

NWP Industries Inc™		Website: www.nwp.ca
PO Box 6280 4017-60 Ave.		Phone: (403) 227-4100
T4G 1S9		Fax: (403) 227-4102

QC & Instrumentation Documentation

Manual

3.0 MM BTU Line Heater

Prepared for:
EnCana Corporation
PO# 41979

Job Order # 08562-002
Unit Serial # NWP-08562-002
Coil Serial # NWP-08562-002-A

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CCS Temperature Switch
CCS Pressure Switch
NWP Scrubber

P&ID and BOM (Full Sized)

Instrumentation Manual

For component replacement parts or technical questions, please contact NWP Industries Inc. at (403) 227-4100.

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Equipment/Instrumentation Manual Contents

1. ACL 5500
2. Alberta Y Strainer Model YS 800
3. ASCO Solenoid Valves
4. CCS Pressure Switch
5. CCS temperature Switch 6900
6. CM1 Century Needle Valve
7. Emico ball valves
8. Fisher 67CFR
9. Fisher 119 control valve
10. Fisher 627 pressure regulator
11. Fisher DVC 6030
12. Fossils pneumatic actuator
13. Headline 360A filters
14. Kimray HT-12PG temperature controller
15. Kimray separable sockets
16. Magnum needle valves
17. Nutron T3 floating ball valves
18. SOR 1510 Electric
19. Speed control valve NAS4000-NO2
20. Taylor 8200 Safety Relief Valve
21. Trend Thermometers 33
22. Wenco flame arrested burner
23. Wenco Thief Hatch
24. Wheatley swing check valve
25. Wika 233.53

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Pre Start Checklist

Following is a Pre Start Checklist of items to be checked prior to package start up:

Ensure temporary-shipping support braces, plugs, blinds and flange protectors have been removed from package piping and vessels.

Ensure level controller dis-placer's have been installed. Ensure level controller connections have been made up correctly and tightened.

Install temperature and pressure indicators as required.

Chemical pumps are shipped dry, check / add oil as required. (Note: CVS Series 51 Chemical Injection Pumps are an oil free operation pump)

Ensure relief valves are installed on piping and vessels. (Shipped loose due to configuration of piping and vessels)

IMPORTANT

Your NWP equipment is shipped from the plant with appropriate "CAUTION" signs attached. These advise of precautions to be taken to avoid potential danger and/or injury. They warn of one or more of the following potential hazards:

- Combustible materials
- Electrical shock
- Moving machinery
- Contents under pressure
- High temperature
- Chemicals present
- Burner start-up

After the equipment is set up and before any process or utility is attached to it, inspect the equipment to be certain that no CAUTION tags are damaged or lost in transit. If this has occurred, or if you feel the equipment requires additional tags, immediately contact NWP Industries Inc. - Innisfail Branch at (403) 227-4100. We will gladly and promptly provide additional tags for equipment and answer any questions and/or problems that you have. SAFETY IS EVERYONE'S BUSINESS!

Issuing Authority: Marvin J. (Ty) DeBelser		Quality Control
Date of Issue: March 13, 2008		QCFOFinalInspectionReleaseCertificateR00

FINAL INSPECTION RELEASE CERTIFICATE

CUSTOMER: Encana Corporation		
PRODUCT: 3.0 MM BTU/HR LINEHEATER PACKAGE	WO#: 08562-002	
	DATE: <i>Jan 29.13</i>	

FINAL INSPECTION DOCUMENTATION

REVIEWED BY:	ACCEPTED:	REJECTED:
STANDARD DOCUMENTATION REQUIREMENTS: (SEE DOCUMENT REQUIREMENT LIST)		
ADDITIONAL DOCUMENT REQUIREMENTS: (TO BE RECORDED HERE IF APPLICABLE I.E. DOCUMENT PACKAGE REQUIRED BY CUSTOMER ETC.)		

Q.C. FILE CLOSURE BY: <i>Kasha Fox</i>	DATE: <i>Feb 5 2013</i>
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LOOSE COMPONENTS REQUIRED / PREPARED

ITEMS REQUIRED:	NO. OF BOXES OR PKGS. _____
<i>3.0mm lineheater Pkg</i> ADDITIONAL HARDWARE OR FASTENERS REQUIRED	
YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/>

PREPARATION FOR SHIPMENT / STORAGE

PREPARATION NEEDED / COMPLETED	
<i>Ready to ship</i> SN # NWP-08562-002	
INVENTORY TAGS ATTACHED	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>

SHIPPING INSTRUCTIONS

CUSTOMER P.O. REVIEWED	YES <input type="checkbox"/> N/A <input checked="" type="checkbox"/>
CONTACT PERSON AUTHORIZED TO RELEASE PRODUCT: _____	
PHONE: _____	FAX: _____
RELEASED TO INVENTORY: _____	
RELEASED TO CUSTOMER: <i>[Signature]</i>	DATE: <i>Jan 29.13</i>

DATE: 04/22 TIME: 10:15

NWP INDUSTRIES INCORPORATED

SKIDDED EQUIPMENT TRAVEL SHEET

APPROVED BY:

DATE:

NOV 22 2012

WO #: 08562-002 DESCRIPTION: 3.0 MM BTU/HR LINEHEATER PACKAGE

DRAWING #: 08562-1 REV 0; 08562 REV 0; 08562-2B REV 0

	REQ.	HOLD	EMPLOYEE INT.	DATE COMPLETE	QC INIT.	DATE
QUOTATION REVIEWED	✓					
WORK INSTRUCTIONS ISSUED	✓		<i>TH</i>		<i>EMP</i>	NOV 23/12
WORK INSTRUCTIONS REVIEWED	✓	✓	<i>TH</i>		<i>EMP</i>	NOV 23/12
ABSA NOTIFIED FOR INSTALLATION INSPECTION	NA					
MATERIAL & PARTS RELEASED	✓	✓			<i>Q</i>	Jan 28
HYDRO TEST PIPING	✓	✓	<i>TH</i>	JAN 9/12	<i>Q</i>	Jan 28
INSTRUMENTATION	✓		<i>TH</i>	JAN 28/13	<i>Q</i>	Jan 28
PNEUMATIC LEAK TEST	✓	✓	<i>TH</i>	JAN 28/13	<i>Q</i>	Jan 28
INSTRUMENTATION VALVES/FUNCTION TEST	✓		<i>TH</i>	JAN 28/13	<i>Q</i>	Jan 28
VISUAL INSPECTION P & ID CHECKED	✓	✓			<i>Q</i>	Jan 24
VISUAL INSPECTION OF BUILDING & RECEIVING OF P.O.	✓				<i>Q</i>	Jan 29
ANY CHANGE ORDERS VERIFIED COMPLETE	✓	✓			<i>Q</i>	Jan 29
PREPARED FOR SHIPMENT & PACKAGE LOOSE ITEMS, TEST, CRATED AND DOCUMENTED	✓	✓			<i>Q</i>	Jan 29
VISUAL INSPECTION AFTER PAINT & RECEIVING OF P.O.	✓	✓			<i>Q</i>	Jan 29
PACKAGING / PRESERVATION REQUIREMENTS COMPLETE	✓	✓			<i>Q</i>	Jan 29
SERVICING REQUIREMENTS DEFINED AND APPROVED	NA				—	
QC INSPECTION & FINAL RELEASE AND STICKER ATTACHED	✓				<i>Q</i>	Jan 29

ACCEPTED BY CUSTOMER

DATE



PRESSURE PIPING CONSTRUCTION AND TEST DATA REPORT

In accordance with the provisions of the PESR Section 31(1)

Shop Construction ☒:

Field Construction ☐:

Final Data Report ☒:

Partial Data Report ☐ (from one ABSA- authorized Contractor to another ABSA- authorized Contractor).

Complete both sides of this Form

1. Constructed By: NWP Industries Inc. Owner's Job No: 08562-002
(Name of ABSA authorized primary contractor or subcontractor)
4017 60th Ave. Innisfail Alberta, T4G-1S9

(Address)

Certificate of Authorization Permit No. AQP-1253

Expiry Date: Novemebr 24th, 2014

2. Constructed For: EnCana Corporation Inc.
(Name of primary contractor if different from above)
1313 10th Ave SW Calgary AB T3C 3P9

(Address)

Certificate of Authorization Permit No. AQP-NA

Expiry Date: NA

(Required when the primary contractor undertakes some/all of the quality functions, e.g., NDE, PWHT, Tie-in, fabrication, hydro test, final assembly etc.)

3. Owner: EnCana Corporation Inc.
(Name and address)
1313 10th Ave SW Calgary AB T3C 3P9

(Location of installation)

Certificate of Authorization Permit No. AQP-NA

Expiry Date: NA

(Required when the owner undertakes some/all of the quality functions, e.g., NDE, PWHT, Tie-in, fabrication, hydro test, final assembly etc.)

4. Piping Design Alberta Registration No.: PP-NA
(Required if aggregate piping volume is over 0.5m³)

5. Design Responsibility: Owner ☐: Contractor ☒

6. WP No.: WP-1604.2 : Company: NWP Industries Inc. Owner's WP No. (If used): WP-NA
(Alberta Registration No.) (Alberta Registration No.)
WPS No(s). used: NWP-4 rev: 4 ; Owner's WPS No(s). (If used): NA

7. Code: ASME B31.1 Non Boiler External Piping ☐; ASME B31.1 Boiler External Piping ☐;
B31.5 ☐; B31.9 ☐; CSA Z662 Steam Pipelines ☐;
ASME B31.3 ☒ - Service Category: Normal ☒; D ☐; M ☐; High Pressure ☐; Severe Cyclic Condition ☐
High Purity ☐

Drawing No. Rev. No. Line No.	Fluid (Air/Steam Etc.)	Des. Press. PSI	Des. Temp. F (Max. & Min.)	Pressure Test PSI	Test Medium	Pipe Mat'l Spec. & Grade	C.A. Inches	Pipe NPS & Schedule	Flange Material & Rating	PWHT/ Preheat Temp. °F	NDE
08562-2A rev: 0, 08562- 2B Rev 0											
PF-4"-L- XXHBD- 100,101,103 & 104	Hydrocarbons	5171 150	200 -49 200 -49	7757 165	Water Air	SA-333-6 316SS	1/16 0	4"XXH 3-8" 0.035"WT	SA-350-LF2 Cl. 2500 NA	1150-50 NA/NA	100% RT Visual
FG-1"-C- 80A-BD-304	Hydrocarbons	150 150	100 -20- 100 -49 100 -20	225 165	Water Air	SA-106B & SA-333-6 316SS	1/16 0	1", 3/4" & 1" 80 XH 5" 0.035" WT, 3-8" 0.035"WT	NA NA	NA NA/NA	10% RT Random Visual
D-3 4"-C- 80A-BD-250	Hydrocarbons	150	100 -20- 100 -49	225	Water	SA-333-6	1/16	2" 80 XH	NA	NA	Visual
FG-1"-C- 80A-BD- 302-303	Hydrocarbons	150	100 -20- 100 -49	225	Water	SA-106B & SA-333-6	1/16	1" and 1.5" 80 XH NA/NA	NA	NA	100% RT PSA Inses 10% RT Random

FG-F-C- 80A/BD 300/304	Hydrocarbons	150	100/-20- 100/+49	225	Water	SA-106B & SA-333-6	1/16	1" SCH XII/80	NA	NA	10% RT Random
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Partial Data Reports certified by sub-contractors are listed below and attached to this Data Report ☐

No.	Line No.	Spool No.	Dwg. No. (with Rev. No.)	Sub-contractor (Name)	AQP No. (if from Alberta)	Expiry (if from Alberta)

Remarks: For partial data report provide information about the code work that was not completed by the subcontractor (e.g., hydrostatic test, PWHT etc.). For final data report provide information about the code work that was not completed by subcontractors and subsequently completed by the primary contractor (e.g., hydrostatic test of entire assembly, PWHT etc.)

Hardness Testing – Max 200 BHN 10% of welds.

Endorse certificate 'A' or 'B'

A. CERTIFICATE OF COMPLIANCE

Signed by the subcontractor when supplying this certificate as a
Partial Data Report

We certify that the statements in this Data Report are correct and that materials, construction and workmanship of the piping fabrication conform to the registered quality system and the applicable Piping code(s).

Date: _____
Contractor

Print Authorized Representative's Name Signature

This certificate is not valid unless it forms part of a Final Data Report signed by Primary Contractor

B. CERTIFICATE OF COMPLIANCE

Signed by the primary contractor when supplying this certificate as a
Final Data Report

We certify that the statements in this Data Report are correct and that piping job no. 08562-002 described in this Data Report was constructed in accordance with the Province of Alberta Safety Codes Act and Regulations, and applicable ASME Piping Code(s).

Date: Jan 25, 2013 NWP Industries Inc.

Contractor

Colleen Tysoe

Print Authorized Representative's Name Signature

CERTIFICATE OF INSPECTION

I, the undersigned, employed by Caliper Inspection have verified that all required examination and testing has been completed, and inspected the piping described in this construction data report to the extent necessary to be satisfied that it conforms to all applicable examination requirements of the Code and of the engineering design, and state that, to the best of my knowledge and belief, the contractor has constructed this piping in accordance with the Alberta Safety Codes Act and Regulations. By signing this certificate neither the inspector nor his or her employer makes any warranty, expressed or implied, concerning the piping described in this construction data report. Furthermore, neither the inspector nor his or her employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Date: Jan 25, 2013

Date: _____

Nick Berry

Owner's Inspector Name (please print)

ABSA Safety Codes Officer (please print)
(BOILER EXTERNAL PIPING ONLY)

(Signature)
Owner's Inspector Signature

(Signature)
ABSA Safety Codes Officer's Signature

Revised version of this form may be obtained from www.ab.ca

Issuing Authority: Marvin J. (Ty) DeBulser/Dale Karg		ABSA
Date of Issue: March 30 2012		FORM_NDE_001
*Rev Status: 2.0		N.D.E Requirements

N.D.E Requirements

Client: Encana

JO# 08562-002

Project: Threaded Piping – 3.5 mm Lineheater

Date: 07/01/2013

Piping: ☒ Pressure Vessel: ☐ Tank: ☐ Other:

- | | | |
|--|---|---|
| <input type="checkbox"/> X-Ray | <input type="checkbox"/> 100% | <input type="checkbox"/> ASME Section VIII-UW-51 |
| <input checked="" type="checkbox"/> Gamma Ray | <input type="checkbox"/> Full | <input type="checkbox"/> ASME Section VIII-UW-52 |
| <input type="checkbox"/> Ultrasonics | <input type="checkbox"/> 25% | <input type="checkbox"/> Customer Specification |
| <input type="checkbox"/> Liquid Penetrant | <input checked="" type="checkbox"/> 10% | <input type="checkbox"/> ASME B31.3 NFS |
| <input type="checkbox"/> Magnetic Particle | Other(Define) | Other (Specify) |
| <input type="checkbox"/> Accoustic Emission | <input type="checkbox"/> Spot | <input checked="" type="checkbox"/> Customer Spec |
| <input type="checkbox"/> Hardness test Max 200 BHN | | <input type="checkbox"/> CSA W47.1/W59 |

General Instructions:

Vessel S/N

P1 Material

Welder ID

Shell-T=

Pipe-T= 1" XH

Total Welds 15 x threaded shots as per attached drawings (first # is XT-1)

Please use wire type iQi

Please Note locations of all indications on films on reports

Please include O.F.D-S.O.D S.F.D on reports

Special Requirements:

Shots

Buttweld Xray to be identified as X-#

Gap Shots to be identified as GS-#

Threaded Shots to be identified as XT-#

Identify on Envelope part of package being shot ie: Coil, Piping, ect.

Flashes must contain: Customer, JO#, Spool Identification, Xray number, Clock tape, Welder's ID Symbol, Date

Mark all indicated repairs on the project

NOTE: Encana Spec for Welded Piping-acceptance is zero UC and Zero iP

Encana Spec for Socket Welds-acceptance is minimum 1/16" gap

Encana Spec for Threaded Piping- acceptance is 7 threads engaged

HT is a 5 Point Traverse

Prepared By: Karim Bouslama

Date: 07/01/2013



Job / P.O. #: 08562-002 IRISNDT #: 256407 Date: 08-Jan-13
Client: ENCANA C/O NWP
Location: Innisfail, Alberta
Item Inspected: Threaded Piping - 3.5mm Lineheater Material: CS



RADIOGRAPHIC INSPECTION REPORT

CG24 - RT1486

Page 1 of 1

Exposure Device #: D6274	Source #: 79875B	Job / P.O. #: 08562-002	IRISNDT #: 256376	Date: 7-Jan-13
Cobalt 60 <input type="checkbox"/> IR 192 <input checked="" type="checkbox"/> X-Ray <input type="checkbox"/>	EFSS: .135	Client: ENCANA C/O NWP		
Film Brand: AGFA	#Film/cassette: 1	Location: INNISFAIL Alberta		
Code: ENCANA SPEC.	Item Inspected: THREADED - 3.5mm LINEHEATER Material: C.S			

Film #	Size, Location, Thickness	Welder ID	IRISNDT Proc.	S.O.D. Inches	O.F.D. Inches	# of Exp.	Work Loc.	Film Type	Type and Location of Discontinuities (rejectable discontinuities in square brackets [])	(A)cccept (R)eject
									JO# 08562-002	
XT1	1"XH		RT 8	15	.179	1	1	D7	7/8"ENGAGED	A
XT2	1"XH		RT 8	15	.179	1	1	D7	1"ENGAGED	A
XT3	1"XH		RT 8	15	.179	1	1	D7	1"ENGAGED	A
XT4	1"XH		RT 8	15	.179	1	1	D7	9 THREADS ENGAGED	A
XT5	1"XH		RT 8	15	.179	1	1	D7	8 THREADS ENGAGED	A
XT6	1"XH		RT 8	15	.179	1	1	D7	7/8"ENGAGED	A
XT7	1"XH		RT 8	15	.179	1	1	D7	1"ENGAGED	A
XT8	1"XH		RT 8	15	.179	1	1	D7	1"ENGAGED	A
XT9	1"XH		RT 8	15	.179	1	1	D7	7/8"ENGAGED	A
XT10	1"XH		RT 8	15	.179	1	1	D7	1 1/8"ENGAGED	A
XT11	1"XH		RT 8	15	.179	1	1	D7	1"ENGAGED	A
XT12	1"XH		RT 8	15	.179	1	1	D7	7 THREADS ENGAGED	A
XT13	1"XH		RT 8	15	.179	1	1	D7	1"ENGAGED	A
XT14	1"XH		RT 8	15	.179	1	1	D7	9 THREADS ENGAGED	A
XT15	1"XH		RT 8	15	.179	1	1	D7	1"ENGAGED	A
									15-1"XH THREAD SHOTS	

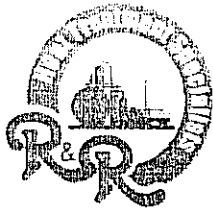
Number of Radiation Barrier Warning Signs Erected: 5

Number of Radiation Barrier Warning Signs Returned: 5

Work Location Legend: [1] Inside Fab. Shop [2] Yard/Lay-down Area [3] Piping/Modular Fab. Area [4] N/A (Other)

IRIS Procedure: Single Wall Exposure: RT 1, 2, 2A, 6, 7 Double Wall Exposure RT 3, 3A, 4, 5, 8	S.O.D. = Source-to-object distance (D) O.F.D. = Distance from source side of object to film (d)	AB - Arc Burns BT - Burn Through CK - Crack EP - Excessive Penetration P - Porosity	EUC - External Undercut IUC - Internal Undercut HB - Hollow Bead IP - Incomplete Penetration S - Slag	IC - Internal Concavity LF - Lack of Fusion LC - Low Cover MA - Misalignment
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Unit#: 331 In: _____ Out: _____ Hrs: 3 In: _____ Out: _____ Hrs: _____ Personnel: BS / RS / MV	Interpretation by: BRODY SMITH (Print) (Signature) Client Representative: (Print) I am in full agreement with report contents (Sign)	SNT-TC-1A II C.G.S.B. II (Level) C.G.S.B. # 12569
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R & R Stress Relieving Service Ltd.

Nisku: 2105 - 6th Street, T9E 7X8 Tel: (780) 955-7559 Fax: (780) 955-2903
Blackfalds: #13 Burbank Industrial Park Tel: (403) 885-2280 Fax: (403) 885-0177
Toll Free: 1-800-499-HEAT(4328)

CERTIFICATE OF CONFORMANCE OF RECORDING INSTRUMENTS

CERTIFIED BY: R & R Stress Relieving Service Ltd.
TEST NUMBER: RR1112
DATE: November 9, 2012
DATE DUE: February 9, 2013
INSTRUMENT MFG: Chino
MODEL NUMBER: AH-3725 N00
SERIAL NUMBER: AH-057C171
RECORDER NUMBER: IR-181


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

REFERENCE STANDARDS

DIGI MITE 311600 S/N48430-5522

CERT DATE Oct 22/12

The calibration of all standards and measuring instruments used in the calibration are traceable to the National Research Council of Canada in Ottawa or to the National Bureau of Standards in Washington, D.C.


Shane Stimson

1210F TCS2 (Chris Lewis)

R & R Stress Relieving

Client: NIWE

- End Soak
hr

Date: Jan 17/13 Job #:

App: P071120

Operator: Chris Lewis

ESD:

Chart S.P.: 50 mm/hr

Description: BF32-13-03

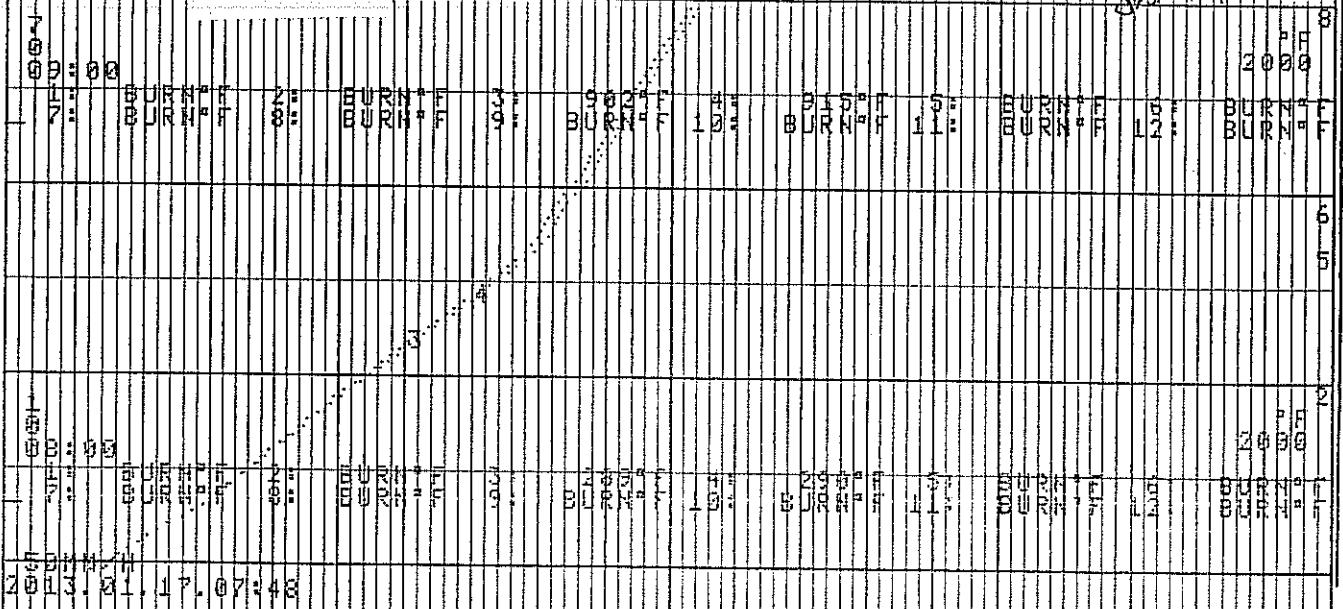
- Start Soak

- 43 Spools Job# 08542-001-B
- 2 Spools Job# 08542-001-G
- 2 Spools Job# 08542-001-H
- 1 Spool Job# 08542-001-I
- 1 Spool Job# 08562-002-D

1000

1500

[Signature]
JAN 18/13



2013.01.17.07:48



HEAT TREATMENT REQUIREMENTS

PO# 711120

JOB NO.: 08562-002-D

CUSTOMER: EnCana Corporation

DATE: January 17 2013

COMPONENT DESCRIPTION: Welded Piping for 3.0 mm Line Heater Package

Total Spools: 1

DWG. NO. AND LINE NO.	DIAMETER	THICKNESS	MATERIAL	LENGTH	WEIGHT
08562-2A REV 0	4" NPS	SCH XXH	SA-333-6	Various	Unknown

TYPE OF HEAT TREATMENT: PRESSURE VESSEL or Process Piping STRESS RELIEVE P1 and Materials

HEATING

Temperature to be raised from 800°F (427°C) to 1150°F (621°C) at a maximum rate of 400 ° F

() ° C) per hour. NOTE: THIS VALUE MUST NEVER EXCEED 400°F (204°C) PER HOUR.

[Calculated rate = 400 degrees F/hr. (204 degrees C/hr) Divided by the maximum metal thickness of the shell or head plate in inches]

HOLDING

Temperature to be held in range of 1150°F to 1175°F for 60 minutes.

[Holding time to be determined by Table UCS-56 for Nominal Thickness as specified in UW-40(f)]

COOLING

Temperature to be lowered from 1150°F (621°C) to 800°F (427°C) at a maximum rate of 500 ° F

() ° C) per hour. NOTE: THIS VALUE MUST NEVER EXCEED 500°F (260°C) PER HOUR.

[Calculated rate = 500 degrees F/hr. (260 degrees C/hr.) Divided by the maximum metal thickness of the shell or head plate in inches]

From 800°F (427°C) items may be cooled in still air.

Additional Requirements:

- ☐ Job number and description required on heat treatment charts along with the operator's signature & date.
- ☐ Reporting of thermocouple attachment method and location, and verification of furnace thermocouple calibration is required.
- ☐ A sufficient number of thermocouples shall be located to control and maintain uniform distribution of temperature on all vessels and parts. Thermocouples shall be directly attached to the item or provision shall be made for thermocouple placement at bottom, centre and top of the furnace charge in accordance with the ASME Code.
- ☐ During the heating period, there shall not be a greater variation in temperature throughout the portion of the vessel being heated than 250° F (121° C) within any 15 ft. (4.6 m) interval of length. An adequate number of thermocouples must be used to ensure this Code requirement is met.
- ☐ During the holding period, there shall not be a greater difference than 150° F (66° C) between the highest and lowest temperature throughout the portion of the vessel being heat treated, except where the range is further limited by these instructions.
- ☐ If Capacitor Discharge welding is used to attach thermocouples an ASME Code Section IX Welding Procedure Specification is required (WPS qualification is not required), and the energy output must be limited to 125 Watt-Seconds.
- ☐ No other welding is permitted on vessels or parts. [0.5 x Capacitance in farads X Voltage ² = W-Sec.]
- ☐ The method of thermocouple removal shall not damage the heat treated item.

Q.C. Inspector Signature

Date: JAN 18/13

Thermocouple Attachment Method: Capacitor Discharge Location(s) Furnace diagonals

Furnace Heat Number BF32-13-037

Furnace Operator Signature Chris Lewis

Date: Jan 15th/13

Form Prepared by: Kasha Fox

Date: January 15 2013

NWP Industries Inc™	NWP Industries Inc.™	Website: www.nwp.ca
PO Box 6280 4017-60 Ave.		Phone: (403) 227-4100
T4G 1S9		Fax: (403) 227-4102

HYDROSTATIC TEST AFFIDAVIT

Customer: Encana Corporation

JO# 08562-002-D

Project: Piping for 3.0 mm Lineheater

Project#

Test Pressure: 7757 PSI

Hold Time: 60 minutes

Code Requirements: ASME B31.3 NFS 2010 Edition

All Personnel Advised of Test ☒ All Signs & Flagging Posted ☒

Prior to Filling – Fitting/Hoses & Component Meet Required Test Pressure

Sign-Off Supervisor: Tester:

Date: 18/01/2013

Product Description:

1)PF-4"-I-XXHBD-101 = 7757 PSI

50% Test Pressure Leak/Systems Check Completed ☒


1) 50% = 3879 PSI

Equipment Drained & Flushed to Prevent Freezing: Yes: ☐ No: ☐

Start Time:	Finish Time:
<u>12:00</u>	

Test Gauge Identification #	Pressure Range	Calibration Date
NWPG- 20,000- <u>20,000</u>	0-20,000 PSI	<u>11-Dec-2013</u>
NWPG- 20,000- <u>20,000-1</u>	0-20,000 PSI	<u>31 Aug 2013</u>
NWPG-	PSI	
NWPG-	PSI	
NWPG-	PSI	
NWPG-	PSI	
NWPG-	PSI	
NWPG-	PSI	

Test By: <u>Maul Prayaga</u>	Date: <u>Jan 18/13</u>
Approved By: <u>[Signature]</u>	Date: <u>JAN 18/13</u>

NWP Industries Inc.™		Website: www.nwp.ca
PO Box 6280 4017-60 Ave.		Phone: (403) 227-4100
T4G 1S9		Fax: (403) 227-4102

PNEUMATIC TEST AFFIDAVIT

Customer: Encana Corporation
 Project: Shell Assembly
 Test Pressure: 24 oz
 Code Requirements: CSA W47.1 and W59, API 12F
Product Description:

JO# 08562-002-C
 Project# _____
 Hold Time: AS REQUIRED
 Date: 09/01/2013

Tank Serial # 08562-002 DWG# LH-7224-BARE

REV# 3

Test-

#1. All Welded and Bolted Connections

<p><u>4-leaks</u></p> <p><u>one on 1" coupler on side of shell assembly</u></p> <p><u>three on the 2 1/2" couplers on end of exp. tank.</u></p>	<p><u>Leak's repaired LR</u></p>
---	----------------------------------

Repairs

Ground to sound metal by: <u>Jarrett Whyke</u>	Repair preparation, QC witness by: <u>[Signature]</u>
Reweld using E7018. QC: <u>LR</u>	Repaired by: <u>Jarrett Whyke</u>
Procedure approved by QC: <u>LR</u>	Completed repair checked by QC: <u>LR</u>

Additional Comments

PSV Used:	Range:	Calibration Due:
<u>7543-399</u>	<u>0 - 28 oz</u>	

Test #	Test By:	Q.C.	Date	Test Gauge ID.	Range	Calibration Due:
<u>1</u>	<u>[Signature]</u>	<u>LR</u>	<u>Jan. 9/13</u>	<u>NWPG- 125 126</u>	<u>0-5 PSI</u>	
Test(s) Approved By: <u>[Signature]</u>				Date: <u>Jan. 9, 2013</u>		



406 - 11979 40 Street SE
Calgary, Alberta
Canada T2Z 4M3
Tel: 403 543-3232
Fax: 403 543-3233

SHIPPING RELEASE

DATE: 25 March 2013

CALIPER JOB #: 20355-101-L-01

SUPPLIER: NWP Industries Inc.

PURCHASE ORDER #: 41979

LOCATION: Innisfail, Alberta

SUB ORDER: _____

PROJECT: 13-05 Wellsite

DESCRIPTION: 3.0 MMBTU / HR Line heater Package. NWP Job # 08562-002

DEFICIENCIES REMAINING AT TIME OF SHIPPING:

- Silicon touchups and flange covers to be installed before shipping.

Shipped Loose Items: Packed inside enclosure -

Items Not Shipped: N/A

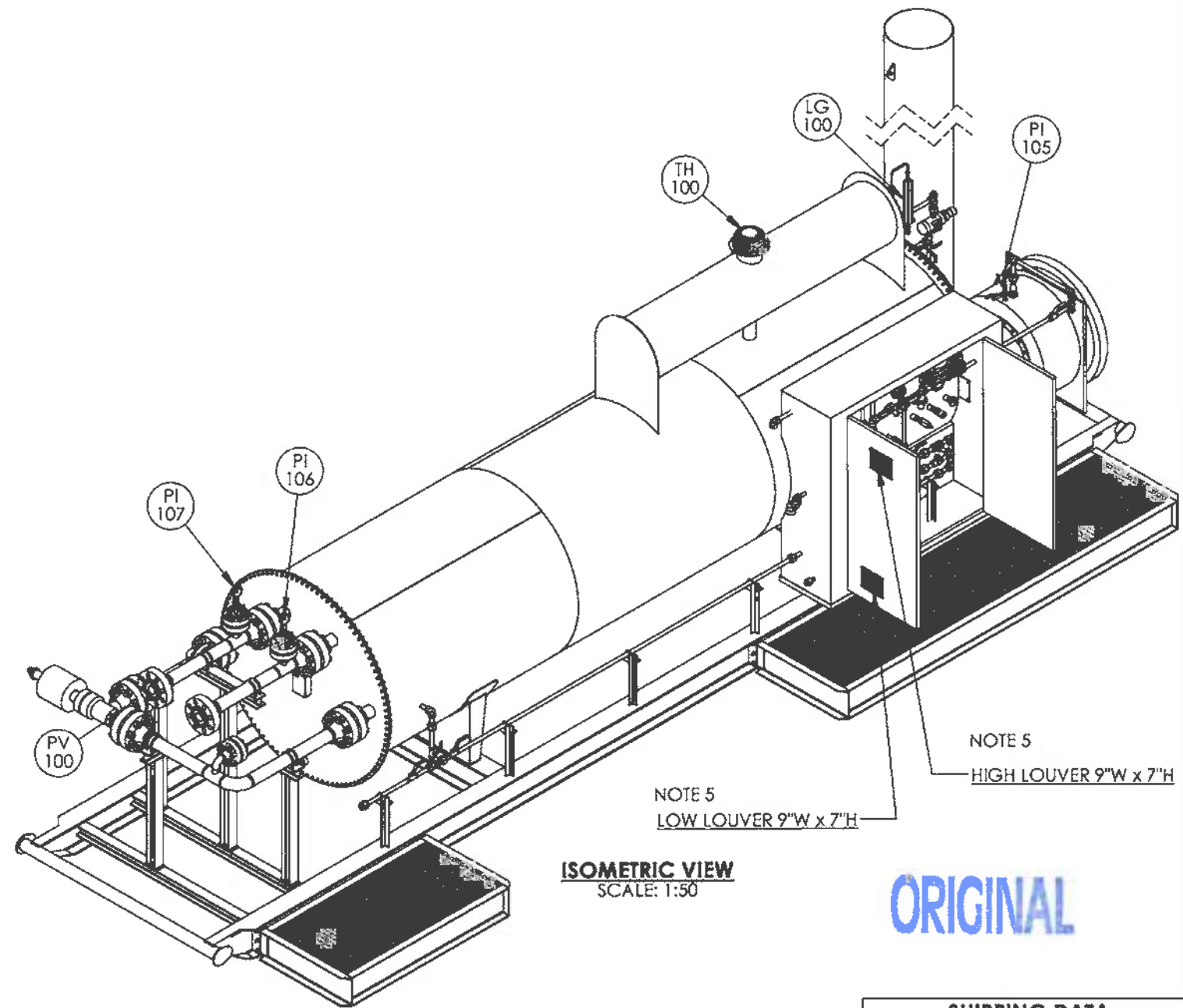
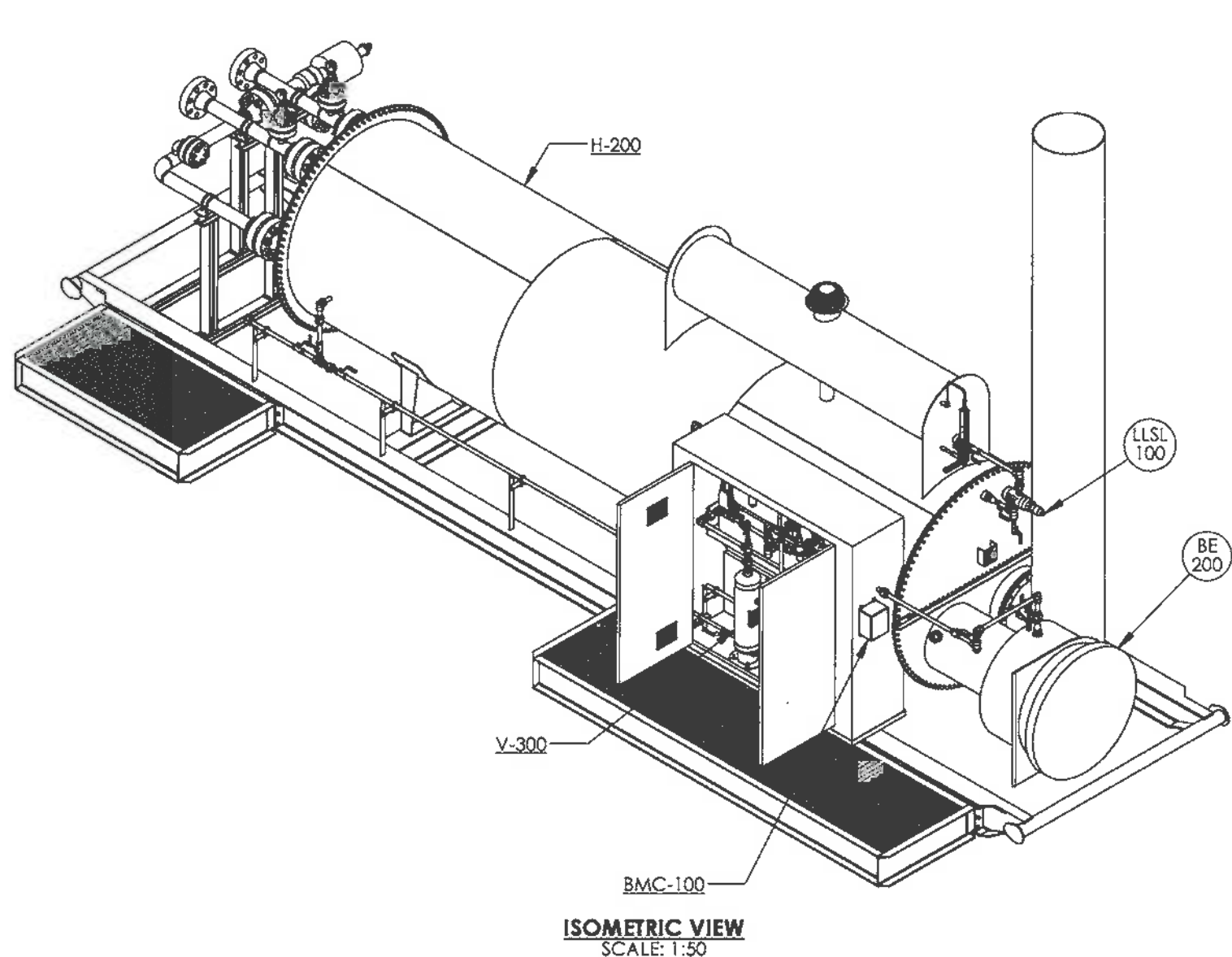
THIS IS A COMPLETE SHIPMENT ☒

THIS IS A PARTIAL SHIPMENT ☐

This does not relieve the supplier of any responsibility to ensure that the material or equipment meets all contractual requirements.

Signed: [Signature]
Supplier

Signed: [Signature]
Inspector



ORIGINAL

NOTES

1. 24 oz. PNEUMATIC TEST REQUIRED ON SHELL & FIRETUBE.
2. PIPE SUPPORTS WHERE REQUIRED.
3. SHIP LOOSE ITEMS TO BE BOXED AND SEALED PRIOR TO SHIPMENT.
4. PLUG ALL OUTLETS PRIOR TO SHIPMENT.
5. LOUVERS MUST BE LOCATED AS SHOWN IN THIS ORIENTATION.
6. HEAT MEDIUM APPROXIMATE VOLUME IS 470 CU FT.

SHIPPING DATA

OVERALL HEIGHT	11' - 6 7/8"
OVERALL LENGTH	37' - 5"
OVERALL WIDTH	10' - 5"
APPROX. WEIGHT	33200 BLS

ENCANA PO#	P041978
08562-001	
08562-002	

LH-7224-BARE	WELDED BATH ASSEMBLY						
LH-PH-7224-1	PREHEAT PIPING						
LH-LAD-72	LADDER ASSEMBLY						
LH-FIRSTK-24-2	WELDED FIRETUBE / STACK ASSEMBLY						
08562-6/08562-11	SKID, SHELL, LADDER, PREHEAT PIPING ASSE/ENCLOSURE DRAWING						
08562-3/08562-4	SKID ASSEMBLY / COIL ASSEMBLY	0	OCT 31/12	VW			ISSUED FOR CONSTRUCTION
08562-1/08562-2	P&ID / PIPING ASSEMBLIES	A	OCT 01/12	VW			ISSUED FOR APPROVAL
DOCUMENT NO.	DESCRIPTION	REV	DATE	BY	CHK	APP	
REFERENCE DRAWINGS		DRAWING REVISIONS					

ISSUED FOR CONSTRUCTION

SIGNED: _____
DATE: _____
W.O.: _____
S/N: _____

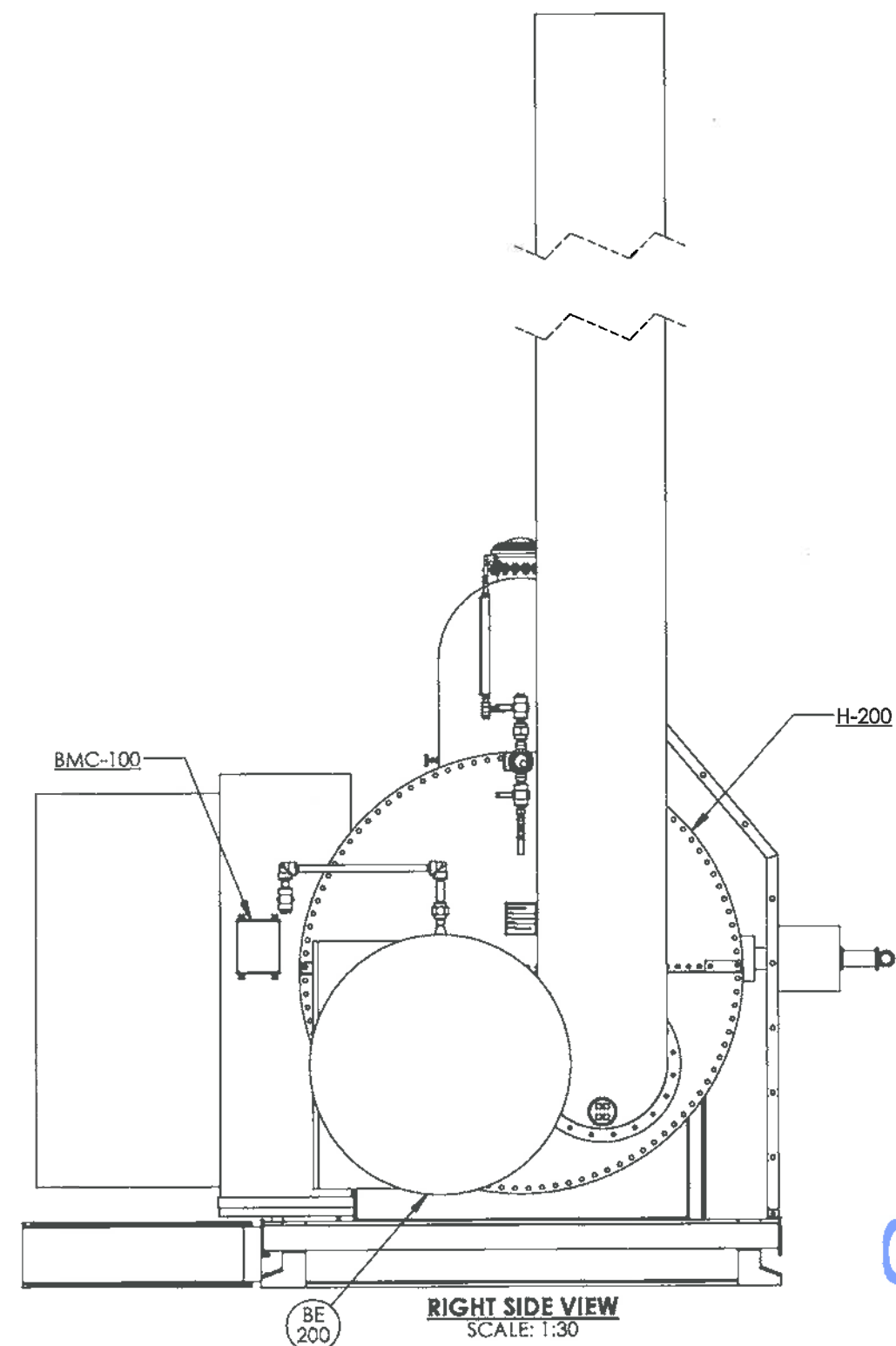
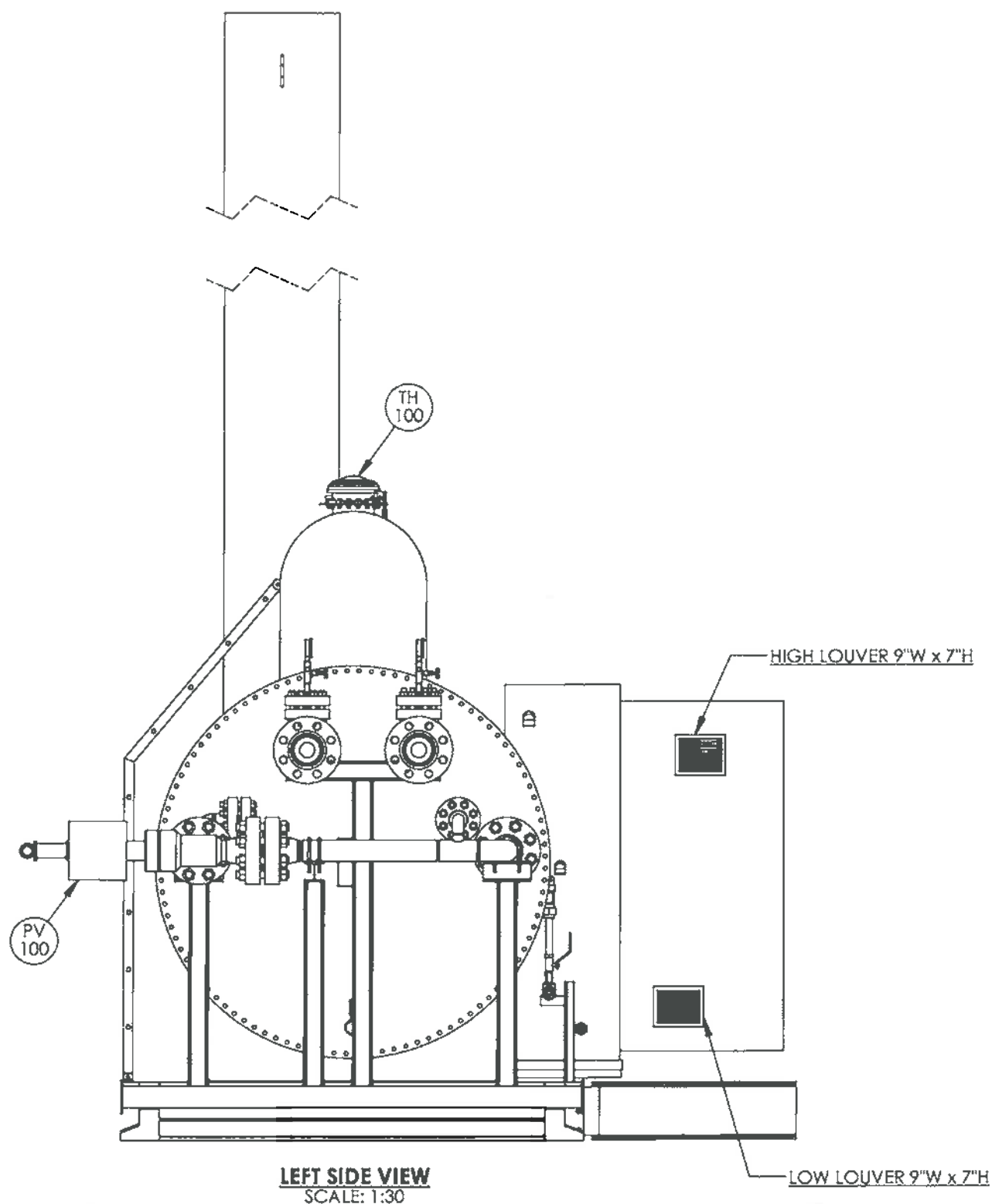


P.O. BOX 6280, INNISFAIL, AB T4G 1S9
PH: (403) 227-4100 FAX: (403) 227-4102

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THIS DRAWING MUST BE RETURNED UPON REQUEST.

ENCANA CORPORATION
LINEHEATER PACKAGE
3.0 MMBTU
C/W 4"-2500# RTJ SPLIT COILS
GENERAL ARRANGEMENT

DWN: VW	CHK:	APP:
DATE: OCT 01/12	DATE: NOV 02 2012	DATE: NOV 02 2012
SCALE: 1:50	DWG: 08562	REV: 0
SHEET: 1 OF 3		



ORIGINAL

LH-7224-BARE	WELDED BATH ASSEMBLY						
LH-PH-7224-1	PREHEAT PIPING						
LH-LAD-72	LADDER ASSEMBLY						
LH-FIRSTK-24-2	WELDED FIRETUBE / STACK ASSEMBLY						
08562-6/08562-11	SKID, SHELL, LADDER, PREHEAT PIPING ASSE./ENCLOSURE DRAWING						
08562-3/08562-4	SKID ASSEMBLY / COIL ASSEMBLY	0	OCT 31/12	VW			ISSUED FOR CONSTRUCTION
08562-1/08562-2	P&ID / PIPING ASSEMBLIES	A	OCT 01/12	VW			ISSUED FOR APPROVAL
DOCUMENT NO.	DESCRIPTION	REV	DATE	BY	CHK	APP	
REFERENCE DRAWINGS		DRAWING REVISIONS					

ISSUED FOR
CONSTRUCTION

SIGNED: _____

DATE: _____

W.O.: _____

S/N: _____

ALL DIMENSIONS IN INCHES



P.O. BOX 6280, INNISFAIL, AB T4G 1S9
PH: (403) 227-4100 FAX: (403) 227-4102

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ENCANA CORPORATION
LINEHEATER PACKAGE
3.0 MMBTU
c/w 4"-2500# RTJ SPLIT COILS
GENERAL ARRANGEMENT

DWN: VW	CHK: <i>[Signature]</i>	APP: <i>[Signature]</i>
DATE: OCT 01/12	DATE: NOV 02 2012	DATE: NOV 02 2012
SCALE: 1:30	DWG: 08562	REV: 0
SHEET: 3 OF 3		

P&ID Bill of Materials**ORIGINAL****Job: 08562****Item:** Lineheater-08562-2B**Description:** 3.0 MM BTU/HR**Drawing:** 08562-1 Rev 0**Customer:** ENCANACORP

<i>Part #</i>	<i>Qty</i>	<i>Description/Notes</i>
BA-1	2.00	BALL VALVE, EMICO, 1" NPT VALVE, BALL, EMICO, 1" NPT, 720 SERIES, 3 PIECE BODY, 600 PSI WOG, FULL PORT, STAINLESS STEEL, LOCKING HANDLE, UL APPROVED EAY 730-01-05 REQUIRED FOR B149 COMPLIANCE
BA-2	2.00	BALL VALVE, EMICO, 1/4" NPT VALVE, BALL, EMICO, 1/4 IN. NPT, 720 SERIES, TWO PIECE BODY, 600 PSI, WOG, FULL PORT, STAINLESS STEEL, LOCKING HANDLE, UL APPROVED EAY 720-01-01 REQUIRED FOR B149 COMPLIANCE
BA-3	3.00	Ball Valve,Nutron 3000 PSI 1/4" NPT CS Body ,STD Trim,FP Lever Operated MODEL - T3-R02S30BZ
BA-4	5.00	Ball Valve,Nutron 3000 PSI 1/2" NPT CS Body ,STD Trim,FP, Lever Operated MODEL:T3-F05S30BZ
BA-5	3.00	Ball Valve,Nutron 3000 PSI 1" NPT CS Body ,STD Trim,RP, Lever Operated Model: T3-R10S30BZ
BA-6	1.00	Ball Valve,Nutron 3000 PSI 2" NPT CS Body ,STD Trim,RP, Lever Operated Model : T3-R20S30BZ
BA-7	1.00	Ball Valve,Nutron 3000 PSI 3/4" NPT CS Body ,STD Trim,RP, Lever Operated MODEL:T3-R07S30BZ
BA-8	3.00	Ball Valve,Nutron 3000 PSI 1" L/T CS Body ,STD Trim,RP, Lever Operated, LOW TEMP Model: T3-R10S30BLZ
BA-9	1.00	Ball Valve,Nutron 3000 PSI 1/4" L/T CS Body ,STD Trim,RP Lever Operated, LOW TEMP MODEL - T3-R02S30BLZ
BE-200	1.00	Flame Arrestor Wenco Burner Model SB 42/24-24-NG Firebox Flame Arrestor. Two Piece O-type aluminum housing, 42" flame cell element, to fit a 24" fire tube. Burner rated at 3,000,000 BTU/hr (net)

NWP Industries Inc.
P&ID Bill of Materials

ORIGINAL

Job: 08562
Item: Lineheater-08562-2B
Description: 3.0 MM BTU/HR

Drawing: 08562-1 Rev 0
Customer: ENCANACORP

Part #	Qty	Description/Notes
		<i>No Internals FBP: blank Hinge: Left 2" Main gas connection at 12:00 1/2" Pilot gas connection at 12:00</i>
		<i>Incendium Quote Q2910 Oct 20/12</i>
BE-200 INT	1.00	Burner Internals <i>(2) ACL-M2000 air/gas mixers (2) ACL-B20016 venturi barrels ACL-2X0N20024 High Efficiency burner nozzle Orifices sized for 3.0 MM BTU/HR natural gas.</i>
		<i>Price Confirmed Oct 20/12</i>
BMC-100	1.00	Burner Control System Zirco <i>Burner Control System Zirco Safety-Light ACL 5500 24 VDC (2.4Watt) Must Come with 3/16" Flame Rod</i>
CH-464593	1.00	Swing Check Valve Wheatley 1" 2160 <i>CH-1</i>
		<i>Swing Check Valve Wheatley 1" 2160 RP Thrd Carbon Steel Body NACE Trim 820-013216-131P</i>
FG-100	1.00	Headline Filter 360A-70 <i>FILTER HEADLINE MODEL 360A-70 1/2 IN. NPT INLET/OUTLET 25 MICRON CARTRIDGE 500 PSI MAWP</i>
FG-101	1.00	Headline Filter 370A <i>Filter Headline, Model 370A 1/2 IN. NPT C/W TWO 25-178-CC Activated Carbon Dessicant filters for adsorption of hydrocarbons and other organic vapors Maximum Pressure 500 PSI Maximum Temperature 120F Flow at 100 PSIG 40 SCFM</i>
FY-100	1.00	Valve Positioner <i>Fisher Fieldvue DVC 6030 Pneumatic Valve Positioner C/W Hart Communications Control Signal: 4 -20 mA</i>
		<i>SUPPLIED WITH PV-100</i>
HIC-100	1.00	Conant Selector Valve <i>Model AL4TSL CONANT SELECTOR VALVE 1/4" NPT aluminum construction</i>

NWP Industries Inc.
P&ID Bill of Materials

ORIGINAL

Job: 08562
Item: Lineheater-08562-2B
Description: 3.0 MM BTU/HR

Drawing: 08562-1 Rev 0
Customer: ENCANACORP

<i>Part #</i>	<i>Qty</i>	<i>Description/Notes</i>
		2 stack 4-way valve body Provides for block & vent on actuator supply
LG-100	1.00	Level gauge 5700-22-CTRH-GS-ATM-AMB-NS 1/2" NPT, 22"
LLSL-100	1.00	LEVEL SWITCH ELECTRIC SOR LEVEL SWITCH ELECTRIC SOR 2 IN. NPT 316SS BODY 316 SS FLOAT MODEL 1510C-G2A-C-L9-ES-CSNCCVMC Body Material 316 Stainless Steel Process Connections 2" NPT(M) Float Material 316SS (Standard) 1500 PSIG -40 to 400°F Switch Mechanisms - Low Power SPST 25 Watts Max CSA Certified. Class 1, Group A, B, C, D; Divisions 1 & 2. For relay option; Class 1, Group C & D, Divisions 1 & 2. Single seal ambient & process temperatures -40°C to +125°C Canadian Registration Number (CRN). Manual check accessory (uses Viton GLT o-rings) NACE construction - MR 01-75 / ISO 15156 2003. Available only with 316SS materials of construction
NE-100864	5.00	Needle Valve MAGNUM 1/4" NPT 6000 M NE-1 VALVE NEEDLE MAGNUM 1/4" NPT 6000 M X F STRAIGHT 316 SS BODY ,MODEL 3600B222
NE-2	2.00	Needle valve,Century 316 SST NACE Century Gauge Valve,3/4" MNPT x 1/2" FNPT,316 SST,NACE, Model CM11L1M64TCNTSSP100
PI-101	1.00	Pressure Gauge, WIKA, 0-200 PSI PRESSURE GAUGE WIKA 2-1/2 IN. FACE, 1/4 IN. BOTTOM MOUNT,DUAL SCALE, 0-200 PSI STAINLESS STEEL, MODEL 233.53
PI-102/103/104	3.00	Pressure Gauge, WIKA, 0-30 PSI

NWP Industries Inc.
P&ID Bill of Materials

ORIGINAL

Job: 08562
Item: Lineheater-08562-2B
Description: 3.0 MM BTU/HR

Drawing: 08562-1 Rev 0
Customer: ENCANACORP

Part #	Qty	Description/Notes
		PRESSURE GAUGE WIKA 2-1/2 IN. F 1/IN.0-30PSI,.DUAL SCALE, STAINLESS STEEL MODEL 233.53, CENTER BACK MOUNT
PI-105	1.00	Pressure Gauge, WIKA, 0 -30 PSI PRESSURE GAUGE WIKA 2-1/2 IN. F 1/4 IN. BOTTOM MOUNT,DUAL SCALE, 0 - 30 PSI STAINLESS STEEL,MODEL 233.53
PI-106	1.00	Pressure Gauge, WIKA, 0 - 10000 PS PRESSURE GAUGE WIKA 4 IN. F 1/2 IN. BOTTOM MOUNT, 0 - 10000 PSI STAINLESS STEEL, MODEL 233.53
PI-107	1.00	Pressure Gauge, WIKA, 0 - 1500 PSI PRESSURE GAUGE WIKA 4 IN. F 1/2 IN. BOTTOM MOUNT,DUAL SCALE, 0 - 1500 PSI STAINLESS STEEL, MODEL 233.53
PI-109/110	2.00	Pressure Gauge, WIKA, 0 - 200 PSI PRESSURE GAUGE WIKA 2-1/2 IN. F 1/4 IN. BOTTOM MOUNT,DUAL SCALE, 0 - 200 PSI STAINLESS STEEL,MODEL 233.53
PRV-101	1.00	Fisher 627 Regulator REGULATOR PRESSURE FISHER 1 IN. NPT 627-489 5-20 PSI ADJUSTABLE RANGE, 1/2" ORIFICE STD TRIM TAPPED BONNET BODY 500 PSI MAWP
PRV-67CF166338582	2.00	Regulator, Fisher, 0-125psi, 1/4" PRV-103/107 Regulator, Fisher, 0-125psi, 1/4" NPT Tapped-Bonnet, Type: 67 CFR, Adjustable spring range, 5 micron filter, 0-160 psi gauge, adjustable screw with closing cap, temperature range: -20 to 180 Deg F,Tapped Bonnet
PSHH-100	1.00	CCS Pressure switch SWITCH, PRESSURE, CCS DUAL SNAP MODEL 6900GZE14, 1/2 IN. NPT, SS CONSTRUCTION, CSA APPROVED, SET @ 14 PSI RISING CALIBRATION CERTIFICATE IS REQUIRED
PSLL-100	1.00	CCS pressure switch SWITCH, PRESSURE, CCS DUAL SNAP MODEL 6900GZE12, 1/2 IN. NPT, SS CONSTRUCTION, CSA APPROVED, SET @ 4 PSI FALLING CALIBRATION CERTIFICATE IS REQUIRED
PSV-300	1.00	Relief valve,Taylor 1" RELIEF VALVE TAYLOR 1 IN.X 1-1/2" NPT SET AT 150 PSI NACE TRIM "F" ORIFICE. INSP & TEST REPORT REQ'D UV STAMP REQ'D STD SERVICE MODEL 8200 N,FIRE RATED DESIGN BASIS THERMAL RELIEF

NWP Industries Inc.
P&ID Bill of Materials

ORIGINAL

Job: 08562
Item: Lineheater-08562-2B
Description: 3.0 MM BTU/HR

Drawing: 08562-1 Rev 0
Customer: ENCANACORP

<i>Part #</i>	<i>Qty</i>	<i>Description/Notes</i>
SC-100	1.00	SPEED CONTROL VALVE <i>SPEED CONTROL VALVE, MODEL NAS4000-NO2, 1/4" NPT, 150 PSI MAWP</i>
SCR-FLOAT-599928	1.00	SCRUBBER FLOAT 2" HLSD <i>HLSD-300</i> <i>Must be flat disc type, ball type is not approved</i>
SCR823-1	1.00	Fuel Gas Scrubber 8-5/8" OD x 23" <i>V-300</i> <i>Fuel Gas Scrubber 8-5/8" OD x 23" S/S 285 PSI, 1/8" C.A, -50 F - 100 F; Radiography None</i>
SOV/UY-100	1.00	1" Fossil POC Valve <i>VFossil 1 IN. Gas Safety Shut-off Valve with Proof of Closure Limit Switch 24 volt power source c/w: SS valve, actuator, solenoid and quick dump valve. Approved as a safety shut-off valve assembly to CSA 6.5-2000 C/I (as required by CSA B149.3) Approved to temperatures as low as minus 45 degrees celsius using instrument air.</i>
ST-1	1.00	1" Y Strainer <i>Y STRAINER 1 IN. NPT C/W 1/32 IN. PERFORATION MODEL YS800 2000 PSI @ 100F</i>
SY-EF8314H301	1.00	Solenoid ASCO 3-Way, 1/4" NPT SST <i>EY-100</i> <i>Solenoid ASCO 3-Way, 1/4" NPT SST Body 24VDC Coil, CSA Approved Explosion Proof, 130 PSI Maximum Operating Pressure Differential, Low Power 0.55 Watts</i>
TC-100	1.00	Kimray HT-12 <i>Temperature Controller - KIMRAY, MODEL HT12, SIZE 1/2 IN. NPT 30DEG.F -400 DEG.F TEMP RANGE, 12" PROBE c/w SS THERMOWELL</i>
TCV-100	1.00	Control Valve,Fisher <i>VALVE, CONTROL, FISHER MODEL 119, 1" NPT, 9/16 IN PORT, 5-35 PSI RANGE, CAST IRON BODY, 150 PSI MAWP, STD SERVICE</i>
TH8-16	1.00	Thief Hatch Wenco 16 oz Pressure <i>TH-100</i> <i>Thief Hatch Wenco 16 oz Pressure Spring 0.4 oz Vacuum Setting Sweet Service c/w Base Gasket</i>

NWP Industries Inc.
P&ID Bill of Materials

ORIGINAL

Job: 08562
Item: Lineheater-08562-2B
Description: 3.0 MM BTU/HR

Drawing: 08562-1 Rev 0
Customer: ENCANACORP

<i>Part #</i>	<i>Qty</i>	<i>Description/Notes</i>
TI-100	1.00	Thermometer,3" dial THERMOMETER 3" DIAL TREND 6" STEM -20 TO 120C / 0 TO 250F 304SS MODEL 33
TSHH-100	1.00	Temperature Switch TEMPERATURE SWITCH CCS DUAL SNAP SET @ 90 C RISING C/W FACTORY SET CERTIFICATE MODEL 6900TE 14
TW-100/102	2.00	SEPARABLE SOCKET SEPARABLE SOCKET KIMRAY HCE 1 IN. SS-12SS
TW-101	1.00	Thermowell, WIKA 1/2" X 1" X 6" THERMOWELL WIKA 1/2" X 1" X 6" 304SS
UY-101	1.00	ASCO Solenoid Asco 24VDC Solenoid C/I Rated ANSI Z21.21 & CSA6.5 Certification 1/4" NPT 10.6 Watts P/N HV426716002.
PRV-67CFR362SCSG3	2.00	Regulator, Fisher, 0-35psi, 1/4" PRV-102/104 Regulator, Fisher, 0-35psi, 1/4" NPT Tapped-Bonnet, Type: 67 CFR, Adjustable spring range, 5 micron filter, 0-35 psi gauge, adjustable screw with closing cap, temperature range: -20 to 180 Deg F,Tapped Bonnet
PV/FY100	1.00	CUSTOMER SUPPLIED CUSTOMER SUPPLIED Master Flo P3E choke,4In 2500RTJ x 4In 250RTJ Nace EE, Trim TC, TC outlet wear sleeve 34J8S-4J8MT72PBY2 Master Flo 100DA actuator, PDA-100PDA100203AAC3E10IV Fisher positioner DVC-6030

1. PIPE SUPPORTS WHERE REQUIRED.
2. SHIP LOOSE ITEMS TO BE BOXED AND SEALED PRIOR TO SHIPMENT.
3. PLUG ALL OUTLETS PRIOR TO SHIPMENT.
4. BNC WIRED BY NWP.
5. FUEL GAS SYSTEM DESIGNED FOR SWEET GAS ONLY.
6. REMOVABLE COIL INSPECTION PLATE.
7. 10% XRAY ON NWP MANUFACTURED THREADED PIPING, 100% XRAY ON PSY-300 CONNECTIONS.
8. 3/8" (0.065" WT) SS TUBING.
9. 3/8" (0.035" WT) SS TUBING.
10. AIR TEST TO 75 PSI AND ALL PNEUMATIC INSTRUMENTS TO BE FUNCTIONED TESTED.
11. BUILT TO FOLLOWING ENCANVA SPECS: PIPING MATERIAL -
ECA-PVF-5-03 FEB 8, 2012
12. TUBING CONFIGURATION SHOWN IN AUTO POSITION.
13. PORTION OF LINEHEATER SHELL INSIDE INSTRUMENT ENCLOSURE NOT BE INSULATED.

