



Job# EV-10310

Description:

2MM BTU/HR

66" OD x 20'-0" s/s

Sour Service Line Heater Package

Project: Sunrise Area Development

Constructed For:

ARC Resources Ltd.

c/o XXL Engineering Ltd.

QUALITY CONTROL MANUAL

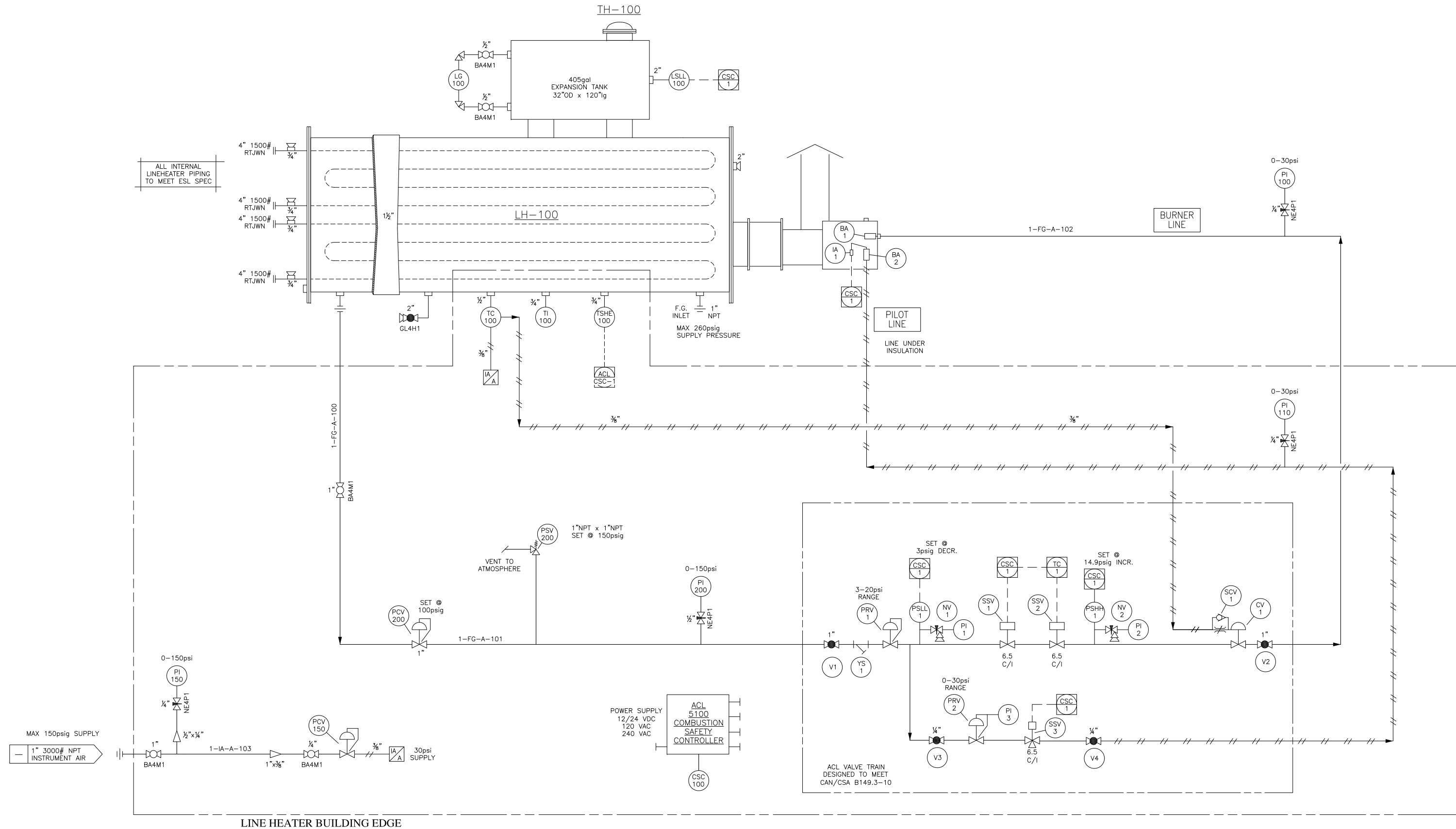
SN#: LH-714

LINE NO.	Drawing #	DESCRIPTION	Revision #	Customer Name	Customer Address	COMMENTS
1	EV-10310-F-001	P & I D	0	ARC RESOURCES	101 807 Manning Road NE	Phone 205-825-9322
2	EV-10310-F-001	BOM	0	c/o XXL Engineering	Calgary Alberta	Contact Filkret Sentgoz
3		ISO			T2E 7M8	2/10/2011
4		ISO				PO 2896-005
5		ISO				
6		ISO				
7		ISO				
8		ISO				
9		ISO				
10		ISO				
11		ISO				
12		ISO				
13		ISO				
14	EV-10310-L-001	Layout	0			
15	EV-10310-L-001	Layout	0			
16	EV-10310-L-001	Layout	0			
17	EV-10310-L-001	Layout	0			
18		Layout				
19		Layout				
20	EV-10310-S-001	Skid	0			
21	BDD-401 pg 1-4	4 1/2" Pre Heat	1			
22		Re Heat				
		Line Heater				

Please destroy all previous issues.
When this is complete please sign below and return
one (1) copy to:

Panax Oil & Gas Inc.
3730-69 Avenue
Edmonton Alberta T6B 2V2





ALL INTERNAL
LINEHEATER PIPING
TO MEET ESL SPEC

REV	ISSUED FOR CONSTRUCTION / P.ENG STAMP	MEW	17/03/11
REV	REVISION	BY	APPR
0	ISSUED FOR CONSTRUCTION / P.ENG STAMP	MEW	17/03/11
		BY	APPR



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www.evolutionequipment.com

DATE	CLIENT
04/01/11	ARC RESOURCES LTD. c/o XXL ENGINEERING LTD.
DESIGNED BY	PROJECT: SUNRISE AREA DEVELOPMENT
DRAWN BY	TITLE
CHECKED BY	MECHANICAL FLOW DIAGRAM
APPROVED BY	2MM BTU/HR
	SOUR SERVICE LINEHEATER PACKAGE
SCALE	JOB #:
N.T.S.	EV-10310
	REF. NO.:
	PNID
	DRAWING:
	FLOW DIAGRAM
	SHEET NO.:
	1 OF 2
	DRAWING NO.:
	EV-10310-F-001
	REV. NO.:
	0

THIS DESIGN IS THE PROPERTY OF EVOLUTION PRODUCTION EQUIPMENT LTD. AND IS SUBJECT TO AUTHORIZED USE.

LH-100
2MM BTU/HR LINEHEATER

SIZE: 66" O.D. x 20'-0" S/S
c/w 10 PASSES OF 4" 1500# SCH.160 RTJWN PREHEAT COIL
10 PASSES OF 4" 1500# SCH.160 RTJWN REHEAT COIL
DESIGN PRESSURE: 3212 psig
DESIGN TEMPERATURE: 200°F
MDMT: -20°F
PWHT: 1150°F ± 50°F FOR 1 HOUR MINIMUM
CORROSION ALLOWANCE: 1/8"
RADIOGRAPHY: 100%
c/w 405gal EXPANSION TANK
(32"O.D. x 120"lg)

BL-100
FLAME ARRESTOR
2-PIECE BURNER HOUSING

MODEL: FAH32/18-20A2
TWO PIECE ALUMINUM CONSTRUCTION
RATED FOR 2.0MM BTU/HR TO FIT A
20" FIRETUBE
c/w (1) 1/2" ELECTRICAL CONNECTION
(1) ACL-M200 MIXER
(1) ACL-B20016 VENTURI BARREL
(1) ACL-ON20018 HIGH EFFICIENCY
BURNER NOZZLE

GENERAL NOTES:

- QUANTITIES IN B.O.M. ARE FOR (1) UNIT.
- ALL PIPING TO BE IN ACCORDANCE WITH THE LATEST EDITION OF ASME B31.3 PRESSURE PIPING CODE.
- VESSEL TO BE FABRICATED TO THE LATEST EDITION OF ASME SECTION VIII, DIVISION 1 PRESSURE VESSELS.
- SPEC 'ES' SOCKETWELD PIPING: 3/4"-1 1/2" = SCH XXS
SPEC 'ES' WELDED PIPING: 2",3" = SCH 160
4" = SCH 160min (CALC WT & MDMT)
6" = SCH XXSmin (CALC WT & MDMT)
SPEC 'ESL' FOR HEATER COILS: 1/2"-1 1/2" = SCH XXS SCRD/SW (ASTM A333 Gr.6 SMLS)
2",3" = SCH 160 BW/RTJ (ASTM A333 Gr.6 SMLS)
4" = SCH 160min BW/RTJ (ASTM A333 Gr.6 SMLS)
6" = SCH XXSmin BW/RTJ (ASTM A333 Gr.6 SMLS)
- ALL FORGED STEEL FITTINGS TO BE: SA-105N, 6000# (min) RATING (SPEC 'ES').
FUEL GAS COIL TO BE: SA-105N, 3000# (min) RATING.
ALL WELDED FITTINGS TO BE: SA-234-WPB NORMALIZED
- SPEC 'ESL' TUBING: 1/4"-3/8" = 0.035" (min) ASTM A269 TP316/316L SMLS, FULLY ANNEALED
1/2" = 0.049" (min) ASTM A269 TP316/316L SMLS, FULLY ANNEALED
ALL TUBING FITTINGS: ASTM A182 F316/316L SWAGelok
- SPEC 'A' THREADED PIPING: 1/2"-2" = SCH 60
SPEC 'A' WELDED PIPING: 2"-10" = SCH 40
12" = STD
- ALL FORGED STEEL FITTINGS TO BE: SA-105N, 3000# (min) RATING (SPEC 'A').
- PAINTING SPEC:
EXTERNAL SURFACE PREPARATION: SSPC-SP-6 (COMMERCIAL SAND BLAST) - (PIPING, HEATER SKID, BODY & STACK)
EXTERNAL PRIMER: ONE (1) SHOP COAT OF COVERDALE FAST DRY PRIMER 5 mils
VESSEL EXTERNAL FINISH PAINT: TWO (2) SHOP COATS OF CLOVERDALE GREY ENAMEL (HIGH HEAT STACK & L.H. BODY)
SKID FLOOR/STRUCTURAL STEEL: TWO (2) SHOP COATS OF CLOVERDALE BLACK ENAMEL
PIPING EXTERNAL FINISH: TWO (2) SHOP COATS OF CLOVERDALE GREY ENAMEL
INTERNAL SURFACE PREPARATION: NA
INTERNAL COATING OF VESSEL: NA
- PROTECT ALL OPENINGS FOR SHIPMENT.
- BOLTING TO BE SA-193-B7M STUDS w/ SA-194-2HM NUTS c/w 316SS FLEXITALLIC GASKET.
- BUILDING SIZE: 5'-4" LG x 2'-0" WIDE.
BUILDING TYPE: FOAM PANEL, BOX STYLE/SIDE MOUNTED ENCLOSURE
ROOF TYPE: SHED
WALL HEIGHTS: 5'-6" EAVE
EXTERIOR: 22 GAUGE GALVALUME PRE-PAINTED COOL GREY 6.
INTERIOR: 22 GAUGE GALVALUME PRE-PAINTED WHITE
DOORS & TRIM PRE-PAINTED RED (PANTONE 186)
DOORS: ONE (1) 2'-6"x5'-4" DOUBLE DOOR WITH PANIC HARDWARE, CHECK CHAIN, WHITECOMB DOOR LATCH
WEATHER STRIP, SPRING LOADED BARREL BOLT.
VENTILATION: ONE (1) 8"x8" MANUAL LOUVER.
- PACKAGE IS HYDRO TESTED @ 1.5 TIMES MAWP FOR ONE (1) HOUR AT ROOM TEMPERATURE.
- VESSEL SHELL COVERED WITH 1 1/2" MINERAL WOOL HOT INSULATION, 0.20 STUCCO EMBOSSED ALMINUM COVERING WITH STEEL BANDING (HEADS NOT INCLUDED)
- ALL INSTRUMENTS TO BE VENTED TO ATMOSPHERE.
- ALL PIPE, VALVES AND FITTINGS IN SOUR PROCESS LINES, EXCEPT INSTRUMENT AIR, TO BE NACE/ISO, LATEST EDITION ACCEPTABLE.
- ALL PIPING TO MEET ARC RESOURCES SPEC 'ES' AND 'A' PIPING SPECIFICATIONS.
- RUN INSTRUMENT TUBING UNDER LINE HEATER INSULATION WHERE POSSIBLE.
- ELECTRICAL INSTALLED BY 3RD PARTY CONTRACTOR.
- 5-PIECE MITRE FIRETUBE AND COILS TO BE STRESS RELIEVED
- ACL BURNER TO BE PRE-WIRED
- ENGINEER STAMPED DRAWINGS ON FUEL TRAIN

BILL OF MATERIALS

TAG	QTY	MAKE	DESCRIPTION
PSV-200	1	TAYLOR	PRESSURE SAFETY VALVE, MODEL 8200-1, 1" NPT INLET x 1" NPT OUTLET, STD. PRESSURE SERVICE TRIM, WCB BODY, SET@150psig, 1.25MM CAPACITY
LSLL-100	1	SOR	MODEL 1510B-G2A-C-W9-ES-CS-CV, ELECTRIC LEVEL SWITCH, 2" NPT CONNECTION, STEM, 6" EXTENSION-ES-1500 (SS FLOAT) STD. SERVICE
PCV-200	1	FISHER	627 PRESSURE REGULATOR, 1" FNPT CONNECTIONS, WCB BODY, SST TRIM, NITRILE DISC, 75-150psig S.R., 1/4" ORIFICE, STD. SERVICE, 1500psig MAWP
PCV-150	1	FISHER	67CFR-362 INSTRUMENT GAS REGULATOR, 1/4" FNPT CONNECTIONS, STANDARD SERVICE TRIM, 0 TO 35psig SPRING RANGE, 250psig MAWP
TC-100	1	KIMRAY	T 12T TEMPERATURE CONTROLLER, INDIRECT THROTTLING, CAT. No.: HAI, TEMP. RANGE -30°F to 750°F MAX
TSHE-100	1	TELEMATIC CONTROLS	CCS 6900TE-14 TEMPERATURE SWITCH, 1/2" MNPT CONNECTION, XPROOF, 300°F MAX PROBE TEMP., 80°F-205°F ON INCR, 60°F-198°F ON DECR. TEMP
TI-100	1	WIKA	TEMPERATURE INDICATOR, 1/2" BCM x 3" FACE x 6" STEM, 0 TO 250°F TEMP. RANGE, DUAL SCALE, c/w 1/2" FNPT x 3/4" MNPT x 6" "U" DIMENSION LENGTH, 316SST THERMOWELL
PI-100 PI-110	2	WIKA	PRESSURE GAUGE, LF, 1/4" NPT BTM x 2 1/2" FACE, 0-30psig RANGE, DUAL SCALE, STD. SERVICE
PI-200	1	WIKA	PRESSURE GAUGE, LF, 1/2" NPT BTM x 4" FACE, 0-150psig RANGE, DUAL SCALE, MOUNTED ON FUEL GAS LINE, STD. SERVICE
PI-150	1	WIKA	PRESSURE GAUGE, LF, 1/4" NPT BTM x 2 1/2" FACE, 0-150psig RANGE, DUAL SCALE, MOUNTED ON INSTRUMENT AIR LINE
LG-100	1	ZIMCO	LEVEL GAUGE, QUES-TEC SIGHT GLASS, (1) ONE 1/2" NPT x 5/8" TUBE GLASS, ITC VALVE c/w INTERNAL BALL CHECK AND ACRYLIC SIGHT GLASS c/w GAUGE GLASS GAURDS
CSC-100	1	ACL	5100 COMBUSTION SAFETY CONTROLLER, 12/24 VDC c/w MOUNTING HARDWARE, ACL M-50 PILOT MIXER AND NOZZLE, 10'-0" HIGH VOLTAGE GROUND WIRE, 6'-6" NONMETALLIC FLEX w/ CONNECTORS, IGNITOR FLAME/ROD c/w MOUNTING HARDWARE, SPEED CONTROL VALVE, 1/2" CONDUIT SEALS, FLAME CURRENT TEST LEADS, OPERATIONS MANUALS, NIOXXLE B10016 VENTURI BARREL, M100 MIXER

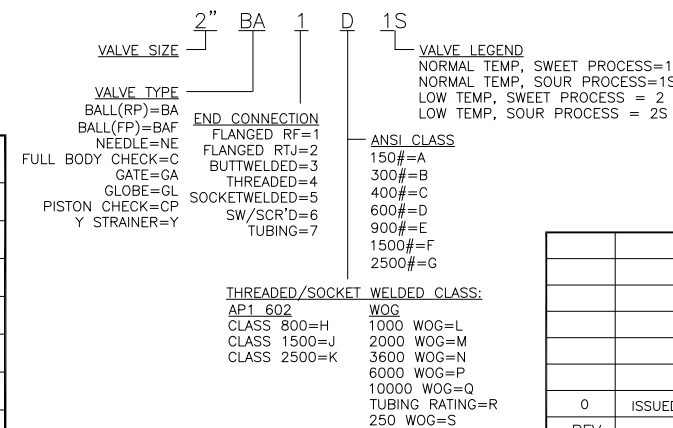
VALVE TRAIN BOM (by OTHERS)

TAG	QTY	DESCRIPTION
CSC-1	1	ACL-5100 or ACL-5500 COMBUSTION SAFETY CONTROLLER CSA C22.2 No. 199-M89 APPROVED CLASS 1 DIV 2
PSHH-1	1	UNITED ELECTRIC, UE-12SHSN9B (3-50psi) HIGH PRESSURE SHUT DOWN SWITCH, ELECTRIC, DRY CONTACTS, SWITCH TO BE CERTIFIED FOR APPROPRIATE ELECTRICAL AREA CLASS.
PSLL-1	1	UNITED ELECTRIC, UE-12SHSN9A (1-15psi) LOW PRESSURE SHUT DOWN SWITCH, ELECTRIC, DRY CONTACTS, SWITCH TO BE CERTIFIED FOR APPROPRIATE ELECTRICAL AREA CLASS.
V-1/2	2	1" NPT MANUAL SHUTOFF VALVE, SOFT SEAT EMICO 720 SERIES UL/ULC OR EQUIVALENT
V-3/4	2	3/4" NPT MANUAL SHUTOFF VALVE, SOFT SEAT EMICO 720 SERIES UL/ULC OR EQUIVALENT
NV-1/2	2	1/4" MULTI PORT NEEDLE VALVE
YS-1	1	1" Y-STRAINER
PI-1/2/3	3	WIKA 0-30 1/4" BM 2 1/2" LIQUID FILLED GAUGE OR EQUAL
PRV-1	1	1" PRESSURE REGULATOR SELF OPERATED POSITIVE SHUTOFF FISHER 627 OR EQUAL. 1/2" YELLOW ORIFICE
PRV-2	1	1/4" PILOT GAS REGULATOR FISHER 67CFR OR EQUAL
SSV-1/2	2	1" NPT CERTIFIED GAS SAFETY SHUT OFF VALVE CSA 6.5-2005 C/I OR EQUIVALENT
SSV-3	1	CERTIFIED PILOT GAS SAFETY SHUT OFF VALVE CSA 6.5-2005 C/I OR EQUIVALENT
BA-1	1	ACL-HE-ON SERIES HIGH EFFICIENCY BURNER ASSY. DESIGN PRESSURE FROM 1 PSI TO 14 PSI. FIXED ORIFICE LIMITS BTU/H
BA-2	1	ACL-M50 PILOT ASSEMBLY. FIXED ORIFICE LIMITS BTU TO UNDER 20,000.
LSLL-1	1	FIELD SELECTION OF SUITABLE LOW LEVEL SWITCH IS ALLOWED
IA-1	1	ACL-IGNITOR ASSEMBLY
CV-1	1	1" FISHER 119 OR EQUIVALENT FOR SLOW OPENING OPERATION
SCV-1	1	SPEED CONTROL VALVE

VALVE LIST

VALVE NUMBER	QTY.	MANUFACTURER	DESCRIPTION
1"BA4M1	2	WKM	1" NPT WOG 3000# REG. PORT BALL VALVE
1/2"BA4M1	2	WKM	1/2" NPT WOG 3000# R.P. BALL VALVE
1/4"BA4M1	1	WKM	1/4" NPT WOG 3000# R.P. BALL VALVE
1/4"NE4P1	1	CENTURY	1/2" NPT 6000# C.S. FxF NEEDLE VALVE
1/4"NE4P1	3	CENTURY	1/4" NPT 6000# C.S. FxF NEEDLE VALVE
2"GL4H1	1	VELAN	2" CL. 800# GLOBE VALVE

VALVE LEGEND



0	ISSUED FOR CONSTRUCTION / P.ENG STAMP	MEW	17/03/11
REV	REVISION	BY	APPR d/m/y



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www.evolutionequipment.com

DATE: 04/01/11	CLIENT: ARC RESOURCES LTD. c/o XXL ENGINEERING LTD.
DESIGNED BY: M.E.W.	PROJECT: SUNRISE AREA DEVELOPMENT
DRAWN BY: TY	TITLE: BILL OF MATERIALS - FLOW DIAGRAM 2MM BTU/HR SOUR SERVICE LINEHEATER PACKAGE
CHECKED BY:	
APPROVED BY:	JOB #: EV-10310 REF. NO.: PNIID DRAWING: FLOW DIAGRAM
SCALE: N.T.S.	SHEET NO.: 2 OF 2 DRAWING NO.: EV-10310-F-001 REV. NO.: 0

