	
INTRODUCTION PAGE 3 OF 3	CHECKED BY:	DATE:	0	

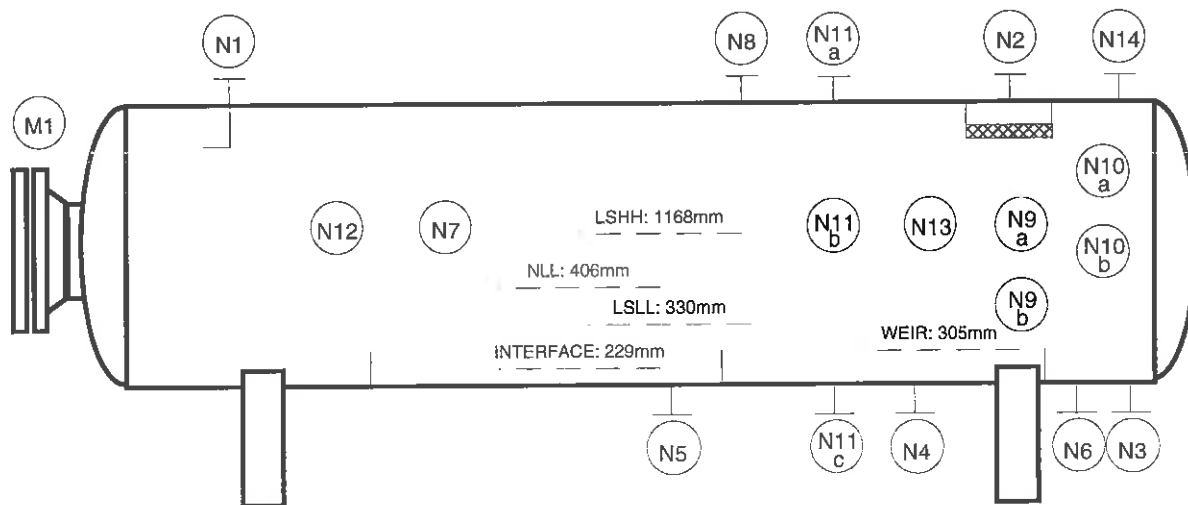
Major Equipment

SPECIFICATION

AEC WEST, CLAIRMONT SOUR OIL / GAS BATTERY

THERMO DESIGN
ENGINEERING LTD.INLET SEPARATOR PACKAGE
OPERATIONS MANUAL**2. MAJOR EQUIPMENT****2.1 INLET SEPARATOR (V-3101)**

ITEM	3 PHASE SEPARATOR			TAG	V-3101	SIZE	1830mm ID x 9145mm S/S		
SERVICE		PRESSURE	TEMP.	SPECIAL NOTES					
DESIGN		9755 kPag	66°C	SOUR SERVICE					
OPERATING		3100 kPag	21°C						
MDMT	-28.9°C	CORR. ALL.	3.2mm						
CODE	ASME SECTION VIII, DIV. I								
WELD INSPECTION		100% RADIOGRAPHY		NOZZLE SCHEDULE					
UT ON SHELL, HEADS & CAT "D" WELDS				MARK	SIZE	QNTY	RATING	TYPE	SERVICE
STRESS RELIEVE		YES		M1	500	1	600#	RFWN	MANWAY
SPEC	MATERIAL	TYPE	THICKNESS	N1	200	1	600#	RFWN	GAS INLET
SHELL	SA-516-70N	ROLLED PLT	82.55mm	N2	150	1	600#	RFWN	GAS OUTLET
HEADS	SA-516-70N	2:1 SE	82.55mm	N3	50	1	600#	RFWN	CONDENSATE OUT
INTERNALS SUMMARY				N4	50	1	600#	RFWN	WATER OUT
INLET DEFLECTOR, WEIR PLATE, WAVE BREAKERS				N5	50	1	600#	RFWN	DRAIN
REMOVABLE MIST EXTRACTOR, 144kg/m³				N6	50	1	600#	RFWN	SPARE
VORTEX BREAKERS ON LIQUID OUTLETS				N7	50	1	600#	RFWN	ANODE (C/W BLIND)
INSULATION	2" ON HEADS ONLY			N8	80	1	600#	RFWN	PSV
				N9	50	2	600#	RFWN	LSLL
SURFACE PREPARATION		COMMERCIAL BLAST TO		N10	50	2	600#	RFWN	LSHH
SSPC-SP6				N11	50	3	600#	RFWN	LEVEL BRIDLE
PAINTING	ONE COAT PRIMER, TWO COATS			N12	50	1	600#	RFWN	TG
FINISH ON EXPOSED SURFACES				N13	100	1	600#	RFWN	LIQUID SLUG FINGER
				N14	80	1	600#	RFWN	VAPOR SLUG FINGER

REFERENCES: JOB NUMBER: 9087-0780
MAJOR EQUIPMENT

PAGE 1 OF 1

PREPARED BY: JRH
CHECKED BY:DATE: FEB98
DATE:REV
0



APPENDIX A

PROCESS & INSTRUMENTATION DIAGRAM

H-3101A/B
BUILDING HEATERS
MAKE: CATADYNE MODEL BX 24x60
TYPE: INFRA-RED
DUTY: 17.57 kW
POWER: 120V

A/B
EXHAUST FANS
MAKE: ENERTECH
POWER: 187 kW, 120V/1Ø/60 HZ



- [illegible]



