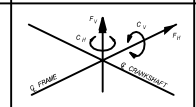


PLAN VIEW

COMPRESSOR UNBALANCED FORCES @ 1200 RPM		
	PRIMARY	SECONDARY
HORIZONTAL FORCE, KN	1.769	0.500
VERTICAL FORCE, KN	0.00	0.00
HORIZONTAL COUPLE, KN-M	16.483	0.160
VERTICAL COUPLE, KN-M	22.921	0.00



CUSTOMER CONNECTIONS		
NO.	DESCRIPTION	SIZE
1	STAGE ONE INLET	6"-150#RF
9	FINAL DISCHARGE	3"-900# RF
16	SCRUBBER DRAIN HEADER	1-1/2" NPT
29	PSV VENT HEADER	4"-150#RF
30	FUEL GAS SUPPLY	2"-150#RF
34	START GAS SUPPLY	2"-150#RF

OTHER CUSTOMER LOCAL CONNECTIONS & VENTS		
NO.	DESCRIPTION	SIZE
C	COMPRESSOR OIL TANK FILL	1" NPT
D	ENGINE OIL TANK FILL	1" NPT
K	START GAS VENT	3" PIPE
P	WASTE OIL TANK VENT	2" PIPE
Q	GLYCOL TANK VENT	2" PIPE
V	WASTE OIL TANK PUMP OUT	2" NPT
W	GLYCOL TANK PUMP OUT	2" NPT

SHIPPING WEIGHTS		UNIT DIMENSIONS	
AA COMPRESSOR: ARIEL JGK/4	2950 KGS	MAIN SKID w/ALL EQUIP MOUNTED	
A1 (2) 9-1/8" K" 1270 PSIG	2330 KGS	LENGTH	14578 mm 47'-11"
A2 (2) 5-3/8" K" 2500 PSIG	1940 KGS	WIDTH	7162 mm 23'-6"
BB ENGINE: CAT 3516TALE	8755 KGS	HEIGHT	6300 mm 20'-9"
SHIPPING DIMENSIONS			
D1 30" DIA., 54" S/S	1000 KGS	LENGTH	11643 mm 38'-3"
D2 20" DIA., 54" S/S	910 KGS	WIDTH	7162 mm 23'-6"
E1 16" DIA., 72" S/S	430 KGS	HEIGHT	5605 mm 18'-6"
E2 18" DIA., 62" S/S	635 KGS	COOLER DIMENSIONS	
E3 12-3/4" DIA., 72" S/S	455 KGS	LENGTH	3200 mm 10'-6"
E4 12-3/4" DIA., 62" S/S	500 KGS	WIDTH	6547 mm 21'-6"
		HEIGHT	3862 mm 12'-9"
PIPING & MISC	2100 KGS		
FF FUEL GAS SCRUBBER	135 KGS		
GG CONTROL PANEL	200 KGS		
SKID	29315 KGS		
BUILDING	3650 KGS		
CRANE	2400 KGS	CC COOLER:	7600 KGS
		MUFFLER	485 KGS
		PIPING & MISC	1000 KGS
TOTAL SHIPPING WEIGHT	57705 KGS	SHIPPED LOOSE ITEMS	9085 KGS
		TOTAL UNIT WEIGHT	66790 KGS

- GENERAL NOTES**
- ALL TAIL DIMENSIONS FROM REFERENCE POINT.
  - THIS DRAWING IS NOT TO BE USED FOR CONSTRUCTION UNLESS STAMPED "RELEASED FOR MANUFACTURE".
  - DO NOT SCALE THIS DRAWING.
  - ALL DIMENSIONS ARE IN MILLIMETERS.
  - FOR DESIGN PARAMETERS AND PAINT SPECIFICATION REFER TO PROJECT SCOPE SUMMARY DRAWING NO. SS.
  - ALL PIPING MUST BE SELF SUPPORTING BEYOND UNIT CONNECTIONS.
  - LOCATIONS OF CUSTOMER CONNECTIONS ARE NOT GUARANTEED AS THESE DIMENSIONS MAY BE SUBJECT TO AN ACCUMULATION OF TOLERANCES ON SEVERAL COMPONENTS. MINOR CHANGES MAY ALSO BE MADE ON SCREWED SERVICE PIPING IN ORDER TO FACILITATE INSTALLATION AND MAINTENANCE. ON COMPLETION A FINAL DRAWING WILL BE ISSUED WITH FIELD CONNECTIONS CORRECTED TO 5 mm.
  - IT IS EFX'S RECOMMENDATION THAT ANY PRE-SPOOLING TO THIS COMPRESSOR PACKAGE CONTAIN FIELD WELDS AT ALL CUSTOMER CONNECTIONS.
  - THE FOLLOWING ITEMS WILL BE SHIPPED LOOSE FOR FIELD INSTALLATION BY OTHERS.

REV	DESCRIPTION	DATE	DRAWN BY	CHECKED BY
2	AS BUILT	06/03/09	MGN	EAM
1	FOR CONSTRUCTION	06/01/12	SWT	
0	FOR APPROVAL	06/01/11	SWT	EAM

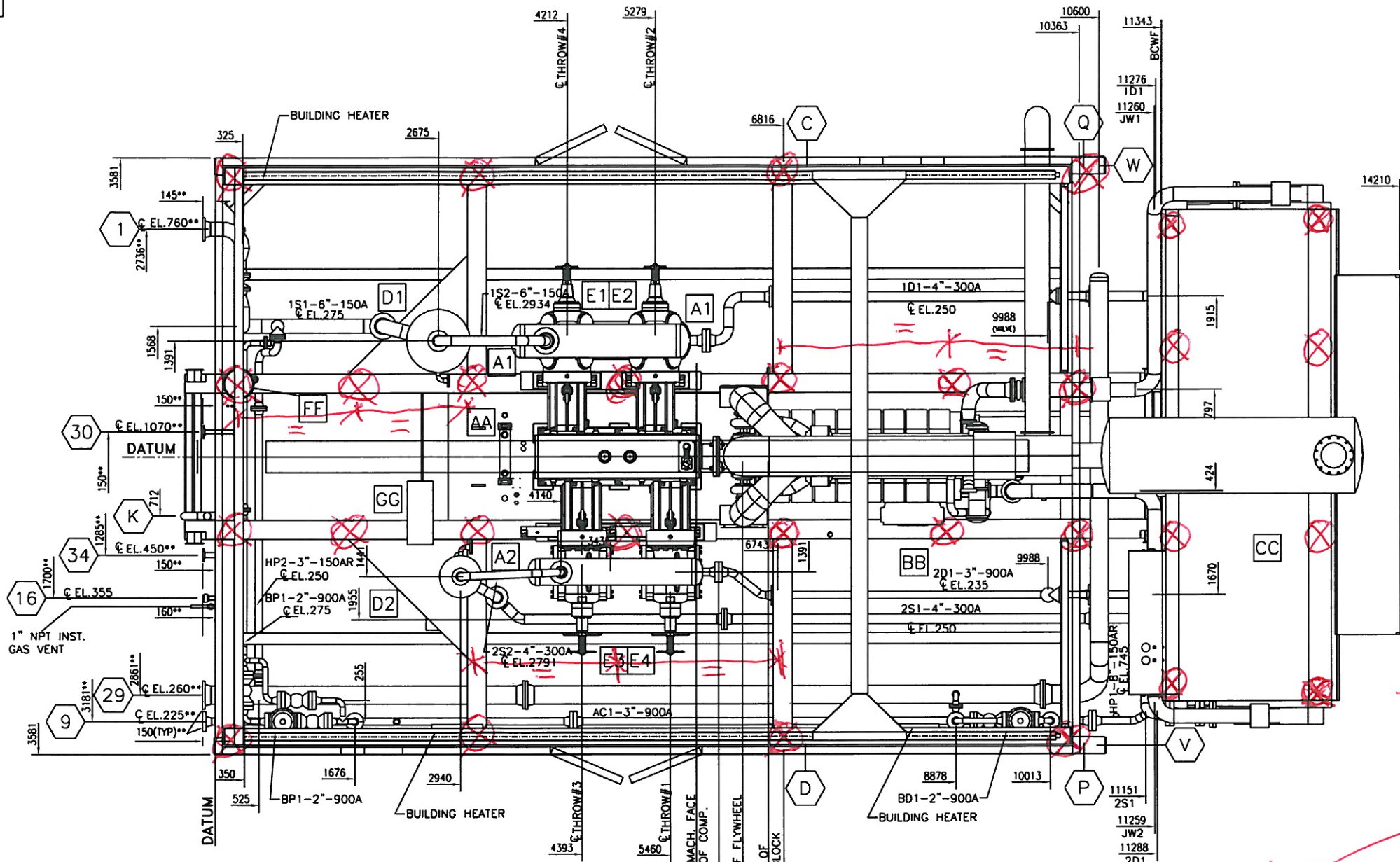
**EFX Compression**  
 4700 47 Street SE Calgary AB Canada T2B 3R1 Canada Tel: +1.403.236.8800 Fax: +1.403.279.0387  
 www.enerflex.com

TITLE: GENERAL ARRANGEMENT  
 ARIEL JGK/4, CAT 3516TALE, AIR-X-CHANGERS 132EH  
 COMPRESSOR PACKAGE

FOR: HUSKY OIL OPERATIONS LTD.  
 (TOLMAN)

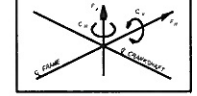
CONSULTANT: TAG: K-650  
 DESIGN BY: DRO DATE: 04/09/22  
 DATE: 2004/09/22 CHKD BY: DATE:  
 SCALE: 1:30 APPVD BY: DATE:

LSD: 13-29-35-22 W4M  
 JOB No.: 050883  
 DWG. No. GA050883 PG.1/4  
 OP# 10



⊗ = Recommended support locations  
 • Foundation design by others  
 • Minimum pile spacing = 3 x pile diameter

COMPRESSOR UNBALANCED FORCES @ 1200 RPM		
	PRIMARY	SECONDARY
HORIZONTAL FORCE, KN	1.769	0.500
VERTICAL FORCE, KN	0.00	0.00
HORIZONTAL COUPLE, KN-M	16.483	0.160
VERTICAL COUPLE, KN-M	22.921	0.00



CUSTOMER CONNECTIONS		
NO.	DESCRIPTION	SIZE
1	STAGE ONE INLET	6"-150/RF
9	FINAL DISCHARGE	3"-900/ RF
16	SCRUBBER DRAIN HEADER	1-1/2" NPT
29	PSV VENT HEADER	4"-150/RF
30	FUEL GAS SUPPLY	2"-150/RF
34	START GAS SUPPLY	2"-150/RF

OTHER CUSTOMER LOCAL CONNECTIONS & VENTS		
NO.	DESCRIPTION	SIZE
C	COMPRESSOR OIL TANK FILL	1" NPT
D	ENGINE OIL TANK FILL	1" NPT
K	START GAS VENT	3" PIPE
P	WASTE OIL TANK VENT	2" PIPE
Q	GLYCOL TANK VENT	2" PIPE
V	WASTE OIL TANK PUMP OUT	2" NPT
W	GLYCOL TANK PUMP OUT	2" NPT

SHIPPING WEIGHTS		UNIT DIMENSIONS	
AA COMPRESSOR: ARIEL JGK/4	2950 KGS	MAIN SKID w/ ALL EQUIP MOUNTED	
A1 (2) 9-1/8" "K" 1270 PSIG	2330 KGS	LENGTH	14578 mm 47'-11"
A2 (2) 5-3/8" "K" 2500 PSIG	1940 KGS	WIDTH	7162 mm 23'-6"
BB ENGINE: CAT 3516TALE	8755 KGS	HEIGHT	6300 mm 20'-9"
SHIPPING DIMENSIONS		COOLER DIMENSIONS	
D1 30" DIA., 54" S/S	1000 KGS	LENGTH	11643 mm 38'-3"
D2 20" DIA., 54" S/S	910 KGS	WIDTH	7162 mm 23'-6"
E1 18" DIA., 72" S/S	430 KGS	HEIGHT	5605 mm 18'-6"
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E3 12-3/4" DIA., 72" S/S	455 KGS	LENGTH	3200 mm 10'-6"
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		HEIGHT	3862 mm 12'-9"
PIPING & MISC	2100 KGS		
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GG CONTROL PANEL	200 KGS		
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		MUFFLER	485 KGS
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		TOTAL UNIT WEIGHT	66790 KGS

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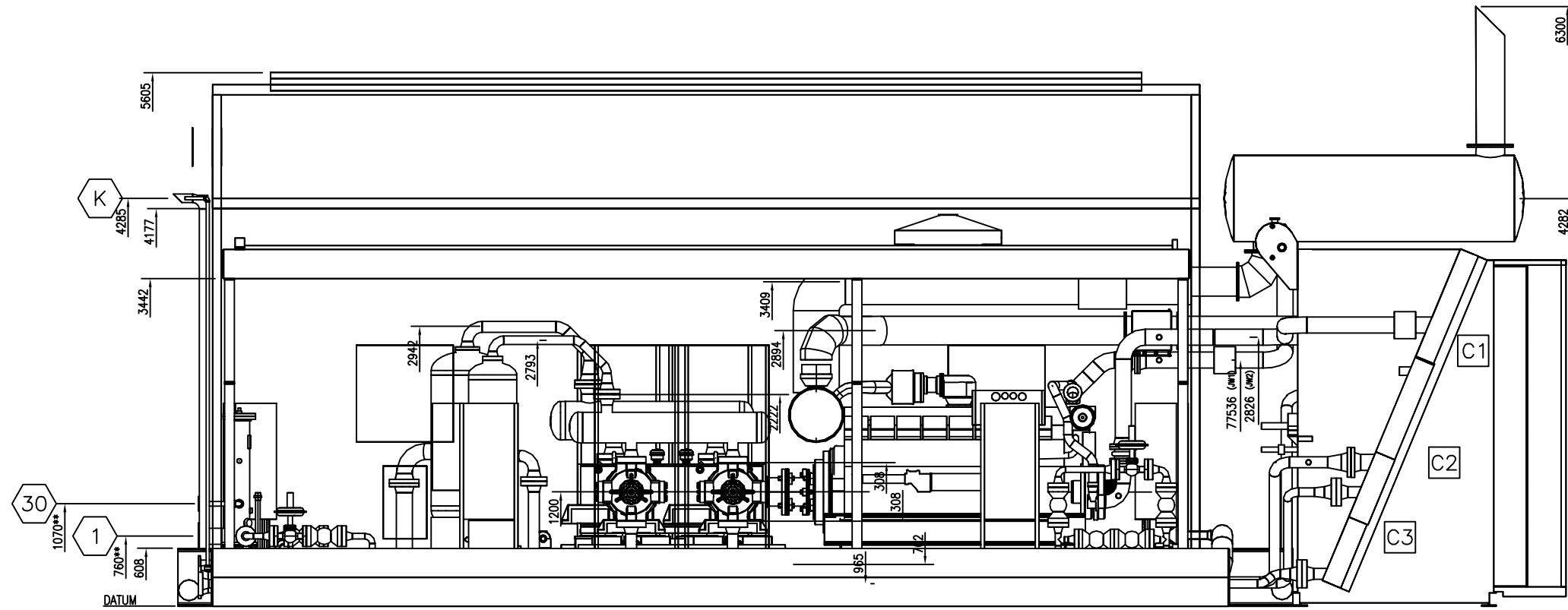
**EFX Compression**  
 4788 41 Street SE Calgary AB Canada T2B 3P1 Canada Tel: +1403.242.8888 Fax: +1403.242.8887  
 www.efx.com