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Size	Ident	Spec	No.	FLUID	FROM	TO	CODE	PIPE SCH	C.A. inches	PIPE MATERIAL (smls)	DESIGN			TEST PRESS. (psi)	OPERATING		INSUL.		X RAY (%)	STRESS RELIEF	HARDNESS TESTING (%)	ASME FLUID SERVICE CATEGORY	RADIOGRAPHY CATEGORY	NOTES	P&ID NO.	REV	
											PRESS. (psi)	TEMP (F)	MDMT (F)		PRESS. (psi)	TEMP. (F)	THK. inches	HEAT TRA.									
1	-	FG	-	A	-	100					ASME B31.3	XS	0.0625"	A 106 B	260	200	-20	390	-	-	-	-	-	-	2, 4	EV-10310-F-001	0
1	-	FG	-	A	-	101					ASME B31.3	XS	0.0625"	A 106 B	150	200	-20	225	-	-	-	-	-	-	2, 4	EV-10310-F-001	0
1	-	FG	-	A	-	102					ASME B31.3	XS	0.0625"	A 106 B	150	200	-20	225	-	-	-	-	-	-	2, 4	EV-10310-F-001	0
1	-	IA	-	A	-	103					ASME B31.3	XS	0.0625"	A 106 B	150	100	-20	225	-	-	-	-	-	-	2, 4	EV-10310-F-001	0

ENGINEERING STAMPS

NOTES:

1. REDUCED CORROSION ALLOWANCE
2. NPT PIPING
3. PRESSURE TEST WITH AIR
4. REDUCE DESIGN PRESSURE

0	ISSUED FOR ENGINEERING APPROVAL	MEW		17/03/11	
REV	REVISION	BY	APPR	d/m/y	



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ENGINEERING RECORD		CLIENT	
DRAWN BY	TY	DATE	11/01/11
CHECKED BY	M.E.W.	DATE	11/01/11
APPROVED BY		DATE	
APPROVED BY		DATE	
ENGINEERED BY		DATE	

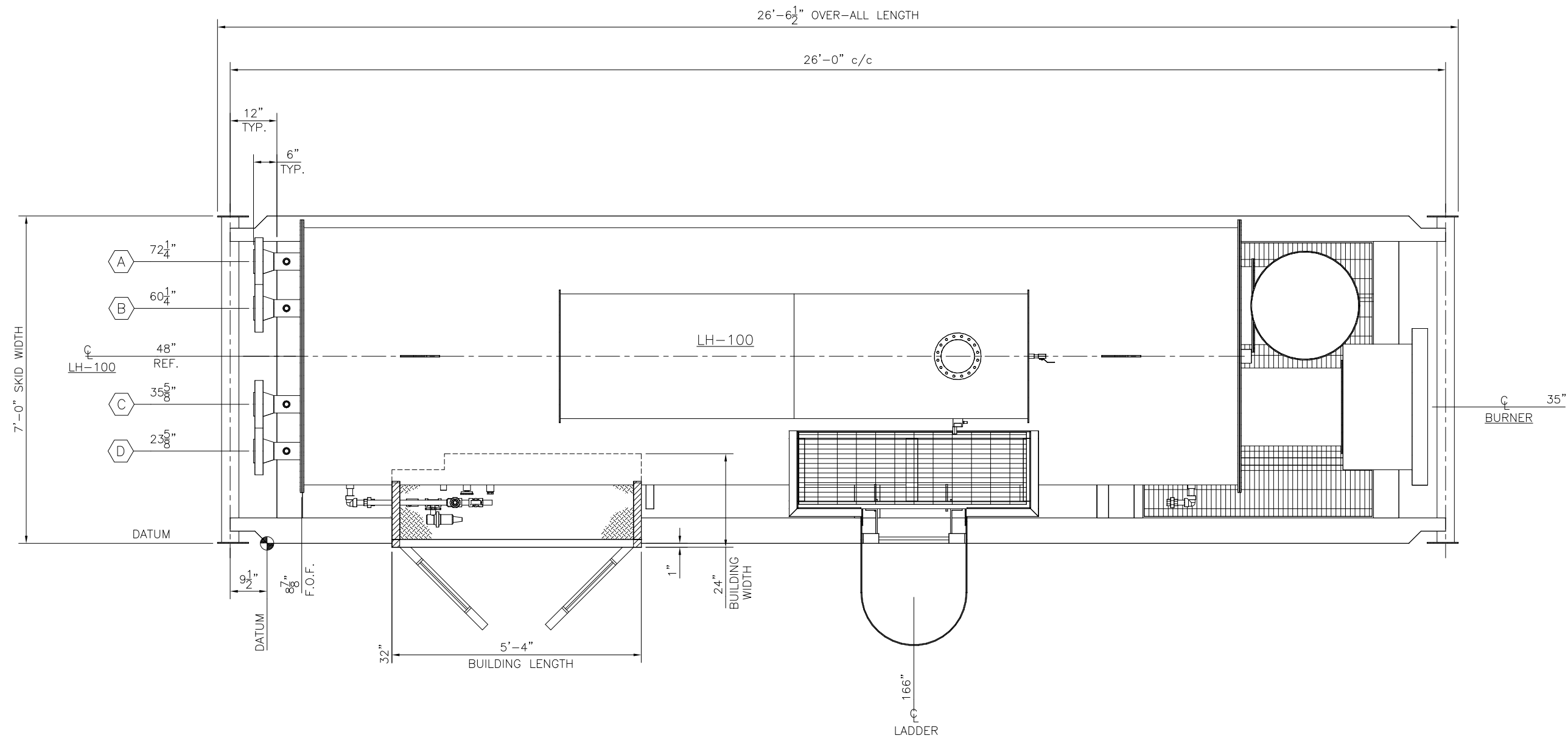
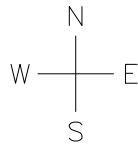
ARC RESOURCES LTD. c/o
XXL ENGINEERING LTD.
PROJECT: SUNRISE AREA DEVELOPMENT

TITLE
LINE LIST
200,000 BTU/HR
SOUR SERVICE LINEHEATER PACKAGE

JOB #: EV-10310
DRAWING: LINE LIST

SHEET NO. 1 OF 1
DRAWING NO. EV-10310-LL-001
REV. NO. 0

THIS DESIGN IS THE PROPERTY OF EVOLUTION PRODUCTION EQUIPMENT LTD. AND IS SUBJECT TO AUTHORIZED USE.



- NOTES:**
1. ORDINATE DIMENSIONS ARE FROM DATUM
 2. ELEVATION MEASUREMENTS ARE FROM TOP OF SKID (FTOS).
- TO GET A BOTTOM OF SKID MEASUREMENT (FBOS)
ADD 12 3/8" TO THE ELEVATIONS LISTED.
 3. PROJECTION MEASUREMENTS ARE FROM SKID EDGE. (FSE)

SHIPPING DIMENSIONS:
 WIDTH: XX'-XX"
 LENGTH: XX'-XX"
 HEIGHT: XX'-XX"
 PACKAGE WEIGHT: lbs

TAG #	SIZE	DESCRIPTION	ELEVATION	PROJECTION
A	4" 1500# RTJWN	PREHEAT COIL	4'-9" FTOS	6" FSE
B	4" 1500# RTJWN	PREHEAT COIL	6'-5 3/4" FTOS	6" FSE
C	4" 1500# RTJWN	RE-HEAT COIL	6'-5 3/4" FTOS	6" FSE
D	4" 1500# RTJWN	RE-HEAT COIL	4'-9" FTOS	6" FSE
E	1"	PSV-100 VENT	4'-7" FTOS	-

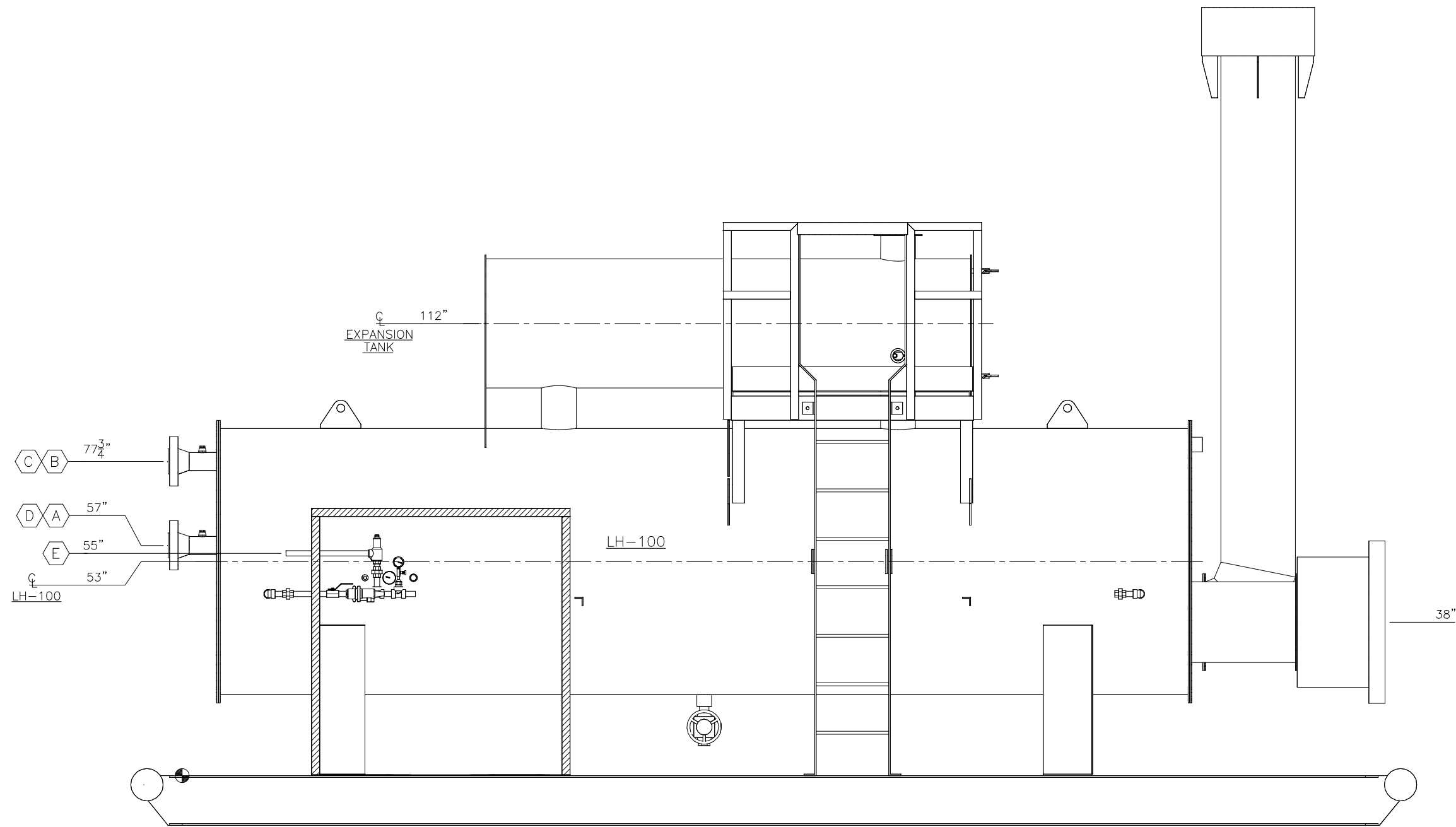
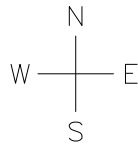
REV	REVISION	BY	APPR	DATE
0	ISSUED FOR CONSTRUCTION	MEW		17/03/11
REV		BY	APPR	d/m/y



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DATE 10/01/11	CLIENT ARC RESOURCES LTD. c/o XXL ENGINEERING LTD.
DESIGNED BY M.E.W.	PROJECT: SUNRISE AREA DEVELOPMENT
DRAWN BY TY	TITLE LAYOUT - TOP VIEW 2MM BTU/HR SOUR SERVICE LINEHEATER PACKAGE
CHECKED BY	
APPROVED BY	JOB # EV-10310
SCALE 1:30	REF. NO.: LAYOUT
	DRAWING: PLAN VIEW
	SHEET NO. 1 OF 4
	DRAWING NO. EV-10310-L-001
	REV. NO. 0

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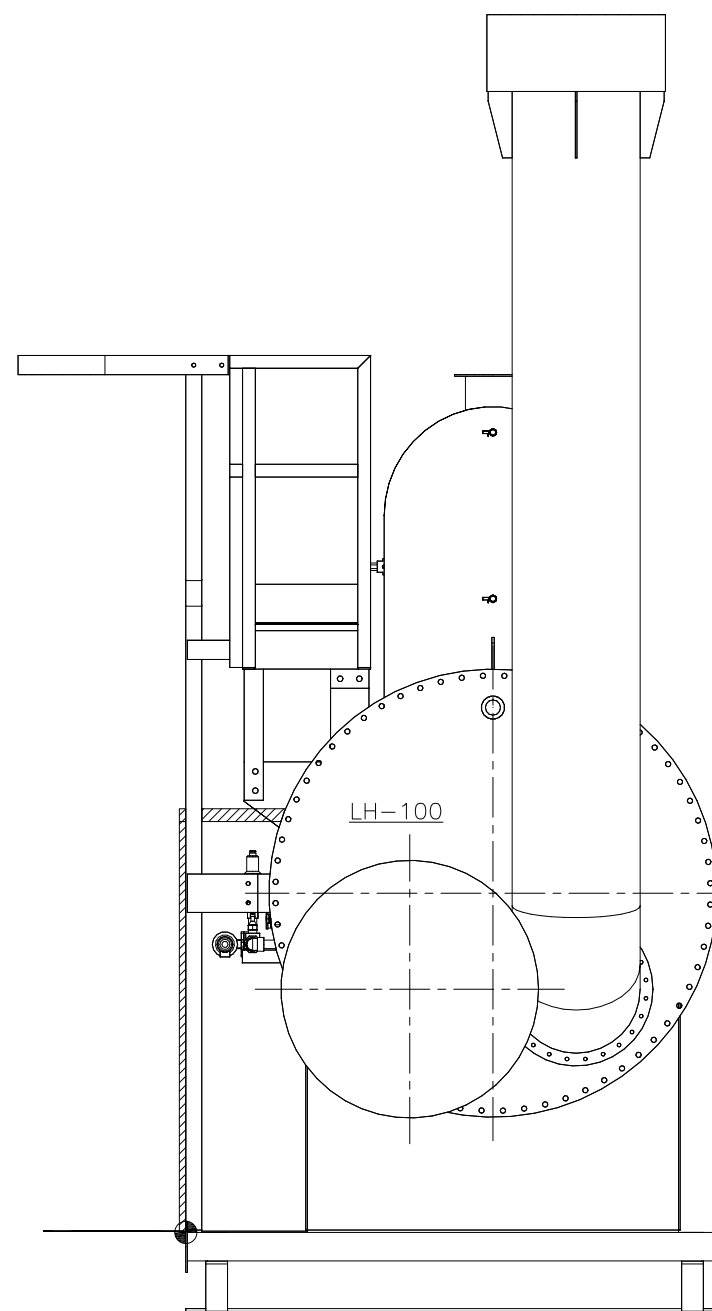
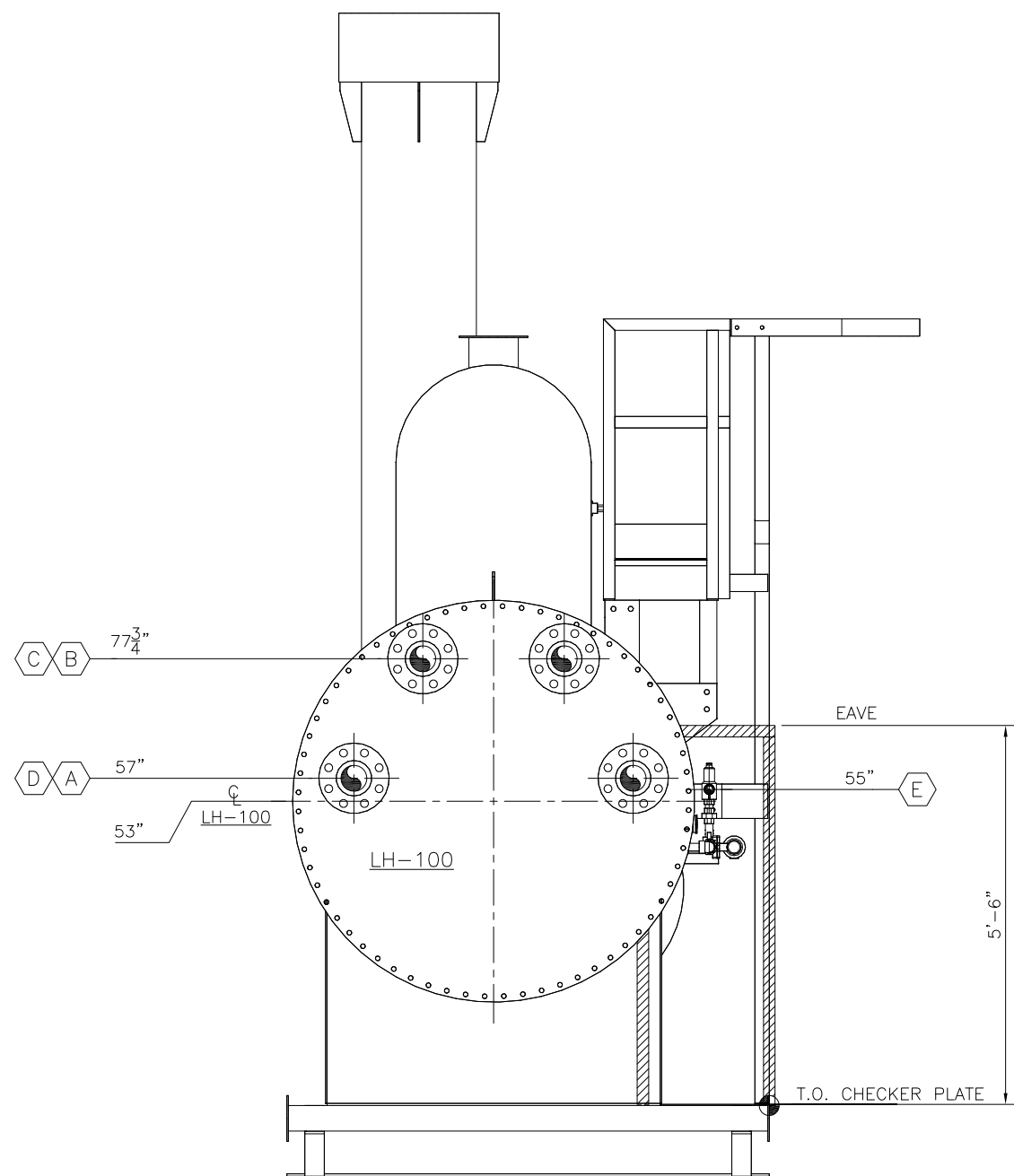
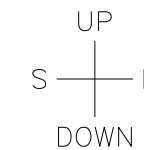
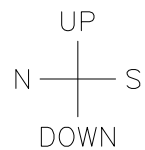
REV	REVISION	BY	APPR	d/m/y
0	ISSUED FOR CONSTRUCTION	MEW		17/03/11



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DATE 10/01/11	CLIENT ARC RESOURCES LTD. c/o XXL ENGINEERING LTD.
DESIGNED BY M.E.W.	PROJECT: SUNRISE AREA DEVELOPMENT
DRAWN BY TY	TITLE LAYOUT - ELEVATION VIEW 2MM BTU/HR SOUR SERVICE LINEHEATER PACKAGE
CHECKED BY	
APPROVED BY	JOB # EV-10310
SCALE 1:30	REF. NO.: LAYOUT
	DRAWING: ELEVATION VIEW
	SHEET NO. 2 OF 4
	DRAWING NO. EV-10310-L-001
	REV. NO. 0

THIS DESIGN IS THE PROPERTY OF EVOLUTION PRODUCTION EQUIPMENT LTD. AND IS SUBJECT TO AUTHORIZED USE.