AEC WEST
CLAIRMONT SOUR OIL/GAS BATTERY
UNIT 3000: INLET GAS SEPARATION
PIPING & INSTRUMENTATION DIAGRAM

CADD NO.	PROJECT NO.	DRAWING NO.
043F109	97043	0-97043-F-109

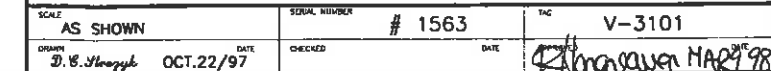
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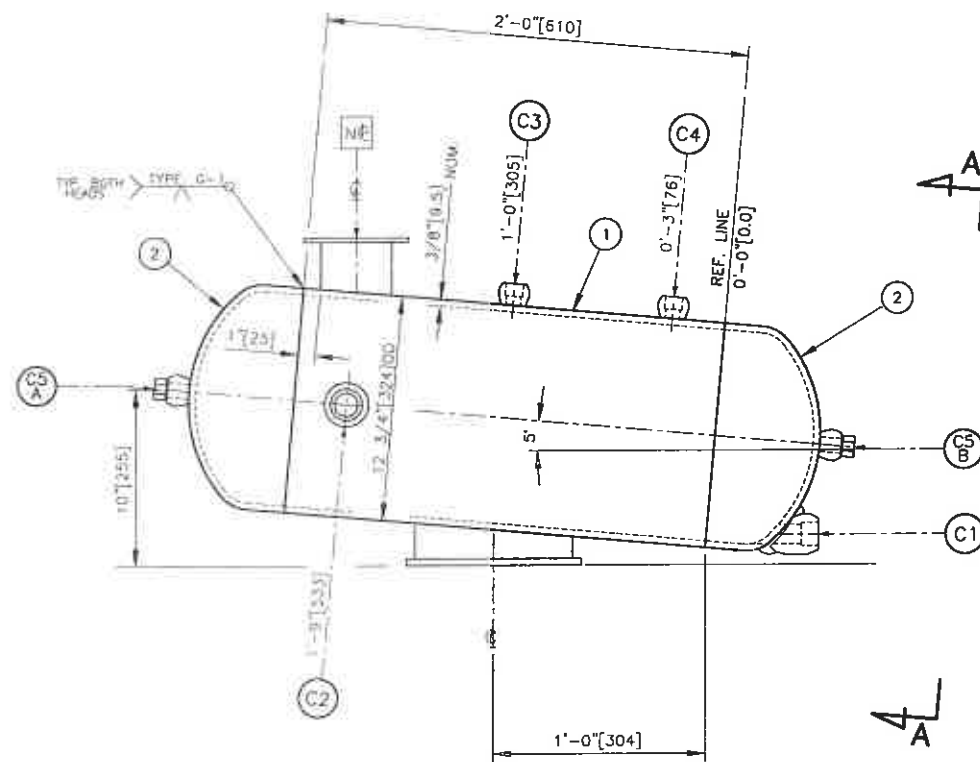
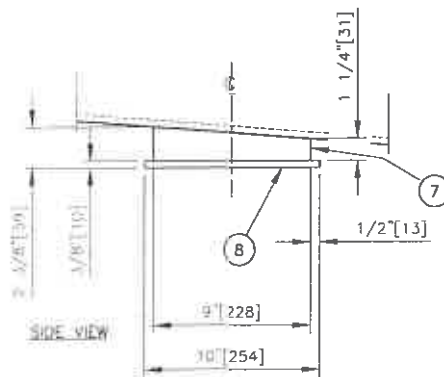
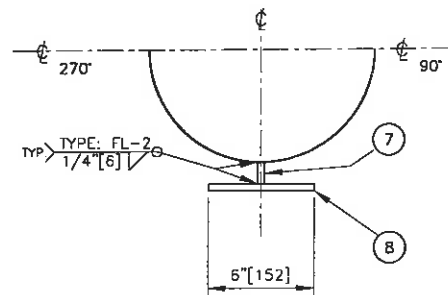
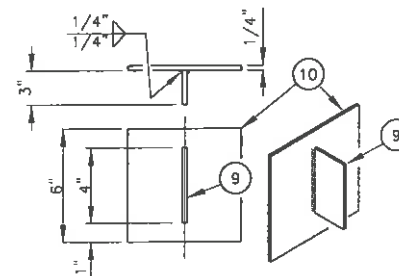
APPENDIX B

MECHANICAL DRAWINGS





Rev. 02 12/98 - 02-27-01 DWG Name: T:\PROJECT\CLAIMONT VESSEL\BLOW.DWG Updated By: Wes

SIDE VIEW
SCALE: 1:5MOUNTING SHOE DETAIL
SCALE: 1:5END VIEW "A-A"
SCALE: 1:5NAME PL BRACKET DET.
N.T.S.