TITLE: GENERAL ARRANGEMENT  
 ARIEL JGK/4, CAT 3516TALE, AIR-X-CHANGERS 132EH  
 COMPRESSOR PACKAGE

FOR: HUSKY OIL OPERATIONS LTD.  
 (TOLMAN)

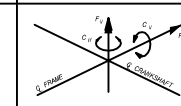
CONSULTANT: LSD: 13-29-35-72 WAM  
 TAG: K-850 JOB No.: 050883

DRWN BY: DRO DATE: 2004/09/22 DWG. No.:  
 DATE: 2004/09/22 CHKD BY: DATE: GAO50883 PG.1/4  
 SCALE: 1:30 APPVD BY: DATE: OP# 10



ELEVATION VIEW

COMPRESSOR UNBALANCED FORCES @ 1200 RPM		
	PRIMARY	SECONDARY
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VERTICAL FORCE, KN	0.00	0.00
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0	FOR APPROVAL	06/01/11	SWT	EAM

**EFX Compression**  
 4700 47 Street SE Calgary AB Canada T2B 3R1 Canada Tel. +1.403.238.8800 Fax +1.403.278.0387  
 www.enflex.com

TITLE: GENERAL ARRANGEMENT  
 ARIEL JGK/4, CAT 3516TALE, AIR-X-CHANGERS 132EH  
 COMPRESSOR PACKAGE

FOR: HUSKY OIL OPERATIONS LTD.  
 (TOLMAN)

CONSULTANT: TAG: K-650  
 DESIGN BY: DRO DATE: 04/09/22  
 DATE: 2004/09/22 CHKD BY: DATE:  
 SCALE: 1:30 APPVD BY: DATE:

LSD: 13-29-35-22 W4M  
 JOB No.: 050883

DWG. No. GA050883 PG.2/4 OP# 10



D1 1ST STG SUCTION SCRUBBER  
30" OD x 54" S/S  
655 PSIG MAWP @ 300°F  
S/N: 050883-01  
CRN: R9526.213

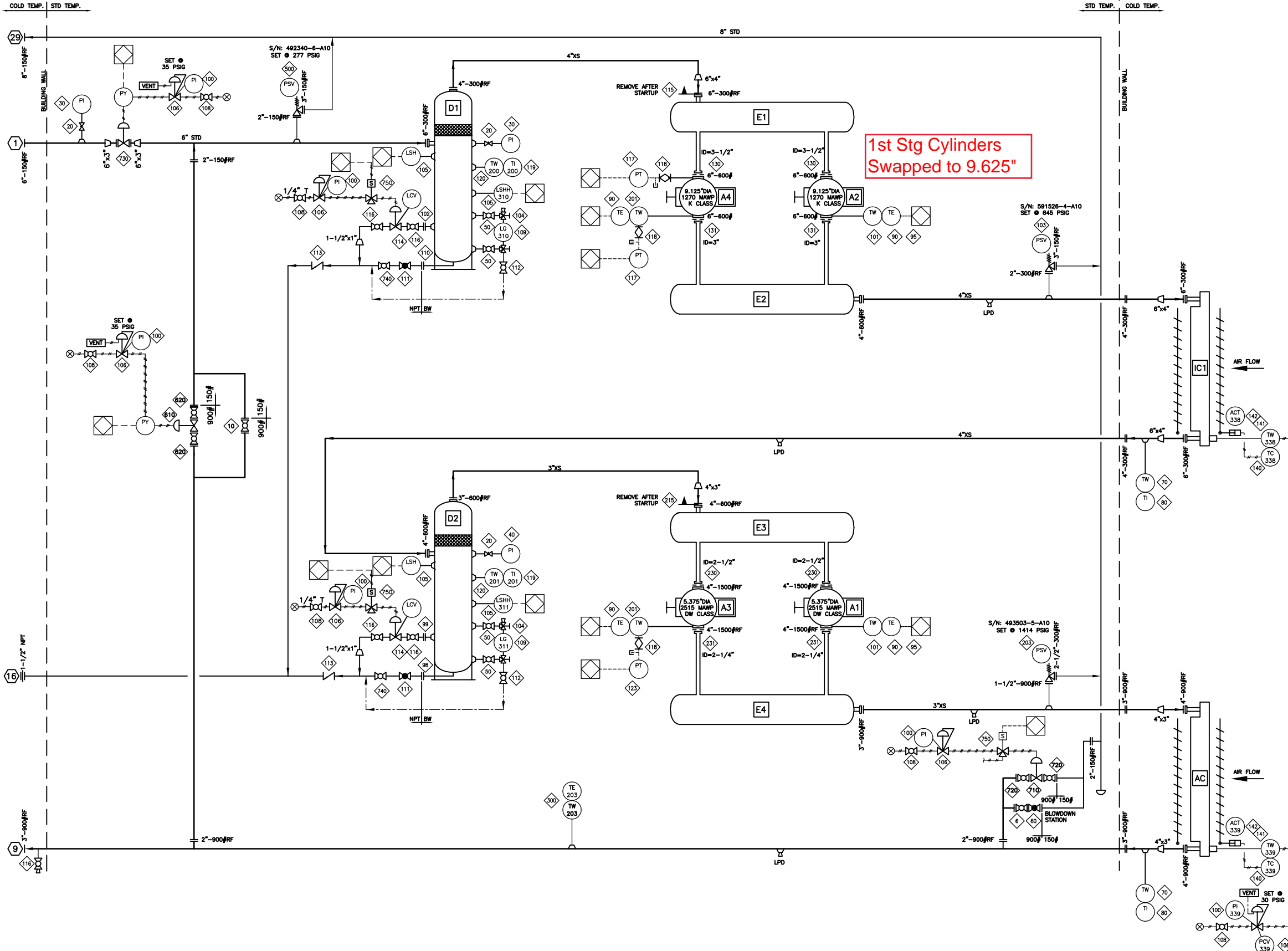
D2 2ND STG SUCTION SCRUBBER  
20" OD x 54" S/S  
850 PSIG MAWP @ 300°F  
S/N: 050883-02  
CRN: R9505.213

E1 1ST STG SUCTION BOTTLE  
16" OD x 72" S/S  
655 PSIG MAWP @ 300°F  
S/N: 050883-03  
CRN: R0777.213

E2 1ST STG DISCHARGE BOTTLE  
18" OD x 62" S/S  
1292 PSIG MAWP @ 350°F  
S/N: 050883-04  
CRN: R0780.213

E3 2ND STG SUCTION BOTTLE  
12-3/4" OD x 72" S/S  
1315 PSIG MAWP @ 300°F  
S/N: 050883-05  
CRN: 0778.213

E4 2ND STG DISCHARGE BOTTLE  
12-3/4" OD x 62" S/S  
1650 PSIG MAWP @ 350°F  
S/N: 050883-06  
CRN: R0781.213



1st Stg Cylinders Swapped to 9.625"

BILL OF MATERIAL

ITEM	QTY	PART ID	DESCRIPTION
6	1	102959	VALVE, BALL, 2" 9/1500# RF, RP, CS C/W HANDLE [NUTRON, T3-R20R156]
10	1	102959	VALVE, BALL, 2" 9/1500# RF, RP, CS C/W HANDLE [NUTRON, T3-R20R156]
20	3	108003	VALVE, NEEDLE, 3/4" MNPT X 1/2" FNPT, 316SS, [CENTURY, CM11L-1-M64T-CN-T-SP100]C582
30	2	107893	GAUGE, PRESSURE, BM, 4" LF, 0-200 PSI DUAL, 1/2" NPT [NIKA, 233.54]
40	1	107929	GAUGE, PRESSURE, BM, 4" LF, 0-600 PSI DUAL, 1/2" NPT [NIKA, 233.54]
50	4	119102	VALVE, BALL, 3/4" NPT, 3000# WOG, RP, CS, [NUTRON, T3-R07S30S]
60	1	113233	VALVE, GLOBE, 2" 9/1500# RF, CS, SWEET [NEWCO, 215F-CB2]
70	2	105167	THERMOWELL, 316SS, BTB STYLE 8, 1/2" X 1/2" NPTM, U=2.5", .280" BORE
80	2	107942	GAUGE, TEMP, 3" DIAL LF, 2-1/2" STEM, 0-250 DEG F DUAL, 1/2" NPT [TREND, SF3002S]
90	4	117910B	TCOUPLE, K TYPE, 316SS, 7.5" [THERMOKINETICS, K125-316S0007.5882X000-0048-99]
95	2	105164	FITTING, COMPRESSION FOR BTB STYLE 8 THERMOCOUPLE, 1/2" NPT
98	1	106467	FLANGE, RF SCRD, 1-1/2" 600# SA105N
99	1	106476	FLANGE, RF SCRD, 1" 600# SA105N
100	6	107925	GAUGE, PRESSURE, CBM, 2" DRY, 0-60 PSI DUAL, 1/4" NPT [NIKA, 111.10]
101	2	115505	THERMOWELL, 316SS, BTB STYLE 8B, 1/2" X 1/2" NPTM, U=2.5", .203" BORE
102	1	106474	FLANGE, RF SCRD, 1" 300# SA105N
103	1	113155	VALVE, PSV, 2" 300#RF X 3" 150#RF, .785 OR, NACE I, [FARRIS, 26A12-120/00]
104	2	103693	VALVE, SET GAUGE, SWEET, 1/2" FNPT X 3/4" MNPT, CS, 3470# [DANIEL, 1S]
105	4	104500	SWITCH, LEVEL, 2" NPT, XP, CSA C/W SS FLOAT [MURPHY, L1200SF]
106	6	104872	REGULATOR, 1/4" NPT, ALUM, 0-125#, TAPPED (W/O P) [FISHER, 67CFR-601/SPEC]
108	6	113090	VALVE, BALL, 1/4" NPT, 2000# WOG, FP, SS, 2 PIECE C/W LOCKING HANDLE [MAS, G2]
109	2	103659	GAUGE, LEVEL, CS WITH REFLEX FLAT GLASS, 1820# [DANIEL, 71RL]
110	1	106465	FLANGE, RF SCRD, 1-1/2" 300# SA105N
111	2	102861	VALVE, GLOBE, 1-1/2" NPT, 800# WOG, CS [NAVCO, GL-R15S084B]
112	2	102920	VALVE, BALL, 1/2" NPT, 2000# WOG, FP, CS C/W LOCKING HANDLE [NUTRON, T3-F05S20B]
113	2	109946	VALVE, CHECK, PISTON, 1-1/2" NPT, 800# WOG, CS [NAVCO, CP-R15S084B]
114	2	104854	VALVE, DUMP, 1" NPT, LOC, FLOW ADJUSTER, FC, NACE, 6-30# [FISHER/FLOPRO, D2]
115	1	104255	STRAINER, CONE, 6" 300# CS, 40 MESH, 150X FLOW AREA
116	5	109995	VALVE, BALL, 1" NPT, 3000# WOG, RP, CS, NACE C/W LOCKING HANDLE [NUTRON, T3-R10S30S]
117	2	NPN-REQ	TRANSMITTER, PRESSURE (INCLUDED IN PANEL)
118	3	102801	VALVE, PLUG, 3/8" TUBE, 316SS [NUPRO, SS-6P4T]
119	2	107949	GAUGE, TEMP, 3" DIAL, 9" STEM, 0-250 DEG F DUAL, 1/2" NPT [TREND, 33090]
120	2	107981	THERMOWELL, 304SS, 1/2" X 3/4" NPTM X 9" LONG, U=7", .260" BORE C/W 1/2" LAG, TRANSMITTER, PRESSURE (INCLUDED IN PANEL)
123	1	NPN-REQ	TRANSMITTER, PRESSURE (INCLUDED IN PANEL)
130	2	105504	***ORIFICE PLATE, TYPE 520, 316LSS, 1/8" THK, 6" 600# BORE=3.5"
131	2	105504	***ORIFICE PLATE, TYPE 520, 316LSS, 1/8" THK, 6" 600# BORE=3"
140	2	103630	CONTROLLER, TEMPERATURE, DIRECT, 1" NPT C/W 8" PROBE [NORRISEAL, 5000-8-S0T]
141	2	103628	THERMOWELL, 1" MNPT, 8" STEM LENGTH, 3000 PSIG MAWP, 316SS [NORRISEAL, HCE]
142	2	100315	>>ACTUATOR, 6-30 PSIG, SUPPLIED WITH COOLER [GARZO, 501-12]
201	2	1141980	TWELL, 316LSS, 1/8" X 1/2" MNPT, 1/4" FNPT PRESSURE PORT, U=2.625", 1650 MAWP
203	1	116807	VALVE, PSV, 1-1/2" 900#RF X 2-1/2" 300#RF, .307 OR, NACE I [FARRIS, 26A14-120/00]
215	1	104245	STRAINER, CONE, 4" 600# CS, 40 MESH, 150X FLOW AREA
230	2	105383	***ORIFICE PLATE, TYPE 520, 316LSS, 1/8" THK, 4" 1500# RF BORE=2.5"
231	2	105383	***ORIFICE PLATE, TYPE 520, 316LSS, 1/8" THK, 4" 1500# RF BORE=2.25"
300	1	112330	***TCOUPLE ASSY C/W TWELL, 304SS, 3/4" NPT, 60" [NIKA, AB113-102-U-14-60-K-]
500	1	114044	VALVE, PSV, 2" 150#RF X 3" 150#RF, 1.287 OR, NACE I, [FARRIS, 26A10-120/00]
610	1	118873	VALVE, CONTROL, 2" 9/1500# RF, LOC, 3/4" OR, FO, NACE 0-33# [FISHER, D4X2B8K/NT]
620	2	102959	VALVE, BALL, 2" 9/1500# RF, RP, CS C/W HANDLE [NUTRON, T3-R20R156]
710	1	NPN-REQ	VALVE, CONTROL, 2 3/4" 1500# (FISHER, D4)
720	2	102959	VALVE, BALL, 2" 9/1500# RF, RP, CS C/W HANDLE [NUTRON, T3-R20R156]
730	1	NPN-REQ	VALVE, CONTROL, 3" 150# RF, FC, WCC, NACE, SIZE 40 ACTUATOR [FISHER I501-V200B-DVC6020]
740	2	102996	VALVE, BALL, 1-1/2" NPT, 3000# WOG, FP, CS, NACE C/W [NUTRON, T3-F15S30S]
750	3	103792	VALVE, SOLENOID, 3-WAY, 24VDC, XP, NC, SS, 1/4" NPT, [ASCO, EF8320G202]