	MAJOR PROCESS LINE
	UTILITY LINE
	BUILDING LIMITS
	PROCESS/UTILITY TUBING LINE
	INSTRUMENT PNEUMATIC LINE
	INSTRUMENT CAPILLARY LINE
	ELECTRICAL DATALINK LINE
	ELECTRICAL CONNECTION LINE
	BALL VALVE
	GLOBE VALVE
	GATE VALVE
	CHECK VALVE
	PLUG VALVE
	NEEDLE VALVE
	STRAIGHT CHOKE VALVE
	SOCKET WELD VALVE
	RUPTURE VALVE
	SOLENOID VALVE
	BUTTERFLY VALVE
	3-WAY VALVE
	4-WAY VALVE
	DIAPHRAGM ACTUATED CONTROL VALVE
	PRESSURE REGULATOR
	3-WAY DIAPHRAGM CONTROL VALVE

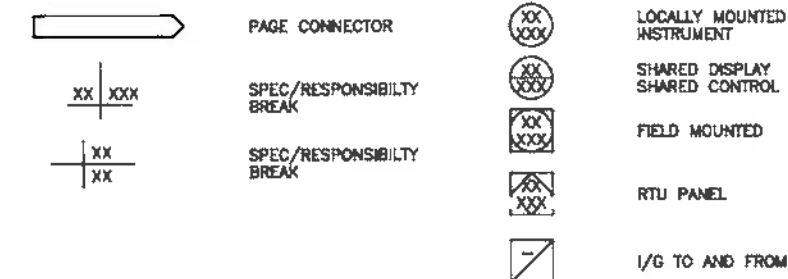
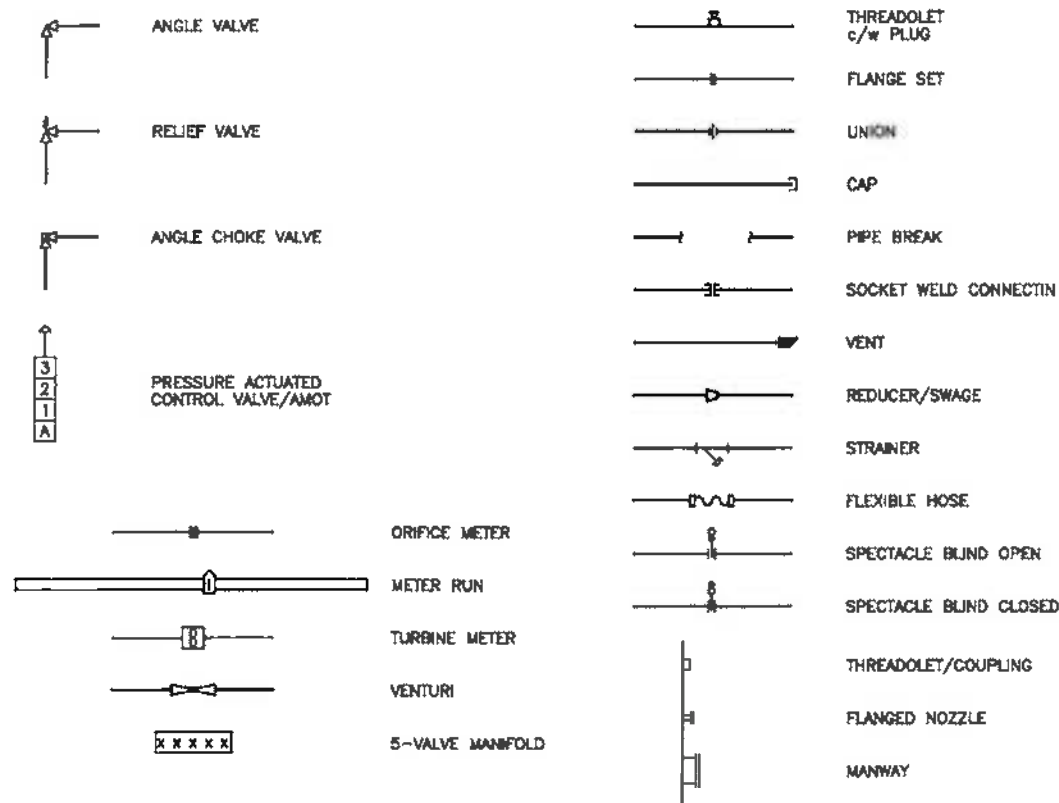
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XX-X"-X-XXXX-XXX
|
CONDENSATE - C
DRAIN - D
FUEL GAS - FG
LIQUID - L
LEAN GLYCOL - LG
METHANOL - M
OIL - O
PROCESS FLUID - PF
PROCESS GAS - PG
PRESSURE RELIEF - PR
RICH GLYCOL - RG
WATER - W
NOMINAL PIPE SIZE
|
CLASS 2000 THREADED - A
CLASS 3000 THREADED - B
CLASS 8000 THREADED - C
150 ANSI FLANGED - D
300 ANSI FLANGED - E
600 ANSI FLANGED - F
900 ANSI FLANGED - G
1500 ANSI FLANGED - H
2500 ANSI FLANGED - J
|
100-199 MAJOR PROCESS FLUIDS
200-248 MINOR PROCESS FLUIDS
250-299 RELIEF, DRAINS
300-398 UTILITY VAPOURS
400-498 UTILITY LIQUIDS
|
INSTRUMENT TUBING
A - GALVANIZED TUBING w/ CS FITTINGS
B - 304 SS TUBING w/ CS FITTINGS
C - 304 SS TUBING w/ 316 SS FITTINGS
D - 316 SS TUBING w/ 316 SS FITTINGS
E - NOT APPLICABLE
|
PIPE GRADE
A - SA-106B
B - SA-333 GR.8
|
PIPE SCHEDULE

```


XX-X
 BALL VALVE - BA
 NEEDLE VALVE - NE
 GLOBE VALVE - GL
 CHECK VALVE - CH
 GATE VALVE - GA
 BUTTERFLY VALVE - BU

START WITH 1

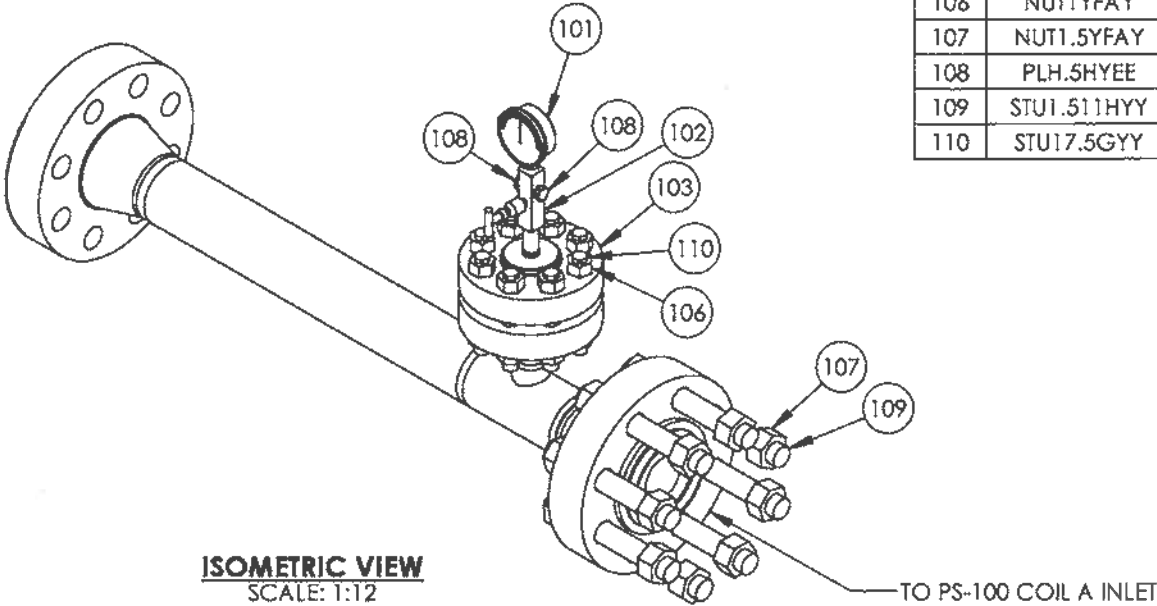


ORIGINAL

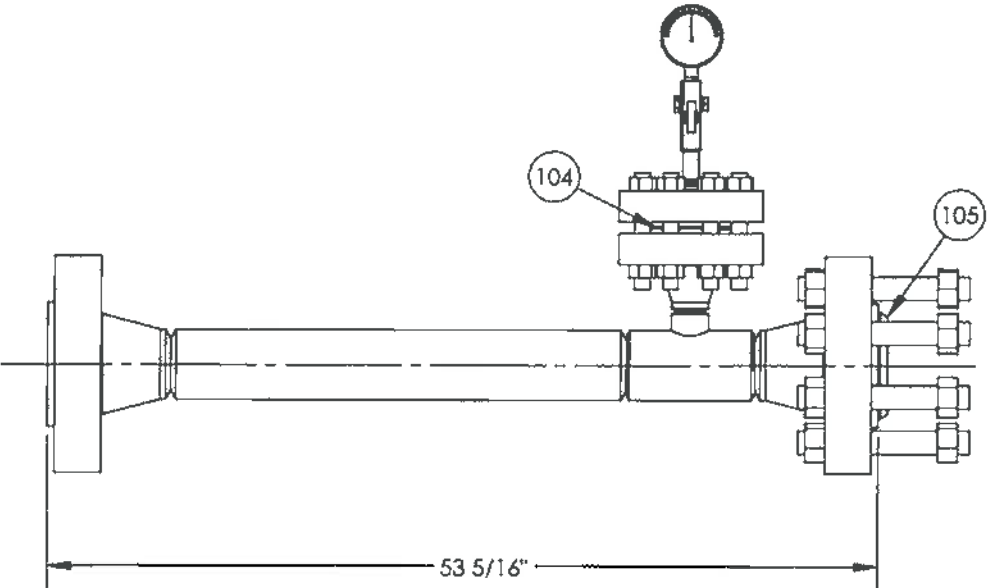
ENCANA PO#
PO41978
08562-001
08562-002

08562-6	BATH ASSEMBLY							AS BUILT	ISSUED FOR CONSTRUCTION	SIGNED: _____ DATE: _____ W.O.: _____ S.O.: _____ ALL DIMENSIONS IN INCHES	<div> NWP INDUSTRIES INC. Total oilfield supply. P.O. BOX 6280, INNISFAIR, AB T4G 1S9 PH: (403) 227-4100 FAX: (403) 227-4102</div> <div>THIS DRAWING IS PROPERTY OF NWP INDUSTRIES INC. AND MAY NOT BE REPRODUCED WITHOUT PERMISSION. THIS DRAWING MUST BE RETURNED UPON REQUEST.</div>	ENCANA CORPORATION LINEHEATER PACKAGE 3.0 MMBTU/HR c/w 4" 2500# RTJ SPLIT COILS PIPING AND INSTRUMENTATION DIAGRAM			
08562-4	COIL ASSEMBLY														
08562-3	SKID ASSEMBLY														
08562-2B	PIPING ASSEMBLY														
08562-2A	WELDED PIPING	0	OCT 31/12	EP	0	0			ISSUED FOR CONSTRUCTION			DWN: EP	CHK: 0	APP: 0	
08562	GENERAL ARRANGEMENT	A	SEPT 25/12	EP	-	-			ISSUED FOR APPROVAL			DATE: SEP 25/12	DATE: MAY 21 2012	DATE: MAY 20 2012	
DOCUMENT NO.	DESCRIPTION	REV	DATE	BY	CHK	APP						SCALE: NTS	DWG: 08562-1	REV: 0	
	REFERENCE DRAWINGS								DRAWING REVISIONS						

ITEM	PART #	DESCRIPTION	MTR #	LENGTH	QTY.
101	233.54-10000	PRESSURE GAUGE WIKA 0-10000 PSI MODEL 233.54 SS			1
102	BUY	VALVE NEEDLE CENTURY 3/4" M x 1/2" F NPT CM1111M64TCN1SSP100			1
103	FLH2.75FYBF	FLANGE HUBBED 2" 2500 ANSI TAPPED 3/4" NPT RTJ SA350LF2-CL1			1
104	GASR26YYYD	GASKET 2" 2500 ANSI R26 RTJ MILD STEEL			1
105	GASR38YYYD	GASKET 4" 2500 ANSI R38 RTJ MILD STEEL			1
106	NUT1YFAY	NUT 1" 2HM HEX			16
107	NUT1.5YFAY	NUT 1 1/2" 2HM HEX			16
108	PLH.5HYEE	PLUG HEX 1/2" 6M THRD SA105N			2
109	STU1.511HY	STUD 1 1/2" x 11" LG B7M			8
110	STU17.5GY	STUD 1" x 7 1/2" LG B7M			8



ISOMETRIC VIEW
SCALE: 1:12



FRONT VIEW
SCALE: 1:12

ORIGINAL

- NOTES
1. ALL DIMENSIONS SHALL HAVE A TOLERANCE OF $\pm 1/8"$ UNLESS OTHERWISE SPECIFIED.
 2. DIMENSIONS INCLUDE $1/8"$ ROOT GAP.
 3. ALL BOLT HOLES STRADDLE COMMON CENTER LINE.
 4. CUT LENGTHS FOR PIPE ARE FOR REFERENCE ONLY. SHOP TO ADJUST PIPE LENGTHS AS REQUIRED.
 5. HARDNESS TESTING - MAX 200 BNH 10%.

DESIGN DATA	
LINE NUMBER:	PF-4"-XXHBD-100
CLIENT SPECIFICATION:	ENCANA FAB
DESIGN & FABRICATE TO:	ANSI/ASME B31.3 NFS 2010 EDITION
DESIGN PRESSURE:	5171 PSIG
MAXIMUM DESIGN TEMPERATURE:	200°F
MINIMUM DESIGN TEMPERATURE:	-49°F
SERVICE:	HYDROCARBONS
HYDROSTATIC TEST PRESSURE:	7757 PSIG
RADIOGRAPHY:	100%
OTHER NDE:	SEE NOTE 5
POST WELD HEAT TREATMENT:	1150°F TO 1175°F FOR 1HR MIN.
CORROSION ALLOWANCE:	1/16"
Q.C. PROGRAM NO.:	AQP-1253
WELDING PROCEDURE REGISTRATION NO.:	WP-1604.2

						AS BUILT	
08562-6	BATH ASSEMBLY						
08562-3	SKID ASSEMBLY						
08562-2A	WELDED PIPING						
08562-1	PIPING AND INSTRUMENTATION DIAGRAM						
08562	GENERAL ARRANGEMENT	0	OCT 05/12	VW	9	ISSUED FOR CONSTRUCTION	
DOCUMENT NO.	DESCRIPTION	REV	DATE	BY	CHK	APP	
REFERENCE DRAWINGS		DRAWING REVISIONS					

ISSUED FOR CONSTRUCTION


SIGNED: _____

DATE: _____

W.O.: _____

S/N: _____

ALL DIMENSIONS IN INCHES

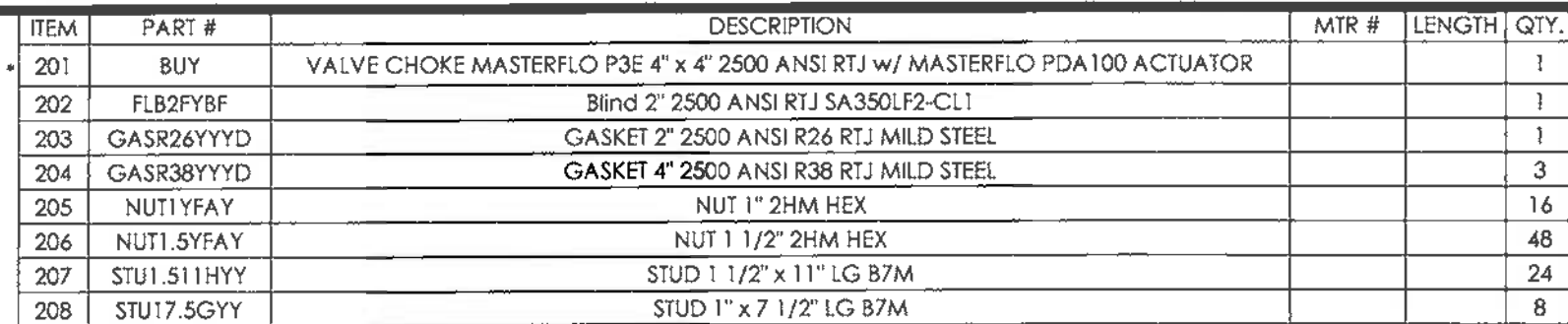


NWP
INDUSTRIES INC.
Total oilfield supply.

P.O. BOX 6280, INNISFAIL, AB T4G 1S9
PH: (403) 227-4100 FAX: (403) 227-4102

THIS DRAWING IS PROPERTY OF NWP INDUSTRIES INC.
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ENCANA CORPORATION LINEHEATER PACKAGE 3.0 MMBTU c/w 4"-2500# RTJ SPLIT COILS PIPING ASSEMBLY			
DWN: VW	CHK: 9	APP: 9	
DATE: OCT 05/12	DATE: NOV 20 2012	DATE: NOV 19 2012	
SCALE: 1:12	DWG: 08562-2B	SHEET: 1 OF 8	REV: 0



ORIGINAL

- NOTES**
1. ALL DIMENSIONS SHALL HAVE A TOLERANCE OF $\pm 1/8"$ UNLESS OTHERWISE SPECIFIED.
 2. DIMENSIONS INCLUDE $1/8"$ ROOT GAP.
 3. ALL BOLT HOLES STRADDLE COMMON CENTER LINE.
 4. CUT LENGTHS FOR PIPE ARE FOR REFERENCE ONLY. SHOP TO ADJUST PIPE LENGTHS AS REQUIRED.
 5. HARDNESS TESTING - MAX 200 BNH 10%.

LINE NUMBER:	PF-4"-LXXHBD-101
CLIENT SPECIFICATION:	ENCANA FAB
DESIGN & FABRICATE TO:	ANSI/ASME B31.3 NFS 2010 EDITION
DESIGN PRESSURE:	5171 PSIG
MAXIMUM DESIGN TEMPERATURE:	200°F
MINIMUM DESIGN TEMPERATURE:	-49°F
SERVICE:	HYDROCARBONS
HYDROSTATIC TEST PRESSURE:	7757 PSIG
RADIOGRAPHY:	100%
OTHER NDE:	SEE NOTE 5
POST WELD HEAT TREATMENT:	1150°F TO 1175°F FOR 1HR MIN.
CORROSION ALLOWANCE:	1/16"
Q.C. PROGRAM NO.:	AQP-1253
WELDING PROCEDURE REGISTRATION NO.:	WP-1604.2

AS BUILT

ISSUED FOR
CONSTRUCTION

SIGNED: _____

DATE: _____

W.O.:

S/N: _____

ALL DIMENSIONS IN INCHES

P.O. BOX 6280, INNISFAIL, AB T4G 1S9
PH: (403) 227-4100 FAX: (403) 227-4102

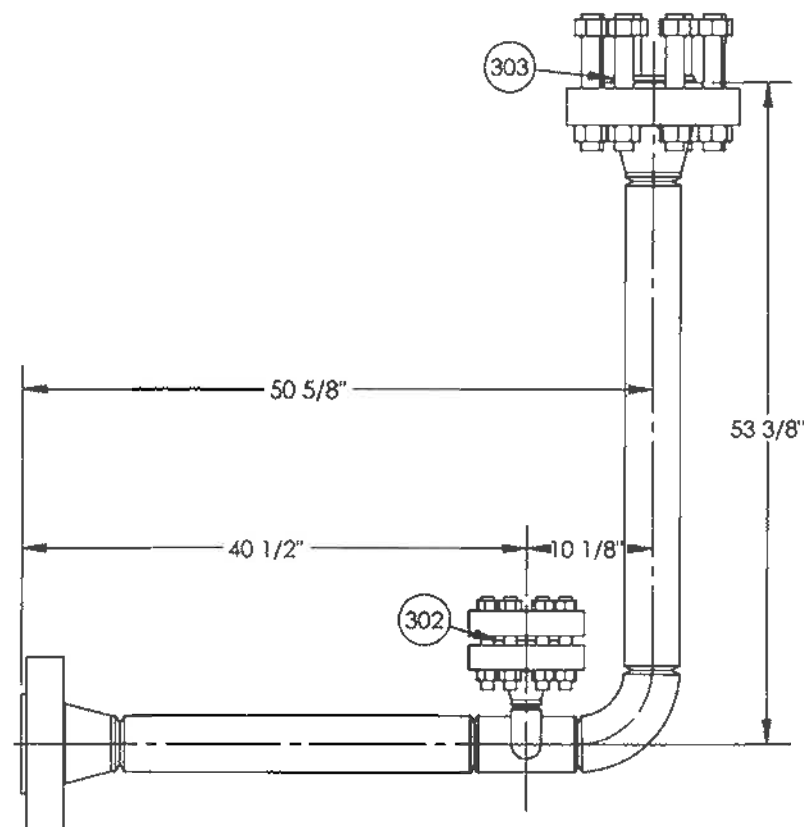
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DWN: VW	CHK: <i>o</i>	APP: <i>SA</i>
DATE: OCT 05/12	DATE: NOV 20 2012	DATE: NOV 19 2012

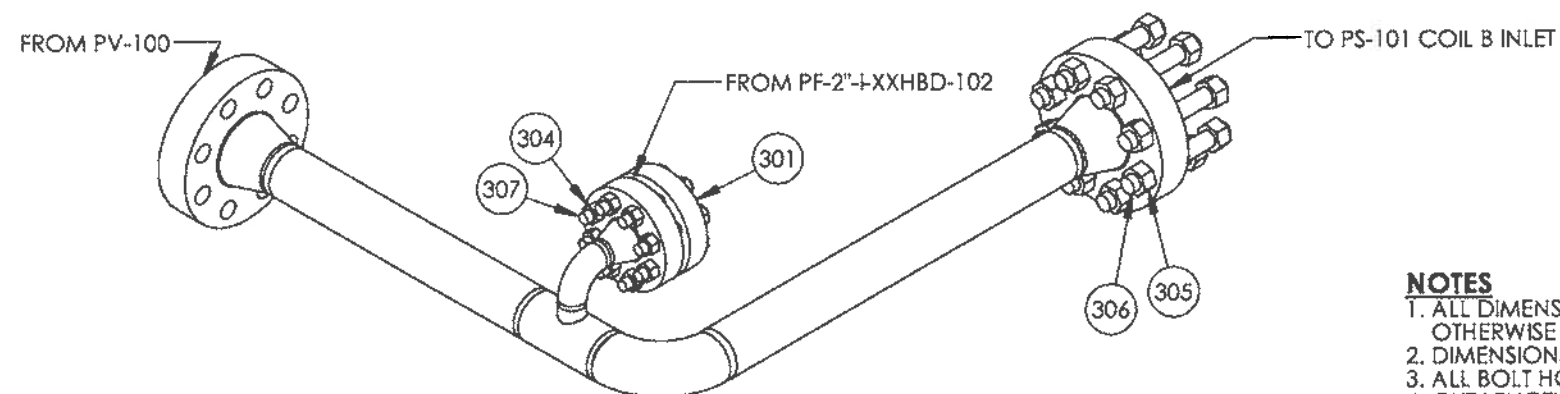
SCALE: 1:12	DWG: 08562-2B	REV: 0
SHEET: 2 OF 8		

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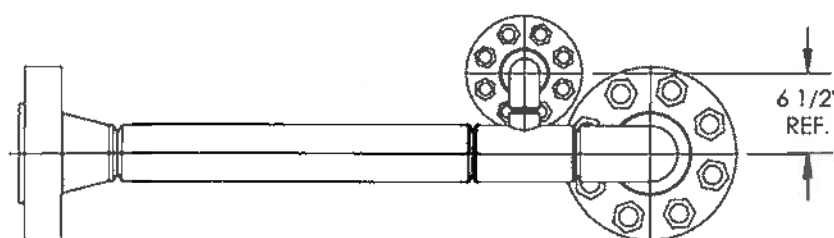
ITEM	PART #	DESCRIPTION	MTR #	LENGTH	QTY.
301	FLB2FYBF	Blind 2" 2500 ANSI RTJ SA350LF2-CL1			1
302	GASR26YYD	GASKET 2" 2500 ANSI R26 RTJ MILD STEEL			1
303	GASR38YYD	GASKET 4" 2500 ANSI R38 RTJ MILD STEEL			1
304	NUT1.YFAY	NUT 1" 2HM HEX			16
305	NUT1.5YFAY	NUT 1 1/2" 2HM HEX			16
306	STU1.511HYY	STUD 1 1/2" x 11" LG B7M			8
307	STU17.5GY	STUD 1" x 7 1/2" LG B7M			8



PLAN VIEW
SCALE: 1:15



ISOMETRIC VIEW
SCALE: 1:15



FRONT VIEW
SCALE: 1:15

ORIGINAL

NOTES

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2. DIMENSIONS INCLUDE $1/8$ " ROOT GAP.
3. ALL BOLT HOLES STRADDLE COMMON CENTER LINE.
4. CUT LENGTHS FOR PIPE ARE FOR REFERENCE ONLY. SHOP TO ADJUST PIPE LENGTHS AS REQUIRED.
5. HARDNESS TESTING - MAX 200 BNH 10%.

DESIGN DATA

LINE NUMBER:	PF-4"-+XXHBD-103
CLIENT SPECIFICATION:	ENCANA FAB
DESIGN & FABRICATE TO:	ANSI/ASME B31.3 NFS 2010 EDITION
DESIGN PRESSURE:	5171 PSIG
MAXIMUM DESIGN TEMPERATURE:	200 °F
MINIMUM DESIGN TEMPERATURE:	-49 °F
SERVICE:	HYDROCARBONS
HYDROSTATIC TEST PRESSURE:	7757 PSIG
RADIOGRAPHY:	100%
OTHER NDE:	SEE NOTE 5
POST WELD HEAT TREATMENT:	1150 °F TO 1175 °F FOR 1HR MIN.
CORROSION ALLOWANCE:	1/16"
Q.C. PROGRAM NO.:	AQP-1253
WELDING PROCEDURE REGISTRATION NO.:	WP-1604.2

						AS BUILT	
08562-6	BATH ASSEMBLY						
08562-3	SKID ASSEMBLY						
08562-2A	WELDED PIPING						
08562-1	PIPING AND INSTRUMENTATION DIAGRAM						
08562	GENERAL ARRANGEMENT	0	OCT 05/12	VW	CHK	APP	ISSUED FOR CONSTRUCTION
DOCUMENT NO.	DESCRIPTION	REV	DATE	BY	CHK	APP	
REFERENCE DRAWINGS		DRAWING REVISIONS					

ISSUED FOR CONSTRUCTION

SIGNED: _____
DATE: _____
W.O.: _____
S/N: _____
ALL DIMENSIONS IN INCHES

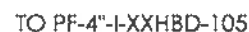


P.O. BOX 6280, INNISFAIL, AB T4G 1S9
PH: (403) 227-4100 FAX: (403) 227-4102

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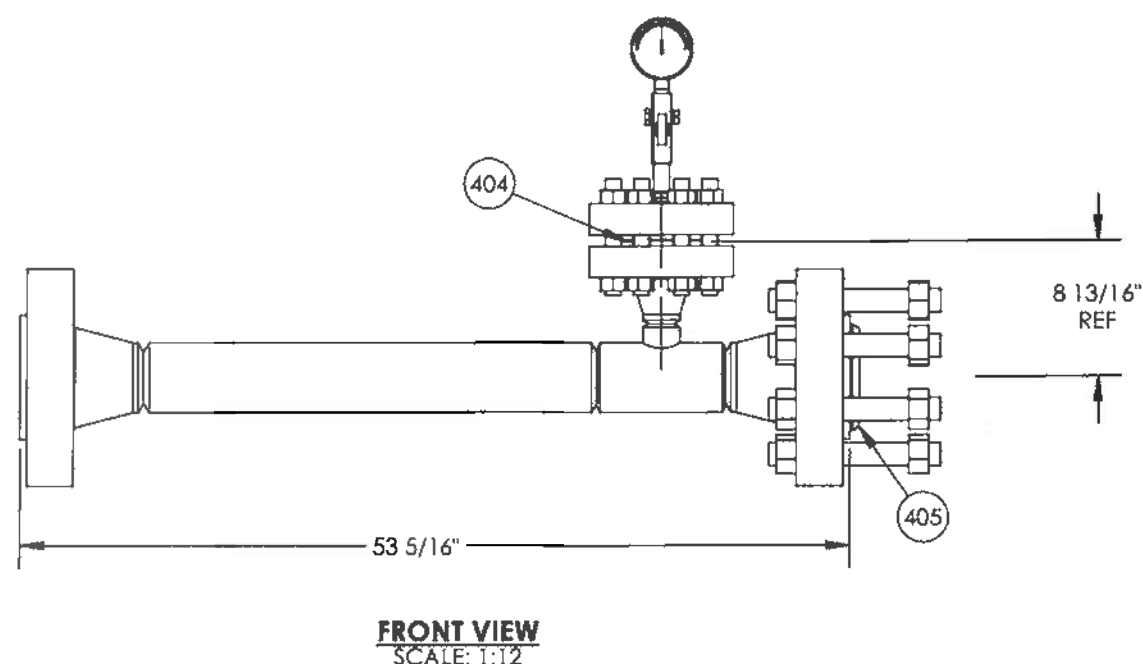
ENCANA CORPORATION
LINEHEATER PACKAGE
3.0 MMBTU
c/w 4"-2500# RTJ SPLIT COILS
PIPING ASSEMBLY

DWN: VW CHK: *[Signature]* APP: *[Signature]*
DATE: OCT 05/12 DATE: NOV 20 2012 DATE: NOV 19 2012
SCALE: 1:15
SHEET: 3 OF 8
DWG: 08562-2B
REV: 0



ITEM	PART #	DESCRIPTION	MTR #	LENGTH	QTY.
401	233.54-10000	PRESSURE GAUGE WIKA 0-10000 PSI MODEL 233.54 SS			1
402	BUY	VALVE NEEDLE CENTURY 3/4" M x 1/2" F NPT CM111LM64TCNTSSPI00			1
403	FLH2.75FYBF	FLANGE HUBBED 2" 2500 ANSI TAPPED 3/4" NPT RTJ SA350LF2-CL1			1
404	GASR26YYD	GASKET 2" 2500 ANSI R26 RTJ MILD STEEL			1
405	GASR38YYD	GASKET 4" 2500 ANSI R38 RTJ MILD STEEL			1
406	NUT1FYAY	NUT 1" 2HM HEX			16
407	NUT1.5FYAY	NUT 1 1/2" 2HM HEX			16
408	PLH.5HYEE	PLUG HEX 1/2" 6M THRD SA105N			2
409	STU1.511HY	STUD 1 1/2" x 11" LG B7M			8
410	STU17.5GY	STUD 1" x 7 1/2" LG B7M			8

ORIGINAL



NOTES

- NOTES**
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 2. DIMENSIONS INCLUDE $1/8"$ ROOT GAP.
 3. ALL BOLT HOLES STRADDLE COMMON CENTER LINE.
 4. CUT LENGTHS FOR PIPE ARE FOR REFERENCE ONLY. SHOP TO ADJUST PIPE LENGTHS AS REQUIRED.
 5. HARDNESS TESTING - MAX 200 BNH 10%.

DESIGN DATA	
LINE NUMBER:	PF-4"-LXXHBD-104
CLIENT SPECIFICATION:	ENCANA FAB
DESIGN & FABRICATE TO:	ANSI/ASME B31.3 NFS 2010 EDITION
DESIGN PRESSURE:	5171 PSIG
MAXIMUM DESIGN TEMPERATURE:	200 °F
MINIMUM DESIGN TEMPERATURE:	-49 °F
SERVICE:	HYDROCARBONS
HYDROSTATIC TEST PRESSURE:	7757 PSIG
RADIOGRAPHY:	100%
OTHER NDE:	SEE NOTE 5
POST WELD HEAT TREATMENT:	1150 °F TO 1175 °F FOR 1HR MIN.
CORROSION ALLOWANCE:	1/16"
Q.C. PROGRAM NO.:	AQP-1253
WELDING PROCEDURE REGISTRATION NO.:	WP-1604.2

							AS BUILT
08562-6	BATH ASSEMBLY						
08562-3	SKID ASSEMBLY						
08562-2A	WELDED PIPING						
08562-1	PIPING AND INSTRUMENTATION DIAGRAM						
08562	GENERAL ARRANGEMENT	0	OCT 05/12	VW			ISSUED FOR CONSTRUCTION
DOCUMENT NO.	DESCRIPTION	REV	DATE	BY	CHK	APP	
REFERENCE DRAWINGS		DRAWING REVISIONS					

ISSUED FOR
CONSTRUCTION

SIGNED:

DATE: _____

W.O.:

S/N:

ALL DIMENSIONS IN INCHES



P.O. BOX 6280, INNISFAIL, AB T4G 1S9
PH: (403) 227-4100 FAX: (403) 227-4102

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ENCANA CORPORATION
LINEHEATER PACKAGE
3.0 MMBTU

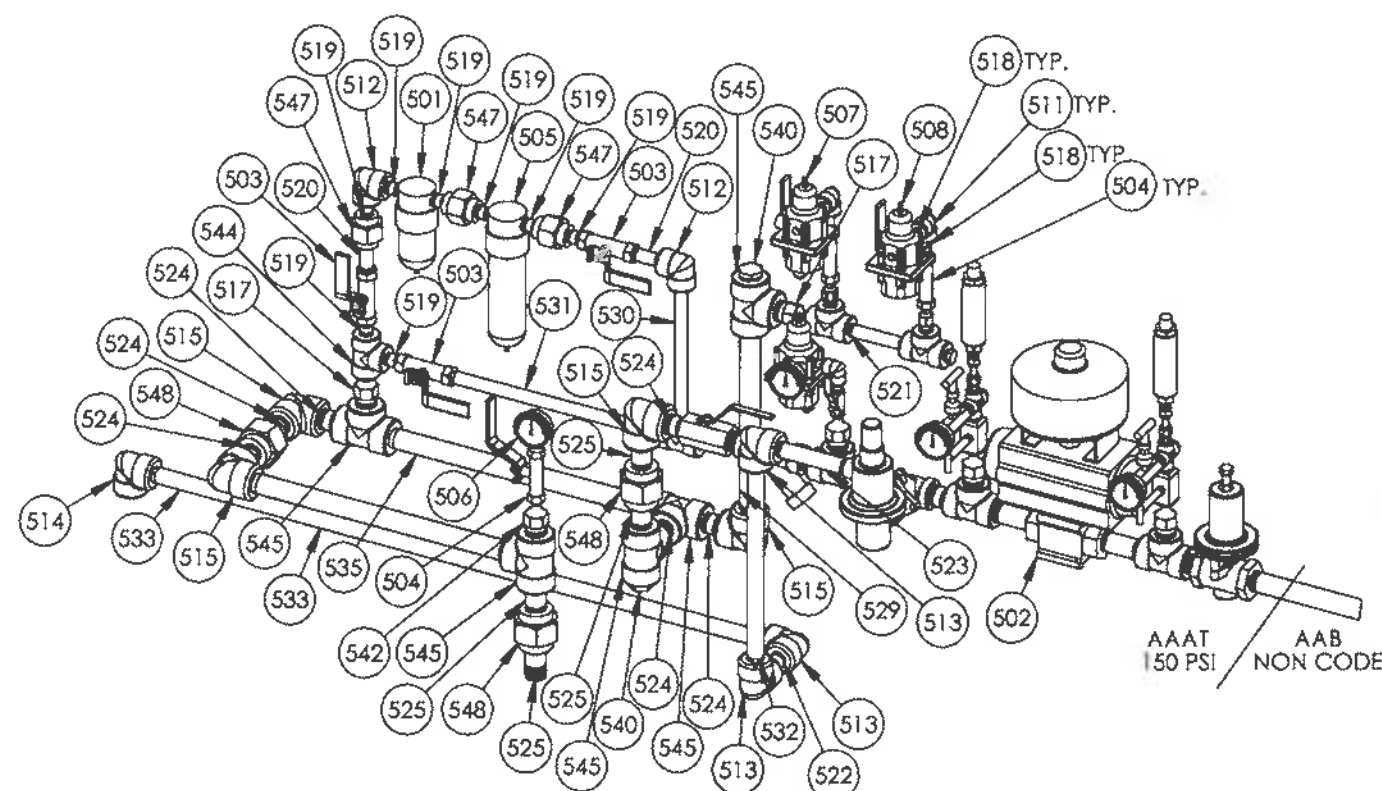
C/W 4"-2500# RTJ SPLIT COILS
PIPING ASSEMBLY

DWN: VW	CHK: 	APP: 
DATE: OCT 25 12	DATE: NOV 29 2012	DATE: NOV 19 2012

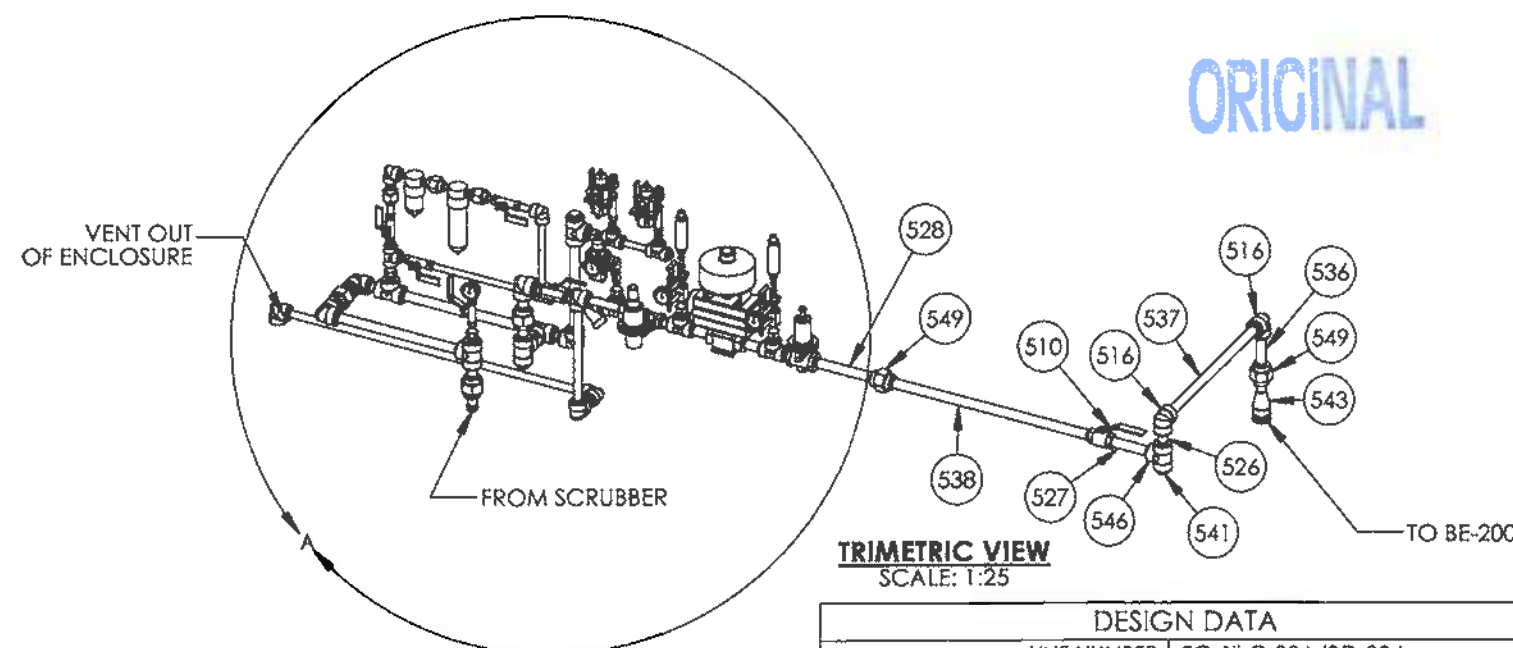
SCALE: 1:12	DWG: 08562-2B	REV: 0
SHEET: 4 OF 8		

ITEM	PART #	DESCRIPTION	MIR #	LENGTH	QTY.
501	100218	FILTER, HEADLINE, MDL 360A-70, MAWP 500 PSI, 1/2" NPT			1
502	100963	VALVE TRIN ENCANA SPEC L-R FLOW			1
503	BUY	BALL VALVE NUTRON 1/2" 3000 PSI NPT FP NACE T3			3
504	BUY	BALL VALVE NUTRON 1/4" 3000 PSI NPT FP STD T3			3
505	BUY	FILTER, HEADLINE, MDL 370A, MAWP 500 PSI, 1/2" NPT			1
506	BUY	PRESSURE INDICATOR WIKA 2 1/2" FACE x 1/4" NPT 0-200 PSI SS			1
507	BUY	PRESSURE REGULATOR FISHER 67CFR 0-35 PSI SPRING STD TRIM			1
508	BUY	PRESSURE REGULATOR FISHER 67CFR 0-125 PSI SPRING STD TRIM			1
509	BUY	SWAGE 1/2" x 1/4" SCH XH/80 THRD 316 SST			2
510	BUY	VALVE BALL EMICO 1" NPT 720 SERIES 600 PSI WOG FP			1
511	EL9.25HYEE	Elbow 90 Deg 1/4" 6M THRD SA105N			2
512	EL9.5HYEE	Elbow 90 Deg 1/2" 6M THRD SA105N			2
513	EL9.75HYEE	Elbow 90 Deg 3/4" 6M THRD SA105N			3
514	EL9.75HYEF	ELBOW 90 DEG 3/4" 6M THRD SA350-LF2-CL1			1
515	EL91HYEE	Elbow 90 Deg 1" 6M THRD SA105N			4
516	EL91HYEF	ELBOW 90 DEG 1" 6M THRD SA350-LF2-CL1			2
517	SWA1.5Y80EE	SWAGE 1" x 1/2" SCH XH/80 THRD SA105N			2
518	NIP.25Y80EK	NIPPLE 1/4" x 2" SCH XH/80 316/316L SST			4
519	NIP.52Y80EA	NIPPLE 1/2" x 2" SCH XH/80 SA106-B			8
520	NIP.53Y80EA	NIPPLE 1/2" x 3" SCH XH/80 SA106-B			2
521	NIP.55Y80EA	NIPPLE 1/2" x 5" SCH XH/80 SA106-B			1
522	NIP.752.5Y80EA	NIPPLE 3/4" x 2 1/2" SCH XH/80 SA106-B			1
523	NIP.756Y80EA	NIPPLE 3/4" x 6" SCH XH/80 SA106-B			1
524	NIP.12.5Y80EA	NIPPLE 1" x 2 1/2" SCH XH/80 SA106-B			6
525	NIP.13Y80EA	NIPPLE 1" x 3" SCH XH/80 SA106-B			4
526	NIP.13Y80EB	NIPPLE 1" x 3" SCH XH/80 SA333-6			1
527	NIP.18Y80EB	NIPPLE 1" x 8" SCH XH/80 SA333-6			1

ITEM	PART #	DESCRIPTION	MIR #	LENGTH	QTY.
528	NIP.110Y80EB	NIPPLE 1" x 10" SCH XH/80 SA333-6			1
529	NIP.115Y80EA	NIPPLE 1" x 15" SCH XH/80 SA106-B			1
530	PIP.580A	PIPE 1/2" SCH XH/80 SA106B TE		11"	1
531	PIP.580A	PIPE 1/2" SCH XH/80 SA106B TE		16 3/16"	1
532	PIP.7580A	PIPE 3/4" SCH XH/80 SA106B TE		15 5/8"	1
533	PIP.7580B	PIPE 3/4" SCH XH/80 SA333-6 TE		45 11/16"	1
534	PIP.180A	PIPE 1" SCH XH/80 SA106B		19 11/16"	1
535	PIP.180A	PIPE 1" SCH XH/80 SA106B		20 1/16"	1
536	PIP.180B	PIPE 1" SCH XH/80 SA333-6 TE		5 7/8"	1
537	PIP.180B	PIPE 1" SCH XH/80 SA333-6 TE		25 13/16"	1
538	PIP.180B	PIPE 1" SCH XH/80 SA333-6 TE		31 5/16"	1
539	PLH.5HYEE	PLUG HEX 1/2" 6M THRD SA105N			1
540	PLH.1HYEE	PLUG HEX 1" 6M THRD SA105N			2
541	PLH.1HYEF	PLUG HEX 1" 6M THRD SA350-LF2-CL1			1
542	SWA.1.25Y80EK	SWAGE 1" x 1/4" SCH XH/80 THRD 316 SST			1
543	SWA.21Y80EF	SWAGE 2" x 1" SCH XH/80 THRD SA350-LF2-CL1			1
544	TEE.5HYEE	Tee 1/2" 6M THRD SA105N			4
545	TEE.1HYEE	Tee 1" 6M THRD SA105N			5
546	TEE.1HYEF	TEE 1" 6M THRD SA350-LF2-CL1			1
547	UNN.5HYEE	UNION 1/2" 6M THRD SA105N			3
548	UNN.1HYEE	UNION 1" 6M THRD SA105N			3
549	UNN.1HYEF	UNION 1" 6M THRD SA350-LF2-CL1			2



DETAIL 'A'
SCALE: 1:8



TRIMETRIC VIEW
SCALE: 1:25

DESIGN DATA	
LINE NUMBER:	FG-1"-C-80A/BD-304
CLIENT SPECIFICATION:	ENCANA AAAT/AAB
DESIGN & FABRICATE TO:	ANSI/ASME B31.3 NFS 2010 EDITION
DESIGN PRESSURE:	150 PSIG
MAXIMUM DESIGN TEMPERATURE:	100°F
MINIMUM DESIGN TEMPERATURE:	-20°F/-49°F
SERVICE:	HYDROCARBONS
HYDROSTATIC TEST PRESSURE:	225 PSIG
JOINT SEALANT:	JET LUBE TF-15
CORROSION ALLOWANCE:	1/16"
Q.C. PROGRAM NO.:	AQP-1253

NOTES

1. SHOP TO ADJUST RANDOM PIPE LENGTHS AS REQUIRED.
2. 10% XRAY ON NWP MANUFACTURED THREADED PIPING.

AS BUILT					
08562-6	BATH ASSEMBLY				
08562-3	SKID ASSEMBLY				
08562-2A	WELDED PIPING				
08562-1	PIPING AND INSTRUMENTATION DIAGRAM				
08562	GENERAL ARRANGEMENT	0	OCT 05/12	VW	ISSUED FOR CONSTRUCTION
DOCUMENT NO.	DESCRIPTION	REV	DATE	BY	CHK
REFERENCE DRAWINGS		DRAWING REVISIONS			

ISSUED FOR CONSTRUCTION

SIGNED: _____

DATE: _____

W.O.: _____

S/N: _____



P.O. BOX 6280, INNISFAIL, AB T4G 1S9
PH: (403) 227-4100 FAX: (403) 227-4102

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ENCANA CORPORATION
LINEHEATER PACKAGE
3.0 MMBTU
c/w 4"-2500# RTJ SPLIT COILS
PIPING ASSEMBLY

DWN: VW	CHK:	APP:
DATE: OCT 05/12	DATE: NOV 21 2012	DATE: NOV 21 2012
SCALE: 1:25	DWG: 08562-2B	REV: 0
SHEET: 5 OF 8		

This diagram shows an exploded view of a mechanical assembly. Key components are labeled with callouts: 606, 611, 629, 639, 630, 606, 619, 619, 606, 621, 636, 619, 639, XT-12, and XT-13. XT-12 points to a long shaft with a nut at one end, and XT-13 points to a smaller shaft or pin. The assembly includes various fittings, seals, and structural components.

ORIGINAL

2. 10% XRAY ON NWP MANUFACTURED THREADED PIPING.
100% XRAY ON PSV-300 CONNECTIONS.

[illegible]

ITEM	PART #	DESCRIPTION	MTR #	LENGTH	QTY.
601	385935	SCRUBBER BASE FORMED 9" W x 11" LG x 2" H x 10 GA. SA-36/44W			1
602	599928	SCRUBBER FLOAT - 2" FOR HUSD			1
603	926312	8 5/8" OD x 23" S/S SWEET FUEL GAS SCRUBBER			1
604	BOL.52KY	BOLT 1/2" x 2" LG GR. 5 HEX HEAD			4
605	BUY	BALL VALVE NUTRON 1" 3000 PSI T3			1
606	BUY	BALL VALVE NUTRON 1" 3000 PSI NPT RP LOW TEMP T3			3
607	BUY	BALL VALVE NUTRON 3/4" 3000 PSI T3			1
608	BUY	TAYLOR RELIEF VALVE 1" x 1 1/2", SET @ 150 PSI, NACE TRIM (8200 SERIES)		-	1
609	BUY	VALVE SWING CHECK WHEATLEY 1" NPT 2160 PSI P/N 9D-822-013216-166			1
610	EL91HYEE	Elbow 90 Deg 1" 6M THRD SA105N			6
611	EL91HYEF	ELBOW 90 DEG 1" 6M THRD SA350-LF2-CL1			1
612	EL91.5HYEE	ELBOW 90 DEG 1 1/2" 6M THRD SA105N			1
613	EL91.5HYEF	ELBOW 90 DEG 1 1/2" 6M THRD SA350-LF2-CL1			1
614	NIP.753Y80EA	NIPPLE 3/4" x 3" SCH XH/80 SA106-B			1
615	NIP1.53Y80EA	Nipple 1-1/2" X 3" S/80 SA106B			1
616	NIP1.54Y80EA	Nipple 1-1/2" X 4" S/80 SA106B			1
617	NIP12Y80EA	NIPPLE 1 x 2" SCH XH/80 SA106-B		-	1
618	NIP13Y80EA	NIPPLE 1" x 3" SCH XH/80 SA106-B		-	3
619	NIP13Y80EB	NIPPLE 1" x 3" SCH XH/80 SA333-6		-	3
620	NIP14Y80EA	NIPPLE 1" x 4" SCH XH/80 SA106-B		-	7
621	NIP17Y80EB	NIPPLE 1" x 7" SCH XH/80 SA333-6		-	1
622	NUT.5YBAA	NUT 1/2" GR. 2 HEX PLATED			4
623	PIP.7580B	PIPE 3/4" SCH XH/80 SA333-6 TE		18 5/16"	1
624	PIP1.580B	PIPE 1 1/2" SCH XH/80 SA333-6 TE		41 3/16"	1
625	PIP180A	PIPE 1" SCH XH/80 SA106B		4 1/16"	1
626	PIP180A	PIPE 1" SCH XH/80 SA106B		8 1/2"	1
627	PIP180A	PIPE 1" SCH XH/80 SA106B		9 5/16"	1
628	PIP180A	PIPE 1" SCH XH/80 SA106B		10 5/8"	1
629	PIP180B	PIPE 1" SCH XH/80 SA333-6 TE		4 1/16"	1
630	PIP180B	PIPE 1" SCH XH/80 SA333-6 TE		9"	1
631	PIP180B	PIPE 1" SCH XH/80 SA333-6 TE		20 7/8"	1
632	PIP180B	PIPE 1" SCH XH/80 SA333-6 TE		69 15 1/16"	1
633	PIP180B	PIPE 1" SCH XH/80 SA333-6 TE		162 13 1/16"	1
634	PLH.75HYEF	PLUG HEX 3/4" 6M THRD SA350-LF2-CL1			1
635	TEE1HYEE	Tee 1" 6M THRD SA105N			2
636	TEE1HYEF	TEE 1" 6M THRD SA350-LF2-CL1			1
637	UNN.75HYEF	UNION 3/4" 6M THRD SA350-LF2-CL1			1
638	UNN1HYEE	UNION 1" 6M THRD SA105N			5
639	UNN1HYEF	UNION 1" 6M THRD SA350-LF2-CL1			4
640	UNN1.5HYEE	UNION 1 1/2" 6M THRD SA105N			1
641	WAS.5YKYA	FLAT WASHER 1/2" GR. 5 PLATED			8

AS BUILT

ISSUED FOR
CONSTRUCTION

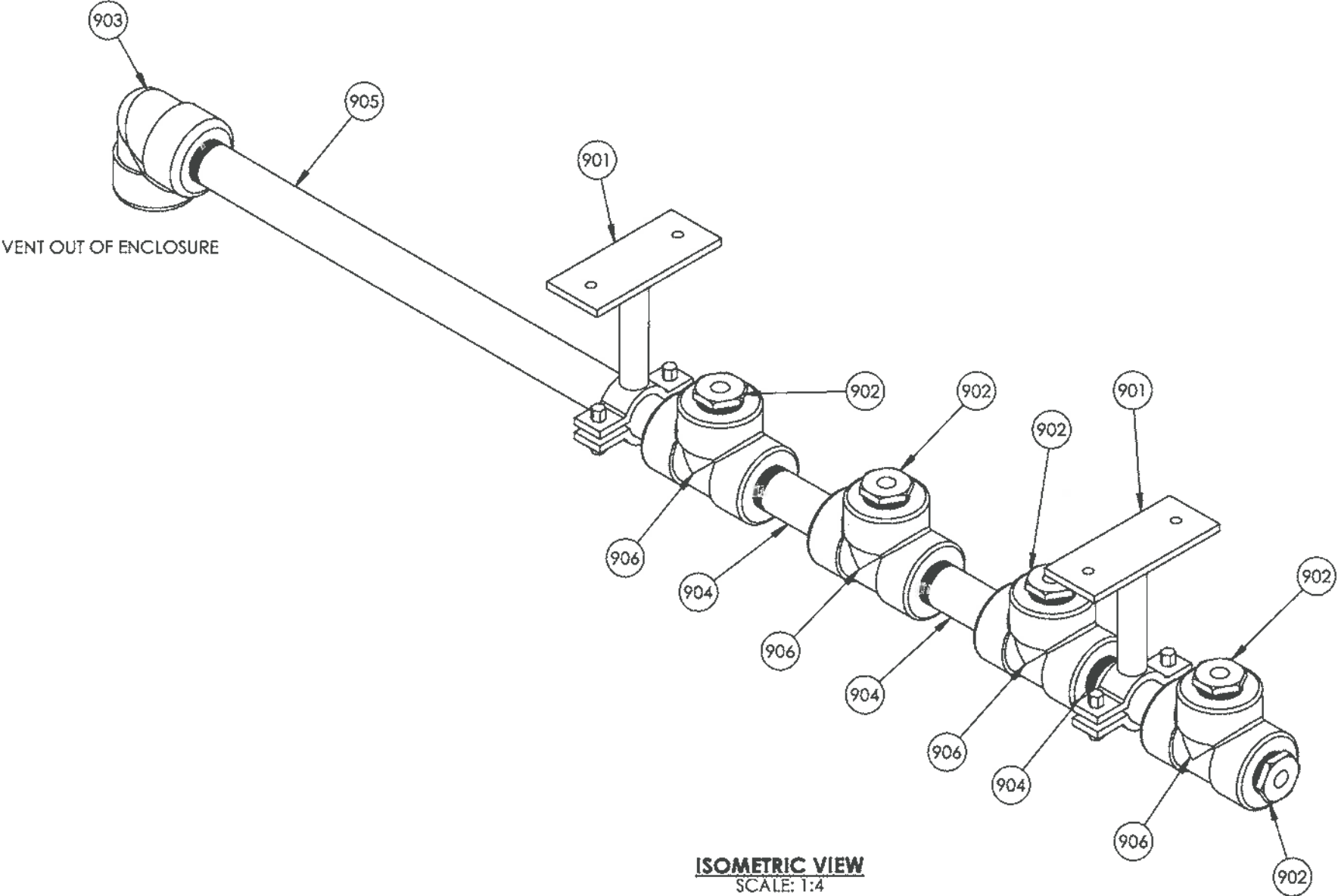
ALL DIMENSIONS IN INCHES



SCALE: 1:8	DWG: 08562-2B	REV: 0
SHEET: 6 OF 8		

							AS BUILT
08562-6	BATH ASSEMBLY						
08562-3	SKID ASSEMBLY						
08562-2A	WELDED PIPING						
08562-1	PIPING AND INSTRUMENTATION DIAGRAM						
08562	GENERAL ARRANGEMENT	0	OCT 05/12	VW			ISSUED FOR CONSTRUCTION
DOCUMENT NO.	DESCRIPTION	REV	DATE	BY	CHK	APP	
REFERENCE DRAWINGS		DRAWING REVISIONS					

ITEM	PART #	DESCRIPTION	MTR #	LENGTH	QTY.
901	100812	BRACKET, FUEL GAS VENT HEADER 1"			2
902	706720	1" x 1/4" FS THRD HEX BUSHING			5
903	EL91HYEF	ELBOW 90 DEG 1" 6M THRD SA350-LF2-CL1			1
904	NIP14Y80EA	NIPPLE 1" x 4" SCH XH/80 SA106-B		-	3
905	NIP120Y80EB	NIPPLE 1" x 20 SCH XH/80 SA333-6		-	1
906	TEE1HYEE	Tee 1" 6M THRD SA105N			4



ISOMETRIC VIEW
SCALE: 1:4

ORIGINAL

- NOTES**
1. SHOP TO ADJUST RANDOM PIPE LENGTHS AS REQUIRED.
 2. 10% XRAY ON NWP MANUFACTURED THREADED PIPING.

AS BUILT

ISSUED FOR
CONSTRUCTION



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ENCANA CORPORATION
LINEHEATER PACKAGE
3.0 MMBTU
c/w 4"-2500# RTJ SPLIT COILS
PIPING ASSEMBLY

DWN: VW	CHK: <i>Q</i>	APP: <i>SA</i>
DATE: OCT 05/12	DATE: NOV 20 2012	DATE: NOV 19 2012
SCALE: 1:4	DWG: 08562-2B	REV: 0
SHEET: 8 OF 8		

DOCUMENT NO.	DESCRIPTION	REV	DATE	BY	CHK	APP	DRAWING REVISIONS
08562-6	BATH ASSEMBLY						
08562-3	SKID ASSEMBLY						
08562-2A	WELDED PIPING						
08562-1	PIPING AND INSTRUMENTATION DIAGRAM						
08562	GENERAL ARRANGEMENT	0	OCT 05/12	VW	<i>Q</i>	<i>SA</i>	ISSUED FOR CONSTRUCTION
REFERENCE DRAWINGS							

ALL DIMENSIONS IN INCHES

Table 2: Summary of Piping Classes

Piping Class	Pipe Sch	Fitting Rating PSI	Flange Rating	Mat.	MDMT Deg F	Service	Corrosion Allowance Inches
AAA	80	3000	150	CS	-20	Sweet hydrocarbons	1/16
AAAT	80	2000	150	CS	-20	Sweet hydrocarbons, threaded	0.0394
AAB	80	3000	150	LT \ CS	-49	Low temp, sweet hydrocarbons	1/16
ASA	160	3000	150	CS	-20	Sour hydrocarbons	1/8
ASB	160	3000	150	LT \ CS	-49	Low temp, sour hydrocarbons	1/8
AWA	160	3000	150	CS	-20	Produced water, corrosive	1/8
BAA	160	3000	300	CS	-20	Sweet hydrocarbons	1/16
BAAT	80	3000	300	CS	-20	Sweet hydrocarbons, threaded	0.0394
BAB	160	3000	300	LT \ CS	-49	Low temp, sweet hydrocarbons	1/16
BSA	XXH	3000	300	CS	-20	Sour hydrocarbons	1/8
BSB	XXH	3000	300	LT \ CS	-49	Low temp, sour hydrocarbons	1/8
CAA	160	3000	600	CS	-20	Sweet hydrocarbons	1/16
CAAT	80	3000	600	CS	-29	Sweet hydrocarbons, threaded	0.0394
CAB	160	3000	600	LT \ CS	-49	Low temp, sweet hydrocarbons	1/16
CSA	XXH	6000	600	CS	-20	Sour hydrocarbons	1/8
CSB	XXH	6000	600	LT \ CS	-49	Low temp, sour hydrocarbons	1/8
CWA	160	3000	600	CS	-20	Produced / Brackish water, sour	1/8
DAA	160	6000	900	CS	-20	Sweet hydrocarbons	1/16
DAB	160	6000	900	LT \ CS	-49	Low temp, sweet hydrocarbons	1/16
DSA	XXH	6000	900	CS	-20	Sour hydrocarbons	1/8
DSB	XXH	6000	900	LT \ CS	-49	Low temp, sour hydrocarbons	1/8
EAA	XXH	6000	1500	CS	-20	Sweet hydrocarbons	1/16
EAB	XXH	6000	1500	LT \ CS	-49	Low temp, sweet hydrocarbons	1/16
ESA	XXH	6000	1500	CS	-20	Sour hydrocarbons	1/8
ESB	XXH	6000	1500	LT \ CS	-49	Low temp, sour hydrocarbons	1/8
FAA	XXH	SW ONLY	2500	CS	-20	Sweet hydrocarbons	1/16
FAB	XXH	SW ONLY	2500	LT \ CS	-49	Low temp, sweet hydrocarbons	1/16
FSA	XXH	SW ONLY	2500	CS	-20	Sour hydrocarbons	1/8
FSB	XXH	SW ONLY	2500	LT \ CS	-49	Low temp, sour hydrocarbons	1/8

Issuing Authority: Marvin J. (Ty) DeBelser		Quality Control
Date of Issue: March 13, 2008		QCFO Final Inspection Release Certificate R00

FINAL INSPECTION RELEASE CERTIFICATE

CUSTOMER:	ENCANA	
PRODUCT:	4" 2500# x 4" 2500# Split Coil for 3.0 mm LH Pkg	WO#: 08562-002-A DATE: Jan 7, 2013

FINAL INSPECTION DOCUMENTATION

REVIEWED BY:	ACCEPTED:	REJECTED:
STANDARD DOCUMENTATION REQUIREMENTS: (SEE DOCUMENT REQUIREMENT LIST)		
ADDITIONAL DOCUMENT REQUIREMENTS: (TO BE RECORDED HERE IF APPLICABLE I.E. DOCUMENT PACKAGE REQUIRED BY CUSTOMER ETC.)		
Q.C. FILE CLOSURE BY: <i>Kasha Fox</i>		DATE: Jan 8 2013

LOOSE COMPONENTS REQUIRED / PREPARED

ITEMS REQUIRED:	NO. OF BOXES OR PKGS. _____
<i>Coil for 3.0mm LH package</i>	
ADDITIONAL HARDWARE OR FASTENERS REQUIRED	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>

PREPARATION FOR SHIPMENT / STORAGE

PREPARATION NEEDED / COMPLETED
<i>Release to next process</i>
SN # NWP-08562-002-A ITEM # Coil

INVENTORY TAGS ATTACHED	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>
-------------------------	---

SHIPPING INSTRUCTIONS

CUSTOMER P.O. REVIEWED	YES <input type="checkbox"/> N/A <input checked="" type="checkbox"/>
CONTACT PERSON AUTHORIZED TO RELEASE PRODUCT: _____	
PHONE: _____	FAX: _____

RELEASED TO INVENTORY:	DATE: _____
RELEASED TO CUSTOMER: <i>[Signature]</i>	DATE: Jan 7, 2013

NWP Industries Inc.

INDIRECT FIRED HEATER COIL EXAMINATION AND INSPECTION REPORT

DO NOT START CONSTRUCTION WITHOUT AI REVIEW					EXAMINATION AND INSPECTION REPORT					
REVISION NO.: 0										
AI REVIEW: <i>[Signature]</i>					REVIEW DATE: 5 NOV. 2012					
SERIAL NO. NWP-08562-002-A JOB NO.: 08562-002-A COIL TYPE: 4" 2500 # X 4" 2500 # SPLIT COIL										
DRAWING NO.: 08562-4 DWG. REVISION NO.: 0 EXAMINATION AND INSPECTION REPORT										
INITIATION BY: <i>[Signature]</i>										
Seq.	Item	Comments	Q.C.I.	Date	A.I. Hold Points	A.I.	Date	Owner	Date	
1.	Calculations in File		<i>RMP</i>	NOV 01/12	"	<i>JF</i>	11.5.12			
2.	Release of App'd Dwg.		<i>RMP</i>	NOV 01/12	"	<i>JF</i>	11.5.12			
3.	Heat Numbers Recorded		<i>RMP</i>	DEC 06/12	"	<i>JF</i>	1.7.13			
4.	MTRs Checked		<i>RMP</i>	DEC 18/12	"	<i>JF</i>	1.7.13			
5.	Materials Checked Against Drawings and specs	HOLD	<i>RMP</i>	NOV 16/12						
6.	W.P.S. Checked		<i>RMP</i>	NOV 16/12						
7.	Welders Qualified	HOLD	<i>RMP</i>	NOV 16/12						
8.	Thicknesses Recorded		<i>RMP</i>	DEC 13/12						
9.	Fit-up Examination(s)		<i>RMP</i>	DEC 06/12	"	<i>JF</i>	1.7.13			
10.	Impact Tests	NA								
11.	Welds Examined		<i>RMP</i>	DEC 06/12	"	<i>JF</i>	1.7.13			
12.	Welder I.D. Checked		<i>RMP</i>	DEC 06/12	"	<i>JF</i>	1.7.13			
13.	Final External Inspection		<i>RMP</i>	DEC 06/12	"	<i>JF</i>	1.7.13			
14.	Radiography	HOLD	<i>RMP</i>	DEC 06/12	"	<i>JF</i>	1.7.13			
15.	Other N.D.E.	HOLD	<i>RMP</i>	DEC 19/12						
16.	Final Ext. Prior to P.W.H.T.	HOLD	<i>RMP</i>	DEC 06/12						
17.	PWHT Chart Checked	HOLD	<i>RMP</i>	DEC 12/12	"	<i>JF</i>	1.7.13			
18.	Hydrostatic Test	<div style="display: flex; justify-content: space-between;"> <div> HOLD Coil No. 1 Gauge # </div> <div> <i>[Signature]</i> Jan 7.13 ** </div> </div>								
19.	CRN Drawing	CRN# P9417.213	<i>RMP</i>	NOV 01/12	"	<i>JF</i>	11.5.12			
20.	N.C.R. #									
21.	Nameplate Stamping		<i>RMP</i>	DEC 13/12	"	<i>JF</i>	1.7.13			
22.	Data Report (AB-28) completed		<i>[Signature]</i>	Jan 7.13	"	<i>JF</i>	1.7.13			
23.	Nameplate Installation									

The Authorized Inspector shall be presented with the Examination and Inspection Report prior to construction so that he can designate additional inspection points and/or Hold Points. Any revisions shall be marked with a delta symbol with revision number and described at the bottom of this page.

* Denotes an A.I. Inspection Point ** Denotes an A.I. Hold Point

PARTIAL ☐

A# 605766

Manufactured By: NWP Industries Inc. 4017 60th Ave, Innisfail Alberta, T4G-1S9

Manufactured For: Encana Corporation, Suite 1800, 855-2nd Street SW, Box 2850, Calgary Alberta, T2P-2S5

Ultimate Owner: Encana Corporation, Suite 1800, 855-2nd Street SW, Box 2850, Calgary Alberta, T2P-2S5

Location of Installation: Encana Corporation, Suite 1800, 855-2nd Street SW, Box 2850, Calgary Alberta, T2P-2S5

Manufacturer's Serial No.	Construction Drawing No.	CODE: ASME B31.3			Year Built
NWP-08562-002-A	08562-4 Rev 0	Edition	2010	Addenda	2013

CONSTRUCTION

Coil ID/Purpose	Design Pressure	Design Temp	Design Minimum Temp	Corrosion Allowance	Registered Drawing No.	CRN
a PS - 100/Coil A	5171 psi	200 F	-20 F	0.0625"	BDD-400A REV 1	P-9417.213
b PS - 101/Coil B	5171 psi	200 F	-20 F	0.0625"	BDD-400A REV 1	P-5417.213
c						
d						
e						

COIL

Tubes			End Closures				Openings		
Mat'l Spec.	Diameter	Thickness	Return Bend	Flanges	Mat'l Spec.	Rating	Mat'l Spec.	Size/Type	Rating
a SA-333-6	4" NPS	SCH XXH	SA-420-WPL6	SCH XXH	SA-350-LF2 Cl 1	CL 2500	N/A	N/A	N/A
b SA-333-6	4" NPS	SCH XXH	SA-420-WPL6	SCH XXH	SA-350-LF2 Cl 1	CL 2500	N/A	N/A	N/A
c									
d									
e									

HEADERS/MANIFOLDS

HEADERS/MAIN CELLS										
	Purpose	Size	Shell	Thickness	Ends		Openings			
			Mat'l Spec.			Thickness	No	Mat'l Spec	Size/Type	Rating
f	NA	NA	NA	NA	NA	NA		NA	NA	NA
g	NA	NA	NA	NA	NA	NA		NA	NA	NA

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 7757 PSI	100%	NA	1150F	60 MIN	294.875	264 sq.ft.	12.2 cu.ft.
b 7757 PSI	100%	NA	1150F	60 MIN	294.875	160 sq.ft.	7.4 cu.ft.
c							
d							
e							
f							
g							

IMPACT TESTING: Exempt per table 323.2.2 Col A

REMARKS:

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 Jan 7, 2013 Signed RAI Spence For NWP Industries Inc.

(Representative)

(Manufacturer)

CERTIFICATE OF SHOP INSPECTION

I, the undersigned, a duly authorized boiler and pressure vessel inspector employed by ABSA of Alberta have inspected the above Heater Coils and state that, to the best of my knowledge and belief, the constructed is in accordance with the Alberta Safety Codes Act and Regulations. By signing this certificate, neither the inspector nor his or her employer makes any warranty, expressed or implied, concerning the vessel described in this manufacturer's data report. Furthermore, neither the inspector nor his or her employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Date 7 JAN 2013 Signed Joe Tworek NB 12995 A.B AB 261

RT-100%

HT

CERTIFIED BY



NWP
INDUSTRIES INC.

MADE IN CANADA

SERIAL NO. NWP- 08562-002-A

COIL A 4" CL 2500 PS-100