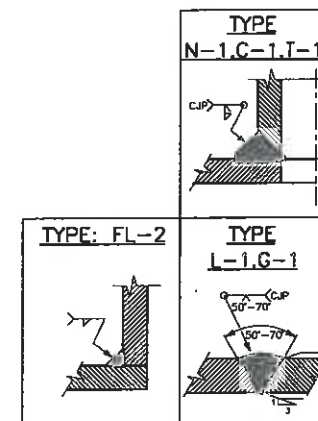
NOZZLE SCHEDULE

MARK	SIZE	QTY	TYPE	RATING	SCH	PROJ	MAT'L	ITEM#	SERVICE
C1	1" [25]	1	E-O-L	3000#			A	11	LIQUID OUTLET
C2	1" [25]	1	S-O-L	3000#			A	3	LIQUID INLET
C3	3/4" [20]	1	S-O-L	3000#			A	4	GAS INLET
C4	3/4" [20]	1	S-O-L	3000#			A	4	GAS OUTLET
C5	3/4" [20]	2	T-O-L	3000#			A	5,6	INSPECTION c/w PLUG

* = METHOD OF ATTACHMENT PER UW-16.1

GENERAL NOTES:

- DESIGN & CONSTRUCTION IN ACCORDANCE WITH ASME CODE, SECTION VIII, DIV. 1.
- DESIGN PRESSURE: 150 PSIG @ 150°F [1034 kPa @ 66°C].
- HYDROSTATIC TEST: 225 PSIG [1551 kPa].
- CORROSION ALLOWANCE: 1/8" [3.18 mm].
- POST WELD HEAT TREATMENT: STRESS RELIEVE @ 1150°F FOR 60 MIN.
- RADIOGRAPHY: FULL (100%).
- MINIMUM DESIGN METAL TEMPERATURE: -20°F [-29°C].
- (MIT): AS PER UG-20(r).
- USE "TDE" WPS#: 861.2 (TDE-2, TDE-3, TDE-4).
- PAINT: COMM. SANDBLAST TO SSPC-SP6; ONE COAT ZINC CHROMATE PRIMER, TWO COATS INDUSTRIAL ENAMEL FINISH.
- INSULATION: NONE.
- SHIPPING WEIGHT: 200 LBS [91 kg].
- CAPACITY: 1.77 FT³ [0.050 m³].
- REMOVE ALL WELD SLAG.
- VESSEL TO BE THOROUGHLY CLEANED INSIDE & OUTSIDE.