\*\*\*\*\*  
BILL OF MATERIAL: W 050883 - CUSTOM-CA1085-4-2(SWEET)-HUSKY SPEC W/ NOTED EXC  
DATE-TIME EXPORTED: 2004-09-20-17.06

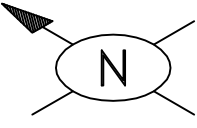
REV	DESCRIPTION	DATE	DRAWN BY	CHECKED BY
3	REVISED SUCTION PSV SET PRESSURE AND AS BUILT	06/05/17	MGN	EAM
2	AS BUILT	06/03/15	MGN	EAM
1	FOR CONSTRUCTION	06/01/10	SWT	EAM
0	FOR APPROVAL	05/12/05	SWT	EAM

REVISIONS

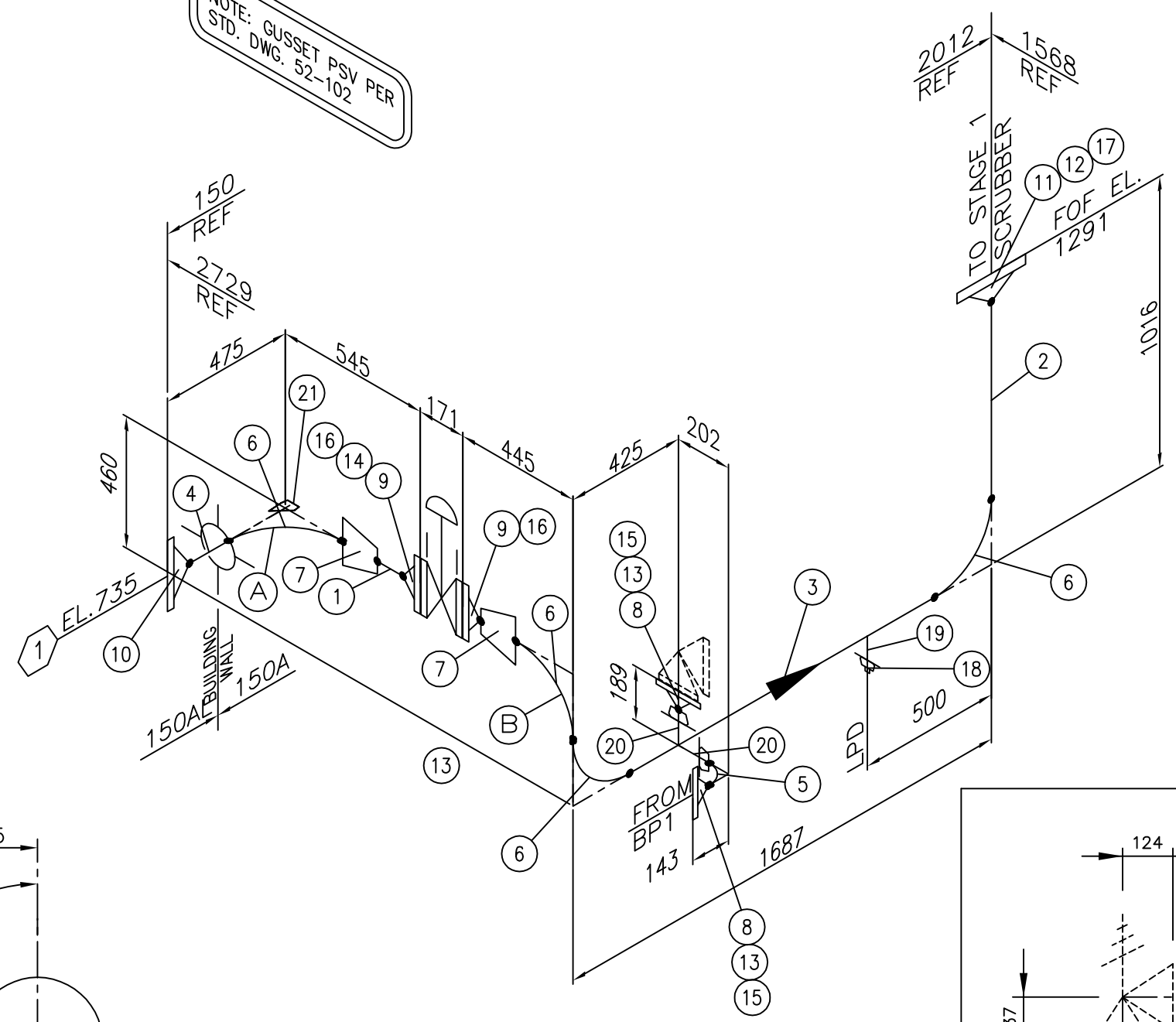
**ENERFLEX**

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ENGINEERING RECORD	LSO	13-29-35-22 W4M	CONSULTANT
DRAWN BY NDS	DATE 2004/09/22	TITLE PROCESS & INSTRUMENTATION DIAGRAM ARIEL JGK/4, CAT G3516TALE, AXC 132EH HUSKY OIL OPERATIONS LTD. TOLMAN (K-650)	REV 3
SCALE NONE	JOB NO. 050883	DWG NO. PF-050883-50	



NOTE: GUSSET PSV PER STD. DWG. 52-102



BILL OF MATERIAL					
MARK	QTY	ALPHA SIZE	DESCRIPTION	LENGTH	WEIGHT
1	1	3"	PIPE, SCH XS SMLS, SA-106-B	97	1.52
2	1	6"	PIPE, SCH STD SMLS, SA-106-B	683	19.27
3	1	6"	PIPE, SCH STD SMLS, SA-106-B	1224	34.55
4	1	6"	PIPE, SCH STD SMLS, SA-333-6	151	4.27
5	1	2"	ELBOW, 90° LR SCH XS, SA-234-WPB		0.95
6	4	6"	ELBOW, 90° LR SCH STD, SA-234-WPB		41.36
7	2	6"x3"	REDUCER, CONC SCH STD x XS, SA-234-WPB		7.26
8	2	2"	FLANGE, RFWN 150# SCH XS BORE, SA-105		5.44
9	2	3"	FLANGE, RFWN 150# SCH XS BORE, SA-105		10.20
10	1	6"	FLANGE, RFWN 150# SCH STD BORE, SA-350-LF2		10.89
11	1	6"	FLANGE, RFWN 300# SCH STD BORE, SA-105		19.05
12	1	3/4"	(12) STUD BOLTS, SA-193-B7 w/ 2X NUTS SA-194-2H	125	3.00
13	2	5/8"	(4) STUD BOLTS, SA-193-B7 w/ 2X NUTS SA-194-2H	90	3.00
14	1	5/8"	(4) STUD BOLTS, SA-193-B7 w/ 2X NUTS SA-194-2H	254	2.00
15	2	2"	GASKET, 1/8" THK 150#, SPIRAL WOUND 316SS, NON ASB FILL		1.00
16	2	3"	GASKET, 1/8" THK 150#, SPIRAL WOUND 316SS, NON ASB FILL		2.00
17	1	6"	GASKET, RF, 1/8" THK 300#, SPIRAL WOUND 316SS, NON ASB FILL		1.00
18	1	3/4"	PLUG, HEX HEAD THD 6000#, SA-105		0.68
19	1	6"x3/4"	THREDOLET, 3000#, SA-105		0.16
20	2	6"x2"	WELDOLET, SCH XS, SA-105		1.58
21	1	6"x3/4"	ELBOWLET, THD 3000#, SA-105		0.11
TOTAL WEIGHT: 170.29					

- NOTES:
- ALL PIPE CUT LENGTHS INCLUDE 3mm WELD GAPS.
  - PIPING DESIGNED IN ACCORDANCE WITH ASME B31.3 2004 EDITION
  - FLANGES THAT MATE TO ROTATED VESSEL NOZZLES ARE TO HAVE THEIR BOLT HOLES STRADDLE THE NATURAL CENTERLINE OF THE VESSEL.

<input type="checkbox"/> SPECIAL CHEM. REQ'D	STRESS RELIEVE:	<input type="checkbox"/> REQ'D.	DESIGN PRESS. (PSIG)	277
<input type="checkbox"/> NACE REQ'D	CLEAN & OIL:	<input checked="" type="checkbox"/> REQ'D.	DESIGN TEMP (°F)	130
VOLUME: 0.089 cu.m	PICKLE:	<input type="checkbox"/> REQ'D.	CORR. ALLOWANCE	1/16"
PIPE SPEC.: 150A 150AL	SANDBLAST:	<input checked="" type="checkbox"/> REQ'D.	HYDROSTATIC TEST PRESS. (PSIG)	450
	M.T.R.:	<input checked="" type="checkbox"/> REQ'D.	HYDROSTATIC TEST DURATION	10 MIN.
	HYDROSTATIC TEST CHART:	<input type="checkbox"/> REQ'D.	HYDROSTATIC TEST MEDIUM	WATER
	RADIOGRAPH MAP:	<input type="checkbox"/> REQ'D.	MEDIUM TEMP. (°F)	70°
	SERVICE:	SEVERE <input type="checkbox"/> NORMAL <input checked="" type="checkbox"/> X-RAY		10%

REV	DESCRIPTION	DATE	DWN. BY	CHK. BY
SS-050883	2	AS BUILT	06/05/17	MGN EAM
PF-050883-50	1	FOR CONSTRUCTION	05/12/08	SWT
GA050883	0	FOR APPROVAL	04/09/23	DRO DLL

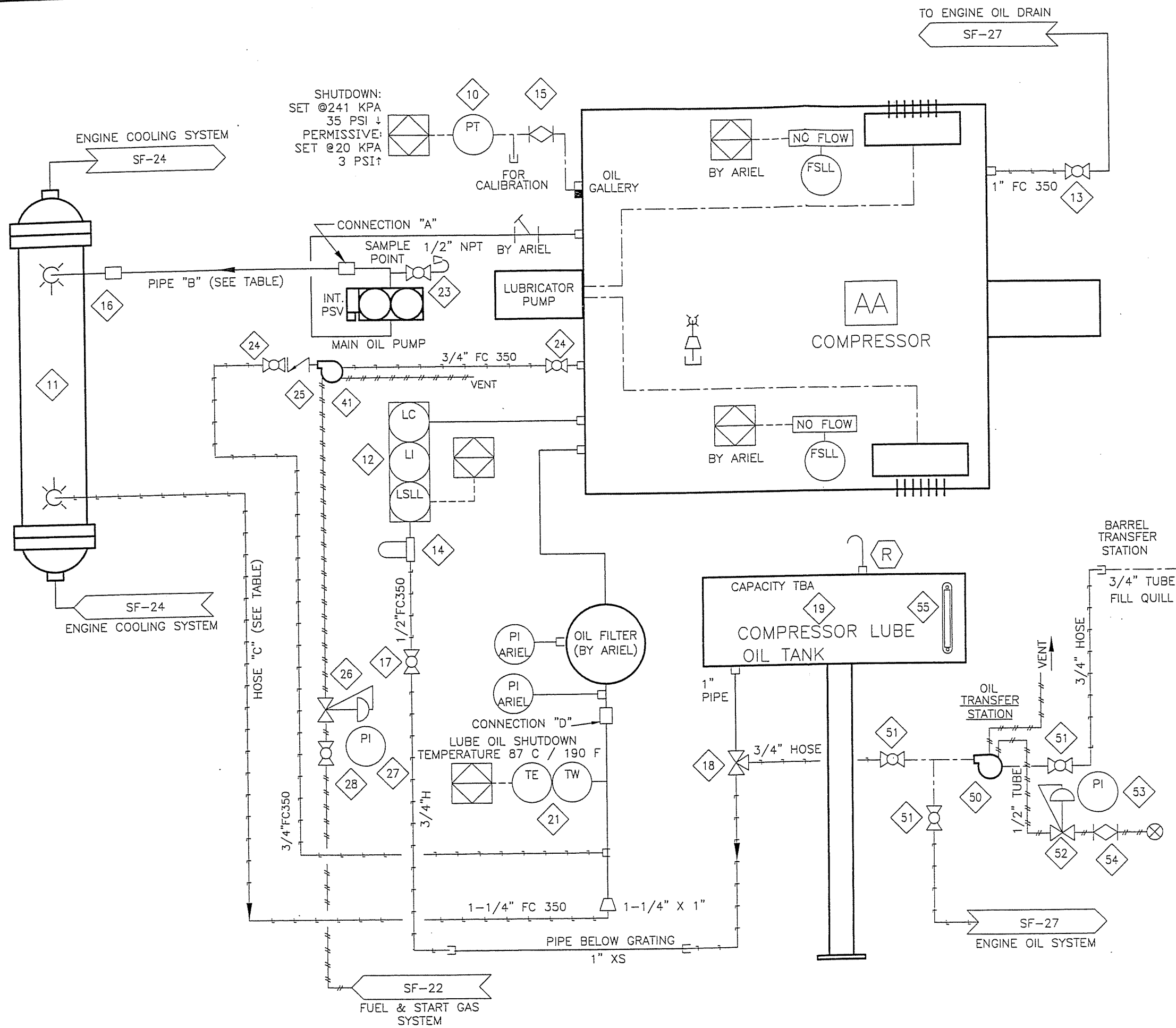
**BFX Compression**  
ENERFLEX  
4700 47 Street SE Calgary AB Canada T2B 3R1 Canada Tel. +1.403.236.6800 Fax +1.403.279.0367  
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TITLE: SKID EDGE TO STAGE ONE SCRUBBER  
HUSKY OIL OPERATIONS LTD.  
(TOLMAN)

DRAWN BY: DRO	DATE: 04/09/23	JOB NO. 050883	DWG. NO. 1S1	OPER.# 52
CHK'D BY: DLL	DATE: 04/09/29			
APPR'D BY:	DATE:			