MAWP 5171 PSI AT 200 °F

MDMT -20 °F AT 5171 PSI

CRN P 9417-213 YEAR BUILT 2013

COIL B 4" CL 2500 PS-101

MAWP 5171 PSI AT 200 °F

MDMT -20 °F AT 5171 PSI

CRN P 9417-213

COIL C

MAWP PSI AT °F

MDMT °F AT PSI

CRN

COIL D

MAWP PSI AT °F

MDMT °F AT PSI

CRN

A#6005766

Issuing Authority: Marvin J. (Ty)
DeBelser/Dale Karg

Date of Issue: November 13 2012

Rev Status: 2.1

NWP
Industries Inc.™

ABSA

FORM_NDE_001

N.D.E Requirements

NDE Requirements

Client: Encana

JO# 08562-002-A

Project: 4" Coil – 3.0mm Lineheater

Date: 16/11/2012

Piping: ☒

Pressure Vessel: ☐

Tank: ☐

Other:

☐ X-Ray

☒ Gamma Ray

☐ Ultrasonics

☐ Liquid Penetrant

☐ Magnetic Particle

☐ Acoustic Emission

☒ 100%

☐ Full

☐ 25%

☐ 10%

Other(Define)

☐ Spot

☐ ASME Section VIII-UW-51

☐ ASME Section VIII-UW-52

☒ Customer Specification

☒ ASME B31.3 NFS

Other (Specify)

☐ Hardness test Max 200 BHN

☐ CSA W47.1/W59

General Instructions:

Vessel S/N NWP-08562-002-A

P1 Material

Welder ID E

Shell-T=

Pipe-T= 4" XXH

Total Welds start shooting pkg (first # is X-1)

Please use wire type iQi

Please Note locations of all indications on films on reports

Please include O.F.D-S.O.D S.F.D on reports

Special Requirements:

Shots

Buttweld Xray to be identified as X-#

Gap Shots to be identified as GS-#

Threaded Shots to be identified as XT-#

Identify on Envelope part of package being shot ie. Coil, Piping, ect.

Flashes must contain: Customer, JO#, Spool Identification, Xray number, Clock tape, Welder's ID Symbol, Date

Mark all indicated repairs on the project

NOTE: Encana Spec for Welded Piping-acceptance is zero root defects

Encana Spec is Zero Elongated Indications

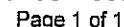
Encana Spec for Socket Welds-acceptance is minimum 1/16" gap

Encana Spec for Threaded Piping- acceptance is 7 threads engaged

HT is a 5 Point Traverse

Prepared By: Karim Bouslama


Date: 16/11/2012



Material: C.S

Client:

Mailing Address
5311-86 Street
Edmonton, Alberta
T6E 5T8

Issuing Authority: Marvin J. (Ty) DeBelser/Dale Karg		ABSA
Date of Issue: November 13 2012		FORM_NDE_001
Rev Status: 2.1		N.D.E Requirements

N.D.E Requirements

Client: Encana JO# 08562-002-A
 Project: 4" Coil – 3:0mm Lineheater Date: 19/11/2012

Piping: ☒ Pressure Vessel: ☐ Tank: ☐ Other:

- | | | |
|---|---|---|
| <input type="checkbox"/> X-Ray
<input checked="" type="checkbox"/> Gamma Ray

<input type="checkbox"/> Ultrasonics
<input type="checkbox"/> Liquid Penetrant
<input type="checkbox"/> Magnetic Particle
<input type="checkbox"/> Accoustic Emission | <input checked="" type="checkbox"/> 100%
<input type="checkbox"/> Full
<input type="checkbox"/> 25%
<input type="checkbox"/> 10%
Other(Define)

<input type="checkbox"/> Spot | <input type="checkbox"/> ASME Section VIII-UW-51
<input type="checkbox"/> ASME Section VIII-UW-52
<input checked="" type="checkbox"/> Customer Specification
<input checked="" type="checkbox"/> ASME B31.3 NFS
Other (Specify) |
|---|---|---|

☐ Hardness test Max 200 BHN

☐ CSA W47.1/W59

General Instructions:

Vessel S/N NWP-08562-002-A

P1 Material

Welder ID E

Shell-T=

Pipe-T= 4" XXH

Total Welds continue shooting pkg (first # is X-4)

Please use wire type IQi

Please Note locations of all indications on films on reports

Please include O.F.D-S.O.D S.F.D on reports

Special Requirements:

Buttweld Xray to be identified as X-#

Gap Shots to be identified as GS-#

Threaded Shots to be identified as XT-#

Identify on Envelope part of package being shot ie. Coil, Piping, ect.

Flashes must contain: Customer, JO#, Spool Identification, Xray number, Clock tape, Welder's ID Symbol, Date

Mark all indicated repairs on the project

Sor Shots
more

NOTE: Encana Spec for Welded Piping-acceptance is zero root defects

Encana Spec is Zero Elongated Indications

Encana Spec for Socket Welds-acceptance is minimum 1/16" gap

Encana Spec for Threaded Piping- acceptance is 7 threads engaged

HT is a 5 Point Traverse

Prepared By: R.M. Spence

R.M. Spence

Date: 19/11/2012



Job / P.O. #: 08562-002-A IRISNDT #: 255694 Date: 19-Nov-12
Client: ENCANA C/O NWP
Location: INNISFAIL Alberta
Item Inspected: 4" COIL - 3.5mm LINEHEATER Material: C.S

Interpretation by:
BRODY SMITH

(Print)

(Signature)

Client Representative:

(Print)

I am in full
agreement with
report contents

(Sign)

SNT-TC-1A II
C.G.S.B. II
C.G.S.B. # 12569
(Level)

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Issuing Authority: Marvin J. (Ty)

DeBelser/Dale Karg

Date of Issue: November 13 2012

Rev Status: 2.1

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Industries Inc.™

ABSA

FORM_NDE_001

N.D.E Requirements

N D E Requirements

Client: Encana

JO# 08562-002-A

Project: 4" Coil – 3.0mm Lineheater

Date: 20/11/2012

Piping: ☒

Pressure Vessel: ☐

Tank: ☐

Other:

☐ X-Ray

☒ Gamma Ray

☐ Ultrasonics

☐ Liquid Penetrant

☐ Magnetic Particle

☐ Acoustic Emission

☒ 100%

☐ Full

☐ 25%

☐ 10%

Other(Define)

☐ Spot

☐ ASME Section VIII-UW-51

☐ ASME Section VIII-UW-52

☒ Customer Specification

☒ ASME B31.3 NFS

Other (Specify)

☐ Hardness test Max 200 BHN

☐ CSA W47.1/W59

General Instructions:

Vessel S/N NWP-08562-002-A

P1 Material

Welder ID E

Shell-T=

Pipe-T= 4" XXH

Total Welds continue shooting pkg (first # is X-9)

Please use wire type iQi

Please Note locations of all indications on films on reports

Please include O.F.D-S.O.D S.F.D on reports

Special Requirements:

5 Shots

Buttweld Xray to be identified as X-#

Gap Shots to be identified as GS-#

Threaded Shots to be identified as XT-#

Identify on Envelope part of package being shot ie. Coil, Piping, ect.

Flashes must contain: Customer, JO#, Spool Identification, Xray number, Clock tape, Welder's ID Symbol, Date

Mark all indicated repairs on the project

NOTE: Encana Spec for Welded Piping-acceptance is zero root defects

Encana Spec is Zero Elongated Indications


Encana Spec for Socket Welds-acceptance is minimum 1/16" gap

Encana Spec for Threaded Piping- acceptance is 7 threads engaged

HT is a 5 Point Traverse

Prepared By: R.M. Spence

Date: 20/11/2012

Issuing Authority: Marvin J. (Ty) DeBelser/Dale Karg		ABSA
Date of Issue: November 13 2012		FORM_NDE_001
Rev Status: 2.1		N.D.E Requirements

N D E Requirements

Client: Encana JO# 08562-002-A
 Project: 4" Coil – 3.0mm Lineheater Date: 21/11/2012

Piping: ☒ Pressure Vessel: ☐ Tank: ☐ Other:

- | | | |
|---|--|--|
| <input type="checkbox"/> X-Ray | <input checked="" type="checkbox"/> 100% | <input type="checkbox"/> ASME Section VIII-UW-51 |
| <input checked="" type="checkbox"/> Gamma Ray | <input type="checkbox"/> Full | <input type="checkbox"/> ASME Section VIII-UW-52 |
| <input type="checkbox"/> Ultrasonics | <input type="checkbox"/> 25% | <input checked="" type="checkbox"/> Customer Specification |
| <input type="checkbox"/> Liquid Penetrant | <input type="checkbox"/> 10% | <input checked="" type="checkbox"/> ASME B31.3 NFS |
| <input type="checkbox"/> Magnetic Particle | Other(Define) | Other (Specify) |
| <input type="checkbox"/> Accoustic Emission | <input type="checkbox"/> Spot | |

☐ Hardness test Max 200 BHN

☐ CSA W47.1/W59

General Instructions:

Vessel S/N NWP-08562-002-A

P1 Material

Welder ID E

Shell-T=

Pipe-T= 4" XXH

Total Welds continue shooting pkg (first # is X-14)

Please use wire type iQi

Please Note locations of all indications on films on reports

Please include O.F.D-S.O.D S.F.D on reports

Special Requirements:

4 Shots

Buttweld Xray to be identified as X-#

Gap Shots to be identified as GS-#

Threaded Shots to be identified as XT-#

Identify on Envelope part of package being shot ie. Coil, Piping, ect.


Flashes must contain: Customer, JO#, Spool identification, Xray number, Clock tape, Welder's ID Symbol, Date

Mark all indicated repairs on the project

NOTE: Encana Spec for Welded Piping-acceptance is zero root defects
 Encana Spec is Zero Elongated Indications
 Encana Spec for Socket Welds-acceptance is minimum 1/16" gap
 Encana Spec for Threaded Piping- acceptance is 7 threads engaged
 HT is a 5 Point Traverse

Prepared By: R.M. Spence

Date: 21/11/2012

Issuing Authority: Marvin J. (Ty) DeBelser/Dale Karg		ABSA
Date of Issue: November 13 2012		FORM_NDE_001
Rev Status: 2.1		N.D.E Requirements

NDE Requirements

Client: Encana JO# 08562-002-A
 Project: 4" Coil – 3.0mm Lineheater Date: 22/11/2012

Piping: <input checked="" type="checkbox"/>	Pressure Vessel: <input type="checkbox"/>	Tank: <input type="checkbox"/>	Other: <input type="checkbox"/>
---	---	--------------------------------	---------------------------------

<input type="checkbox"/> X-Ray <input checked="" type="checkbox"/> Gamma Ray <input type="checkbox"/> Ultrasonics <input type="checkbox"/> Liquid Penetrant <input type="checkbox"/> Magnetic Particle <input type="checkbox"/> Accoustic Emission <input type="checkbox"/> Hardness test Max 200 BHN	<input checked="" type="checkbox"/> 100% <input type="checkbox"/> Full <input type="checkbox"/> 25% <input type="checkbox"/> 10% Other(Define) <input type="checkbox"/> Spot	<input type="checkbox"/> ASME Section VIII-UW-51 <input type="checkbox"/> ASME Section VIII-UW-52 <input checked="" type="checkbox"/> Customer Specification <input checked="" type="checkbox"/> ASME B31.3 NFS Other (Specify) <input type="checkbox"/> CSA W47.1/W59
---	---	---

General Instructions:

Vessel S/N NWP-08562-002-A

P1 Material
 Welder ID E
 Shell-T=
 Pipe-T= 4" XXH
 Total Welds continue shooting pkg (first # is X-18)

Please use wire type iQi
 Please Note locations of all indications on films on reports
 Please include O.F.D-S.O.D S.F.D on reports

Special Requirements:

5 Shots

Buttweld Xray to be identified as X-#
 Gap Shots to be identified as GS-#
 Threaded Shots to be identified as XT-#
 Identify on Envelope part of package being shot ie. Coil, Piping, ect.
 Flashes must contain: Customer, JO#, Spool Identification, Xray number, Clock tape, Welder's ID Symbol, Date
 Mark all indicated repairs on the project


NOTE: Encana Spec for Welded Piping-acceptance is zero root defects
 Encana Spec is Zero Elongated Indications
 Encana Spec for Socket Welds-acceptance is minimum 1/16" gap
 Encana Spec for Threaded Piping- acceptance is 7 threads engaged
 HT is a 5 Point Traverse

Prepared By: R.M. Spence Date: 22/11/2012



Job / P.O. #: 08562-002-A IRISNDT #: 255772 Date: 22-Nov-12
Client: ENCANA C/O NWP
Location: INNISFAIL Alberta
Item Inspected: 4" COIL - 3.0mm LINEHEATER Material: C.S

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Issuing Authority: Marvin J. (Ty) DeBelsèr/Dale Karg		ABSA
Date of Issue: November 13 2012		FORM_NDE_001
Rev Status: 2.1		N.D.E Requirements

N D E Requirements

Client: Encana JO# 08562-002-A
 Project: 4" Coil – 3.0mm Lineheater Date: 28/11/2012

Piping: ☒ Pressure Vessel: ☐ Tank: ☐ Other:

- | | | |
|---|--|--|
| <input type="checkbox"/> X-Ray | <input checked="" type="checkbox"/> 100% | <input type="checkbox"/> ASME Section VIII-UW-51 |
| <input checked="" type="checkbox"/> Gamma Ray | <input type="checkbox"/> Full | <input type="checkbox"/> ASME Section VIII-UW-52 |
| <input type="checkbox"/> Ultrasonics | <input type="checkbox"/> 25% | <input checked="" type="checkbox"/> Customer Specification |
| <input type="checkbox"/> Liquid Penetrant | <input type="checkbox"/> 10% | <input checked="" type="checkbox"/> ASME B31.3 NFS |
| <input type="checkbox"/> Magnetic Particle | Other(Define) | Other (Specify) |
| <input type="checkbox"/> Accoustic Emission | <input type="checkbox"/> Spot | |

☐ Hardness test Max 200 BHN

☐ CSA W47.1/W59

General Instructions:

Vessel S/N NWP-08562-002-A

P1 Material

Welder ID E

Shell-T=

Pipe-T= 4" XXH

Total Welds continue shooting pkg (first # is X-23)

Please use wire type iQi

Please Note locations of all indications on films on reports

Please include O.F.D-S.O.D S.F.D on reports

Special Requirements:

5 Shots

Buttweld Xray to be identified as X-#

Gap Shots to be identified as GS-#

Threaded Shots to be identified as XT-#

Identify on Envelope part of package being shot ie. Coil, Piping, ect.

Flashes must contain: Customer, JO#, Spool Identification, Xray number, Clock tape, Welder's ID Symbol, Date

Mark all indicated repairs on the project

NOTE: Encana Spec for Welded Piping-acceptance is zero root defects
 Encana Spec is Zero Elongated Indications
 Encana Spec for Socket Welds-acceptance is minimum 1/16" gap
 Encana Spec for Threaded Piping- acceptance is 7 threads engaged
 HT is a 5 Point Traverse

Prepared By: R.M. Spence

R.M. Spence

Date: 28/11/2012

Issuing Authority: Marvin J. (Ty)

DeBelser/Dale Karg

Date of Issue: November 13 2012

Rev Status: 2.1

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ABSA

FORM_NDE_001

N.D.E Requirements

N D E Requirements

Client: Encana

JO# 08562-002-A

Project: 4" Coil – 3.0mm Lineheater

Date: 29/11/2012

Piping: ☒

Pressure Vessel: ☐

Tank: ☐

Other:

☐ X-Ray

☒ Gamma Ray

☐ Ultrasonics

☐ Liquid Penetrant

☐ Magnetic Particle

☐ Accoustic Emission

☒ 100%

☐ Full

☐ 25%

☐ 10%

Other(Define)

☐ Spot

☐ ASME Section VIII-UW-51

☐ ASME Section VIII-UW-52

☒ Customer Specification

☒ ASME B31.3 NFS

Other (Specify)

☐ Hardness test Max 200 BHN

☐ CSA W47.1/W59

General Instructions:

Vessel S/N NWP-08562-002-A

P1 Material

Welder ID B,L

Shell-T=

Pipe-T= 4" XXH

Total Welds continue shooting pkg (first # is X-28)

Please use wire type iQ:

Please Note locations of all indications on films on reports

Please include O.F.D-S.O.D S.F.D on reports

Special Requirements:

Shots

Butt weld Xray to be identified as X-#

Gap Shots to be identified as GS-#

Threaded Shots to be identified as XT-#

Identify on Envelope part of package being shot ie. Coil, Piping, ect.

Flashes must contain: Customer, JO#, Spool Identification, Xray number, Clock tape, Welder's ID Symbol, Date

Mark all indicated repairs on the project

NOTE: Encana Spec for Welded Piping acceptance is zero root defects

Encana Spec is Zero Elongated Indications

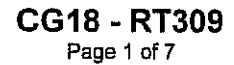
Encana Spec for Socket Welds-acceptance is minimum 1/16" gap

Encana Spec for Threaded Piping- acceptance is 7 threads engaged

HT is a 5 Point Traverse

Prepared By: R.M. Spence

Date: 29/11/2012



Date: 29-Nov-12

Material: CS

(Sign)

(281) 476-4444
(713) 722-7177
(918) 446-8773

IRISNDT E-2004N

Issuing Authority: Marvin J. (Ty)

DeBelser/Dale Karg

Date of Issue: November 13 2012

Rev Status: 2.1

NWP
Industries Inc.™

ABSA

FORM_NDE_001

N.D.E Requirements

N.D.E Requirements

Client: Encana

JO# 08562-002-A

Project: 4" Coil – 3.0mm Lineheater

Date: 30/11/2012

Piping: ☒

Pressure Vessel: ☐

Tank: ☐

Other:

☐ X-Ray

☒ Gamma Ray

☐ Ultrasonics

☐ Liquid Penetrant

☐ Magnetic Particle

☐ Acoustic Emission

☒ 100%

☐ Full

☐ 25%

☐ 10%

Other(Define)

☐ Spot

☐ ASME Section VIII-UW-51

☐ ASME Section VIII-UW-52

☒ Customer Specification

☒ ASME B31.3 NFS

Other (Specify)

☐ Hardness test Max 200 BHN

☐ CSA W47.1/W59

General Instructions:

Vessel S/N NWP-08562-002-A

P1 Material

Welder ID B,L

Shell-T=

Pipe-T= 4" XXH

Total Welds continue shooting pkg (first # is X-30)

Please use wire type iQi

Please Note locations of all indications on films on reports

Please include O.F.D-S.O.D S.F.D on reports

Special Requirements:

Shots

Buttweld Xray to be identified as X-#

Gap Shots to be identified as GS-#

Threaded Shots to be identified as XT-#

Identify on Envelope part of package being shot ie. Coil, Piping, ect.

Flashes must contain: Customer, JO#, Spool Identification, Xray number, Clock tape, Welder's ID Symbol, Date

Mark all indicated repairs on the project

NOTE: Encana Spec for Welded Piping-acceptance is zero root defects

Encana Spec is Zero Elongated Indications

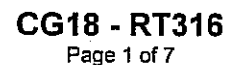
Encana Spec for Socket Welds-acceptance is minimum 1/16" gap

Encana Spec for Threaded Piping- acceptance is 7 threads engaged

HT is a 5 Point Traverse


Prepared By: R.M. Spence

Date: 30/11/2012



Job / P.O. #: 08562-002-A IRISNDT #: 255923 Date: 30-Nov-12
Client: ENCANAL C/O NWP
Location: Innisfail, Alberta
Item Inspected: 4" Coil - 3mm Lineheater Material: CS

Interpretation by:
JEFF BRUCKSHAW (PED LEVEL 2)


(Print) 

(Signature)

Client Representative:


(Print) _____

I am in full
agreement with
report contents

(Sign) 

SNT-TC-1A 2
C.G.S.B. 2
(Level)
C.G.S.B. # 12007

Deer Park, TX (281) 476-4444
Matrix, Houston, TX (713) 722-7177
Tulsa, OK (918) 446-8773

Issuing Authority: Marvin J. (Ty) DeBelser/Dale Karg		ABSA
Date of Issue: November 13 2012		FORM_NDE_001
Rev Status: 2.1		N.D.E Requirements

N D E Requirements

Client: Encana JO# 08562-002-A
 Project: 4" Coil – 3.0mm Lineheater Date: 03/12/2012

Piping: ☒ Pressure Vessel: ☐ Tank: ☐ Other: ☐

- | | | |
|---|--|--|
| <input type="checkbox"/> X-Ray | <input checked="" type="checkbox"/> 100% | <input type="checkbox"/> ASME Section VIII-UW-51 |
| <input checked="" type="checkbox"/> Gamma Ray | <input type="checkbox"/> Full | <input type="checkbox"/> ASME Section VIII-UW-52 |
| <input type="checkbox"/> Ultrasonics | <input type="checkbox"/> 25% | <input checked="" type="checkbox"/> Customer Specification |
| <input type="checkbox"/> Liquid Penetrant | <input type="checkbox"/> 10% | <input checked="" type="checkbox"/> ASME B31.3 NFS |
| <input type="checkbox"/> Magnetic Particle | Other(Define) | Other (Specify) |
| <input type="checkbox"/> Accoustic Emission | <input type="checkbox"/> Spot | |

☐ Hardness test Max 200 BHN

☐ CSA W47.1/W59

General Instructions:

Vessel S/N NWP-08562-002-A

P1 Material

Welder ID B,L

Shell-T=

Pipe-T= 4" XXH

Total Welds continue shooting pkg (first # is X-34)

Please use wire type iQI

Please Note locations of all indications on films on reports

Please include O.F.D-S.O.D S.F.D on reports

Special Requirements:

Buttweld Xray to be identified as X-#

Gap Shots to be identified as GS-#

Threaded Shots to be identified as XT-#

Identify on Envelope part of package being shot ie. Coil, Piping, ect.

Flashes must contain: Customer, JO#, Spool Identification, Xray number, Clock tape, Welder's ID Symbol, Date

Mark all indicated repairs on the project

NOTE: Encana Spec for Welded Piping-acceptance is zero root defects

Encana Spec is Zero Elongated Indications

Encana Spec for Socket Welds-acceptance is minimum 1/16" gap

Encana Spec for Threaded Piping- acceptance is 7 threads engaged

HT is a 5 Point Traverse

6 Shots

Prepared By: R.M. Spence

Date: 03/12/2012

Exposure Device #: D6274 Source #: 79875B
Cobalt 60 ☐ IR 192 ☒ X-Ray ☐ EFSS: .135
Film Brand: AGFA #Film/cassette: 1
Code: ASME B31.3 N & ENCANA SPEC.

Job / P.O. #: 08562-002-A IRISNDT #: 255935 Date: 3-Dec-12
Client: ENCANNA C/O NWP
Location: INNISFAIL Alberta
Item Inspected: 4" COIL - 3.0mm LINEHEATER Material: C.S

[illegible]

Number of Radiation Barrier Warning Signs Erected: 5

Number of Radiation Barrier Warning Signs Returned: 5

Work Location Legend: [1] Inside Fab. Shop [2] Yard/Lay-down Area [3] Piping/Modular Fab. Area [4] N/A (Other)


IRIS Procedure:	S.O.D. = Source-to-object distance (D)	AB - Arc Burns	EUC - External Undercut	IC - Internal Concavity
Single Wall Exposure:		BT - Burn Through	IUC - Internal Undercut	LF - Lack of Fusion
RT 1, 2, 2A, 6, 7		CK - Crack	HB - Hollow Bead	LC - Low Cover
Double Wall Exposure	O.F.D. = Distance from source side of object to film (d)	EP - Excessive Penetration	IP - Incomplete Penetration	MA - Misalignment
RT 3, 3A, 4, 5, 8		P - Porosity	S - Slag	

Unit#:	<u>226</u>	Kilometers:	<u>10</u>
In:	<u> </u>	Out:	<u> </u>
		Hrs:	<u>1.75</u>
In:	<u> </u>	Out:	<u> </u>
		Hrs:	<u> </u>
Personnel:			
BS / JS / MV			

Film Quantity:		
24	(2 ¾ x 8 ½)	D5

Interpretation by:
BRODY SMITH

(Print)



(Signature)

Client Representative:

(Print)

I am in full
agreement with
report contents

(Sign)

SNT-TC-1A II

C.G.S.B. II

C.G.S.B. # 12569

5311 - 86 Street Edmonton, Alberta, T6E 5T8 Phone: (780) 437-2022 Fax: (780) 438-1438
 Calgary (403) 279-8121
 Lloydminster (780) 875-8455
 Banhead (780) 674-3018
 Nisku (780) 955-7616

38
Cold Lake
Fort McMurray
Red Deer

{780} 626-6105
{780} 743-1538
{403} 347-1742

Deer Park, TX
Marble, Houston, TX
Tulsa, OK

(281) 476-4444
(713) 722-7177
(916) 440-8773

Issuing Authority: Marvin J. (Ty)

DeBelser/Dale Karg

Date of Issue: November 13 2012

Rev Status: 2.1

NWP
Industries Inc.™

ABSA

FORM_NDE_001

N.D.E Requirements

N.D.E Requirements

Client: Encana

JO# 08562-002-A

Project: 4" Coil – 3.0mm Lineheater

Date: 04/12/2012

Piping: ☒

Pressure Vessel: ☐

Tank: ☐

Other:

☐

X-Ray

☒

100%

☐

ASME Section VIII-UW-51

☒

Gamma Ray

☐

Full

☐

ASME Section VIII-UW-52

☐

Ultrasonics

☐

25%

☒

Customer Specification

☐

Liquid Penetrant

☐

10%

☒

ASME B31.3 NFS

☐

Magnetic Particle

☐

Other(Define)

Other (Specify)

☐

Acoustic Emission

☐

Spot

☐

Hardness test Max 200 BHN

☐

CSA W47.1/W59

General Instructions:

Vessel S/N NWP-08562-002-A

P1 Material

Welder ID B,L

Shell-T=

Pipe-T= 4" XXH

Total Welds continue shooting pkg (first # is X-40)

Please use wire type iQi

Please Note locations of all indications on films on reports

Please include O.F.D-S.O.D S.F.D on reports

Special Requirements:

3 Shots

Buttweld Xray to be identified as X-#

Gap Shots to be identified as GS-#

Threaded Shots to be identified as XT-#

Identify on Envelope part of package being shot ie. Coil, Piping, ect.

Flashes must contain: Customer, JO#, Spool Identification, Xray number, Clock tape, Welder's ID Symbol, Date

Mark all indicated repairs on the project

NOTE: Encana Spec for Welded Piping-acceptance is zero root defects

Encana Spec is Zero Elongated Indications

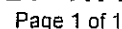
Encana Spec for Socket Welds-acceptance is minimum 1/16" gap

Encana Spec for Threaded Piping- acceptance is 7 threads engaged

HT is a 5 Point Traverse

Prepared By: R.M. Spence

Date: 04/12/2012



Date: 4-Dec-12

Location: INNISFAIL Alberta

#Film/cassette: 1

Item Inspected: 4" COIL - 3.0mm LINEHEATER

Material: C.S

{ Sign)

(281) 476-4444
(713) 722-7177
(918) 446-8773

IRISNDT E-2004N

Issuing Authority: Marvin J. (Ty)
DeBelser/Dale Karg

Date of Issue: November 13 2012

Rev Status: 2.1

NWP
Industries Inc.™

ABSA

FORM_NDE_001

N.D.E Requirements

NDE Requirements

Client: Encana

JO# 08562-002-A

Project: 4" Coil - 3.0mm Lineheater

Date: 05/12/2012

Piping: ☒

Pressure Vessel: ☐

Tank: ☐

Other:

☐ X-Ray

☒ Gamma Ray

☐ Ultrasonics

☐ Liquid Penetrant

☐ Magnetic Particle

☐ Accoustic Emission

☐ Hardness test Max 200 BHN

☒ 100%

☐ Full

☐ 25%

☐ 10%
Other(Define)

☐ Spot

☐ ASME Section VIII-UW-51

☐ ASME Section VIII-UW-52

☒ Customer Specification

☒ ASME B31.3 NFS

Other (Specify)

☐ CSA W47.1/W59

General Instructions:

Vessel S/N NWP-08562-002-A

P1 Material

Welder ID B,L

Shell-T=

Pipe-T= 4" XXH

Total Welds continue shooting pkg (first # is X-43)

Please use wire type iQi

Please Note locations of all indications on films on reports

Please include O.F.D-S.O.D S.F.D on reports

Special Requirements:

2 Shots

Buttweld Xray to be identified as X-#

Gap Shots to be identified as GS-#

Threaded Shots to be identified as XT-#

Identify on Envelope part of package being shot ie. Coil, Piping, ect.

Flashes must contain: Customer, JO#, Spool Identification, Xray number, Clock tape, Welder's ID Symbol, Date

Mark all indicated repairs on the project

NOTE: Encana Spec for Welded Piping-acceptance is zero root defects
Encana Spec is Zero Elongated Indications
Encana Spec for Socket Welds-acceptance is minimum 1/16" gap
Encana Spec for Threaded Piping- acceptance is 7 threads engaged
HT is a 5 Point Traverse

Prepared By: R.M. Spence

Date: 05/12/2012

Issuing Authority: Marvin J. (Ty)

DeBelser/Dale Karg

Date of Issue: November 13 2012

Rev Status: 2.1

NWP
Industries Inc.™

ABSA

FORM_NDE_001

N.D.E Requirements

N D E Requirements

Client: Encana

JO# 08562-002-A

Project: 4" Coil – 3.0mm Lineheater AFTER PWHT

Date: 19/12/2012

Piping: ☒

Pressure Vessel: ☐

Tank: ☐

Other:

☐ X-Ray

☐ Gamma Ray

☐ Ultrasonics

☐ Liquid Penetrant

☐ Magnetic Particle

☐ Acoustic Emission

☒ Hardness test Max 200 BHN

☐ 100%

☐ Full

☐ 25%

☒ 10%

Other(Define)

☐ Spot

☐ ASME Section VIII-UW-51

☐ ASME Section VIII-UW-52

☒ Customer Specification

☒ ASME B31.3 NFS

Other (Specify)

☐ CSA W47.1/W59

General Instructions:

Vessel S/N NWP-08562-002-A

P1 Material

Welder ID F,B,L

Shell-T=

Pipe-T= 4" XXH

Total Welds HT x 7 welds (first # is HT-1)

Please use wire type iQi

Please Note locations of all indications on films on reports

Please include O.F.D-S.O.D S.F.D on reports

Special Requirements:

Shots

Buttweld Xray to be identified as X-#

Gap Shots to be identified as GS-#

Threaded Shots to be identified as XT-#

Identify on Envelope part of package being shot ie. Coil, Piping, ect.

Flashes must contain: Customer, JO#, Spool Identification, Xray number, Clock tape, Welder's ID Symbol, Date

Mark all indicated repairs on the project

NOTE: Encana Spec for Welded Piping-acceptance is zero root defects

Encana Spec is Zero Elongated Indications

Encana Spec for Socket Welds-acceptance is minimum 1/16" gap

Encana Spec for Threaded Piping- acceptance is 7 threads engaged

HT is a 5 Point Traverse

Prepared By: R.M. Spence

Date: 19/12/2012



HARDNESS TEST REPORT

DATE:	19-Dec-12	REPORT #:	HJC121219-1	PAGE	1 of 1
CLIENT:	NWP		ECHO JOB #:	4953	
CONTRACTOR:	ENCANA				
LOCATION:	NWP INDUSTRIES (INNISFAIL)		PROJECT:	VESSEL SN# NWP-08562-002-A	
ITEMS EXAMINED:	4" COIL - 3.6mm LINEHEATER (AFTER PWHT)				
CODE / SPECIFICATION:	ENCANA SPEC.ASME B31.3NFS		CLIENT PO # / JOB #:	JOB# 08562-002-A	

METHOD

HARDNESS SCALE:	BHN	MAXIMUM TOLERANCE:	200 BHN		
EQUIPMENT TYPE:	HL200	SERIAL #:	39702870	LAST CALIBRATION:	SEPT. 7, 2012

TEST RESULTS

HT#	XRAY#/STAMP	DIAMETER / SCH.	HARDNESS VALUES				
			P.M	H.A.Z	WELD	H.A.Z	P.M.
1	X-41 / B,L	4" / XXH	140	141	143	140	139
2	X-40 / B,L	4" / XXH	136	147	138	144	141
3	X-28 / L	4" / XXH	144	140	137	141	133
4	X-29 / B	4" / XXH	148	135	142	140	134
5	X-24 / F	4" / XXH	147	142	145	131	135
6	X-27 / F	4" / XXH	139	144	142	141	136
7	X-5 / F	4" / XXH	141	143	137	140	140
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

Misc Charges	JON CRUICKSHANK	Regular Hours	SEE FIELD
SEE FIELD INVOICE		Overtime Hours	INVOICE
FJC-121219-A	CGSB / SNT-TC-1A LII MT #16356	Shift Premium	FJC-121219-1
		Kilometers	
Client : BOB <i>[Signature]</i>	Technician Signature: <i>[Signature]</i>	Assistant:	BRAYDEN C.

53A Burnt Park Drive | Red Deer, AB | T4P 0J7

Ph: (403) 347-7042 Fax: (403) 347-7052 www.echonde.com



R & R Stress Relieving Service Ltd.

Nisku: 2103 - 6th Street, T9E 7X8 Tel: (780) 955-7559 Fax: (780) 955-2903
Blackfalds: #13 Burbank Industrial Park Tel: (403) 885-2280 Fax: (403) 885-0177
Toll Free: 1-800-499-HEAT(4328)

CERTIFICATE OF CONFORMANCE OF RECORDING INSTRUMENTS

CERTIFIED BY:	<u>R & R Stress Relieving Service Ltd.</u>
TEST NUMBER:	<u>RR1112</u>
DATE:	<u>November 9, 2012</u>
DATE DUE:	<u>February 9, 2013</u>
INSTRUMENT MFG:	<u>Chino</u>
MODEL NUMBER:	<u>AH-3725 N00</u>