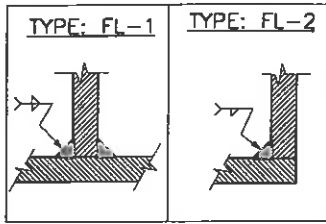
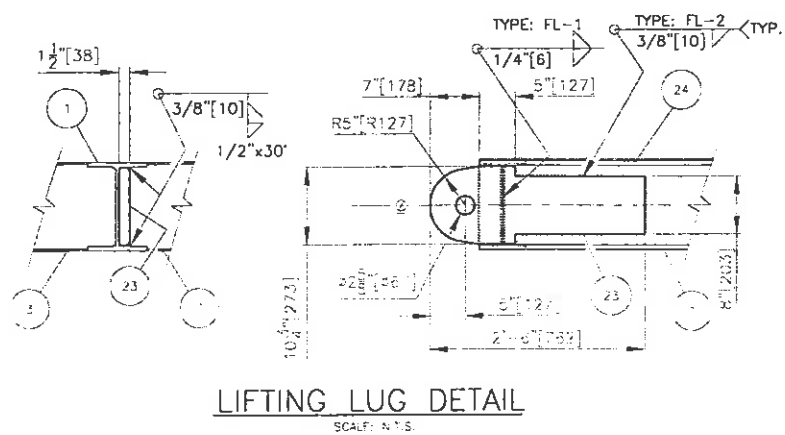
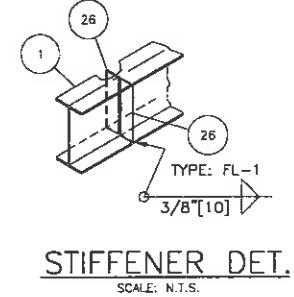
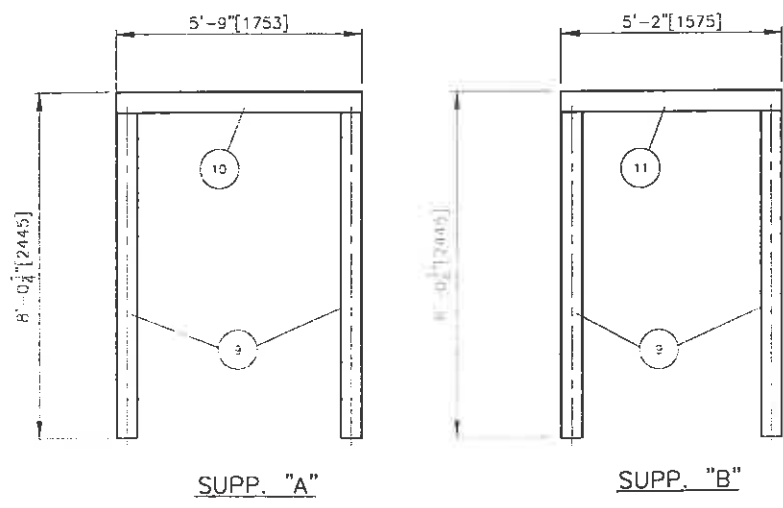
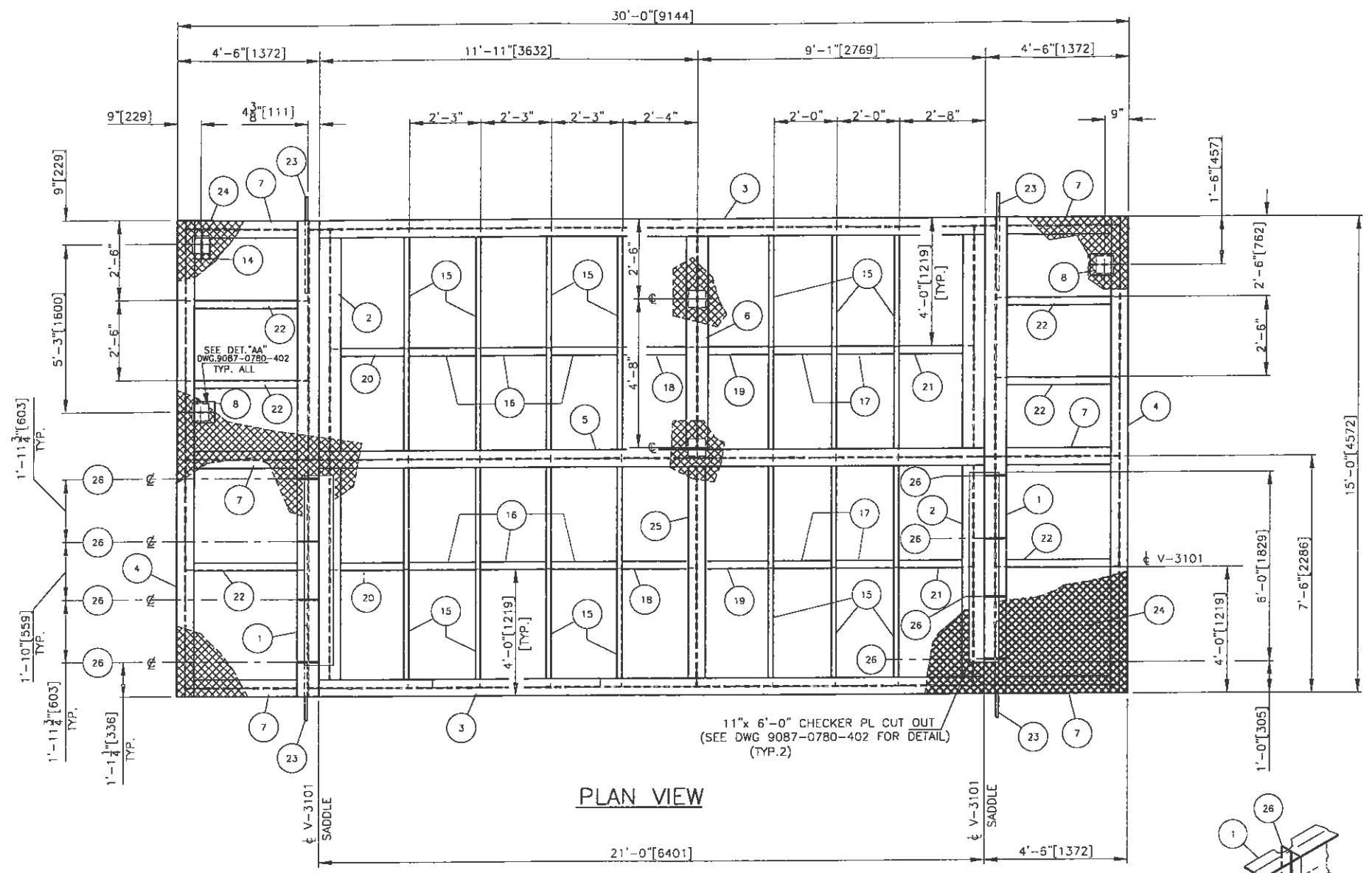
ITEM	QTY	DESCRIPTION	MATERIAL
1	1	1" [25] - 3000# SW ELBOW-O-LET	SA-105N
10	1	1/4" [6] PL @ 6" [152] x 6" [152] LG	NAME PL SA-36
9	1	1/4" [6] PL @ 3" [76] x 4" [102] LG - TRIM AS REQ'D	BRACKET SA-516-70
8	1	3/8" [10] PL @ 6" [152] x 10" [254] LG	SA-36
7	1	3/8" [10] PL @ 2" [51] x 9" [229] LG - TRIM AS REQ'D	SA-516-70
6	2	3/4" [20] - 3000# NPT HEX. HEAD PLUG	SA-105
5	2	3/4" [20] - 3000# NPT FS THREAD-O-LET	SA-105N
4	2	3/4" [20] - 3000# SW SOCK-O-LET	SA-105N
3	1	1" [25] - 3000# SW SOCK-O-LET	SA-105N
2	2	12 3/4" [324] OD - SCH STD BW CAP	SA-234-WPB
1	1	12 3/4" [324] OD SCH STD SMLS PIPE @ 2'-0" [610] LG	SA-106-B

MATERIAL LIST

REVISION	DATE	BY
2	AS BUILT	MAR.05/98 W.W.K.
1	ADDED INFORMATION TO GENERAL NOTE #1 (VESSEL TO BE STAMPED UN).	DEC.19/97 W.W.K.
0	ISSUED FOR FABRICATION	DEC.03/97 W.W.K.