- NOTES:
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- TO GET A BOTTOM OF SKID MEASUREMENT (FBOS)
ADD 12 3/8" TO THE ELEVATIONS LISTED.
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SHIPPING DIMENSIONS:
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PACKAGE WEIGHT: lbs

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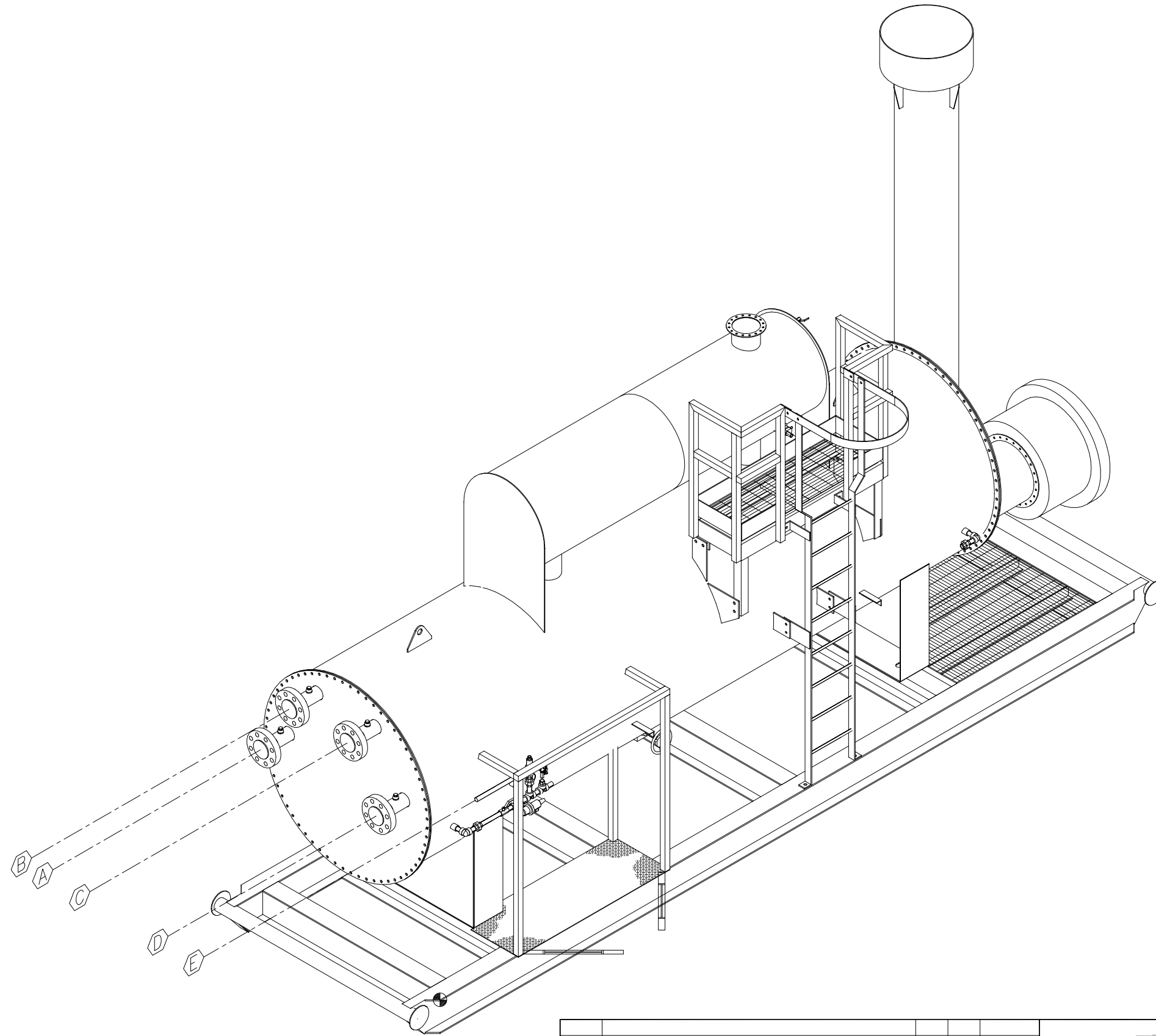
REV	REVISION	BY	APPR	d/m/y
0	ISSUED FOR CONSTRUCTION	MEW		17/03/11



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DATE	DESIGNED BY	CHECKED BY	APPROVED BY	SCALE	JOB #	REF. NO.	DRAWING	REV. NO.
10/01/11	M.E.W.	TY		1:30	EV-10310	LAYOUT	LAYOUT SIDE VIEWS	3 OF 4

CLIENT: ARC RESOURCES LTD. c/o
XXL ENGINEERING LTD.
PROJECT: SUNRISE AREA DEVELOPMENT
TITLE: LAYOUT - SIDE VIEWS
2MM BTU/HR
SOUR SERVICE LINEHEATER PACKAGE
DRAWING NO.: EV-10310-L-001



- NOTES:**
1. ORDINATE DIMENSIONS ARE FROM DATUM
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ADD 12³/₈" TO THE ELEVATIONS LISTED.
 3. PROJECTION MEASUREMENTS ARE FROM SKID EDGE. (FSE)

SHIPPING DIMENSIONS:
 WIDTH: XX'-XX"
 LENGTH: XX'-XX"
 HEIGHT: XX'-XX"
 PACKAGE WEIGHT: lbs

TAG #	SIZE	DESCRIPTION	ELEVATION	PROJECTION
A	4" 1500# RTJWN	PREHEAT COIL	4'-9" FTOS	6" FSE
B	4" 1500# RTJWN	PREHEAT COIL	6'-5 ¹ / ₄ " FTOS	6" FSE
C	4" 1500# RTJWN	RE-HEAT COIL	6'-5 ¹ / ₄ " FTOS	6" FSE
D	4" 1500# RTJWN	RE-HEAT COIL	4'-9" FTOS	6" FSE
E	1"	PSV-100 VENT	4'-7" FTOS	-

REV	REVISION	BY	APPR	d/m/y
0	ISSUED FOR CONSTRUCTION	MEW		17/03/11

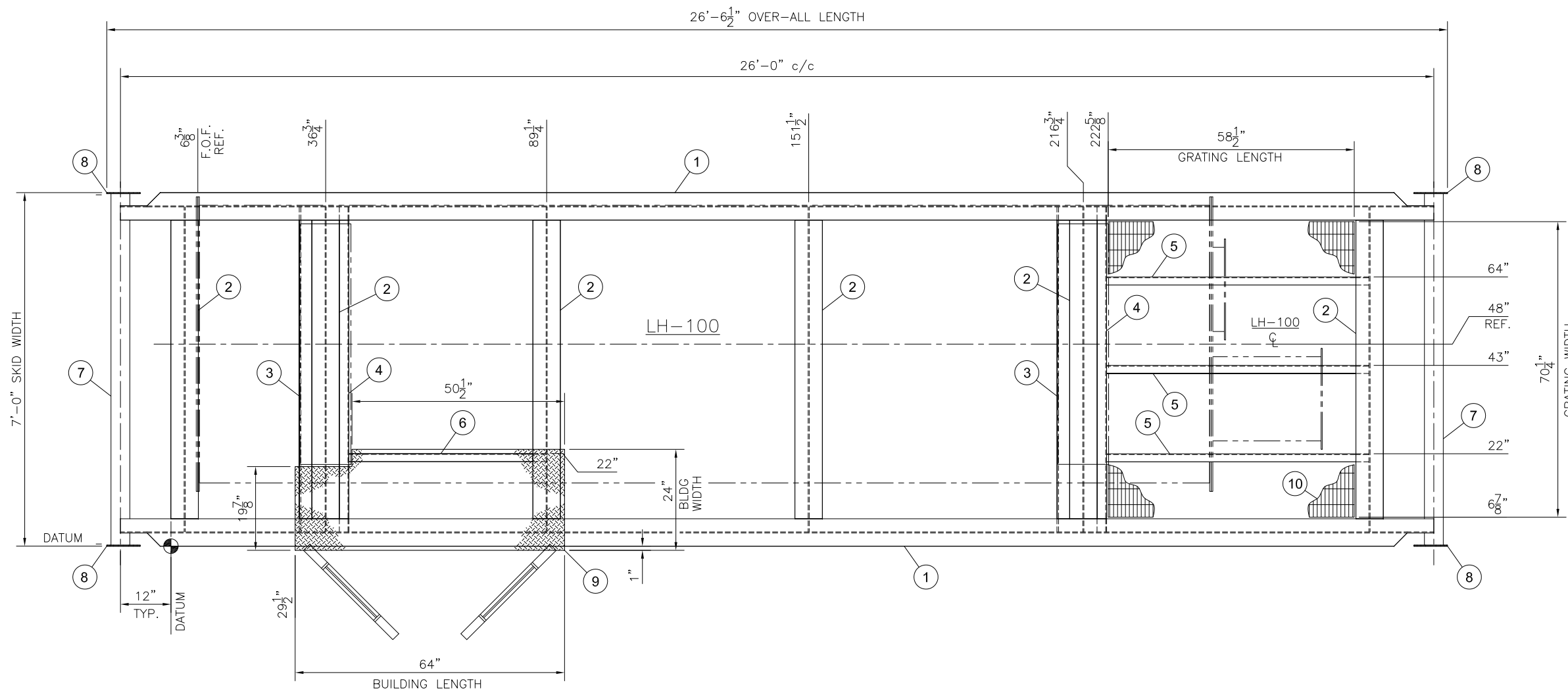


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 www.evolutionequipment.com

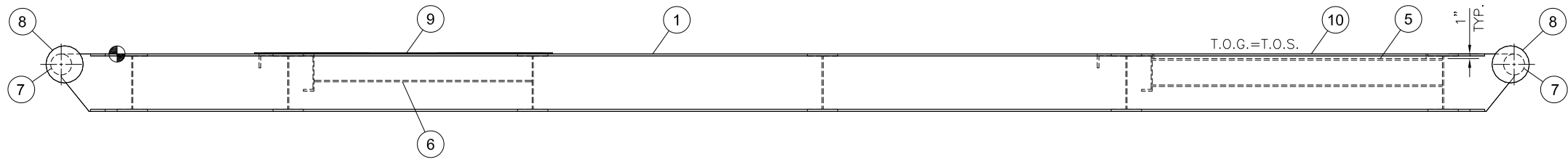
DATE: 10/01/11	CLIENT: ARC RESOURCES LTD. c/o XXL ENGINEERING LTD.
DESIGNED BY: M.E.W.	PROJECT: SUNRISE AREA DEVELOPMENT
DRAWN BY: TY	TITLE: LAYOUT - SW ISOMETRIC VIEW 2MM BTU/HR SOUR SERVICE LINEHEATER PACKAGE
CHECKED BY:	
APPROVED BY:	JOB #: EV-10310 REF. NO.: LAYOUT DRAWING: S.W. ISOMETRIC
SCALE: 1:35	SHEET NO.: 4 OF 4 DRAWING NO.: EV-10310-L-001 REV. NO.: 0

BILL OF MATERIALS

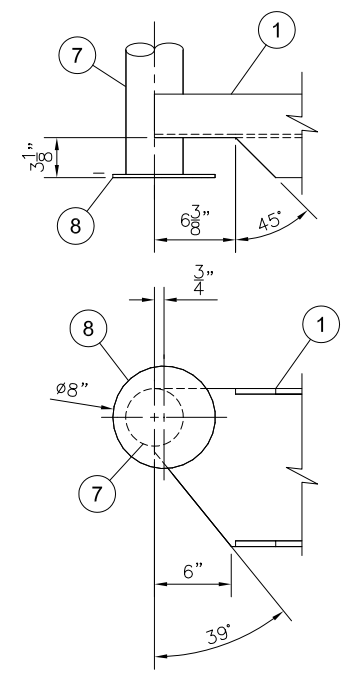
MARK	QTY.	DESCRIPTION	LENGTH
1	2	W12 x 30#	26'-0" (312")
2	6	W12 x 30#	6'-5 1/4" (77 1/4")
3	2	ANGLE, 3"x3"x3/8"	6'-5 1/4" (77 1/4")
4	2	C8 x 11.5#	6'-5 1/4" (77 1/4")
5	3	C6 x 8.2#	5'-2 3/8" (62 3/8")
6	1	C6 x 8.2#	3'-10 7/8" (46 7/8")
7	2	PIPE, 4" SCH.80 SMLS PBE	6'-11 1/2" (83 1/2")
8	4	PLATE, 1/4" THK x 8"Ø	
9	SQ.FT	CHKR PLATE, 3/16" THK x 24"x64"	10.67
10	SQ.FT	SERRATED GRATING, 1" THK x 3/16"	58 1/2" LG x 70 1/4" WD
WEIGHT:			3900 lbs.



PLAN
LADDER & PLATFORM NOT SHOWN FOR CLARITY



ELEVATION



ROLL END DETAIL
1 : 15
(4) REQ'D

- NOTES:**
- 1) ALL SHARP EDGES MUST BE DEBURRED AND/OR ROUNDED.
 - 2) DIMENSIONS MAY VARY ±1/8".
 - 3) ALL STEEL SPECIFICATION MINIMUM SA-36 / 44W.
 - 4) ORDINATE DIMENSIONS ARE FROM DATUM

0	ISSUED FOR CONSTRUCTION	MEW	18/03/11
REV	REVISION	BY	APPR



info@evolutionequipment.com
www.evolutionequipment.com

DATE	10/01/11	CLIENT	ARC RESOURCES LTD. c/o XXL ENGINEERING LTD.
DESIGNED BY	TY	PROJECT	SUNRISE AREA DEVELOPMENT
DRAWN BY	TY	TITLE	STRUCTURAL STEEL LAYOUT 2MM BTU/HR SOUR SERVICE LINEHEATER PACKAGE
CHECKED BY		JOB #	EV-10310
APPROVED BY		REF. NO.	SKID
SCALE	1:30	DRAWING NO.	SKID LAYOUT
		SHEET NO.	1 OF 1
		DRAWING NO.	EV-10310-S-001
		REV. NO.	0

THIS DESIGN IS THE PROPERTY OF EVOLUTION PRODUCTION EQUIPMENT LTD. AND IS SUBJECT TO AUTHORIZED USE.

DESIGN BASIS	
DESIGNED TO MEET	CAN/CSA B149.3-10
FUEL GAS TRAIN DESIGN PRESSURE: FROM FIRST MANUAL SHUTOFF VALVE TO PRV-1 FROM PRV-1 TO BURNER ASSEMBLY	120 PSIG (827 KPAG) -MAX 14.9 PSIG (103 KPAG) -MAX
FUEL GAS TRAIN DESIGN TEMPERATURE:	-20° F TO 150° F (-29° C TO 65° C) (SEE NOTE #1)
FUEL GAS TRAIN LOCATION:	INDOOR OR OUTDOOR
FUEL GAS TRAIN ELECTRICAL AREA:	ZONE 1 OR ZONE 2 SUITABLE
CONTROL POWER:	12 VDC, 24 VDC, 120 VAC, 240 VAC
BURNER CAPACITY:	UP TO 5MM BTU/HR (NET)

CERTIFICATE OF COMPLIANCE:
THE FUEL GAS TRAIN SHOWN ON THIS DRAWING IS ACCEPTABLE FOR USE IN THE PROVINCE OF ALBERTA, SASKATCHEWAN AND BRITISH COLUMBIA PROVIDED THAT:

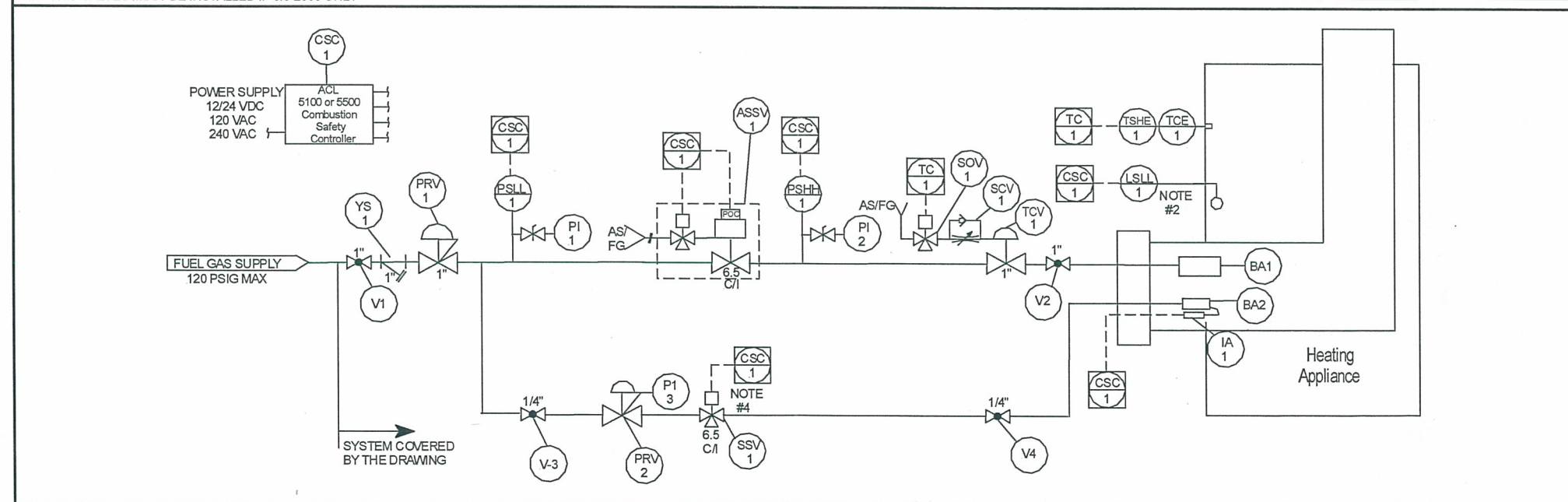
- 1.0 ALL APPLICABLE PROVINCIAL CODES, STANDARDS, AND REGULATIONS ARE COMPLIED WITH. VARIANCES AND SPECIAL INSPECTIONS ARE ACCEPTABLE.
- 2.0 THE FUEL GAS TRAIN IS FABRICATED AS DETAILED ON THE DRAWINGS. FIELD SELECTION OF SUITABLE LEVEL SWITCHES IS ALLOWED. FUEL GAS CONTROLS AND INSTRUMENTS MUST BE INSTALLED IN LOCATIONS INDICATED BY THE SCHEMATICS BELOW. NO ALTERNATE CONTROL SCHEMES OR LAYOUTS ARE ALLOWED.
- 3.0 THE APPLIANCE IS EQUIPPED WITH A PROPER FLAME ARRESTOR.
- 4.0 PIPE AND FITTING MATERIALS ARE SUITABLE FOR DESIGN PRESSURE AND TEMPERATURE SPECIFIED.
- 5.0 THREADED PIPING SCH 80 MINIMUM.
- 6.0 FOR LARGER BTU RATINGS CONTACT FACTORY.
- 7.0 NO SUBSTITUTION OF ACL COMPONENTS.

NOTES:

- 1.0 ALL ACL EQUIPMENT IS DESIGNED FOR -40°C/F OPERATION. PROPER SELECTION OF PIPING MATERIALS AND REMAINING CONTROLS CAN ALLOW FOR THE FUEL GAS SYSTEM TO HAVE A MINIMUM DESIGN TEMPERATURE OF -40°C/F, WITH THE EXCEPTION OF THE FISHER REGULATORS WHICH ARE RATED TO -29°C.
- 2.0 IF ELECTRIC SWITCHES ARE USED, THEY MUST BE CERTIFIED FOR THE ELECTRICAL CLASSIFICATION OF THE AREA.
- 3.0 ALL VENTS MUST BE PIPED TO A SAFE AREA.
- 4.0 TWO VALVES MUST BE INSTALLED IF 6.5-2005 ONLY.

BILL OF MATERIALS		
ITEM	QTY.	DESCRIPTION
CSC-1	1	ACL-5100 or ACL-5500 COMBUSTION SAFETY CONTROLLER CSA C22.2 No. 199-M89 APPROVED CLASS I DIV2
TC-1	1	ACL TC-200 TEMPERATURE CONTROLLER CSA 22.2 No. M1987 APPROVED CLASS I DIV. 2
TSHE-1 TCE-1	1	CSA APPROVED CLASS I DIV. 1 TYPE K THERMOCOUPLE ELEMENTS FOR HIGH TEMPERATURE SHUTDOWN & TEM- PERATURE CONTROL. NOTE: CAN BE 2 SINGLE TYPE K OR A DUAL TYPE K.
PSHH-1	1	HIGH FUEL GAS SHUT DOWN SWITCH, ELECTRIC, DRY CON- TACTS, CONTACTS TO OPEN ON PRESSURE RISING, SWITCH TO BE CERTIFIED FOR APPROPRIATE ELECTRICAL AREA CLASSIFICATION
PSLL-1	1	LOW FUEL GAS SHUT DOWN SWITCH, ELECTRIC, DRY CON- TACTS, CONTACTS TO OPEN ON PRESSURE FALLING, SWITCH TO BE CERTIFIED FOR APPROPRIATE ELECTRICAL AREA CLASSIFICATION
V-1/V-2	2	1" NPT MANUAL SHUTOFF VALVE, SOFT SEAT EMICO 720 SERIES UL/ULC OR EQUIVALENT
V-3/V4	2	1/4" NPT MANUAL SHUT OFF VALVE SOFT SEAT EMICO 720 SERIES UL/ULC OR EQUIVALENT
YS-1	1	1" Y STRAINER
PI1/PI2/PI3	3	WIKA 0-30 1/4" BM 2 1/2" LIQUID FILLED GAUGE OR EQUAL
SOV-1	1	1/8" OR 1/4" SOLENOID VALVE OR EQUIVALENT

BILL OF MATERIALS		
ITEM	QTY.	DESCRIPTION
PRV-1	1	1" PRESSURE REGULATOR, SELF OPERATED, POSITIVE SHUTOFF FISHER 627 OR EQUAL. ORIFICE MUST BE SIZED TO MEET APPLIANCE CAPACITY
PRV-2	1	1/4" PILOT GAS REGULATOR FISHER 67C OR EQUAL
ASSV-1	1	1" CERTIFIED AUTOMATIC SAFETY SHUTOFF VALVE WITH PROOF OF CLOSURE CSA CLASS I DIV1 6.5-2005 C/I. MINIMUM ACTUATOR OPERATING PRESSURE 60 PSIG OR EQUIVA- LENT
SSV-1	1	CERTIFIED GAS SAFETY SHUT OFF VALVE, CSA 6.5-2005 C/I OR EQUIVALENT
TCV-1	1	TEMP CONTROL VALVE FISHER 119 OR 128 OR EQUIVALENT
BA-1	1	ACL-HE-ON SERIES HIGH EFFICIENCY BURNER ASSEMBLY. DESIGN PRESSURE FROM 1PSI TO 14.9PSI. FIXED ORIFICE LIMITS BTU/H
BA-2	1	ACL-M50 PILOT ASSEMBLY. FIXED ORIFICE
LSLL-1	1	FIELD SELECTION OF SUITABLE LOW LEVEL SWITCH IS ALLOWED NOTE 2
SCV-1	1	SPEED CONTROL VALVE
IA-1	1	ACL-IGNITOR ASSEMBLY

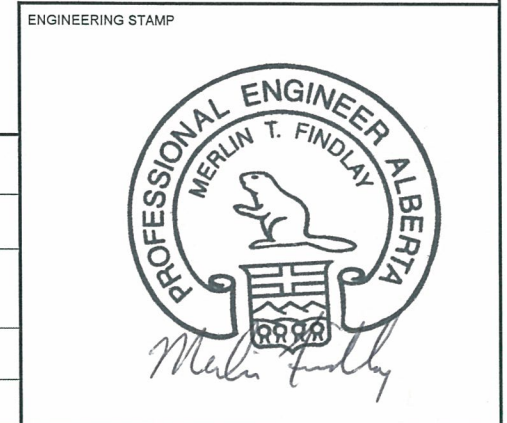


DRAWING #	ACL-1-P-XX-MDY Rev. 4	DATE	October 29, 2010
NO.	21-100 PO-2425	DATE	03/16/11
DESCRIPTION	ACL-1-P-24-021711-LR-02	BY	AD
NO.		DATE	
DESCRIPTION		BY	
NO.		DATE	
DESCRIPTION		BY	
NO.		DATE	
DESCRIPTION		BY	

ACL
Manufacturing Inc.