LINE	PWHT	DATE	HYDRO	DATE
A				
B				
C				
D				
E				
F				
G				

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BILL OF MATERIAL

ITEM	QTY	PART #	DESCRIPTION
10	1	107987	TRANSMITTER, PRESSURE, 0-100 PSIG, SWEET, 1/4" NPT [WIKA, 892.13.500]
11	1	104966	COOLER, LUBE OIL [THERMAL TRANSFER, EK-1024-0]
12	1	107966	CONTROLLER, OIL LEVEL C/W ELECTRIC SWITCH, XP, CSA & BRACKET [KENC0, LCE-24]
13	1	102928	VALVE, BALL, 1" NPT, 2000# WOG, RP, CS, NACE C/W LOCKING [NUTRON, T3-R10S20SL]
14	1	121735	FILTER, ASSEMBLY, OIL, 1/2" NPT, 25 MICRON C/W SF-6510 [KINECOR, SAF-05-00-0]
15	1	102802	VALVE, PLUG, 1/4" TUBE, 316SS [NUPRO, SS-4P4T]
16	1	101240	COUPLING, ELBOW, 90 DEG, 1-1/2", STYLE 90 [DRESSER, 0080-0244-082]
17	1	102920	VALVE, BALL, 1/2" NPT, 2000# WOG, FP, CS C/W LOCKING HANDLE [NUTRON, T3-FOSS20B]
18	1	121893	VALVE, BALL, 3-WAY, 1" NPT, FULL SS, 800 PSI C/W LOCKING HANDLE [MAS, G4]
19	1	110094	>>TANK, LUBE OIL MAKEUP, COMPRESSOR, INTEGRAL WITH CRANE RAIL PER EFX CRANE DWG
21	1	112330	***T*COUPLE ASSY C/W T*WELL, 304SS, 3/4" NPT, 60" [WIKA, A8113-T02-U-14-60-K-]
23	1	102920	VALVE, BALL, 1/2" NPT, 2000# WOG, FP, CS C/W LOCKING HANDLE [NUTRON, T3-FOSS20B]
24	2	102973	VALVE, BALL, 3/4" NPT, 2000# WOG, RP, 316SS, NACE C/W [NAVCO, C1-R07S20A]
25	1	103075	VALVE, CHECK, PISTON, 3/4" NPT, 800# WOG, CS [NEWCO, 48T-FS2]
26	1	104872	REGULATOR, 1/4" NPT, ALUM., 0-125#, TAPPED (W/O PI) [FISHER, 67CFR-601/SPEC]
27	1	107894	GAUGE, PRESSURE, CBM, 2" DRY, 0-200 PSI DUAL, 1/4" NPT [WIKA, 111.10]
28	1	102949	VALVE, BALL, 1/2" NPT, 2000# WOG, RP, 316SS, NACE C/W [NAVCO, C1-R05S20A]
41	1	121741	PUMP, DIAPHRAGM, 1/2" NPT, ALUM, SWEET GAS, CSA [WARREN RUPP, G05B1ABTXSX00]
50	1	121741	PUMP, DIAPHRAGM, 1/2" NPT, ALUM, SWEET GAS, CSA [WARREN RUPP, G05B1ABTXSX00]
51	3	102973	VALVE, BALL, 3/4" NPT, 2000# WOG, RP, 316SS, NACE C/W [NAVCO, C1-R07S20A]
52	1	104872	REGULATOR, 1/4" NPT, ALUM., 0-125#, TAPPED (W/O PI) [FISHER, 67CFR-601/SPEC]
53	1	107894	GAUGE, PRESSURE, CBM, 2" DRY, 0-200 PSI DUAL, 1/4" NPT [WIKA, 111.10]
54	1	102801	VALVE, PLUG, 3/8" TUBE, 316SS [NUPRO, SS-6P4T]
55	1	115052	INDICATOR, LEVEL, SIGHT GLASS WINDOW, 10" BOLT CENTERS, [MP FILTRI, LVA 30 TA]

FRAME	JGK/4
FRAME CRANKCASE VOLUME	140 L
OIL FLOWRATE	1.6 L/s
CONNECTION "A"	1-1/2" NPT
PIPE "B"	1-1/2" NPT
HOSE "C"	1-1/4" 350
CONNECTION "D"	1" NPT

AS-BUILT

NOTES:  
DATE MAR 16 2006

- > VENT CRANKCASE OUTSIDE OF BUILDING FOR SOUR SERVICE.
- 1. 1/2" PLUGGED SAMPLE POINTS TO BE PROVIDED.

REV	DESCRIPTION	DATE	DRAWN BY	CHECKED BY
2	AS BUILT	06/03/15	MGN	EAM
1	FOR CONSTRUCTION	06/01/10	SWT	
0	FOR APPROVAL	05/12/05	SWT	EAM

**EFX Compression**  
ENERFLEX

4700 47 Street SE Calgary AB Canada T2B 3R1 Canada Tel. +1.403.236.6800 Fax +1.403.279.0367  
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TITLE: SERVICE FLOW COMPRESSOR OIL SYSTEM  
ARIEL JGK/4, CAT. G3516TALE, AXC 132EH

FOR: HUSKY OIL OPERATIONS LTD.  
TOLMAN

CONSULTANT: TAG: K-650  
LSD: 13-29-35-22 W4M  
JOB No.: 050883

DRWN BY: SB  
DATE: 04/04/06  
SCALE: NTS

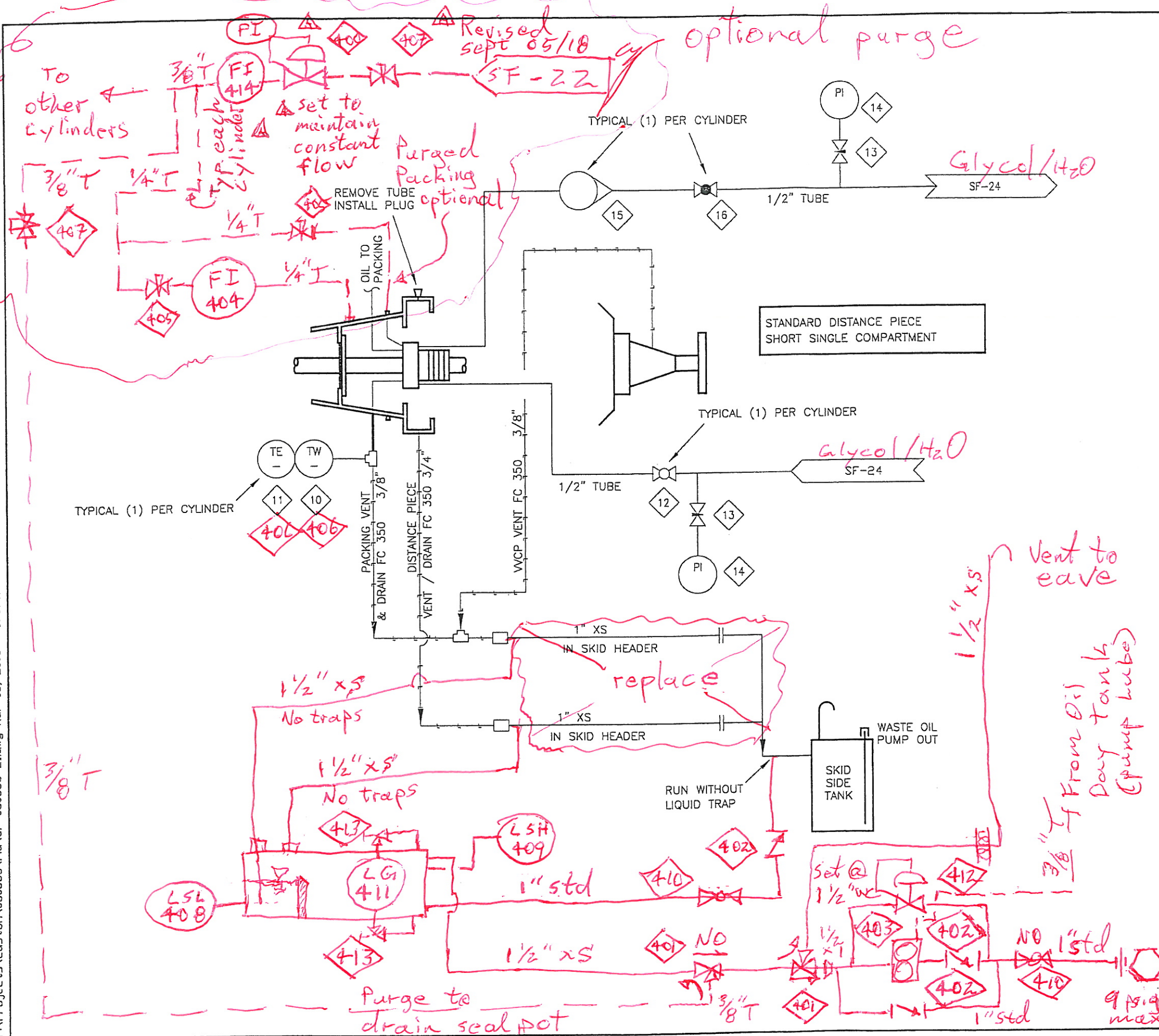
DESIGN BY: SB  
CHKD BY: EAM  
APPVD BY: EAM

DATE: 04/04/06  
DATE: 04/04/06

DWG. No. SF-050883-20  
OP# 20



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MATERIAL LIST			
ITEM	QTY	PART #	DESCRIPTION
10	4	116701	***THERMOWELL, 316SS, 1/2" X 1/2" MNPT, 2-1/2" LONG, U=1
11	4	114007	***THERMOCOUPLE, K TYPE, 316SS C/V (THERMOKINETICS, K-125-316-S-0040-3-80S-YT21
12	2	102920	VALVE, BALL, 1/2" NPT, 2000# WGG, FP, CS C/V LOCKING HANDLE (NUTRON, T3-F05S203)
13	4	108014	VALVE, NEEDLE, 1/2" MNPT X 1/2" FNPT, CS, A108, TEFLON (CENTURY, CM2-3-M44T-DN-T)
14	4	107878	GAUGE, PRESSURE, 3N, 2-1/2" LF, 0-100 PSI DUAL, 1/4" NPT (VIXA, 233.53)
15	2	119410	INDICATOR, SIGHT FLOW, 1/2" FNPT, CS (OPW, 1421500VIT03)
16	2	102877	VALVE, GLOBE, 1/2" NPT, 800# WGG, CS (NEWCO, 28T-F32)

NOTE: OIL SEAL POT AND VACUUM PUMP ASS'Y REQUIRED WHEN CUSTOMER CONNECTING TO FLARE SYSTEM  
 PACKING COOLING SYSTEM REQUIRED ON 5-3/8" CYLINDERS ONLY

Notes: Vacuum pump must run for start service on a continuous basis.

**AS-BUILT**  
 DATE MAR 16 2006

REV	DESCRIPTION	DATE	DRAWN BY	CHECKED BY
2	AS BUILT	06/03/15	MGN	EAM
1	FOR CONSTRUCTION	06/01/10	SWT	
0	FOR APPROVAL	05/12/05	SWT	EAM

**EFX Compression**  
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4700 47 Street SE Calgary AB Canada T2B 3R1 Canada Tel: +1403.236.6800 Fax: +1403.279.0367  
 www.enerflex.com

TITLE: SERVICE FLOW PACKING VENT & DRAIN SYSTEM 0<H2S<100 PPM COMPRESSOR PACKAGE

FOR: HUSKY OIL OPERATIONS LTD. TOLMAN

CONSULTANT: - LSD: 13-29-35-22 W4M  
 TAG: K-650 JOB No.: 050883

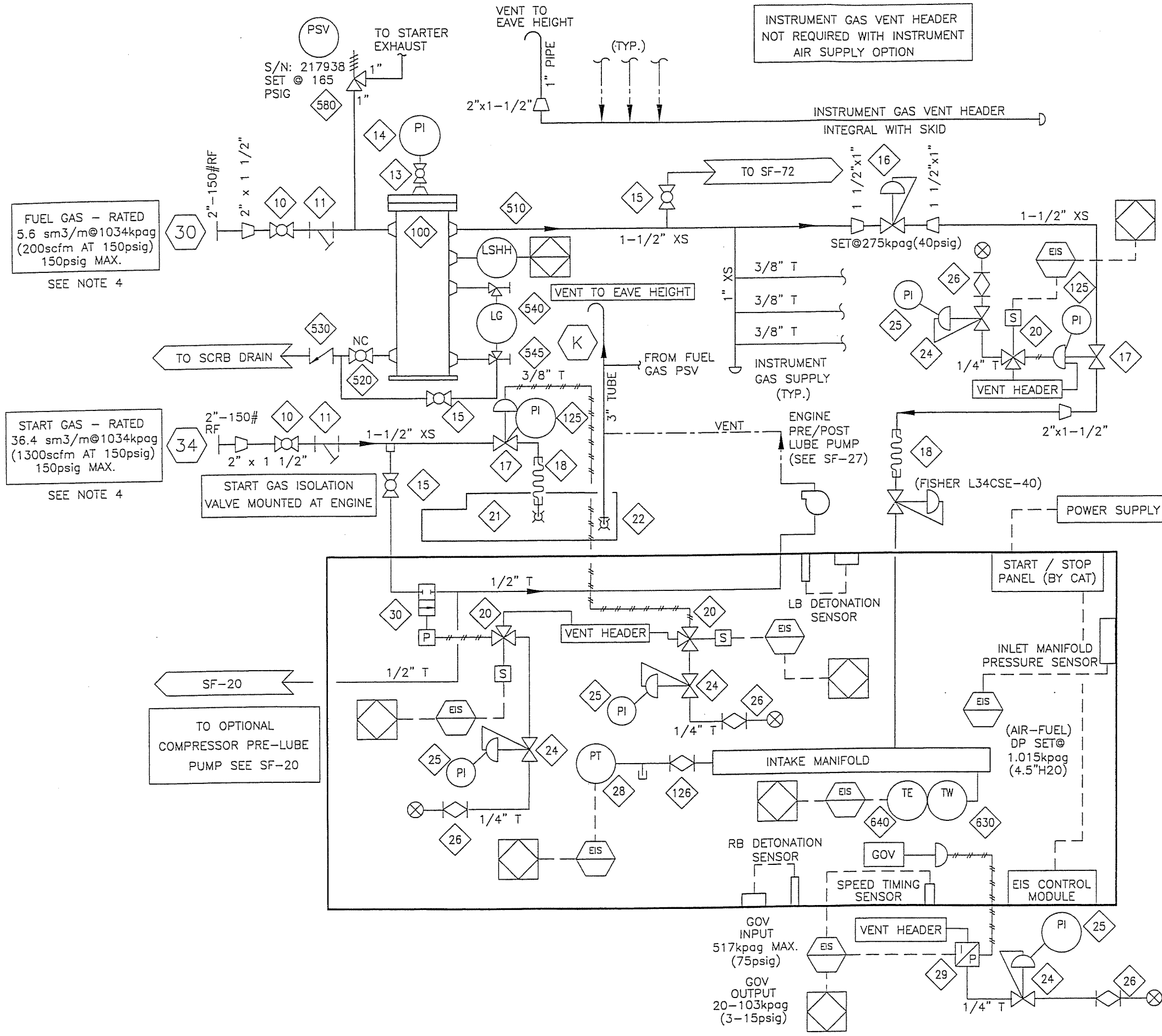
DRWN BY: SB DESIGN BY: - DATE: - DWG. No. OP#  
 DATE: 04/04/07 CHKD BY: - DATE: - SF-050883-21 21  
 SCALE: NTS APPVD BY: EAM DATE: 03/03/06

Bill of Materials for BOM for EFX drawing number SF-050883-21 mark-up for seal pot and vacuum pump

Item	Quantity	Description
400	1	Regulator, 1/4" NPT, Fisher 67CFR, 0-20 psi range, Fisher part number T14130T0012, c/w PI
401	2	Three way hand operated ball valve, 1 1/2 " NPT, 1000 psi, Meridian Model M21SRL or equal
402	3	Check valve, 1" NPT, Velan forged steel Class 800, 1975 psi @ 100F, Model S05-211Z02, standard trim
403	1	Vacuum pump, LGA-12-1.5-12-3, 1-1/2 HP, 1140 RPM, 230-460/3/60 XP MOTOR, c/w Utile Model LGA12 Vacuum Pump for Sour Gas Service.
404	4	Flow Indicator, Muis Controls model 74C-123G081-223820 glass tube purge meter with Sapphire float, 1/4" FNPT, 316L SS fittings, 316L SS outlet valve, stainless steel frame, Viton seals, and polycarbonate shield. Supplied with 10-100% scale with tag stating 10-100% = approx. 0.92 – 9.2 SCFH of Gas (SG = 0.65) @ 14 psig & 90°F. Panel mountable using 10 - 32 screws. No CRN.
405	8 (4 optional)	Needle valve, 1/4" tubing style. Swagelok Needle Valve Model SS- 1RS4, 1/4" tube connections, 316SS, Regulator Tip, or equal to suit tubing and fitting manufacturer
406	0	Thermocouple c/w thermowell, Type 'K' thermocouple, existing.
407	2	Needle valve, 3/8" tubing style. Swagelok or equal to suit tubing and fitting manufacturer
408	1	Level switch, Murphy model MLS, 2" NPT SS float and body, Trip on falling.
409	1	Level switch, Murphy model MLS, 2" NPT SS float and body, Trip on rising.
410	2	Ball valve, Nutron T3 or equal, 2000 WOG, RP, 1" NPT; model T3-R10S20S c/w locking handle.
411	1	Level Indicator, Penberthy Red Line c/w guard
412	1	Vacuum breaker, Fisher model Y690-1053-101437, 1"NPT CFM8 Body, 1/4" orifice, 0-4" WC range
413	2	Gauge cocks, Penberthy N7A c/w neoprene o-rings
414	1	Flow indicator, Muis Controls model 74C-214G021-323820 glass tube purge meter with 316L SS float, 1/4" FNPT, 316L SS fittings, 316L SS outlet valve, stainless steel frame, Viton seals, and polycarbonate shield. Supplied with 10-100% scale with tag stating 10-100% = approx. 4.8 – 48 SCFH of Gas (SG = 0.65) @ 14 psig & 90°F. Panel mountable using 10 - 32 screws. No CRN.