SERIAL NUMBER:	<u>AH-059C172</u>
RECORDER NUMBER:	<u>IR-182</u>


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

REFERENCE STANDARDS

DIGI MITE 311600 S/N48430-5522

CERT DATE Oct 22/12

The calibration of all standards and measuring instruments used in the calibration are traceable to the National Research Council of Canada in Ottawa or to the National Bureau of Standards in Washington, D.C.


Shane Stimson

50MM/H

IR# 182 OF Tck 2

R & R Stress Relieving

Client: NWP

Date: 12/11/12 Job# 500

PO: 710533

Operator: Alex Maske

Chart Speed: 50mm/hr

Chart #: BF 3 2 - 1 2 - 8 9 6

Description: (17) Spools - Job# 128467-015-D

(1) Coil Tack # 0852-002-A 5/NWP-0852-002-A

1hr Soak

Start Soak

DEC 12/12

50MM/H

500

1000

1500

2000

2012.12.10.08:28



HEAT TREATMENT REQUIREMENTS

Serial#: NWP-08562-002-A

PO# 710533

JOB NO.: 08562-002-A

CUSTOMER: EnCana Corporation

DATE: December 11 2012

COMPONENT DESCRIPTION: 3.0 mm btu/hr Line Heater Coil

DWG. NO. AND LINE NO.	DIAMETER	THICKNESS	MATERIAL	LENGTH	WEIGHT
08467-4 REV 0 Coil A	4" NPS	XXH	SA-333-6	294.875	6356
Coil B	4" NPS	XXH	SA-333-6	294.875	3930
Total:					10286 lbs

TYPE OF HEAT TREATMENT: PRESSURE VESSEL or Process Piping STRESS RELIEVE P1 and Materials

HEATING

Temperature to be raised from 800°F (427°C) to 1150°F (621°C) at a maximum rate of 400 ° F

() ° C) per hour. NOTE: THIS VALUE MUST NEVER EXCEED 400°F (204°C) PER HOUR.

[Calculated rate = 400 degrees F/hr. (204 degrees C/hr) Divided by the maximum metal thickness of the shell or head plate in inches]

HOLDING

Temperature to be held in range of 1150°F to 1175°F for 60 minutes.

[Holding time to be determined by Table UCS-56 for Nominal Thickness as specified in UW-40(f)]

COOLING

Temperature to be lowered from 1150°F (621°C) to 800°F (427°C) at a maximum rate of 500 ° F

() ° C) per hour. NOTE: THIS VALUE MUST NEVER EXCEED 500°F (260°C) PER HOUR.

[Calculated rate = 500 degrees F/hr. (260 degrees C/hr.) Divided by the maximum metal thickness of the shell or head plate in inches]

From 800°F (427°C) items may be cooled in still air.

Optional Requirements:

- ☐ Job number and description required on heat treatment charts along with the operator's signature & date.
- ☐ Reporting of thermocouple attachment method and location, and verification of furnace thermocouple calibration is required.
- ☐ A sufficient number of thermocouples shall be located to control and maintain uniform distribution of temperature on all vessels and parts. Thermocouples shall be directly attached to the item or provision shall be made for thermocouple placement at bottom, centre and top of the furnace charge in accordance with the ASME Code.
- ☐ During the heating period, there shall not be a greater variation in temperature throughout the portion of the vessel being heated than 250° F (121° C) within any 15 ft. (4.6 m) interval of length. An adequate number of thermocouples must be used to ensure this Code requirement is met.
- ☐ During the holding period, there shall not be a greater difference than 150° F (66° C) between the highest and lowest temperature throughout the portion of the vessel being heat treated, except where the range is further limited by these instructions.
- ☐ If Capacitor Discharge welding is used to attach thermocouples an ASME Code Section IX Welding Procedure Specification is required (WPS qualification is not required), and the energy output must be limited to 125 Watt-Seconds.
- ☐ No other welding is permitted on vessels or parts. [0.5 x Capacitance in farads X Voltage ² = W-Sec.]
- ☐ The method of thermocouple removal shall not damage the heat treated item.

Q.C. Inspector Signature

Date: Dec 12/12

Thermocouple Attachment Method:

Capacitor Discharge

Location(s)

Coil Ends opposite Sides

Furnace Heat Number

BF32-12-846

Furnace Operator Signature

Date: Dec 11/12

Form Prepared by:

Kasha Fox

Date: December 5 2012

NWP Industries Inc.™		Website: www.nwp.ca
PO Box 6280 4017-60 Ave.		Phone: (403) 227-4100
T4G 1S9		Fax: (403) 227-4102

HYDROSTATIC TEST AFFIDAVIT

Customer: Encana Corp

JO# 08562-002-A

Project: Coil for 3.0 mm Lineheater

Project#

Test Pressure: 7757 PSI

Hold Time: 60 minutes

Code Requirements: ASME B31.3 2010 edition

All Personnel Advised of Test ☒ All Signs & Flagging Posted ☒

Prior to Filling – Fitting/Hoses & Component Meet Required Test Pressure

Sign-Off

Supervisor: ✓

Tester: ✓

Date: 07/01/2013

Product Description:

PS-100 & 101 / Coils A & B = 7757 PSI ✓

50% Test Pressure Leak/Systems Check Completed ☒

50% Coils A & B = 3879 PSI ✓

Equipment Drained & Flushed to Prevent Freezing:


Yes: ☐

No: ☐

Start Time:	Finish Time:
<u>12:10 pm</u>	<u>2:55 pm</u>

Test Gauge Identification #	Pressure Range	Calibration Date
NWPG- 20,000 #41	0-20,000 PSI	13 Aug 2013
NWPG- 20,000 #5	0-20,000 PSI	13 Aug 2013
NWPG-	PSI	
NWPG-	PSI	
NWPG-	PSI	
NWPG-	PSI	
NWPG-	PSI	
NWPG-	PSI	

Test By: <u>[Signature]</u>	Date: <u>Jan 7/2013</u>
Approved By: <u>[Signature]</u>	Date: <u>Jan 7.13</u>

NWP Industries Inc. [™]		Website: www.nwp.ca
PO Box 6280		Phone: (403) 227-4100
4017-60 Ave.		
T4G 1S9		Fax: (403) 227-4102

CHECKLIST FOR CLEANING OF INDIRECT FIRED HEATER COILS

Initial

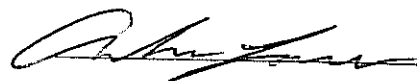
- ☒ Operator has reviewed safe work practice and signed permit
- ☒ Operator has inspected pig receiver to ensure it is in good operating condition and verified that transition spools are correct size and rating for coil to be cleaned
- ☒ Operator has verified system is not under pressure
- ☒ Operator has ensured
 - block valve is in the proper position
 - valves and seal on blind flange are tight and secure
 - closure on receiver is properly installed and secure
 - working pressure of the system and pig receiver are not exceeded
- ☒ Operator has reported to supervisor any material collected
- ☒ Operator certifies that indirect fired heater coil is free of debris

Serial Number: 8562-002

Date: Jan 8/2013

Operator: Andrew Lundgren

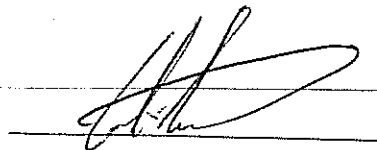
Print



Signature

Witness: Colin Gera

Print



Signature



MANUFACTURER'S DATA REPORT FOR INDIRECT FIRED HEATER COILS

AB 25-2011-05

PARTIAL ☐

A# 605766

Manufactured By: NWP Industries Inc. 4017 60th Ave, Innisfail Alberta, T4G-1S9

Manufactured For: Encana Corporation, Suite 1800, 855-2nd Street SW, Box 2850, Calgary Alberta, T2P-2S5

Ultimate Owner: Encana Corporation, Suite 1800, 855-2nd Street SW, Box 2850, Calgary Alberta, T2P-2S5

Location of Installation: Encana Corporation, Suite 1800, 855-2nd Street SW, Box 2850, Calgary Alberta, T2P-2S5

Manufacturer's Serial No.	Construction Drawing No.	CODE: ASME B31.3			Year Built
NWP-08562-002-A	08562-4 Rev 0	Edition	2010	Addenda	2013

CONSTRUCTION

	Coil ID/Purpose	Design Pressure	Design Temp	Design Minimum Temp	Corrosion Allowance	Registered Drawing No.	CRN
a	PS - 100/Coil A	5171 psi	200 F	-20 F	0.0625"	BDD-400A REV 1	P-9417 213
b	PS - 101/Coil B	5171 psi	200 F	-20 F	0.0625"	BDD-400A REV 1	P-9417 213
c							
d							
e							

COIL

Tubes			End Closures				Openings			
			Return Bend		Flanges					
	Mat'l Spec.	Diameter	Thickness	Mat'l Spec.	Thickness	Mat'l Spec.	Rating	Mat'l Spec.	Size/Type	Rating
a	SA-333-6	4" NPS	SCH XXH	SA-420-WPL6	SCH XXH	SA-350-LF2 Cl 1	CL 2500	N/A	N/A	N/A
b	SA-333-6	4" NPS	SCH XXH	SA-420-WPL6	SCH XXH	SA-350-LF2 Cl 1	CL 2500	N/A	N/A	N/A
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
f NA	NA	NA	NA	NA	NA		NA	NA	NA
g NA	NA	NA	NA	NA	NA		NA	NA	NA

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 7757 PSI	100%	NA	1150F	60 MIN	294.875	264 sq.ft.	12.2 cu.ft.
b 7757 PSI	100%	NA	1150F	60 MIN	294.875	160 sq.ft.	7.4 cu.ft.
c							
d							
e							
f							
g							

IMPACT TESTING: Exempt per table 323.2.2 Col A

REMARKS:

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 Jan 7, 2013 Signed [Signature] For NWP Industries Inc.

(Representative)

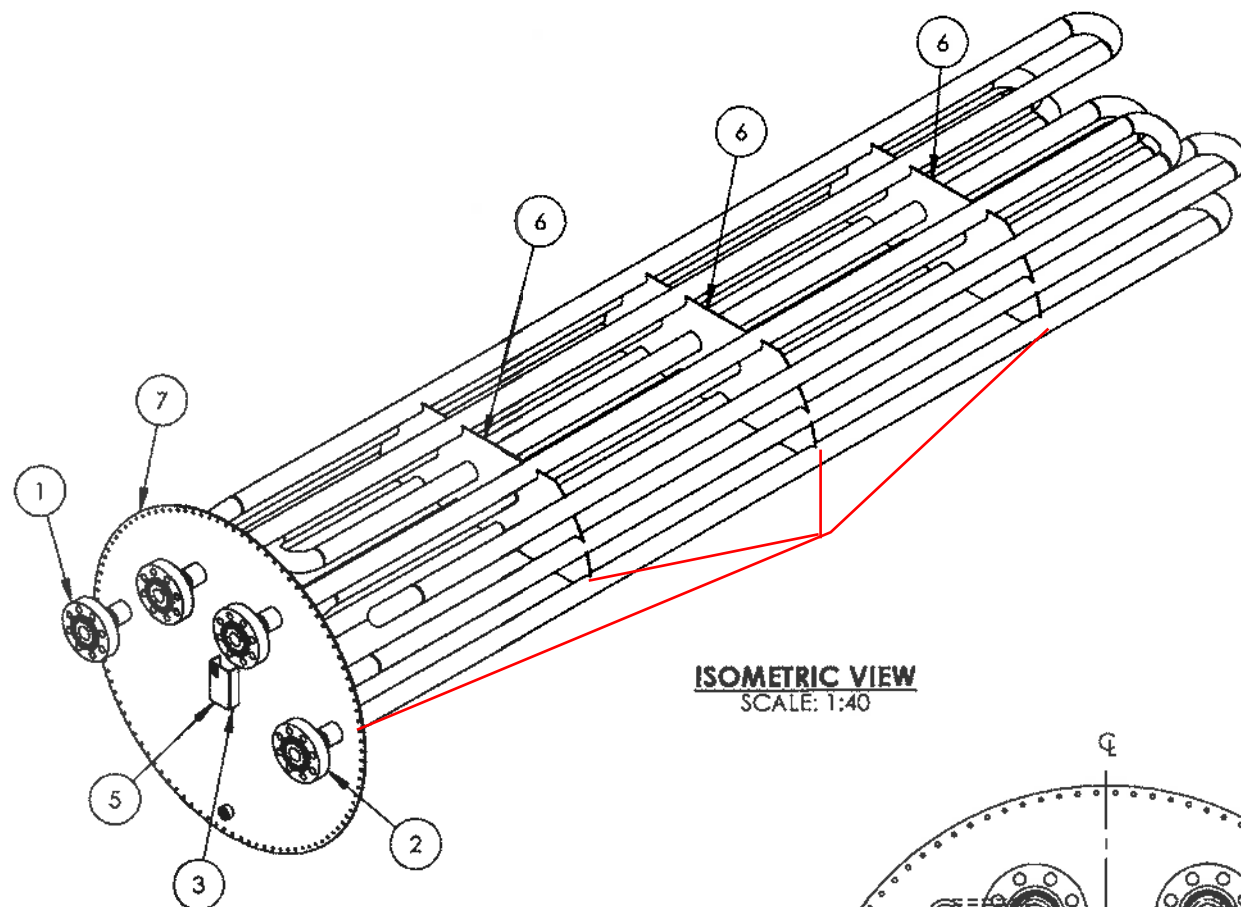
(Manufacturer)

CERTIFICATE OF SHOP INSPECTION

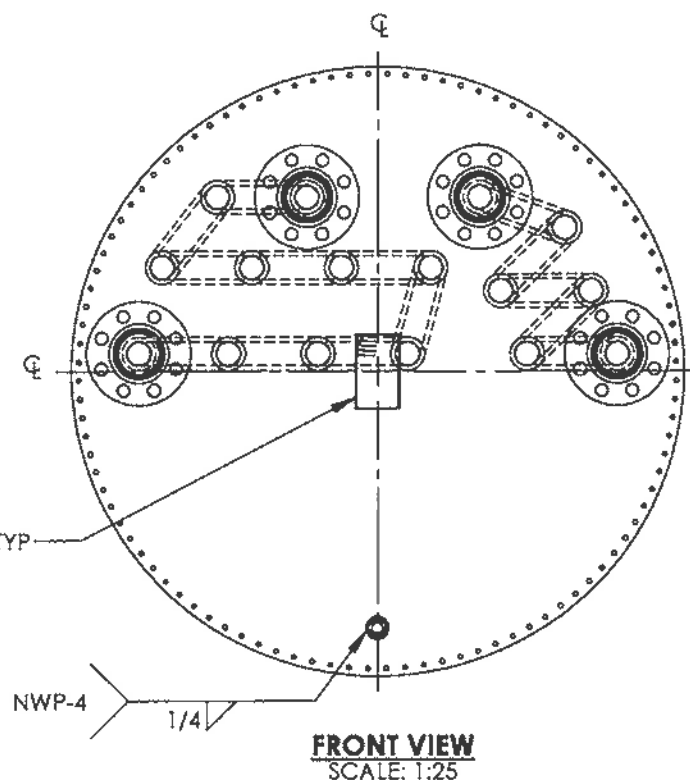
The undersigned, a duly authorized boiler and pressure vessel inspector employed by ABSA of Alberta have inspected the above Heater Coils and state that, to the best of my knowledge and belief, the constructed is in accordance with the Alberta Safety Codes Act and Regulations. By signing this certificate, neither the inspector nor his or her employer makes any warranty, expressed or implied, concerning the vessel described in this manufacturer's data report. Furthermore, neither the inspector nor his or her employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Date 7 JAN 2013

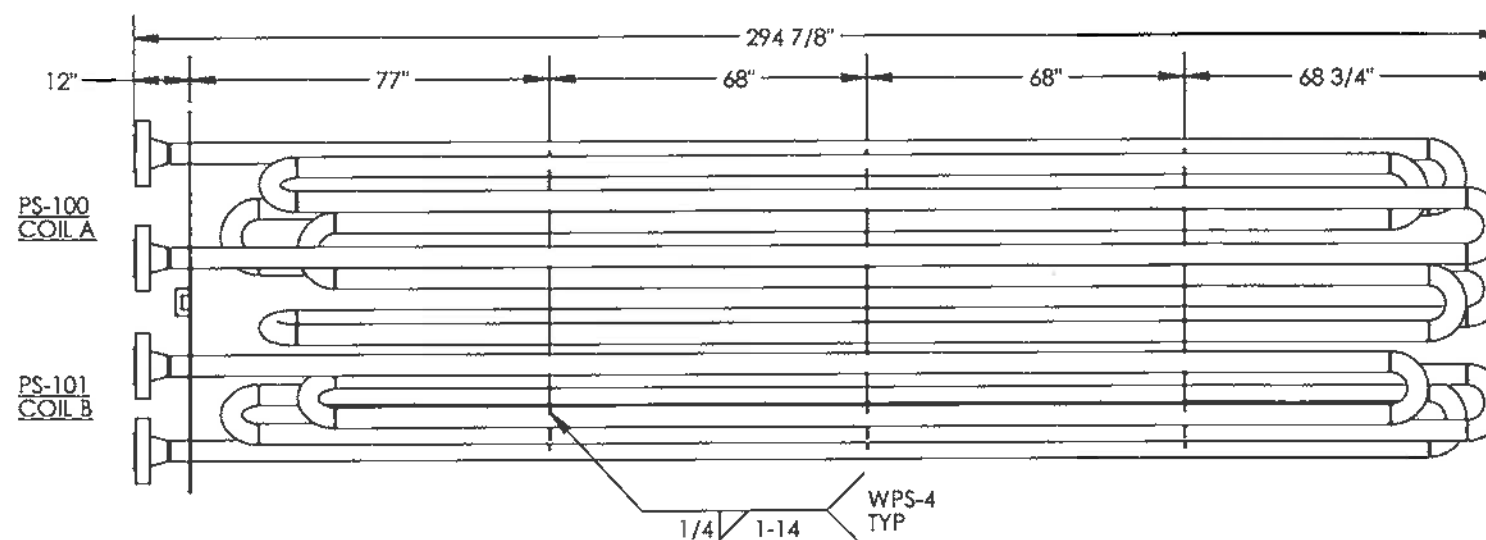
Signed Joe Tworek NB 12995 A,B AB 261



ISOMETRIC VIEW
SCALE: 1:40



FRONT VIEW
SCALE: 1:25

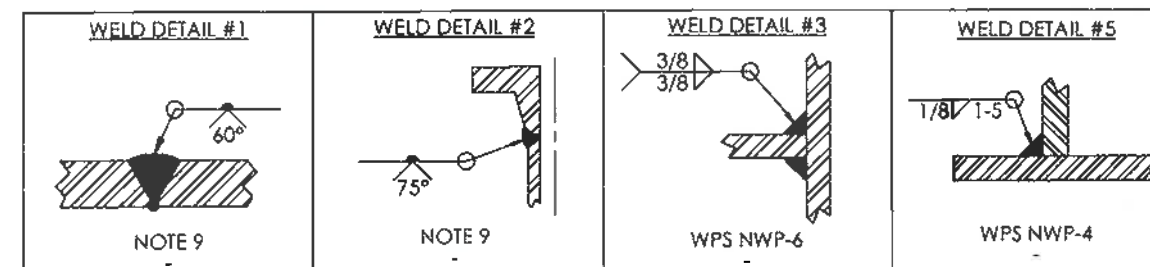


PLAN VIEW
SCALE: 1:40

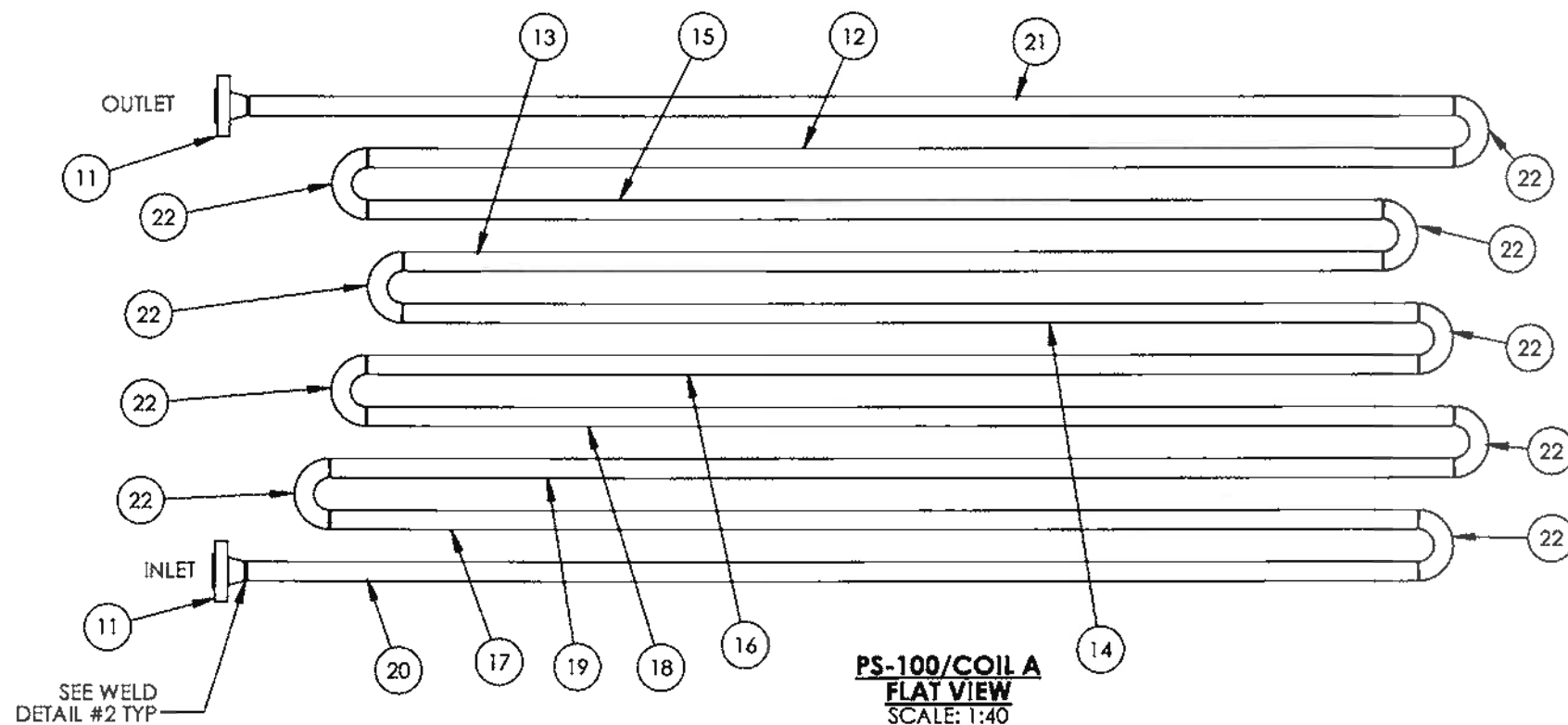
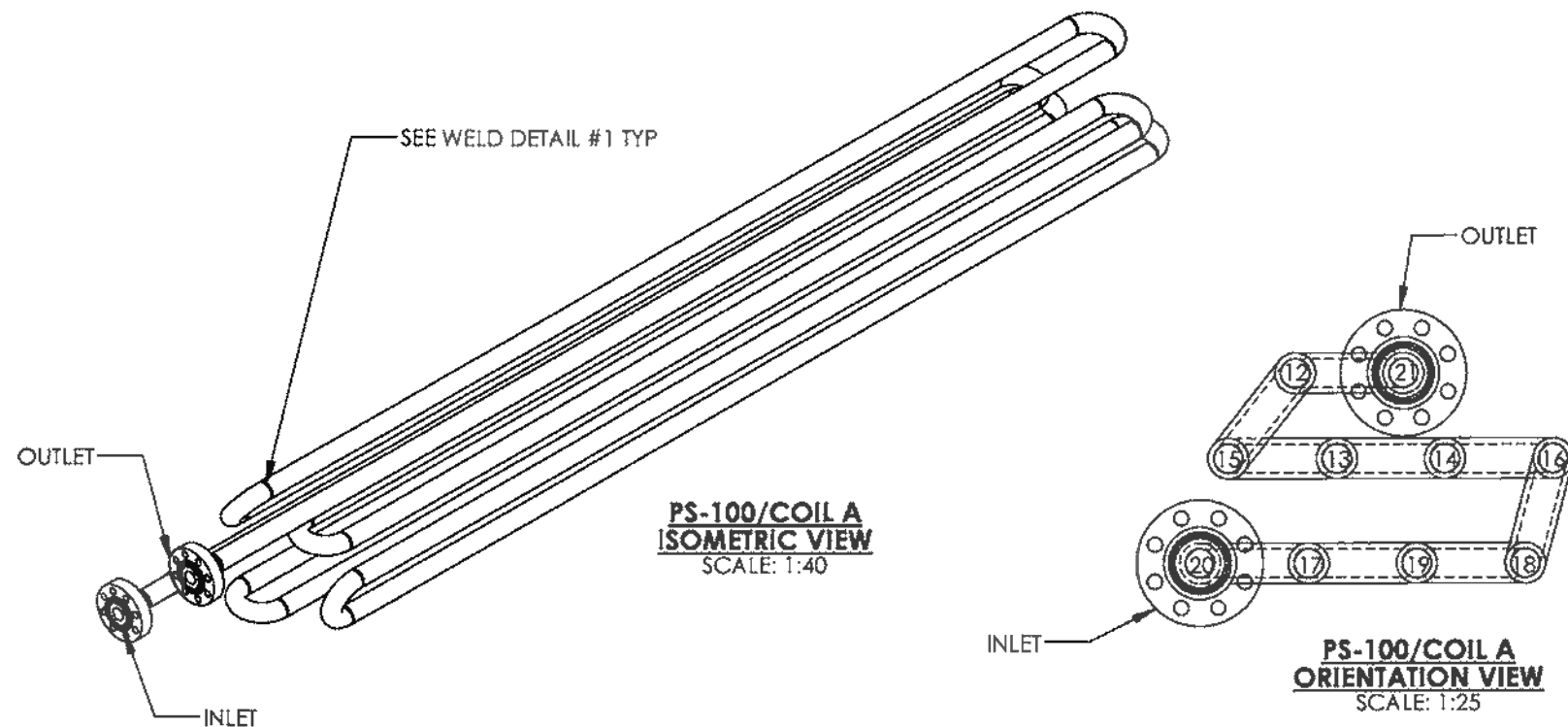
ORIGINAL

NOTES

1. ALL DIMENSIONS SHALL HAVE A TOLERANCE OF $\pm 1/8$ " UNLESS OTHERWISE SPECIFIED.
2. DIMENSIONS INCLUDE $1/8$ " ROOT GAP.
3. ALL BOLT HOLES STRADDLE COMMON CENTER LINE.
4. CUT LENGTHS FOR PIPE ARE FOR REFERENCE ONLY.
5. COIL TO BE CLEANED BEFORE SHIPMENT.
6. USE WELD PROCEDURE NWP-4 OR NWP-6 FOR ALL TACK WELDS.
7. HARDNESS TESTING - MAX 200 BNH 100% OF COIL BUTTWELD. BASELINE UT ON COIL RETURN BENDS.
8. APPROXIMATE WEIGHT: 11,100 LBS.
9. ROLL WELDS TO BE NWP-6, POSITION WELDS TO BE NWP-4. REFERENCE WELD DETAILS 1 & 2.



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ITEM	PART #	DESCRIPTION	MTR #	LENGTH	QTY.
11	FLA4FXXHBF	FLANGE 4" 2500 ANSI SCH XXH RTJWN SA350-LF2-CL1			2
12	PIP3XXHB	PIPE 4" SCH. XXH SA333-GR6		251 1/4"	1
13	PIP4XXHB	PIPE 4" SCH. XXH SA333-GR6		226 1/2"	1
14	PIP4XXHB	PIPE 4" SCH. XXH SA333-GR6		234 3/4"	1
15	PIP4XXHB	PIPE 4" SCH. XXH SA333-GR6		234 3/4"	1
16	PIP4XXHB	PIPE 4" SCH. XXH SA333-GR6		243"	1
17	PIP4XXHB	PIPE 4" SCH. XXH SA333-GR6		251 1/4"	1
18	PIP4XXHB	PIPE 4" SCH. XXH SA333-GR6		251 1/4"	1
19	PIP4XXHB	PIPE 4" SCH. XXH SA333-GR6		259 1/2"	1
20	PIP4XXHB	PIPE 4" SCH. XXH SA333-GR6		270 7/16"	1
21	PIP4XXHB	PIPE 4" SCH. XXH SA333-GR6		278 1 1/16"	1
22	RET4LXXHGD	Return 180 Deg 4" LR S/XXH BW SA420WPL6			9

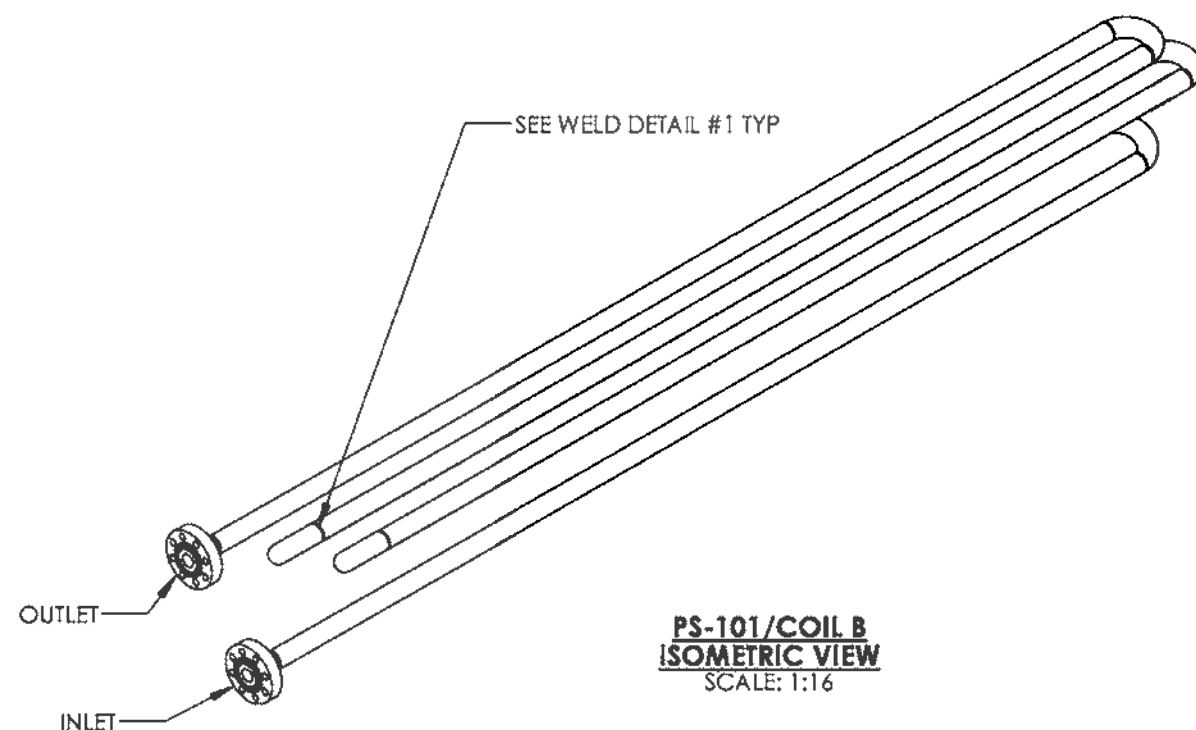
ORIGINAL

WELD SEQUENCE
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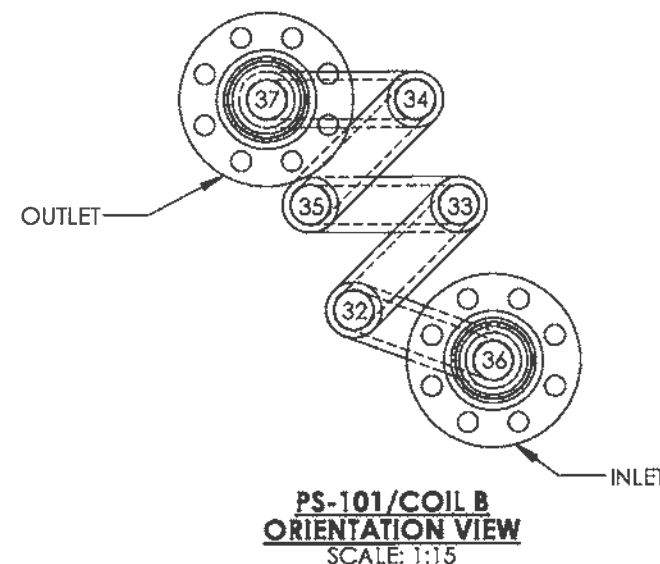
PS-100/COIL A DESIGN DATA	
DESIGN AND FABRICATE TO:	ANSI/ASME B31.3 NFS 2010 EDITION
CLIENT SPECIFICATION:	ECA-PVF-S-03 REV 0 SPEC FAA
DESIGN PRESSURE:	5171 PSI
MAX. DESIGN METAL TEMPERATURE:	200°F
MIN. DESIGN METAL TEMPERATURE:	-20°F
IMPACT TEST:	EXEMPT PER TABLE 323.2.2 COLUMN A
RADIOGRAPHY:	100%
OTHER NDE:	SEE NOTE 7
POST WELD HEAT TREATMENT:	1150°F ± 25°F FOR 1 HOUR MIN.
HYDROSTATIC TEST PRESSURE:	7757 PSIG
CORROSION ALLOWANCE:	1/16"
PRE-HEAT:	50°F
WEIGHT EMPTY:	6356 LBS
WEIGHT FULL:	7113 LBS
CAPACITY:	12.2 CU FT
SURFACE AREA:	264 SQ FT
QUALITY CONTROL PROGRAM:	AQP-1253
WELDING PROCEDURE REGISTRATION NO.:	1604.2
WELD PROCEDURES:	NWP-4, NWP-6
SERVICE:	HYDROCARBONS
CRN NO.:	P-9417.213
DESIGN REGISTRATION DRAWINGS:	BDD-400A REV1
REFERENCE CALCULATIONS:	BDD-400A REV4

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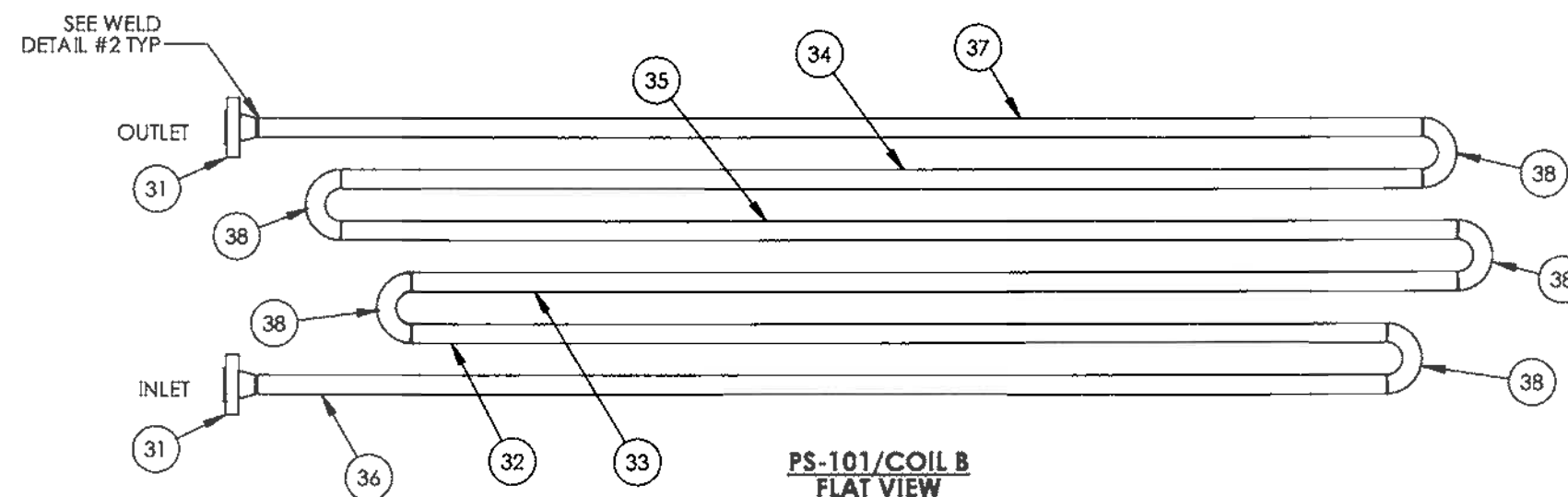
ITEM	PART #	DESCRIPTION	MTR #	LENGTH	QTY.
31	FLA4FXHBF	FLANGE 4" 2500 ANSI SCH XXH RTJWN SA350-LF2-CL1			2
32	PIP4XXHB	PIPE 4" SCH. XXH SA333-GR6		226 1/2"	1
33	PIP4XXHB	PIPE 4" SCH. XXH SA333-GR6		243"	1
34	PIP4XXHB	PIPE 4" SCH. XXH SA333-GR6		251 1/4"	1
35	PIP4XXHB	PIPE 4" SCH. XXH SA333-GR6		259 1/2"	1
36	PIP4XXHB	PIPE 4" SCH. XXH SA333-GR6		262 3/16"	1
37	PIP4XXHB	PIPE 4" SCH. XXH SA333-GR6		270 7/16"	1
38	RET4LXXHGD	Return 180 Deg 4" LR S/XXH BW SA420WPL6			5



PS-101/COIL B
ISOMETRIC VIEW
SCALE: 1:16



PS-101/COIL B
ORIENTATION VIEW
SCALE: 1:15



PS-101/COIL B
FLAT VIEW
SCALE: 1:16

WELD SEQUENCE
37
34
35
33
32
36

ORIGINAL

PS-101/COIL B DESIGN DATA	
DESIGN AND FABRICATE TO:	ANSI/ASME B31.3 NFS 2010 EDITION
CLIENT SPECIFICATION:	ECA-PVF-S-03 REV 0 SPEC FAA
DESIGN PRESSURE:	5171 PSI
MAX. DESIGN METAL TEMPERATURE:	200°F
MIN. DESIGN METAL TEMPERATURE:	-20°F
IMPACT TEST:	EXEMPT PER TABLE 323.2.2 COLUMN A
RADIOGRAPHY:	100%
OTHER NDE:	SEE NOTE 7
POST WELD HEAT TREATMENT:	1150°F ± 25°F FOR 1 HOUR MIN.
HYDROSTATIC TEST PRESSURE:	7757 PSIG
CORROSION ALLOWANCE:	1/16"
PRE-HEAT:	50°F
WEIGHT EMPTY:	3930 LBS
WEIGHT FULL:	4388 LBS
CAPACITY:	7.4 CU FT
SURFACE AREA:	160 SQ FT
QUALITY CONTROL PROGRAM:	AQP-1253
WELDING PROCEDURE REGISTRATION NO.:	1604.2
WELD PROCEDURES:	NWP-4, NWP-6
SERVICE:	HYDROCARBONS
CRN NO.:	P-9417.213
DESIGN REGISTRATION DRAWINGS:	BDD-400A REV1
REFERENCE CALCULATIONS:	BDD-400A REV4

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ISSUED FOR CONSTRUCTION

SIGNED: _____

DATE: _____

W.O.: _____

S/N: _____

ALL DIMENSIONS IN INCHES

NWP INDUSTRIES INC.
Total oilfield supply.

P.O. BOX 6280, INNISFAIR, AB T4G 1S9
PH: (403) 227-4100 FAX: (403) 227-4102

THIS DRAWING IS PROPERTY OF NWP INDUSTRIES INC.
AND MAY NOT BE REPRODUCED WITHOUT PERMISSION.
THIS DRAWING MUST BE RETURNED UPON REQUEST.

ENCANA CORPORATION
LINEHEATER PACKAGE
3.0 MMBTU/HR
c/w 4" 2500# RTJ SPLIT COILS
COIL ASSEMBLY

DWN: VW CHK: *[Signature]* APP: *[Signature]*

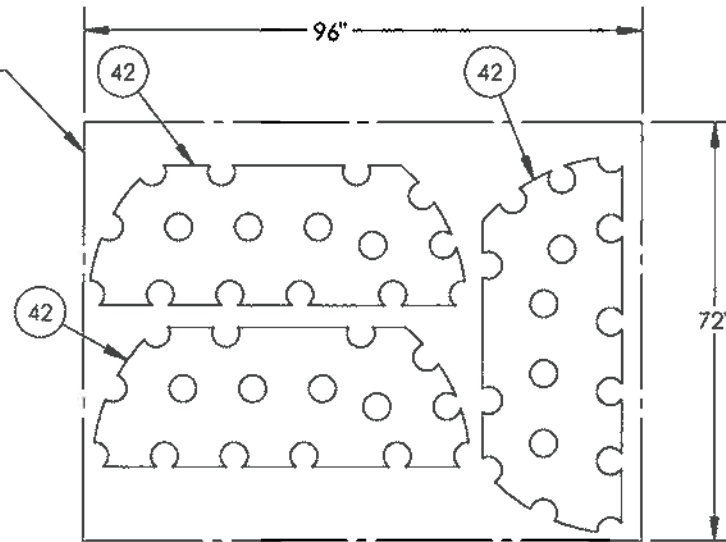
DATE: OCT 05/12 DATE: **OCT 29 2012** DATE: **OCT 29 2012**

SCALE: 1:40 DWG: **08562-4** REV: **0**

SHEET: 3 OF 4

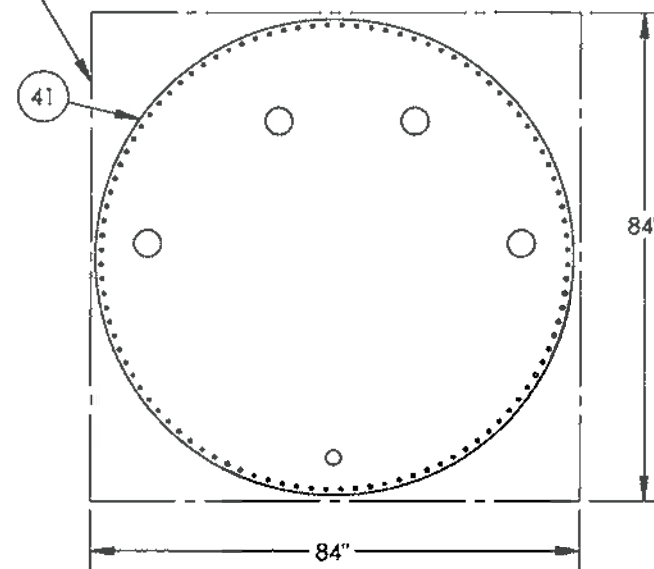
ITEM	PART #	DESCRIPTION	MTR #	LENGTH	QTY.
41	PLAC8484A	PLATE 3/8" x 84" x 84" SA36/44W		1	1
42	PLAB7296A	PLATE 1/4" x 72" x 96" SA36/44W		.3	3

NESTING PROGRAM
MAY NOT EXACTLY AS SHOWN
1/4" PLATE




08352 -CNC QTY OF PARTS PER 1/4" SHEET
SCALE: 1:32

NESTING PROGRAM
MAY NOT EXACTLY AS SHOWN
3/8" PLATE



08352 -CNC QTY OF PARTS PER 3/8" SHEET
SCALE: 1:32

ORIGINAL

							AS BUILT		ISSUED FOR CONSTRUCTION		 NWP INDUSTRIES INC. Total oilfield supply. P.O. BOX 6280, INNISFAIL, AB T4G 1S9 PH: (403) 227-4100 FAX: (403) 227-4102		ENCANA CORPORATION LINEHEATER PACKAGE 3.0 MMBTU/HR C/W 4" 2500# RTJ SPLIT COILS COIL ASSEMBLY			
08562-6	BATH ASSEMBLY															
08562-3	SKID ASSEMBLY															
08562-2B	PIPING ASSEMBLY	0	OCT 22/12	VW												
08562-2A	WELDED PIPING	A	OCT 05/12	VW												
DOCUMENT NO.	DESCRIPTION	REV	DATE	BY	CHK	APP										
REFERENCE DRAWINGS		DRAWING REVISIONS					ALL DIMENSIONS IN INCHES									

12520070

VT. 643 --.680

"Conforms with A.C.I.V.I. 311/12"

Sec II, Part A, 2010 edition,

Wuxi Huayou Special Steel Co., Ltd. addenda

Page 10 / 11


华友特钢
 HUAYOU SPECIAL STEEL

 MATERIAL CONFORMING
 TO CUSTOMER SPECIFICATIONS
 AS PER P.O.

产品质量证明书
 MILL TEST CERTIFICATE

 无锡市滨湖胡埭工业园西拓振湖路
 Tel: (0510)85580556 Fax: (0510)85580556

订货单位 CUSTOMER	REQUIREMENTS		证书号 CERTIFICATE NO.	11000252	制造方法 MAKING METHOD	热轧 HOT-ROLLED
收货单位 PURCHASER	Name: <i>Wuxi Huayou</i>		使用证号 LIC NO.	-	交货状态 DELIVERY CONDITION	热轧态 AS-ROLLED
产品名称 PRODUCT	无缝钢管 SEAMLESS STEELPIPES		合同号 CONTRACT NO.	100810	热处理工艺 HEAT TREATMENT	-
标准等级 SPEC/GRADE	ASTM/AASME A5A333-10 GR.B NACE MR0175-2008		生产日期 DATE OF ISSUE	2011-11-15		
外径 O.D.	114.3 MM	壁厚 W.T.	17.12 MM	长度 LENGTH	6.1 M	总重量(吨) TOTAL WEIGHT(TONS)
NPS 4	XXH	长度 LENGTH	6.1 M	总重量(吨) TOTAL WEIGHT(TONS)	39.044	
支数 PCS		168	总重量(吨) TOTAL WEIGHT(TONS)	39.044		

序号 NO.	生产批号 WORK NO.	炉号 HEAT NO.	支数 PCS	化学成份 %																			
1	110062	000132	168	CHEMICAL COMPOSITION																			
				C	Si	Mn	P	S	Ni	Cu	Cr	Mo	V	B	Nb	Ti	Mn/C	CE(CSA)	A	B	C	D	
				Max	0.300	1.350	0.025	0.025	1.000	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Min	0.100	0.280	0.017	0.008	0.008	-	-	-	-	-	-	-	-	-	-	-	-	-	-
拉伸试验 TENSILE TEST				屈服强度 Y.S.	抗拉强度 T.S.	伸长率 E.L.	冲击试验 IMPACT TEST																
				MPa	MPa	%	ACV (J)																
				415	240	30	10*10*55 (-45C)																
				555 / 560	355 / 365	34 / 35	51 43 33 42																
外观和尺寸 VISUAL & DIMENSION				合格	合格	合格	硬度试验 HARDNESS TEST																
				合格	合格	合格	(HR<22)																
				合格	合格	合格	(HB<34)																
				合格	合格	合格	水压试验 HYDROSTATIC TEST																
				合格	合格	合格	19.0 MPa, 10s																
				合格	合格	合格	无损探伤 N.D.E.																
				合格	合格	合格	超声波探伤 U.T.																
				合格	合格	合格	显微组织 MICROSTRUCTURE																
				合格	合格	合格	晶粒度 GRAIN SIZE																
				合格	合格	合格	F+P																
				合格	合格	合格	B																
试验方法 TEST METHOD				1. H. HEAT (LADLE) ANALYSIS, P. PRODUCT ANALYSIS.																			
试验方法 TEST METHOD				2. 试样尺寸: 10*10*55 (-45C)																			
试验方法 TEST METHOD				3. 试验方法: 拉伸、冲击、硬度、水压、无损探伤、显微组织、晶粒度。																			
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会签者
SURVEYOR
 WE HEREBY CERTIFY THAT THE MATERIALS DESCRIBED HEREIN HAVE BEEN MANUFACTURED, SAMPLED, TESTED AND
 INSPECTED IN ACCORDANCE WITH THE CUSTOMER'S SPECIFICATION(S), AND THAT THEY SATISFY THE REQUIREMENTS.

 检验员
INSPECTOR
王金峰
工厂检验员
STAMP OF MILL INSPECTOR


ESSAR Steel Algoma Inc.

105 West Street, Sault Ste. Marie, Ontario Canada P6A 7B4

CUSTOMER PURCHASE ORDER NUMBER 15063-BS
 ENTRY DATE 2011/10/05
 CREATE DATE 2011/11/20
 TALLY NUMBER 251758
 SHIPPER'S NO. -
 CARRIER NOXL

CHARGE TO CUSTOMER NAME AND ADDRESS
 ALBERTA INDUSTRIAL METALS LTD
 4821 - 78TH STREET
 RED DEER ALBERTA
 T4P 1N5

SHIP TO CUSTOMER NAME AND ADDRESS
 ALBERTA INDUSTRIAL METALS LTD
 7660 49TH AVENUE
 CALGARY, ALBERTA
 T4P 4G6

-380828

MILL TEST REPORTS

ESSAR STEEL ALGOMA INC. HEREBY CERTIFIES THAT THE MATERIAL HEREIN DESCRIBED WAS MADE AND TESTED IN ACCORDANCE WITH THE RULES OF THE SPECIFICATION SHOWN. ALL RESULTS ARE RETAINED IN ACCORDANCE WITH THE COMPANY'S STANDARD RECORD KEEPING PRACTICES.

K. UGHADPAGA

MANAGER METALLURGICAL SERVICES

THIS MILL TEST REPORT MAY NOT BE REPRODUCED EXCEPT IN FULL WITHOUT WRITTEN APPROVAL OF ESSAR STEEL ALGOMA INC. IF YOU RECEIVE THIS DOCUMENT AND ARE NOT THE INTENDED RECEIVER, PLEASE CALL (705) 945-2624 COLLECT FOR INSTRUCTIONS ON METHOD OF DISPOSAL OF DOCUMENT.

SUPPLEMENTARY INSTRUCTIONS

TEST CERT 1: BRADGABIM.CA TEST CERT 2: PLATE TEST COUPON:

WSP T/M TEST REPORTS REQUIRED
 USE VETTED RESALE

"Conforms with ASME Sec II, Part A, 2010 edition,"

2000204562 WS
 2011/11/21 19:02

MEETS EN 10204:2004 TYPE 3.1
 ISO QUALITY AND ENVIRONMENTAL CERTIFICATES AVAILABLE AT WWW.ESSARSTEELALGOMA.COM
 HEATS INDICATED WITH (+) MADE IN CANADA WITH DOMESTIC AND NORTH AMERICAN MATERIALS

CUSTOMER ITEM 00004 OUR ITEM 004 DIMENSIONS .240 MIN X 72 X COIL

COIL NUMBER	HEAT-MS	PIECES	NO. WEIGHT	COIL NUMBER	HEAT-MS	PIECES	NO. WEIGHT
446011000	0054M-03	1	39480	446013000	0054M-05	1	39100
446015000	0054M-54	1	38750				

TENSILE TESTS:

HEAT	0054M	SAMPLE	SRCE	GAUGE	COND	TEST METH	DIR	YIELD	TENSILE	% ELONG
HEAT	0054M	106"	.2400	AR	.2	64.2	77.2	26(2")		
HEAT	0054M	(WT %)	C	TI	MN	SN	P	S	SI	CR
			16	.87	.010	.007	.02	.02	.04	.01
			.001					.032	.022	.000

LAB ALG

WARNING

THE TEST RESULTS AND VALUES REPORTED HEREIN INDICATE ONLY THAT (1) THE PARTICULAR STEEL FOR WHICH THIS CERTIFICATE IS ISSUED MEETS THE MINIMUM SPECIFIED YIELD STRENGTH AND (2) THE CHEMICAL ANALYSIS AND PHYSICAL PROPERTIES OF SUCH STEEL ARE IN CONFORMANCE WITH THE REQUIREMENTS OF THE SPECIFICATION INDICATED. THE RESULTS OR VALUES REPORTED HEREIN CAN NOT BE USED TO QUALIFY THE STEEL FOR ANY SPECIFICATION OTHER THAN THE ONE INDICATED AND CAN NOT BE RELIED UPON FOR ANY PURPOSE INCLUDING DESIGN OR CALCULATIONS AS REPRESENTING THE ACTUAL STRENGTH OF SUCH STEEL.

ArcelorMittal Dofasco Inc.
P.O. Box 2460
Hamilton, Ontario
L8N 3J5

TEST REPORT
RAPPORT D'ESSAI

Attention: S/B Admin Dept.
Fax: 9 05 204 774 5732
Date: 05/05/2011

Page 1 of 1

Purchase Order/Bon de Commande
M51032461-02 JUNE
Bill of Lading/Connaissance
750536

Customer/Client
243000

Sales Order/Bon de Commande
HS2 306201006

Vendor/Vendeur

Packing Slip/Bordereau de Charge

Vehicle or Carrier/Vehicule ou Transporteur
TBA/TBA/C

Sold To/Vendu A
RUSSEL METALS INC.
P.O. BOX 39
WINNIPEG, MB.
R3C 2G3

Ship To/Expédier A
RUSSEL METALS INC.
1359 ST. JAMES ST.
WINNIPEG, MB.
R3H 0K9

Spec/Norm et Spec.
DOFASCO G40.21 44W/50W
STANDARD THICKNESS TOLERANCE
STANDARD UNEXPOSED SURFACE
MATERIAL CERTIFICATION REQUIRED
CODE SPOT 508-14

Material Description/Description du Material
HOT ROLLED STEEL SHEET
STRUCTURAL STEEL
COILS
MILL EDGE PLAIN DRY

.1740 MIN .1820 X 60 X COIL
Weight - 56400 LBS
Test Methods
ASTM A370, E1019, E415

051044379

MECHANICAL PROPERTIES

HEAT	SERIAL NUMBER	TEST UNITS KSI	GAUGE LENGTH 2 INCH
COULEE	NOMBRE DE SERIE	LIFT NUMBER YIELD STRENGTH	ULTIMATE STRENGTH %ELONG
		RESISTANCE A LA RESISTANCE A LA ALLONG	
		D'ELASTICITE TRACTION	
100512	P21493/00	4622159 71. ✓	78 ✓ 27.4 ✓

"Conforms with ASME
Sec II, Part A, 2010 edition"
Checked to SA36
Sept 26, 2011
OT

HEAT	C	Mn	P	S	Si	Cu	Ni	Cr	Sn	Mo	Al	Alt.	Cb	V	Ti	Ca	N	B	O
100512	.06 ✓	.62 ✓	.01 ✓	.007 ✓	.06 ✓	.16 ✓	.05	.08	.012	.013	.049	.051	.042	.003	.020	.002	.0075	.0002	

We Certify That The Material Described Herein Conforms To The Specification Shown On This Document
ArcelorMittal Dofasco Inc. as per Diane Skupny-MacBride - CMTL Supervisor
The Results Relate Only To The Items Tested

This Report Shall Not Be Reproduced Except In Full Without The Expressed Written Approval of The CMTL Supervisor.

This Contract Is Subject To The Terms And Conditions Of Sale Shown On The Order Acknowledgement.
Ce Contrat est Sujet aux Termes et Conditions de Vente Indiqués Sur l'Accuse de Reception de Commande.

VT.697-0.718

Ekanca

HENGYANG VALIN STEEL
TUBE CO., LTD

MILL CERTIFICATE

Add: 10 Dalixincun, Hengyang City, Hunan, P. R. China P. C.: 421001

Tel and Fax: +86 734 8873739
E-mail: hsienc@hysteel.com

(ACCORDING TO EN10204 3.1)

CUSTOMER	KELLY PIPE		CERTIFICATE NO.	C201139822-1	
CONTRACT NO.	NO. 190471		DATE:	2011-12-31	
PRODUCT	SEAMLESS CARBON STEEL PIPE		DELIVERY CONDITION	N	
SPECIFICATION	SEE SPECIFICATION NOTE		HEAT TREATMENT		
GRADE	B/A333-GR.6/X42		DIMENSIONS(mm)	4" * 0.674" * 40FT	
TOTAL BUNDLES:	39	TOTAL PIECES:	190	TOTAL LENGTH:	7604.94 FT
				TOTAL WEIGHT:	95.113 MT

NO.	LOT No.	HEAT No.	BUNDLES	PIECES	LENGTH		WEIGHT	TENSILE TEST ASTM A370							FLATTENING TEST
					FT	MT		SAMPLE TYPE/ ORIENTATION / SIZE(mm)/GAUGE LENGTH(mm)/SL25.4/50							
								TS(Psi)	YS(Psi)	R0.5	EL(%)	R.A. (%)	YSTS		
						#1									
1	812100049	1115920	8	38	1520.99	19.023		67425/67135 ✓	✓	49140/47850 ✓	✓	44.5/44.0 ✓	0.71/0.71	ACCEPTABLE	
2	812100050	1115921	6	30	1200.78	15.018		71340/70515 ✓	✓	51620/50750 ✓	✓	44.5/46.0 ✓	0.72/0.72	ACCEPTABLE	
3	812100051	1115925	7	36	1440.94	18.021		68005/68295		48865/49300		45.0/44.0	0.72/0.72	ACCEPTABLE	
4	812200052	1115926	9	42	1681.09	21.025		69310/68875 ✓	✓	49590/49445 ✓	✓	44.0/45.0 ✓	0.72/0.72	ACCEPTABLE	
5	812200053	1115924	9	44	1761.14	22.026		71485/70905 ✓	✓	53070/52490 ✓	✓	44.5/44.0 ✓	0.74/0.74	ACCEPTABLE	

NO.	IMPACT TEST										NON METALLIC INCLUSION	GRAIN SIZE	HARDNESS TEST	
	NOTCH TYPE/ORIENTATION/TEMPERATURE/SIZE (mm) :												NACE MR0175	HRC <22
	V8T/45/10													
	AK1 (J)	Av. (J)	% SHEAR AREA	LE	AK2 (J)	Av. (J)	% SHEAR AREA	LE						
1	123.0/145.0/132.0	134	85/90/88										OK ✓	
2	158.0/136.0/178.0	157	85/80/92										OK	
3	150.0/172.0/130.0	151	90/92/85										OK	
4	128.0/114.0/156.0	133	86/85/88										OK ✓	
5	147.0/159.0/168.0	158	85/87/90										OK ✓	

NOTES:

W1--THEORETICAL WEIGHT
W2--ACTUAL WEIGHT
NR--NORMALIZING ROLLED
AK1--ABSORB ENERGY FOR THE FIRST SET
AK2--ABSORB ENERGY FOR THE SECOND SET

Date: 2011-12-31

SAMPLE ORIENTATION: L--LONGITUDINAL T--TRANSVERSE
SAMPLE TYPE: S--STRIP C--CLUBBED F--FULL-SECTION
Q&T--QUENCHING AND TEMPERING
N--NORMALIZING
A--ANNEALING
AV--AVERAGE
LE--SIDE EXPANSION

HE--HOT EXPANDED
HR--HOT ROLLED
N&T--NORMALIZING AND TEMPERING

Add: 10 Daitvincun, Hengyang City, Hunan, P. R. China
P. C. :421001
Tel and Fax: +86 734 8873749
E-mail: hsioc@hysteel tube.com

MILL CERTIFICATE

HENGYANG VALIN STEEL
TUBE CO., LTD

CUSTOMER		KELLY PIPE		CERTIFICATE NO.	C201139822-1	
CONTRACT NO.		2011-12-31		DATE:	2011-12-31	
PRODUCT		SEAMLESS CARBON STEEL PIPE		DELIVERY CONDITION	N	
SPECIFICATION		SEE SPECIFICATION NOTE		HEAT TREATMENT		
GRADE		B/A333-GR.6/X42		DIMENSIONS(mm)	4" * 0.674" * 40FT	
TOTAL BUNDLES: 39		TOTAL PIECES: 190	TOTAL LENGTH: 7604.94	FT	TOTAL WEIGHT:	95.113 MT

CHEMICAL COMPOSITION (%)																				
NO	HEAT No.	LOT No.	Type	C	Si	Mn	Cr	Mo	W	Cu	Ni	P	Al	Sn						
				*100																
				As	Pb	Sb	Nb	Ti	Zr	N	Bi	S	V	B						
				*10000																
				Ca	CEIPE	CEPER	SUM1	SUM2	SUM3	R1	R2	R3								
				*100																
1	1115920		H	14	31	10	5	1	6	2	16	24	40	40	2	34	144	5	8	7.9
	812100049		P	15	32	108	5	1	4	2	15	27	80	47	1	35	125	5.7	8.7	7.2
	812100049		P	14	33	107	5	1	4	2	15	27	80	47	1	34	125	5.7	8.7	7.6
	1115921		H	15	33	112	6	3	6	2	16	23	50	43	2	36	174	5.3	7.3	7.5
	812100050		P	14	31	108	5	1	4	2	15	27	80	47	1	34	125	5.7	8.7	7.7
2	812100050		P	15	32	107	5	1	4	2	15	27	80	47	1	35	125	5.7	8.7	7.1
	1115925		H	15	34	110	5	1	4	2	16	30	70	44	2	35	124	5.4	8.4	7.3
	812100051		P	14	31	106	5	1	4	2	15	27	80	47	1	33	125	5.7	8.7	7.6
3	1115926		H	15	31	107	5	1	4	2	15	27	80	47	1	35	125	5.7	8.7	7.1
	812100051		P	16	31	109	5	1	5	2	14	28	60	44	2	36	134	5.4	8.4	6.8
	812200052		P	15	32	106	5	1	4	2	15	27	80	47	1	35	125	5.7	8.7	7.1
4	812200052		P	15	32	106	5	1	4	2	15	27	80	47	1	34	125	5.7	8.7	7.1
	1115924		H	15	31	109	5	1	5	2	16	31	120	42	3	35	134	5.2	8.2	7.3
	812200053		P	13	33	106	5	1	4	2	15	28	80	47	1	32	125	5.7	8.7	8.2
5	812200053		P	14	32	107	5	1	4	2	15	28	80	47	1	34	125	5.7	8.7	7.6

NON-DESTRUCTIVE TEST									
PIPE BODY					PIPE END				
ET					MPI				
ACCEPTABLE					ACCEPTABLE				
ACCEPTABLE					ACCEPTABLE				
N/A					N/A				
ACCEPTABLE					ACCEPTABLE				
3000/6					ACCEPTABLE				

POSITION	PIPE END		BEVELLING	
NDT Type(Leve)	MPI		ACCEPTABLE	
LAMINAR	N/A		ACCEPTABLE	
TEST RESULT	ACCEPTABLE		COATING	
RESIDUAL MAGNETISM	ACCEPTABLE		ACCEPTABLE	
UT THICKNESS MEASUREMENT (50%)	N/A		ACCEPTABLE	
HYDROSTATIC TEST	3000/6		ACCEPTABLE	

NOTES: H-HEAT ANALYSIS P-PRODUCT ANALYSIS CE-EQUIVALENT CARBON R-RATIO R1=Ca /S R2=A1/N R3=Mn/C
CEIW=C+Mn/6+(Cr+Mo+V)/5+(Cu+Ni)/15
SUM1=C+Cu+Mo+Ni+V
SUM2=Nb+V
SUM3=Nb+V+Ti
L4--ACCEPT LEVEL L4 NOTCH DEPTH IS 12.5% THE SPECIFIED WALL THICKNESS
L2--ACCEPT LEVEL L2 NOTCH DEPTH IS 5% THE SPECIFIED WALL THICKNESS

$$Mn/C = \frac{\text{lowest Mn}}{\text{highest C}} = \frac{1.09}{.16} = 6.81$$

HENGYANG VALIN STEEL
TUBE CO., LTD

MILL CERTIFICATE

Add: 10 Dalixincun, Hengyang
City, Hunan, P. R. China P. C. :421001
Tel and Fax: +86 734 8873739
E-mail: hsteel@hysteelube.com

(ACCORDING TO EN10204 3.1)

CUSTOMER	KELLY PIPE		CERTIFICATE NO.	C201139822-1
CONTRACT NO.	NO. 190471		DATE:	2011-12-31
PRODUCT	SEAMLESS CARBON STEEL PIPE		DELIVERY CONDITION	N
SPECIFICATION	SEE SPECIFICATION NOTE		HEAT TREATMENT	
GRADE	B/A333-GR.61 X42		DIMENSIONS(mm)	4" * 0.674" * 40FT
TOTAL BUNDLES:	39	TOTAL PIECES:	190	TOTAL LENGTH: 7604.940
			FT	TOTAL WEIGHT: 95.113
				MT

REMARK:

SPECIFICATION NOTE
ASTM A53B/A106B/A333-6-2010, ASME SA53B/SA106B/SA333-6-2010, API 5LB/X42, PSL-2-2008, NACE MR-0175-2009 (FOR HARDNESS ONLY) (CSA Z245.1 GR.241/290 CAT II -2007)

We hereby certify that material herein described has been manufactured in accordance with the standards and specifications required in your order and satisfies the corresponding requirements.