REVISION	DATE	BY
2	9087-0780-202	ATS REV.#2

CLAIMONT SOUR GAS / OIL BATTERY LSD 1-9-73-6 W6M AEC WEST c/w TITAN PROJECTS LTD. (PROJECT No.: 97043) 12 3/4" [324] OD x 2'-0" [610] S/S BLOWCASE - GAS SEPARATOR SKID	SCALE: 1:5 DRAWN: WES K. DATE: NOV.26/97	SEAL NUMBER: #1547 CHECKED: DATE: TAC: SP-3101
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- GENERAL NOTES:**
- 1. SURFACE PREPARATION: COMMERCIAL SANDBLAST PER SSPC-SP6
 - 2. PAINTING: PRIMER - (1) COAT
FINISH - (1) COAT (ANTI-SLIP) GREY ENAMEL
 - 3. SHIPPING WEIGHT: 8140 LBS (3700 kg)
 - 4. FOR PIPING LAYOUT SEE DWG. 9087-0780-301
 - 5. FOR SKID DETAILS SEE DWG.: 9087-0780-402

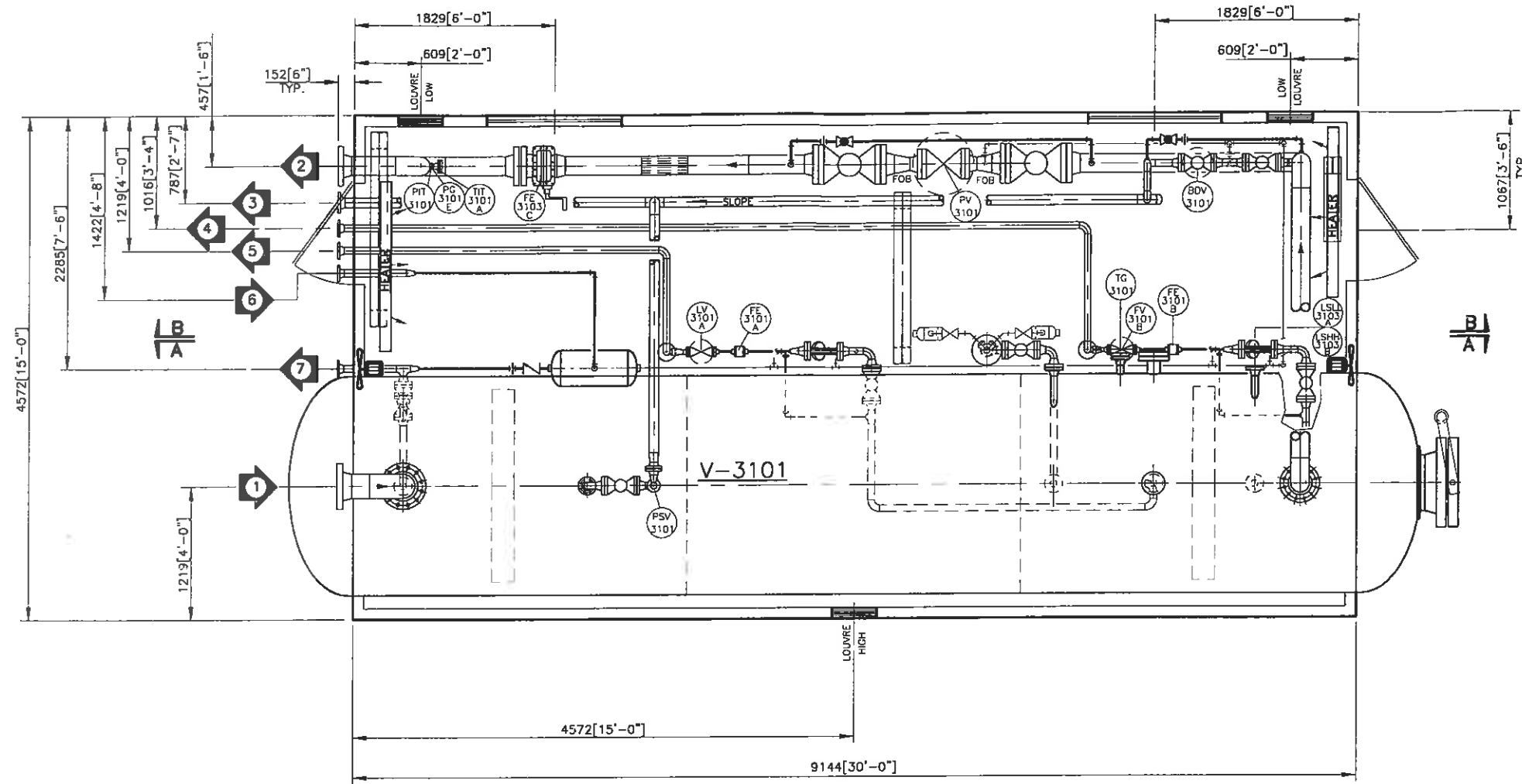
ITEM	QTY	DESCRIPTION	LENGHT	MATERIAL	REMARKS
26	16	FB3 1/2"x1/2" [FB89x13]	10 7/8"	SA-36	STIFFENER
25	1	W12x26# [W310x39]	7'-2 3/8"	G40.21-300W	
24	1	1/4" CHECKER PL	15'-0" x 30'-0"	SA-36	
23	4	1 1/2" PL x 10 3/4"	2'-6"	SA-36	LIFT LUG
22	6	L3x3x1/4" [75x75x6]	3'-10 1/4"	G40.21-300W	
21	2	L3x3x1/4" [75x75x6]	2'-3 1/2"	G40.21-300W	
20	2	L3x3x1/4" [75x75x6]	2'-5 1/8"	G40.21-300W	
19	2	L3x3x1/4" [75x75x6]	2'-4 1/8"	G40.21-300W	
18	2	L3x3x1/4" [75x75x6]	2'-3 1/2"	G40.21-300W	
17	4	L3x3x1/4" [75x75x6]	1'-11 5/8"	G40.21-300W	
16	6	L3x3x1/4" [75x75x6]	2'-2 5/8"	G40.21-300W	
15	14	C6x8.2# [C150x12]	7'-2 1/2"	G40.21-300W	
14	1	W6x15# [W150x22]	0'-10"	G40.21-300W	
13					
12	1	W6x15# [W150x22]	2'-6"	G40.21-300W	
11	1	W6x15# [W150x22]	5'-2"	G40.21-300W	
10	1	W6x15# [W150x22]	5'-9"	G40.21-300W	
9	5	W6x15# [W150x22]	7'-6 1/4"	G40.21-300W	
8	2	W8x31# [W200x46]	0'-10"	G40.21-300W	
7	6	W12x26# [W310x39]	3'-10 1/4"	G40.21-300W	
6	1	W8x31# [W200x46]	7'-2 3/8"	G40.21-300W	
5	1	W12x26# [W310x39]	21'-7 1/2"	G40.21-300W	
4	2	W12x26# [W310x39]	15'-0"	G40.21-300W	
3	2	W12x26# [W310x39]	21'-7 1/2"	G40.21-300W	
2	4	W12x50# [W310x74]	7'-2 3/8"	G40.21-300W	
1	2	W12x50# [W310x74]	15'-0"	G40.21-300W	