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BILL OF MATERIAL

ITEM	QTY	EFX CODE	DESCRIPTION
10	2	102923	VALVE, BALL, 1-1/2" NPT, 2000# WOG, FP, CS C/W LOCKING HANDLE [NUTRON, T3-F15520BL]
11	2	102830	STRAINER, Y, 1-1/2" NPT, 1480 PSIG MAMP, CS, 1/32" SS SCREEN [ALTA, YS-600]
13	1	121054	VALVE, BALL, 1/4" NPT, 2000#, A105 BODY, NO LOCKING HANDLE [NAVCO]
14	1	107911	GAUGE, PRESSURE, BM, 2-1/2" LF, 0-300 PSI DUAL, 1/4" NPT [WIKA, 233.53]
15	3	102920	VALVE, BALL, 1/2" NPT, 2000# WOG, FP, CS C/W LOCKING HANDLE [NUTRON, T3-F05520B]
16	1	104863	REGULATOR, 1" NPT, DI, 3/8" OR, 35-80# SPR RING, SET @ 50 PSIG [FISHER, 627-494]
17	2	103762	VALVE, RELAY, GAS, 1-1/2" NPT, MAMP 450 PSI [TDI, RLV256B3001201]
18	2	104695	HOSE, BRAIDED STEEL, 2" MNPT X MALE NPT UNION X 12" LONG
20	3	NPN-REQ	VALVE, SOLENOID, (INCLUDED IN PANEL)
21	1	103758	STARTER, AIR/GAS, STD 150-80 PSIG, INERTIA DUAL [TDI TURBOSTART, T112-60001-B1R]
22	1	103741	ELBOW, STARTER EXHAUST, 90 DEG, SR, 3" MNPT, CS [TDI, T100-27900]
24	4	NPN-REQ	REGULATOR, 1/4" NPT, ALUM, (INCLUDED IN PANEL)
25	4	NPN-REQ	GAUGE, PRESSURE, CBM, 2" DRY, 0-60 PSI DUAL, 1/4" NPT [INCLUDED IN PANEL]
26	4	NPN-REQ	VALVE, PLUG, 1/4" TUBE, 316SS (INCLUDED IN PANEL)
28	1	107994	TRANSMITTER, PRESSURE, -30 HG/30 PSIG, SWEET, 1/4" [WIKA 892.13.500]
29	1	120478	TRANSDUCER, 1/P, 4-20MA INPUT, 3-15 PSIG OUTPUT, XP [FAIRCHILD TXI-7800-401E-2]
30	1	116700	X-VALVE, SWITCHING, 3-WAY, 1/2" NPT, 40-100 PSI [FISHER, 164A-B1]
100	1	109083	VESSEL, FUEL GAS, 8-5/8" OD, 285 PSIG MAMP, 100 DEG. F, WAUK VHP C/W FG-12 ELEMET
126	1	102802	VALVE, PLUG, 1/4" TUBE, 316SS [NUPRO SS-4P4T]
125	2	107881	GAUGE, PRESSURE, CBM, 2" DRY, 0-100 PSI DUAL, 1/4" NPT [WIKA, 111.10]
510	1	104499	SWITCH, LEVEL, 2" NPT, XP, CSA, SPDT C/W BUOYGAS FLOAT [MURPHY, L1200]
520	1	102927	VALVE, BALL, 1" NPT, 2000# WOG, RP, CS C/W LOCKING HANDLE [NUTRON, T3-R10S20B]
530	1	103085	VALVE, CHECK, SWING, 1" NPT, 800# WOG, CS [NEWCO, 3BT-FS2]
540	1	120416	GAUGE, LEVEL, CS WITH REFLEX FLAT GLASS, 2800# [DANIEL, 11RM]
545	1	103893	VALVE, SET GAUGE, SWEET, 1/2" FNPT X 3/4" MNPT, CS, 3470# [DANIEL, 1S]
580	1	104299	VALVE, PSV, 1" MNPT X 1" FNPT, .212 OR (E), STD TRIM, [MERCER, 81-17151V00000]
630	1	105165	THERMOWELL, 316SS, BTB STYLE 4, 1/4" X 1/2", U=2", 2" BORE
640	1	113106	THERMOCOUPLE, K TYPE, 316SS C/W [THERMOKINETICS, K125-316S-0006-B-82S-000-0016S]

NOTES:

1. INSTRUMENTS USING INSTRUMENT GAS MUST BE VENTED TO INSTRUMENT GAS VENT HEADER.
2. ALL SERVICE LINES OPERATING ABOVE 103KPA(15 PSI) MUST BE PRESSURE TESTED PER THE PROCEDURE IN THE QC MANUAL.
3. INSTRUMENT REGULATORS C/W VENTED BONNETS ARE NOT REQUIRED ON INSTRUMENT AIR SERVICE.
4. CLEAN DRY GAS REQUIRED FOR BOTH FUEL AND START GAS.

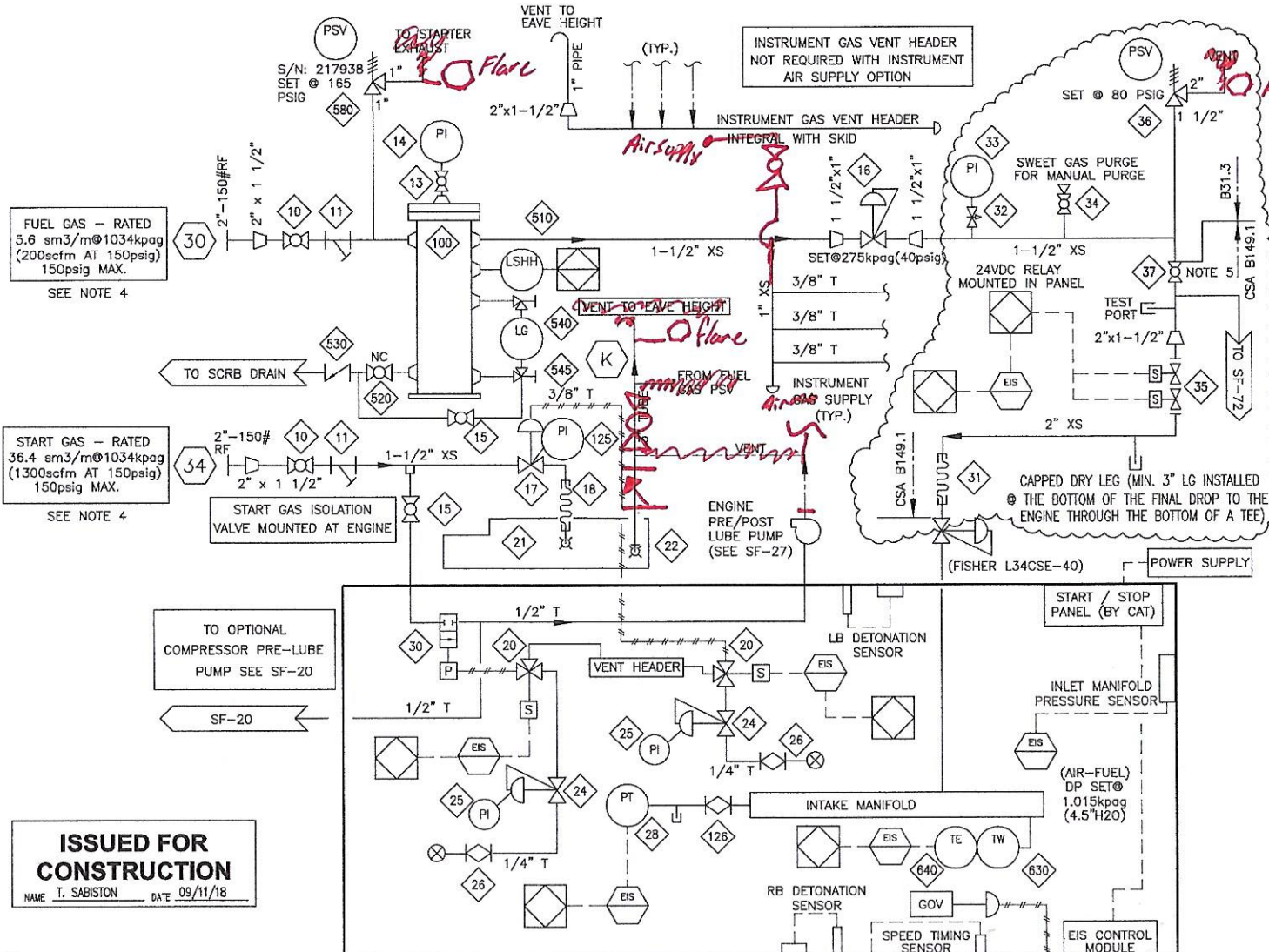
**AS-BUILT**  
DATE MAR 16 2006

REV	DESCRIPTION	DATE	DRAWN BY	CHECKED BY
2	AS BUILT	06/03/15	MGN	EAM
1	FOR CONSTRUCTION	06/01/10	SWT	
0	FOR APPROVAL	05/12/05	SWT	EAM

**EFX Compression**  
ENERFLEX

4700 47 Street SE Calgary AB Canada T2B 3R1 Canada Tel. +1.403.236.6800 Fax +1.403.279.0367  
www.enerflex.com

TITLE:	SERVICE FLOW FUEL AND START GAS SYSTEM ARIEL JGK/4, CAT. G3516TALE, AXC 132EH			
FOR:	HUSKY OIL OPERATIONS LTD. TOLMAN			
CONSULTANT:	LSD: 13-29-35-22 W4M JOB No.: 050883			
DRWN BY: SB	DESIGN BY: SB	DATE: 04/04/06	DWG. No.	OP#
DATE: 04/04/06	CHKD BY: EAM	DATE: 04/03/06	SF-050883-22	22
SCALE: NTS	APPVD BY: EAM	DATE: 04/03/06		



FUEL GAS - RATED  
5.6 sm<sup>3</sup>/m @ 1034 kpag  
(200 scfm AT 150 psig)  
150 psig MAX.  
SEE NOTE 4

START GAS - RATED  
36.4 sm<sup>3</sup>/m @ 1034 kpag  
(1300 scfm AT 150 psig)  
150 psig MAX.  
SEE NOTE 4

**ISSUED FOR CONSTRUCTION**  
NAME T. SABISTON DATE 09/11/18

- NOTES:
- INSTRUMENTS USING INSTRUMENT GAS MUST BE VENTED TO INSTRUMENT GAS VENT HEADER.
  - ALL SERVICE LINES OPERATING ABOVE 103KPA(15 PSI) MUST BE PRESSURE TESTED PER THE PROCEDURE IN THE QC MANUAL.
  - INSTRUMENT REGULATORS C/W VENTED BONNETS ARE NOT REQUIRED ON INSTRUMENT AIR SERVICE.
  - CLEAN DRY GAS REQUIRED FOR BOTH FUEL AND START GAS.
  - PRESSURE TEST CSA B149.1 SECTION @ 120 PSIG FOR DURATION OF 180 MINS.