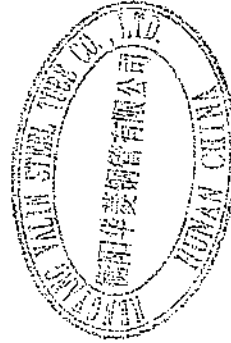
This certificate is issued by a computerized system and it is valid with electronic signature. On the original certificate the trade-mark JOINTIME light-green coloured at the bottom of the page is stamped. In case the owner of the certificate would release a copy of it, he must attest its conformity to the original one taking upon himself the responsibility for any unlawful or not allowed use.

Any alteration and/or falsification will be subject to the law.

If you need to assure the authenticity of this certificate, please do not hesitate to contact Hengyang Valin Steel Tube CO., LTD, E-mail: hsteel@hysteelube.com

CUSTOMER THIRD PARTY

Quality Manager: 胡双开



Certificate-maker: 唐娅娜

CLIENTE / Customer / Client

CCTF CORPORATION (EDMONTON)
5407 - 53 AVENUE NW
EDMONTON, AB T8B 3G2
CANADA

CERTIFICADO DE INSPECCION

Inspection Certificate - Certificat de Réception

DIN EN 10204 / 3.1
ISO 10474 / 3.1

FECHA:
Date:

19/10/2012

N.
No.

151901

HOJA:
Page: 1



PRODUCTO
Article - Produit

FLANGES

SU PEDIDO N.
Your Order No.

4891890-00

DE

of. - de 28/09/2012

Certified acc. PED 97/23/EC+AD2000-W0
by TÜV Rheinland
N.º 01 202 E/Q 02 7443

Bº Zubilaga, 3 - Apdo. 14
20560 Oñati (Gipuzkoa) SPAIN
Tel.: 34 - 943 780552
Fax: 34 - 943 781808
E-mail: ulma@ulmapiping.com

NORMAS APLICABLES
Requirements - Normes Applicables

ASME B16.5-09

MATERIAL CORRESPONDIENTE ASTM/ASME A/SA105N-11 A/SA350LF2CL1-11

Material Correspondent - Qualité

MODO DE FUSION (*)

Steel Making - Elaboration de l'acier

E = Elec. Y = Origeno básico

NACE MR0175/ISO15156-2-09 & MR0103-10

Clause 7.2.1.4, Annex A.2 and SSC Region 3.

CSA-Z245.12-09 GR248 CAT II - SS (WN & BLIND FLANGES ONLY)

MARCA DEL FABRICANTE
Mark of factory
Marque du fabricant



Packing List: 96870

DEPARTAMENTO QUALITY ASSURANCE
Section
Département

PARTIDA Item Poste	CANTIDAD Quantity Quantité	DESCRIPCION Description Description	LOTE	OBSERVACIONES Remarks Observations (*)	COLADA N. Heat No N.ºCoulée	RESISTENCIA T.Strength Resist Tens N/mm2	LONGITUD Y.Strength Y. Strength N/mm2	ALARGAM. Elongation Allongement Lo: 4 d %	ESTRICCION Red. Area Striction %	RESILIENCIA Impact test Résilience Joules	CHARPY V 10x10mm MEDIA Average Moyenne °C	DUREZA Hardness Dureté HBW
18 7586840	7	WN 12 150LB STD RF A350LF2	1742	NE	329V2	513	325	28,40	58,30	50 56 52	53 -50	155 161
18 7586840	17	WN 12 150LB STD RF A350LF2	2482	NE	526V2	515	318	26,40	55,30	63 69 66	66 -50	150 152
29 7581234	4	WN 4 2500LB XXS RTJ A350LF2	1062	NE	192V2	533	338	25,00	47,60	61 35 38	45 -50	155 156

RATIO = 4.15

COLADA N. Heat No N.ºCoulée	COMPOSICION QUIMICA - STEEL MAKER'S LADLE ANALYSIS - ANALYSE CHIMIQUE														
	C %	Si %	Mn %	P %	S %	Cr %	Ni %	Mo %	Nb %	V %	Cu %	Al %	Ti %	N %	CEq %
192V2	0,200	0,220	0,830	0,009	0,001	0,150	0,080	0,020	0,001	0,002	0,250	0,020	0,000	0,000	0,395
329V2	0,200	0,240	0,860	0,011	0,001	0,200	0,090	0,040	0,001	0,003	0,190	0,028	0,000	0,000	0,411
526V2	0,210	0,195	0,840	0,012	0,002	0,059	0,083	0,025	0,006	0,005	0,260	0,025	0,000	0,000	0,391

- Las dimensiones y la condición superficial se hallaron satisfactorias.
- Dimension and surface condition were found acceptable.
- Les dimensions et états de surface sont satisfaisants.

- Los materiales citados cumplen las normas aplicables.
- Manufacturing requirements are satisfied.
- Les normes applicables sont respectées.

(*) OBSERVACIONES:
Remarks
Observations

N NORMALIZED AT 900 C AND ALLOWED TO COOL IN STILL AIR

2012/11/7 S. Nason
"Conforms with ASME
Sec II, Part A, 2010 edition,
2011a addenda"

ENCANA
MATERIAL CONFORMS
TO CUSTOMER
SPECIFICATIONS
AS PER P.O.
REQUIREMENTS

Name: S. Nason

Date: 2012/11/7



NOV 05 2012

DeBeiser/Dale Karg
Date of Issue: March 30 2012
Rev Status: 2.0

NWP
Industries Inc. TM

ABSA
FORM NDE_001
N.D.E Requirements

N.D.E Requirements

Client: NWP Industries

Project: UT 4" Return Bends (HT # 387032, 356547)

JO#

Date: 08/11/2012

Piping: ☒

Pressure Vessel: ☐

Tank: ☐

Other:

☐ X-Ray

☐ Gamma Ray

☒ Ultrasonics

☐ Liquid Penetrant

☐ Magnetic Particle

☐ Acoustic Emission

☐ Hardness test Max 200 BHN

☒ 100%

☐ Full

☐ 25%

☐ 10%

Other(Define)

☐ Spot

☐ ASME Section VIII-UW-51

☐ ASME Section VIII-UW-52

☐ Customer Specification

☒ ASME B31.3 NFS

Other (Specify)

☐ Customer Spec

☐ CSA W47.1/W59

General Instructions:

Vessel S/N

P1 Material

Welder ID

Shell-T=

Pipe-T= 4" XXH

Total Welds UT x 564" XXH return bends for Mill Tolerances record min & avg reading on report (First # is UT-264)

Please use wire type iQi

Please Note locations of all indications on films on reports

Please include O.F.D-S.O.D S.F.D on reports

Special Requirements:

Shots

Butt Weld Xray to be identified as X-#

Gap Shots to be identified as GS-#

Threaded Shots to be identified as XT #

Identify on Envelope part of package being shot i.e. Coil, Piping, ect.

Flashes must contain: Customer, JO#, Spool Identification, Xray number, Clock, Logo, Welder's ID Symbol, Date

Mark all indicated repairs on the project

NOTE: Encana Spec for Welded Piping-acceptance is zero UC and Zero IP
Encana Spec for Socket Welds-acceptance is minimum 1/16" gap
Encana Spec for Threaded Piping- acceptance is 7 thread engaged
HT is a 5 Point Traverse

Prepared By: Karim Boustanta

Date: 08/11/2012



ULTRASONIC INSPECTION REPORT

DATE:	NOVEMBER 9/2012	REPORT #:	UGM-121109	PAGE 1 OF 3
CLIENT:	NWP INDUSTRIES		ECHO JOB #:	4815
CONTRACTOR:				
LOCATION:	NWP SHOP (INNISFAIL AB)	PROJECT:	UT 4" RETURN BENDS (HT # 387032, 356547)	
ITEMS EXAMINED:	56 RETURN BENDS (UT-264 THRU UT-319)			
PROCEDURE:	UT-1	CLIENT JOB # (PO, WO, AFE.):		
ACCEPTANCE CRITERIA & SPECIFICATION:		ASME B31.3 NFS		
MODE:	<input checked="" type="checkbox"/> Zero Degree <input type="checkbox"/> Shear Wave <input type="checkbox"/> Specialty:			
EQUIPMENT TYPE:	GE DMS/USM GO	Serial No.:	USMGO11105174	Last Calibration: JUNE 15/2012
CABLE LENGTH:	80"	COUPLANT:	UT-X	
CAL BLOCK(S):	<input type="checkbox"/> 1/2" Step <input checked="" type="checkbox"/> 1" Step <input type="checkbox"/> 3/4" ASME <input type="checkbox"/> 1 1/2" ASME <input type="checkbox"/> DSC <input type="checkbox"/> IIW <input type="checkbox"/> TEST PIECE:			
REF RELECTOR:	Type: Perpendicular	Size:	Depth:	Response Ht.: 80% FSH
	0 DEG	LONG	5MHZ	0.250"
			STRESSTEL	01YB62
			1.000"	58
				+6
				64

SURFACE CONDITION: ☒ Clean Base Metal
☐ As Ground
☐ Machined
☐ Sand Blast
☐ Painted
☐ Other:

SCOPE:

A ZERO DEGREE ULTRASONIC INSPECTION WAS PERFORMED ON THE ABOVE STATED AREAS AS REQUESTED BY CLIENT. THIS INSPECTION INCLUDED 56 RETURN BENDS. A LOW AND AVERAGE READING WAS RECORDED FOR EACH RETURN BEND. EACH RETURN BEND WAS 4" XXS (NOMINAL 0.674" AND MILL TOLERANCE @ 12.5% WOULD BE 0.590").

RESULTS:

REFER TO PAGES 2 THRU 3 FOR AREAS OF INSPECTION AND RESULTS.

Misc Charges SEE FIELD INVOICE FGM-121109	NAME / CERTIFICATION/SIGNATURE GREG MERCER CGSB / SNT-TC-1A UTI / MTH # 11987	Regular Hours Overtime Hours Shift Premium Kilometers Assistant	SEE FIELD INVOICE FGM-121109
Client: (name:approval) <i>[Signature]</i>			

53A Burnt Park Drive | Red Deer, AB | T4P 0J7

Ph: (403) 347-7622 Fax: (403) 347-7652 www.echonde.com



ULTRASONIC INSPECTION REPORT

DATE:	NOVEMBER 9/2012	REPORT #:	UGM-121109	PAGE 2 OF 2
CLIENT:	NWP INDUSTRIES			ECHO JOB #: 4815
CONTRACTOR:				
LOCATION:	NWP SHOP (INNISFAIL AB)	PROJECT:	UT 4" RETURN BENDS (HT # 387032, 356547)	

UT264 1	0.686in	UT276 1	0.666in	UT288 1	0.710in
UT264 2	0.702in	UT276 2	0.707in	UT288 2	0.728in
UT265 1	0.704in	UT277 1	0.687in	UT289 1	0.708in
UT265 2	0.718in	UT277 2	0.710in	UT289 2	0.716in
UT266 1	0.674in	UT278 1	0.712in	UT290 1	0.689in
UT266 2	0.690in	UT278 2	0.730in	UT290 2	0.698in
UT267 1	0.717in	UT279 1	0.673in	UT291 1	0.669in
UT267 2	0.735in	UT279 2	0.697in	UT291 2	0.699in
UT268 1	0.684in	UT280 1	0.704in	UT292 1	0.685in
UT268 2	0.700in	UT280 2	0.723in	UT292 2	0.698in
UT269 1	0.695in	UT281 1	0.670in	UT293 1	0.651in
UT269 2	0.710in	UT281 2	0.688in	UT293 2	0.669in
UT270 1	0.673in	UT282 1	0.692in	UT294 1	0.721in
UT270 2	0.694in	UT282 2	0.704in	UT294 2	0.733in
UT271 1	0.673in	UT283 1	0.640in	UT295 1	0.688in
UT271 2	0.689in	UT283 2	0.676in	UT295 2	0.715in
UT272 1	0.666in	UT284 1	0.702in	UT296 1	0.707in
UT272 2	0.685in	UT284 2	0.723in	UT296 2	0.716in
UT273 1	0.702in	UT285 1	0.684in	UT297 1	0.682in
UT273 2	0.718in	UT285 2	0.719in	UT297 2	0.697in
UT274 1	0.688in	UT286 1	0.684in	UT298 1	0.718in
UT274 2	0.710in	UT286 2	0.699in	UT298 2	0.743in
UT275 1	0.674in	UT287 1	0.668in	UT299 1	0.723in
UT275 2	0.695in	UT287 2	0.689in	UT299 2	0.747in

Misc Charges	NAME/CERTIFICATION	Regular Hours	SEE
SEE FIELD INVOICE FGM-121109	CGSB / SNT-TC-1A UT/MTII # 11987	Overtime Hours	FIELD
		Shift Premium	INVOICE
		Kilometers	FGM-121109
Client Representative:		Technician Signature:	Assistant:

53A Burnt Park Drive | Red Deer, AB | T4P 0J7
 Ph: (403) 347-7042 Fax: (403) 347-7052 www.echonde.com



ULTRASONIC INSPECTION REPORT

DATE:	NOVEMBER 9/2012	REPORT #	UGM-121109	PAGE 2 OF 3
CLIENT:	NWP INDUSTRIES			ECHO JOB #:
CONTRACTOR:				4815
LOCATION:	NWP SHOP (INNISFAIL AB)	PROJECT:	UT 4" RETURN BENDS (HT # 387032, 358547)	


UT300 1	0.711in	UT312 1	0.690in
UT300 2	0.726in	UT312 2	0.710in
UT301 1	0.706in	UT313 1	0.695in
UT301 2	0.720in	UT313 2	0.718in
UT302 1	0.716in	UT314 1	0.694in
UT302 2	0.730in	UT314 2	0.708in
UT303 1	0.672in	UT315 1	0.724in
UT303 2	0.696in	UT315 2	0.742in
UT304 1	0.704in	UT316 1	0.697in
UT304 2	0.723in	UT316 2	0.711in
UT305 1	0.696in	UT317 1	0.701in
UT305 2	0.714in	UT317 2	0.720in
UT306 1	0.662in	UT318 1	0.690in
UT306 2	0.684in	UT318 2	0.703in
UT307 1	0.714in	UT319 1	0.708in
UT307 2	0.744in	UT319 2	0.725in
UT308 1	0.702in		
UT308 2	0.715in		
UT309 1	0.697in		
UT309 2	0.718in		
UT310 1	0.681in		
UT310 2	0.689in		
UT311 1	0.688in		
UT311 2	0.697in		

Misc Charges	NAME/CERTIFICATION CGSB / SNT-TC-1A UTI/MTII # 11987	Regular Hours	SEE
SEE FIELD INVOICE FGM-121109		Overtime Hours	FIELD
		Shift Premium	INVOICE
		Kilometers	FGM-121109
Client Representative: <i>[Signature]</i>	Technician Signature: <i>[Signature]</i>	Assistant:	

53A Burnt Park Drive | Red Deer, AB | T4P 0J7

Ph: (403) 347-7042 Fax: (403) 347-7052 www.echonde.com

Return Bend 180° 4" XXH

erne fittings gmbh A-6024 Schllns Hauptstrasse 48 Austria/Europe Telefon +43/5524 501-0. Telefax +43/5524 501-930		 Reg. No. 12 100 3054		Abnahmeprüfzeugnis Inspection Certificate EN 10204 - 3.1				Artikelbezeichnung [designation] elbows LR-180-S-WPL6-4"-XXS ✓			
Kunde [customer] TRANS AM Piping Products Ltd. Attn: Svava 9335 Endeavor Drive S.E. CDN-T3S 0A1 Calgary, Alberta		Zeugnis Nr. [cert. no.] 032448/12-SD		Rev.		Datum [date] 24/07/2012		Anforderungen der Bestellung [requirements of the order] ASME B16.9-2007 LR, material:WPL6, TR-fitting:ASTM A 420/A 420M-10, ASME SA-420M-Ed.07, TR-addit fitting:NACE ✓ MR0175/ISO15156-2:2003A.2, NACE MR0103-2007 2.1 and 4, certificate:EN 10204/3.1, end preparation:ASME B16.9-2007 Tab. 12(a), rust protection:Millstandard, execution:Seamless			
		Code-Nr. [code no.] 356637		Ident Nr. [ident no.]							
		Unsere Auftrags.Nr./Art.Nr. [our order no./item no.] 141790IH-0060 / 114448									
		Ihre Bestell Nr. [your order no.] CI-12-387									
Vormaterial [base material] seamless pipe		Menge [quantity] 30		J-Faktor CEQ [CEQ]:		$(Si + Mn) * (P + Sn) * 10000$ $C + (Mn / 6) + (Cr + Mo + V) / 5 + (Cu + Ni) / 15$					
Analyse [analysis] Schmelze Nr. [heat no.] Y		Erschmelzungsart [melting process] 1 = Schmelzanalyse [heat analysis]		CEQ [CEQ]:							
Index 1		C ✓ Si ✓ Mn ✓ P ✓ S ✓ Cr ✓ Mo ✓ Ni ✓ Cu ✓ V ✓ Nb ✓ Al B Ti N Ceq		0.15 0.17 0.92 0.014 0.001 0.07 0.01 0.02 0.01 0.001 0.001 0.038 0.0003 0.004 0.0081 0.322 ✓							
Mech.-technologische Prüfung [mech. technological test]											
Proben Nr. [test no.] 6388 12		Zugversuch [tensile test]				Kerbschlagbiegeversuch [notched bar impact test] Form: ISO-V				Härteprüfung [hardness test] 135-147 HB ✓	
		Pr.-Lage [pos. of sample] Temp.		Dehng. [yield str.] ReH Rp 0.2		Zugfestigkeit [tensile str.] Rm (MPa)		Dehnung [elongation] 4D (%)		PR-Lage [pos. of sample] Temp. Querschnitt [cross sec.] Kerbschlagarbeit [impact values] (J)	
		LNZ +20 °C		381 361 481		35		LNZ -50 °C 80		268-312-330	
6.1 Ratio										Wärmebehandlung [heat treatment] quenched and tempered temperature 940 °C / 640 °C Cooling in water/in still air	
Kennzeichnung [marking]		e QS AUSTRIA / WPL6 / 356637 / 4" / XXS				Zusatzmarkierung [add. mark.]					
Besichtigung und Ausmessung [visual inspection and dimensional check]		o.B./o.K.				Die gelieferten Produkte entsprechen den Anforderungen der Bestellung (einschließlich Herstellung, Probennahme, Testen und Prüfen). [The supplied products comply with the requirements of the order (including manufacturing, sampling, testing and inspections).]					
Bemerkungen [remarks] hot formed over mandrel						Der Werksachverständige [the Works Inspector] 24/07/12 Scheibenstock Daniel ☎ - 323					
						Dieses Dokument wurde elektronisch erstellt und ist ohne Unterschrift gültig. [The certificate is issued by the computerized system and is valid without signature.]					

Zertifiziert nach DGRL 97/23/EG Anhang I - Absatz 4.3 durch TÜV SÜD Industrie Service, Benannte Stelle 0036, Zertifikat Nr. 129/2002/MUC [Certified acc. to PED 97/23/EG Annex I, Paragraph 4.3 by TÜV SÜD Industrie Service, Notified Body 0036, Certificate No. 129/2002/MUC]

"Conforms with ASME
 Sec II, Part A, 2010 edition,
 2011a addenda"

NOV 05 2012

TO CUSTOMER
 SPECIFICATIONS
 AS PER P.O.
 REQUIREMENTS

Name: Enlana

Date: NOV 05 2012

08562-002-A

2012/8/21 S. Nason
 "Conforms with ASME
 Sec II, Part A, 2010 edition,
 2011a addenda"

MILL TEST & INSPECTION CERTIFICATE

ACCORDING TO EN 10204 :2004 3.1

CUSTOMER : SEYBOLD INTERNATIONAL CORP.

CERT. NO : 122328

L/C NO :

ORDER NO : 7005475

DATE : 07/10/2012

INVOICE NO : BW01210102123

PAGE : 9

ORIGIN : TAIWAN



柏緯鐵工股份有限公司

高雄市仁武區烏林里仁心路 303 號

BOTH-WELL STEEL FITTINGS CO., LTD.

NO.303, JEN-HSIN ROAD JEN-WU DISTRICT

KAOHSIUNG CITY, TAIWAN R.O.C. (81460)

TEL: 886-7-371-0497, 371-1536, 372-0260

An ISO 9001:2008 Registered Manufacturer



FAX: 886-7-371-3864, 371-3882

web site: http://www.bothwell.com.tw e-mail: bothwell@www.bothwell.com.tw or box@bothwell.com.tw

ITEM	BW HT. CD.	RAW MATERIAL HEAT NO.	DESCRIPTION	QUANTITY	SPECIFICATION FOR		INSPECTION	
					MATERIAL	FITTING	SURFACE	DIM.
024	3760	327004	HALF CPLG 1/2" 3000# NPT	700 PC	ASTM A105N -05	ASME B16.11 - 2009	GOOD	GOOD
025	3697	325198	HALF CPLG 3/4" 3000# NPT	500 PC	ASME SA105N -A08			
026	3753	326700	HALF CPLG 1" 3000# NPT	1800 PC				
027	3803	328082	HALF CPLG 1-1/2" 3000# NPT	125 PC				
028	3799	328437	HALF CPLG 2" 3000# NPT	400 PC				

ITEM	BW HT. CD.	CHEMICAL COMPOSITION (%)																MATERIAL SUPPLIER
		C	Si	Mn	P	S	Cu	Cr	Ni	Mo	V	Cb(Nb)	N	Al	Ti	Zr	CE	
Min		-	0.10	0.60	-	-	-	-	-	-	-	-	-	-	-	-	-	
Max		0.35	0.35	1.05	0.035	0.040	0.40	0.30	0.40	0.12	0.08	-	-	-	-	-	0.45	
024	3760	0.190	0.200	0.820	0.015	0.010	0.180	0.120	0.070	0.020	0.002	0.001	-	-	-	-	0.372	
025	3697	0.200	0.190	0.810	0.024	0.010	0.250	0.110	0.050	0.020	0.002	0.001	-	-	-	-	0.381	
026	3753	0.190	0.200	0.840	0.016	0.005	0.140	0.130	0.060	0.020	0.002	0.001	-	-	-	-	0.374	
027	3803	0.190	0.190	0.850	0.017	0.010	0.150	0.080	0.040	0.020	0.002	0.001	-	-	-	-	0.365	
028	✓ 3799	0.190	0.200	0.840	0.013	0.012	0.100	0.070	0.050	0.010	0.002	0.001	-	-	-	-	0.356	

ITEM	BW HT. CD.	MECHANICAL PROPERTIES						HEAT TREATMENT				ADDITIONAL TEST /REMARKS CONFORMS TO NACE MR0175-09 /MR0103-10 STEEL MAKING PROCESS : ELECTRIC FURNACE CONFORMS TO NACE ISO15156-3 2009		MATERIAL CONFORMS TO CUSTOMER SPECIFICATIONS AS PER PROJECT REQUIREMENTS	
		T. S. (KSI)	Y. S. (KSI)	EL. (%)	R of A (%)	Hardness (HBW)(AVG)	Charpy Impact °F / 0 °C								
		70	36	22	30	-	MIN./AVG. / (Joule)								
Min	Max	-	-	-	-	187	1	2	3	AVG.	NORMALIZED <				

WE HEREBY CERTIFY, THAT THE MATERIAL DESCRIBED ABOVE HAS BEEN TESTED AND COMPLIES WITH THE TERMS OF THE ORDER CONTRACT.

C.C. Huang
 Q.C. MANAGER
 CHEN CHI HUANG

Y.Y. Chang
 INSPECTOR
 YUAN YAO CHANG

☺ BW-D0839 REV:1

P.O.# 708678 Item# 1
 Heat Number: 3799
 Trans Am Piping Products Ltd. ; Rev'd By: SB
 Shipment / Seq #: 17

SSAB

Test Certificate

1770 Bill Sharp Boulevard, Muscatine, IA 52761-9412

Form TCI: Revision 1: Date 31 Oct 2000

Customer:
SAMUEL & SON LIMITED
(A DIVISION OF SAMUEL SALES)
2368 DIXIE ROAD
MISSISSAUGA
ON L4Y1Z7

Customer P.O. No.: U01112 & 41-336026
Product Description: CSA G40.21(2004)48W/300W / ASTM A36(08)
A709(01A)36/ASME SA36(01ED)

Mill Order No.: 41-330027-04 **Shipping Manifest:** MTR169567

Ship Date: 20 May 12 **Cert No.:** 061326631
Cert Date: 20 May 12 **(Page 1 of 1)**

Size: 0.375 X 96.00 X 480.0 (IN)

Tested Pieces										Tensiles					Charpy Impact Tests									
Heat Id	Piece Id	Tested Thickness	1st Loc (KSI)	YS (KSI)	UTS (KSI)	%RA Elong % 1st Dir	Average Hardness	Abs. Energy (FTLB) 1 2 3 Avg	% Shear 1 2 3 Avg	1st Imp	1st Dir	1st Siz (mm)	BDWTT 1st Imp %Shr											
W2D776	F50	0.373 (DISCRT)	L 50	69	44	T																		
Heat Id	C	Ma	P	S	Si	Total	Cu	Ni	Ce	Mo	Co	V	Ti	B	N	ORGN								
W2D776	.15	.85	.011	.007	.03	.022	.29	.15	.10	.04	.001	.007	.017	.0001	.0075	USA								

MERCURY IS NOT A METALLURGICAL COMPONENT OF THE STEEL AND NO MERCURY WAS INTENTIONALLY ADDED DURING THE MANUFACTURE OF THIS PRODUCT
MTR EN 10204:2004 INSPECTION CERTIFICATE 3.1 COMPLIANT
PRODUCTS SHIPPED:
W2D776 F50 PCS: 5, WGT: 24567

"Conforms with SA 36"
Sec II, Part A, 2004 Edition
2011a addendum

(P) Cust Part #:

WE HEREBY CERTIFY THAT THIS MATERIAL WAS TESTED IN ACCORDANCE WITH, AND MEETS THE REQUIREMENTS OF, THE APPROPRIATE SPECIFICATION

B. H. Wales
SENIOR METALLURGIST PRODUCT

ORIGINAL 708222.
CERTIFIED COPY OF
08/20/12.
08/20/12.

Issuing Authority: Marvin J. (Ty) DeBelser		Quality Control
Date of Issue: March 13, 2008		QCFO Final Inspection Release Certificate R00

FINAL INSPECTION RELEASE CERTIFICATE

CUSTOMER: ENCANA	SALES ORDER#: NA
PRODUCT: Welded Piping for 3.0 mm btu Lineheater Pkg	WO#: 08562-002-D
	DATE: Jan 9, 13

FINAL INSPECTION DOCUMENTATION

REVIEWED BY:	ACCEPTED:	REJECTED:
--------------	-----------	-----------

STANDARD DOCUMENTATION REQUIREMENTS: (SEE DOCUMENT REQUIREMENT LIST)

ADDITIONAL DOCUMENT REQUIREMENTS: (TO BE RECORDED HERE IF APPLICABLE I.E. DOCUMENT PACKAGE

REQUIRED BY CUSTOMER ETC.)

Q.C. FILE CLOSURE BY: Kasha D Fox	DATE: Jan 17 2013
--	--------------------------

LOOSE COMPONENTS REQUIRED / PREPARED

ITEMS REQUIRED:	NO. OF BOXES OR PKGS. _____
-----------------	-----------------------------

Welded Piping for 3.0 mm Lineheater

ADDITIONAL HARDWARE OR FASTENERS REQUIRED YES ☒ NO ☐

PREPARATION FOR SHIPMENT / STORAGE

PREPARATION NEEDED / COMPLETED

Release to next process

LOT #	08562-002-D
ITEM #	Welded Piping

INVENTORY TAGS ATTACHED	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>
-------------------------	---

SHIPPING INSTRUCTIONS

CUSTOMER P.O. REVIEWED	YES <input type="checkbox"/> N/A <input checked="" type="checkbox"/>
------------------------	--

CONTACT PERSON AUTHORIZED TO RELEASE PRODUCT: _____

PHONE:	FAX:
--------	------

RELEASED TO INVENTORY:	DATE:
------------------------	-------

RELEASED TO CUSTOMER: [Signature]	DATE: Jan 9, 13
--	------------------------

NWP Industries Inc.


PRESSURE PIPING EXAMINATION CHECKLIST

DRWG # 08562-2A REV 0

JOB NUMBER: 08562-002-D

NO.	FUNCTION	SIGNATURE OR INITIAL AND DATE	
		Q.C. INSPECTOR	OWNERS INSPECTOR
1	DRAWINGS: ABSA registration over 0.5 Cu.M. Approved by Owner. Approved for Construction (signed & dated).		
2	Owner's Inspector notified.	OKL NOV 23/12	
3	Registered Welding Procedure Specifications, Q.C. Manual and Forms available at site, Job File started.	OKL NOV 23/12	
4	Welders qualified for WPS's and have valid Performance Qualification cards. Welders Log completed. WPS reviewed with Welders. <i>HOLD</i>	OKL NOV 23/12	
5	Material checked against P.O., drawings, and specifications. Identification confirmed. Colour coding applied. <i>HOLD</i>	OKL DEC 05/12	
6	Sample of each Welder's work examined, including root spacing, alignment, cleaning, joint preparation, preheat and electrode control.	OKL DEC 12/12	
7	Nondestructive Examination completed. Reports and radiographs reviewed, signed by Level II or III, Radiograph I.D. detailed on drawings. <i>HOLD</i>	HT OKL DEC 11/12 X-RAY OKL DEC 13/12	
8	Visual Examination of all completed welds. Welders I.D. stamped and recorded on drawings.	OKL DEC 12/12	
9	Heat Treatment verified and recorded on drawings. <i>HOLD</i>	OKL DEC 19/12	
10	Each system checked against specifications and drawings before test.	OKL DEC 13/12	
11	All deficiencies recorded and signed off by Q.C.I. and Owner's Inspector before test.	OKL DEC 13/12	
12	Pressure Test checked. Gauge calibration verified, gauge #'s recorded. <i>HOLD</i>	OKL Jan 9, 13	
13	System checked after test. Deficiencies recorded and corrected.	OKL Jan 9, 13	
14	Construction data reports (AB-83) prepared and signed by Q.C.I. and Owner's Inspector.	SEE ASSEMBLY	
15	Declaration form (AB-81) submitted to ABSA		
16	As built drawings accepted by Owner.		

NOV 20 2012

Issuing Authority: Marvin J. (Ty) DeBelser/Dale Karg		ABSA
Date of Issue: November 13 2012		FORM_NDE_001
Rev Status: 2.1		N.D.E Requirements

N D E Requirements

Client: Encana JO# 08562-002-D
 Project: Welded Piping – 3.0mm Lineheater Date: 06/12/2012

Piping: ☒ Pressure Vessel: ☐ Tank: ☐ Other:

- | | | |
|---|--|--|
| <input type="checkbox"/> X-Ray | <input checked="" type="checkbox"/> 100% | <input type="checkbox"/> ASME Section VIII-UW-51 |
| <input checked="" type="checkbox"/> Gamma Ray | <input type="checkbox"/> Full | <input type="checkbox"/> ASME Section VIII-UW-52 |
| <input type="checkbox"/> Ultrasonics | <input type="checkbox"/> 25% | <input checked="" type="checkbox"/> Customer Specification |
| <input type="checkbox"/> Liquid Penetrant | <input type="checkbox"/> 10% | <input checked="" type="checkbox"/> ASME B31.3 NFS |
| <input type="checkbox"/> Magnetic Particle | Other(Define) | Other (Specify) |
| <input type="checkbox"/> Accoustic Emission | <input type="checkbox"/> Spot | |

☐ Hardness test Max 200 BHN

☐ CSA W47.1/W59

General Instructions:

Vessel S/N

P1 Material

Welder ID S,F,M

Shell-T=

Pipe-T= 4" XXH

Total Welds start shooting pkg (first # is X-1)

Please use wire type iQi

Please Note locations of all indications on films on reports

Please include O.F.D-S.O.D S.F.D on reports

Special Requirements:

6

Shots

Buttweld Xray to be identified as X-#

Gap Shots to be identified as GS-#

Threaded Shots to be identified as XT-#

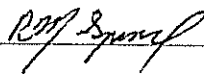
Identify on Envelope part of package being shot ie. Coil, Piping, ect.

Flashes must contain: Customer, JO#, Spool Identification, Xray number, Clock tape, Welder's ID Symbol, Date

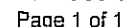
Mark all indicated repairs on the project

NOTE: Encana Spec for Welded Piping-acceptance is zero root defects
 Encana Spec is Zero Elongated Indications
 Encana Spec for Socket Welds-acceptance is minimum 1/16" gap
 Encana Spec for Threaded Piping- acceptance is 7 threads engaged
 HT is a 5 Point Traverse

Prepared By: R.M. Spence



Date: 06/12/2012



Date: 6-Dec-12


Item Inspected: PIPING - 3.0mm LINEHEATER

Material: C.S

(Sign)

(281) 476-4444
(713) 722-7177
(918) 446-6773

IRISNDT E-2004N

Issuing Authority: Marvin J. (Ty) DeBelser/Dale Karg		ABSA
Date of Issue: November 13 2012		FORM_NDE_001
Rev Status: 2.1		N.D.E Requirements

N D E Requirements

Client: Encana

JO# 08562-002-D

Project: Welded Piping – 3.0mm Lineheater

Date: 07/12/2012

Piping: ☒ Pressure Vessel: ☐ Tank: ☐ Other:

☐ X-Ray

☒ 100%

☐ ASME Section VIII-UW-51

☒ Gamma Ray

☐ Full

☐ ASME Section VIII-UW-52

☐ Ultrasonics

☐ 25%

☒ Customer Specification

☐ Liquid Penetrant

☐ 10%

☒ ASME B31.3 NFS

☐ Magnetic Particle

Other(Define)

Other (Specify)

☐ Accoustic Emission

☐ Spot

☐ Hardness test Max 200 BHN

☐ CSA W47.1/W59

General Instructions:

Vessel S/N

P1 Material

Welder ID S,M,X

Shell-T=

Pipe-T= 4" XXH, 2" XXH

Total Welds start shooting pkg (first # is X-4)

Please use wire type iQi

Please Note locations of all indications on films on reports

Please include O.F.D-S.O.D S.F.D on reports

Special Requirements:

9 Shots

Buttweld Xray to be identified as X-#

Gap Shots to be identified as GS-#

Threaded Shots to be identified as XT-#

Identify on Envelope part of package being shot ie. Coil, Piping, ect.

Flashes must contain: Customer, JO#, Spool Identification, Xray number, Clock tape, Welder's ID Symbol, Date

Mark all indicated repairs on the project

NOTE: Encana Spec for Welded Piping-acceptance is zero root defects

Encana Spec is Zero Elongated Indications

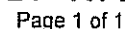
Encana Spec for Socket Welds-acceptance is minimum 1/16" gap

Encana Spec for Threaded Piping- acceptance is 7 threads engaged

HT is a 5 Point Traverse

Prepared By: Karim Bouslama

Date: 07/12/2012




Date: 7-Dec-12

Material: C.S

(Sign)

(281) 476-4444
(713) 722-7177
(918) 446-8773

IRISNOT E-2004N

Issuing Authority: Marvin J. (Ty) DeBelser/Dale Karg		ABSA
Date of Issue: November 13 2012		FORM_NDE_001
Rev Status: 2.1		N.D.E Requirements

N D E Requirements

Client: Encana JO# 08562-002-D
 Project: Welded Piping – 3.0mm Lineheater Date: 10/12/2012

Piping: ☒ Pressure Vessel: ☐ Tank: ☐ Other:

- | | | |
|---|--|--|
| <input type="checkbox"/> X-Ray | <input checked="" type="checkbox"/> 100% | <input type="checkbox"/> ASME Section VIII-UW-51 |
| <input checked="" type="checkbox"/> Gamma Ray | <input type="checkbox"/> Full | <input type="checkbox"/> ASME Section VIII-UW-52 |
| <input type="checkbox"/> Ultrasonics | <input type="checkbox"/> 25% | <input checked="" type="checkbox"/> Customer Specification |
| <input type="checkbox"/> Liquid Penetrant | <input type="checkbox"/> 10% | <input checked="" type="checkbox"/> ASME B31.3 NFS |
| <input type="checkbox"/> Magnetic Particle | <u>Repair shot</u> Other(Define) | Other (Specify) |
| <input type="checkbox"/> Accoustic Emission | <input type="checkbox"/> Spot | |

☐ Hardness test Max 200 BHN

☐ CSA W47.1/W59

General Instructions:

Vessel S/N

P1 Material

Welder ID S,M,X

Shell-T=

Pipe-T= 4" XXH, 2" XXH

Total Welds 1 x repair (# is X-6R) & continue shooting pkg (first # is X-13)

Please use wire type iQi

Please Note locations of all indications on films on reports

Please include O.F.D-S.O.D S.F.D on reports

Special Requirements:

Shots

Buttweld Xray to be identified as X-#

Gap Shots to be identified as GS-#

Threaded Shots to be identified as XT-#

Identify on Envelope part of package being shot ie. Coil, Piping, ect.

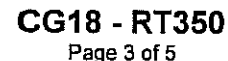
Flashes must contain: Customer, JO#, Spool Identification, Xray number, Clock tape, Welder's ID Symbol, Date

Mark all indicated repairs on the project

NOTE: Encana Spec for Welded Piping-acceptance is zero root defects
 Encana Spec is Zero Elongated Indications
 Encana Spec for Socket Welds-acceptance is minimum 1/16" gap
 Encana Spec for Threaded Piping- acceptance is 7 threads engaged