805 Main Ave West
Box 2002
Sundre, Alberta, CANADA
PHONE: (403) 638-5234
FAX: (403) 638-4973

COMPANY: <i>ARC Resources</i>				
LOCATION/JOB # <i>2-25-78-18 W6m</i>				
FUEL GAS VALVE TRAIN USING ONE PNEUMATIC SAFETY SHUTOFF VALVE (CERTIFIED) WITH PROOF OF CLOSURE				
DRAWN NS	APPROVED	DATE	SCALE NONE	REVISION
S.O. NO.	UNIT NO.	NO. REQ'D	DRAWING NO. STD-003	SHEET 1 OF 1



QR7 Oracle SO#: **INSPECTION AND TEST REPORT - PSV / PRV** SO#: 0100 - 39468.1.2
 Customer: PANAX OIL AND District: Location: EDMONTON CUST PO#: 8499 Date: MAY.03/11
 S.R#: 39468 Repair#: CST Tag #: PCI ID: E3881 Doc #: 100N Sales Code: 3000

Customer Instructions: **SET AND SEALED @ 150 PSI** Contact: ALAN CC#: _____
 Requested Completion Date: **MAY.03/11** A#: _____ LSD: _____ Phone: **780.413.6656**
 Make: **TAYLOR** Model: **T-8200-1** S/N: **010062-519** Shop # _____ CRN#: **0G01316.2C**
 Size: **1** In **E** Orf **1** Out End Type: **NPT** Cap Assy.: Open Closed Lift Lever Adj. Screw Meas. _____
 Visual Condition: Good Fair Poor Fouling Dirty Plugged Condition Rating: New Routine Minor Major BER
 Seal Condition: Top: **ACC** Bottom: _____ Insignia: **T** Last Service Date: _____ Data Plate Condition: **GOOD**
 Op. Temp.: _____ C Capacity: **582 SCFM/AIR** Code Symbol: V UV HV NB None Other
 Set Pressure.: **150** **1034** Back Pressure.: _____ Cold Differential Set: _____
psig kpag psig kpag psig kpag

PRE TEST YES NO Set Pressure: _____ psig _____ kpag Tested By: _____ Testing Medium: _____
 Relieve Press.: _____ psig _____ kpag Reseat Press.: _____ psig _____ kpag No Reseat: _____ PASS FAIL
 Comments: 1ST: _____ psig _____ kpag 2ND: _____ psig _____ kpag 3RD: _____ psig _____ kpag Leakage Rate: _____ BPM

ITEM	DESCRIPTION	QTY	MATERIAL:	
			ITEM	DESCRIPTION
1	Recondition & Test		32	
2	Priority Rate		33	
3	Certification Test Only		34	
4	Pre Pop Test		35	
5	Back Pressure Test		36	Duplicate Tag (SPM 3.5)
6	Bellows Test		37	Sub Contractor
7	Cap Assembly <input type="checkbox"/> Mild <input type="checkbox"/> Subst <input type="checkbox"/> Sev		38	Cap Assembly
8	Repack Lift Lever		39	Lift Lever
9	Adjusting Screw / Nut <input type="checkbox"/> Mild <input type="checkbox"/> Subst <input type="checkbox"/> Sev		40	Adjusting Screw / Nut
10	Bonnet		41	Bonnet
11	Spring / Number		42	Spring / Number
12	Spring Buttons		43	Spring Buttons
13	Spindle / Stem <input type="checkbox"/> Mild <input type="checkbox"/> Subst <input type="checkbox"/> Sev		44	Spindle / Stem
14	Stem Retainer <input type="checkbox"/> Mild <input type="checkbox"/> Subst <input type="checkbox"/> Sev		45	Stem Retainer
15	Guide <input type="checkbox"/> Mild <input type="checkbox"/> Subst <input type="checkbox"/> Sev		46	Guide
16	Bellows		47	Bellows
17	Ring Pin		48	Ring Pin
18	Blowdown Ring(s)		49	Blowdown Ring
19	Disc Holder <input type="checkbox"/> Mild <input type="checkbox"/> Subst <input type="checkbox"/> Sev		50	Disc Holder
20	Disc <input type="checkbox"/> Mild <input type="checkbox"/> Subst <input type="checkbox"/> Sev		51	Disc
21	Nozzle <input type="checkbox"/> Mild <input type="checkbox"/> Subst <input type="checkbox"/> Sev		52	Nozzle
22	Ball Keeper		53	Ball Keeper
23	Keeper Seal		54	Keeper Seal
24	Ball		55	Ball
25	Ball / Seat Assembly		56	Ball / Seat Assembly
26	Seat Frame		57	Seat Frame
27	Body		58	Body
28	Gaskets		59	Gasket Set
29	Inlet <input type="checkbox"/> Mild <input type="checkbox"/> Subst <input type="checkbox"/> Sev		60	Reset Tag (SPM 3.3 ; 3.4)
30	Outlet <input type="checkbox"/> Mild <input type="checkbox"/> Subst <input type="checkbox"/> Sev		61	Shop Supplies
31	Lap Nozzle to Base		62	Hazardous Waste Disposal

Additional: Cleaning Lapping Nozzle Lapping Disc Pipe Fitting for Reassembly & Test Recommended Replacements

POST ASSEMBLY INSPECTION & SIGN OFF (Refer to OR8 #14): DATE: _____ NEW MODEL#: _____

MEASMT. DATA	IM&T Equipment (REF. SPM 05)		Linial#	Pressure#	Test Bench#
	Min. Man. Specified Dimensions	Dimensions As Found			
Disc Ht. _____ Step _____	Disc Ht. _____ Step _____	Disc Ht. _____ Step _____			
Nozzle Ht. _____ Step _____	Nozzle Ht. _____ Step _____	Nozzle Ht. _____ Step _____			<input type="checkbox"/> Accept <input type="checkbox"/> Machine <input type="checkbox"/> Customer Review

Set Point: Definition: _____ Tolerance: _____ Set Using: Air Nitrogen H2O Air / H2O Lock Nut Secured
 Set Pressure Change: Yes No New Spring Non Code Repair Ring Pin Torqued
 Set Pressure: **150** psig **1034** kpag QR018B Item #: _____ Lift Lever Ass'y Secured
 Back Pressure: _____ psig _____ kpag Capacity: **582 SCFM/AIR** QR018C Item #: _____
 Cold Diff. Set: _____ psig _____ kpag Reseat: _____ Service Interval: _____ Months Date: _____
 Bellows Test @: _____ psig _____ kpag Ring Setting: Upper: _____ Tested By: _____
 Back Press. Test: _____ psig _____ kpag Blowdown: _____ Lower: _____
 Leakage Rate: _____ BPM Ends Covered Appearance Packing Slip Witness: _____
 Comments: **FACTORY SET @ 150 PSI** Painting Tagging EDM - Final Inspection: **JT**



4 1/2"OD PRE-HEAT & RE-HEAT
SOUR SERVICE LINE HEATER
Serial# LH-714
Data Booklet

Panax Oil & Gas Inc.
3730 - 69th Avenue
Edmonton, AB T6B-2V2
PH: (780) 413-6656 Fax: 468-5784
email: panax@telusplanet.net
Website: WWW.PANAXINC.COM

Certificate of Authorization Permit

Quality Management System

Expiry Date: **August 5, 2012**

Reg. No.: **AQP-1268(S)**

This is to certify that:

PANAX OIL & GAS INC.
3730 - 69 AVENUE
EDMONTON, ALBERTA

having complied with the provisions of the SAFETY CODES ACT, is hereby authorized to:

Construct ASME Section VIII-1 Pressure Vessels

Manufacture Category 'H' Fittings in accordance with CSA B51

at the above SHOP address.

Construct, Repair/Alter ASME B31.3 Process Piping.

Construct, Repair/Alter ASME B31.3 Indirect Fired Heater Coils

Repair/Alter ASME Section VIII-1 Pressure Vessels

at the SHOP and FIELD sites controlled from the above address.



Dated at Edmonton, this 24th day of August, 2009

Chief Inspector and Administrator

Contents



Section 1

- *Registrations*
- *Name Plate (Copy)* (Exhibit 9.3)
- *Manufacturers Data Report*

Section 2

- *Travel Sheet* (Exhibit 9.1 front)

Section 3

- *Material Test Reports* (Exhibit 9.1 back)
- - *Heads & Shells*
- - *Fittings & Pipe*

Section 4

- *NDE Reports*
- *PWHT Reports(if applicable)*
- *HYDRO Test Report*

Section 5

- *Welder(s) Qualification(s)*

Section 6

- *Construction Drawing*
- *Drawing Index* (Exhibit 7.1)



Alberta Boilers Safety Association

#200, 4208 - 97 Street

Edmonton, Alberta, Canada T6E 5Z9

Tel: (780) 437-9100 / Fax: (780) 437-7787

June 14, 2002

Phil Dade
BLUE DIAMOND DESIGN LTD
1977 VALLEY VIEW PLACE
VICTORIA, BC V9B 6H8

Dear Phil Dade,

The drawings, specifications and/or information received on May 21, 2002 are accepted for registration as follows:

CRN : P9417.2

Drawing No. : BDD-400A Rev 1 As Noted

Fee : \$ 306.00

Add. Prints: \$ 0

Accepted on : June 14, 2002

Reg Type : New Design

Track No. : 2002-03305

Description

Design Pressure

Design Temperature

MDMT

Design Pr.- Per Chart

kPa

93°C

-29°C

The registration is conditional on your compliance with the following notes:

Please note that we have accepted the design with the following correction per your email of 13 June '02:

-Revised Note 3 to read, "...WPS qualified to 0.674" thk."

An invoice covering survey and registration fees will be forwarded from our Revenue Accounts.

Enclosed are stamped prints for your reference.

Sincerely,

B.C. DESAI, P. Eng.
Design Survey Engineer



Corrections and
Public Safety

Licensing and Inspections

Boiler & Pressure Vessel Safety
330, 1855 Victoria Avenue
REGINA, SK S4P 3V7
PH : (306)787-4522
FAX : (306)787-9273

APPROVAL AND INVOICE

Thursday, July 04, 2002

Blue Diamond Design Ltd.
1977 Valley View Place
Victoria, B.C.
V9B 6H8

Our File 31363 [0 V]

ATTENTION : Phil Dade

FAXED
7/11/02

With reference to your submission respecting the registration of the item below, for legal use in the province, please note we have surveyed, approved and registered this design as noted.

MANUFACTURER :	Blue Diamond Design Ltd.	
ITEM :	DRAWING NUMBER :	CRN :
4" Heater Coil	BDD-400A Rev1	P9417.23
REGISTRATION FEE: \$190.00 (CANADIAN FUNDS ONLY)		

PLEASE SEND REMITTANCE WITH A COPY OF THIS INVOICE TO: MINISTER OF FINANCE. WE ACCEPT PAYMENT BY CHEQUE/MONEY ORDER OR BANK DRAFT.

We wish to point out that every vessel must be constructed strictly in accordance with the registered design.

In addition to stamping every vessel with the registration number given above and as required in CSA Code B51, a Manufacturer's Data Report must be forwarded to this office immediately at the time a vessel is shipped. Such forms may be obtained upon request.

Sincerely,

Mike Beriault
Codes and Standards Compliance

#327 Reg. of Design

REMARKS: CRN registered under reciprocal agreement.



TO: BLUE DIAMOND DESIGN LTD
 1977 VALLEY VIEW PL
 VICTORIA BC
 V9B 6H8

Registered: 2002/07/12
 Journal #: 29129
 Account #: 32255

Attn: PHIL DADE

Re: BLUE DIAMOND DESIGN LTD

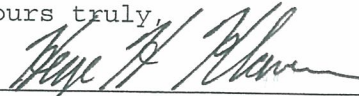
DESIGN REGISTRATION

C.R.N. P9417.21

Drawings / Documents	Description			
4" HEATER COIL BDD-400A REV 1 H.S.: 471.2 ft ² maximum <div style="font-size: 2em; font-weight: bold; margin-top: 20px;">REGISTERED</div>	MDMT ----- -20 F	MAWT ----- 200 F	MAWP -----	EXT PRESS -----
	Shell: 4.5" O.D. Length per Pass: 20'-0" maximum No. of Passes: 20 maximum Pressure Rating: See Chart for MAWP Code: ASME B31.3, 1999 Edition, 2001 Addenda.			

Remarks: This design has been registered as noted above. An invoice for survey will follow in the amount of \$ 60.00

dc

Yours truly,


 H. KLAVER
 Design Surveyor

HT
W
RT-100

MANUFACTURED AND CERTIFIED BY



OIL & GAS INC.

PREHEAT COIL

DESIGN PRESS 3212 PSI AT 200 °F

DESIGN MIN. TEMP -20 °F AT 3212 PSI

REHEAT COIL

DESIGN PRESS 3212 PSI AT 200 °F

DESIGN MIN. TEMP -20 °F AT 3212 PSI

SERIAL NO. LH-714 YEAR BUILT 2011

CRN P9417,213

Ⓐ 583633

3730-69 AVE. EDMONTON ALBERTA CANADA
PH: 780-413-6656 WWW.PANAXINC.COM

MANUFACTURER'S DATA REPORT FOR INDIRECT FIRED HEATER COILS

AB-28 2006-02

PARTIAL

A# 1583633

Manufactured By: PANAX OIL & GAS INC. 3730-69th AVE EDMONTON, AB. T6B-2V2
 Manufactured For: ARC PETROLEUM c/o XXL ENGINEERING 101, 807 MANNING ROAD NE CALGARY, AB T2E 7M8
 Ultimate Owner: ARC PETROLEUM c/o XXL ENGINEERING 101, 807 MANNING ROAD NE CALGARY, AB T2E 7M8
 Location of Installation: Unknown

Manufacturer's Serial No. LH-714	Construction Drawing No. BDD-401 Rev.1	CODE: ASME B31.3			Year Built 2011
		Edition	2008	Addenda	

CONSTRUCTION

Coil ID/Purpose	Design Pressure	Design Temp	Design Minimum Temp	Corrosion Allowance	Registered Drawing No.	CRN
a BDD-401 PRE-HEAT COIL	3212 PSIG	200°F	-20°F	0.125"	BDD-400A Rev.1	P9417.213
b BDD-401 RE-HEAT COIL	3212 PSIG	200°F	-20°F	0.125"	BDD-400A Rev.1	P9417.213
c						
d						
e						

COIL

	Tubes			End Closures				Openings		
	Mat'l Spec.	Diameter	Thickness	Return Bend		Flanges		Mat'l Spec.	Size/Type	Rating
				Mat'l Spec.	Thickness	Mat'l Spec.	Rating			
a	SA-333 GR.6	NPS 4	0.531"	SA-420-WPL6	0.531"	RTJ WN / SA-350-LF2	CL1500	SA-105N	NPS 3/4 CPLG	CL6000
b	SA-333 GR.6	NPS 4	0.531"	SA-420-WPL6	0.531"	RTJ WN / SA-350-LF2	CL1500	SA-105N	NPS 3/4 CPLG	CL6000
c										
d										
e										

HEADERS/MANIFOLDS

Purpose	Size	Shell	Ends				Openings			
		Mat'l Spec.	Thickness	Mat'l Spec.	Thickness	No	Mat'l Spec	Size/Type	Rating	

TEST PRESSURE, NDE, POSTWELD HEAT TREATMENT AND SIZE

	Hydrostatic Test Pressure	Radiography (100% or % Random)	Other NDE (MT) (PT) (UT)	Postweld Heat Treatment		Overall Length	Heating Surface	Volume
				Temp.	Time			
a	4818 PSIG	100%	N/R	1150F	60 MINUTES	20'-1"	223.82FT ²	11.10 FT ³
b	4818 PSIG	100%	N/R	1150F	60 MINUTES	20'-1"	223.82FT ²	11.10 FT ³
c								
d								
e								
f								
g								

IMPACT TESTING: IMPACT TEST EXEMPT PER ASME B31.3 2008 EDITION (TABLE 323.2.2-COLUMN A)

REMARKS: SAFETY RELIEF VALVE IS THE RESPONSIBILITY OF THE END USER.

CERTIFICATE OF COMPLIANCE

We certify that the statements in this report are correct and that all details of design, material, construction, and workmanship of this coil bundle are in accordance with the above Provincial Registered Design.

Date 05-25-2011 Signed [Signature] For PANAX OIL & GAS INC.
 (Representative) (Manufacturer)

CERTIFICATE OF SHOP INSPECTION

I, the undersigned, a duly authorized Safety Codes Officer employed by ABSA has inspected the above Heater Coils and state that, to the best of my knowledge and belief, the construction is in accordance with the Alberta Safety Codes Act and Regulations.

e 05-25-2011 Signed [Signature] NB12304ABN AB13613



SER# LH-714
CRN: P9417.213

DISCRIPTION: NPS 4 PRE-HEAT COIL @ 3212Psig

CONSTRUCTION DWG: BDD-401 Rev.0

ATTACHMENT AND / OR NOZZLE MATERIAL THICKNESS VERIFICATION AND IDENTIFICATION						WELDR. SYMBOLS / FIT-UP		
Mark	Mat. I.D.	Neck	Fitting	Flange	Repad or Attachment	Cat. B	Cat. C	Cat. D
N1A (PRE-HEAT COIL)	Spec.-Grd.	SA-333 GR.6 / SMLS	SA-420-WPL6	SA-350-LF2	(RTJWN) Attachment		✓	
	Thk./Rating	NPS4 SCH.160	NPS4 SCH.160 LR 180° RETURN	NPS4 SCH.160 CL1500			FITR F	
	Heat/PO #	31B530 / 17373	2-70116 / 17452	738967 / 17353			WLDR F	
N1B (PRE-HEAT COIL)	Spec.-Grd.	SA-333 GR.6 / SMLS	SA-420-WPL6	SA-350-LF2	(RTJWN) Attachment		✓	
	Thk./Rating	NPS4 SCH.160	NPS4 SCH.160 LR 180° RETURN	NPS4 SCH.160 CL1500			FITR F	
	Heat/PO #	31B530 / 17373	08E01018 / 17371	738967 / 17353			WLDR F	
C6A (T.I.)	Spec.-Grd.		SA-105N		(CPLG) Attachment		✓	
	Thk./Rating		NPS 3/4 CL6000				FITR F	
	Heat/PO #		4780 / 17387				WLDR F	
C6C (T.I.)	Spec.-Grd.		SA-105N		(CPLG) Attachment		✓	
	Thk./Rating		NPS 3/4 CL6000				FITR F	
	Heat/PO #		4780 / 17387				WLDR F	

DISCRIPTION: NPS 4 RE-HEAT COIL @ 3212Psig

CONSTRUCTION DWG: BDD-401 Rev.0

ATTACHMENT AND / OR NOZZLE MATERIAL THICKNESS VERIFICATION AND IDENTIFICATION						WELDR. SYMBOLS / FIT-UP		
Mark	Mat. I.D.	Neck	Fitting	Flange	Repad or Attachment	Cat. B	Cat. C	Cat. D
N2A (RE-HEAT COIL)	Spec.-Grd.	SA-333 GR.6 / SMLS	SA-420-WPL6	SA-350-LF2	(RTJWN) Attachment		✓	
	Thk./Rating	NPS4 SCH.160	NPS4 SCH.160 LR 180° RETURN	NPS4 SCH.160 CL1500			FITR F	
	Heat/PO #	31B530 / 17373	53D01106 / 17400	738967 / 17353			WLDR F	
N2B (RE-HEAT COIL)	Spec.-Grd.	SA-333 GR.6 / SMLS	SA-420-WPL6	SA-350-LF2	(RTJWN) Attachment		✓	
	Thk./Rating	NPS4 SCH.160	NPS4 SCH.160 LR 180° RETURN	NPS4 SCH.160 CL1500			FITR F	
	Heat/PO #	31B530 / 17373	2-70116 / 17452	738967 / 17353			WLDR F	
C6B (T.I.)	Spec.-Grd.		SA-105N		(CPLG) Attachment		✓	
	Thk./Rating		NPS 3/4 CL6000				FITR F	
	Heat/PO #		4780 / 17387				WLDR F	
C6D (T.I.)	Spec.-Grd.		SA-105N		(CPLG) Attachment		✓	
	Thk./Rating		NPS 3/4 CL6000				FITR F	
	Heat/PO #		4780 / 17387				WLDR F	

MTR Approved
 Meets ASME Section II, latest code edition
 04-11-2011 *P* 2010ED.
 Panax Oil & Gas Inc.