ITEM	QTY	EFX CODE	DESCRIPTION
10	2	102923	VALVE, BALL, 1-1/2" NPT, 2000# WOG, FP, CS C/W LOCKING [NUTRON, 13-F155208L]
11	2	102830	STRAINER, Y, 1-1/2" NPT, 1480 PSIG WAMP, CS, 1/32" SS SCREEN [ALTA, YS-600]
13	1	121054	VALVE, BALL, 1/4" NPT, 2000#, A105 BODY, NO LOCKING HANDLE [NAVCO]
14	1	107911	GAUGE, PRESSURE, BM, 2-1/2" LF, 0-300 PSI DUAL, 1/4" NPT [WKA, 233.53]
15	2	102920	VALVE, BALL, 1/2" NPT, 2000# WOG, FP, CS C/W LOCKING HANDLE [NUTRON, 13-F155208]
16	1	104663	REGULATOR, 1" NPT, 3" W, 35-80 SPR RING, SET @ 40 PSIG [FISHER, 627-494]
17	1	103762	VALVE, RELAY, GAS, 1-1/2" NPT, WAMP 450 PSI [DI, RLW2568301201]
18	1	104695	HOSE, BRAIDED STEEL, 2" WMP X MALE NPT UNION X 12" LONG
20	2	NPN-REQ	VALVE, SOLENOID, (INCLUDED IN PANEL)
21	1	103758	STARTER, AIR/GAS, STD 150-60 PSIG, INERTIA DUAL [101 TURBOSTART, T112-60001-B1R]
22	1	103741	ELBOW, STARTER EXHAUST, 90 DEG, SR, 3" NPT, CS [DIA, T100-27800]
24	3	NPN-REQ	REGULATOR, 1/4" NPT, ALUM, (INCLUDED IN PANEL)
25	3	NPN-REQ	GAUGE, PRESSURE, CBM, 2" DRY, 0-60 PSI DUAL, 1/4" NPT [INCLUDED IN PANEL]
26	3	NPN-REQ	VALVE, FLUG, 1/4" TUBE, 316SS (INCLUDED IN PANEL)
28	1	107994	TRANSFORMER, PRESSURE, -30 HG/30 PSIG, SWEET, 1/4" (WKA 892.13.500)
29	1	120478	TRANSOUCKER, 1/P, 4-20MA INPUT, 3-15 PSIG OUTPUT, XP [FAIRCHILD T02-7600-401E-2]
30	1	116700	X-VALVE, SWITCHING, 3-WAY, 1/2" NPT, 40-100 PSI [FISHER-1644-B1]
31	1	NEW	AR THOMPSON, 2" 321 HOSE, 30AL, WMP/HPX, EE, 12", CSA APPROVED
32	1	NEW	CENTURY, NEEDLE VALVE, 1/4" FNPT, STAINLESS STEEL
33	1	NEW	WKA, PRESSURE GAUGE, DIAL SIZE 2 1/2", 1/4" NPT PROCESS CONN.
34	1	NEW	MERIDIAN, BALL VALVE, MODEL M4C2F NPT 1/2", 2000 WOG, FULL PORT, HAGE
35	2	NEW	SOLENOID VALVE, DINIS SERIES, MODEL: HPSV 10020/604, 2"-150 CL ANSI FF
36	1	NEW	VALVE, RELIEF, FARRIS, 1 1/2" NPT, WMP/WNPT, WCR, F, SET 80 PSIG @ 70F
37	1	NEW	VALVE, BALL, 1 1/2" VALVE-TEX FG V12, FULL PORT, 2PCS, 316SS, 2000#, NPT CSA APPROV
100	1	100883	VESSEL, FUEL GAS, 3'-5 1/2" DIA, 265 PSIG WMP, 100 DEG. F, WAMP WIP C/W FG-12 ELITE
126	1	102902	VALVE, FLUG, 1/4" TUBE, 316SS [NUPRO SS-4P4T]
125	1	107681	GAUGE, PRESSURE, CBM, 2" DRY, 0-100 PSI DUAL, 1/4" NPT [WKA, 111.10]
510	1	104499	SWITCH, LEVEL, 2" NPT, XP, CSA, SPOT C/W BUOYGLAS FLOAT [MURPHY, L1200]
520	1	102927	VALVE, BALL, 1" NPT, 2000# WOG, RP, CS C/W LOCKING HANDLE [NUTRON, 13-R105208]
530	1	103085	VALVE, CHECK, SWING, 1" NPT, 800# WOG, CS [INVEDCO, 3BT-F32]
540	1	120416	GAUGE, LEVEL, CS WITH REFLEX FLAT GLASS, 2900# [DANIEL, 11R1U]
545	1	103993	VALVE, SET GAUGE, SWEET, 1/2" FNPT X 3/4" WMP, CS, 3420# [DANIEL, 15]
580	1	104299	VALVE, PSV, 1" WMP X 1" FNPT, 212 OR (3), STD TRIM, [WERCER, 81-1715100000]
630	1	105165	THERMOWELL, 316SS, BTB STYLE 4, 1/4" X 1/2", L=2", 3" BORE
640	1	113106	THERMOCOUPLE, K TYPE, 316SS C/W [THERMOMETRICS, K125-3165-0006-B-825-000-0011]

**ENERFLEX** UNIT NO. 050833-BTB

NOTICE:  
THE FUEL GAS TRAIN FOR THIS PACKAGE IS COMPLIANT WITH CSA B149.1 NATURAL GAS AND PROPANE INSTALLATION CODE.

ENGINE MANUFACTURER	CATERPILLAR	ENGINE MODEL	G3516TALE
FUEL TYPE	NATURAL GAS	FUEL INLET PRESSURE (PSIG)	150 PSIG
ADVERTISED POWER (HP)	1085	MAX. INPUT RATING (BTU/HR)	15,000,000 BTU/HR
SITE ALTITUDE (FASL)	<5000	ALTITUDE ADJUSTED POWER (HP)	1085

CSA B149.1 ENGINE RATING PLATE

REV	DESCRIPTION	DATE	DRAWN BY	CHECK BY
3	AS PER RETROFIT SOLD SCOPE OF SUPPLY (FC)	18/09/11	TS	RP
2	AS BUILT	06/03/15	MGN	EAM
1	FOR CONSTRUCTION	06/01/10	SWT	
0	FOR APPROVAL	05/12/05	SWT	EAM

# ENERFLEX

TITLE: SERVICE FLOW FUEL AND START GAS SYSTEM  
ARIEL JGK/4, CAT. G3516TALE, AXC 132EH

FOR: FUELLED ENERGY MARKETING  
LOCATION: TBA

CONSULTANT: TAG: --- LSD: 10-19-87-23 W6M (NE BY RETROFIT JOB No.: E002952-C)

DRWN BY: SB	DESIGN BY: SB	DATE: 04/04/06	DWG. No.:	REV 1
DATE: 04/04/06	CHKD BY:	DATE:	SF-050883-22	3
SCALE: NTS	APPVD BY:	DATE:		

ENERFLEX LTD REPRODUCTION OF ANY PORTION OF THESE MATERIALS WITHOUT THE EXPRESS WRITTEN CONSENT OF ENERFLEX LTD IS STRICTLY PROHIBITED.



<b>Pneumatic Test Report</b>	<b>Project Number</b>	<b>Rev. of Calculation</b>	0
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Test Number:	
System description:	<i>Fuel Gas B149.1</i>
P&ID designation color:	
Test Medium:	<i>Air</i>
Removed System PSV(s)?	<i>Yes</i>
System MAWP:	<i>80</i> psig <i>80</i> kPag
Test Pressure:	<i>132</i> psig <i>132</i> kPag
Test PSV Setpoint:	<i>132</i> psig <i>132</i> kPag
Known Test Volume:	<i>0.146</i> Ft <sup>3</sup> <i>0.146</i> m <sup>3</sup>
Safe Standing Distance:	<i>9</i> Ft <i>9</i> m
Date performed:	<i>Oct-02-2019</i>
Performed by:	<i>Dave Miller</i>

Test Number:	
System description:	<i>B31.3 gas Down Stream 90 PSI Regulator</i>
P&ID designation color:	
Test Medium:	<i>Air</i>
Removed System PSV(s)?	<i>Yes</i>
System MAWP:	<i>80</i> psig <i>80</i> kPag
Test Pressure:	<i>120</i> psig <i>120</i> kPag
Test PSV Setpoint:	<i>132</i> psig <i>132</i> kPag
Known Test Volume:	<i>0.25</i> Ft <sup>3</sup> <i>0.25</i> m <sup>3</sup>
Safe Standing Distance:	<i>11</i> Ft <i>11</i> m
Date performed:	<i>Oct-02-2019</i>
Performed by:	<i>Dave Miller</i>

Test Number:	
System description:	
P&ID designation color:	
Test Medium:	
Removed System PSV(s)?	
System MAWP:	
Test Pressure:	
Test PSV Setpoint:	
Known Test Volume:	
Safe Standing Distance:	
Date performed:	
Performed by:	

Test Number:	
System description:	
P&ID designation color:	
Test Medium:	
Removed System PSV(s)?	
System MAWP:	
Test Pressure:	
Test PSV Setpoint:	
Known Test Volume:	
Safe Standing Distance:	
Date performed:	
Performed by:	

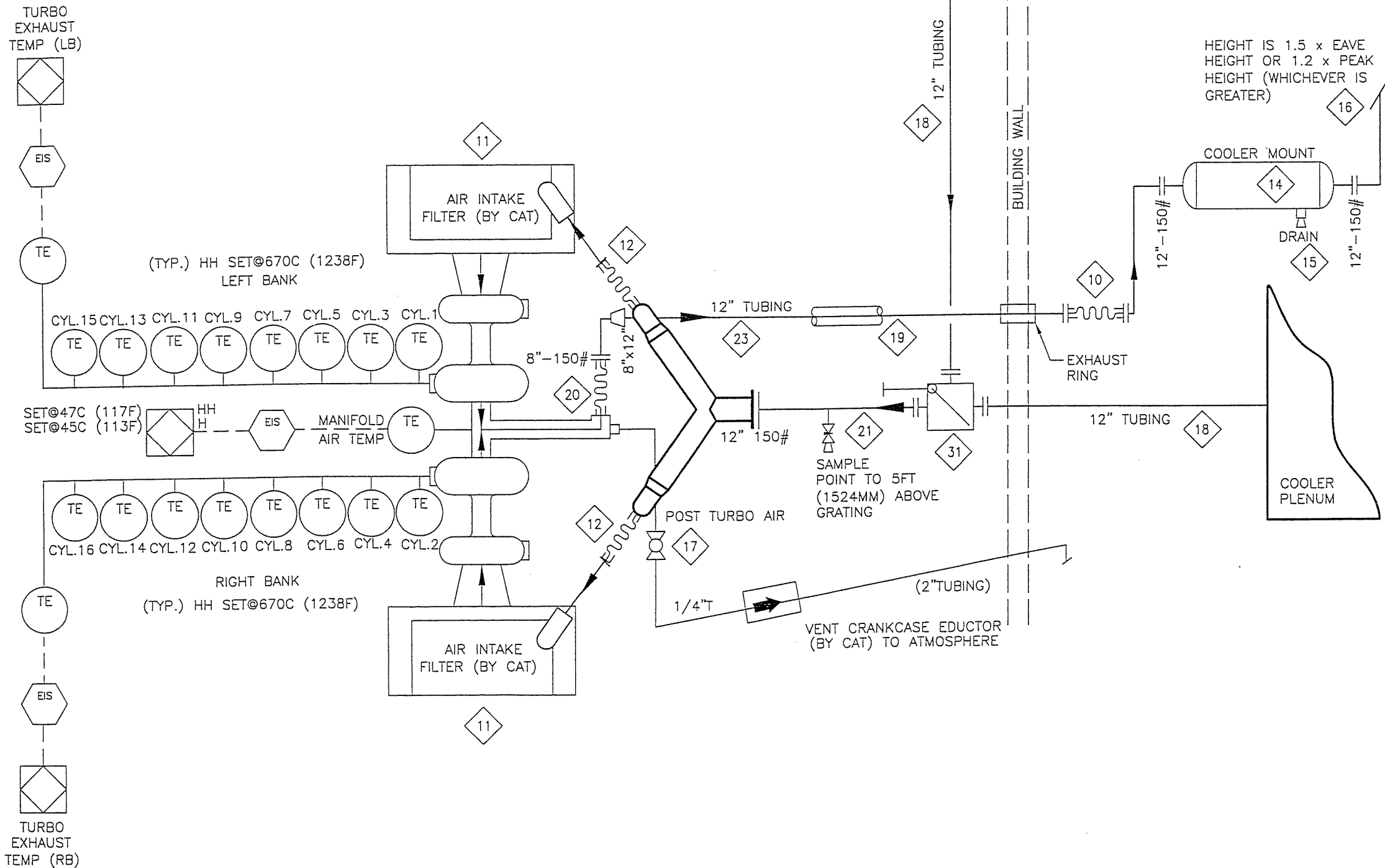
Test Number:	
System description:	
P&ID designation color:	
Test Medium:	
Removed System PSV(s)?	
System MAWP:	
Test Pressure:	
Test PSV Setpoint:	
Known Test Volume:	
Safe Standing Distance:	
Date performed:	
Performed by:	

Comments:	<p style="color: red; font-size: 1.2em;">3 hour test for CSA B149.1 Test 2 may be combined with test 1</p>
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MATERIAL LIST

ITEM	QTY	PART #	DESCRIPTION
10	1	104682	EXPANSION BELLOW, 12" 150# INTERNAL FLANGES C/W 2" COLLAR & SS LINER X 12" LONG
11	2	NPN-REQ	>>AIR FILTER BOX C/W FILTER ( BY CAT)
12	2	112314	HOSE, STRAIGHT, RUBBER, 12"ID (GOODYEAR WD75-192)
14	1	108934	MUFFLER, HOSPITAL PLUS GR, 12" 150# SISO (SILEX, JCOPR-12-SIS012-F14-FO14-LL-A)
15	1	NPN-REQ	MUFFLER SUPPORT BY ENERFLEX, BUILD TO SUIT
16	1	NPN-REQ	EXHAUST STACK, 12" - 150#, BUILD TO SUIT
17	1	102950	VALVE, BALL 1/4"NPT, 2000# WOG, RP, 316 SS, NACE (NAVCO C1-R02S20A)
18	20	104562	(AIR INTAKE) EXHAUST TUBING, MECHANICAL, 12"OD X 10 GAUGE (.134" WALL) ERW
19	1	104171	***INSULATION, EXHAUST SHROUDING, ALUM CLAD, FIBRE BATT C/W SS LINER, C/W 2" AIR SPACE
20	1	NPN-REQ	>>EXPANSION BELLOW, 8" 150#, SUPPLIED BY CAT
21	1	102807	VALVE, NEEDLE, 3/8" TUBE, CS (WHITEY S-1VS6)
23	40	NPN-REQ	EXHAUST TUBING, MECHANICAL, 12"OD X 10 GAUGE, 316LSS
31	1	126513	AIR INTAKE FIVE-WAY DIVERTER, 12"

NOTE:

1. MAXIMUM PERMISSIBLE BACK PRESSURE (1775 BHP @1000 RPM IS 12".00 INCHES H2O)

**AS-BUILT**  
DATE MAR 16 2006

REV	DESCRIPTION	DATE	DRAWN BY	CHECKED BY
2	AS BUILT	06/03/15	MGN	EAM
1	FOR CONSTRUCTION	06/01/11	SWT	
0	FOR APPROVAL	05/12/05	SWT	EAM

**BFX Compression**  
ENERFLEX

4700 47 Street SE Calgary AB Canada T2B 3R1 Canada Tel. +1.403.236.6800 Fax +1.403.279.0367  
www.enerflex.com