 HT is a 5 Point Traverse

Prepared By: Karim Bouslama

Date: 10/12/2012



Job / P.O. #: 08562-002-D IRISNDT #: 256063 Date: 10-Dec-12
Client: ENCANA C/O NWP
Location: Innisfail, Alberta
Item Inspected: Piping 3.0mm Lineheater Material: CS

(Sign)

IRISNDT E-2004N

Issuing Authority: Marvin J. (Ty) DeBelser/Dale Karg	NWP Industries Inc.™	ABSA
Date of Issue: November 13 2012		FORM_NDE_001
Rev Status: 2.1		N.D.E Requirements

N D E Requirements

Client: Encana JO# 08562-002-D
 Project: Welded Piping – 3.0mm Lineheater Date: 11/12/2012

Piping: ☒ Pressure Vessel: ☐ Tank: ☐ Other:

- | | | |
|---|--|--|
| <input type="checkbox"/> X-Ray | <input checked="" type="checkbox"/> 100% | <input type="checkbox"/> ASME Section VIII-UW-51 |
| <input checked="" type="checkbox"/> Gamma Ray | <input type="checkbox"/> Full | <input type="checkbox"/> ASME Section VIII-UW-52 |
| <input type="checkbox"/> Ultrasonics | <input type="checkbox"/> 25% | <input checked="" type="checkbox"/> Customer Specification |
| <input type="checkbox"/> Liquid Penetrant | <input type="checkbox"/> 10% | <input checked="" type="checkbox"/> ASME B31.3 NFS |
| <input type="checkbox"/> Magnetic Particle | <input type="checkbox"/> Other(Define) | Other (Specify) |
| <input type="checkbox"/> Accoustic Emission | <input type="checkbox"/> Spot | |

☐ Hardness test Max 200 BHN

☐ CSA W47.1/W59

General Instructions:

Vessel S/N

P1 Material

Welder ID S,M,X

Shell-T=

Pipe-T= 4" XXH

Total Welds continue shooting pkg (first # is X-15)

Please use wire type iQi

Please Note locations of all indications on films on reports

Please include O.F.D-S.O.D S.F.D on reports

Special Requirements:

6 Shots 1

Buttweld Xray to be identified as X-#

Gap Shots to be identified as GS-#

Threaded Shots to be identified as XT-#

Identify on Envelope part of package being shot ie. Coil, Piping, ect.

Flashes must contain: Customer, JO#, Spool Identification, Xray number, Clock tape, Welder's ID Symbol, Date

Mark all indicated repairs on the project

NOTE: Encana Spec for Welded Piping-acceptance is zero root defects

Encana Spec is Zero Elongated Indications

Encana Spec for Socket Welds-acceptance is minimum 1/16" gap

Encana Spec for Threaded Piping- acceptance is 7 threads engaged

HT is a 5 Point Traverse

Prepared By: Karim Bouslama

Date: 11/12/2012

Job / P.O. #: 08562-002-D IRISNDT #: 256083 Date: 11-Dec-12
Client: ENCANNA C/O NWP
Location: Innisfail, Alberta
Item Inspected: Piping 3mm Lineheater Material: CS

Interpretation by:
JEFF BRUCKSHAW (PED LEVEL 2)

(Print)

(Signature)

Client Representative:

(Print)

I am in full
agreement with
report contents

(Sign)

SNT-TC-1A

C.G.S.B.


C.G.S.B. #

2

2

(Level)

12007

Issuing Authority: Marvin J. (Ty) DeBelser/Dale Karg		ABSA
Date of Issue: November 13 2012		FORM NDE_001
Rev Status: 2.1		N.D.E Requirements

NDE Requirements

Client: Encana JO# 08562-002-D
 Project: Welded Piping – 3.0mm Lineheater Date: 09/01/2013

Piping: ☒ Pressure Vessel: ☐ Tank: ☐ Other: ☐

- | | | |
|---|--|--|
| <input type="checkbox"/> X-Ray | <input checked="" type="checkbox"/> 100% | <input type="checkbox"/> ASME Section VIII-UW-51 |
| <input checked="" type="checkbox"/> Gamma Ray | <input type="checkbox"/> Full | <input type="checkbox"/> ASME Section VIII-UW-52 |
| <input type="checkbox"/> Ultrasonics | <input type="checkbox"/> 25% | <input checked="" type="checkbox"/> Customer Specification |
| <input type="checkbox"/> Liquid Penetrant | <input type="checkbox"/> 10% | <input checked="" type="checkbox"/> ASME B31.3 NFS |
| <input type="checkbox"/> Magnetic Particle | <u>Cut Out</u> Other(Define) | Other (Specify) |
| <input type="checkbox"/> Accoustic Emission | <input type="checkbox"/> Spot | |

☐ Hardness test Max 200 BHN

☐ CSA W47.1/W59

General Instructions:

Vessel S/N

P1 Material
 Welder ID M
 Shell-T=
 Pipe-T= 2" XXH
 Total Welds 1 x cut out X-9CO

Please use wire type IQI
 Please Note locations of all indications on films on reports
 Please include O.F.D. S.O.D. S.F.D on reports

Special Requirements:

Shots 1-shot

Buttweld Xray to be identified as X-#
 Gap Shots to be identified as GS-#
 Threaded Shots to be identified as XT-#
 Identify on Envelope part of package being shot ie. Coil, Piping, ect.
 Flashes must contain: Customer, JO#, Spool Identification, Xray number, Clock tape, Welder's ID Symbol, Date
 Mark all indicated repairs on the project

NOTE: Encana Spec for Welded Piping-acceptance is zero root defects
 Encana Spec is Zero Elongated Indications
 Encana Spec for Socket Welds-acceptance is minimum 1/16" gap
 Encana Spec for Threaded Piping- acceptance is 7 threads engaged
 HT is a 5 Point Traverse

Prepared By: Karim Bouslama

Date: 09/01/2013

Exposure Device #: D6306 Source #: 88662B
Cobalt 60 ☐ IR 192 ☒ X-Ray ☐ EFSS: .154
Film Brand: AGFA #Film/cassette: 1
Code: ASME B31.3 NFS & Encana Spec.

Job / P.O. #: 08562-002-D IRISNDT #: 256425

Date: 09-Jan-13

Client: ENCANA C/O NWP

Location: Innisfail, Alberta

Item Inspected: Piping 3.0mm Lineheater

Material: C5

[illegible]

Number of Radiation Barrier Warning Signs Erected: 2

Number of Radiation Barrier Warning Signs Returned: 2

Work Location Legend: [1] Inside Fab. Shop [2] Yard/Lay-down Area [3] Piping/Modular Fab. Area [4] N/A (Other)

IRIS Procedure:	S O D =	Source-to-object distance (D)	AB - Arc Burns	EUC - External Undercut	IC - Internal Concavity
Single Wall Exposure:			BT - Burn Through	IUC - Internal Undercut	LF - Lack of Fusion
RT 1, 2, 2A, 6, 7	O F D =	Distance from source side of object to film (d)	CK - Crack	HB - Hollow Bead	LC - Low Cover
Double Wall Exposure			EP - Excessive Penetration	IP - Incomplete Penetration	MA - Misalignment
RT 3, 3A, 4, 5, 8			P - Porosity	S - Slag	

Unit#.	<u>334</u>		Kilometers	<u>N/A</u>
In.	<u>0200</u>	Out	<u>0400</u>	Hrs <u>20</u>
In		Out		Hrs

Personnel
J. BRUCKSHAW
Joseph S.
Michael V.


[illegible]

Interpretation by:	SNT-TC-1A	2
JEFF BRUCKSHAW (PED LEVEL 2)	C.G.S.B	2
(Print)	C.G.S.B #	(Level) 12007

(Signature) _____
Client Representative:

I am in full agreement with report contents.

{Sign}

Issuing Authority: Marvin J. (Ty) DeBelser/Dale Karg		ABSA
Date of Issue: November 13 2012		FORM_NDE_001
Rev Status: 2.1		N.D.E Requirements

pink

N D E Requirements

Client: Encana JO# 08562-002-D
 Project: Welded Piping – 3.0mm Lineheater PWHT Date: 18/12/2012

Piping: ☒ Pressure Vessel: ☐ Tank: ☐ Other: ☐

- | | | |
|---|---|--|
| <input type="checkbox"/> X-Ray | <input type="checkbox"/> 100% | <input type="checkbox"/> ASME Section VIII-UW-51 |
| <input type="checkbox"/> Gamma Ray | <input type="checkbox"/> Full | <input type="checkbox"/> ASME Section VIII-UW-52 |
| <input type="checkbox"/> Ultrasonics | <input type="checkbox"/> 25% | <input checked="" type="checkbox"/> Customer Specification |
| <input type="checkbox"/> Liquid Penetrant | <input checked="" type="checkbox"/> 10% | <input checked="" type="checkbox"/> ASME B31.3 NFS |
| <input type="checkbox"/> Magnetic Particle | Other(Define) | Other (Specify) |
| <input type="checkbox"/> Accoustic Emission | <input type="checkbox"/> Spot | |
| <input checked="" type="checkbox"/> Hardness test Max 200 BHN | | <input type="checkbox"/> CSA W47.1/W59 |

General Instructions:

Vessel S/N

P1 Material
 Welder ID S,F,M,X
 Shell-T=
 Pipe-T= 4" XXH, 2" XXH
 Total Welds 4 x HT (first # is HT-1)

Please use wire type iQi
 Please Note locations of all indications on films on reports
 Please include O.F.D-S.O.D S.F.D on reports

Special Requirements:

Buttweld Xray to be identified as X-#
 Gap Shots to be identified as GS-#
 Threaded Shots to be identified as XT-#
 Identify on Envelope part of package being shot ie. Coil, Piping, ect.
 Flashes must contain: Customer, JO#, Spool Identification, Xray number, Clock tape, Welder's ID Symbol, Date
 Mark all indicated repairs on the project

Sx1 Shots
 Fx1
 Mx1
 Xx1

NOTE: Encana Spec for Welded Piping-acceptance is zero root defects
 Encana Spec is Zero Elongated Indications
 Encana Spec for Socket Welds-acceptance is minimum 1/16" gap
 Encana Spec for Threaded Piping- acceptance is 7 threads engaged
 HT is a 5 Point Traverse

Prepared By: Karim Bouslama

Date: 18/12/2012



R & R Stress Relieving Service Ltd.

Nisku: 2103 - 6th Street, T9E 7X8 Tel: (780) 955-7559 Fax: (780) 955-2903
Blackfalds: #13 Burbank Industrial Park Tel: (403) 885-2280 Fax: (403) 885-0177
Toll Free: 1-800-499-HEAT(4328)

CERTIFICATE OF CONFORMANCE OF RECORDING INSTRUMENTS

CERTIFIED BY: R & R Stress Relieving Service Ltd.
TEST NUMBER: RR1112
DATE: November 9, 2012
DATE DUE: February 9, 2013
INSTRUMENT MFG: Chino
MODEL NUMBER: AH-3725 N00
SERIAL NUMBER: AH-057C171
RECORDER NUMBER: IR-181


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

REFERENCE STANDARDS

DIGI MITE 311600 S/N48430-5522

CERT DATE Oct 22/12

The calibration of all standards and measuring instruments used in the calibration are traceable to the National Research Council of Canada in Ottawa or to the National Bureau of Standards in Washington, D.C.


Shane Stimson

REF 181 OF TC's 2

NWP

100 莊

716881

500

2	5	1	9	4
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BF 32-12

4 Spools, Job# 08562-001-D

1. Spec. Job# 08467-009-D

Q-1. 1-1-128157-003-A. S/N: NWYP-08157-003-A

4 Snodis, Job# 00562-002-D

Start Soak

DEC 19/12

2012.12.18.06:06



HEAT TREATMENT REQUIREMENTS

PO# 710681

JOB NO.: 08562-002-D

CUSTOMER: EnCana Corporation

DATE: December 18 2012

COMPONENT DESCRIPTION: Welded Piping for 3.0 mm Line Heater Package

Total Spools: 4

DWG. NO. AND LINE NO.	DIAMETER	THICKNESS	MATERIAL	LENGTH	WEIGHT
08562-4 Rev 0	4" NPS	SCH XXH	SA-333-6	Various	Unknown

TYPE OF HEAT TREATMENT: PRESSURE VESSEL or Process Piping STRESS RELIEVE P1 and Materials

HEATING

Temperature to be raised from 800°F (427°C) to 1150°F (621°C) at a maximum rate of 400 ° F

() ° C) per hour. NOTE: THIS VALUE MUST NEVER EXCEED 400°F (204°C) PER HOUR.

[Calculated rate = 400 degrees F/hr. (204 degrees C/hr) Divided by the maximum metal thickness of the shell or head plate in inches]

HOLDING

Temperature to be held in range of 1150°F to 1175°F for 60 minutes.

[Holding time to be determined by Table UCS-56 for Nominal Thickness as specified in UW-40(f)]

COOLING

Temperature to be lowered from 1150°F (621°C) to 800°F (427°C) at a maximum rate of 500 ° F

() ° C) per hour. NOTE: THIS VALUE MUST NEVER EXCEED 500°F (260°C) PER HOUR.

[Calculated rate = 500 degrees F/hr. (260 degrees C/hr.) Divided by the maximum metal thickness of the shell or head plate in inches]

From 800°F (427°C) items may be cooled in still air.

Additional Requirements:

- ☐ Job number and description required on heat treatment charts along with the operator's signature & date.
- ☐ Reporting of thermocouple attachment method and location, and verification of furnace thermocouple calibration is required.
- ☐ A sufficient number of thermocouples shall be located to control and maintain uniform distribution of temperature on all vessels and parts. Thermocouples shall be directly attached to the item or provision shall be made for thermocouple placement at bottom, centre and top of the furnace charge in accordance with the ASME Code.
- ☐ During the heating period, there shall not be a greater variation in temperature throughout the portion of the vessel being heated than 250° F (121° C) within any 15 ft. (4.6 m) interval of length. An adequate number of thermocouples must be used to ensure this Code requirement is met.
- ☐ During the holding period, there shall not be a greater difference than 150° F (66° C) between the highest and lowest temperature throughout the portion of the vessel being heat treated, except where the range is further limited by these instructions.
- ☐ If Capacitor Discharge welding is used to attach thermocouples an ASME Code Section IX Welding Procedure Specification is required (WPS qualification is not required), and the energy output must be limited to 125 Watt-Seconds.
- ☐ No other welding is permitted on vessels or parts. [0.5 x Capacitance in farads X Voltage ² = W-Sec.]
- ☐ The method of thermocouple removal shall not damage the heat treated item.

Q.C. Inspector Signature

Don Spurr

Date: DEC 19/12

Thermocouple Attachment Method:

CAPACITOR DISCHARGE

Location (s) *Coil ends*Furnace Heat Number *B F 3 2 - 1 2 - 9 1 4*

Furnace Operator Signature

*Chris Lewis*Date: *Dec 18th 12*

Form Prepared by: Kasha Fox

Date: December 13 2012

NWP Industries Inc.™	NWP Industries Inc.™	Website: www.nwp.ca
PO Box 6280 4017-60 Ave.		Phone: (403) 227-4100
T4G 1S9		Fax: (403) 227-4102

HYDROSTATIC TEST AFFIDAVIT

Customer: Encana Corporation

JO# 08562-002-D

Project: Piping for 3.0 mm Lineheater

Project#

Test Pressure: 7757 PSI, 225 PSI

Hold Time: 60 minutes

Code Requirements: ASME B31.3 NFS 2010 Edition

All Personnel Advised of Test ☒ All Signs & Flagging Posted ☒

Prior to Filling – Fitting/Hoses & Component Meet Required Test Pressure

Sign-Off Supervisor: _____ Tester: _____

Date: 09/01/2013

Product Description:

1) PF-4"-I-XXHBD-100, PF-4"-I-XXHBD-101, PF-4"-I-XXHBD-103, PF-4"-I-XXHBD-104 = 7757 PSI
2) FG-1"-C-80A/BD-304, FG-1"-C-80AD-302/303, D-3/4"-C-80A/BD-250 = 225 PSI

50% Test Pressure Leak/Systems Check Completed ☒

1) 50% = 3879 PSI
2) 50% = 113 PSI

Equipment Drained & Flushed to Prevent Freezing:

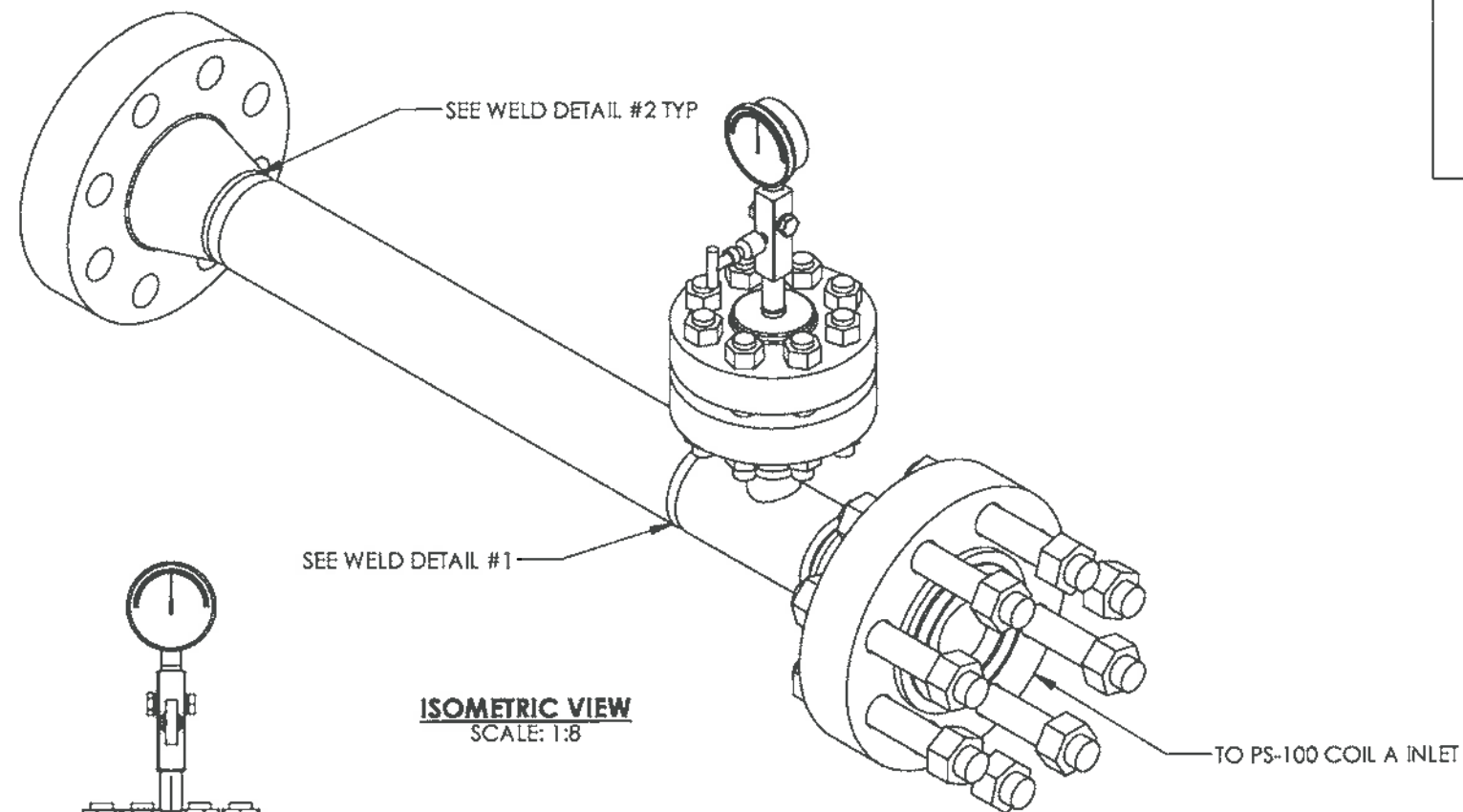
Yes: ☐

No: ☐

Start Time:	Finish Time:
<u>10:45 AM</u>	

Test Gauge Identification #	Pressure Range	Calibration Date
NWPG- 20,000- <u>1</u>	0-20,000 PSI	<u>31 Aug 2013</u>
NWPG- 20,000- <u>20000</u>	0-20,000 PSI	<u>11 Dec 2013</u>
NWPG- 600- <u>3</u>	0-600 PSI	<u>5 Dec 2013</u>
NWPG- 600- <u>4</u>	0-600 PSI	<u>11 Dec 2013</u>
NWPG-	PSI	
NWPG-	PSI	
NWPG-	PSI	
NWPG-	PSI	

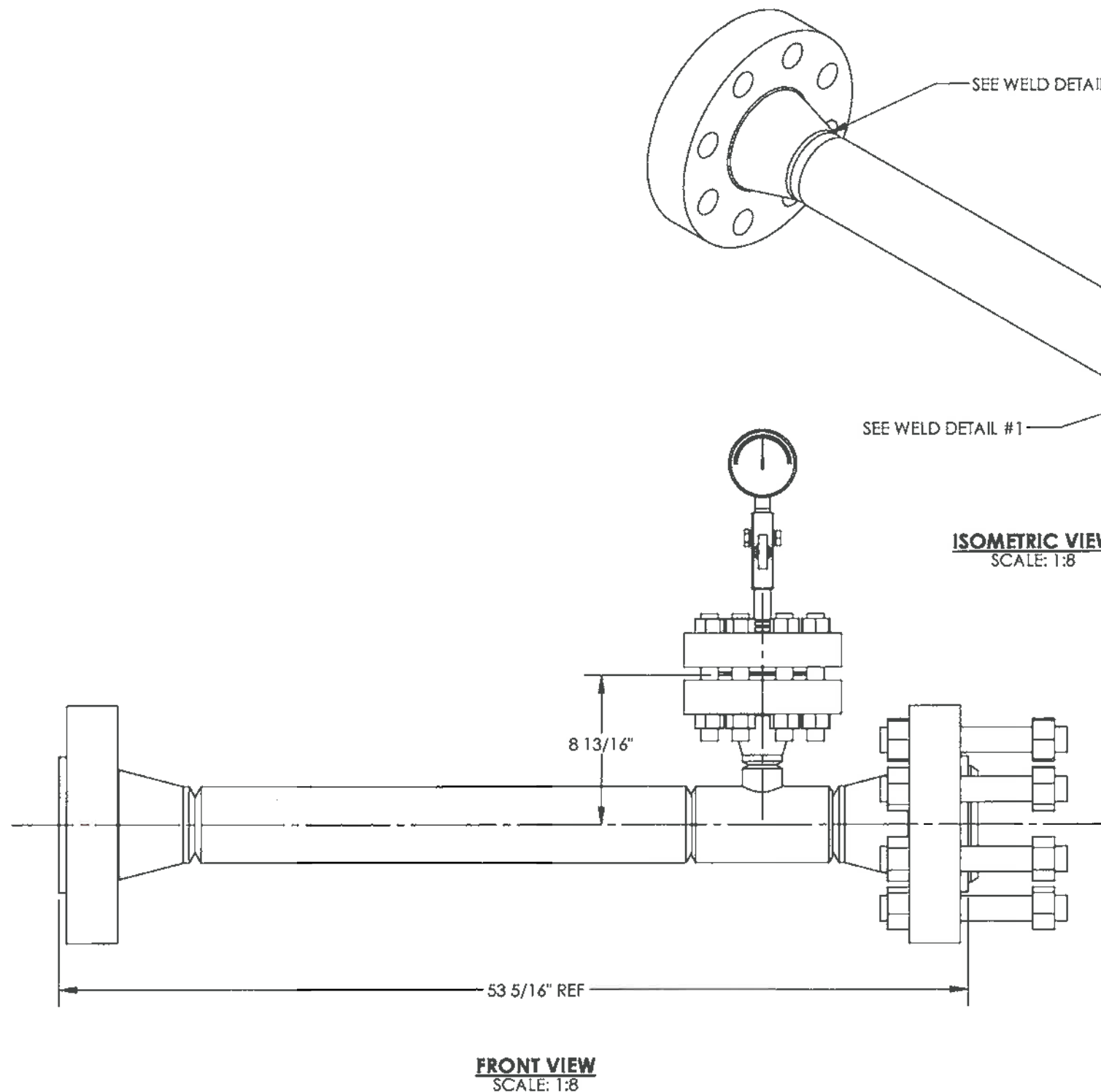
Test By: <u>Mandy Ferguson</u>	Date: <u>Jan 9/2013</u>
Approved By: <u>Ray Simpson</u>	Date: <u>Jan 09/13</u>





NOTES

- NOTES**
1. ALL DIMENSIONS SHALL HAVE A TOLERANCE OF $\pm 1/8"$ UNLESS OTHERWISE SPECIFIED.
 2. DIMENSIONS INCLUDE $1/8"$ ROOT GAP.
 3. ALL BOLT HOLES STRADDLE COMMON CENTER LINE.
 4. CUT LENGTHS FOR PIPE ARE FOR REFERENCE ONLY. SHOP TO ADJUST PIPE LENGTHS AS REQUIRED.
 5. HARDNESS TESTING - MAX 200 BNH 10%.

DESIGN DATA	
LINE NUMBER:	PF-4"-I-XXHBD-100
CLIENT SPECIFICATION:	ENCANA FAB
DESIGN & FABRICATE TO:	ANSI/ASME B31.3 NFS 2010 EDITION
DESIGN PRESSURE:	5171 PSIG
MAXIMUM DESIGN TEMPERATURE:	200°F
MINIMUM DESIGN TEMPERATURE:	-49°F
SERVICE:	HYDROCARBONS
HYDROSTATIC TEST PRESSURE:	7757 PSIG
RADIOGRAPHY:	100%
OTHER NDE:	SEE NOTE 5
POST WELD HEAT TREATMENT:	1150°F TO 1175°F FOR 1HR MIN.
CORROSION ALLOWANCE:	1/16"
Q.C. PROGRAM NO.:	AQP-1253
WELDING PROCEDURE REGISTRATION NO.:	WP-1604.2



LH-7224-BARE	WELDED BATH ASSEMBLY							AS BUILT
LH-PH-7224-1	PREHEAT PIPING							
LH-LAD-72	LADDER ASSEMBLY							
LH-FIRSTK-24-2	WELDED FIRETUBE / STACK ASSEMBLY							
08562-6	SKID, SHELL, LADDER, PREHEAT PIPING ASSEMBLY							
08562-3/08562-4	SKID ASSEMBLY / COIL ASSEMBLY							
08562/08562-1	GA / P&ID	0	OCT05/12	VW			ISSUED FOR CONSTRUCTION	
DOCUMENT NO.	DESCRIPTION	REV	DATE	BY	CHK	APP		
REFERENCE DRAWINGS		DRAWING REVISIONS						

ISSUED FOR
CONSTRUCTION

SIGNED: _____

DATE: _____

W.O.:

S/N: _____

ALL DIMENSIONS IN INCHES

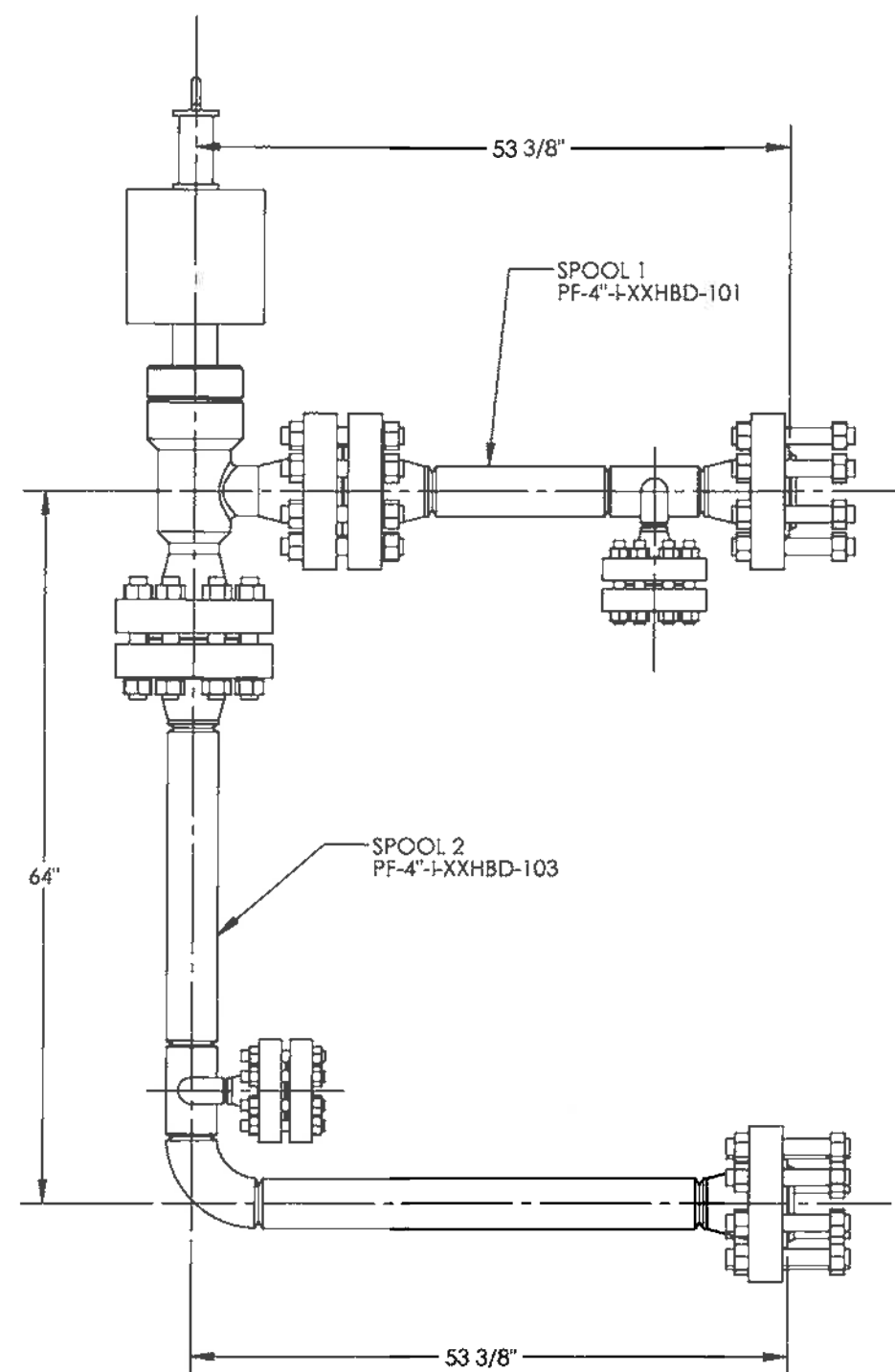
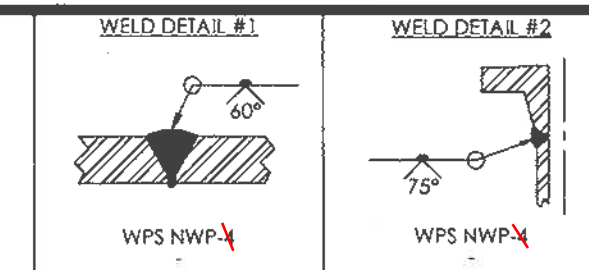


P.O. BOX 6280, INNISFAIR, AB T4G 1S9
PH: (403) 227-4100 FAX: (403) 227-4102

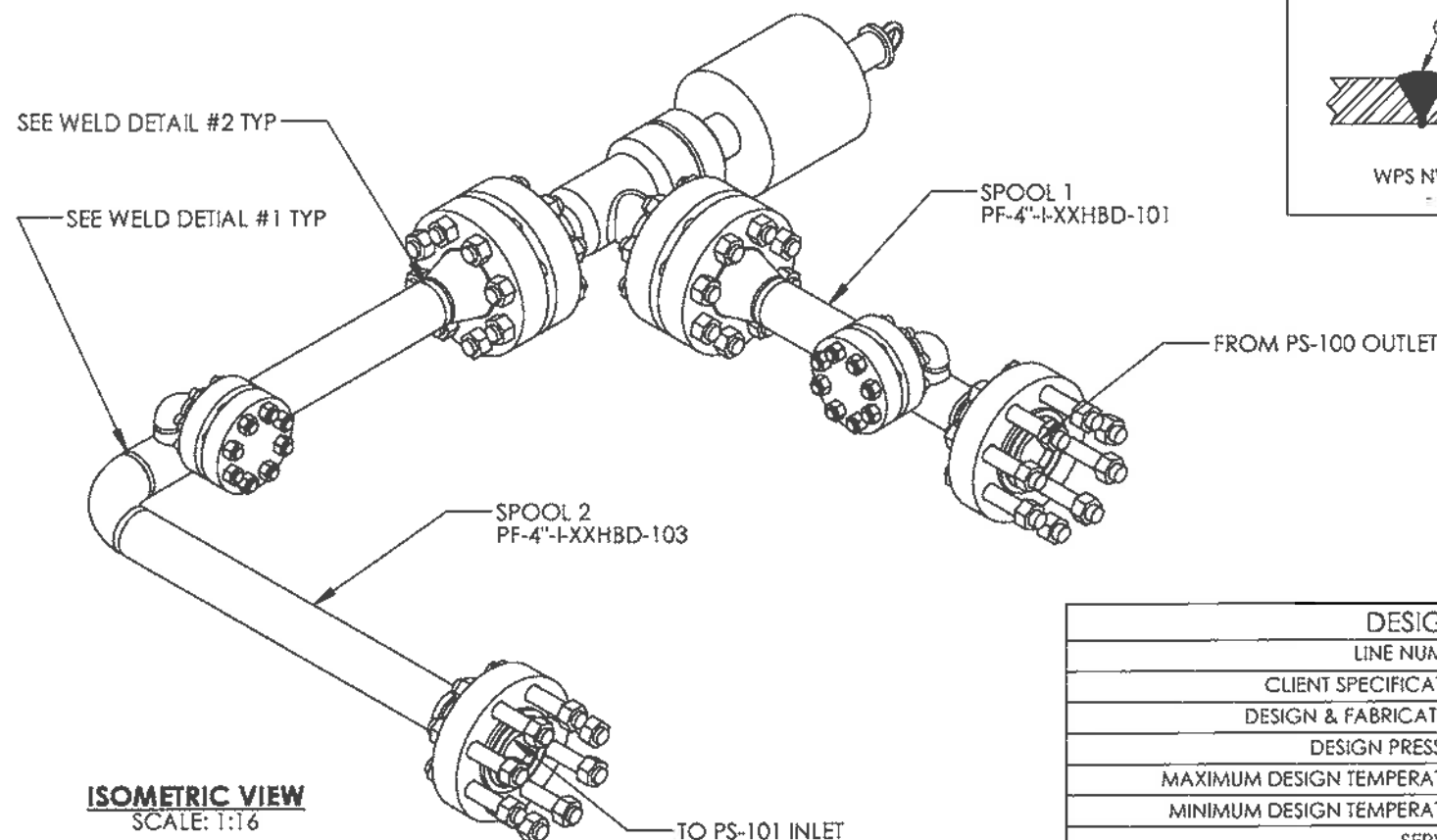
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ENCANA CORPORATION
LINEHEATER PACKAGE
3.0 MMBTU
C/W 4"-2500# RTJ SPLIT COILS
WELDED PIPING

DWN: VW	CHK: <i>LD</i>	APP: <i>LA</i>
DATE: OCT 05/12	DATE: NOV 14 2012	DATE: NOV 14 2012
SCALE: 1:8	DWG: 08562-2A	REV: 0
SHEET: 1 OF 6		



PLAN VIEW
SCALE: 1:16



ISOMETRIC VIEW
SCALE: 1:16

NOTES

1. ALL DIMENSIONS SHALL HAVE A TOLERANCE OF $\pm 1/8$ " UNLESS OTHERWISE SPECIFIED.
2. DIMENSIONS INCLUDE $1/8$ " ROOT GAP.
3. ALL BOLT HOLES STRADDLE COMMON CENTER LINE.
4. CUT LENGTHS FOR PIPE ARE FOR REFERENCE ONLY. SHOP TO ADJUST PIPE LENGTHS AS REQUIRED.
5. HARDNESS TESTING - MAX 200 BNH 10%.

DESIGN DATA	
LINE NUMBER:	PF-4"-I-XXHBD-101
CLIENT SPECIFICATION:	ENCANA FAB
DESIGN & FABRICATE TO:	ANSI/ASME B31.3 NFS 2010 EDITION
DESIGN PRESSURE:	5171 PSIG
MAXIMUM DESIGN TEMPERATURE:	200°F
MINIMUM DESIGN TEMPERATURE:	-49°F
SERVICE:	HYDROCARBONS
HYDROSTATIC TEST PRESSURE:	7757 PSIG
RADIOGRAPHY:	100%
OTHER NDE:	SEE NOTE 5
POST WELD HEAT TREATMENT:	1150°F TO 1175°F FOR 1HR MIN.
CORROSION ALLOWANCE:	1/16"
Q.C. PROGRAM NO.:	AQP-1253
WELDING PROCEDURE REGISTRATION NO.:	WP-1604.2
DESIGN DATA	
LINE NUMBER:	PF-4"-I-XXHBD-103
CLIENT SPECIFICATION:	ENCANA FAB
DESIGN & FABRICATE TO:	ANSI/ASME B31.3 NFS 2010 EDITION
DESIGN PRESSURE:	5171 PSIG
MAXIMUM DESIGN TEMPERATURE:	200°F
MINIMUM DESIGN TEMPERATURE:	-49°F
SERVICE:	HYDROCARBONS
HYDROSTATIC TEST PRESSURE:	7757 PSIG
RADIOGRAPHY:	100%
OTHER NDE:	SEE NOTE 5
POST WELD HEAT TREATMENT:	1150°F TO 1175°F FOR 1HR MIN.
CORROSION ALLOWANCE:	1/16"
Q.C. PROGRAM NO.:	AQP-1253
WELDING PROCEDURE REGISTRATION NO.:	WP-1604.2

LH-7224-BARE	WELDED BATH ASSEMBLY								
LH-PH-7224-1	PREHEAT PIPING								
LH-LAD-72	LADDER ASSEMBLY								
LH-FIRSTK-24-2	WELDED FIRETUBE / STACK ASSEMBLY								
08562-6	SKID, SHELL, LADDER, PREHEAT PIPING ASSEMBLY								
08562-3/08562-4	SKID ASSEMBLY / COIL ASSEMBLY								
08562/08562-1	GA / P&ID	0	OCT05/12	VW	D	APP	ISSUED FOR CONSTRUCTION		
DOCUMENT NO.	DESCRIPTION	REV	DATE	BY	CHK	APP			
REFERENCE DRAWINGS							DRAWING REVISIONS		

AS BUILT

ISSUED FOR
CONSTRUCTION

SIGNED: _____
DATE: _____
W.O.: _____
S/N: _____



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PH: (403) 227-4100 FAX: (403) 227-4102

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ENCANA CORPORATION
LINEHEATER PACKAGE
3.0 MMBTU
C/W 4"-2500# RTJ SPLIT COILS
WELDED PIPING

DWN: VW CHK: D APP: A
DATE: OCT 05/12 DATE: NOV 14 2012 DATE: NOV 14 2012
SCALE: 1:16 DWG: 08562-2A REV: 0
SHEET: 3 OF 6

"Conforms with ASME
Sec II Part A 2007 edition
2009 addenda"

EL92LXX HGD

IN STOCK 4

HEAT # 01329


2" 90° Elbow LR/XXH BW

APR-26-2010 MON 07:48 AM

CE FRANKLIN



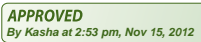


FAX No. 403414130

P. 003

 erne fittings gmbh A-5824 Schöns Hauptstrasse 48 Austria/Europe Telefon +43/3424 501-0 Telefax +43/5524 501-930 Reg. No. 12 100 3434		Abnahmeprüfzeugnis Inspection Certificate EN 10204 - 3.1		Zeugnisnummer [certificate no.] 009341/07-GM		Rev. A		Datum [date] 26/02/2007	
Kunde [customer] CE Franklin Ltd. 10050 - 29A Avenue CDN-T6N 1A8 Edmonton, Alberta		Ihre Bestellnummer [your order no.] 1674708-OR-2100		Unsere Auftrags.Nr. [our order no.] 89341-PS-0410		Schmelze Nr [heat no.] 01329		Ident.Nr. [ident no.] 144920	
Menge [quantity] 200		Artikelbezeichnung [designation] elbows LR-80-S-WPL6-2"-XXS		Anforderungen [requirements] ASME B16.9-2007 LR WPL6 ASTM A420A420M-01 ASME SA420 Sec II Part A NACE MR-01-75, EN 10204/3.1, rust protection. Manufacturers standard, TR-addit. basemat.: Chemical requirements: CAN/CSA Z245.11, Mechanical values: CAN/CSA Z245.11 CaL2 Gr. 241					
Vormaterial [base material] Rohrzeugnisnr. [tube work's cert.no.] 11543SV06		Hersteller [manufacturer] V&M		Dichtheitsprüfung [leakage test] ASTM E309					
Analyse [analysis] Index		Schmelze Nr. [heat no.] 01329		Ermittelungsart [melting process] Y C ✓ Si ✓ Mn ✓ P ✓ S ✓ Cr ✓ Mo ✓ Ni ✓ Cu ✓ V ✓ Nb ✓ Al ✓ B ✓ Ti ✓ N ✓ Ceq ✓ CEQ ✓ J-Fact. ✓		1 = Schmelzeanalyse [heat analysis] 2 = Produktanalyse [product analysis] J-Faktor [J-Factor]: (Si + Mn) * (P + Sn) * 10000 CEQ [CEQ]: C + (Mn / 6) + (Cr + Mo + V) / 5 + (Cu + Ni) / 15			
2		01329		0.16 0.20 0.004 0.011 0.003 0.07 0.03 0.01 0.01 0.00 0.00 0.027 0.008 0.06 0.007 0.35		0.123 0.223 1.039 0.014 0.001 0.067 0.028 0.009 0.004 <0.001 0.003 0.023 0.00015 0.002 0.007 0.316			
Mech.-technologische Prüfung [mech. technological test]									
Proben Nr. [test no.] M0544038/07		Zugversuch [tensile test] Pr-Lage [pos. of sample] Temp. Dehngr. [yield str.] Zugfestigkeit [tensile str.] Rm (N/mm²) Dehnung [elongation] z (%)				Kerbschlagbiegeversuch [notched bar impact test] Form: ISO V Pr-Lage [pos. of sample] Temp. Querschnitt [cross sec.] Kerbschlagarbeit [impact value] (J)			
139-144 HB		347 492 33.58				152 165 160			
Wärmebehandlung [heat treatment] Normalized temperature 820 °C holding time 30 min cooling in air at 100 °C									
Kennzeichnung [marking] E105 Mat. 01329/DN/wall									
Besichtigung und Ausmessung [visual inspection and dimensional check] o.B./o.K. Name: Encana									
Bemerkungen [remarks] cold formed Hardness test and stamping acc. to NACE MR-01-75. Stamped with round nosed tools. Hardness test, visual and dimensional test are checked on 10%.									
Zusatzmarkierung [add. mark.] Die gestellten Anforderungen wurden erfüllt [Manufacturing requirements are satisfied] Der Werksachverständige [the Works Inspector] 26/02/07 Geiger Martin 322 Dieses Dokument wurde elektronisch erstellt und ist ohne Unterschrift gültig. [The certificate is issued by the computerized system and is valid without signature.]									

Zertifiziert nach DGR L 87/23/EG Anhang I - Absatz 4.3 durch TÜV Süddeutschland CE 0036; Zertifikat-Nr. DGR 0036-QM-WH-104-01 [Certified acc. to PED 97/23/EC by TÜV Cert CE 0036; certificate no. DGR-0036-QM-WH-104-01, Certified acc. to EN ISO 9001]

17

 erne fittings gmbh A-6824 Schlins Hauptstrasse 48 Austria/Europe Telefon +43/5524 501-0 Telefax +43/5524 501-930  Reg. No. 12 100 3054		Abnahmeprüfzeugnis Inspection Certificate EN 10204 - 3.1		Artikelbezeichnung [designation] tees R-S-WPL6-4"/2"-XXS/XXS ✓																
Kunde [customer] CCTF Corporation 5407-53 Avenue CDN-T6B 3G2 Edmonton, Alberta		Zeugnis Nr. [cert. no.] 046233/11-HG	Rev.	Datum [date] 28/10/2011	Anforderungen der Bestellung [requirements of the order] ASME B16.9-2007, material:WPL6, TR-basematerial:ASME Sect. II part D table Y-1, TR-fitting:ASTM A 420/A 420M-10, ASME SA-420M-Ed.07, TR-addit fitting:NACE MR0175/ISO15156-2:2003A.2, NACE MR0103-2007 2.1 and 4, M0803-05, certificate:EN 10204/3.1, rust protection:Millstandard, execution:Seamless ✓															
		Schmelze Nr [heat no.] 1011318301		Ident Nr. [ident no.]																
		Unsere Auftrags.Nr./Art.Nr. [our order no./item no.] 135033TD-0110 / 059549																		
		Ihre Bestell Nr. [your order no.] 4890518-00 7565300																		
Vormaterial [base material] seamless pipe		Menge [quantity] 35		4"x2" Tee																
Analyse [analysis]	Schmelze Nr. [heat no.]	Erschmelzungsart [melting process] Y		1 = Schmelzanalyse [heat analysis] 2 = Produktanalyse [product analysis]																
Index		C	Si	Mn	P	S	Cr	Mo	Ni	Cu	V	Nb	Al	B	Ti	N	Sn			
1	1011318301 ✓	0.1652	0.2429	0.9397	0.0089	0.0029	0.0355	0.0066	0.0134	0.0129	0.0022	0.0001	0.0315	0.0003	0.0018	0.0068	0.0021			
2	1011318301	0.159	0.235	0.918	0.0076	0.00246	0.035	0.013	0.014	0.011	0.001	0.001	0.031	0.00059	0.002	0.004	0.001			
Mech.-technologische Prüfung [mech. technological test]																				
Proben Nr. [test no.]	Zugversuch [tensile test]						Kerbschlagbiegeversuch [notched bar impact test] Form: ISO-V						Härteprüfung [hardness test]							
	Pr.-Lage [pos. of sample]	Temp.	Dehng. [yield str.] ReH	Zugfestigkeit [tensile str./Rm (MPa)] Rp 0.2	Dehnung [elongation] 4D (%)	PR-Lage [pos. of sample]	Temp.	Querschnitt [cross sec.]	Kerbschlagarbeit [impact values] (J)	158-161 HB ✓										
6387_11	L	+20 °C	326 ✓	475 ✓	33,5 ✓		-50 °C	80	157-154-265											
"Conforms With ASME Sec II, Part A, 2010 edition, 2011a addenda"  Encana										Wärmebehandlung [heat treatment] normalized temperature 920 °C Holding Time 20 min. Cooling in still air										
Kennzeichnung [marking]   AUSTRIA / WPL6 / 1011318301 / 4" / 2" / XXS/XXS / MT										Zusatzmarkierung [add. mark.]										
Besichtigung und Ausmessung [visual inspection and dimensional check] o.B./o.K.										Die gelieferten Produkte entsprechen den Anforderungen der Bestellung (einschließlich Herstellung, Probennahme, Testen und Prüfen). [The supplied products comply with the requirements of the order (including manufacturing, sampling, testing and inspections).]										
Bemerkungen [remarks] cold formed magnetic particle examination acc. ASTM E709: o.k.										Der Werksachverständige [the Works Inspector] 28/10/11 Grabherr Harald 321 Dieses Dokument wurde elektronisch erstellt und ist ohne Unterschrift gültig. [The certificate is issued by the computerized system and is valid without signature.]										

Zertifiziert nach DGRL 97/23/EG Anhang I - Absatz 4.3 durch TÜV SÜD Industrie Service, Benannte Stelle 0036, Zertifikat Nr. 129/2002/MUC [Certified acc. to PED 97/23/EG Annex I, Paragraph 4.3 by TÜV SÜD Industrie Service, Notified Body 0036, Certificate No. 129/2002/MUC]

Vendor:

Encana

Heat No:

1011318301

Date:

15-Nov-12

	C	Mn	Cr	Mo	Ni	Cu	V
	Carbon	Manganese	Chromium	Molybdenum	Nickel	Copper	Vanadium
Fill in Product Analysis from MTR's	0.1652	0.9397	0.0355	0.0066	0.0134	0.0129	0.0022

			Mn	C	Standard	Ratio
Do Not Fill in these Numbers	Ratio	Mn/C	0.9397	0.1652	>3.00	5.6883

	C	Mn	Cr	Mo	V	Ni	Cu
Do Not Fill in these Numbers	0.1652	0.9397	0.0355	0.0066	0.0022	0.0134	0.0129

$CE = C + (Mn/6) + ((Cr + Mo + V)/5) + ((Ni + Cu)/15)$	CE=	0.33243
Do Not Fill in these Numbers	Standard	<.45

Vendor:

Encana

Heat No:

1011322931

Date:

15-Nov-12

	C	Mn	Cr	Mo	Ni	Cu	V
	Carbon	Manganese	Chromium	Molybdenum	Nickel	Copper	Vanadium
Fill in Product Analysis from MTR's	0.1678	0.8969	0.0230	0.0033	0.0129	0.0137	0.0007

			Mn	C	Standard	Ratio
Do Not Fill in these Numbers	Ratio	Mn/C	0.8969	0.1678	>3.00	5.3451

	C	Mn	Cr	Mo	V	Ni	Cu
Do Not Fill in these Numbers	0.1678	0.8969	0.0230	0.0033	0.0007	0.0129	0.0137

$CE = C + (Mn/6) + ((Cr + Mo + V)/5) + ((Ni + Cu)/15)$	CE=	0.32446
Do Not Fill in these Numbers	Standard	<.45

CLIENTE / Customer / Client
CCTE CORPORATION (EDMONTON)
5407 - 53 AVENUE NW
EDMONTON, AB T6B 3G2
CANADA

CERTIFICADO DE INSPECCION
Inspection Certificate - Certificat de Réception
 FECHA: 20/06/2012 N.º 149135
 Date: 20/06/2012 No. 149135

DIN EN 10204 / 3.1
 ISO 10474 / 3.1



ULMA
 ULMA FORJA, S.COOP.
 Bº Zabalgara, 3 - Ando. 14
 20580 ONATI (Gipuzkoa) SPAIN
 Tel.: 34 - 943 780352
 Fax: 34 - 943 781808
 E-mail: ulma@ulmaprobing.com

PRODUCTO **FLANGES** **SU PEDIDO N.º**
 Article - Produit Your Order No. 4891318-00
 Your Code N.º

DE **24/04/2012**

NORMAS APLICABLES **ASME B16.5-09**
 Requirements - Normes Applicables

MATERIAL CORRESPONDIENTE **ASA105N-11 II ASA350LF2CL-1-11**
 Material Correspondent - Qualité

MODO DE FUSION (*)
 Steel Making - Elaboration de l'acier

NACE MR0175/ISO15156-2-09 & MR0103-10
 Clause 7.2.1.4, Annex A.2 and SSC Region 3.
CSA-Z245.12-09 GR248 CAT II - SS (WN & BLIND FLANGES ONLY)

DEPARTAMENTO **QUALITY ASSURANCE**
 Section



Packing List: 94112

PARTIDA Item Poste	CANTIDAD Quantity Quantité	DESCRIPCION Description Description	LOTE	OBSERVACIONES Remarks Observations	COLADA N.º Heat No N.º Coulee	TENSIL T Strength T Strength Min/m2	ALARGAM. Elongation Elongation Lo: 4 d %	ESTRICCION Red. Area Reduction %	RESILIENCIA Impact test Resilience Joules	CHAPY V 10x10mm Welding Welding Min/mm	DUREZA Hardness Dureté HBW	