SAN ENG STEEL FORGING CO LTD
 311, Jen Hsin Road, Jen Wu Hsiang
 Kaohsiung Hsien, Taiwan, R.O.C.
 TEL:07-3724249; FAX:07-3712923
 URL: www.saneng.com.tw
 e-mail: saneng@ksts.seed.net.tw

MILL TEST CERTIFICATE

EN10204-3.1.B(DIN50049/3.1.B)

Customer: **W.E.F.FITTINGS & FLANGES (CANADA) LTD.**

Order No.: **E00052KD/MID**

PO# 17353
 Certificate No.: **SE100091**
 Date: **04/07/2010**

PRODUCT		MATERIAL SPECIFICATIONS										DIMENSIONAL SPECIFICATIONS								
FORGED CARBON STEEL FLANGES		ASTM A350 LF2-07 CL.1/ ASME SA350 LF2-07										ASME B16.5-09 CSA Z245.12-								
Item No.	CUSTOMER P/N	DESCRIPTION	QUANTITY	CHEMICAL COMPOSITION (%)																
				C	Si	Mn	P	S	Cu	Cr	Ni	Mo	V	Nb	N	CE(*)				
				Min	0.300	0.150	0.600	-	0.040	-	0.400	0.300	0.400	0.120	0.080	0.080	-	-	-	
				Max	0.300	0.300	1.350	0.035	0.040	0.400	0.300	0.400	0.120	0.080	0.080	0.030	0.010	0.004	0.001	0.007
1		1500 WNRTJ S160 4" LF2	10 PCE		0.195	0.290	0.930	0.014	0.019	0.007	0.019	0.049	0.002	0.004	0.005	0.005				0.358
2		1500 BLRTJ 3" LF2	30 PCE		0.210	0.210	1.080	0.014	0.008	0.090	0.080	0.030	0.010	0.004	0.001	0.007				0.413
3		150 WNRF STD 6" LF2	60 PCE		0.212	0.240	1.010	0.015	0.017	0.005	0.019	0.050	0.002	0.004	0.001	0.004				0.388
4		150 WNRF XS 2" LF2	410 PCE		0.222	0.240	1.010	0.015	0.014	0.022	0.063	0.122	0.009	0.015	0.005	0.003				0.414
5		150 BLRF(1"NPT TAP) 2" LF2	20 PCE		0.200	0.220	1.160	0.019	0.013	0.100	0.080	0.070	0.005	0.003	0.005	0.010				0.422
6		150 BLRF(2"NPT TAP) 4" LF2	10 PCE		0.209	0.250	1.010	0.013	0.014	0.010	0.014	0.055	0.002	0.005	0.005	0.004				0.385
7		150 THRF 2"x1 1/2" LF2	10 PCE		0.200	0.200	1.000	0.007	0.012	0.120	0.070	0.070	0.005	0.003	0.005	0.009				0.394
8		150 WNRF STD 12" LF2	10 PCE		0.200	0.200	1.140	0.013	0.003	0.200	0.090	0.060	0.010	0.010	0.001	0.005				0.427
9		2500 BLRTJ 2" LF2	10 PCE		0.210	0.200	1.110	0.007	0.010	0.060	0.060	0.050	0.005	0.003	0.005	0.008				0.415
10		300 WNRF STD 4" LF2	140 PCE		0.180	0.250	0.870	0.015	0.013	0.160	0.130	0.140	0.020	-	0.001	0.008				0.375

Item No.	Heat No.	T.S.(*) (MPA)	Y.S.(*) (MPA)	E.L.(*) (%)	Hardness (HB)	R.A.(*) (%)	Impact Test Temp: -46°C			Material Supplier	HEAT TREATMENT(**)
							1	2	3		
		Min	485.0	250.0	22.0	-	-	-	-	-	<input checked="" type="checkbox"/> N
		Max	655.0	-	-	197	-	-	-	-	REMARKS
1	738967	501.1	316.8	38.0	154	65.0	38.0	32.0	43.0	NTMK	880°C X 3HRS
2	802220	508.0	360.9	35.0	155	70.0	53.0	79.0	74.0	KOTOBUKI	CONFORMS WITH NACE MRD103-07 AND NACE MRD175/ISO15156.2
3	920952	513.9	349.1	32.6	158	66.0	35.0	34.0	27.0	NTMK	CONFORMS WITH Z245.12 CAT II GR.248 SOUR SERVICE-05
4	931232	517.8	339.3	32.2	157	64.0	35.0	38.0	27.0	NTMK	TEST SPECIMEN SIZE: 10X10
5	48960	508.0	311.9	35.4	155	69.5	35.0	33.0	25.0	OEMK	TEST SPECIMEN ORIENTATION: TRANSVERSE
6	931274	509.9	325.6	34.8	154	65.0	27.0	26.0	37.0	NTMK	IMPACT TEST TEMP.: -46°C
7	10939	499.2	296.2	40.0	153	67.7	25.0	29.0	21.0	OEMK	S759046445
8	181364	525.6	367.7	32.8	158	69.0	71.0	54.0	77.0	SEAH BESTEEL	
9	13176	523.7	354.0	35.0	157	65.9	21.0	23.0	24.0	OEMK	
10	67109	499.2	311.9	35.0	150	70.0	42.0	76.0	75.0	RED OCTOBER	

*1: T.S. = Tensile Strength, Y.S.=Yield Strength, E.L.=Elongation, R.A.=Reduction of Area.
 *2: N=Normalized, A=Annealed, Q=Quenched, T=Tempered, S.T=Solution Treated, S.R=Stress Relieved, A.C=Air Cooled, F.C=Furnace Cooled, W.C=Water Cooled, O.C=Oil Cooled.
 *3: C.E. Value = C + (Mn/8) + (Cr + Mo + V) / 5 + (Ni + Cu) / 15



We hereby certify that the material has been tested in accordance with the above specification and also with the requirements called for by the above order.

Manager of Quality Assurance Dept

MTR Approved
 Meets ASME Section II, latest code edition
 04.26.2011 *[Signature]* 2010ED.
 Panax Oil & Gas Inc.

PO# 17452

MATERIAL TEST & INSPECTION CERTIFICATE

SUNGKWANG BEND CO., LTD.(SKB)

CUSTOMER: ALLIED FITTINGS
 PROJECT NAME: N/A

According to
 DIN 50049 3.1 / EN 10204 3.1 / ISO 10474 3.1

1720, Songjeong-Dong, Gangseo-Ku, Busan, Korea
 TEL : 82-051-3300-450
 FAX : 82-051-3300-335
 http://www.sk bend.com

PURCHASE ORDER NO.	111510ASB	SPEC. FOR MATERIAL	ASTM A420WPL6-S 07, ASME SA420WPL6-S 07ED	CERTIFICATE NO.	QCLP2011031855
PJT NO.	N/A	SPEC. FOR INSPECTION	ASME B16.9	DATE OF ISSUE	2011.03.11
STARTING MATERIAL	SEAMLESS PIPE	SKB NO.	2010112309	VISUAL & DIMENSION	SATISFACTORY

NO.	SEQ/LINE/ITEM NO	DESCRIPTION	QTY	HEAT NO.	MFG ID NO.	POR/CODE/TAG NO
127		180D ELBOW(L) S160 4" B.W SMLS Black	50	2-70116	2-70116	

CHEMICAL COMPOSITION(%) (L : LADLE, P : PRODUCT)																		TENSILE TEST										
HEAT NO.	STD.	SPEC.	C	Si	Mn	P	S	Ni	Cr	Mo	Cu	V	Nb	N	Al	B	Zr	Fe	Ti	C.E	SPEC.	Y.S 0.2% offset		T.S	EL.	RA		
																						KSI	KSI	KSI	%	%		
2-70116	L	MIN	0.23	0.40	1.35	0.035	0.040	0.40	0.30	0.12	0.40	0.08	0.02									0.42	MIN	35.0	60.0	30.0		
		MAX	0.14	0.22	0.87	0.012	0.004	0.01	0.03	<0.01	0.02	<0.005	<0.001									0.34	MAX	42.8	85.0	40.0		
		P																										
		L																										

HEAT NO.	TEST TEMP.	SIZE OF SPECIMEN(mm)	ABSORBED ENERGY STD. / 10/13ft.lbf.Min/Ave				LATERAL EXPANSION STD. /		PERCENT SHEAR STD. /		HARDNESS HB		HEAT TREATMENT	NORMALIZED. 900°C, 30Min., "Air"			
			VALUE		AVE.		VALUE		AVE.		MIN			PMI	N/A	N.D.E	N/A
			B/M	H.A.Z	W/M					MAX	237	HB					
2-70116	-45°C	10x10	186.50	184.40	180.40	183.77							FLATTENING TEST	N/A			**MEMO
													BENDING TEST	N/A			
													HYDROSTATIC TEST	N/A			
													CORROSION TEST	N/A			
													GRAIN SIZE TEST	N/A			

- MANUFACTURED IN ACCOR. TO DIN 50049-3.1 & MEET NACE MR0175 & 0103-2003 STANDARD SPEC
WE CERTIFY THIS MATERIAL HAS BEEN MANUFACTURED AND EXAMINED IN ACCORDANCE WITH ALL REQUIREMENTS OF THE SPECIFICATION AND THE RESULTS OF ALL EXAMINATION ARE ACCEPTABLE.

REVIEWED BY _____
 WITNESSED BY : _____


 QM DIV. SENIOR MANAGING DIRECTOR

SCH. 160 LR. 180 BW RETURN
 BEND A420-WPL6

ans Am Piping Products Ltd. - Rev'd By: CJ
 O./Seq #: EL.11 - 8003

MTR Approved
 Meets ASME Section II, latest code edition
 04-16-2011 *C* 2010ED.
 Panax Oil & Gas Inc.

Purchaser: WFF FITTINGS AND FLANGES (CANADA) LTD.

INSPECTION CERTIFICATE

Po#17371



Thai Benkan Co., Ltd.
 58 Soi Watkrunai, Bangkru, Prapadaeng,
 Samutprakarn, 10130 Thailand.

TO EN10204 3.1

Purchase Order No.
 EO4975DD/BKT

Job No.

D M Y Certificate No.
 08/07/2008 T- 2008020803

E-No.	Specification for Material Made from Seamless Pipe	Specification for Inspection	Visual Examination	Dimensional Inspection														
MB-137	ASTM A420-06/ASME SA420-04 WPL6 CSA Z46.11-05 Gr.241 CAT II M6C Sour Service	ASME B16.8-2003	Good	Good														
MFG. No. (Heat Identification No.)	Product & Size (T:*1)		Quantity	Hardness Actual Data														
08E01018	180 EL WPL6 4 S160		10/25	HB : 130-150														
Material Manufacturer		Material Heat No.																
		J6KC597																
Specifi- cation	Chemical Composition %													*2 Tension Test			Hardness Max 197 HB : GOOD	
	C	Si	Mn	P	S	Cu	Ni	Cr	Mo	Al	V	Nb	C.E.	YS	TS	E	Impact Test (J) 10 X 10 X 2V AT -45 °C	
Min.	X 100	X 100	X 100	X 1000	X 1000	X 100	X 100	X 100	X 100	X 1000	X 1000	X 1000	X 100	MPa.		%		
Max.	30	40	135	35	40	40	40	30	12		80	20	42	240	415	30	377	AVE. 383
	10	22	130	8	4	2	2	13	1		0	0	35	316	455	53	387	

NORMALIZING 910 C X 0.5 HR. AIR COOLING

Material according to NACE MR0175-2003/ISO 15156

THE RESULTS OF THE TESTS AND INSPECTIONS MEET THE REQUIREMENTS.

C.E. = C+Mn/6+(Cr+Mo+V)/5+(Ni+Cu)/15

MAGNETIC PARTICLE EXAMINATION FOR TEE ONLY :

We hereby certify that the product described herein has been manufactured in accordance with the specifications concerned and also with the purchaser's requirements and that the test results shown herein are correct.

* 1 : "T" symbolized wall thickness in mm. * 2 : YS Yield strength TS = Tensile strength E = Elongation

H
 Quality Assurance Manager
 Thai Benkan Co., Ltd.

MTR Approved
 Meets ASME Section II, latest code edition
 04-16-2011 *[Signature]* 2010ED.
 Panax Oil & Gas Inc.

Purchaser :

INSPECTION CERTIFICATE

TO EN10204:3.1



Thai Benkan Co., Ltd.
 58 Soi Watkrunai, Bangkru, Prapadaeng,
 Samutprakarn, 10130 Thailand.

PO# 17400

D M Y Certificate No.

01/07/2010 T- 2010020154

Purchase Order No. E1-813
 Job No. L-616 REV.1

E-No.	Specification for Material Made from Seamless Pipe	Specification for Inspection	Visual Examination	Dimensional Inspection															
MB-995	ASTM A420-07/ASME SA420-07 WPL6 CSA Z245.11 GR.241 CAT II M46C SS	ASME B16.9-2007	Good	Good															
MFG. No. (Heat Identification No.)	Product & Size (T:*1)	Quantity	Hardness Actual Data																
53D01106	180 EL WPL6 4 S160	50	HB : 119,124,128																
Material Manufacturer	Material Heat No.	Chemical Composition%(Note1)	Boron (%)																
SUMITOMO METAL INDUSTRIES LTD.	JOL2759	Ti = 2	0.0002																
Specifi- cation	Chemical Composition %													*2 Tension Test			Hardness Max 197 HB : GOOD		
	C	Si	Mn	P	S	Cu	Ni	Cr	Mo	Al	V	Nb	C.E.	YS	TS	E	Impact Test (J)		
X	X	X	X	X	X	X	X	X	X	X	X	X	X	MPa.			%	10 X 10 X 2V AT -45 °C	
Min.		15	50											240	415	30	351		
Max.	23	40	135	35	10	40	40	30	12		80	20	40		585		375	AVE 364	
	12	26	128	12	2	2	3	12	0		0	0	36	327	472	48	365		

NORMALIZING 910 C X 0.5 HR. AIR COOLING

(Note 1) : Specification of Ti Composition (%) : Max 11 (Ti x 100) Material according to NACE MR0175/ISO 15156-2-2003 & MR0103-07

The fittings was manufactured, sampled, tested, and inspected in accordance with the specification, and was found to meet the requirements.

C.E. = C+Mn/6+(Cr+Mo+V)/5+(Ni+Cu)/15 MAGNETIC PARTICLE EXAMINATION FOR TEE ONLY :

We hereby certify that the product described herein has been manufactured in accordance with the specifications concerned and also with the purchaser's requirements and that the test results shown herein are correct.

* 1 : "T" symbolized wall thickness in mm. * 2 : YS Yield strength TS = Tensile strength E = Elongation
 Form TZ 6C/2

[Signature]
 Quality Assurance Manager
 Thai Benkan Co., Ltd.

Order#: 112842 Seq: 1 PO#: S8585 Heat#: 53D01106 Mill: BKL - Thai Benkan
 Part#: WF 4 160 LB L6 Part Desc: Weld Fittings 4 (114.3mm O.D.) Sch.160 LR 180 DEG RET BEND /SA420-WPL6

CERTIFIED MILL TEST REPORT



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LOG NO. F00000000010962

BONNEY FORGE CORPORATION

P.O. BOX 330 • 14496 CROGHAN PIKE • MOUNT UNION, PA 17066-0330

(814) 542-2545 • (800) 345-7546 • FAX (814) 542-4906

www.bonneyforge.com

CUSTOMER: MRC MIDFIELD

DATE 02/11/2011

CUSTOMER

BONNEY ORDER NO. B000090745

ORDER NO.: S759094394

SHIP TO: MRC MIDFIELD
502-25 AVENUE
NISKU AB T9E 0K6
Canada

MTR Approved
Meets ASME Section II, latest code edition

04-16-2011 *[Signature]* 2010ED.

Panax Oil & Gas Inc.

PO# 17387

ITEM	QUANTITY	LOT NO.	GRADE OR SPECIFICATION NO. CHEMICAL ANALYSIS, PHYSICAL PROPERTIES, REMARKS:
18C11809		5687 NUT-MO	1 3000 A105N UNAR T SA/A105N Al 0.026 C 0.230 Cb 0.001 Cr 0.090 Cu 0.290 Mn 0.800 Mo 0.030 Ni 0.110 P 0.009 S 0.018 Si 0.250 V 0.001 CE(Long Formula) = 0.41 T/S(PSI) 75,440 Y/S(PSI) 47,940 EL(%) 33.20 RA(%) 64.50 Brinell 139 BHN 139 BHN
18C12094	51 30	4819	2 6M A105N CAP T SA/A105N Al 0.027 C 0.170 Cb 0.001 Co 0.006 Cr 0.090 Cu 0.180 Mn 1.130 Mo 0.020 N 0.008 Ni 0.070 P 0.007 S 0.019 Si 0.270 V 0.036 CE(Long Formula) = 0.40 T/S(PSI) 73,500 Y/S(PSI) 50,500 EL(%) 30.00 RA(%) 67.00 Brinell 144 BHN 143 BHN
18C12106	52 75	4705	1/2 6M A105N COUP T SA/A105N Al 0.026 C 0.200 Co 0.005 Cr 0.060 Cu 0.170 Mn 1.070 Mo 0.010 N 0.006 Nb 0.012 Ni 0.050 P 0.014 S 0.019 Si 0.190 V 0.005 CE(Long Formula) = 0.41 T/S(PSI) 75,000 Y/S(PSI) 52,500 EL(%) 34.70 RA(%) 66.30 Brinell 139 BHN 139 BHN
18C12118	53 125	4780	3/4 6000 A105N COUP T SA/A105N Al 0.026 C 0.210 Co 0.005 Cr 0.060 Cu 0.080 Mn 1.040 Mo 0.010 N 0.007 Nb 0.013 Ni 0.030 P 0.007 S 0.019 Si 0.230 V 0.004 CE(Long Formula) = 0.41 T/S(PSI) 73,750 Y/S(PSI) 52,500 EL(%) 32.00 RA(%) 63.75 Brinell 147 BHN 147 BHN

We certify that the data on this sheet is a true copy taken from our records of material furnished us by the production mill, or as obtained by additional laboratory checks.

by *Meloney Specht*

**Meloney Specht
QUALITY PROCESS MANAGER**

CERTIFIED MILL TEST REPORT



The Best Value -
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All The Time.

LOG NO. F00000000010962

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www.bonneyforge.com

CUSTOMER: MRC MIDFIELD

DATE 02/11/2011

CUSTOMER

BONNEY ORDER NO. B000090745

ORDER NO.: S759094394

SHIP TO: MRC MIDFIELD
502-25 AVENUE
NISKU AB T9E 0K6
Canada

ITEM	QUANTITY	LOT NO.	GRADE OR SPECIFICATION NO. CHEMICAL ANALYSIS, PHYSICAL PROPERTIES, REMARKS:
------	----------	---------	--

1. THE FITTINGS SUPPLIED ARE IN ACCORDANCE WITH PURCHASE ORDER SPECIFICATIONS.
2. CERTIFYING TO ASTM A350 LF2 07 REVISION.
3. THE MATERIAL SUPPLIED IDENTIFIED AS A105N WAS NORMALIZED IN ACCORDANCE WITH ASTM A105 HEAT TREATING REQUIREMENTS.
4. THE MATERIAL SUPPLIED AS A105N MEETS THE REQUIREMENTS OF BOTH NACE MRO103-2007 AND NACE MRO175/ISO 15156-2.
5. CERTIFYING ASTM A105-09 / ASME SA105-07 EDITION.
6. THE MATERIAL OF THE FITTINGS SUPPLIED IS ASTM A350-LF2 BUT MEETS THE REQUIREMENTS OF ASME SA350-LF2.
7. THE CHARPY V-NOTCH IMPACT TEST WAS PERFORMED AT -50 DEGREES FAHRENHEIT IN ACCORDANCE WITH A350-LF2.
8. THE MATERIAL SUPPLIED AS A350 LF2 CL1 MEETS THE REQUIREMENTS OF BOTH NACE MRO103-2007 AND NACE MRO175/ISO 15156-2.
9. THE MATERIAL SUPPLIED WAS NORMALIZED IN ACCORDANCE WITH ASTM A350 HEAT TREATING REQUIREMENTS.
10. THE PRODUCT SUPPLIED WAS INSPECTED IN ACCORDANCE WITH EN 10204:2004 EDITION TYPE 3.1 INSPECTION DOCUMENT. (EUROPEAN STANDARD)
11. THE MATERIAL SUPPLIED IDENTIFIED AS A105QT WAS QUENCHED AND TEMPERED IN ACCORDANCE WITH ASTM A105 HEAT TREATING REQUIREMENTS.
12. THE UNIT OF MEASURE FOR TENSILE AND YIELD (0.2%) STRENGTH ARE IN REPORTED IN PSI.
13. ELONGATION TEST RESULTS ARE OBTAINED USING STANDARD ROUND SPECIMEN, 2 INCH OR 50 MM GAGE LENGTH.