MATERIAL LIST				
3	AS BUILT		WAR/98	S.R.
2	BEAM #1 GUSSETS ADDED, CONFIRM LIFTING LUG DESIGN.		DEC.15/97	S.R.
1	RELEASED FOR FABRICATION		DEC.08/97	S.R.
0	ISSUED FOR APPROVAL		NOV/97	J.D.
#	REVISION			DATE BY
 THERMO DESIGN ENGINEERING LTD. 24 & GAS PRODUCTION EQUIPMENT DESIGN • FABRICATION • INSTALLATION			THIS DRAWING IS THE CONFIDENTIAL PROPERTY OF TDE AND IS ISSUED ON THE UNDERSTANDING THAT NOTHING IS TO BE COPIED OR COMMUNICATED TO A THIRD PARTY WITHOUT THE WRITTEN AUTHORIZATION OF TDE.	
DRAWING NUMBER 9087-0780-401A			ATS	REV.# 3
CLAIRMONT SOUR OIL/GAS BATTERY LSD : 1-9-73-5 W6M				
A.E.C. WEST LTD. C/O TITAN PROJECTS LTD. PROJECT NO: 97043				
3-PHASE SEPARATOR PACKAGE SKID DRAWING & PIPE SUPP.				
SCALE 1 : 25		SERIAL NUMBER		DATE
DRAWN JACK		DATE NOV./97		CHECKED [Signature] DATE NOV.98