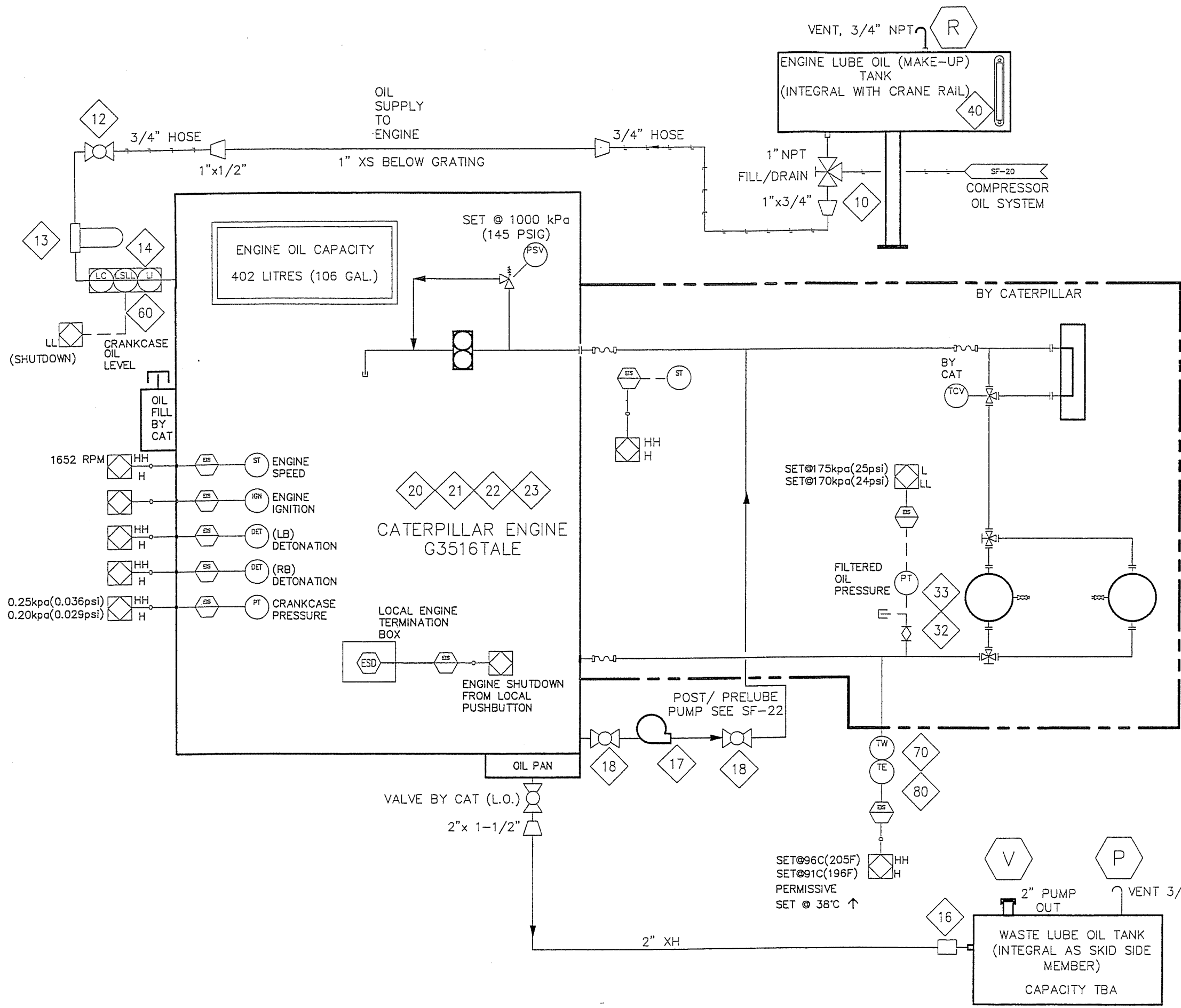
TITLE: SERVICE FLOW AIR & EXHAUST SYSTEMS  
ARIEL JGK/4, CAT. G3516TALE, AXC 132EH

FOR: HUSKY OIL OPERATIONS LTD.  
TOLMAN

CONSULTANT: TAG: K-650  
LSD: 13-29-35-22 W4M  
JOB No.: 050883

DRWN BY: SB	DESIGN BY: SB	DATE: 04/04/06	DWG. No.	OP#
DATE: 04/04/06	CHKD BY: [Signature]	DATE: [Signature]	SF-050883-26	26
SCALE: NTS	APPVD BY: [Signature]	DATE: 06/03/16		

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BILL OF MATERIAL				
ITEM	QTY	EFX CODE	DESCRIPTION	
10	1	121893	VALVE, BALL, 3-WAY, 1" NPT, FULL SS, 800 PSIG ( MAS G-4)	
12	1	102925	VALVE, BALL, 3/4" NPT, 2000# WOG, RP, CS C/W LOCKING HANDLE [NUTRON, T3-R07S20B]	
13	1	121735	FILTER, ASSEMBLY, OIL, 1/2" NPT, 25 MICRON, C/W SF6310 [KINECOR, SAF-05-00-0]	
14	1	107969	CONTROLLER, OIL LEVEL C/W ELECTRIC SWITCH, XP, CSA C/W BRACKET [KENCO, KLCE-9]	
16	1	101245	COUPLING, STRAIGHT, 2", STYLE 90 [DRESSER, 0090-0005-0B2]	
17	1	119979	PUMP, DIAPHRAGM, 1" NPT, ALUM, GAS, CSA [WARREN RUPP, G1FBIATXNSX00]	
18	2	102926	VALVE, BALL, 3/4" NPT, 2000# WOG, RP, CS, NACE C/W LOCKING [NUTRON, T3-R07S20S]	
20	1	NPN-REQ	>>IGNITION SYSTEM, BY CAT, CSA CLASS1, DIV2	
21	1	NPN-REQ	>>HARNES, IGNITION SYSTEM, CSA CLASS1, DIV2, BY CAT	
22	1	NPN-REQ	>>THERMOCOUPLE ASS'Y, TYPE K, 3/4" NPT, 2-1/2" INSERTION, BY CAT	
23	1	NPN-REQ	>>HARNES, K TYPE THERMOCOUPLE, BY CAT	
32	1	102802	VALVE, PLUG, 1/4" TUBE, 316SS [NUPRO, SS-4P4T]	
33	1	112325	TRANSMITTER, PRESSURE, 0-160 PSIG, SWEET, 1/4" NPT [WKA, 892.13.500]	
40	1	115052	INDICATOR, LEVEL, SIGHT GLASS WINDOW, 10" BOLT CENTERS, [MP FILTRI, LVA 30 TA]	
60	1	104174	BRACKET, MOUNTING, KENCO LCE-9 LEVEL CONTROLLER, FABRICATED	
70	1	105165	THERMOWELL, 316SS, BTB STYLE 4, 1/4" X 1/2", U=2", ?" BORE	
80	1	113106	THERMOCOUPLE, K TYPE, 316SS C/W [THERMOKINETICS, K125-316S-0006-B-825-C00-00185]	

NOTE:  
1. 1/2" PLUGGED SAMPLE POINTS TO BE PROVIDED.

**AS-BUILT**  
DATE MAR 16 2006

REV	DESCRIPTION	DATE	DRAWN BY	CHECKED BY
2	AS BUILT	06/03/15	MGN	EAM
1	FOR CONSTRUCTION	06/01/10	SWT	
0	FOR APPROVAL	05/12/05	SWT	EAM

**EFX Compression**  
ENERFLEX

4700 47 Street SE Calgary AB Canada T2B 3R1 Canada Tel. +1.403.236.6800 Fax +1.403.279.0367  
www.enerflex.com

TITLE: SERVICE FLOW  
ENGINE OIL  
ARIEL JGK/4, CAT. G3516TALE, AXC 132EH

FOR: HUSKY OIL OPERATIONS LTD.  
TOLMAN

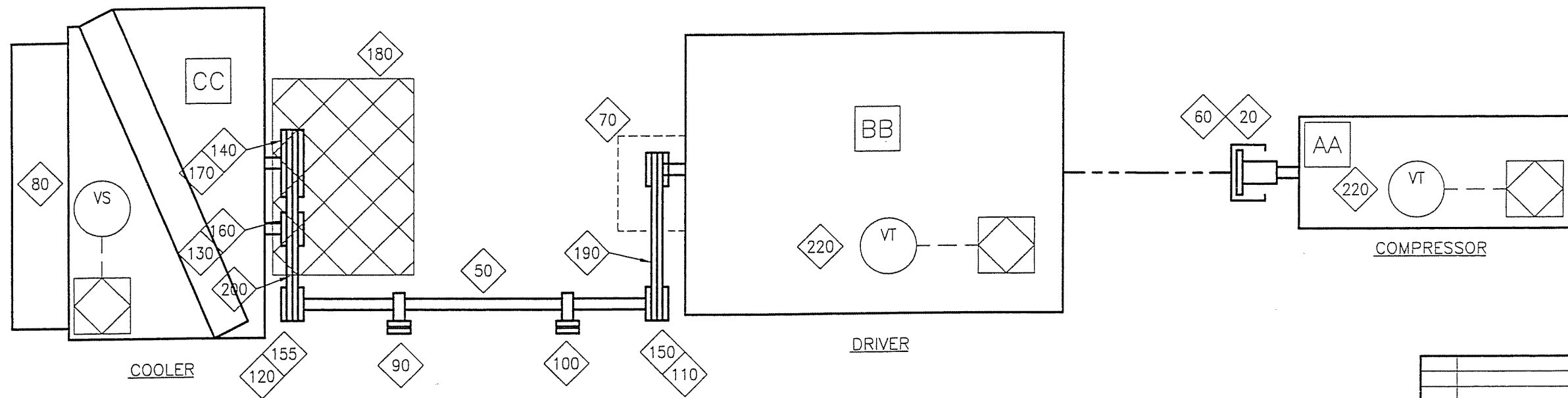
CONSULTANT: TAG: K-650  
LSD: 13-29-35-22 W4M  
JOB No.: 050883

DRWN BY: SB	DESIGN BY: SB	DATE: 04/04/06	DWG. No.	OP#
DATE: 04/04/06	CHKD BY:	DATE:	SF-050883-27	27
SCALE: NTS	APPVD BY: EJA	DATE: 06/03/15		



DESCRIPTION	SHEAVE $\phi$	RPM
ENGINE SHAFT	9.75"	1200
JACK SHAFT		
ENGINE END	16.4"	701
COOLER END	11.8"	
IDLER		
COOLER END	9.6"	N/A
COOLER SHAFT	30.4"	267

BILL OF MATERIAL				
ITEM	QTY	EFX CODE	DESCRIPTION	
20	1	118598	COUPLING, ADAPTER PLATE 26.5" OD HD/SAE C/W STL HUB, RB [FORMFLEX, FSH70-26B-GK]	
50	1	103586	JACKSHAFT, 2-15/16" DIA. C/W 3/4" X 3/8" X 8" KEYWAY @ BOTH ENDS (61"-84")	
60	1	NPN-REQ	GUARD, COUPLING, ALUMINUM, NON-SPARKING	
70	1	NPN-REQ	ENGINE DRIVE BELT GUARD, BUILD TO SUIT	
80	1	104524	SWITCH, VIBRATION, ELECTRIC C/W MANUAL RESET [MURPHY, VS2]	
90	1	107128	PILLOW BLOCK, 2-15/16", EXPANSION [BROWNING, PB970EX 2-15/16]	
100	1	107132	PILLOW BLOCK, 2-15/16", NON-EXPANSION [BROWNING, PB970NEX 2-15/16]	
110	1	125858	SHEAVE, 6-GROOVE, USED WITH SF BUSHING [BROWNING, 6B160SF]	
120	1	107221	SHEAVE, 6-GROOVE, USED WITH R2 BUSHING [BROWNING, 6C110R]	
130	1	107216	SHEAVE, 6-GROOVE, USED WITH R2 BUSHING [BROWNING, 6C96R]	
140	1	107228	SHEAVE, 6-GROOVE, USED WITH R2 BUSHING [BROWNING, 6C300R]	
150	1	107108	BUSHING, SF 2-15/16" [BROWNING, SF]	
155	1	107080	BUSHING, R2 2-15/16" [BROWNING, R2]	
160	1	107087	BUSHING, R2 2-7/16" [BROWNING, R2]	
170	1	107105	BUSHING, R2 3-7/16" [BROWNING, R2]	
180	1	114075	FENCE, CHAIN LINK, LYNX BRAND, 1-5/8" OD AS PER DRAWING:	
190	6	106995	V-BELT, B-SECTION [GOODYEAR, B-103]	
200	6	107028	V-BELT, C-SECTION [GOODYEAR, C-190]	
220	2	104787	TRANSMITTER, VIBRATION, 4-20MA, 24VDC CSA, IS, CENELEC [METRIX, ST5484E-767]	



**AS-BUILT**  
DATE MAR 16 2006

REV	DESCRIPTION	DATE	DRAWN BY	CHECKED BY
2	AS BUILT	06/03/15	MGN	EAM
1	FOR CONSTRUCTION	06/01/10	SWT	
0	FOR APPROVAL	05/12/05	SWT	EAM

**REVISIONS**

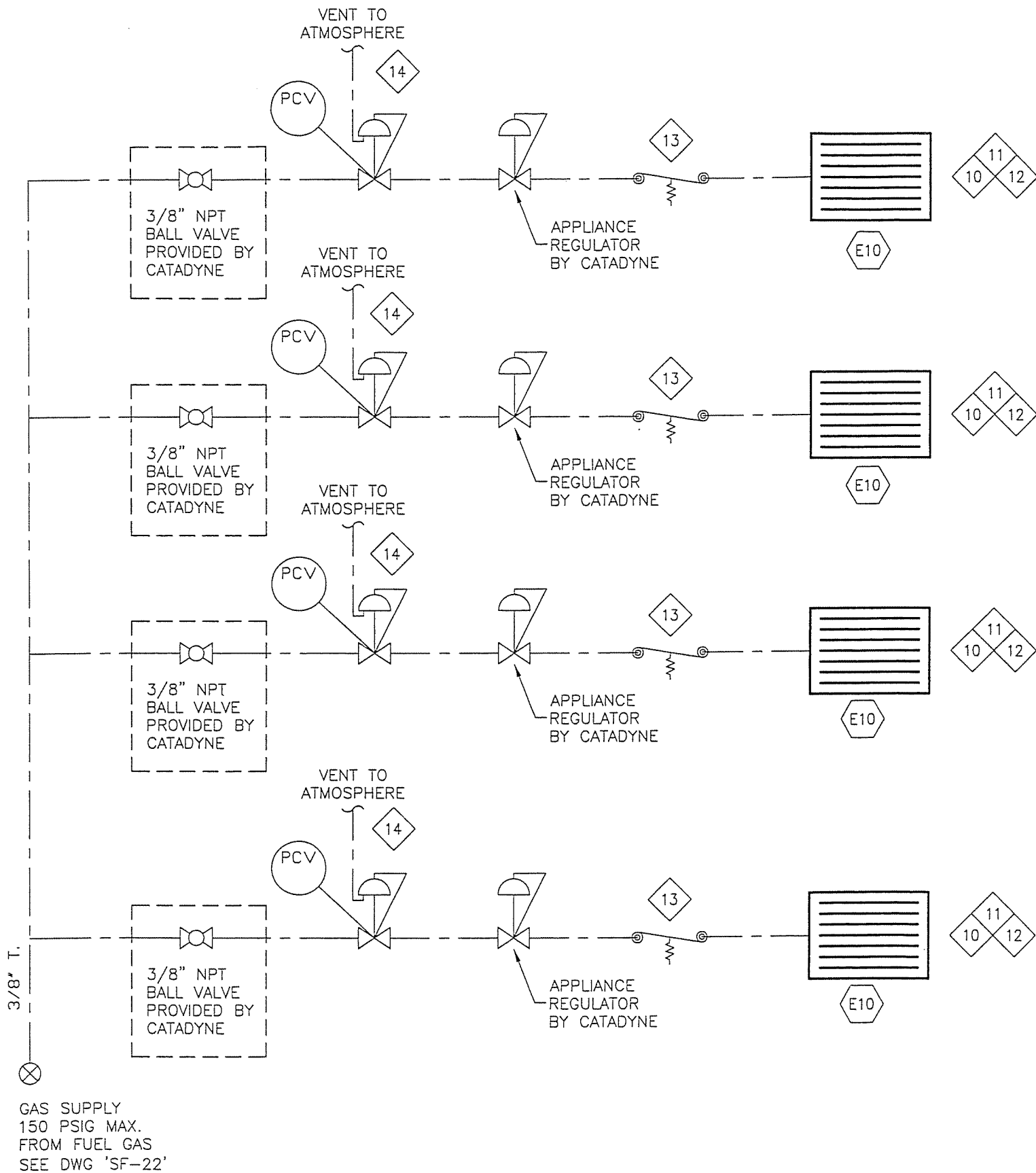
**EFX Compression**  
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www.enerflex.com