We certify that the data on this sheet is a true copy taken from our records of material furnished us by the production mill, or as obtained by additional laboratory checks.

by Meloney Specht

Meloney Specht
QUALITY PROCESS MANAGER

CMTR: REV2



CERTIFYING STATEMENT & APPOINTMENT LETTER

EXHIBIT 12.1

I have reviewed the:

Written Practice	TISI Inspection Services West INC. (operating as & referred to hereafter as) TEAM INDUSTRIAL SERVICES, INSPECTION SERVICES CANADA
	ASME SECTION V. 2007 EDITION / 2008 ADDENDA. (TEAM INDUSTRIAL SERVICES NDE PROCEDURES MANUAL SECTION 1 TO 9 ISSUE NO.1 REV.1)
NDE Procedure	RT-1, RT-2, RT-3, RT-4, RT-5, RT-6, RT-7 (SECTION 1) UT-1, UT-2, UT-3, UT-4, UT-5, UT-6, UT-7, UT-8, AUTO-1 (SECTION 2) MT-1, MT-2, MT-3, MT-4 (SECTION 3) LT-1V, LT-2F, LT-3V, LT-4F (SECTION 4) GVP-1 (SECTION 5) PMI-1 (SECTION 6) TELEBRINELL COMPARATIVE & ELECTRONIC HARDNESS TESTING (HD) (SECTION 7) FERRITE TESTING (FT) (SECTION 8) VB-1, VB-2 (SECTION 9)

And personnel certification records and vision examination records of all Examiners that will perform NDE at

PANAX OIL & GAS INC. 3730-69th Ave. Edmonton, Alberta. Canada. T6B-2V2

FOR:

TEAM INDUSTRIAL SERVICES, INSPECTION SERVICES CANADA. 2507-84th Ave. Edmonton, Alberta. Canada. T6P-1K1

It is my opinion that the specified NDE procedures are in accordance with ASME Section V requirements as referenced by the applicable construction Code and that the Written Practice complies in all aspects within the requirements of the construction Code accepted Edition / Addenda of SNT-TC-1A.

Based upon my review of the above referenced documents I hereby certify that personnel performing and evaluating NDE have been qualified and certified in accordance with their employers Written Practice and that the demonstration of the procedure(s) to the satisfaction of the AI, as required by the ASME Code,

Section V, paragraph T-150, has been completed as specified within the TEAM INDUSTRIAL SERVICES, INSPECTION SERVICES CANADA Written Practice

Therefore:

TEAM INDUSTRIAL SERVICES, INSPECTION SERVICES CANADA are hereby appointed to perform RT, UT, MT, LT, PMI, HD, FT, VB (RT, UT, PT, MT, ET, VT, and / or LT)

For:

PANAX OIL & GAS INC.

APPOINTMENT OF LEVEL III EXAMINER

MOE SHANDRO

(Name of Level III Examiner)

is by this statement appointed to act as the Level III Examiner on behalf of:

PANAX OIL & GAS INC.

(Name of Manufacturer)

in the following methods:

RT, UT, MT, LT, PMI, HD, FT, VB (RT, UT, PT, MT, ET, VT, and / or LT)

(Signature of Quality Control Manager)

September 01, 2010 (Date)

September 01, 2011 (Appointment Expiry Date)

LEVEL III EXAMINER ACCEPTANCE OF APPOINTMENT

I hereby accept the appointment as indicated above

(Signature of Level III Examiner)

RADIOGRAPHIC EXAMINATION REPORT

2507 - 84 Avenue, Edmonton, Alberta T6P 1K1
Phone (780) 417-7777 Fax: (780) 417-1185

RT - 7131 - 1

CLIENT: PANAX OIL & GAS INC. INVOICE ADDRESS: 3730 - 69 Ave. Edmonton, Alberta. DATE: MAY. 10/2011
 WORK LOCATION: EDMONTON SHOP TEAM PROCEDURE: Team Procedure
 EXAMINATION STANDARD: ASME B31.3 N/S ACCEPTANCE STANDARD: ASME B31.3 N/S
 EXAMINATION OF: 100% OF SPOOLING - PRE-HEAT (COIL)

TEAM JOB NO. 5301 - 7131
 BRANCH: EDMONTON
 AFE No.:
 Job No.: SER.# - LH - 714
 PAGE: 1 OF 1

DEFECT LEGEND:	UC - UNDERCUTTING	P - POROSITY	HB - HOLLOW BEAD	TECHNIQUES		TYPE OF ENERGY:	IR - 192	INTENSIFYING SCREENS:	.005" / .010" Pb	FILM MANUFACTURER:	AGFA
IF - INCOMPLETE FUSION	S - SLAG	IC - INTERNAL CONCAVITY	CR - CRACK	EXPOSURE	VIEWING	PHYSICAL SIZE:	3.7 mm	FILM PER CASSETTE:	1		
IP - INCOMPLETE PENETRATION	BT - BURN THROUGH	LC - LOW COVER	AB - ARC BURN	1. SINGLE WALL	3. SINGLE WALL	IQI TYPE:	ASTM Wire	WELD MATERIAL:	P1 - (SA - 106B)		495
EP - EXCESSIVE PENETRATION	SH - SHRINKAGE	HB - HOLLOW BEAD		2. DOUBLE WALL	4. DOUBLE WALL						

RADIOGRAPH IDENTIFICATION				RADIOGRAPH GEOMETRY										RADIOGRAPH RESULTS		
WELD ID	LOCATION	WELD SIZE	WELDER	TECHNIQUE	EXPOSURES PER WELD	WELD DEPOSIT THICKNESS	BASE MATERIAL THICKNESS	REINFORCE THICKNESS	SOURCE - OJECT DISTANCE	OBJECT - FILM DISTANCE	FILM TYPE	IQI SIZE	INTERPRETATION	COMMENTS	STATUS	
X9	Pre - Heat	4" S160	F	2/3	4	.719"	.531"	.188"	4.5"	.719"	I	B			Accept	
X11	Pre - Heat	4" S160	F	2/3	4	.719"	.531"	.188"	4.5"	.719"	I	B			Accept	
X12	Pre - Heat	4" S160	F	2/3	4	.719"	.531"	.188"	4.5"	.719"	I	B	Med. IC @ 17 - 28 cm		Accept	
X13	Pre - Heat	4" S160	F	2/3	4	.719"	.531"	.188"	4.5"	.719"	I	B	SLT. - Por.		Accept	
X14	Pre - Heat	4" S160	F	2/3	4	.719"	.531"	.188"	4.5"	.719"	I	B			Accept	
X16	Pre - Heat	4" S160	F	2/3	4	.719"	.531"	.188"	4.5"	.719"	I	B			Accept	

INTERPRETATION IS IN ACCORDANCE WITH THE ABOVE MENTIONED STANDARD, TO THE BEST OF MY PROFESSIONAL ABILITY

TECHNICIAN (PRINT): RICHARD BOHUCH TECHNICIAN (SIGN): [Signature] CGSB/SNT LEVEL: II / II REG NO. 0077 ASSISTANT: BILL GARDNER
 THE ABOVE REPRESENTATION IS A PROFESSIONAL OPINION, FINAL INTERPRETATION IS THE RESPONSIBILITY OF THE CLIENT. I HAVE REVIEWED AND AM IN FULL AGREEMENT WITH THE CONTENTS OF THIS REPORT.
 CLIENT REPRESENTATIVE (PRINT): Derek Stojewski CLIENT REPRESENTATIVE (SIGN): [Signature] DATE: 05-11-11



R & R Stress Relieving Service Ltd.

2103 - 6 Street, Nisku, AB T9E 7X8 Ph: (780) 955-7559 Fx: (780) 955-2903 1-800-499-4328
#13 Burbank Industrial Park, Blackfalds, AB Ph: (403) 885-2280 Fx: (403) 885-0177

CERTIFICATE OF CONFORMANCE OF RECORDING INSTRUMENTS

CERTIFIED BY: R & R Stress Relieving Service Ltd.
TEST NUMBER: RR0105
DATE: January 5, 2011
DATE DUE: July 5, 2011
INSTRUMENT MFG: Yokogawa
MODEL NUMBER: DR241-12-33-1W/C7/H1/D2
SERIAL NUMBER: 12AC14979
RECORDER NUMBER: IR-156

This instrument has been calibrated and it is within the manufacturers specifications.

REFERENCE STANDARDS

DIGIMITE 311600 S/N 48430-5522 CERT DATE NOV 1/10
GORDON 5060 CALIBRATOR S/N 028-84257113 CERT DATE OCT 28/10

R&R Stress Relieving Service Ltd. certifies that the above listed instrument meets or exceeds all specifications as stated in the referenced procedure (unless otherwise noted). It has been calibrated using measurement standards traceable to the National Institute of Standards and Technology (NIST), or to the NIST accepted intrinsic standards of measurement, or derived by the ratio type of self-calibration techniques. This calibration complies with NIL-STD-45662A and ANSI/NCSL Z540.3-2006.


Steve Pierson



HEAT TREATMENT INSTRUCTIONS
[as per ASME SECTION VIII, 2010 EDITION]
[as per ASME B31.3 2008 EDITION]

Heat Treatment Company: R & R STRESS RELIEVING SERVICE LTD.

Description: (1) NPS4 10(X2) PASS HEATER COIL

Job# LH-714

Diameter : NPS4 Length: 20' Weight: approx 2500 lbs
Shell Thickness: 0.531" Head Thickness: 0.531" CL1500 RTJWN

1) Temperature to be raised from 800°F to 1150°F (427°C to 621°C)
at a maximum rate of 400°F (204°C)
Note: must not exceed 400 °F (204° C) per hour.

2) Temperature to be held at 1150°F plus 25°F, minus 25°F
(at 607°C plus -4°C, minus -4°C) for -- hr(s) 60 min.(minimum)

3) Temperature to be lowered from 1150°F to 800°F (607°C to 427°C)
at a maximum rate of 500°F (260°C)
Note: must not exceed a drop of 500°F (260°C) per hour.

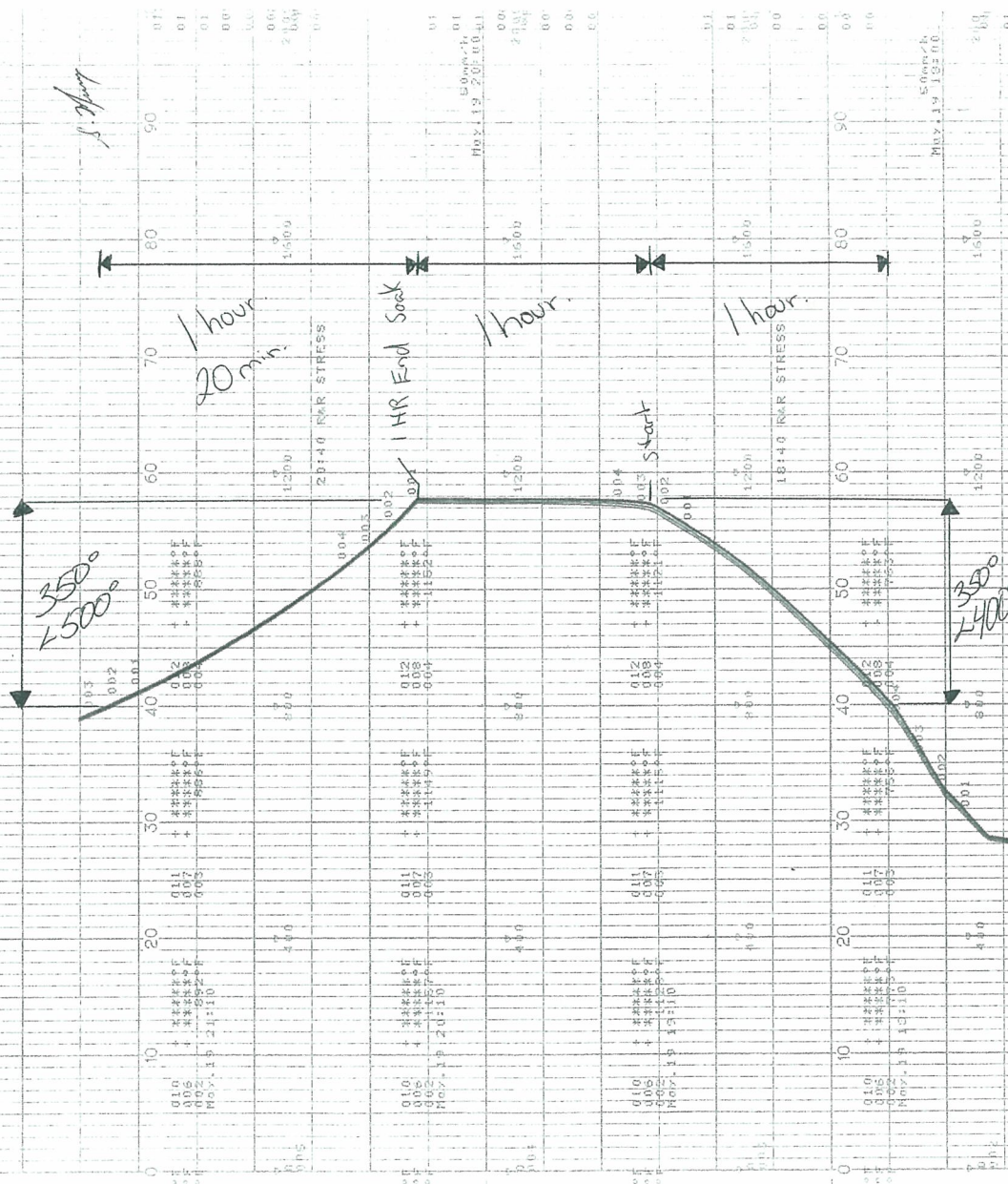
4) Additional requirements _____

Heat Number: F26-HD 740

Operator's signature [Signature] Date MAY 19/11

QC Manager [Signature] Date 05-20-11

Comments: _____



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RSR STRESS RELIEF SERVICE LTD.

CLIENT: PROXY

DATE: 19 JUN 14 2011 RTY No: FALE-10740

CHARGE SPEED: 50 mm/hr I.D. #

OPERATOR: S. MURPHY 1:500

REC No: _____ SECTION & COMMENTS

IRISK: 1-4 (1) NPST Pass

Header: @11

Job No: 11-1714

Accepted & Received
By
Panax Quality Control

Date: 05-20-11

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R & R Stress Relieving Service Ltd.

2103 - 6 Street, Nisku, AB T9E 7X8 Ph: (780) 955-7559 Fx: (780) 955-2903 1-800-499-4328
#13 Burbank Industrial Park, Blackfalds, AB Ph: (403) 885-2280 Fx: (403) 885-0177

CERTIFICATE OF CONFORMANCE OF RECORDING INSTRUMENTS

CERTIFIED BY: R & R Stress Relieving Service Ltd.
TEST NUMBER: RR0303E
DATE: March 3, 2011
DATE DUE: September 3, 2011
INSTRUMENT MFG: Chino
MODEL NUMBER: AH-3745 N00
SERIAL NUMBER: AH-09XQ106
RECORDER NUMBER: IR-192

This instrument has been calibrated and it is within the manufacturers specifications.

REFERENCE STANDARDS

DIGIMITE 311600 S/N 48430-5522 CERT DATE NOV 1/10
GORDON 5060 CALIBRATOR S/N 028-84257113 CERT DATE OCT 28/10

R&R Stress Relieving Service Ltd. certifies that the above listed instrument meets or exceeds all specifications as stated in the referenced procedure (unless otherwise noted). It has been calibrated using measurement standards traceable to the National Institute of Standards and Technology (NIST), or to the NIST accepted intrinsic standards of measurement, or derived by the ratio type of self-calibration techniques. This calibration complies with NIL-STD-45662A and ANSI/NCSL Z540.3-2006.


Steve Pierson



HEAT TREATMENT INSTRUCTIONS
[as per ASME SECTION VIII, 2007 EDITION/2009 ADD.]
[as per ASME B31.3 2008 EDITION]

Heat Treatment Company: R & R STRESS RELIEVING SERVICE LTD.

Description: (1) NPS20 FIRETUBE

Job# LH-714

Diameter : NPS20 Length: 21' Weight: approx 1500 lbs
Shell Thickness: 0.375" Head Thickness: 0.250"

1) Temperature to be raised from 800°F to 1150°F (427°C to 621°C)
at a maximum rate of 400°F (204°C)
Note: must not exceed 400 °F (204° C) per hour.

2) Temperature to be held at 1150°F plus 25°F, minus 25°F
(at 607°C plus -4°C, minus -4°C) for -- hr(s) 60 min.(minimum)

3) Temperature to be lowered from 1150°F to 800°F (607°C to 427°C)
at a maximum rate of 500°F (260°C)
Note: must not exceed a drop of 500°F (260°C) per hour.

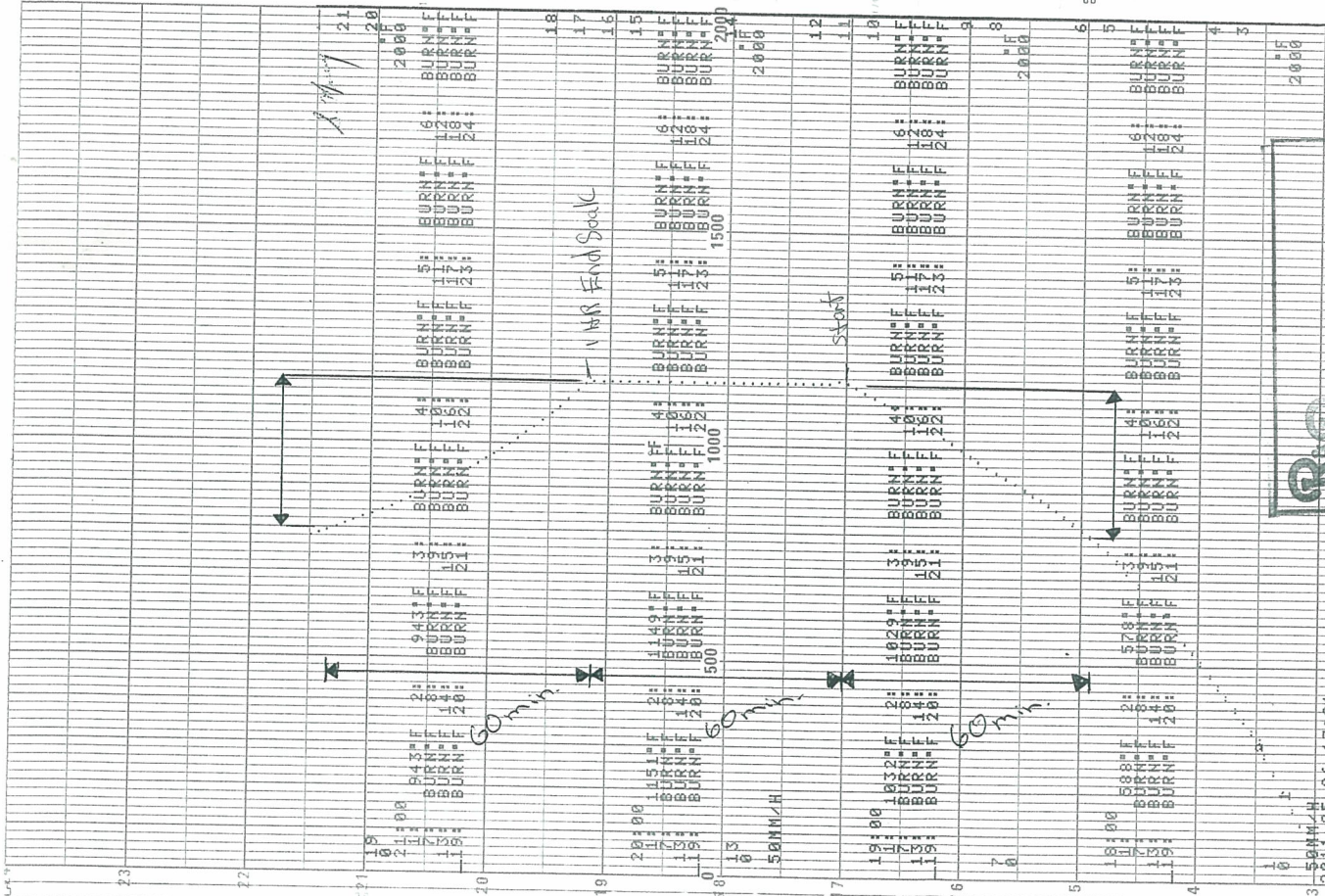
4) Additional requirements _____

Heat Number: F26-110783

Operator's signature [Signature] Date May 26/11

QC Manager [Signature] Date 05-28-11

Comments: _____



REPRESS RELIEF SERVICE LTD.

CLIENT: Panox
 DATE: 05/26/2011 CHART NO: 500
 CHART SPEL: Summit IV (RD): #
 OPERATOR: SIMPATON
 REC. NO.:
 DESCRIPTION & COMMENTS:
IR 192 1-2 500 M. LATH
(N) NPS30 FIRE TUBE

Accepted & Received
 By
 Panax Quality Control
 Date: 05-28-11
 Initial: [Signature]

500
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PANAX OIL & GAS INC.
HYDROSTATIC TEST REPORT

DATE May 25, 2011

SERIAL NUMBER(S): LH-714 JOB NUMBER: PX-09808

VESSEL(S) DESCRIPTION: 10(X2) PASS HEATER COIL SOUR
SERVICE LINE HEATER

HOLDING TIME @ TEST PRESSURE: 15 min (minimum) @ 4818 psig

GAUGE SERIAL #(S) + CALIBRATION DATE: PX-06J (March.24/2011) 4850 psig
PX-09J (March.24/2011) 4850 psig

RESULTS + COMMENTS: NO LEAKS

START TIME 2:30 @ 0 PSIG

FINISH TIME 3:30 @ 4850 PSIG


Signature of QC

Signature of Owners Inspector.

Signature of ABSA Inspector or other code Inspector(s)



BERJA Meter & Controls Ltd.