APPENDIX C

PIPING PLAN WITH SKID EDGE CONNECTIONS



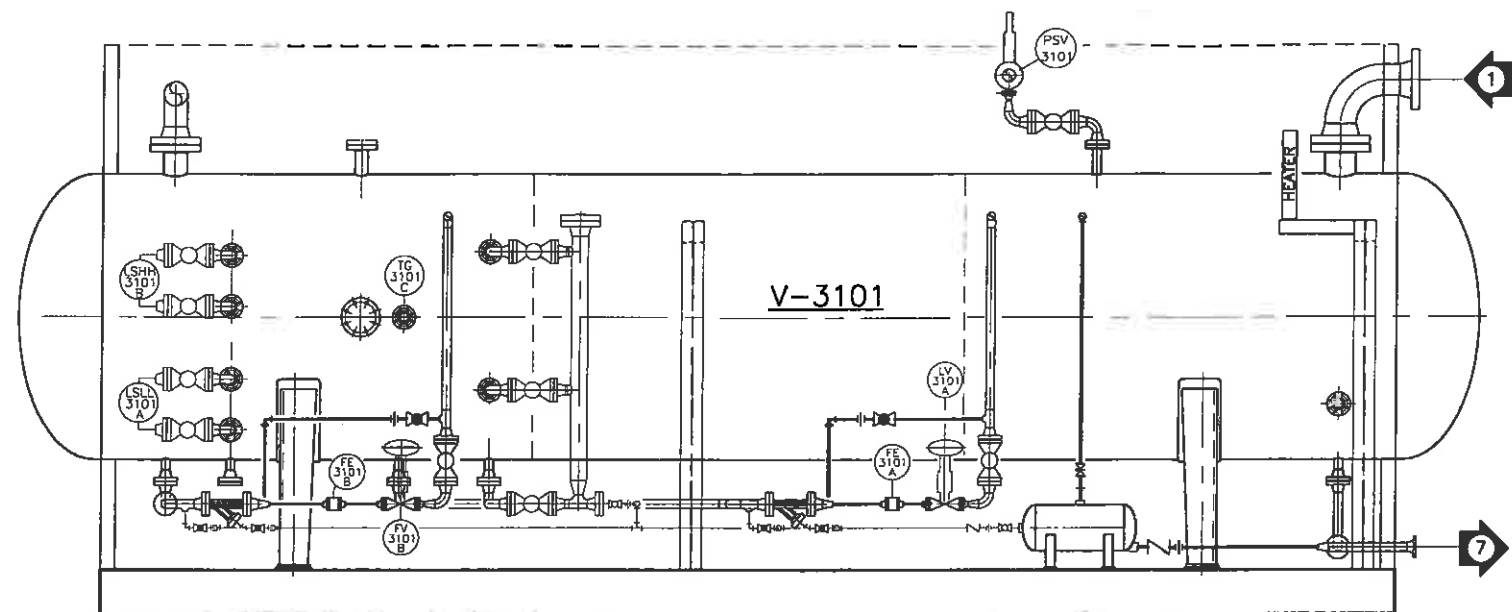
NOTES

1. TOP OF CHECKER PLATE IS 0'-0" (164550 AMSL)
2. DIMENSIONS ARE IN METRIC SYSTEM, IMPERIAL SYSTEM IN BRACKETS
3. CL - CENTER LINE OF PIPE
4. B.O.P. BOTTOM OF PIPE
5. PROVIDE HIGH POINT VENTS AND LOW POINT DRAINS AS REQ'D.
6. TOTAL PACKAGE WEIGHT: 115000LB (52500 kg)

INLETS AND OUTLETS			
#	CONNECTIONS	SERVICE	ELEVATION
1	200(8") - 600# ANSI RFWN FLG.	GAS INLET	B.O.P. 2438 [8'-0"]
2	150(6") - 600# ANSI RFWN FLG.	GAS OUTLET	B.O.P. 2438 [8'-0"]
3	80 (3") - 150# ANSI RFWN FLG.	FLARE HEADER	B.O.P. 2540 [8'-4"]
4	50 (2") - 150# ANSI RFWN FLG.	HC LIQUID OUTLET	B.O.P. 2438 [8'-0"]
5	50 (2") - 150# ANSI RFWN FLG.	WATER OUTLET	B.O.P. 2438 [8'-0"]
6	50 (2") - 150# ANSI RFWN FLG.	FUEL GAS INLET	B.O.P. 2438 [8'-0"]
7	50 (2") - 150# ANSI RFWN FLG.	DRAIN HEADER	C.L. 152 [6"]

ITEM	BUILDING DESCRIPTION
SIZE	4572[15'-0"] WIDE x 9144 [30'-0"] LG x 3558[12'-0"] (FROM CH.PL.) EAVE.
TYPE	SELF FRAMING, GABLE TYPE, ROOF SLOPE 4:12
EXTERIOR	22 GAUGE FLUTED STEEL
COLOR	PANELS: DOFASCO-SURFWHITE TRIM: DOFASCO-SLATE BLUE
INTERIOR	24 GAUGE FLUTED ALUMINUM, PRE-PAINTED WHITE
INSULATION WALL	R12 FIBERGLASS C/W 6 MIL VAPOUR BARRIER, ROOF: R20 FIBERGLASS INSULATION
WINDOW	(2) 914 x 1219 DOUBLE GLAZED, HORIZONTAL SLIDING C/W BUG SCREEN.
RIDGEVENT	(1) 20'-0" C/W MANUAL CONTROLS AND BIRDSCREEN
EXHAUST FAN	(2) 10" XP, 1/4HP 120V/1Ø [SIZED FOR 6AC/HR]
HEATERS	(2) CATADYNE MODEL-BX24x60 [INFRA RED-17.6 KW EACH]
LOUVRES	(3) 16"x16" ADJUSTABLE C/W MANUAL CONTROLS AND BIRDSCREEN
DOORS	(2) 914 [3'-0"] x 2134 [7'-0"] C/W DOOR CLOSURE, LOCKSET, IMG WINDOW, SINGLE STEEL CHECK CHAIN, PANIC HARDWARE & CANOPY
OTHER	ICERAKES, P.ENG.STAMPED BUILDING DRAWING, EAVESTROUGH & DOWNSPOUTS