32 7582180	24	BLIND 8 600LB RF A350LF2	1612	NE	300V2	508	313	32.10	50	40	51	150 156
34 7586220	16	WN 4 900LB XS/80 RF A350LF2	1322	NE	233V2	520	310	32.90	64.90	37	43	155 164
62 7581234	14	WN 4 900LB XS/80 RF A350LF2	942	NE	45V2	525	334	34.10	52	49	47	148 154
62 7581234	32	WN 4 2500LB XXS RTJ A350LF2	1062	NE	173V2	529	319	30.10	55.10	46	60	150 156
62 7581234	16	WN 4 2500LB XS RTJ A350LF2 ✓	1102	NE	189V2	526	321	29.50	52.60	58	64	151 156
7581490	24	WN 8 600LB XS/80 RF A350LF2	1492	NE	230M2	551	382	25.00	48.50	93	63	162 162

COMPOSICION QUIMICA - STEEL MAKERS LADLE ANALYSIS - ANALYSE CHIMIQUE

COLADA N.º Heat No N.º Coulee	C %	SI %	Mn %	P %	S %	Cr %	Ni %	Mo %	Nb %	V %	Cu %	Al %	Ti %	N %	CEQ %
173V2	0.190	0.260	0.850	0.017	0.005	0.250	0.130	0.070	0.001	0.003	0.250	0.032	0.008	0.000	0.422
189V2	0.210	0.290	0.830	0.010	0.004	0.140	0.070	0.020	0.001	0.002	0.220	0.035	0.008	0.000	0.400
230M2	0.170	0.220	1.210	0.007	0.002	0.070	0.080	0.020	0.001	0.006	0.220	0.035	0.008	0.000	0.423
233V2	0.195	0.220	1.090	0.021	0.006	0.050	0.100	0.025	0.000	0.002	0.280	0.020	0.000	0.000	0.417
300V2	0.210	0.220	0.880	0.011	0.005	0.190	0.070	0.010	0.001	0.002	0.260	0.033	0.000	0.000	0.421
45V2	0.200	0.240	0.950	0.020	0.005	0.070	0.140	0.040	0.000	0.002	0.370	0.025	0.000	0.000	0.415

- Las dimensiones y la conformidad superficial se hallaron satisfactorias.
- Dimension and surface condition were found acceptable.
- Les dimensions et états de surface sont satisfaisants.
- Los materiales citados cumplen las normas aplicables.
- Manufacturing requirements are satisfied.
- Les normes applicables sont respectées.



ULMA FORJA, S.COOP.
 Dpto. de Garantía de calidad
 Quality Assurance Dept.

(*) OBSERVACIONES:
 Remarks
 Observations

N.º NORMALIZED AT 900 C AND ALLOWED TO COOL IN STILL AIR

"Conforms with ASME

Sec II, Part A, 2010 edition,

2011a addenda"

Inspector

HEAT # 21308	C	Mn	Cr	Mo	Ni	Cu	V
	Carbon	Manganese	Chromium	Molybdenum	Nickel	Copper	Vanadium
Fill in Product Analysis from MTR's	0.16	1.25	0	0	0.003	0	0

Do Not Fill in these Numbers	Ratio	Mn/C	Mn	C	Standard	Ratio
			1.25	0.16	>3.00	1.25

Do Not Fill in these Numbers	C	Mn	Cr	Mo	V	Ni	Cu
	0.16	1.25	0	0	0	0.003	0

$CE = C + (Mn/6) + ((Cr + Mo + V)/5) + ((Ni + Cu)/15)$	Standard	< 45
Do Not Fill in these Numbers		0.16



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

MILL TEST CERTIFICATE

EN10204-3.1.B(DIN50048/3.1.B)


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

Order No.: D000234/S759086172

Certificate No.: SE102032

Date: 06/11/2012

Page: 1 OF 1

PRODUCT				MATERIAL SPECIFICATIONS										DIMENSIONAL SPECIFICATIONS									
FORGED CARBON STEEL FLANGES ✓				ASTM A350 LF2-11 CL 1/ASME SA350 LF2-11 CL 1 ✓										ASME B16.5-09 CSA Z245.12									
Item No.	CODE NO	DESCRIPTION	QUANTITY	CHEMICAL COMPOSITION (%)																		CE(+3)	
				C	Si	Mn	P	S	Cu	Cr	Ni	Mo	V	Nb	N								
1		2500 WNRTJ XXS 2" LF2 ✓	100 PCE	0.230	0.200	1.150	0.015	0.008	0.006	0.020	0.010	0.005	0.005	0.001	0.007				0.429				
2		1500 WNRTJ S160 3" LF2	50 PCE	0.210	0.200	1.150	0.017	0.005	0.006	0.010	0.010	0.001	0.005	0.001	0.005				0.406				
3		600 BLRF(2"NPT TAP) 3" LF2	30 PCE	0.230	0.200	1.150	0.015	0.008	0.006	0.020	0.010	0.005	0.005	0.001	0.007				0.429				
4		1500 WNRF XXS 3" LF2	10 PCE	0.210	0.200	1.150	0.017	0.005	0.006	0.010	0.010	0.001	0.005	0.001	0.005				0.406				
RATIO = 5.0																							
Item No.	Heat No.	Min Max	T.S.(+1) (MPA)	Y.S.(+1) (MPA)	E.L.(+1) (%)	Hardness (HB)	R.A.(+1) (%)	Impact Test Temp: -46°C Minimum: 20.0 Joule			Material Supplier	HEAT TREATMENT(+2)											
								1	2	3		REMARKS											
1	4510829 ✓		541.3 ✓	395.2 ✓	33.2 ✓	155/153 ✓	68.6	85.0	64.0	70.0	ACOMINAS	890°CX3HRS CONFORMS WITH NACE MR0103-10 AND NACE MR0175/ISO 15156-2-09 CONFORMS WITH Z245.12 CAT II GR.248 SOUR SERVICE-09(FOR USE AS WELDING NECK AND BLIND FLANGES ONLY) TEST SPECIMEN SIZE: 10X10 TEST SPECIMEN ORIENTATION: TRANSVERSE IMPACT TEST TEMP: -46°C											
2	4554034		520.0	362.0	34.0	153/151	69.5	72.0	39.0	45.0	ACOMINAS												
3	4510829		541.3	395.2	33.2	155/153	68.6	86.0	54.0	70.0	ACOMINAS												
4	4554034		520.0	362.0	34.0	153/151	69.5	72.0	39.0	45.0	ACOMINAS												
*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 /16) + (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																							

"Conforms with ASME
Sec II, Part A, 2010 edition,
2011a addenda"

2012/11/19 S. Nasan

MATERIAL CONFORMS
TO CUSTOMER
SPECIFICATIONS
AS PER P.O.
REQUIREMENTS

Name: S. Nasan

Date: 2012/11/19

Order#: 213684 Seq: 1 PO#: 708226 Heat#: bn511 Mill: TK Corporation VA Desc: recertified to a234-wpb
Part#: WF 4 XXS 90 PB Part Desc: Weld Fittings 4 (114.3mm O.D.) DOUBLE EXTRA HEAVY LR 90 DEG ELBOW A/SA234-WPB

EL94LXXHBL
8 in stock
heat # BNS11

OTK Corporation

INSPECTION CERTIFICATE

(EN10204:2004 3.1 / ISO 10474:1991 3.1B)

1489-1, SONG JUNG-DONG,
GANGSEO-GU BUSAN, KOREA
Tel : 82-51-831-6550
Fax : 82-51-831-6986

Customer	Comco Pipe & Supply		Certificate No.	20110801034	Date	2011/09/06
P.O. No.	E1-2321		Project Name			
Job No.			POR/Req'n No			
Specification for Material	ASTM/ASME A/SA420 WPL6(07 Ed.&09 Add.) NACE MR0175/ISO 15156-2 AND NACE MR0103-2007		Starting Material	SEAMLESS PIPE		
Specification for Inspection	ASME B16.9-2007		Dimension and Visual Inspection	GOOD		
Heat Code No [HCN]	No.	Descriptions		Q'ty (Pcs)	Heat Treatment	
✓ BN511	0183	90° ELBOW LONG XX-S ✓ B.W 4"		20	N: 910°C	
<p>2012/7/18 S. Nasou</p> <p>"Conforms with ASME Sec II, Part A, 2010 edition, 2011a addenda"</p>						

CHEMICAL COMPOSITION (%)

Heat Code No [HCN]	Spec.	C	SI	Mn	P	S	NI	Cr	Mo	Cu	V	Cb	Ti	B	C.E	Raw Heat No/Raw Maker
	Max.	0.23	0.40	1.35	0.035	0.010	0.40	0.30	0.12	0.40	0.080	0.020	-	-	0.42	
	Min.	-	0.15	0.50	-	-	-	-	-	-	-	-	-	-	-	
✓ BN511	L P	0.13 0.10	0.23 0.22	0.87 0.85	0.010 0.009	0.004 0.002	0.03 0.01	0.05 0.04	0.01 0.02	0.07 0.06	0.008 0.006	0.012 0.011	0.000 0.001	0.0002 0.0001	0.295 0.260	507983 / TPCO

✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓

new Spec

MATERIAL CONFORMS TO CUSTOMER SPECIFICATIONS AS PER P.O. REQUIREMENTS

MECHANICAL PROPERTIES

Name: ENCANA

Heat Code No [HCN]	Spec	Y.S	T.S	E.L [%]		Hardness Test			* Impact Test(J)				Date: <u>Nov 14 2012</u>	
		Ksi				HB	Temp.(°C)	Size(2mm-v)						
		Max.	85					-46	Ave.					
		Min.	60											
		30				237								
		-				-			Act.					
✓ BN511	P	42.6	65.7	33.9		✓ 148	151	154	194.5	214.3	215.6	208.1		
		✓	✓	✓		✓					✓			

RATIO = 8.5

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

Remark : * CSA Z245.11-09 Gr241 CAT II Sour Service
* Mn/C Min.: 3.00
-BN511 : 6.69
* FORMING METHOD
-BN511 : HOT FORMING

* Impact Specimen Size & Spec. Value
Size Min. Ave.
BN511 10X10X55mm 13.0 17.6

Legend:
HB: Brinell
ST: Solution Treatment
SR: Stress Relieving
N: Normalized
T: Tempered
A: Annealed
Q: Quenched
(G): Hot-Dip Galvanized Coating
Y.S: 0.2% Offset Method
AC: Air Cool
CC: Oil Cool
WQ: Water Quenched
WC: Water Cool
L: Ladle
P: Product

MATERIAL CONFORMS TO CUSTOMER SPECIFICATIONS AS PER P.O. REQUIREMENTS

Reviewed by :

ENCANA

Witnessed by :

Approved by :

S. A. Lee

Director of Quality Assurance Dep't

Name: S. Nasou

Date: 2012/7/18

P.O.# 705955 Item# 2
Heat Number: BU112
Trans Am Piping Products Ltd. - Rev'd By: SB
Shipment/Seq #: S 11 - 1952 82

4" XXH LR 90 BW ELBOW
A420-WPL6

EL94LXXHGD
2 in stock
Heat # BU112

EDTK Corporation

INSPECTION CERTIFICATE

(EN10204:2004 3.1 / ISO 10474:1991 3.1B)

1499-1, SOHO JUNG-DONG,
GANGSEONG-GU BUSAN, KOREA
Tel : 82-51-831-8550
Fax : 82-51-831-8886

Customer	Trans Am Piping Products Ltd.		Certificate No.	20111103716	Date	2011/11/16
P.O. No.	CI-11-408		Project Name			
Job No.			POR/Req'n No.			
Specification for Material	ASTM/ASME A/SA420-WPL6(2010Ed) NACE MR0175/ISO 15156-2 AND NACE MR0103-10 ✓		Starting Material	SEAMLESS PIPE		
Specification for Inspection	ASME B16.9-2007		Dimension and Visual Inspection	GOOD		
Heat Code No [HCN]	No.	Descriptions	Q'ty (Pcs)	Heat Treatment		
BU112	0062	90° ELBOW LONG XX-S 16W 4"		N: 910°C		
<p>"Conforms with ASME Sec II, Part A, 2010 edition 2011a addenda"</p> <p>Nov 12/12</p>						

CHEMICAL COMPOSITION (%)

Heat Code No [HCN]	Spec	C	Si	Mn	P	S	Ni	Cr	Mo	Cu	V	Co	C.E	Raw Heat No
	Max.	0.30	0.35	1.35	0.035	0.040	0.40	0.30	0.12	0.40	0.080	0.020	0.43	
	Min.	-	0.15	0.50	-	-	-	-	-	-	-	-	-	
BU112	L	0.16	0.24	0.03	0.011	0.008	0.05	0.06	0.01	0.09	0.007	0.013	0.340	514318
		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	

MATERIAL CONFORMS TO CUSTOMER SPECIFICATIONS AS PER P.O. REQUIREMENTS

Name: Coil
Date: Mar 12/12

Muic = 581

MECHANICAL PROPERTIES

Heat Code No [HCN]	Spec	Y.S. (ksi)	T.S. (ksi)	EL. (%)	Hardness, Temp. HB	Impact Test (J) Temp. (°C)	Size (mm-v)
	Max.	-	65	-	197	-46	
	Min.	35	60	30			
BU112	P	48.5	73.5	32.5	144	62.1 70.2 65.7 66.0	
		✓	✓	✓	✓		

MATERIAL CONFORMS TO CUSTOMER SPECIFICATIONS AS PER P.O. REQUIREMENTS

Name: EnCana
Date: Nov 14 2012

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

Remark : •CSA Z245.11 Gr. 241 Cat II Sour Service
•CRN No.
QA9067.2, QA9067.24, QA9067.27, QA9067.20,
QA9067.28, QA9067.25, QA9067.29, QA9067.26,
QA9067.2T, QA9067.2Y, QA9067.2N

• Impact Specimen Size & Spec. Value
BU112 Size 10x10x55mm Min. 18.0

Legend:
HB: Brinell
ST: Solution Treatment
SR: Stress Relieving
N: Normalized
T: Tempered
A: Annealed
Q: Quenched
(G): Hot-Dip Galvanized Coating
Y.S: 0.2% Offset Method
AC: Air Cool
OC: Oil Cool
WQ: Water Quenched
WC: Water Cool
L: Ladle
P: Product

Reviewed by :

Witnessed by :

Approved by :

Director of Quality Assurance Dept

Jun. 13. 2012
"Conforms with ASME
Sec II, Part A, 2010 edition,
2011a addenda"

Encana

**MATERIAL CONFORMS
TO CUSTOMER
SPECIFICATIONS
AS PER P.O.
REQUIREMENTS**

Jun. 13. 2012
"Conforms with ASME
Sec II, Part A, 2010 edition,
2011a addenda"

Encana Welded Pipe New Spec

* BOTH #5: H105Z
New spec

DATE: 08/11/11
TIME: 16:36:55
SERIAL NO: L0037153



UNITED STATES STEEL

MILL ORIGIN ITEM NO DR01134 06	SHIPPER'S NO. 111906-00	P.O. NUMBER 111906-00	VEHICLE ID 111906-00
SOLD TO ADDRESS TEXAS PIPE & SUPPLY CO INC 2330 HOLMES RD HOUSTON TX 77051-1098		MAIL TO ADDRESS TEXAS PIPE & SUPPLY CO INC 2330 HOLMES RD HOUSTON TX 77051-1098	
		VENDOR USS TUBULAR PRODUCTS 2199 EAST 28TH ST. LORAIN, OH 44055	

SPECIFICATION AND GRADE

PRESSURE PIPE CARBON SMUS HF ASTM A333-*10 GRADE 1 ASTM A333-*10 GRADE 6 ASME SA333-*2010 EDITION GRADE
 1 ASME SA333-*2010 EDITION GRADE 6 ASTM A106-*08 ASME SA106-*2010 EDITION GRADE 6 DUAL STENCIL 58000
 PSI MAX YIELD BLK REG MILL COAT PE BEV 30 DEG MEETING ALL THE APPLICABLE REQUIREMENTS OF NACE STANDARD
 MR-01-75 3-2003/COR.1:2005 AND MR0103-2007

ix

MATERIAL COND:		FULL BODY NORMALIZED										CND: 4.500(114-300)		WALD: 0.674 (17-119)		In (mm)		In (mm)					
PRODUCT IDENTIFICATION		TENSILE		TEST COND.		GAUGE WIDTH		YIELD		EXT %		TENSILE		Y/T		ELONG %		HARDNESS		MIN HYDRO		DWELL RECD	
		TEST TYPE/ ORIENTATION				IN.		MIN: MAX:		PSI .50		MIN: MAX:		MAX:		MIN:		SCALE: HRB		PSI			
FAL032 P3484A	STRIP/L/B	NM	1.500	44600	✓.50	75000	✓.50	0.59	43.2	✓	B 80.0	2800	5										
FAL032 P3484A	STRIP/L/B	NM	1.500	45300	✓.50	75000	✓.50	0.60	44.9	✓	B 84.1	2800	5										
FAL043 P3474A	STRIP/L/B	NM	1.500	45800	✓.50	76000	✓.50	0.60	45.2	✓	B 84.1	2800	5										
FAL043 P3474A	STRIP/L/B	NM	1.500	46400	✓.50	75500	✓.50	0.62	43.9	✓	B 84.1	2800	5										
				**		END OF DATA THIS SHEET																	
LEGEND:		L - LONGITUDINAL U - UPSET		T - TRANSVERSE NM - NORMALIZED		QT - QUENCH & TEMPERED SR - STRESS RELIEVED		AR - AS ROLLED TR - THEMOMECHANICAL ROLLED		B - BODY		W - WIELD											
PRODUCT IDENTIFICATION		TYPE		C	MN	P	S	SI	CU	NI	CR	MO	AL	N	V	B	TI	CB	CO	CE	MAX	MAX	MAX
FAL032	HEAT	120V	101V	010V	001V	18V	16	11	06	02	020		00	0001	0001	0001	0001	0001	0001	0001	0001	0001	0001
FAL032 P3484A	PROD	17V	99V	006V	001V	19V	15	10	05	02	022		00	0002	0002	0002	0003	0003	0003	0003	0003	0003	0003
FAL032 P3484A	PROD	18V	101V	006V	001V	20V	15	10	05	02	022		00	0002	0002	0002	0005	0005	0005	0005	0005	0005	0005
FAL043	HEAT	19V	102V	011V	007V	19V	16	13	08	03	027		00	0000	0002	0002	0002	0002	0002	0002	0002	0002	0002
FAL043 P3474A	PROD	18V	101V	008V	003V	20V	16	12	08	02	029		00	0002	0001	0004	0004	0004	0004	0004	0004	0004	0004
FAL043 P3474A	PROD	18V	100V	007V	003V	20V	15	12	08	02	028		00	0001	0001	0001	0001	0001	0001	0001	0001	0001	0001

*C.E. IS BASED ON THE FOLLOWING EQUATION(S):

CE = C + (MN / 6) + (CR + MO + V) / 5 + (NT + CU) / 15

$$CE = C + (MN/6) + (CR+MO+V)/5 + (NI+CU)/15$$

DECIMAL POSITIONS FOR ELEMENTS ARE INDICATED BY THE LEFT MARGIN, VERTICAL DOTTED LINE OR DECIMAL POINT. ELEMENTS REPORTED IN MASS FRACTION (%)

Ratio: MN/
C= 5.36



UNITED STATES STEEL

TUBULAR PRODUCTS
CERTIFIED TEST REPORT
(IN ACCORDANCE WITH ISO 10474/EN10224/DIN5049 "Type 3.1")

DATE: 08/11/11
TIME: 16:36:55
SERIAL NO: L40037153

DATE: 08/11/11
TIME: 16:36:55

SERIAL NO: 140037153

MATERIAL CONC:	FULL BODY NORMALIZED		O.D.		WALL:			
	DRO1134 06		111906-00	4.500(114.300)	0.674 (17.119)	(in mils) (in mils)		
PRODUCT IDENTIFICATION	FLAT	BEND	GRAIN SIZE	RIM COLLAPSE	CHARPY V-NOTCH IMPACT TESTING			
PA1032 P3484A HA1043 P3474A	OK OK				% SHEAR			
** END OF DATA THIS SHEET **								
LEGEND	L - LONGITUDINAL	T - TRANSVERSE	B - BODY	W - WELD	HAZ - HEAT AFFECTED ZONE			
TEST / INSPECTION	YES	TESTING / INSPECTION INFORMATION RESULTS / COMMENTS						
FULL LENGTH VISUAL	X							
FULL LENGTH EMI		OD	OD/RD	L	L/T			
FULL LENGTH MPI		ID	OD/RD	L	L/T			
FULL LENGTH UT		MPI	UT					
END AREA INSPECTION (PLAIN END)		MPI	UT					
SPECIAL END AREA (SEA) INSP		DRIFT MANDREL SIZE:						
FULL LENGTH ORIT								
ADDITIONAL NOTES/COMMENTS								
MELTED AND MANUFACTURED IN THE USA. NO REPAIRS BY WELDING. NO MERCURY OR MERCURY COMPOUNDS ARE ADDED TO THE STEEL AND ALL MERCURY BEARING EQUIPMENT IS PROTECTED BY A DOUBLE BOUNDARY OF CONTAINMENT.								

THIS IS TO CERTIFY THAT THE PRODUCT DESCRIBED HEREIN WAS MANUFACTURED,
SAMPLED, TESTED AND/OR INSPECTED IN ACCORDANCE WITH THE SPECIFICATION
AND FULFILLS THE REQUIREMENTS IN SUCH RESPECTS.

PREPARED BY THE OFFICE OF: R. HARRIS - MANAGER, Q.A.

DATE: 08/11/11

DATE 08/11/11

Issuing Authority: Marvin J. (Ty) DeBelser		Quality Control
Date of Issue: March 13, 2008		QCFO Final Inspection Release Certificate R00

FINAL INSPECTION RELEASE CERTIFICATE

CUSTOMER:	ENCANA	SALES ORDER#:	NA
PRODUCT:	Shell, Pre-heat, Expansion Tank, Firetube & Stack for 3.0 mm Lineheater	WO#:	08562-002-C
		DATE:	Jan 16/13

FINAL INSPECTION DOCUMENTATION

REVIEWED BY:	ACCEPTED:	REJECTED:
STANDARD DOCUMENTATION REQUIREMENTS: (SEE DOCUMENT REQUIREMENT LIST)		
ADDITIONAL DOCUMENT REQUIREMENTS: (TO BE RECORDED HERE IF APPLICABLE I.E. DOCUMENT PACKAGE REQUIRED BY CUSTOMER ETC.)		

Q.C. FILE CLOSURE BY: <i>Kasha Fox</i>	DATE: Jan 17 2013
--	-------------------

LOOSE COMPONENTS REQUIRED / PREPARED

ITEMS REQUIRED:	NO. OF BOXES OR PKGS. _____
<i>Shell, preheat, exp tank, Firetube & stack for 3.0 mm line heater</i>	
ADDITIONAL HARDWARE OR FASTENERS REQUIRED	YES <input type="checkbox"/> NO <input type="checkbox"/>

PREPARATION FOR SHIPMENT / STORAGE

PREPARATION NEEDED / COMPLETED
<i>Release to next process.</i>

LOT #	08562-002-C
ITEM #	Bath

INVENTORY TAGS ATTACHED	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>
-------------------------	---

SHIPPING INSTRUCTIONS

CUSTOMER P.O. REVIEWED	YES <input type="checkbox"/> N/A <input checked="" type="checkbox"/>
CONTACT PERSON AUTHORIZED TO RELEASE PRODUCT: _____	
PHONE:	FAX:

RELEASED TO INVENTORY: <i>Kari Pherson</i>	DATE: 1/16/13
RELEASED TO CUSTOMER:	DATE:

NWP Industries Inc.


PRESSURE PIPING EXAMINATION CHECKLIST


DRWG. # **LH-PH-7224-1 REV 3** & **08562-6 REV 0**


JOB NUMBER: **08562-002-C**

NO.	FUNCTION	SIGNATURE OR INITIAL AND DATE	
		Q.C. INSPECTOR	OWNERS INSPECTOR
1	DRAWINGS: ABSA registration over 0.5 Cu.M. Approved by Owner. Approved for Construction (signed & dated).		
2	Owner's Inspector notified.		
3	Registered Welding Procedure Specifications, Q.C. Manual and Forms available at site, Job File started.	<i>QA Nov 16/12</i>	
4	Welders qualified for WPS's and have valid Performance Qualification cards. Welders Log completed. WPS reviewed with Welders. <i>HOLD</i>	<i>QA Nov 16/12</i>	
5	Material checked against P.O., drawings, and specifications. Identification confirmed. Colour coding applied. <i>HOLD</i>	<i>Nov 28/12</i>	
6	Sample of each Welder's work examined, including root spacing, alignment, cleaning, joint preparation, preheat and electrode control.	<i>Nov 28/12</i>	
7	Nondestructive Examination completed. Reports and radiographs reviewed, signed by Level II or III, Radiograph I.D. detailed on drawings. <i>HOLD</i>	<i>Nov 29/12</i>	
8	Visual Examination of all completed welds. Welders I.D. stamped and recorded on drawings.	<i>Nov 28/12</i>	
9	Heat Treatment verified and recorded on drawings. <i>NA</i>		
10	Each system checked against specifications and drawings before test.	<i>Nov 29/12</i>	
11	All deficiencies recorded and signed off by Q.C.I. and Owner's Inspector before test.	<i>Nov 29/12</i>	
12	Pressure Test checked. Gauge calibration verified, gauge #'s recorded. <i>HOLD</i>	<i>Jan 16/13</i>	
13	System checked after test. Deficiencies recorded and corrected.	<i>Jan 16/13</i>	
14	Construction data reports (AB-83) prepared and signed by Q.C.I. and Owner's Inspector.	<i>SEE ASSEMBLY</i>	
15	Declaration form (AB-81) submitted to ABSA		
16	As built drawings accepted by Owner.		

2
NOV 14 2012

Issuing Authority: Marvin J. (Ty) DeBelser / Dale Karg Date of Issue: November 30, 2007 Rev Status: 1.0	 NWP INDUSTRIES INC.	Manufacturing FORM-LHTS-001 Line Heater Travel Sheet (Shell, Skid & Firetube Assembly)				
By: <u>[Signature]</u>		Date: NOV 14 2012				
W.O. # 08562-002-C	Description: FIRETUBE & STACK for 3.0 mm LH PKG.					
Drawing # LH-FIRSTK-24-2 REV 1						
	Req.	Hold	Employee Initial	Date Complete	QC Initial	Date
Work Instructions/Drawings Issued	✓		[Signature]	DEC 5/12	[Signature]	Nov 16/12
Work Instructions/Drawings Reviewed	✓	✓	[Signature]	DEC 5/12	[Signature]	Nov 16/12
Material & Parts Released	✓	✓	[Signature]	DEC 5/12	[Signature]	Jan 11/13
Welding Personnel Assigned	✓	✓	[Signature]	DEC 5/12	[Signature]	Jan 11/13
Visual Dimension Inspection - Firetube/Stack	✓				[Signature]	Dec 13/12
Visual Dimension Inspection - Skid	NA					
Visual Dimension Inspection - Expansion Tank	NA					
Visual Dimension Inspection - Preheat Line	NA					
Visual Dimension Inspection - Shell Assy.	NA					
Pneumatic Test - Firetube	✓	✓			[Signature]	Jan 07/13
Hydro Test - Preheat Line	NA					
Pneumatic Test - Shell Assy.	NA					
Installation of All Welded Components Complete	✓				[Signature]	Jan 11/13
Final Inspection Release	✓				[Signature]	Jan 11/13
<div style="display: flex; justify-content: space-between;"> <div> Accepted By Customer: _____ _____ </div> <div> Date: _____ _____ </div> </div>						

Issuing Authority: Marvin J. (Ty) DeBelser / Dale Karg Date of Issue: November 30, 2007 Rev Status: 1.0	 NWP INDUSTRIES INC.	Manufacturing FORM-LHTS-001 Line Heater Travel Sheet (Shell, Skid & Firetube Assembly)				
By: <u>[Signature]</u>		Date: NOV 14 2012				
W.O. # 08562-002/C	Description: SHELL & EXPANSION TANK for 3.0 mm LH PKG.					
Drawing # LH-7224-BARE REV 3						
	Req.	Hold	Employee Initial	Date Complete	QC Initial	Date
Work Instructions/Drawings Issued	✓				(M)	Nov 16/12
Work Instructions/Drawings Reviewed <small>NOTE ON PAGE 4</small>	✓	✓			(S)	Nov 16/12
Material & Parts Released	✓	✓			(S)	Jan 16
Welding Personnel Assigned	✓	✓			(S)	Jan 16
Visual Dimension Inspection - Firetube/Stack	NA					
Visual Dimension Inspection - Skid	NA					
Visual Dimension Inspection - Expansion Tank	✓				(S)	Jan 16
Visual Dimension Inspection - Preheat Line <small>INSTALL</small>	✓	✓	[Signature]		(S)	Dec 11/12
Visual Dimension Inspection - Shell Assy.	✓				(S)	Jan 16
Pneumatic Test - Firetube	NA					
Hydro Test - Preheat Line	✓	✓			(S)	Jan 16
Pneumatic Test - Shell Assy.	✓	✓			(S)	Jan 16
Installation of All Welded Components Complete	✓				(S)	Jan 16
Final Inspection Release	✓				(S)	Jan 16
Accepted By Customer:			Date:			

Issuing Authority: Marvin J. (Ty) DeBelser/Dale Karg		ABSA
Date of Issue: March 30 2012		FORM_NDE_001
Rev Status: 2.0		N.D.E Requirements

N.D.E Requirements

Client: Encana

JO# 08562-002-C

Project: Preheat Line – 3.0 mm Lineheater

Date: 28/11/2012

Piping: ☒

Pressure Vessel: ☐

Tank: ☐

Other:

☐ X-Ray

☐ 100%

☐ ASME Section VIII-UW-51

☒ Gamma Ray

☐ Full

☐ ASME Section VIII-UW-52

☐ Ultrasonics

☐ 25%

☐ Customer Specification

☐ Liquid Penetrant

☒ 10%

☒ ASME B31.3 NFS

☒ Magnetic Particle

☐ Other(Define)

Other (Specify)

☐ Accoustic Emission

☐ Spot

☒ Customer Spec

☐ Hardness test Max 200 BHN

☐ CSA W47.1/W59

General Instructions:

Vessel S/N

P1 Material

Welder ID S

Shell-T=

Pipe-T= 1" Sch 160

Total Welds 1 x Gap Shot (GS-1) & 1 X MPI (MT-1)

Please use wire type iQi

Please Note locations of all indications on films on reports

Please include O.F.D-S.O.D S.F.D on reports

Special Requirements:

Shots

Buttweld Xray to be identified as X-#

Gap Shots to be identified as GS-#

Threaded Shots to be identified as XT-#

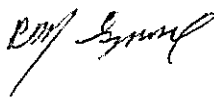
Identify on Envelope part of package being shot ie. Coil, Piping, ect.

Flashes must contain: Customer, JO#, Spool Identification, Xray number, Clock tape, Welder's ID Symbol, Date

Mark all indicated repairs on the project

NOTE: Encana Spec for Welded Piping-acceptance is zero UC and Zero IP
 Encana Spec for Socket Welds-acceptance is minimum 1/16" gap
 Encana Spec for Threaded Piping- acceptance is 7 threads engaged
 HT is a 5 Point Traverse

Prepared By: R.M. Spence



Date: 28/11/2012



MAGNETIC PARTICLE INSPECTION REPORT

CG18 - MT3

Page 1 of 1

Procedures: MT 2V
Code: CSA W47.1W59

Job / P.O. #: 08562-002-C

IRISNDT #: 255874

Date: 28-Nov-12

Client: ENCANA

Location: Alberta

Item Inspected: Piping 1"160 socket weld

Surface Condition: Painted ☐ Sandblasted ☐ Machined ☐ As Cast ☒ As Forged ☐ Weldment ☒ Other ☐

Material: cs

Thickness: 1"160

Heat Treatment: na

Magnetizing Equipment: Yoke ☒ Coil ☐ Prod ☐Bench: Headshot ☐ Central Conductor ☐ Coil ☐

IRISNDT #: 40155

Mfg: contour probe

Calibration Date: 24-Oct-12

Blacklight: ☐
☐

IRISNDT #:

Mfg:

Calibration Date: -Jan-11

Verification per ASME V Art 7 T.777.2

Whitelight:

Battery Powered Min. 3V
110V Power Min. 60W Bulb☒ }
☐ }Held within 30 cm (12in) of the inspection surface
provides minimum 1000 Lx (100fc)Method of Magnetization: AC ☒ DC ☐ Continuous ☒ Residual ☐Magnetic Particles: Dry ☐ Wet ☒Red ☐ Grey ☐ Black ☒ Fluorescent ☐

Batch #: 1206

Mfg: ardrex

Type: 8031

Background: ☒

Batch #: 1243

Mfg: ardrex

Type: 8901w

Scope: Black on white MPI was performed on a 1" 160 socket weld.

Item inspected:

MT-1 1"160 socket weld Welder ID: "S"

RESULTS: A 1" long crack was found on the fitting, ending on the HAZ area of the weld. *Not acceptable to code.***Inspection Limitation(s):**

Unit#: 334

Kilometers: _____

In: 0330

Out: 0400

Hrs: .5

In: _____

Out: _____

Hrs: _____

Personnel:

Joseph Smith, Jeff bruckshaw, Michael V

Consumables:
Min consumInterpretation by:
Joseph Smith

SNT-TC-1A

II

(Print)

C.G.S.B.

II

C.G.S.B. #

(Level)

13231

(Signature)

Client Representative:

(Print)


I am in full
agreement with
report contents

(Sign)

5311 - 86 Street Edmonton, Alberta, T6E 5T8 Phone: (780) 437-2022 Fax: (780) 436-1436
Calgary (403) 270-6121
Lloydminster (780) 875-8455
Banff (780) 674-3018
Nisku (780) 855-7616Cold Lake
Fort McMurray
Red Deer(780) 828-6105
(780) 743-1536
(403) 347-1742Deer Park, TX
Moirix, Houston, TX
Tulsa, OK(281) 478-4444
(713) 722-7177
(918) 446-8773

CUSTOMER COPY

IRISNDT E-2003F

Issuing Authority: Marvin J. (Ty) DeBelser/Dale Karg		ABSA
Date of Issue: March 30 2012		FORM_NDE_001
Rev Status: 2.0		N.D.E Requirements

N.D.E Requirements

Client: Encana

JO# 08562-002-C

Project: Preheat Line – 3.0 mm Lineheater

Date: 30/11/2012

Piping: ☒

Pressure Vessel: ☐

Tank: ☐

Other:

- ☐ X-Ray
☒ Gamma Ray
☐ Ultrasonics
☐ Liquid Penetrant
☒ Magnetic Particle
☐ Accoustic Emission
☐ Hardness test Max 200 BHN

- ☒ 100%
☐ Full
☐ 25%
☒ 10%
Cut out Other(Define)
☐ Spot

- ☐ ASME Section VIII-UW-51
☐ ASME Section VIII-UW-52
☐ Customer Specification
☒ ASME B31.3 NFS
 Other (Specify)
☒ Customer Spec
☐ CSA W47.1/W59

General Instructions:

Vessel S/N

P1 Material

Welder ID S

Shell-T=

Pipe-T= 1" Sch 160

Total Welds 1 x cut out gap shot (GS-1CO), 1 X MPI cut out (MT-1CO) & 3 x MPI (1st # is MT-2)

Please use wire type iQi

Please Note locations of all indications on films on reports

Please include O.F.D-S.O.D S.F.D on reports

Special Requirements:

Shots

Butt weld Xray to be identified as X-#

Gap Shots to be identified as GS-#

Threaded Shots to be identified as XT-#

Identify on Envelope part of package being shot ie. Coil, Piping, ect.

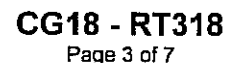
Flashes must contain: Customer, JO#, Spool Identification, Xray number, Clock tape, Welder's ID Symbol, Date

Mark all indicated repairs on the project

NOTE: Encana Spec for Welded Piping-acceptance is zero UC and Zero IP
 Encana Spec for Socket Welds-acceptance is minimum 1/16" gap
 Encana Spec for Threaded Piping- acceptance is 7 threads engaged
 HT is a 5 Point Traverse

Prepared By: R.M. Spence

Date: 30/11/2012



Date: 30-Nov-12

Material: CS

(201) 470-4444
(713) 722-7177
(915) 448-8773



MAGNETIC PARTICLE INSPECTION REPORT

CG18 - MT5
Page 1 of 1

Procedures: MT 2V
Code: CSA W47.1W59

Job / P.O. #: 08562-002-C

IRISNDT #: 255923

Date: 30-Nov-12

Client: ENCANA

Location: Alberta

Item Inspected: Piping 1"160 socket weld (Preheat line- 3.0mm Lineheater)

Surface Condition: Painted ☐ Sandblasted ☐ Machined ☐ As Cast ☒ As Forged ☐ Weldment ☒ Other ☐

Material: cs

Thickness: 1"160

Heat Treatment: na

Magnetizing Equipment: Yoke ☒ Coil ☐ Prod ☐

Bench: Headshot ☐ Central Conductor ☐ Coil ☐

IRISNDT #: 40155

Mfg: contour probe

Calibration Date: 24-Oct-12

Blacklight: ☐
☐

IRISNDT #:
Verification per ASME V Art 7 T.777.2

Mfg:

Calibration Date: -Jan-11

Whitelight:

Battery Powered Min. 3V
110V Power Min. 60W Bulb

☒ }
☐ }

Held within 30 cm (12in) of the inspection surface
provides minimum 1000 Lx (100fc)

Method of Magnetization: AC ☒ DC ☐ Continuous ☒ Residual ☐

Magnetic Particles: Dry ☐ Wet ☒

Red ☐ Grey ☐ Black ☒ Fluorescent ☐

Batch #: 1206

Mfg: ardrex

Type: 8031

Background: ☒

Batch #: 1243

Mfg: ardrex

Type: 8901w

Scope: Black on white MPI was performed on four 1" 160 socket weld.

Items Inspected:

MT-1CO	1"160 socket weld	Welder ID: "S"
MT-2	1"160 socket weld	Welder ID: "S"
MT-3	1"160 socket weld	Welder ID: "S"
MT-4	1"160 socket weld	Welder ID: "S"

RESULTS: acceptable to code.

Inspection Limitation(s):

Unit#: 334 Kilometers: _____

In: 0500 Out: 0600 Hrs: 1

In: _____ Out: _____ Hrs: _____

Personnel:

Joseph Smith, Jeff bruckshaw, Michael V

Consumables:
Min consum

Interpretation by:
Joseph Smith

(Print)

(Signature)
Client Representative:

I am in full
agreement with