831-77th Avenue, Edmonton, Alberta, Canada T6P 1S9 ♦ Ph: (780) 440-1234 Fx: (780) 440-4775 email: shop@berjagroup.com

Certificate of Calibration

Report number FASTCAL-C09684

CRYSTAL
engineering corporation

Company	Location	Date of P.O.	P.O. Number
Panax	Edmonton AB	3/23/2011	17260

Manufacturer	Model	Serial Number	Calibration Date	Expiration Date
CPW	901,0-10000PSI	PX-06J	3/24/2011	3/23/2012

Model Uncertainty
+/- ASME 1A of span (1%)

All instrument calibrations are verified for accuracy before they are shipped. The recommended calibration interval for this instrument is 12 months from the date of verification. Your particular quality assurance requirements may supersede this recommendation.

As Received Condition: In tolerance

As Left Condition: In tolerance

All calibrations are performed in a controlled environment by qualified personnel using instrumentation and methods which guarantee that specifications claimed are reliable. Calibrations conform to ANSI/NCSL Z540-1-1994, MIL-STD 45662A, 10CFR21 and 10CFR50 when specified by customer documentation.

Definitions:	Temperature	Measured temperature of test during data collection.
	Reference Reading	True value according to our reference standards.
	Gauge Reading	Displayed reading from test unit.
	Condition	Pass or Fail.
	Difference	Indicated reading minus reference reading.
	Relative Difference	(Difference / reference reading) x 100
	Allowable Tolerance	± according to manufacturer's specifications.
	Water column	Referenced at 20° C and 1 atmosphere.
	Test Accuracy Ratio	At least 4:1 unless otherwise stated.

Accepted & Received
By
Panax Quality Control

Date: 03-24-11
Initial: JS

Laboratory ambient conditions throughout this calibration were:

Temperature 20 to 24° C
Humidity 30 to 55% RH
Pressure 100 to 103 kPa

Reference Standards used in this calibration are traceable to the National Institute of Standards and Technology of the United States, through the following report numbers:

Manufacturer	Model	Serial Number	Report Number	Due Date	Reference Uncertainty
Crystal Engineering	10KPSIXP2I	649269	J3615	9-Jun-11	0-20% of FS: +/- 0.02% FS, 20%-100% of FS: +/- 0.1% reading

This certificate shall not be reproduced except in full, without written approval.


Laboratory Representative

Quality Representative

Test Results

Report number FASTCAL-C09684

CRYSTAL
engineering corporation

As Received Test Results

10000 PSI

Reference Reading	Gauge Reading	Allowable Tolerance	Difference	Difference (% of FS)	Condition
1000	1000	100	0	0.00%	Pass
3000	3000	100	0	0.00%	Pass
5000	5000	100	0	0.00%	Pass
7000	7000	100	0	0.00%	Pass
10000	10000	100	0	0.00%	Pass

As Left Test Results

10000 PSI

Reference Reading	Gauge Reading	Allowable Tolerance	Difference	Difference (% of FS)	Condition
1000	1000	100	0	0.00%	Pass
3000	3000	100	0	0.00%	Pass
5000	5000	100	0	0.00%	Pass
7000	7000	100	0	0.00%	Pass
10000	10000	100	0	0.00%	Pass

AR Head correction: 0 PSI
AL Head correction: 0 PSI



BERJA Meter & Controls Ltd.

831-77th Avenue, Edmonton, Alberta, Canada T6P 1S9 ♦ Ph: (780) 440-1234 Fx: (780) 440-4775 email: shop@berjagroup.com

Certificate of Calibration

Report number FASTCAL-C09683

CRYSTAL
engineering corporation

Company	Location	Date of P.O.	P.O. Number
Panax	Edmonton AB	3/23/2011	17260

Manufacturer	Model	Serial Number	Calibration Date	Expiration Date
CPW	901,0-10000PSI	PX-09J	3/24/2011	3/23/2012

Model Uncertainty
+/- ASME 1A of span (1%)

All instrument calibrations are verified for accuracy before they are shipped. The recommended calibration interval for this instrument is 12 months from the date of verification. Your particular quality assurance requirements may supersede this recommendation.

As Received Condition: In tolerance

As Left Condition: In tolerance

All calibrations are performed in a controlled environment by qualified personnel using instrumentation and methods which guarantee that specifications claimed are reliable. Calibrations conform to ANSI/NCSL Z540-1-1994, MIL-STD 45662A, 10CFR21 and 10CFR50 when specified by customer documentation.

Definitions:	Temperature	Measured temperature of test during data collection.
	Reference Reading	True value according to our reference standards.
	Gauge Reading	Displayed reading from test unit.
	Condition	Pass or Fail.
	Difference	Indicated reading minus reference reading.
	Relative Difference	(Difference / reference reading) x 100
	Allowable Tolerance	± according to manufacturer's specifications.
	Water column	Referenced at 20° C and 1 atmosphere.
	Test Accuracy Ratio	At least 4:1 unless otherwise stated.

Accepted & Received
By
Panax Quality Control

Date: 03-24-11

Initial:

Laboratory ambient conditions throughout this calibration were:

Temperature 20 to 24° C
Humidity 30 to 55% RH
Pressure 100 to 103 kPa

Reference Standards used in this calibration are traceable to the National Institute of Standards and Technology of the United States, through the following report numbers:

Manufacturer	Model	Serial Number	Report Number	Due Date	Reference Uncertainty
Crystal Engineering	10KPSIXP2I	649269	J3615	9-Jun-11	0-20% of FS: +/- 0.02% FS, 20%-100% of FS: +/- 0.1% reading

This certificate shall not be reproduced except in full, without written approval.

Laboratory Representative

Quality Representative

Test Results

Report number FASTCAL-C09683

CRYSTAL
engineering corporation

As Received Test Results

10000 PSI

Reference Reading	Gauge Reading	Allowable Tolerance	Difference	Difference (% of FS)	Condition
1000	1000	100	0	0.00%	Pass
3000	3000	100	0	0.00%	Pass
5000	5000	100	0	0.00%	Pass
7000	7000	100	0	0.00%	Pass
10000	10000	100	0	0.00%	Pass

As Left Test Results

10000 PSI

Reference Reading	Gauge Reading	Allowable Tolerance	Difference	Difference (% of FS)	Condition
1000	1000	100	0	0.00%	Pass
3000	3000	100	0	0.00%	Pass
5000	5000	100	0	0.00%	Pass
7000	7000	100	0	0.00%	Pass
10000	10000	100	0	0.00%	Pass

AR Head correction:
AL Head correction:

0 PSI
0 PSI

Exhibit 9.3A / AB-76 A Modified WELDER QUALIFICATION RECORD (WQR)

Welder's Name: Young Cockney

ABSA File No.: W- 10676

Stamp No.: F

Identification of WPS followed by welder during welding of test coupon: PX-4A (rev 0)

W.P. Reg. # WP- 1760.2

Base material(s) welded: SA 106 GR B

Thickness: 0.344"

Test Coupon Prod. Weld

Testing Conditions and Qualification Limits

Welding Variables (QW-350)

Welding Process(es) Used:

Type of Welding (manual, semi-automatic) Used:

Base Metal P or S Number to P or S Number:

Plate Pipe enter diameter:

Backing (metal, weld metal, double weld etc.):

Filler Metal or Electrode Specification(s) SFA#:

Filler Metal or Electrode Classification(s):

Filler Metal or Electrode F - number(s):

Filler Type (solid metal, or flux cored/powder) GTAW or PAW:

Consumable Insert for GTAW or PAW:

Deposit Thickness for each process, electrode type, etc. (in.):

Process/Electrode 1: 3 layers minimum Yes No

Welding position (2G, 5G, 6G, 3F, etc.):

Progression (Uphill or Downhill):

Inert Gas backing for GTAW, PAW, GMAW:

Transfer Mode (spray/globular or pulse to short circuit):

GTAW Current Type/ Polarity (AC, DCEP, DCEN):

Actual Values		Range Qualified	
GMAW	SMAW	GMAW	SMAW
Semi-Automatic	Manual	Semi-Automatic	Manual
P1	P1	P1	P1
NPS 2	NPS 2	1.0" OD Min	1.0" OD Min.
None/Weld	Weld Metal	Without/With	With
5.18	5.1		
ER70S-6	E7018-1		
F6	F4	F6	F4
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
0.125"	0.219"	0.1375"	0.438"
Process/Electrode 2: 3 layers minimum Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>			
1G	1G	1G	1G
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
Short Circuit	N/A	Short Circuit	N/A
DCEP	DCEP	DCEP	DCEP

Results

Visual Examination of Fit-Up Root Gap: 5/32"

Tack Welds: Bridge

Length: 0.5"

Number: 3

Root Pass (Describe Discontinuity if Unacceptable): OK

Complete Weld (Describe Defects if Unacceptable): OK

Bend Test

Transverse Root and Face QW-462.3a

Longitudinal Root and Face QW-462.3b

Pipe Bend Specimen, corrosion-resistant overlay QW-462.5c

Plate Bend Specimen, corrosion-resistant overlay QW-462.5d

Side Bend QW-462.2

Macro Test for Fusion QW-462.5b

Macro Test for Fusion QW-462.5e

Bend Type	Result	Bend Type	Result	Bend Type	Result	Bend Type	Result
# 1 Root	Pass	# 2 Face	Pass				

For alternative qualification of groove welds by radiography to QW-191

Radiographic Results: N/A

Fillet Weld-Fracture Test (QW-180): N/A

Length and Percent of Defects: N/A

Macro Examination (QW-184): N/A

Fillet Legs Size (in.): N/A X N/A Concavity/Convexity (in.): N/A

Other Tests: N/A

Record Information

Film or Specimens Evaluated by: Bruce Cormier

Company: GRB Enterprises Ltd

Welding Test Conducted by: Bruce Cormier

Mechanical Tests Conducted by: GRB Enterprises Ltd

Laboratory Test no.: N/A

Welding Supervised by: Panax Representative: Tomasz Chruszcz

We certify that the statements in this record are correct and that the test coupons were prepared, welded and tested in accordance with the requirements of Section IX of the ASME Code.

Accredited Organization: GRB ENTERPRISES LTD. AOQP No: 7107(C) Expiry Date: May 21 2012

Certified by: Bruce Cormier

W.E. File: E-00252

Date: July 29, 2009

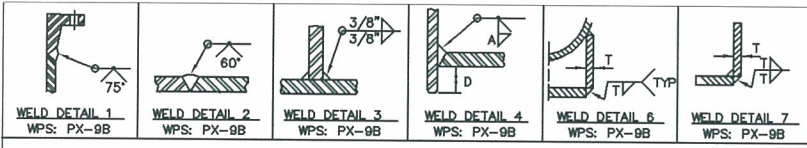
PQ Card No. (When Issued): 14255

Performance Test Reference No.: 09-07-29-09

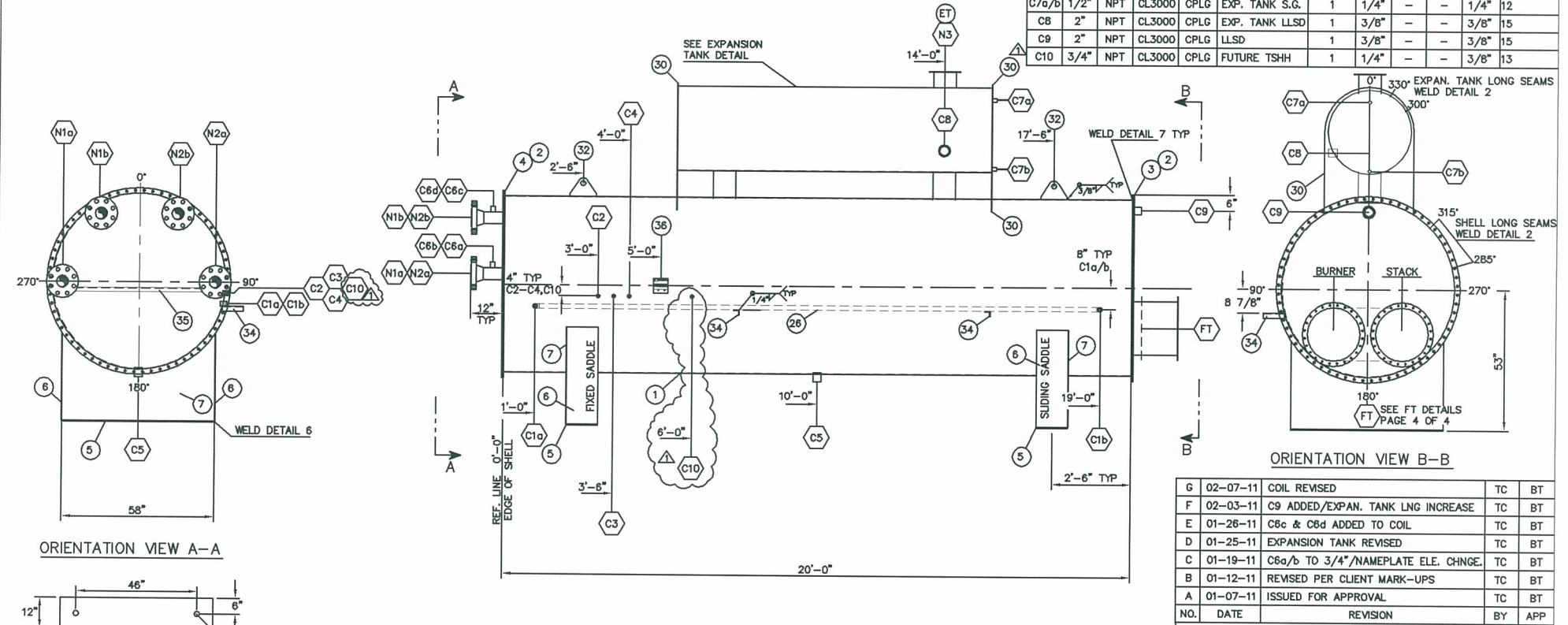
Test Coupon ID No.: Welder Name

Date Coupon is Retained To: N/A

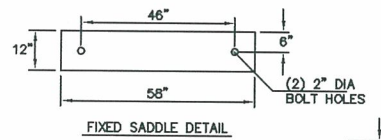
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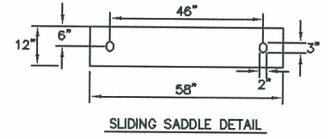
CONNECTION SCHEDULE											
MARK	SIZE	SCH	CLASS	TYPE	SERVICE	WELD	A	B	C MIN	D MIN	ITEM NO'S
N1a/b	4"	160	1500	RTJWN	PREHEAT COIL	1, 2	-	-	-	-	10,19,21-25
N2a/b	4"	160	1500	RTJWN	RE-HEAT COIL	1, 2	-	-	-	-	10,19,21-25
N3	8"	STD	FAB	FLNGE	THIEF HATCH	1, 4	1/4"	-	-	3/8"	28,31
C1a/b	1"	NPT	CL3000	CPLG	FG PREHEAT	1	1/4"	-	-	3/8"	14,18,26
C2	3/4"	NPT	CL3000	CPLG	TC-100 CONN.	1	1/4"	-	-	3/8"	13
C3	3/4"	NPT	CL3000	CPLG	TI-100 CONN.	1	1/4"	-	-	3/8"	13
C4	3/4"	NPT	CL3000	CPLG	TSHH	1	1/4"	-	-	3/8"	13
C5	2"	NPT	CL3000	CPLG	DRAIN	1	3/8"	-	-	3/8"	15
C6a-d	3/4"	NPT	CL6000	CPLG	TI	4	3/8"	-	-	0"	16
C7a/b	1/2"	NPT	CL3000	CPLG	EXP. TANK S.G.	1	1/4"	-	-	1/4"	12
C8	2"	NPT	CL3000	CPLG	EXP. TANK LLSD	1	3/8"	-	-	3/8"	15
C9	2"	NPT	CL3000	CPLG	LLSD	1	3/8"	-	-	3/8"	15
C10	3/4"	NPT	CL3000	CPLG	FUTURE TSHH	1	1/4"	-	-	3/8"	13



ORIENTATION VIEW A-A



ELEVATION VIEW

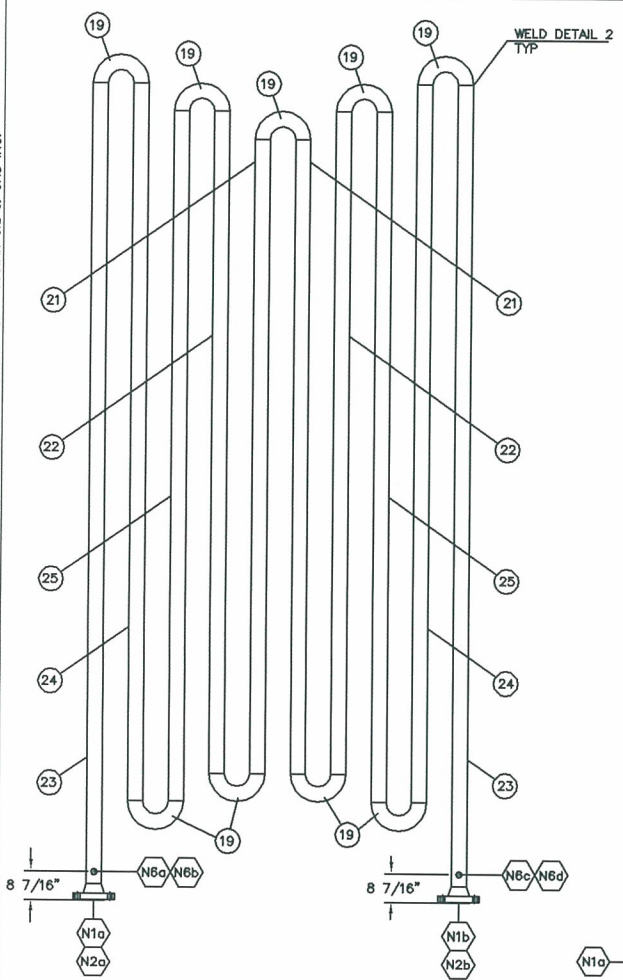


NO.	DATE	REVISION	BY	APP
G	02-07-11	COIL REVISED	TC	BT
F	02-03-11	C9 ADDED/EXPAN. TANK LNG INCREASE	TC	BT
E	01-26-11	C6c & C8d ADDED TO COIL	TC	BT
D	01-25-11	EXPANSION TANK REVISED	TC	BT
C	01-19-11	C6a/b TO 3/4"/NAMEPLATE ELE. CHNGE.	TC	BT
B	01-12-11	REVISED PER CLIENT MARK-UPS	TC	BT
A	01-07-11	ISSUED FOR APPROVAL	TC	BT

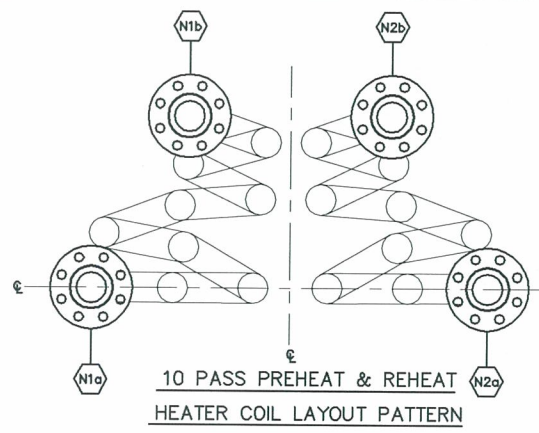
<p>PANAX OIL & GAS INC. 3730 - 69 AVENUE EDMONTON, AB T6B 2V2 TELEPHONE: (780) 413-6656 FAX: (780) 468-5784</p>				
REF DWG:	BDD-400A REV.1	CRN:	P9417.213	
DATE:	01-07-2011	BDD NO.:	---	
JOB NO.:	---		2.0MM BTU/HR	
SCALE:	NTS		SOUR SERVICE LINE HEATER	
DRAWN BY:	TC	3212 PSIG AT -20 / 200° F		
CHECKED BY:	BT	DWG NO.:	SHEET 1 OF 4	REV. 1
APP BY:		BDD-401		

NO.	DATE	REVISION	BY	APP
1	04-07-11	C10 ADDED / CHANGED TO 2008 EDITION	TC	BT
0	02-28-11	C2 TO 3/4" / ISSUE FOR CONSTRUCTION	TC	BT
I	02-23-11	C4 TO 3/4" CPLG CONNECTION	TC	BT
H	02-08-11	C6a-d TO 3/4" CPLG	TC	BT

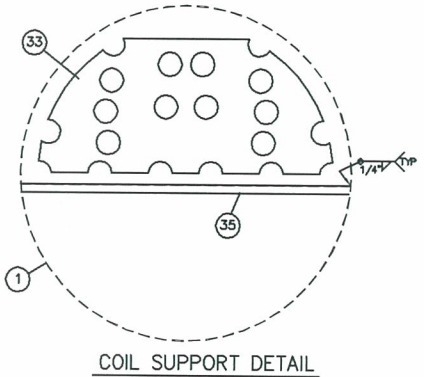
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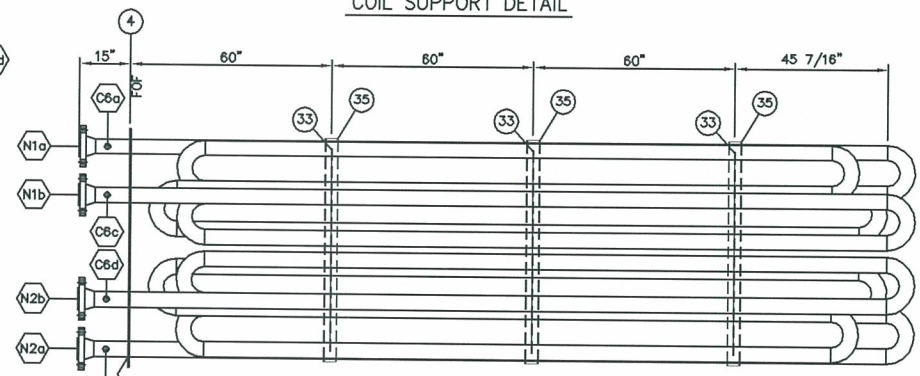
10 PASS PREHEAT & REHEAT
HEATER COIL STRETCH OUT