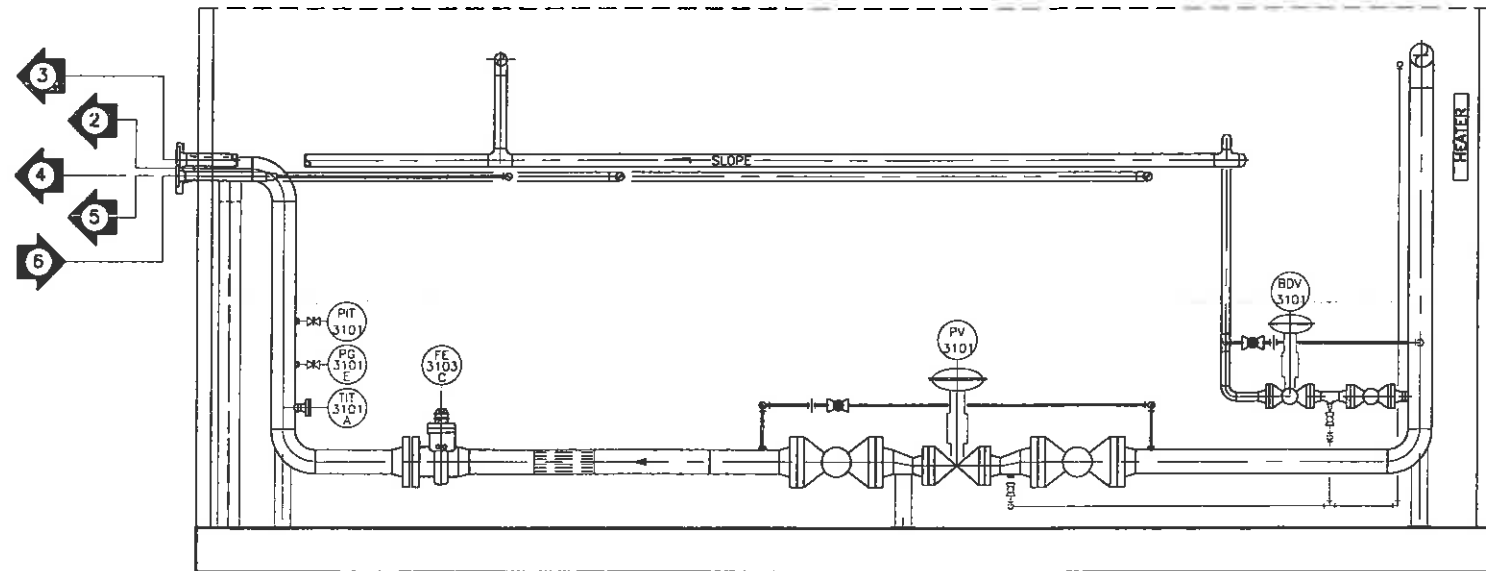
				TDE THERMO DESIGN ENGINEERING LTD.		THIS DRAWING IS THE CONFIDENTIAL PROPERTY OF TDE AND IS NOT TO BE REPRODUCED OR FORWARDED TO ANY OTHER PARTY WITHOUT THE WRITTEN AUTHORIZATION OF TDE.		CLAIRMONT SOUR OIL/GAS BATTERY	
				DESIGN & FABRICATION		1:25		LSD: 1-9-73-5W6M	
				9087-0780-301		SHEET 1 OF 1		AEC WEST LTD. C/O TITAN PROJECTS LTD.	
				DATE NOV.07/97		REV.# 2		PROJECT NO: 97043	
				BY JACK		DATE		SEPARATOR SKID PACKAGE	
								EQUIPMENT AND PIPING LAYOUT	



SECTION A-A

NOTES

1. TOP OF CHECKER PLATE IS 0'-0" [0000] (164550 AMSL)
2. DIMENSIONS ARE IN METRIC SYSTEM, IMPERIAL SYSTEM IN BRACKETS
3. C - CENTER LINE OF PIPE
4. B.O.P. BOTTOM OF PIPE
5. PROVIDE HIGH POINT VENTS AND LOW POINT DRAINS AS REQ'D.
6. TOTAL PACKAGE WEIGHT 115000LB [52500KG]



SECTION B-B

INLETS AND OUTLETS			
#	CONNECTIONS	SERVICE	ELEVATION
1	200(8") - 600# ANSI RFWN FLG.	GAS INLET	B.O.P. 2438 [8'-0"]
2	150(6") - 600# ANSI RFWN FLG.	GAS OUTLET	B.O.P. 2438 [8'-0"]
3	80 (3") - 150# ANSI RFWN FLG.	FLARE HEADER	B.O.P. 2540 [8'-4"]
4	50 (2") - 150# ANSI RFWN FLG.	HC LIQUID OUTLET	B.O.P. 2438 [8'-0"]
5	50 (2") - 150# ANSI RFWN FLG.	WATER OUTLET	B.O.P. 2438 [8'-0"]
6	50 (2") - 150# ANSI RFWN FLG.	FUEL GAS INLET	B.O.P. 2438 [8'-0"]
7	50 (2") - 150# ANSI RFWN FLG.	DRAIN HEADER	C.L. 152 [6"]

				 THERMO DESIGN ENGINEERING LTD. EDMONTON, ALBERTA CANADA		THIS DRAWING IS THE CONFIDENTIAL PROPERTY OF THE FIRM AND IS ISSUED ON THE UNDERSTANDING THAT NOTHING IS TO BE LOANED OR REPRODUCED TO A THIRD PARTY WITHOUT THE WRITTEN AUTHORIZATION OF THE FIRM.				PROJECT: CLAIRMONT SOUR OIL/GAS BATTERY LSD: 1-9-73-5W6M				
				OIL & GAS PRODUCTION EQUIPMENT DESIGN & FABRICATION & INSTALLATION						CLIENT: AEC WEST LTD. C/O TITAN PROJECTS LTD. PROJECT NO: 97043				
2	AS BUILT	MAR/98	JD	DRAWING NUMBER	9087-0780-302	SCALE	1:25	SHEET 1 OF 1	REV.# 2	DATE	ATS			
1	ISSUED FOR FABRICATION	JAN/98	JD	DRAWN	JACK	DATE	NOV.07/97	CHECKED		DATE				
0	ISSUED FOR APPROVAL	NOV/97	JD										ITEM: SEPARATOR SKID PACKAGE PIPING SECTIONS A-A & B-B	
#	REVISION	DATE	BY											