ENGINEERING RECORD	LSO	13-29-35-22 W4M	CONSULTANT
DRAWN BY TTS	DATE 02/07/24	TITLE DRIVE TRAIN MODULE ARIEL JGK/4, CAT 3516 TALE, AIR-X 132EH HUSKY OIL OPERATIONS LTD. TOLMAN (K-650)	
ENGINEER EIM	DATE 06/03/16	SCALE NTS	JOB NO. 050883 DWG NO SF-050883-28
APPD			REV 2

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GAS SUPPLY  
150 PSIG MAX.  
FROM FUEL GAS  
SEE DWG 'SF-22'

BILL OF MATERIAL				
ITEM	QTY	EFX CODE	DESCRIPTION	
10	4	103501	HEATER, 32 MBTU, 120 VOLT C/W VALVE-H17C3-5 (CATADYNE, WX2448-0001)	
11	4	103513	HEATER, PROTECTION GRILL, 24" X 48" (4 PER SET) (CATADYNE, AC-SNAP-1224)	
12	4	100809	BRACKET, MOUNTED FOR CATADYNE HEATERS AS PER ENERFLEX DWG #72-101	
13	4	103517	HEATER, THERMOSTAT (CATADYNE, AC-TC)	
14	4	103515	HEATER, REGULATOR, 250 PSIG, 11" WC, 1/4" X 3/8" NPT (CATADYNE, AC-R-912)	
*****				
BILL OF MATERIALS ( 4 ) HEATERS				
DATE-TIME EXPORTED:				

**AS-BUILT**  
DATE MAR 16 2006

REV	DESCRIPTION	DATE	DRAWN BY	CHECKED BY
2	AS BUILT	06/03/15	MGN	EAM
1	FOR CONSTRUCTION	06/01/10	SWT	
0	FOR APPROVAL	05/12/05	SWT	EAM

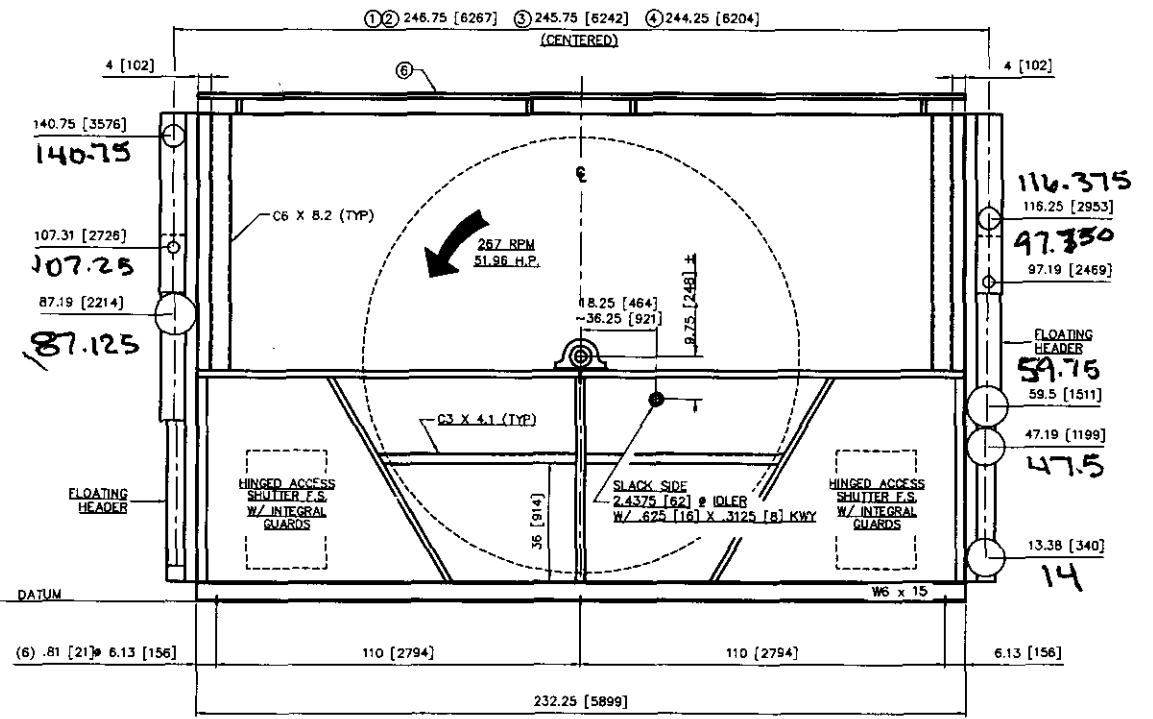
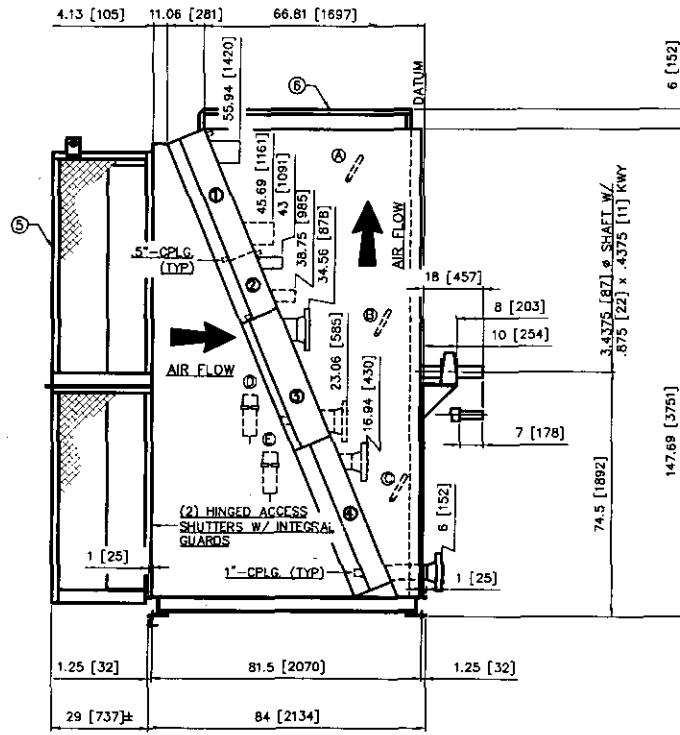
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ENERFLEX  
4700 47 Street SE Calgary AB Canada T2B 3R1 Canada Tel. +1.403.236.6800 Fax +1.403.279.0367  
www.enerflex.com

TITLE: SERVICE FLOW  
(4) BUILDING HEATERS (CATADYNE)  
COMPRESSOR PACKAGE

FOR: HUSKY OIL OPERATIONS LTD  
TOLMAN

CONSULTANT: - TAG: K-650  
LSD: 13-29-35-22 W4M  
JOB No.: 050883

DRWN BY: JAM	DESIGN BY: JAM	DATE: 04/06/17	DWG. No.	OP#
DATE: 04/06/17	CHKD BY: -	DATE: -	SF-050883-72	72
SCALE: NTS	APPVD BY: E.M.	DATE: 06/03/16		



- ① E/W/FLOW (38 GALS)  
D.P. 14 P.S.I. @ 300/-20 F.  
NOZZLES 6"-STUB
- ② TAW/CW (18 GALS)  
D.P. 14 P.S.I. @ 300/-20 F.  
NOZZLES 3"-STUB
- ③ IC-1 (ASME STAMP)  
D.P. 645 P.S.I. @ 350/-40 F.  
NOZZLES 6"-300 RF
- ④ AC (ASME STAMP)  
D.P. 1450 P.S.I. @ 350/-40 F.  
NOZZLES 4"-900 RF

- ⑤ BUGSCREEN FRAME/TANGUARD W/ INTEGRAL GUARD & EXTERNAL REMOVABLE BUGSCREEN (PANELS SHIP LOOSE)
- ⑥ HAIL GUARD

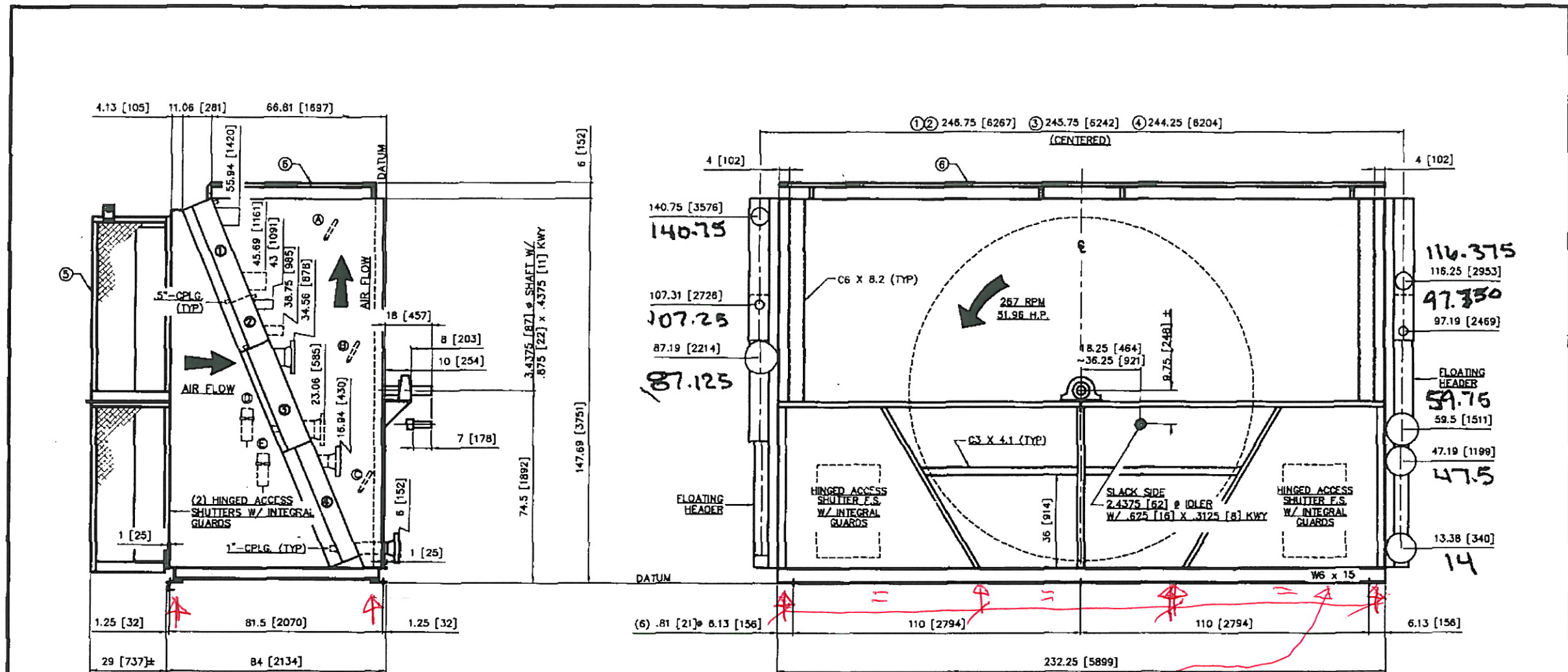
- Ⓐ MANUAL SHUTTER OPERATOR ~ E/W/FLOW & TAW/CW W/ GROUND LEVEL OPERATOR
- Ⓑ MANUAL SHUTTER OPERATOR IC-1
- Ⓒ MANUAL SHUTTER OPERATOR AC
- Ⓓ AUTO AUX SHUTTER OPERATOR IC-1
- Ⓔ AUTO AUX SHUTTER OPERATOR AC (AUTO BY (2) GARZO 501-12 AIR MOTORS)

ESTIMATED DRY WEIGHT: 18,800#  
METRIC [ ]

REV.	DESCRIPTION	BY	DATE	APP'D	DATE	JOB STATUS:	CUSTOMER: ENERFLEX	Air-X-Changers Harsco
1	TAG NUMBER WAS 050882	DB	11/15/05	IM	11/15/05	RELEASED FABRICATION OF THIS ORDER HAS BEGUN	TAG: 050883 P.O. NO.: 0540693	MODEL 132EH AXC JOB NO.: 055094 DRAWN BY: AICS DATE: 08/19/05 CHECKED BY: DB DATE: 08/19/05 DRAWING NO.: CRT SCALE: 1:1

NOTICE: THIS DOCUMENT CONTAINS PROPRIETARY INFORMATION AND IT SHALL NOT BE USED OR REPRODUCED OR CONTENTS DISCLOSED IN WHOLE OR IN PART WITHOUT WRITTEN CONSENT FROM AIR-X-CHANGERS.





*cooler supported on W6 x 15 structural members*

① E/W/FLOW (38 GALS) D.P. 14 P.S.I. @ 300/-20 F. NOZZLES 6"-STUB	③ IC-1 (ASME STAMP) D.P. 645 P.S.I. @ 350/-40 F. NOZZLES 6"-300 RF
② IAW/CW (18 GALS) D.P. 14 P.S.I. @ 300/-20 F. NOZZLES 3"-STUB	④ AC (ASME STAMP) D.P. 1450 P.S.I. @ 350/-40 F. NOZZLES 4"-900 RF

- ⑤ BUGSCREEN FRAME/FANGUARD W/ INTEGRAL GUARD & EXTERNAL REMOVABLE BUGSCREEN (PANELS SHIP LOOSE)
- ⑥ HAIL GUARD

- Ⓐ MANUAL SHUTTER OPERATOR -- E/W/FLOW & IAW/CW W/ GROUND LEVEL OPERATOR
- Ⓑ MANUAL SHUTTER OPERATOR IC-1
- Ⓒ MANUAL SHUTTER OPERATOR AC
- Ⓓ AUTO AUX. SHUTTER OPERATOR IC-1
- Ⓔ AUTO AUX. SHUTTER OPERATOR AC (AUTO BY (2) GARZO 501-12 AIR MOTORS)

ESTIMATED DRY WEIGHT: 18,800#  
METRIC [ ]

REV.	DESCRIPTION	BY	DATE	APP'D	DATE	JOB STATUS:	CUSTOMER: ENERFLEX	Air-X-Changers Haraco
1	TAG NUMBER WAS 050882	DB	11/15/05	IN	11/15/05	RELEASED FABRICATION OF THIS ORDER HAS BEGUN	TAG: 050883	MODEL 132EH
							P.O. NO.: 0540693	AXC JOB NO.: 055094
							NOTED: THIS DOCUMENT CONTAINS PROPRIETARY INFORMATION AND IT SHALL NOT BE USED OR REPRODUCED OR COPIED OR DISCLOSED IN WHOLE OR IN PART WITHOUT PRIOR WRITTEN CONSENT FROM AIR-X-CHANGERS.	AXC JOB NO.: 055094
								DRAWN BY: AICS DATE: 08/19/05
								CHECKED BY: DB DATE: 08/19/05 REV.
								DRAWING NO.: CRT SCALE: 1:1 1