10 PASS PREHEAT & REHEAT
HEATER COIL LAYOUT PATTERN



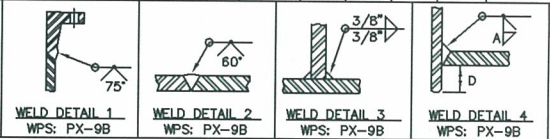
COIL SUPPORT DETAIL



PREHEAT & REHEAT COIL
PLAN VIEW

WELD DETAIL 3

CONNECTION SCHEDULE											
MARK	SIZE	SCH	CLASS	TYPE	SERVICE	WELD	A	B	C MIN	D MIN	ITEM NO'S
N1a/b	4"	160	1500	RTJWN	PREHEAT COIL	1, 2	-	-	-	-	10,19,21-25
N2a/b	4"	160	1500	RTJWN	RE-HEAT COIL	1, 2	-	-	-	-	10,19,21-25
C8a-d	3/4"	NPT	CL8000	CPLG	TI	4	3/8"	-	-	0"	16



BILL OF MATERIALS			
ITEM	QTY	DESCRIPTION	MATERIAL
2	2	MATING FLANGE PLATE - 70" OD x 66" ID x 3/8" THK (PER DETAIL)	SA-36
4	1	BLIND FLANGE PLATE - 70" OD x 3/8" THK N1-N2(PER DETAIL)	SA-36
10	4	FLANGE - 4" CL1500 RTJWN c/w SCH.160 BORE	N1a,b,N2a/b SA-350-LF2
16	4	CPLG - 3/4" NPT CL8000 FULL	C8a/b SA-105N
19	18	RETURN BEND - 4" SCH.160 LR 180°	N1a,b,N2a/b SA-420-WPL6
21	4	PIPE - 4" SCH.160 (.531") x 186 1/2"	COIL SA-333 GR.6
22	4	PIPE - 4" SCH.160 (.531") x 194 3/4"	COIL SA-333 GR.6
23	4	PIPE - 4" SCH.160 (.531") x 235 9/16"	COIL SA-333 GR.6
24	4	PIPE - 4" SCH.160 (.531") x 211 1/4"	COIL SA-333 GR.6
25	4	PIPE - 4" SCH.160 (.531") x 203"	COIL SA-333 GR.6
33	3	PLATE - 3/8" THK x 28 3/16" x 62" WD	COIL SUPPORTS SA-36
35	3	CHANNEL - C4 x 5.4 x 65 3/8" LG	COIL SUPP. 44W

DESIGN NOTES	
DESIGN & FABRICATE TO:	ASME B31.3, (2008 EDITION)
DESIGN PRESSURE:	3212 PSI
MAXIMUM DESIGN METAL TEMPERATURE:	200° F
MINIMUM DESIGN METAL TEMPERATURE:	-20° F
IMPACT TESTS:	EXEMPT PER TABLE 323.2.2 - COLUMN A
RADIOGRAPHY:	100% OF TOTAL WELDS
POST WELD HEAT TREATMENT:	1150° F ± 50° F FOR 1 HOUR MIN.
HYDROSTATIC TEST TEMPERATURE:	4818 PSIG
CORROSION ALLOWANCE:	(INTERNAL) 1/8"
CORROSION ALLOWANCE:	(EXTERNAL) ATMOSPHERE
HEATING SURFACE:	223.82 FT2 (PER 10 PASS COIL)
PREHEAT:	50° F

I	NO.	DATE	REVISION	TC	BT
I	02-23-11		C4 TO 3/4" CPLG CONNECTION	TC	BT
H	02-08-11		C8a-d TO 3/4" CPLG	TC	BT
G	02-07-11		COIL REVISED	TC	BT
F	02-03-11		C9 ADDED/EXPAN. TANK LNG INCREASE	TC	BT
E	01-26-11		C6c & C6d ADDED TO COIL	TC	BT
D	01-25-11		EXPANSION TANK REVISED	TC	BT
C	01-19-11		C8a/b TO 3/4"/NAMEPLATE ELE. CHNGE.	TC	BT
B	01-12-11		REVISED PER CLIENT MARK-UPS	TC	BT
A	01-07-11		ISSUED FOR APPROVAL	TC	BT
NO.	DATE		REVISION	TC	BT

PANAX OIL & GAS INC.
3730 - 69 AVENUE
EDMONTON, AB T6B 2V2
TELEPHONE: (780) 413-6656 FAX: (780) 468-5784

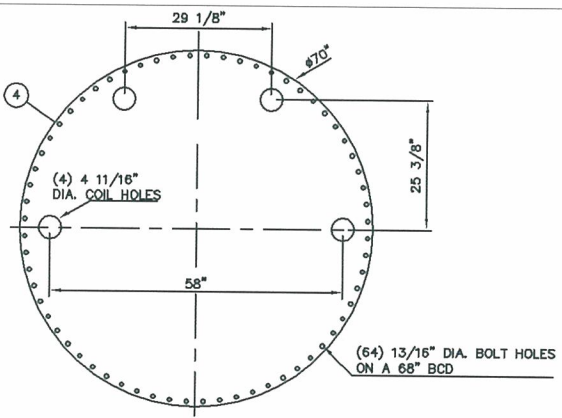
REF DWG:	BDD-400A REV.1	CRN:	P9417.213
DATE:	01-07-2011		
BDD NO.:	---		
JOB NO.:	---		
SCALE:	NTS		
DRAWN BY:	TC		
CHECKED BY:	BT		
APP BY:			

10(X2) PASS HEATER COIL
SOUR SERVICE LINE HEATER
3212 PSIG AT -20 / 200° F

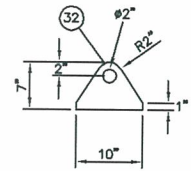
DWG NO.:	SHEET 2 OF 4	REV.	1
	BDD-401		

NO.	DATE	REVISION	TC	BT
1	04-07-11	C10 ADDED / CHANGED TO 2008 EDITION	TC	BT
0	02-28-11	C2 TO 3/4" / ISSUE FOR CONSTRUCTION	TC	BT

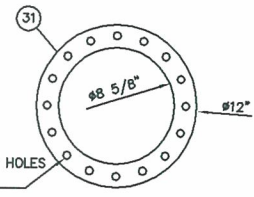
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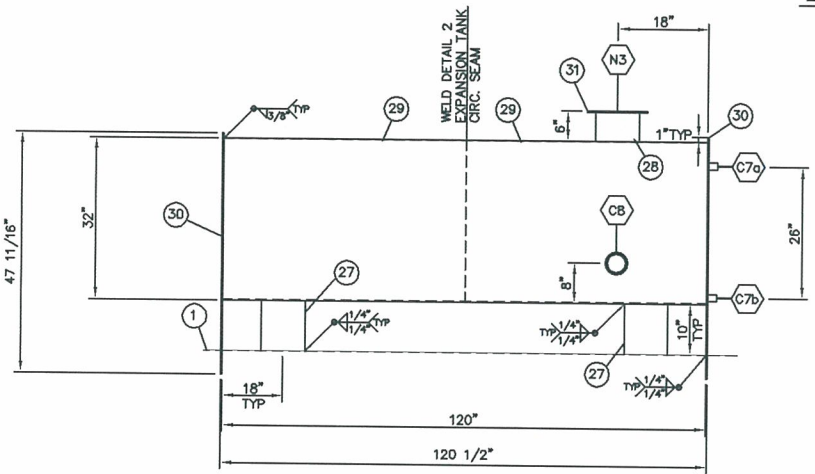
COIL (N1/N2) BLIND FLANGE DETAIL



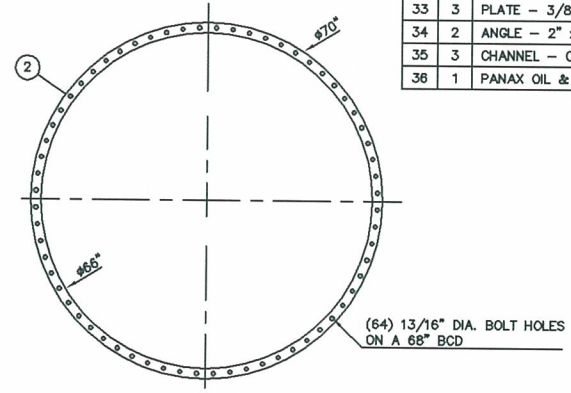
LIFT LUG DETAIL



EXPANSION TANK MATING FLANGE DETAIL



EXPANSION TANK DETAIL



MATING FLANGE DETAIL



WELD DETAIL 2
WPS: PX-9B

BILL OF MATERIALS

ITEM	QTY	DESCRIPTION	MATERIAL
1	1	SHELL PLATE - 66" OD x 1/4" THK x 20'-0" LG	SA-36
2	2	MATING FLANGE PLATE - 70" OD x 66" ID x 3/8" THK (PER DETAIL)	SA-36
3	1	BLIND FLANGE PLATE - 70" OD x 3/8" THK FT(PER DETAIL)	SA-36
4	1	BLIND FLANGE PLATE - 70" OD x 3/8" THK N1-N2(PER DETAIL)	SA-36
5	2	BASE PLATE - 3/8" THK x 58" x 12" WD	SA-36
6	4	SADDLE SIDE PLATE - 1/4" THK x 36 7/8" x 12" WD	SA-36
7	2	SADDLE FACE PLATE - 1/4" THK x 36 7/8" x 58" WD TRIM TO SUIT	SA-36
10	4	FLANGE - 4" CL1500 RTJWN c/w SCH.160 BORE N1a/b,N2a/b	SA-350-LF2
12	2	CPLG - 1/2" NPT CL3000 FULL C7a/b	SA-105N
13	4	CPLG - 3/4" NPT CL3000 FULL C2,C3,C4,C10	SA-105N
14	2	CPLG - 1" NPT CL3000 FULL C1a/b	SA-105N
15	3	CPLG - 2" NPT CL3000 FULL C5,C8,C9	SA-105N
16	4	CPLG - 3/4" NPT CL6000 FULL C6a/b	SA-105N
18	2	ELBOW - 1" SCH.XH LR 90 BW C1a/b	SA-234-WPB
19	1B	RETURN BEND - 4" SCH.160 LR 180° N1a/b,N2a/b	SA-420-WPL6
21	4	PIPE - 4" SCH.160 (.531") x 186 1/2" COIL	SA-333 GR.6
22	4	PIPE - 4" SCH.160 (.531") x 194 3/4" COIL	SA-333 GR.6
23	4	PIPE - 4" SCH.160 (.531") x 235 9/16" COIL	SA-333 GR.6
24	4	PIPE - 4" SCH.160 (.531") x 211 1/4" COIL	SA-333 GR.6
25	4	PIPE - 4" SCH.160 (.531") x 203" COIL	SA-333 GR.6
26	1	PIPE - 1" SCH.XH (.179") x 213" LG C1a/b	SA-105N
27	2	PIPE - 8" SCH.STD (.322") x 12" LG EXPAN. TANK SUPPORT	SA-53-ERW
28	1	PIPE - 8" SCH.STD (.322") x 7" LG N3	SA-53-ERW
29	2	PLATE - 1/4" THK x 60" LG ROLL TO 32" OD EXPAN. TANK	SA-36
30	2	PLATE - 1/4" THK x 47 11/16" x 34" WD EXPAN. TANK	SA-36
31	1	PLATE - 1/4" THK x 12" OD x 8 5/8" ID MATING FLANGE	SA-36
32	2	PLATE - 3/8" THK x 7" x 10" WD LIFT LUG	SA-36
33	3	PLATE - 3/8" THK x 28 3/16" x 62" WD COIL SUPPORTS	SA-36
34	2	ANGLE - 2" x 2" x 1/4" THK x 8" LG EXT. COIL SUPP.	44W
35	3	CHANNEL - C4 x 5.4 x 65 3/8" LG COIL SUPP.	44W
36	1	PANAX OIL & GAS STANDARD NAMEPLATE & BRACKET ASSEMBLY	304SS/SA-36

NO.	DATE	REVISION	BY	APP
I	02-23-11	C4 TO 3/4" CPLG CONNECTION	TC	BT
H	02-08-11	C6a-d TO 3/4" CPLG	TC	BT
G	02-07-11	COIL REVISED	TC	BT
F	02-03-11	C9 ADDED/EXPAN. TANK LNG INCREASE	TC	BT
E	01-26-11	C6c & C6d ADDED TO COIL	TC	BT
D	01-25-11	EXPANSION TANK REVISED	TC	BT
C	01-19-11	C6a/b TO 3/4"/NAMEPLATE ELE. CHNGE.	TC	BT
B	01-12-11	REVISED PER CLIENT MARK-UPS	TC	BT
A	01-07-11	ISSUED FOR APPROVAL	TC	BT

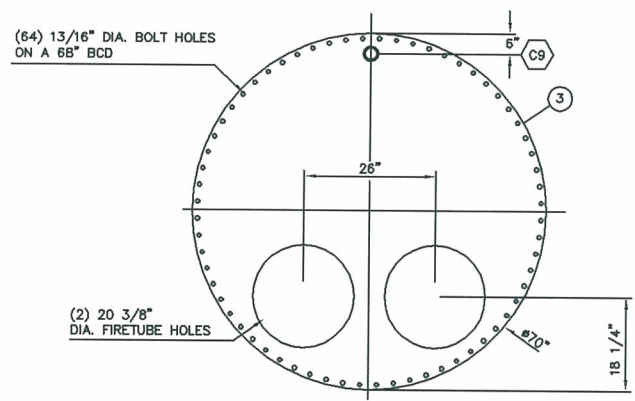
PANAX OIL & GAS INC.

3730 - 69 AVENUE
EDMONTON, AB T6B 2V2
TELEPHONE: (780) 413-6656 FAX: (780) 468-5784

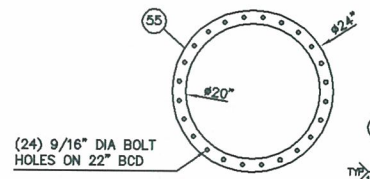
REF DWG: BDD-400A REV.1	CRN: P9417.213
DATE: 01-07-2011	2.0MM BTU/HR SOUR SERVICE LINE HEATER 3212 PSIG AT -20 / 200° F
BDD NO.: ---	
JOB NO.: ---	
SCALE: NTS	
DRAWN BY: TC	DWG NO.: SHEET 3 OF 4 BDD-401
CHECKED BY: BT	
APP BY:	REV. 1

NO.	DATE	REVISION	BY	APP
1	04-07-11	C10 ADDED / CHANGED TO 200B EDITION	TC	BT
0	02-28-11	C2 TO 3/4" / ISSUE FOR CONSTRUCTION	TC	BT

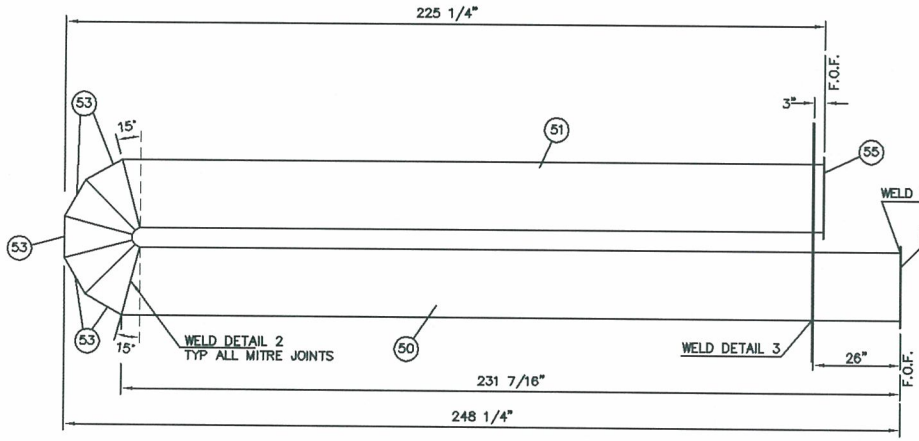
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FIRETUBE BLIND FLANGE DETAIL

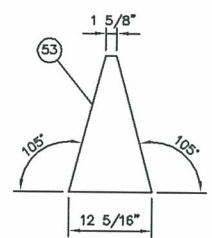


FIRETUBE & STACK MATING FLANGE DETAIL

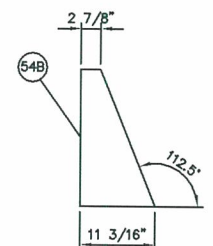
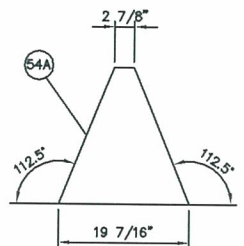


FIRETUBE DETAIL

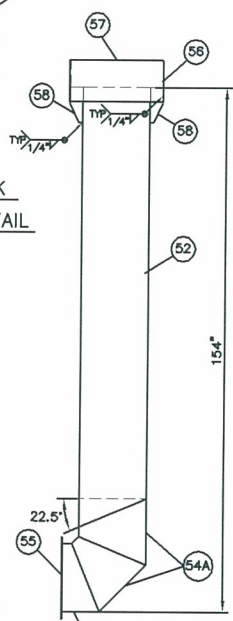
DESIGN NOTE
PWHT FIRETUBE @ 1150° F ± 50° F FOR 1 HOUR MIN.



FIRETUBE MITRE DETAIL



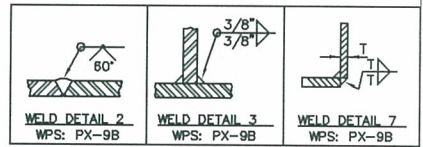
STACK MITRE DETAILS



STACK DETAIL

BILL OF MATERIALS

ITEM	QTY	DESCRIPTION	MATERIAL
50	1	PIPE - 20" SCH.20 (.375") x 231 3/16" LG TRIM TO SUIT	SA-53-ERW
51	1	PIPE - 20" SCH.20 (.375") x 208 3/16" LG TRIM TO SUIT	SA-53-ERW
52	1	PIPE - 20" SCH.20 (.375") x 129" LG TRIM TO SUIT	SA-53-ERW
53	5	PIPE - 20" SCH.20 (.375") x 20" x 12 5/16" WD SEE MITRE DETAIL	SA-53-ERW
54A	2	PIPE - 20" SCH.20 (.375") x 20" x 19 7/16" WD SEE MITRE DETAIL	SA-53-ERW
54B	1	PIPE - 20" SCH.20 (.375") x 20" x 11 3/16" WD SEE MITRE DETAIL	SA-53-ERW
55	2	PLATE - 1/4" THK x 24" OD x 20" ID FT/STACK MATING FLANGE	SA-36
56	1	PLATE - 1/4" THK x 87 3/16" x 12" WD ROLL TO 28" OD	SA-36
57	1	PLATE - 1/4" THK x 27 1/2" OD STACK CAP	SA-36
58	4	PLATE - 1/4" THK x 10 3/8" x 3 3/4" WD CAP SUPP.	SA-36



NO.	DATE	REVISION	BY	APP
1	04-07-11	C10 ADDED / CHANGED TO 2008 EDITION	TC	BT
0	02-28-11	C2 TO 3/4" / ISSUE FOR CONSTRUCTION	TC	BT
I	02-23-11	C4 TO 3/4" CPLG CONNECTION	TC	BT
H	02-08-11	C6a-d TO 3/4" CPLG	TC	BT
G	02-07-11	COIL REVISED	TC	BT
F	02-03-11	C9 ADDED/EXPAN. TANK LNG INCREASE	TC	BT
E	01-26-11	C6c & C6d ADDED TO COIL	TC	BT
D	01-25-11	EXPANSION TANK REVISED	TC	BT
C	01-18-11	C6a/b TO 3/4"/NAMEPLATE ELE. CHNGE.	TC	BT
B	01-12-11	REVISED PER CLIENT MARK-UPS	TC	BT
A	01-07-11	ISSUED FOR APPROVAL	TC	BT

PANAX OIL & GAS INC.

3730 - 69 AVENUE
EDMONTON, AB T6B 2V2
TELEPHONE: (780) 413-6656 FAX: (780) 468-5784

REF DWG:	BDD-400A REV.1	CRN:	P9417.213
DATE:	01-07-2011	SOUR SERVICE LINE HEATER 20" FIRETUBE DETAILS 2.0MM BTU/HR	
BDD NO.:	---		
JOB NO.:	---		
SCALE:	NTS		
DRAWN BY:	TC	DWG NO.:	SHEET 4 OF 4
CHECKED BY:	BT	BDD-401	REV. 1
APP BY:			



DRAWING INDEX (EXHIBIT 7.1)

SER#(s): LH-711 H-717

Drawing Number	Rev. No.	Drawing Title	Date Issued	Copies To QCM	Copies To Shop Mgr.	Copies To Purch. Mgr.	Copies To Eng. File	Copies To ABSA	Copies To
BDD-401	0	<u>2.0MM BTU/HR SOUR SERVICE</u> <u>LINE HEATER</u> 66" OD x 20'-0" s/s 3212psig @ -20°F / 200°F	01-19-2011	1	-----	-----	-----	-----	(customer databook) -----
BDD-401	1	<u>2.0MM BTU/HR SOUR SERVICE</u> <u>LINE HEATER</u> 66" OD x 20'-0" s/s 3212psig @ -20°F / 200°F	04-07-2011	1	1	1	1	-----	(customer databook) 1