report contents

(Print)

(Sign)

SNT-TC-1A

C.G.S.B.

C.G.S.B. #

II

II

(Level)
13231

5311 - 86 Street Edmonton, Alberta, T6E 5T8 Phone: (780) 437-2022 Fax: (780) 430-1430

Calgary (403) 270-8121
Lloydminster (780) 875-8455
Banhead (780) 874-3018
Nisku (780) 655-7818

Cold Lake
Fort McMurray
Red Deer

(780) 826-6105
(780) 743-1538
(403) 347-1742

Deer Park, TX
Matrix, Houston, TX
Tulsa, OK

(281) 478-4444
(713) 722-7177
(918) 448-8773

CUSTOMER COPY

IRISNDT E-2003F

NWP Industries Inc.™

PO Box 6280

4017-60 Ave.

T4G 1S9

NWPI
 Industries Inc.™

Website: www.nwp.ca

Phone: (403) 227-4100

Fax: (403) 227-4102

HYDROSTATIC TEST AFFIDAVIT

Customer: Encana CorporationJO# 08562-002-CProject: Preheat Lines for 3.0 mm Lineheater

Project#

Test Pressure: 2160 PSIHold Time: 60 minutesCode Requirements: ASME B31.3 NFS 2010 EditionAll Personnel Advised of Test ☒ All Signs & Flagging Posted ☒

Prior to Filling – Fitting/Hoses & Component Meet Required Test Pressure

Sign-Off

Supervisor: Tester: Jon GoodeDate: 07/01/2013**Product Description:**

FG-1"-C-160A/BE-301 = 2160 PSI ✓

50% Test Pressure Leak/Systems Check Completed ☒

50% = 1080 PSI ✓

Equipment Drained & Flushed to Prevent Freezing:

Yes: ☐No: ☐Start Time: 12:00 pmFinish Time: 2:55 pm

Test Gauge Identification #	Pressure Range	Calibration Date
NWPG- 5000 <u># 10</u>	0-5000 PSI	
NWPG- 5000 <u># 24</u>	0-5000 PSI	
NWPG-	PSI	
NWPG-	PSI	
NWPG-	PSI	
NWPG-	PSI	
NWPG-	PSI	
NWPG-	PSI	

Test By: Jon GoodeDate: Jan 7/13Approved By: Date: Jan 16/13

NWP Industries Inc.™	NWP Industries Inc.™	Website: www.nwp.ca
PO Box 6280 4017-60 Ave.		Phone: (403) 227-4100
T4G 1S9		Fax: (403) 227-4102

PNEUMATIC TEST AFFIDAVIT

Customer: Encana Corporation

Project: Fire Tube

Test Pressure: 24 oz

Code Requirements: CSA W47.1 and W59

Product Description:

JO# 08562-002-C

Project#

Hold Time: AS REQUIRED

Date: 07/01/2013

Tank Serial # 08562-002

DWG# LH-FIRSTK-24-2

REV# 1

Test-

#1.All Welded Connections

<u>NO LEAKS</u>

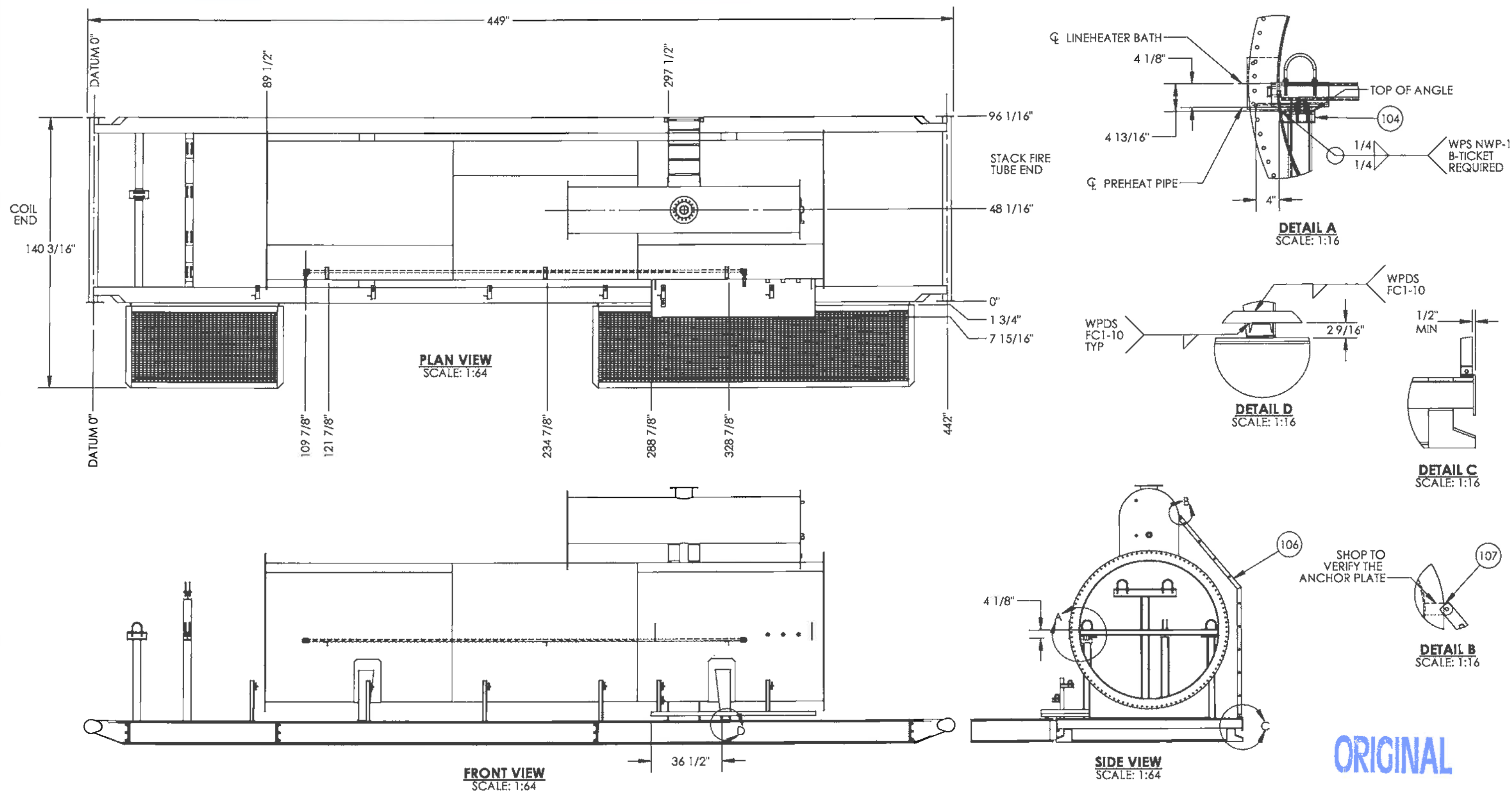
Repairs






Ground to sound metal by:	Repair preparation. QC witness by:
Reweld using E7018. QC:	Repaired by:
Procedure approved by QC:	Completed repair checked by QC:

Additional Comments

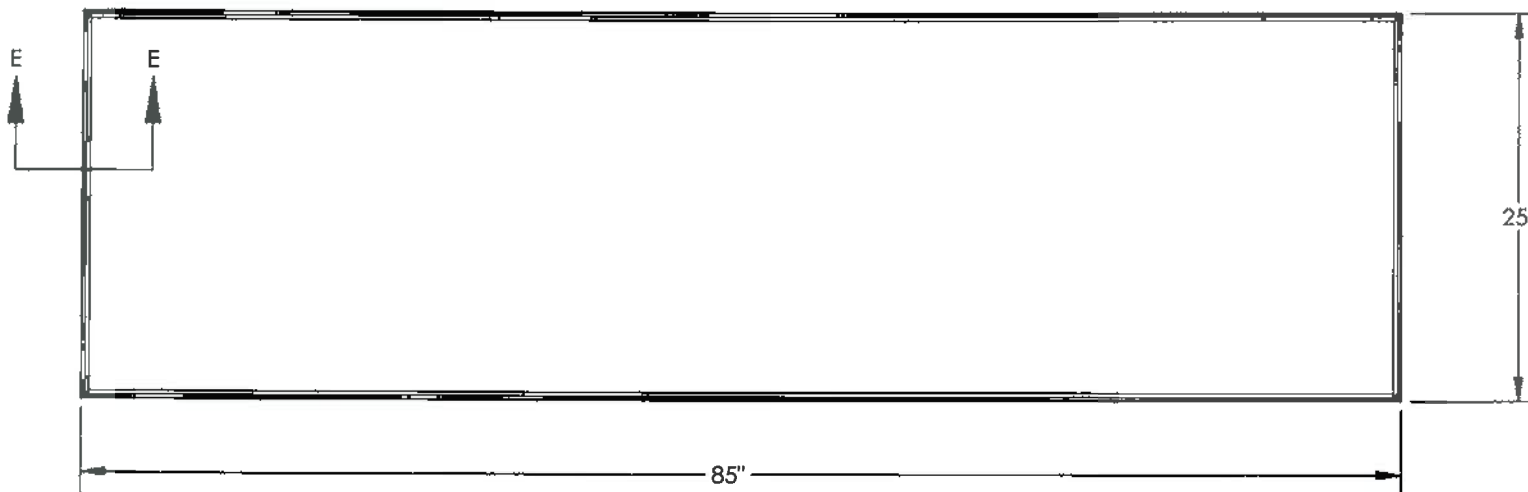
PSV Used:	Range:	Calibration Due:
<u>39168-10</u>	<u>0 - 28 oz.</u>	<u>March 13, 2013</u>

Test #	Test By:	Q.C.	Date	Test Gauge ID.	Range	Calibration Due:
<u>1</u>	<u>[Signature]</u>	<u>[Signature]</u>	<u>JAN 07.13</u>	<u>NWPG- 117 119</u>	<u>0-5 PSI</u>	<u>Jan 11/13 & June 19, 2013.</u>
Test(s) Approved By:				Date: <u>January 07.13</u>		



							AS BUILT		ISSUED FOR CONSTRUCTION		<div> NWP INDUSTRIES INC. Total oilfield supply. P.O. BOX 6280, INNISFAIL, AB T4G 1S9 PH: (403) 227-4100 FAX: (403) 227-4102 THIS DRAWING IS PROPERTY OF NWP INDUSTRIES INC. AND MAY NOT BE REPRODUCED WITHOUT PERMISSION. THIS DRAWING MUST BE RETURNED UPON REQUEST.</div>	ENCANA CORPORATION LINEHEATER PACKAGE 3.0 MMBTU c/w 4"-2500# RTJ SPLIT COILS BATH ASSEMBLY			
08562-3	LINEHEATER SKID ASSEMBLY							SIGNED: _____				DWN: VW	CHK: 	APP: 	
LH-FIRSTK-24-2	LINEHEATER FIRETUBE/STACK ASSEMBLY							DATE: _____				DATE: OCT 05/12	DATE: NOV 14 2012	DATE: NOV 14 2012	
LH-LAD-72	LINEHEATER SKID LADDER ASSEMBLY	0	OCT 31/12	VW			ISSUED FOR CONSTRUCTION	W.O.: _____							
LH-PH-7224-1	LINEHEATER PREHEAT PIPING	A	OCT 23/12	VW			ISSUED FOR APPROVAL	S/N: _____				SCALE: 1:48	DWG: 08562-4	REV: 0	
DOCUMENT NO.	DESCRIPTION	REV	DATE	BY	CHK	APP						SHEET: 2 OF 3			
REFERENCE DRAWINGS		DRAWING REVISIONS						ALL DIMENSIONS IN INCHES							

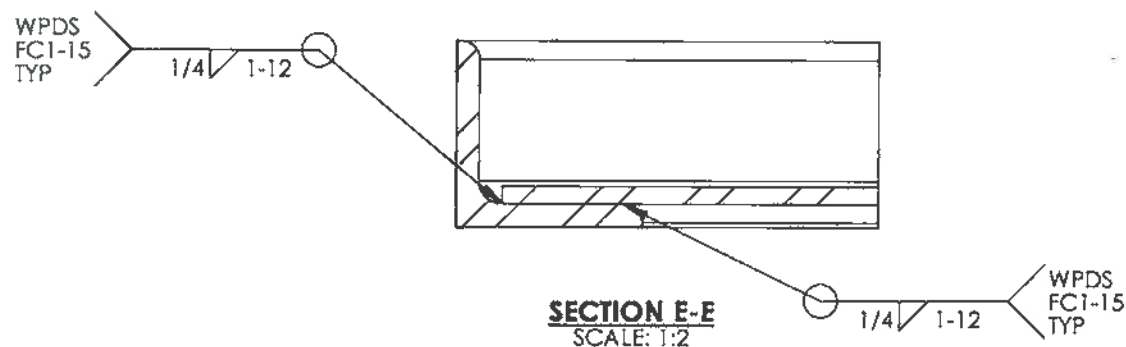
ITEM	QTY.	Description	PART #	LENGTH
201	2	ANGLE IRON 1/4" x 2" x 2" SA36/44W	ANGC22A	85"
202	2	ANGLE IRON 1/4" x 2" x 2" SA36/44W	ANGC22A	25"
203	1	PLATE 3/16" x 24" x 84" SA36/44W	PLAA2484A	14 sq. ft.



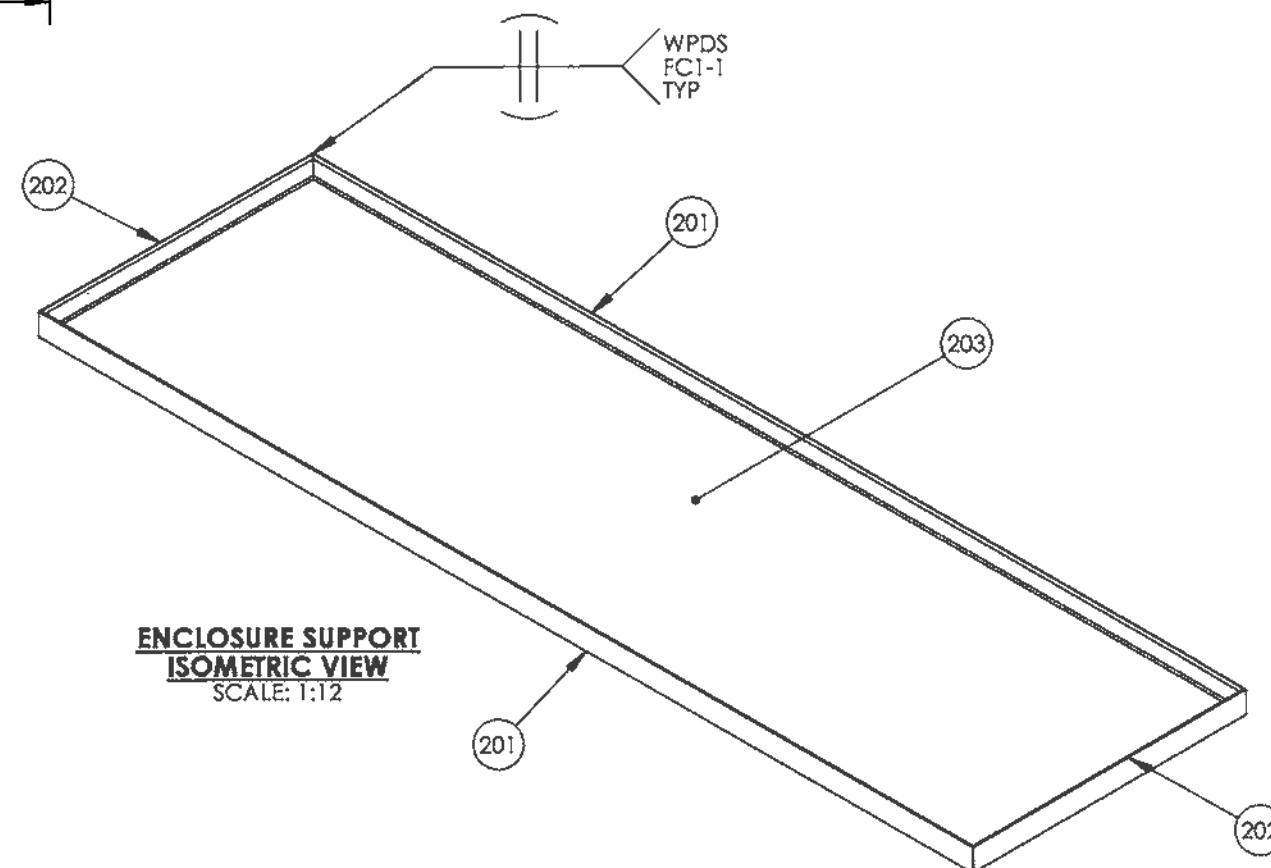
ENCLOSURE SUPPORT
PLAN VIEW
SCALE: 1:12

NOTES

1. FABRICATE TO W47.1 AND W59.
2. RADIUS ALL SHARP EDGES.
3. ALL WELDS TO BE 1/4" CONTINUOUS FILLET WELDS UNLESS OTHERWISE NOTED.
4. WELD PROCESS TO BE MCAW UNLESS OTHERWISE NOTE. WPDS FCI-15








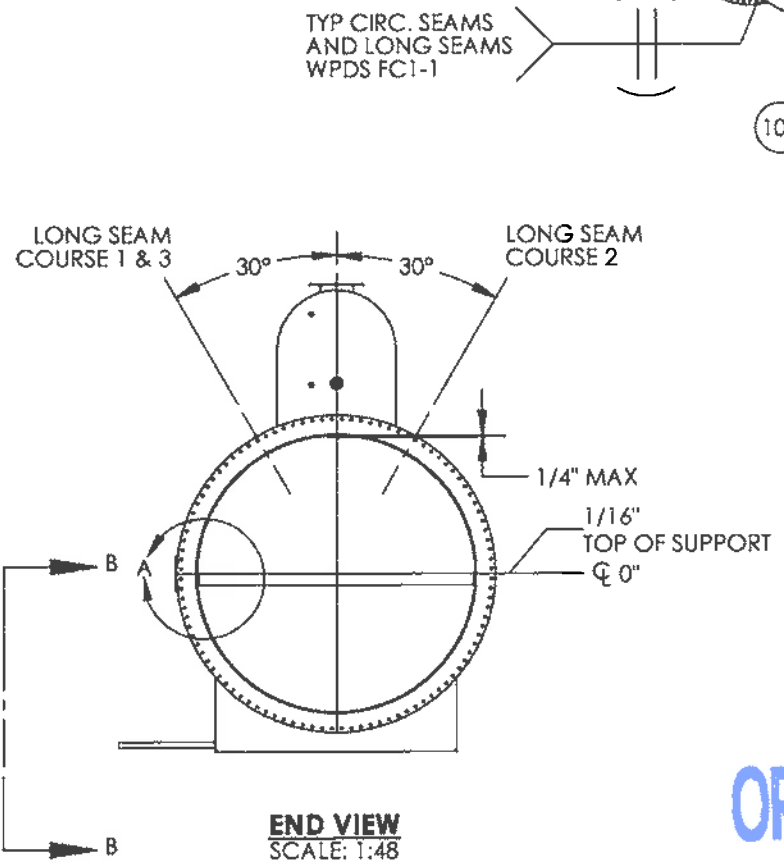
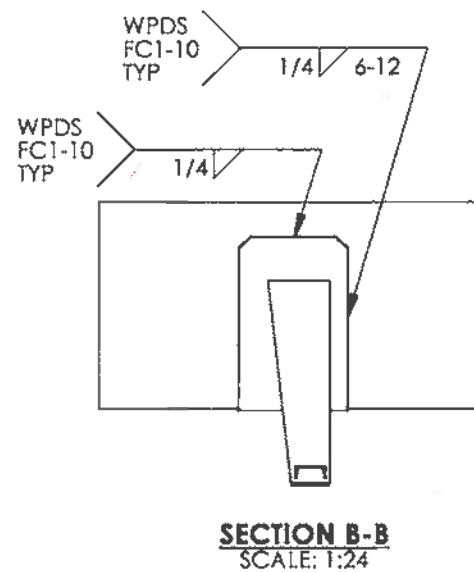
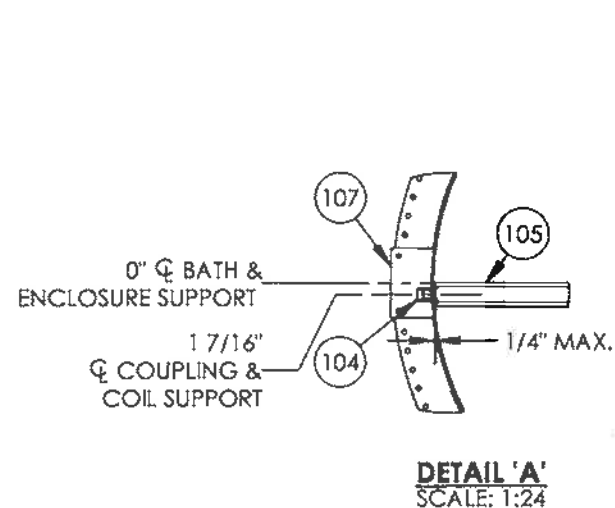
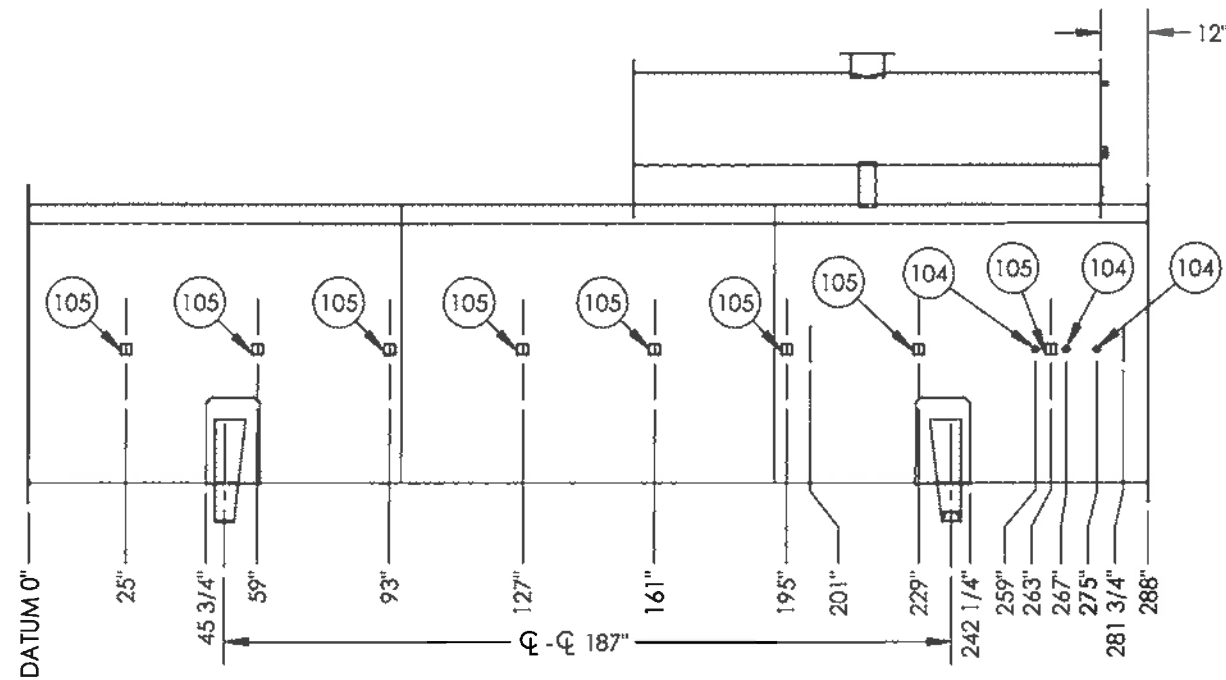
SECTION E-E
SCALE: 1:2



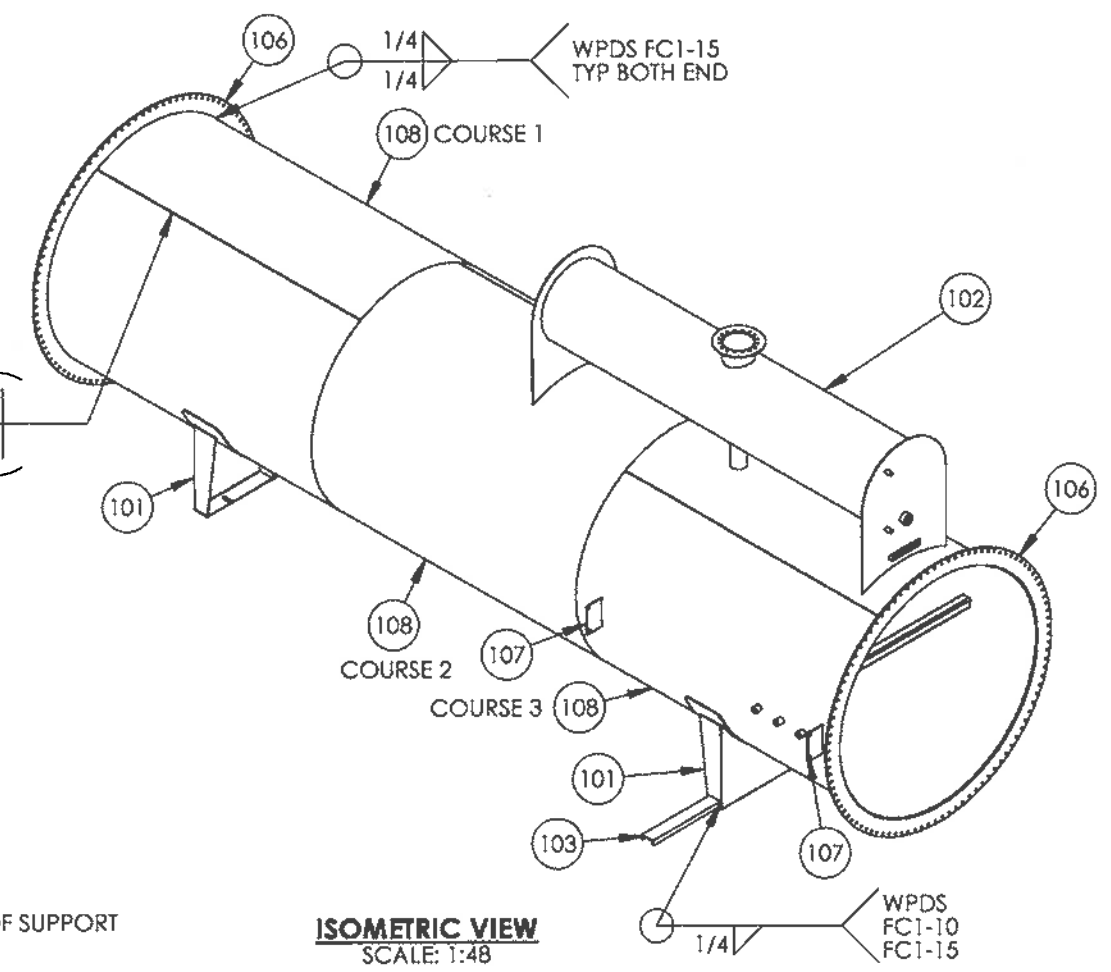
ENCLOSURE SUPPORT
ISOMETRIC VIEW
SCALE: 1:12

ORIGINAL

							AS BUILT		ISSUED FOR CONSTRUCTION	 INDUSTRIES INC. Total oilfield supply. P.O. BOX 6280, INNISFAIL, AB T4G 1S9 PH: (403) 227-4100 FAX: (403) 227-4102 THIS DRAWING IS PROPERTY OF NWP INDUSTRIES INC. AND MAY NOT BE REPRODUCED WITHOUT PERMISSION. THIS DRAWING MUST BE RETURNED UPON REQUEST.	ENCANA CORPORATION LINEHEATER PACKAGE 3.0 MMBTU c/w 4"-2500# RTJ SPLIT COILS BATH ASSEMBLY				
08562-3	LINEHEATER SKID ASSEMBLY										DWN: VW	CHK: 	APP: 		
LH-FIRSTK-24-2	LINEHEATER FIRETUBE/STACK ASSEMBLY										DATE: OCT 05/12	DA NOV 14 2012	DATE: NOV 14 2012		
LH-LAD-72	LINEHEATER SKID LADDER ASSEMBLY	0	OCT 31/12	VW			ISSUED FOR CONSTRUCTION				SCALE: 1:12				
LH-PH-7224-1	LINEHEATER PREHEAT PIPING	A	OCT 23/12	VW			ISSUED FOR APPROVAL				SHEET: 3 OF 3	DWG: 08562-6	REV: 0		
DOCUMENT NO.	DESCRIPTION	REV	DATE	BY	CHK	APP									
REFERENCE DRAWINGS		DRAWING REVISIONS					ALL DIMENSIONS IN INCHES								



ITEM	PART #	DESCRIPTION	MTR #	LENGTH	QTY.
101	-	SEE SADDLE DETAIL			2
102	-	SEE EXPANSION TANK DETAIL			1
103	CHA45R	CHANNEL 4" @ 5.4# 300W		24 3/4"	1
104	COFIGYEE	Coupling 1" 3M SA105N			3
105	HSSC3A	SQUARE TUBE 1/4" x 3" x 3" 350W/ASTM A500		71 1/2"	8
106	LH-FLA-72.375	LH BATH FLANGE FOR 72" OD 3/8" THK			2
107	LH-PLATE-ENCL72	LH ENCLOSURE SUPPORT TAB TO FIT 72" OD BATH			2
108	LH-SHELL-728.25	LH BATH SHELL 72" OD x 8' LG x 1/4" THK SA36/44W			3



- NOTES**
1. DESIGN AND FABRICATE TO CSA W47.1 AND W59.
 2. ALL DIMENSIONS TO HAVE A TOLERANCE OF $\pm 1/8"$ UNLESS OTHERWISE SPECIFIED.
 3. DEBURR AND RADIUS ALL SHARP EDGES.
 4. WELD PROCESS TO BE MCAW UNLESS OTHERWISE NOTED. WPDS-FC1-15, FC1-10.
 5. ALL WELDS TO BE 1/4" CONTINUOUS FILLET WELDS UNLESS OTHERWISE NOTED.
 6. BOLT HOLES TO STRADDLE COMMON CENTERLINE.
 7. APPROXIMATE WEIGHT: 6400 LBS.

ORIGINAL

						AS BUILT	
LH-FIRSTK-24-2	LINEHEATER FIRETUBE/STACK ASSEMBLY	3	2012.10.30	VW	DF	REVISED AS PER RFDC #01219 ADDED REF. DWGS	
LH-PH-7224-1	LINEHEATER PREHEAT PIPING	2	2011.07.14	DJ	GH	REVISED AS PER RFDC #00535, ADDED WELD SYMBOL	
LH-LAD-72	LINEHEATER SKID LADDER ASSEMBLY	1	2011.05.30	JHK	GH	REVISED AS PER RFDC #00483	
DOCUMENT NO.	DESCRIPTION	REV	DATE	BY	CHK	APP	ISSUED FOR CONSTRUCTION
REFERENCE DRAWINGS		DRAWING REVISIONS					

ISSUED FOR CONSTRUCTION

SIGNED: _____

DATE: _____

W.O.: _____

S.O.: _____

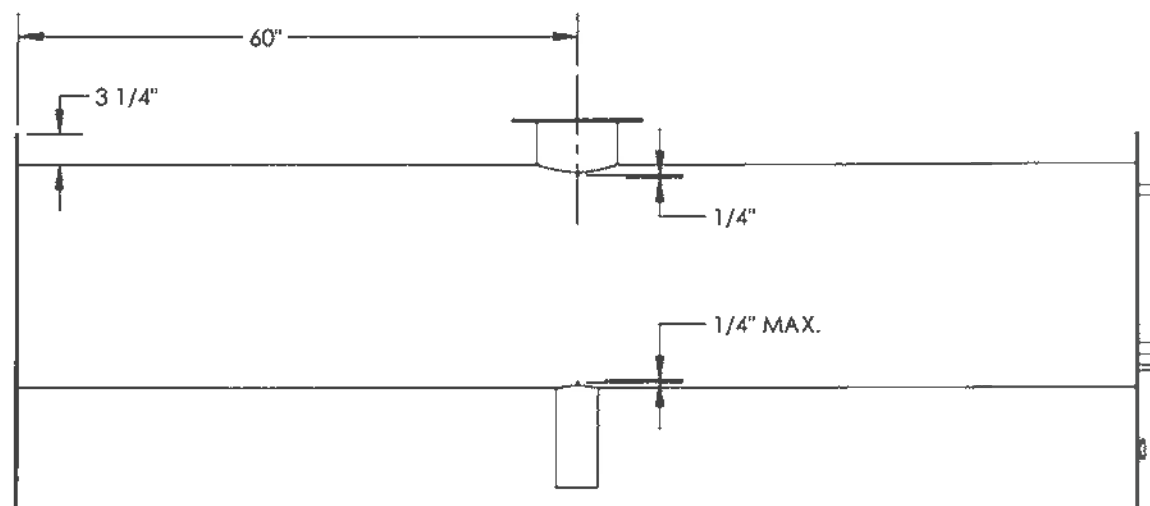
ALL DIMENSIONS IN INCHES

NWP INDUSTRIES INC.
Total oilfield supply.

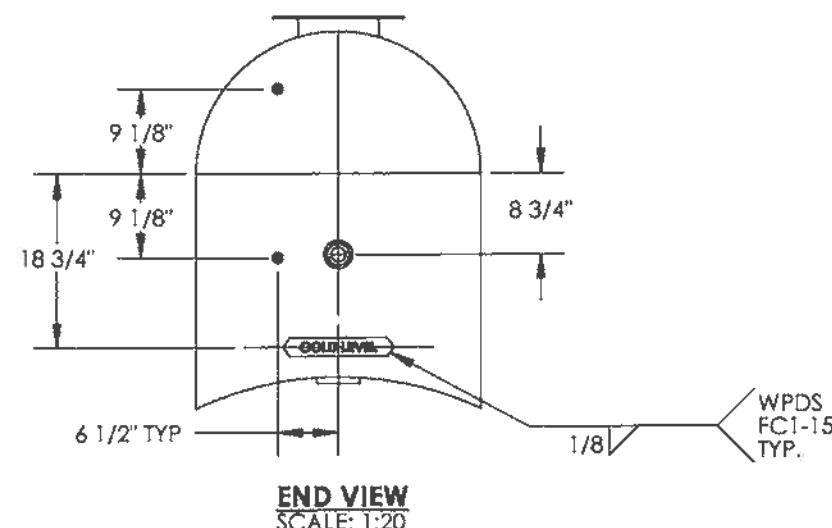
P.O. BOX 6280, INNISFAIR, AB T4G 1S9
PH: (403) 227-4100 FAX: (403) 227-4102

THIS DRAWING IS PROPERTY OF NWP INDUSTRIES INC. AND MAY NOT BE REPRODUCED WITHOUT PERMISSION. THIS DRAWING MUST BE RETURNED UPON REQUEST.

NWP INDUSTRIES INC LINEHEATER BATH 72" OD x 24' LONG		
ASSEMBLY DRAWING		
DWN: JHK	CHK: GH	APP: DF
DATE: 2011.04.20	DATE: 2011.05.13	DATE: 2011.05.13
SCALE: 1:48	DWG: LH-7224-BARE	
SHEET: 1 OF 4	REV: 3	

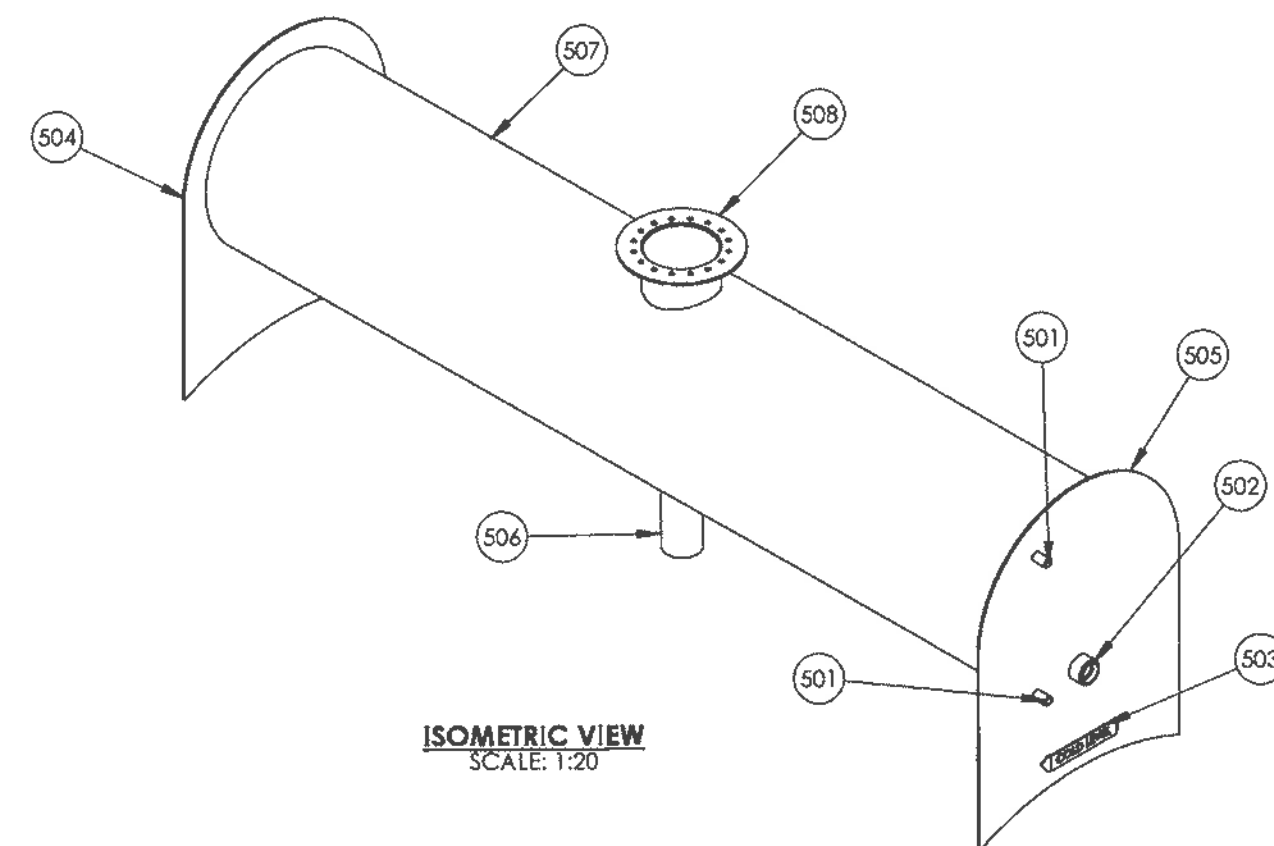


FRONT VIEW
SCALE: 1:20



END VIEW
SCALE: 1:20

ITEM	PART #	DESCRIPTION	MTR #	LENGTH	QTY.
501	COF.5GYEE	Coupling 1/2" 3M THRD SA105N			2
502	COH2GYEE	Coupling Half 2" 3M THRD SA105N			1
503	COLDLEVEL-1	LH COLD LEVEL INDICATOR			1
504	EXP-END2472	EXP. TANK END PLATE TO FIT 24" OD TANK x 72" OD BATH			1
505	EXP-END2472-LGD	EXP. TANK LG END PLATE TO FIT 24" OD TANK x 72" OD BATH			1
506	PIP440A	PIPE 4" SCH STD/40 SA106B		11 1/2"	1
507	PIP2410E	PIPE 24" SCH 10 SA53 ERW		120"	1
508	THIEFBASE-1	THIEF HATCH BASE ASSEMBLY 8 5/8" OD			1



ISOMETRIC VIEW
SCALE: 1:20

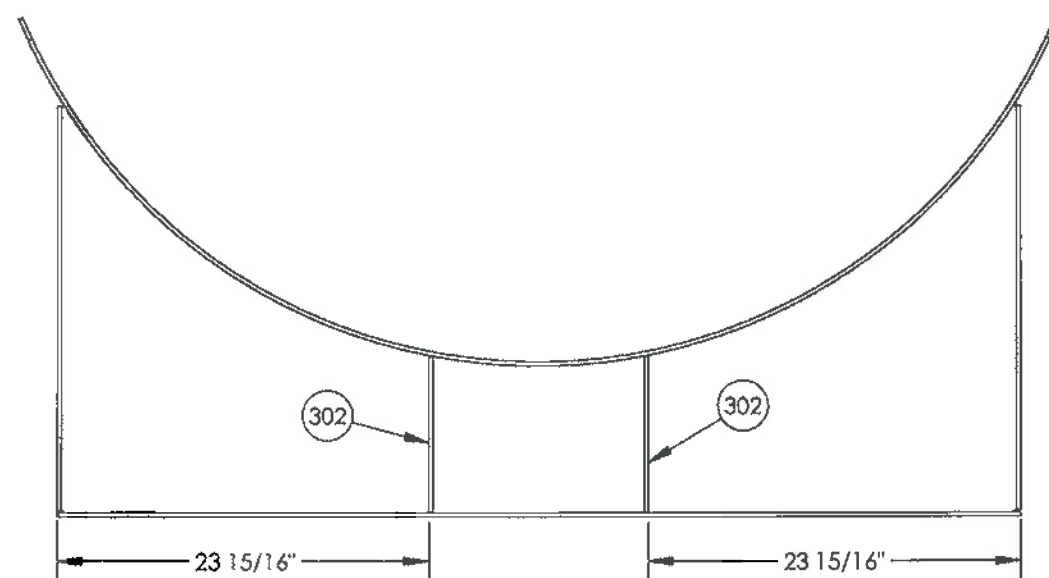
NOTES

1. DESIGN AND FABRICATE TO CSA W47.1 AND W59.
2. ALL DIMENSIONS TO HAVE A TOLERANCE OF $\pm 1/8"$ UNLESS OTHERWISE SPECIFIED.
3. DEBURR AND RADIUS ALL SHARP EDGES.
4. WELD PROCESS TO BE MCAW UNLESS OTHERWISE NOTED. WPDS-FC1-15, FC1-10.
5. ALL WELDS TO BE 1/4" CONTINUOUS FILLET WELDS UNLESS OTHERWISE NOTED.
6. BOLT HOLES TO STRADDLE COMMON CENTERLINE.

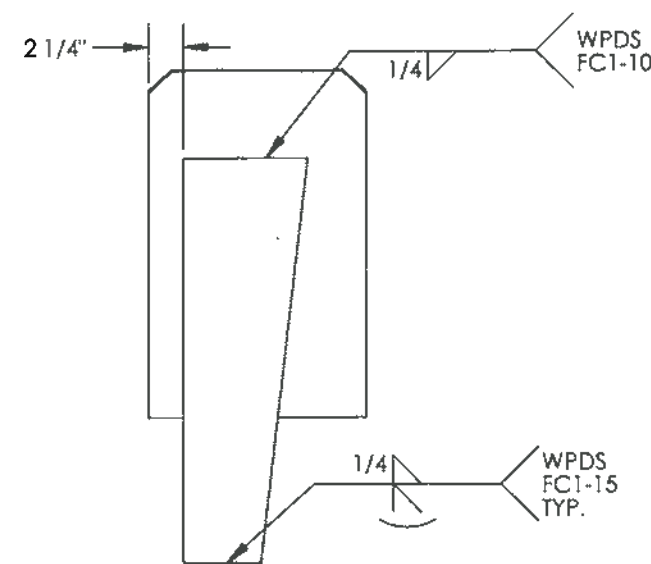
ORIGINAL

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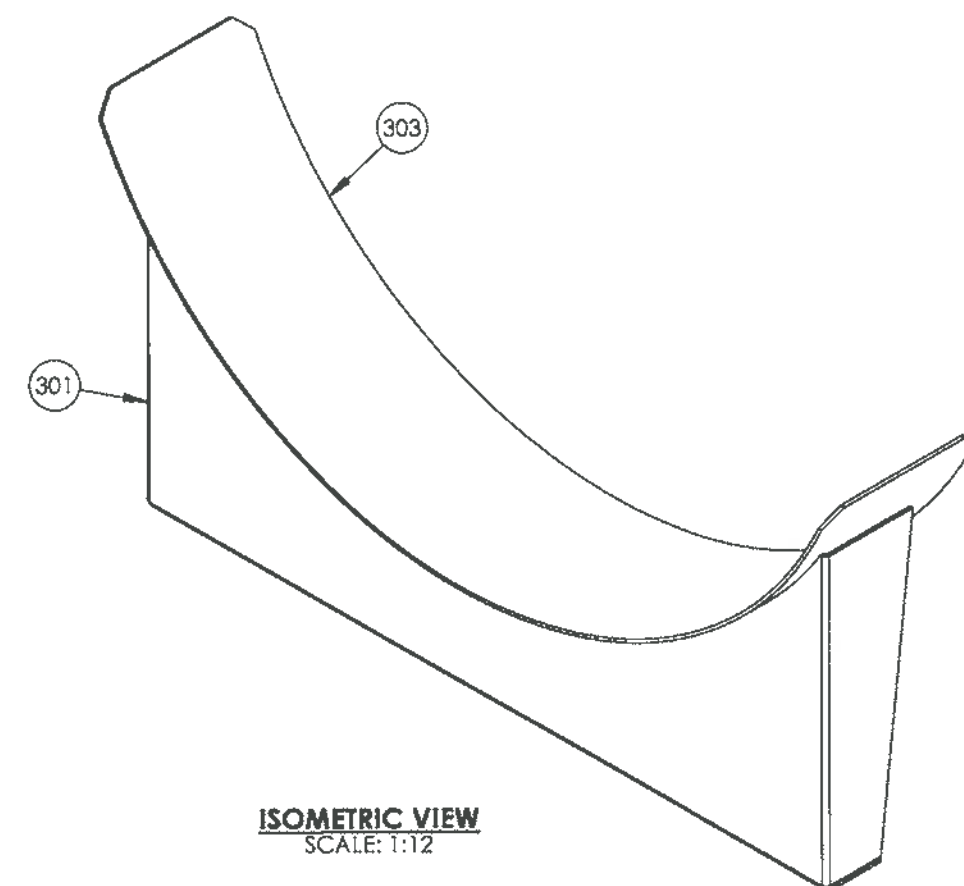
ITEM	PART #	DESCRIPTION	MTR #	LENGTH	QTY.
301	LHSAD72-PLATE	LH SADDLE PLATE FOR 72" OD			1
302	LHSAD72-SUPPORT	LH SADDLE SUPPORT FOR 72" OD			2
303	LHSAD72-WEAR	LH SADDLE WEAR PLATE FOR 72" OD			1



BACK VIEW
SCALE: 1:12



END VIEW
SCALE: 1:12



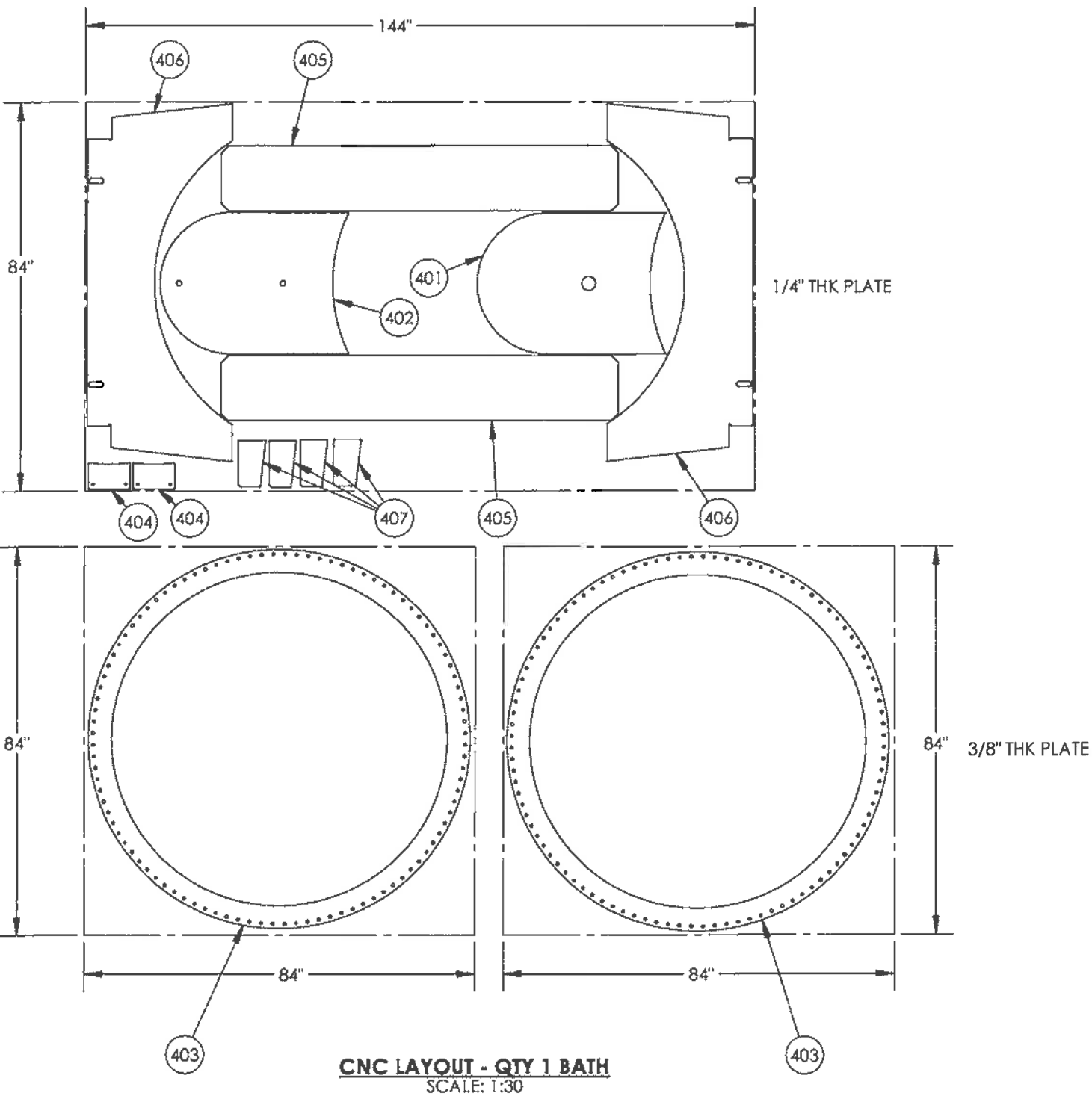
ISOMETRIC VIEW
SCALE: 1:12

NOTES

1. DESIGN AND FABRICATE TO CSA W47.1 AND W59.
2. ALL DIMENSIONS TO HAVE A TOLERANCE OF $\pm 1/8"$ UNLESS OTHERWISE SPECIFIED.
3. DEBURR AND RADIUS ALL SHARP EDGES.
4. WELD PROCESS TO BE MCAW UNLESS OTHERWISE NOTED. WPDS-FC1-15, FC1-10.
5. ALL WELDS TO BE $1/4"$ CONTINUOUS FILLET WELDS UNLESS OTHERWISE NOTED.

ORIGINAL

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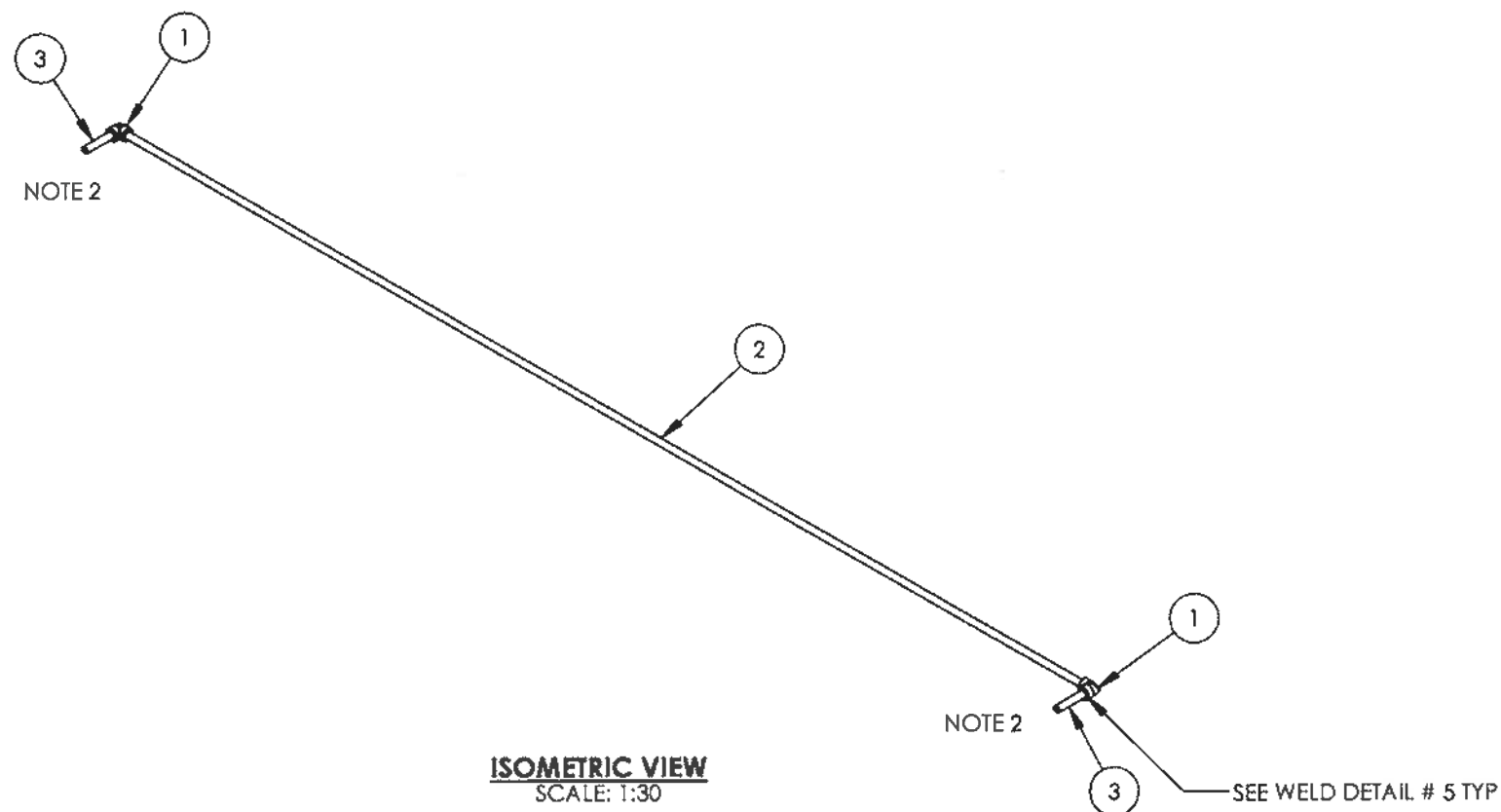
ITEM	PART #	DESCRIPTION	MTR #	LENGTH	QTY.
401	EXP-END2472-D	EXP. TANK LC END PLATE TO FIT 24" OD TANK x 72" OD BATH			1
402	EXP-END2472-LG	EXP. TANK LG END PLATE TO FIT 24" OD TANK x 72" OD BATH			1
403	LH-FLA-72.375	LH BATH FLANGE FOR 72" OD 3/8" THK			2
404	LH-PLATE-ENCL72	LH ENCLOSURE SUPPORT TAB TO FIT 72" OD BATH			2
405	LHSAD72-WEAR	LH SADDLE WEAR PLATE FOR 72" OD		-	2
406	LHSAD72-PLATE	LH SADDLE PLATE FOR 72" OD		-	2
407	LHSAD72-SUPPORT	LH SADDLE SUPPORT FOR 72" OD			4

ORIGINAL

- NOTES**
1. HEAT NUMBER TO BE CLEARLY MARKED ON EACH PIECE WITH PAINT PEN AS A MINIMUM.
 2. ALL DOCUMENTATION MUST ACCOMPANY SHIPMENT OF PARTS IF PART IS OUTSOURCED.
 3. ALL DIMENSIONS TO HAVE A TOLERANCE OF $\pm 1/8"$ UNLESS OTHERWISE SPECIFIED.
 4. DEBURR AND RADIUS ALL SHARP EDGES.

							AS BUILT			ISSUED FOR CONSTRUCTION			NWP INDUSTRIES INC LINEHEATER BATH 72" OD x 24' LONG		
										SIGNED: _____			DWN: JHK		
										DATE: _____			CHK: GH		
										W.O.: _____			APP: DF		
										S.O.: _____			DATE: 2011.04.20		
													DATE: 2011.05.13		
													DATE: 2011.05.13		
													SCALE: 1:30		
													SHEET: 4 OF 4		
													DWG: LH-7224-BARE		
													REV: 3		

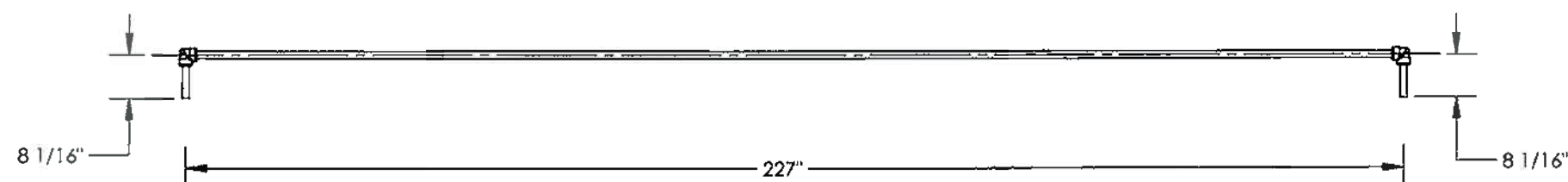
ITEM	PART #	DESCRIPTION	MTR #	LENGTH	QTY.
1	EL91HYFE	Elbow 90 Deg 1" 6M SW SA105N			2
2	PIP1160A	PIPE 1" SCH 160 SA106B		225 1/4"	1
3	PIP1160B	PIPE 1" SCH 160 SA333-6		7"	2



NOTES

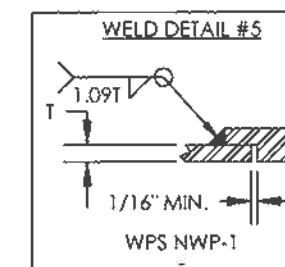
1. ALL DIMENSIONS SHALL HAVE A TOLERANCE OF $\pm 1/8"$ UNLESS OTHERWISE SPECIFIED.
2. SHOP TO THEAD END OF PIPE PRIOR TO WELDING.
3. CUT LENGTHS FOR PIPE ARE FOR REFERENCE ONLY.
4. REVIEW CLIENT SPECIFICATIONS PRIOR TO ISSUE FOR CONSTRUCTION

ISOMETRIC VIEW
SCALE: 1:30



PLAN VIEW
SCALE: 1:30

ORIGINAL



DESIGN DATA

LINE NUMBER:	FG-1"-C-160A/BE-301
CLIENT SPECIFICATION:	SEE NOTE 4
DESIGN & FABRICATE TO:	ANSI/ASME B31.3 NFS 2010 EDITION
DESIGN PRESSURE:	1440 PSIG
MAXIMUM DESIGN TEMPERATURE:	200 °F
MINIMUM DESIGN TEMPERATURE:	-20 °F
SERVICE:	HYDROCARBONS
HYDROSTATIC TEST PRESSURE:	2160 PSIG
RADIOGRAPHY:	10% OF SW FOR GAP
OTHER NDE:	10% MPI ON SW
POST WELD HEAT TREATMENT:	NONE
CORROSION ALLOWANCE:	1/16"
Q.C. PROGRAM NO.:	AQP-1253
WELDING PROCEDURE REGISTRATION NO.:	WP-1604.2

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**ISSUED FOR
CONSTRUCTION**

SIGNED: _____

DATE: _____

W.O.: _____

S.O.: _____

ALL DIMENSIONS IN INCHES



P.O. BOX 6280, INNISFAIR, AB T4G 1S9
PH: (403) 227-4100 FAX: (403) 227-4102

THIS DRAWING IS PROPERTY OF NWP INDUSTRIES INC.
AND MAY NOT BE REPRODUCED WITHOUT PERMISSION.
THIS DRAWING MUST BE RETURNED UPON REQUEST.

ENCANA CORPORATION
LINEHEATER PACKAGE
3.0 MMBTU
C/W 4"-2500# RTJ SPLIT COILS
PREHEAT PIPING

DWN: DJ	CHK: <i>[Signature]</i>	APP: <i>[Signature]</i>
DATE: 2011.05.06	DATE: 2011.05.27	DATE: 2011.05.30
SCALE: 1:30	DWG: LH-PH-7224-1	REV: 3
SHEET: 1 OF 1		

Issuing Authority: Marvin J. (Ty) DeBelser		Quality Control
Date of Issue: March 13, 2008		QCFO Final Inspection Release Certificate R00

FINAL INSPECTION RELEASE CERTIFICATE

CUSTOMER:	ENCANA	WO#:	08562-002-B
PRODUCT:	Skid for 3.0 mm Lineheater Pkg	DATE:	Jan 16 / 2013

FINAL INSPECTION DOCUMENTATION

REVIEWED BY:	ACCEPTED:	REJECTED:
STANDARD DOCUMENTATION REQUIREMENTS: (SEE DOCUMENT REQUIREMENT LIST)		
ADDITIONAL DOCUMENT REQUIREMENTS: (TO BE RECORDED HERE IF APPLICABLE I.E. DOCUMENT PACKAGE REQUIRED BY CUSTOMER ETC.)		
Q.C. FILE CLOSURE BY:	<i>Kashia D Fox</i>	DATE: Jan 17 2013

LOOSE COMPONENTS REQUIRED / PREPARED

ITEMS REQUIRED:	NO. OF BOXES OR PKGS.
<i>Skid for 3.0 mm Lineheater pkg.</i>	
ADDITIONAL HARDWARE OR FASTENERS REQUIRED	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>

PREPARATION FOR SHIPMENT / STORAGE

PREPARATION NEEDED / COMPLETED	
<i>Release to next process.</i>	
LOT #	08562-002-B
ITEM #	Skid

INVENTORY TAGS ATTACHED	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>
-------------------------	---

SHIPPING INSTRUCTIONS

CUSTOMER P.O. REVIEWED	YES <input type="checkbox"/> N/A <input checked="" type="checkbox"/>
CONTACT PERSON AUTHORIZED TO RELEASE PRODUCT:	
PHONE:	FAX:

RELEASED TO INVENTORY:	DATE:
RELEASED TO CUSTOMER: <i>Kari Blom</i>	DATE: 1/16/13

NWP INDUSTRIES INCORPORATED

SKID TRAVEL SHEET

APPROVED

BY: 

DATE:

NOV 15 2012

WO #:






08562-002-B

DESCRIPTION:

Skid for 3.0 mm Lineheater Pkg

DRAWING #:

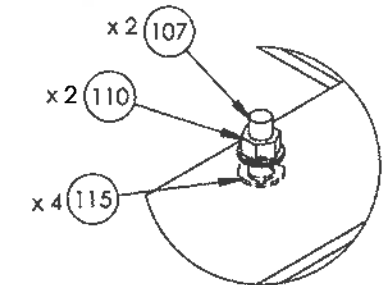
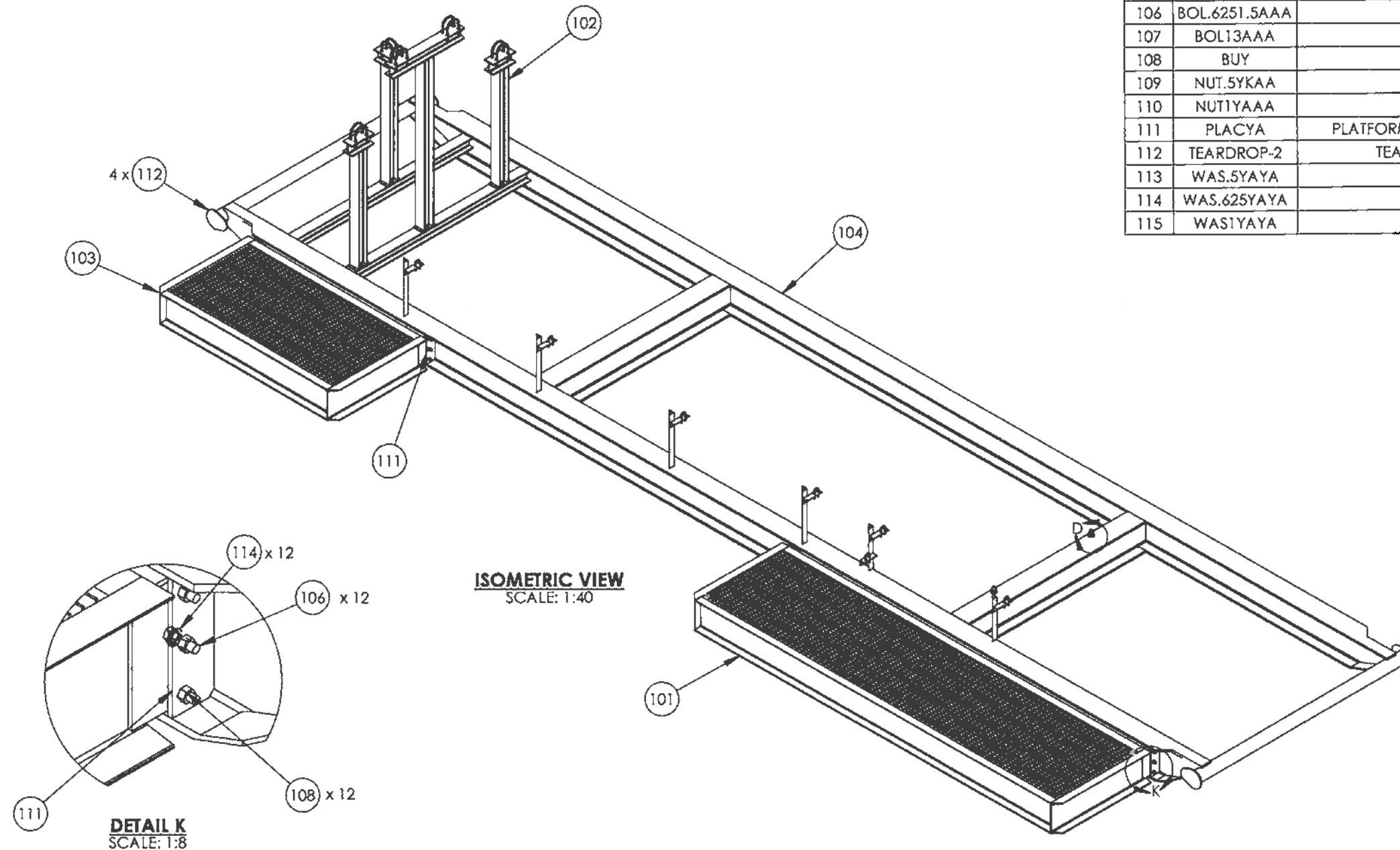
08562-3 REV 0

	REQ.	HOLD	EMPLOYEE INT.	DATE COMPLETE	QC INIT.	DATE
WORK INSTRUCTIONS/DRAWINGS ISSUED	✓					NOV 14/12
WORK INSTRUCTIONS/DRAWINGS REVIEWED	✓	✓				NOV 14/12
MATERIAL & PARTS RELEASED	✓	✓				Jan 16
WELDING PERSONNEL ASSIGNED	✓	✓				Jan 16
VISUAL CHECKS ON WELDS	✓	✓			LR	Dec 17/12
NDE REQUIREMENTS	N/A					
DIMENSIONAL CHECK (FINAL)	✓	✓			LR	Dec 17/16
SURFACE PREP./SANDBLAST ETC. & P.O. RECEIVED	N/A					
PRIMER PAINT	N/A					
FINAL PAINT & P.O. RECEIVED	N/A					
QC INSPECTION & FINAL RELEASE	✓	✓				Jan 16

ACCEPTED BY CUSTOMER _____

DATE _____

ITEM	PART #	DESCRIPTION	MTR #	LENGTH	QTY.
101	-	SEE ENCLOSURE PLATFORM DETAIL			1
102	-	SEE PIPE SUPPORT CUT LIST			1
103	-	SEE PIPING PLATFORM DETAIL			1
104	-	SEE SKID BASE CUT LIST			1
105	BOL.51.5BAA	BOLT 1/2" x 1 1/2" LG GR. 2 HEX HEAD			8
106	BOL.6251.5AAA	BOLT 5/8" x 2" GR. 8 HEX HEAD			12
107	BOL13AAA	BOLT 1" x 3" LG GR. 8 HEX HEAD			2
108	BUY	NUT 5/8" GR. 8 HEX PLATED			12
109	NUT.5YKAA	NUT 1/2" GR. 5 HEX PLATED			8
110	NUT1YAAA	NUT 1" GR. 8 HEX PLATED			2
111	PLACYA	PLATFORM SKID LUG PLATE 3/8" x 10 7/8" x 3 3/4" SA36/44W			4
112	TEARDROP-2	TEAR DROP FOR ROLL ENDS 3/8" THK SA36/44W			4
113	WAS.5YAYA	FLAT WASHER 1/2" GR. 8 PLATED			16
114	WAS.625YAYA	FLAT WASHER 5/8" GR. 8 PLATED			12
115	WAS1YAYA	FLAT WASHER 1" GR. 8 PLATED			4



DETAIL Y
SCALE: 1:8

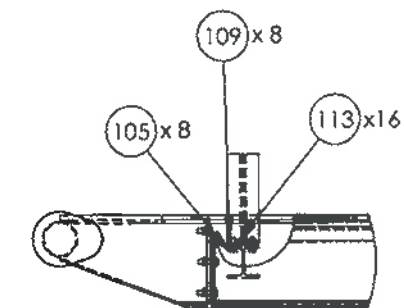
ORIGINAL

NOTES

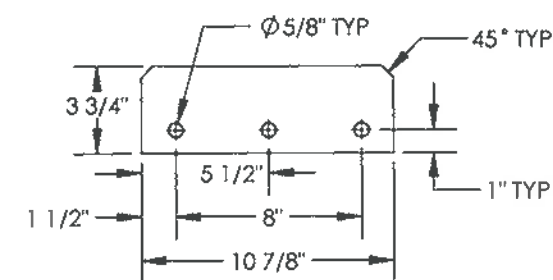
1. FABRICATE TO CSA W47.1 AND W59.
2. ALL DIMENSIONS TO HAVE A TOLERANCE OF $\pm 1/8"$ UNLESS OTHERWISE SPECIFIED.
3. DEBURR AND RADIUS ALL SHARP EDGES.
4. WELD PROCESS TO BE MCAW UNLESS OTHERWISE NOTED.
WPDS-FC1-15, FC1-10.
5. ALL WELDS TO BE $1/4"$ CONTINUOUS FILLET WELDS UNLESS OTHERWISE NOTED.

APPROX. WEIGHT: 7500 LBS

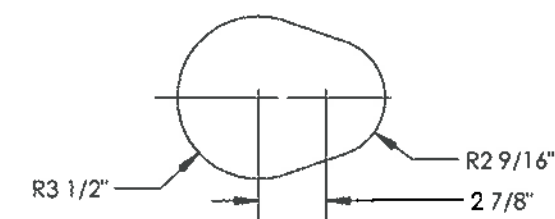
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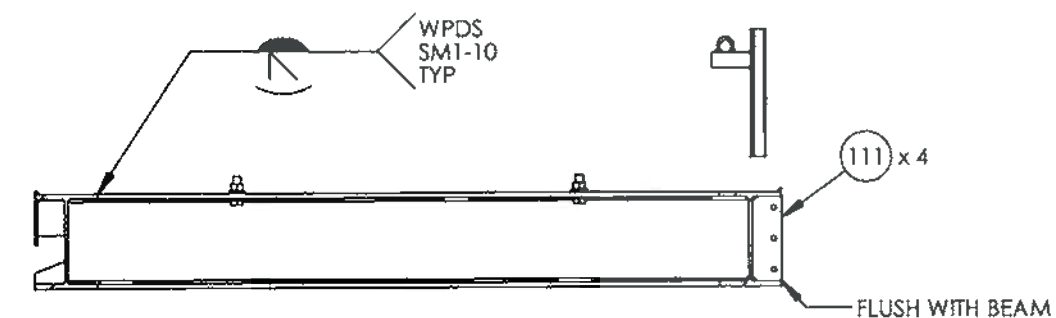
BROKEN SECTION A
SCALE: 1:24



PLATFORM SKID LUG
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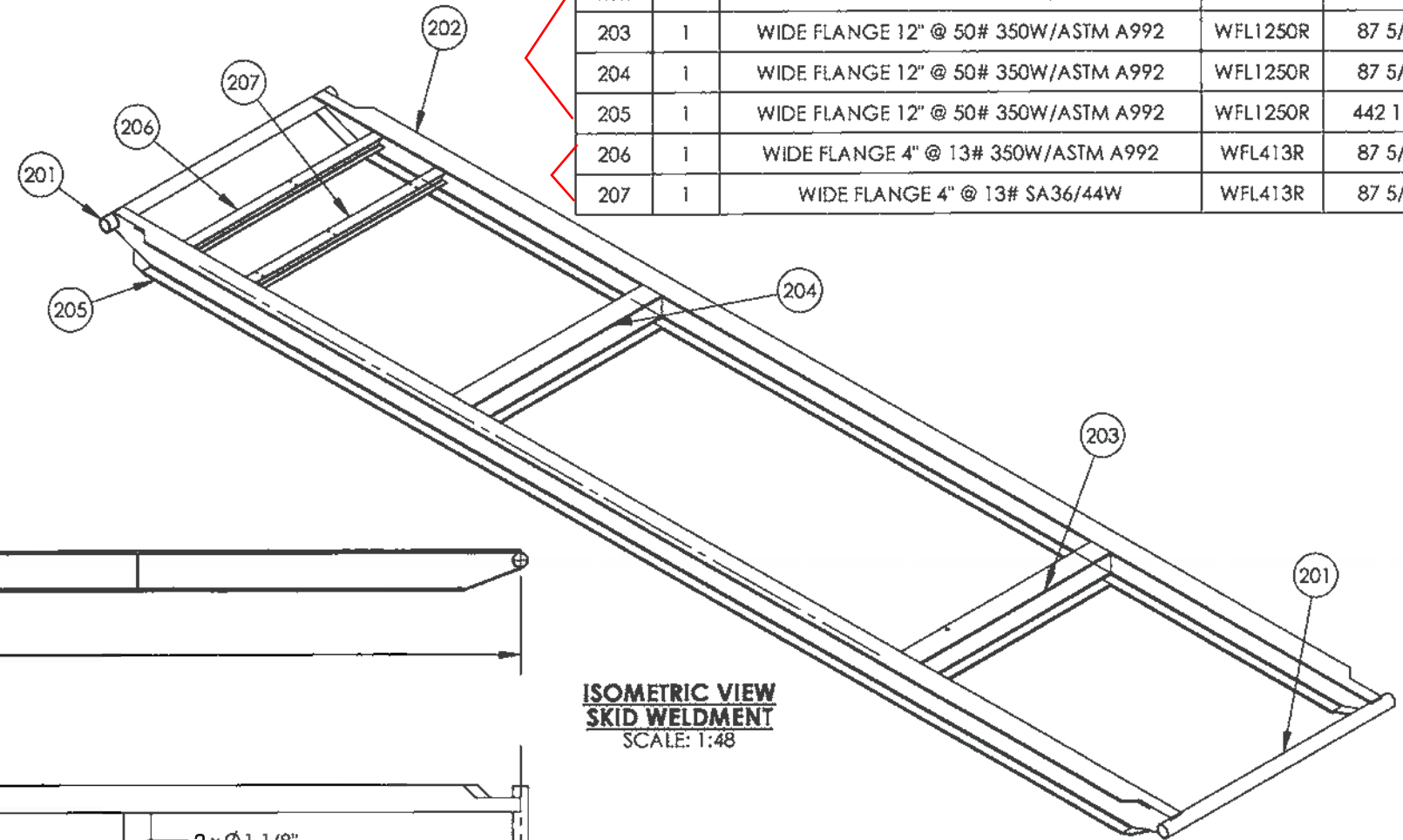


SECTION C-C
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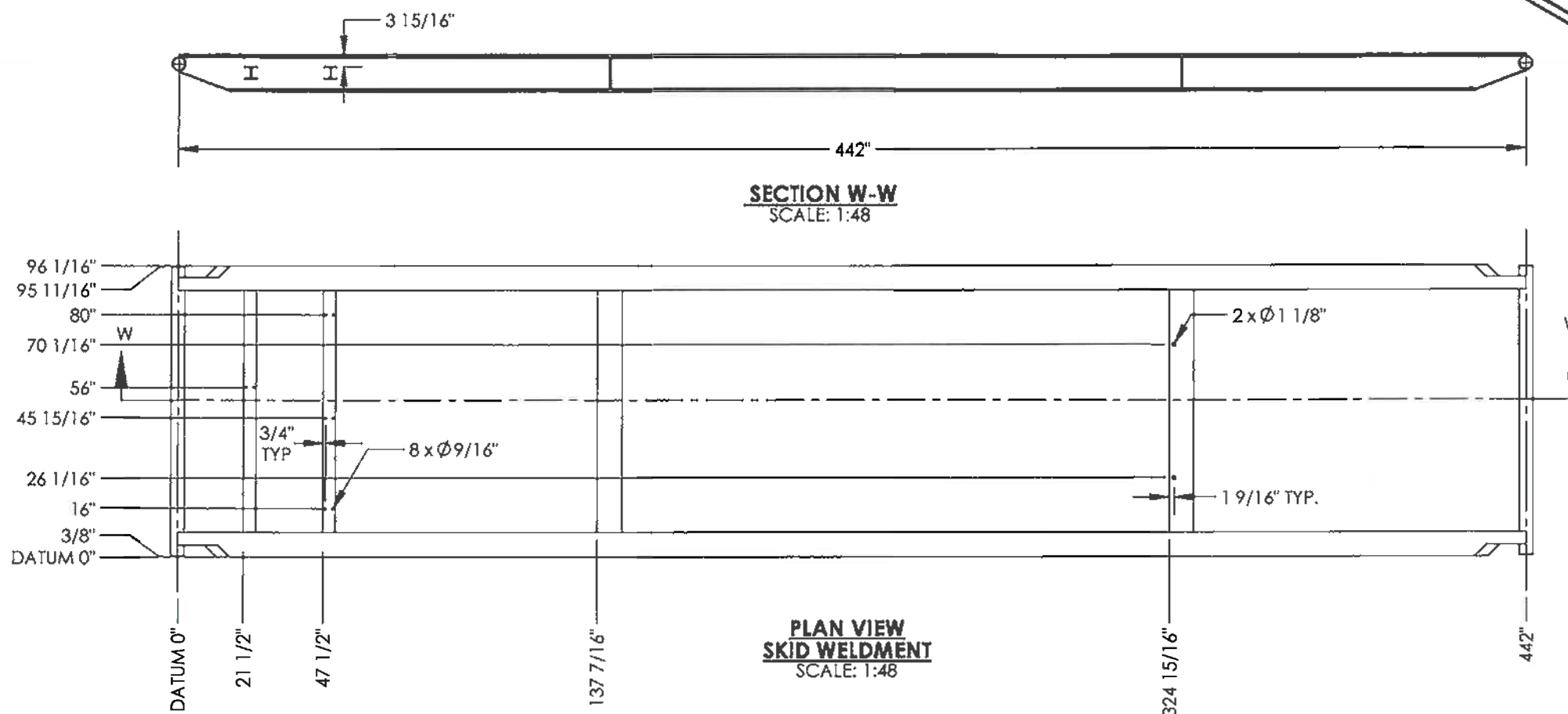
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ITEM	QTY.	DESCRIPTION	PART #	LENGTH
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202	1	WIDE FLANGE 12" @ 50# 350W/ASTM A992	WFL1250R	442 1/8"
203	1	WIDE FLANGE 12" @ 50# 350W/ASTM A992	WFL1250R	87 5/8"
204	1	WIDE FLANGE 12" @ 50# 350W/ASTM A992	WFL1250R	87 5/8"
205	1	WIDE FLANGE 12" @ 50# 350W/ASTM A992	WFL1250R	442 1/8"
206	1	WIDE FLANGE 4" @ 13# 350W/ASTM A992	WFL413R	87 5/8"
207	1	WIDE FLANGE 4" @ 13# SA36/44W	WFL413R	87 5/8"



**ISOMETRIC VIEW
SKID WELDMENT**
SCALE: 1:48



SECTION W-W
SCALE: 1:48

**PLAN VIEW
SKID WELDMENT**
SCALE: 1:48

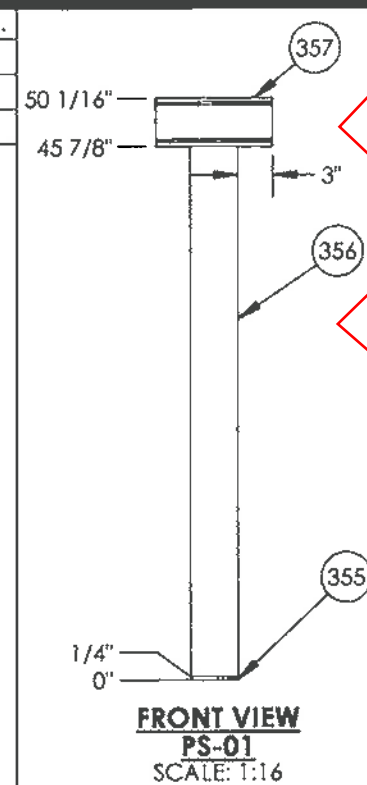
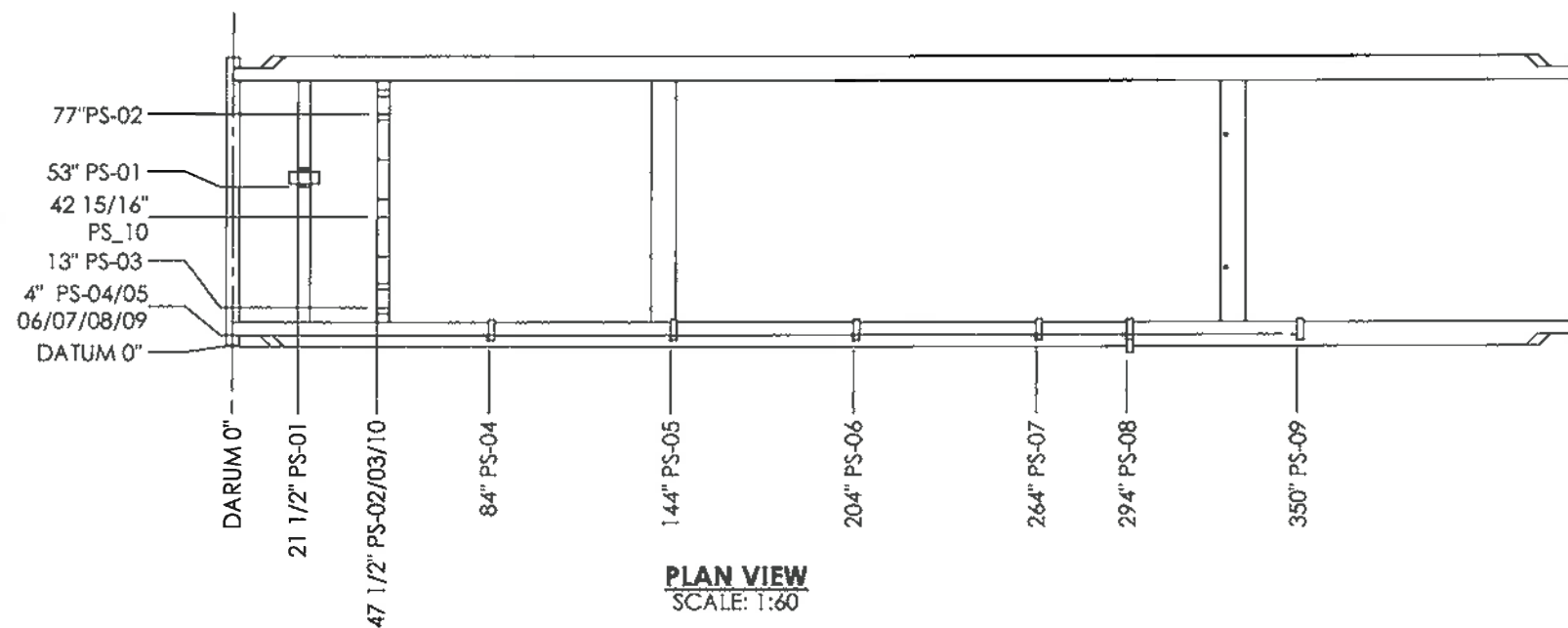
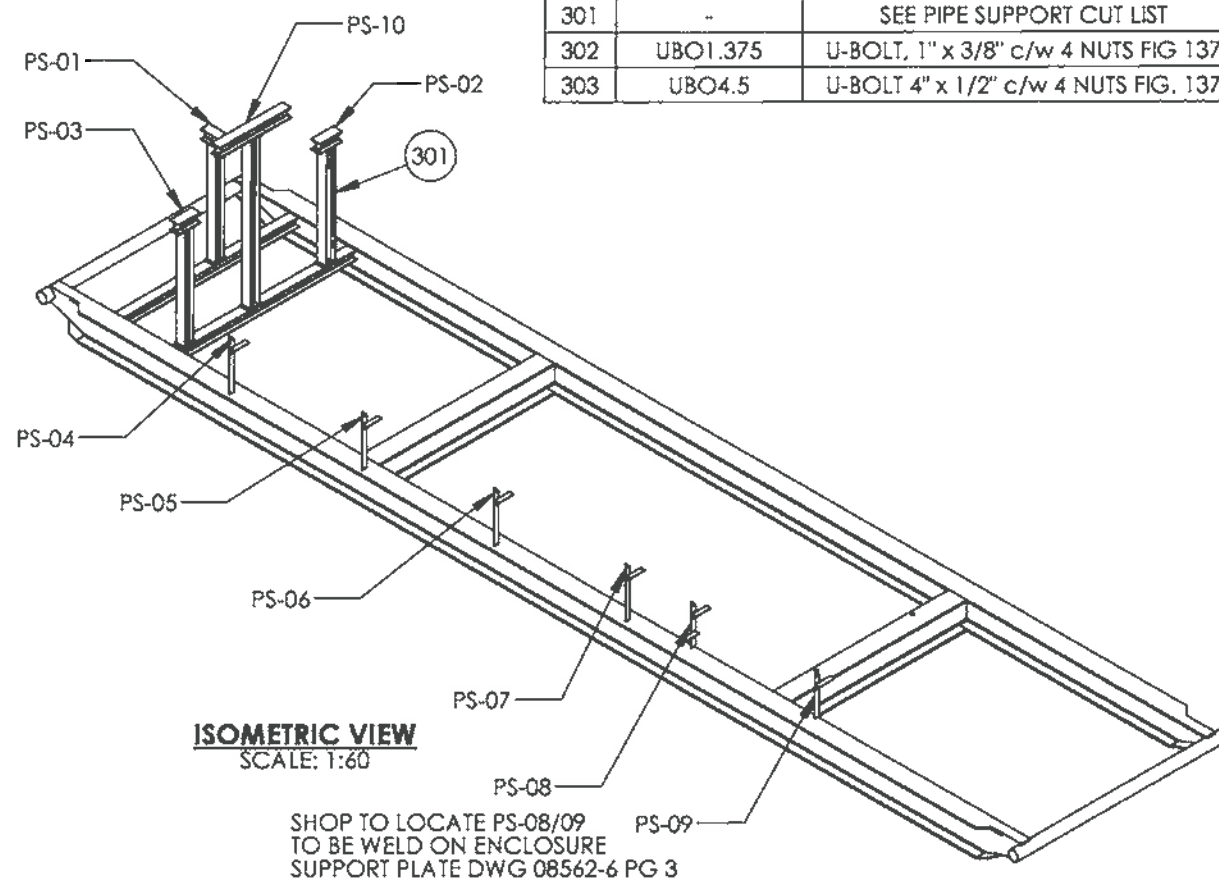
ORIGINAL

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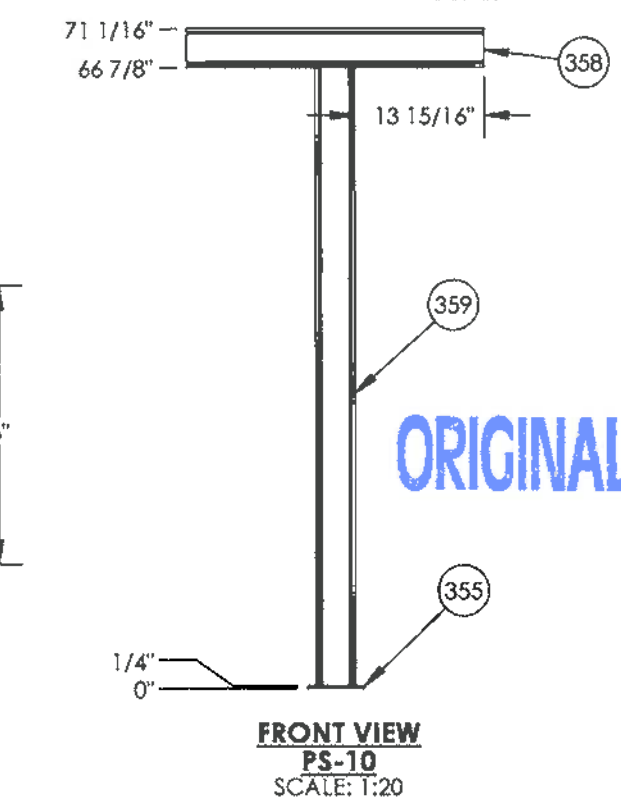
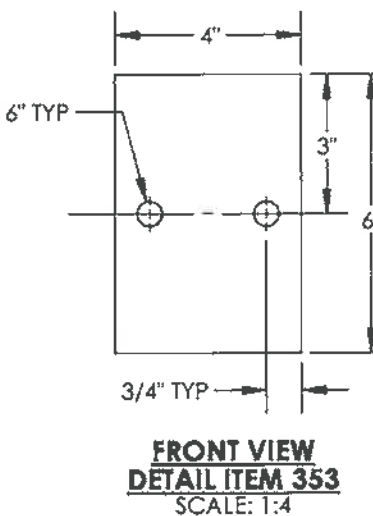
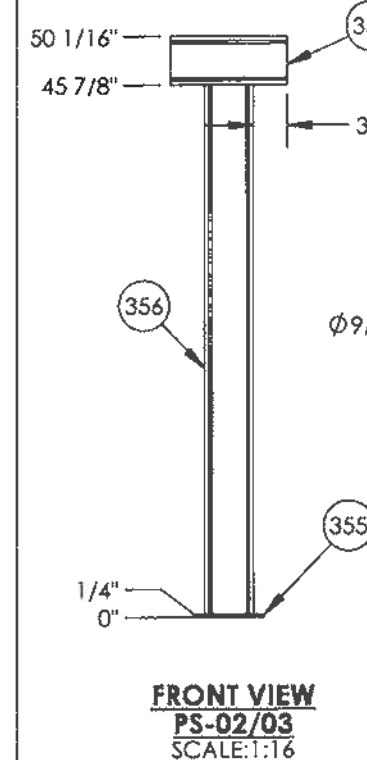
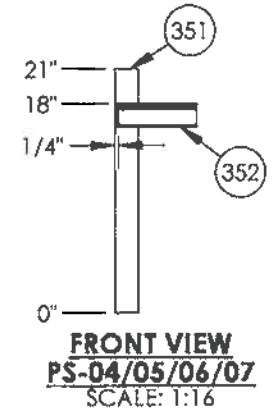
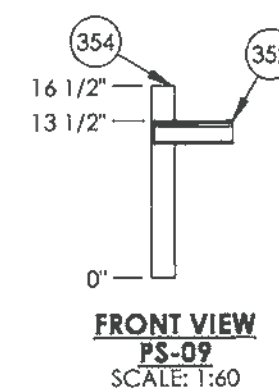
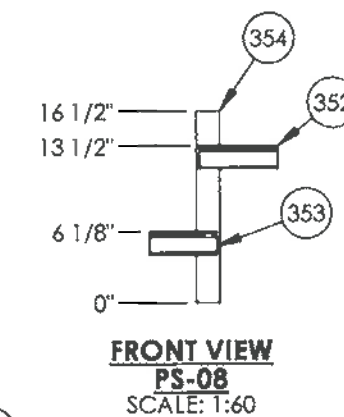
1. SHOP TO VERIFY ALL I-BEAM CUT LENGTHS PRIOR TO SECTIONING BEAMS. 3 1/2" REQUIRED TO ADD LONG BEAM PRIOR TO CUT ITEM 202 & 205.
2. SHOP TO VERIFY ALL PIPING SUPPORT CUT LENGTH

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ITEM	PART #	DESCRIPTION	MTR #	LENGTH	QTY.
301	-	SEE PIPE SUPPORT CUT LIST			1
302	UBO1.375	U-BOLT, 1" x 3/8" c/w 4 NUTS FIG 137			7
303	UBO4.5	U-BOLT 4" x 1/2" c/w 4 NUTS FIG. 137			10



ITEM	QTY.	DESCRIPTION	PART #	LENGTH
351	4	ANGLE IRON 1/4" x 2" x 2" 300W	ANGC22A	21"
352	6	ANGLE IRON 1/4" x 2" x 2" 300W	ANGC22A	6 3/4"
353	1	ANGLE IRON 1/4" x 2" x 2" 300W	ANGC22A	5 3/4"
354	2	ANGLE IRON 1/4" x 2" x 2" 300W	ANGC22A	16 1/2"
355	4	PLATE 1/4" x 4" x 6" SA 36/44W		0.0052
356	3	WIDE FLANGE 4" @ 13# 350W/ASTM A992	WFL413R	45 5/8"
357	3	WIDE FLANGE 4" @ 13# 350W/ASTM A992	WFL413R	10"
358	1	WIDE FLANGE 4" @ 13# SA36/44W	WFL413R	32"
359	1	WIDE FLANGE 4" @ 13# SA36/44W	WFL413R	66 5/8"



AS BUILT					
LH-FIRSTK-24-2	LINEHEATER FIRETUBE/STACK ASSEMBLY				
LH-LAD-72	LINEHEATER SKID LADDER ASSEMBLY				
LH-PH-7224-1	LINEHEATER PREHEAT PIPING	0	OCT 31/12	VW	ISSUED FOR CONSTRUCTION
08562-6	LINEHEATER PACKAGE BATH ASSEMBLY	A	OCT 01/12	VW	ISSUED FOR APPROVAL
DOCUMENT NO.	DESCRIPTION	REV	DATE	BY	CHK APP
REFERENCE DRAWINGS		DRAWING REVISIONS			

ISSUED FOR CONSTRUCTION

SIGNED: _____

DATE: _____

W.O.: _____

S/N: _____

ALL DIMENSIONS IN INCHES

NWP
INDUSTRIES INC.
Total oilfield supply.

P.O. BOX 6280, INNISFAIR, AB T4G 1S9
PH: (403) 227-4100 FAX: (403) 227-4102

THIS DRAWING IS PROPERTY OF NWP INDUSTRIES INC. AND MAY NOT BE REPRODUCED WITHOUT PERMISSION. THIS DRAWING MUST BE RETURNED UPON REQUEST.

ENCANA CORPORATION
LINEHEATER PACKAGE
3.0 MMBTU/HR
c/w 4" 2500# RTJ SPLIT COILS
SKID ASSEMBLY

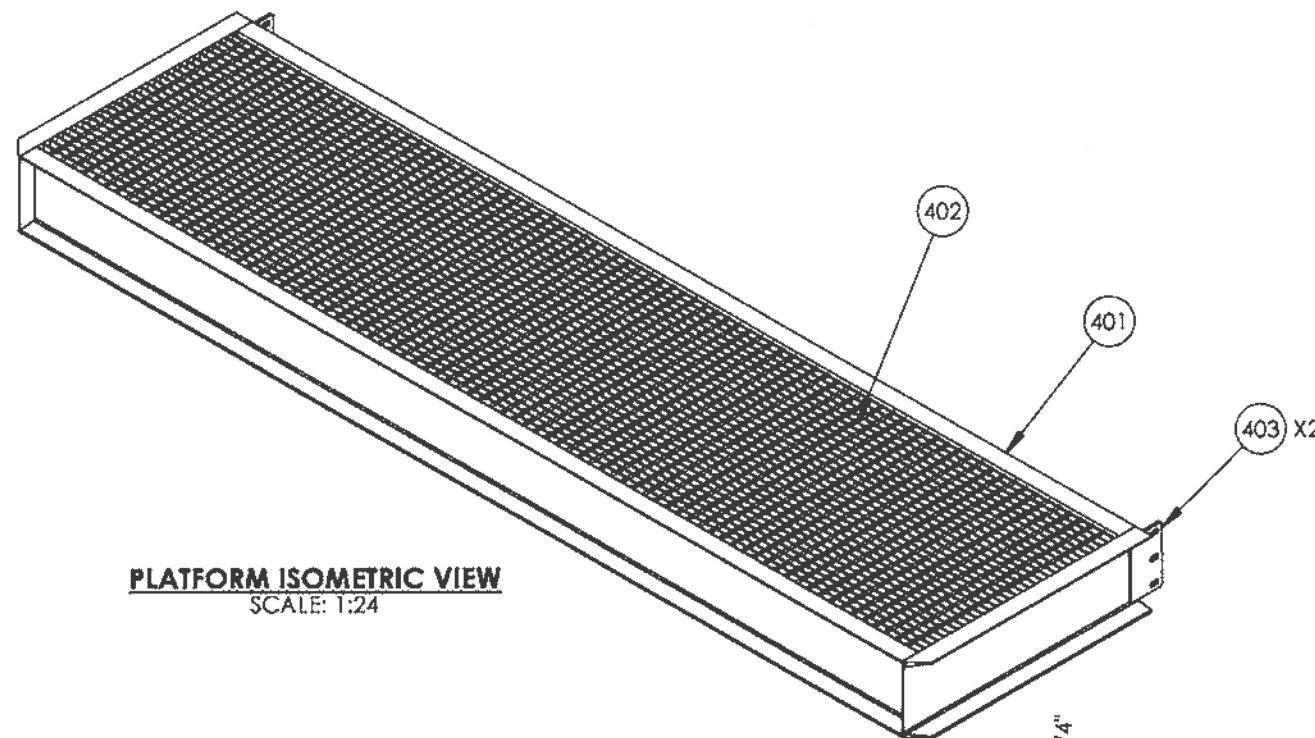
DWN: VW CHK: *[Signature]* APP: *[Signature]*

DATE: OCT 01/12 DATE: NOV 02 2012 DATE: NOV 02 2012

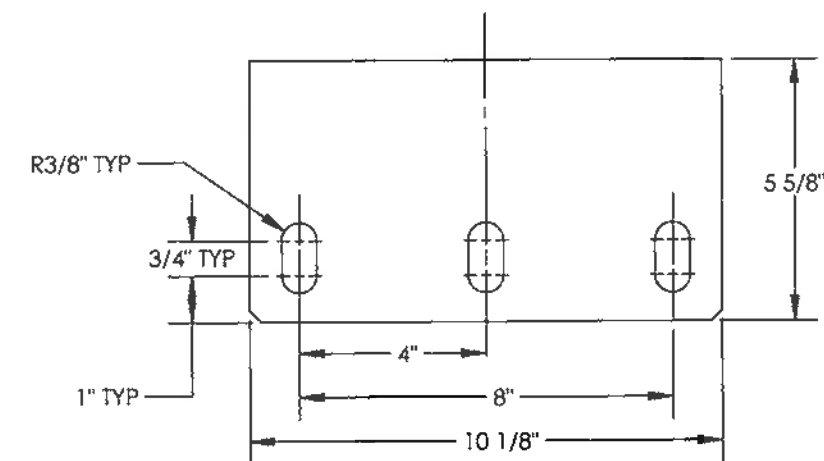
SCALE: 1:60 DWG: 08562-3 REV: 0

SHEET: 4 OF 7

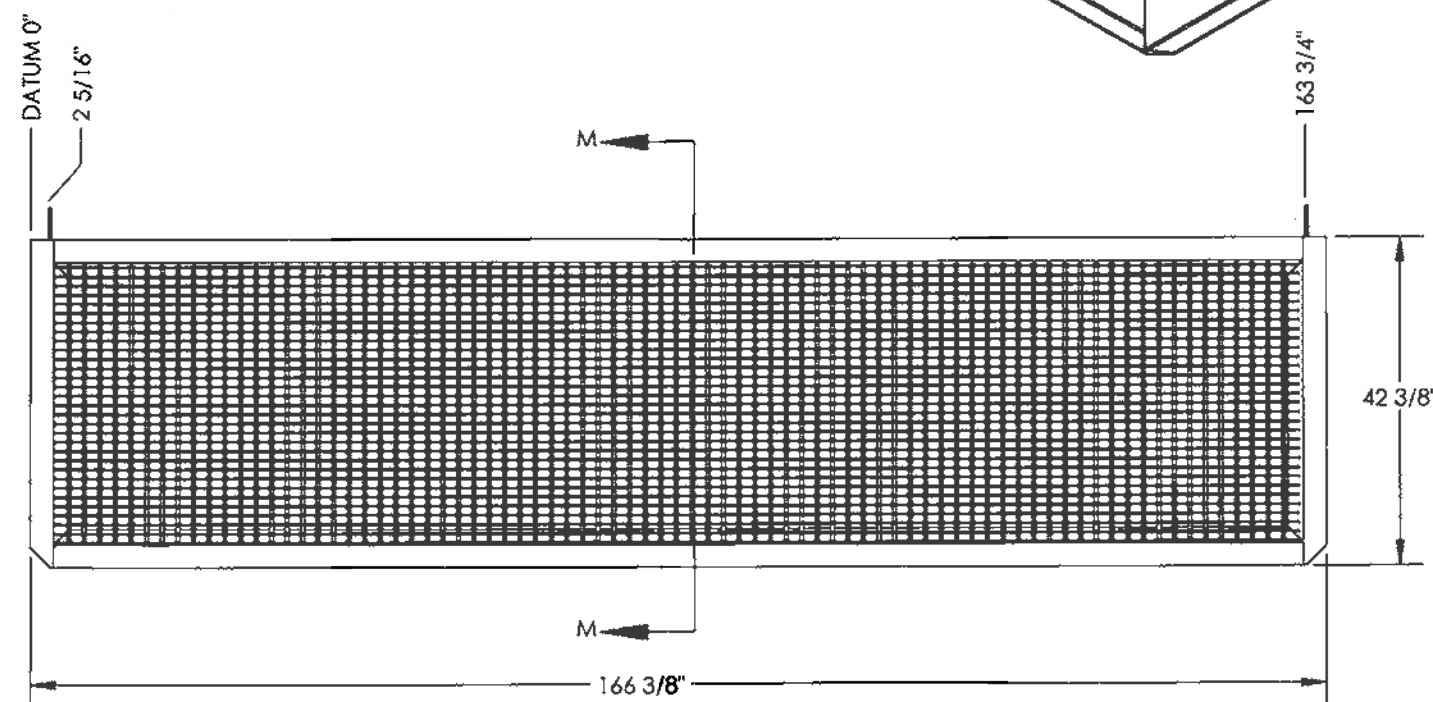
ITEM	PART #	DESCRIPTION	MTR #	LENGTH	QTY.
401	-	SEE ENCLOSURE PLATFORM CUT LIST			1
402	BARCAA	BAR GRATING 3/16" x 1-1/2" SERRATED 3' x 160"		160"	1
403	PLACYA	PLATFORM SUPPORT PLATE 3/8" x 10 1/8" x 5 5/8" SA36/44W			2



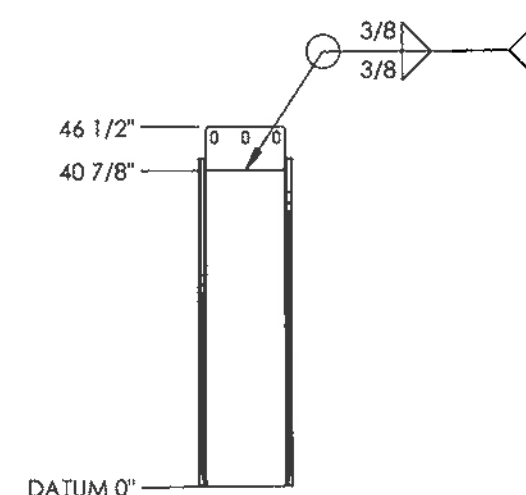
PLATFORM ISOMETRIC VIEW
SCALE: 1:24



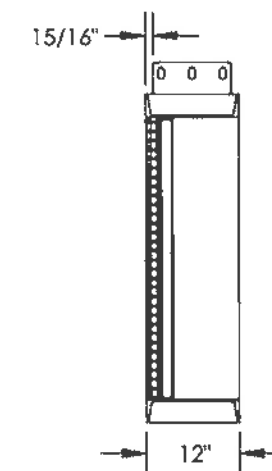
PLATFORM SUPPORT PLATE
THK 3/8"
SCALE: 1:4



PLATFORM
PLAN VIEW
SCALE: 1:24



PLATFORM
SIDE VIEW
SCALE: 1:24



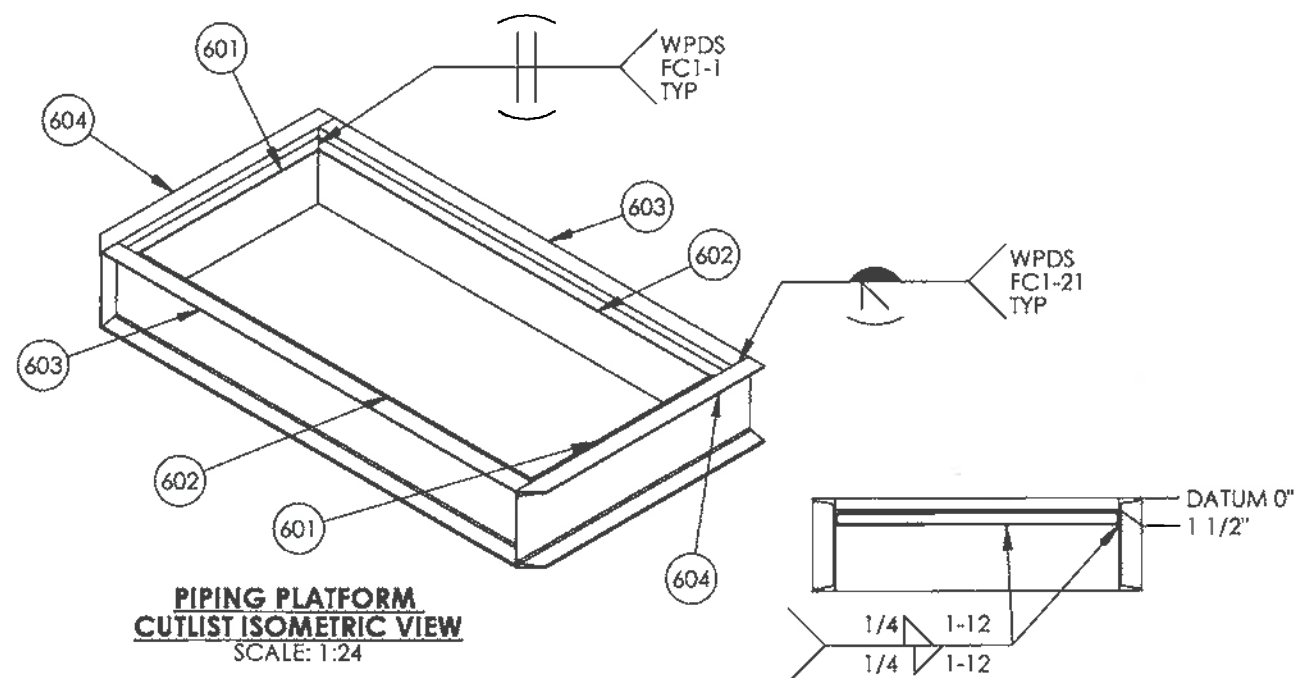
PLATFORM
SECTION M-M
SCALE: 1:24

ORIGINAL

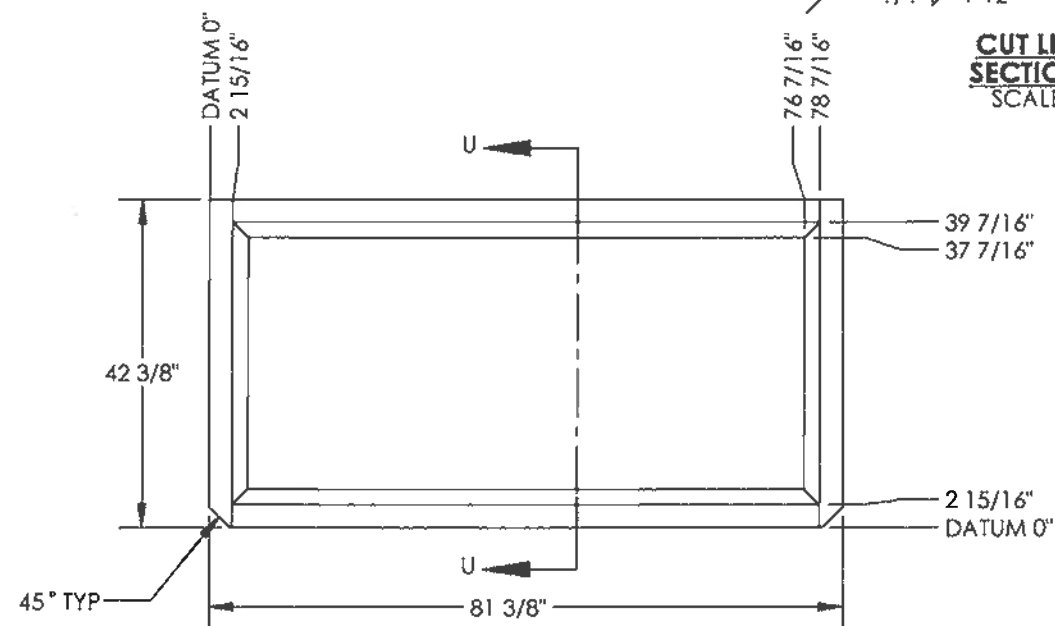
ENCLOSURE PLATFORM APPROX. WEIGHT 1230 LBS

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ITEM NO.	QTY.	DESCRIPTION	PART #	LENGTH
601	2	ANGLE IRON 1/4" x 2" x 2" 300W	ANGC22A	36 1/2"
602	2	ANGLE IRON 1/4" x 2" x 2" 300W	ANGC22A	75 1/2"
603	2	C-CHANNEL 12" @ 20.7# 300W	CHA1220R	75 1/2"
604	2	C-CHANNEL 12" @ 20.7# 300W	CHA1220R	42 3/8"

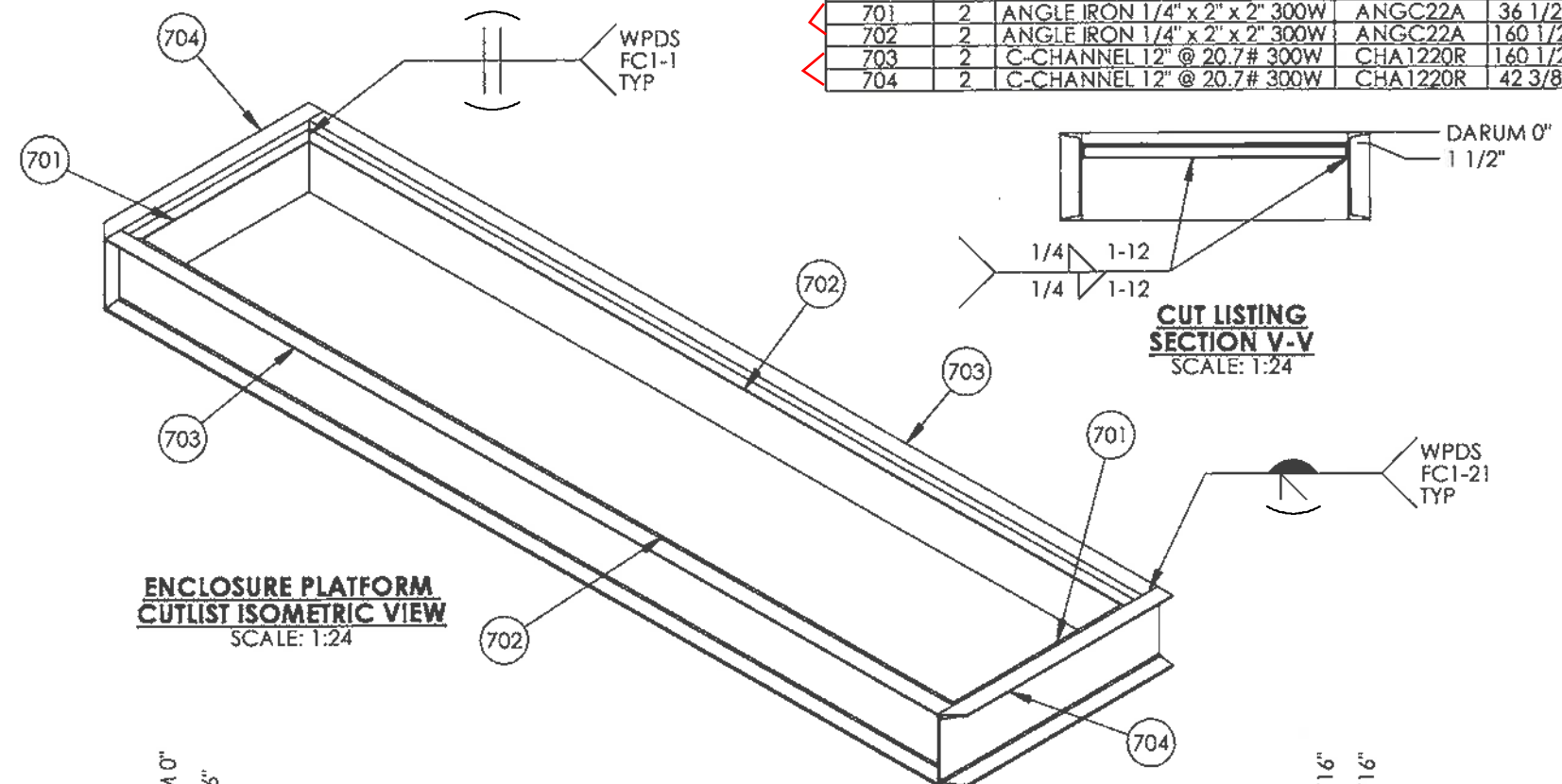


**PIPING PLATFORM
CUTLIST ISOMETRIC VIEW**
SCALE: 1:24

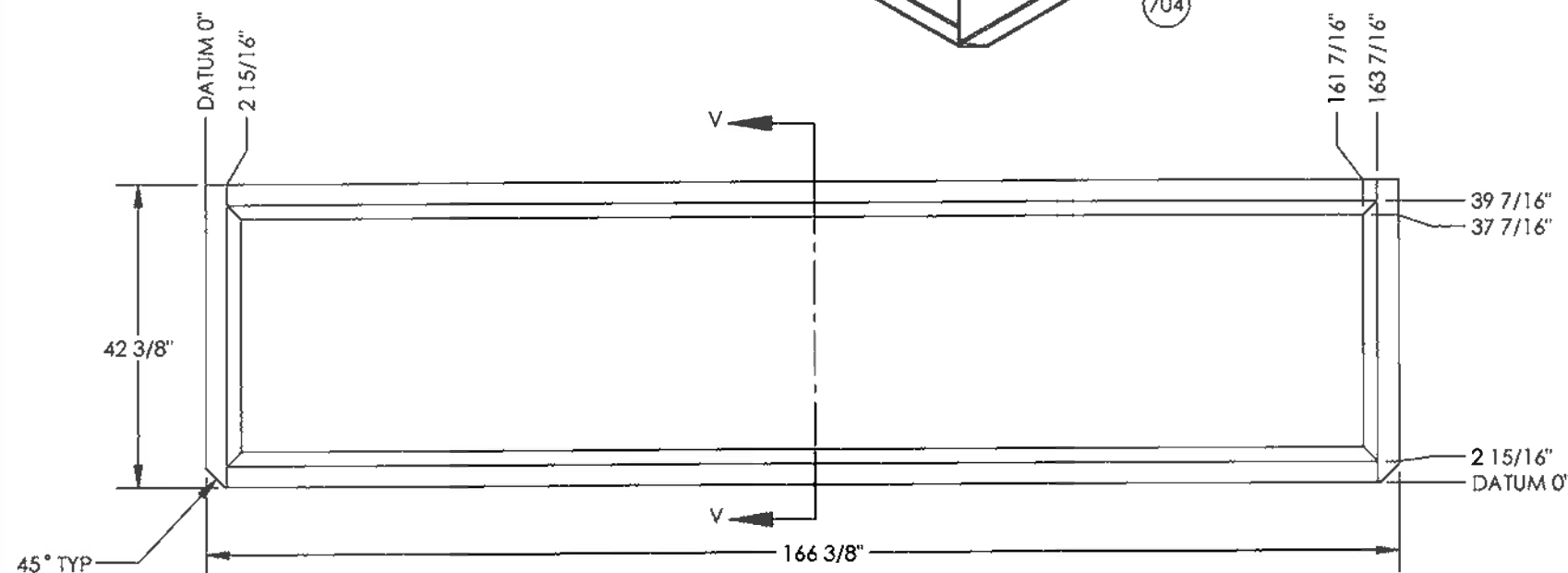


**PIPING PLATFORM
CUT LISTING PLAN VIEW**
SCALE: 1:24

**CUT LISTING
SECTION U-U**
SCALE: 1:24



**ENCLOSURE PLATFORM
CUTLIST ISOMETRIC VIEW**
SCALE: 1:24



**ENCLOSURE PLATFORM
CUTLISTING PLAN VIEW**
SCALE: 1:24

ORIGINAL

AS BUILT					
LH-FIRSTK-24-2	LINEHEATER FIRETUBE/STACK ASSEMBLY				
LH-LAD-72	LINEHEATER SKID LADDER ASSEMBLY				
LH-PH-7224-1	LINEHEATER PREHEAT PIPING	0	OCT 31/12	VW	ISSUED FOR CONSTRUCTION
08562-6	LINEHEATER PACKAGE BATH ASSEMBLY	A	OCT 01/12	VW	ISSUED FOR APPROVAL
DOCUMENT NO.	DESCRIPTION	REV	DATE	BY	CHK APP
REFERENCE DRAWINGS		DRAWING REVISIONS			

**ISSUED FOR
CONSTRUCTION**

SIGNED: _____
DATE: _____
W.O.: _____
S/N: _____

ALL DIMENSIONS IN INCHES

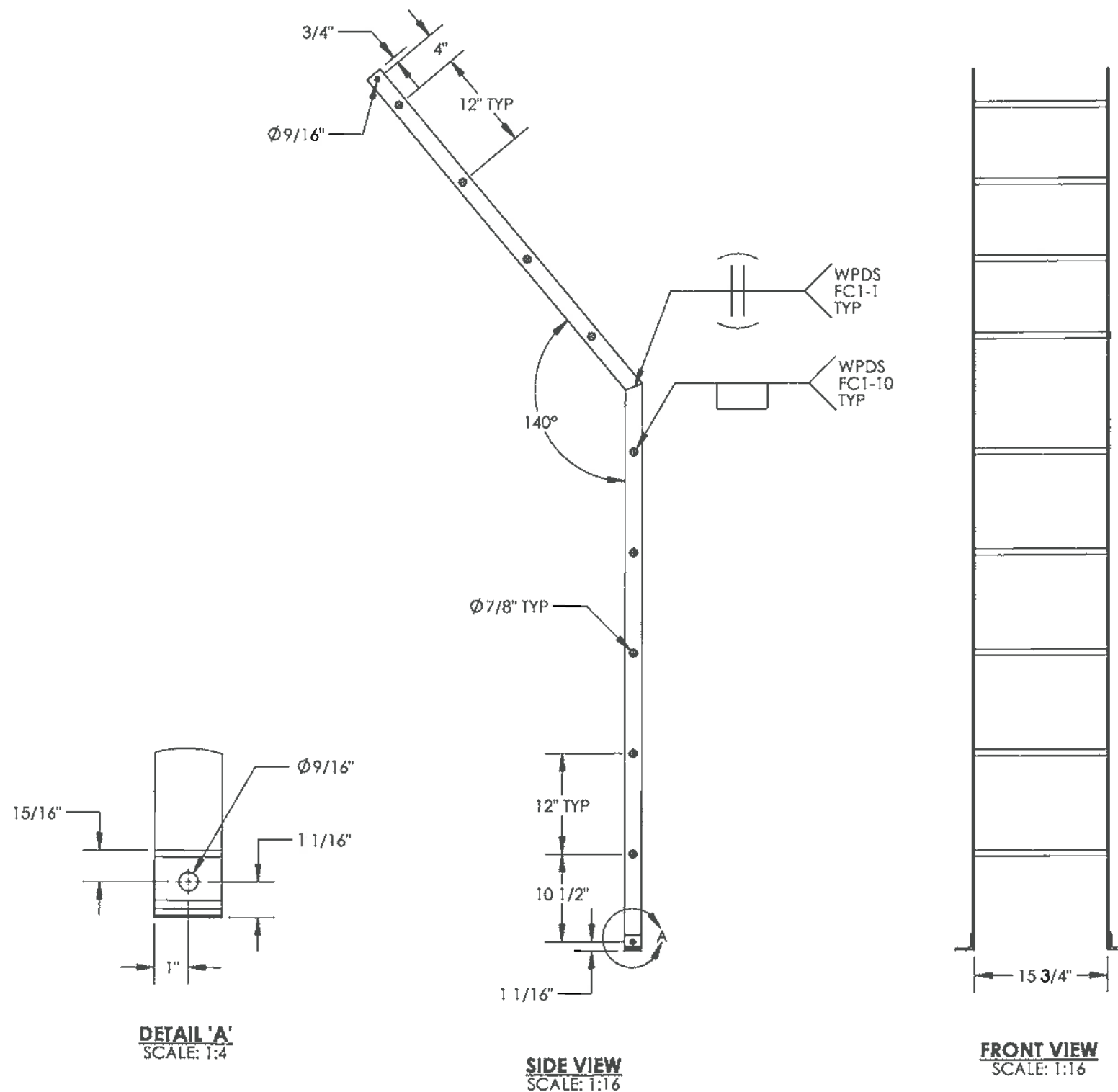


P.O. BOX 6280, INNISFAIR, AB T4G 1S9
PH: (403) 227-4100 FAX: (403) 227-4102

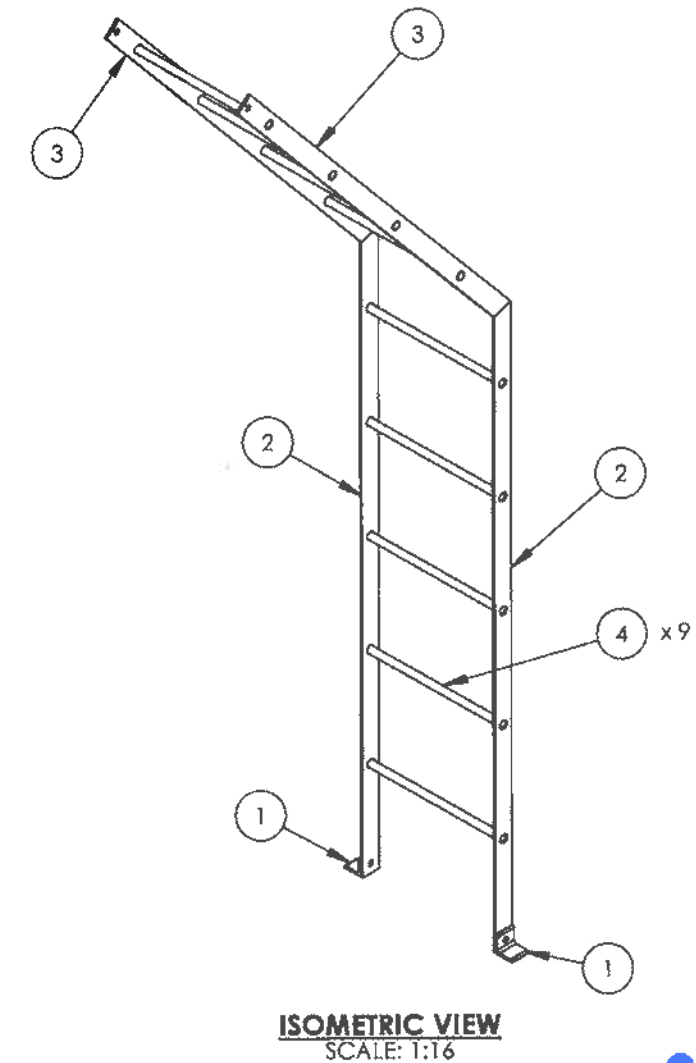
THIS DRAWING IS PROPERTY OF NWP INDUSTRIES INC.
AND MAY NOT BE REPRODUCED WITHOUT PERMISSION.
THIS DRAWING MUST BE RETURNED UPON REQUEST.

ENCANA CORPORATION
LINEHEATER PACKAGE
3.0 MMBTU/HR
C/W 4" 2500# RTJ SPLIT COILS
SKID ASSEMBLY

DWN: VW CHK: *[Signature]* APP: *[Signature]*
DATE: OCT 01/12 DATE: NOV 02 2012 DATE: NOV 02 2012
SCALE: 1:24 DWG: 08562-3 REV: 0
SHEET: 7 OF 7







ITEM	QTY.	DESCRIPTION	PART #	Material	LENGTH
1	2	ANGLE IRON 1/4" x 2" x 2" SA36/44W	ANGC22A		2"
2	2	FLAT BAR 1/4" x 2" SA36/44W	FLBC2A		67 11/16"
3	2	FLAT BAR 1/4" x 2" SA36/44W	FLBC2A		49"
4	9	ROUND BAR 3/4" SA36/44W	RBRGYA		16"



ORIGINAL

- NOTES**
1. FABRICATE TO CSA W47.1 AND W59.
 2. ALL DIMENSIONS TO HAVE A TOLERANCE OF $\pm 1/8"$ UNLESS OTHERWISE SPECIFIED.
 3. DEBURR AND RADIUS ALL SHARP EDGES.
 4. WELD PROCESS TO BE MCAW UNLESS OTHERWISE NOTED. WPDS-FC1-15.
 5. ALL WELDS TO BE 1/4" CONTINUOUS FILLET WELDS UNLESS OTHERWISE NOTED.

							AS BUILT		ISSUED FOR CONSTRUCTION		 NWP INDUSTRIES INC. Total oilfield supply. P.O. BOX 6280, INNISFAIR, AB T4G 1S9 PH: (403) 227-4100 FAX: (403) 227-4102 THIS DRAWING IS PROPERTY OF NWP INDUSTRIES INC. AND MAY NOT BE REPRODUCED WITHOUT PERMISSION. THIS DRAWING MUST BE RETURNED UPON REQUEST.	NWP INDUSTRIES INC LINEHEATER SKID TO FIT 72"OD BATH LADDER ASSEMBLY						
									SIGNED: _____			DWN: DJ			CHK: GH		APP: DF	
									DATE: _____			DATE: 2011.04.21			DATE: 2011.05.13		DATE: 2011.05.13	
									W.O.: _____			SCALE: 1:16			DWG: LH-LAD-72		REV: 1	
									S/N NWP- _____			SHEET: 1 OF 1						
DOCUMENT NO.		DESCRIPTION		REV	DATE	BY	CHK	APP	ALL DIMENSIONS IN INCHES									
REFERENCE DRAWINGS				DRAWING REVISIONS														
				1	2012.07.06	JHK			RFDC #01111 REVISED NOTE									
				0	2011.04.21	DJ	GH	DF	ISSUED FOR CONSTRUCTION									

Issuing Authority: Marvin J. (Ty) DeBelser		Quality Control
Date of Issue: March 13, 2008		QCFOFinalInspectionReleaseCertificateR00

FINAL INSPECTION RELEASE CERTIFICATE

CUSTOMER:	ENCANA	
PRODUCT:	Valve Train, Encana Spec, NWP MFD, Pneumatic proof of Closure Valve, B149.3	WO#: 08562-002-E
	Compliant	DATE: Jan 29, 13

FINAL INSPECTION DOCUMENTATION

REVIEWED BY:	ACCEPTED:	REJECTED:
STANDARD DOCUMENTATION REQUIREMENTS: (SEE DOCUMENT REQUIREMENT LIST)		
ADDITIONAL DOCUMENT REQUIREMENTS: (TO BE RECORDED HERE IF APPLICABLE I.E. DOCUMENT PACKAGE REQUIRED BY CUSTOMER ETC.)		

Q.C. FILE CLOSURE BY: Kasha Fox	DATE: Feb 5 2013
---------------------------------	------------------

LOOSE COMPONENTS REQUIRED / PREPARED

ITEMS REQUIRED:	NO. OF BOXES OR PKGS. _____
Valve Train of a 30 mm Linchetype Plug ADDITIONAL HARDWARE OR FASTENERS REQUIRED YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	

PREPARATION FOR SHIPMENT / STORAGE

PREPARATION NEEDED / COMPLETED
Release to Next process
SERIAL # 08562-002-E
ITEM # LH-VALVETRAIN-1

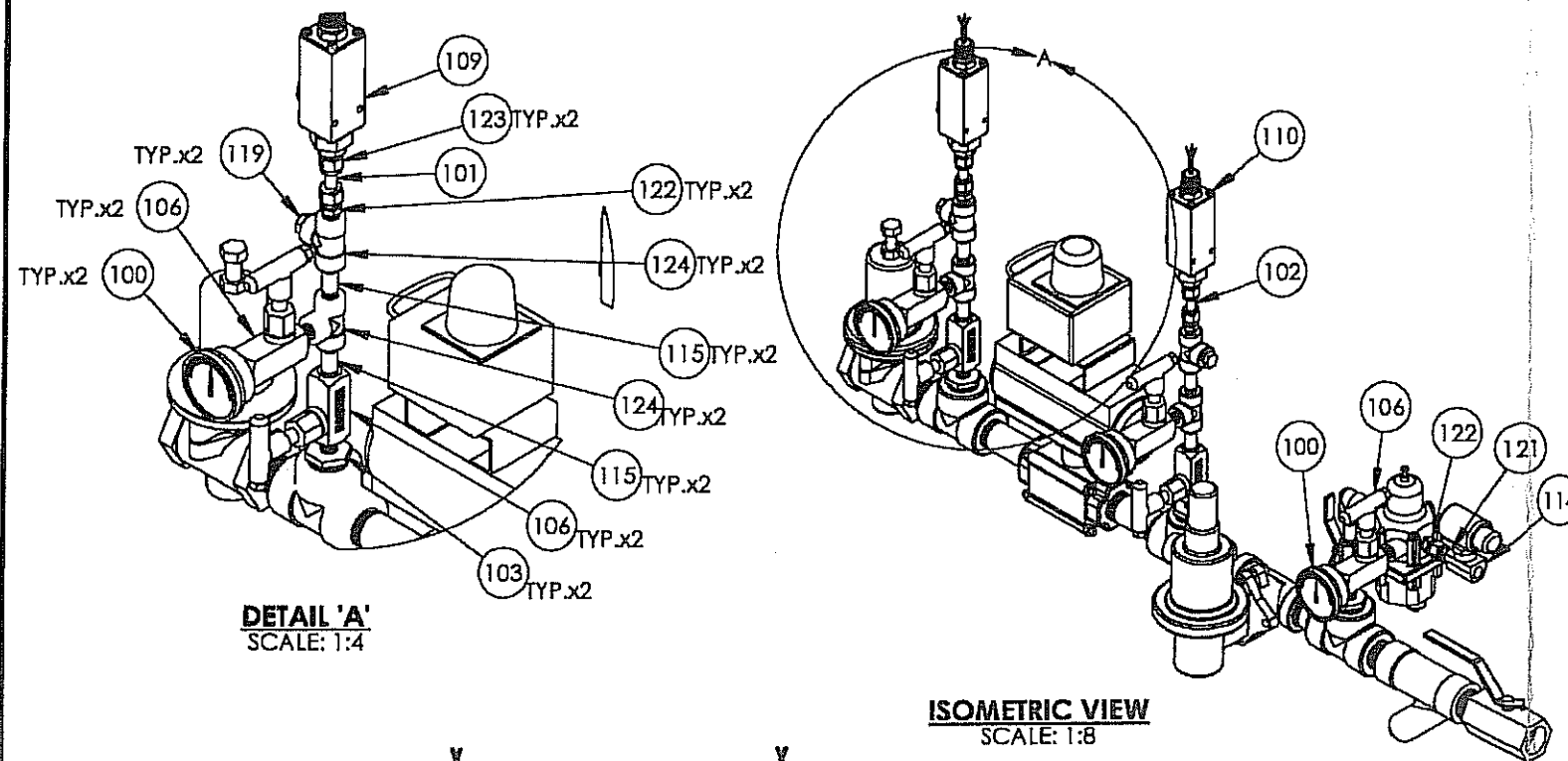
INVENTORY TAGS ATTACHED	YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/>
-------------------------	---	-----------------------------

SHIPPING INSTRUCTIONS

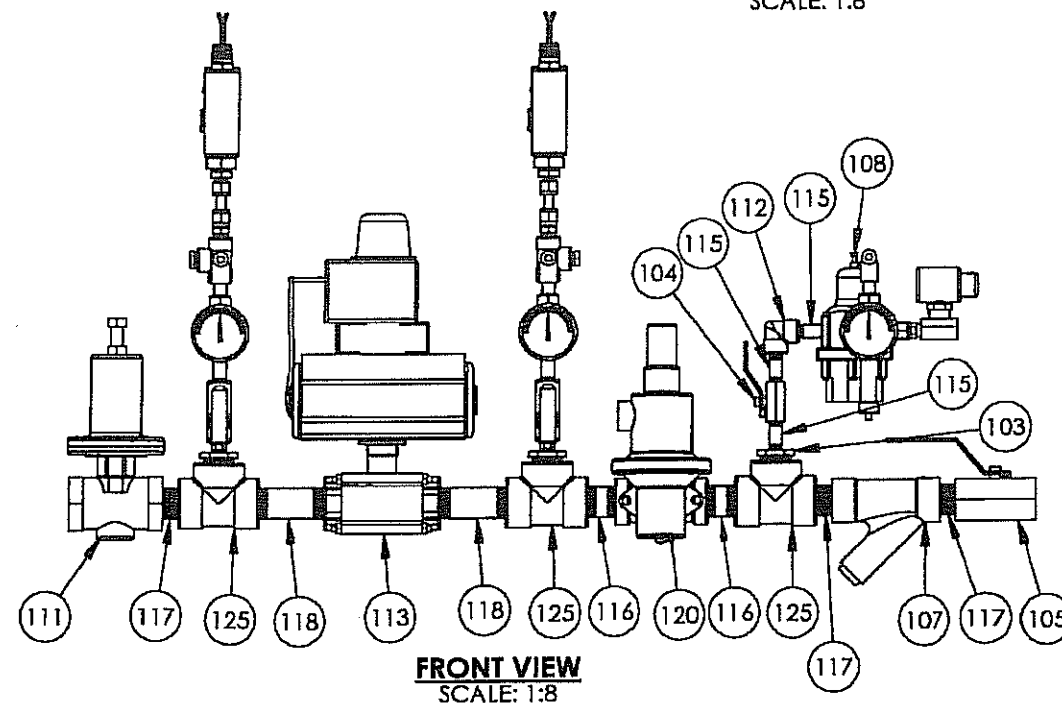
CUSTOMER P.O. REVIEWED	YES <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>
------------------------	------------------------------	---

CONTACT PERSON AUTHORIZED TO RELEASE PRODUCT:
PHONE: FAX:

RELEASED TO INVENTORY:	DATE:
RELEASED TO CUSTOMER: [Signature]	DATE: Jan 29, 13



DETAIL 'A'
SCALE: 1:4



FRONT VIEW
SCALE: 1:8

ITEM	PART #	DESCRIPTION	MTR #	LENGTH	QTY.
100	233.53	PRESSURE GAUGE WIKA 2 1/2" FACE 1/4" NPT, 0-30 PSI, MODEL NO. 233.53 CENTER BACK MOUNT			3
101	SS-T6-S-035-20	TUBING, 0.035" WT SMLS 3/8"		2 3/4"	1
102	SS-T6-S-035-20	TUBING, 0.035" WT SMLS 3/8"		2 3/4"	1
103	BUS1.25YEE	Bushing 1" x 1/4" THRD SA 105N	6007		3
104	BUY	BALL VALVE EMICO 1/4" 600 PSI			1
105	BUY	BALL VALVE EMICO 1" 600 PSI			1
106	BUY	VALVE NEEDLE MAGNUM 1/4" 6000 PSI MF-25-SS			5
107	BUY	STRAINER ALTA STRAINER 1" NPT CL 3000 MDL YS3000			1
108	BUY	PRESSURE REGULATOR FISHER 67CFR 0-35 PSI SPRING STD TRIM			1
109	BUY	PRESSURE SWITCH CCS MODEL 6900GZE12 SET @ 14 PSI RISING			1
110	BUY	PRESSURE SWITCH CCS MODEL 6900GZE12 SET @ 4 PSI FALLING			1
111	CV-1198869383	Fisher 119 1" NPT 9/16" Orifice Spring Range: 5 to 35 psig			1
112	EL9.25GYEE	Elbow 90 Deg 1/4" 3M THRD SA 105N	6M	3260	1
113	FOSSIL-24	PROOF OF CLOSURE VALVE FOSSIL 1" NPT			1
114	HV426716002	SOLENOID VALVE ASCO 1/4" NPT			1
115	NIP.252Y80EK	NIPPLE 1/4" x 2" SCH XH/80 316/316L SST	0112182	-	7
116	NIP12.5Y80EA	NIPPLE 1" x 2 1/2" SCH XH/80 SA 106-B		-	2
117	NIP12Y80EA	NIPPLE 1 x 2" SCH XH/80 SA 106-B		-	3
118	NIP14Y80EA	NIPPLE 1" x 1" SCH XH/80 SA 106-B	1x5 1/2	N6M N5Y	2
119	PLH.25HYEE	PLUG HEX 1/4" 6M THRD SA 105N		4973	2
120	PRV-627121729855	PRESSURE REGULATOR FISHER 627-489 1" NPT 5-20 PSI 1/2" ORIFICE STD TRIM 250 MAWP			1
121	SS-6-TA-1-4	TUBE ADAPTOR 3/8" TUBE x 1/4" MNPT MDL SS-6-TA-1-4			1
122	SS-600-1-4	TUBING, STRAIGHT CONNECTOR, 3/8" TUBING x 1/4" MNPT, SS-600-1-4			3
123	SS-600-1-8	TUBING, STRAIGHT CONNECTOR, 3/8" TUBING x 1/2" MNPT, SS-600-1-8			2
124	TEE.25GYEE	Tee 1/4" CL 3M THRD SA 105N	6M	133	4
125	TEE1GYEE	Tee 1" 3M THRD SA 105N	6M	130	3

Build in Reverse order
All Fittings to be 6000#

Nov 16/12

Encana 3.0 mm BTU/HR 08562/08563

ORIGINAL

DOCUMENT NO.	DESCRIPTION	REV.	DATE	BY	CHK	APP	DESCRIPTION
		1	2012.09.27	EP			RE-ISSUED FOR CONSTRUCTION (UPDATED PART NUMBERS)
		0	2012.06.22	JHK			ISSUED FOR CONSTRUCTION

ISSUED FOR CONSTRUCTION
SIGNED: *[Signature]*
DATE: NOV 16 2012
8562-002-E
S.O.: *[Signature]*
ALL DIMENSIONS IN INCHES

NWP
INDUSTRIES INC.
Total oilfield supply.
P.O. BOX 6280, INNISFAIR, AB T4G 1S9
PH: (403) 227-4100 FAX: (403) 227-4102

NWP INDUSTRIES INC
VALVE TRAIN ASSEMBLY
1" NPT
RIGHT TO LEFT FLOW
ASSEMBLY DRAWING

DWN: JHK	CHK: <i>[Signature]</i>	APP: <i>[Signature]</i>
DATE: 2012.06.22	DATE: 2012.06.22	DATE: 2012.06.22
SCALE: 1:8	DWG: LH-VALVETR-1	REV: 1
SHEET: 1 OF 1		



8300 Southwest 8th Street
Oklahoma City, Oklahoma

telephone: 405.787.0145 facsimile: 405.789.8198

email: info@taylorvalve.com

Date : 04-Feb-13

Sales Order # : 022617

Serial # : 022617-1

Part#: 82F4661341

Customer : **NWP INDUSTRIES**
4017, 60 AVE
INNISFAL, ALBERTA
T0G 1S9

Customer PO # : 710161

Safety Relief Valve Certification

Taylor Valve Technology, Inc. Safety Relief Valves are designed, manufactured and tested in accordance with the provisions of the ASME Boiler and Pressure Vessel Code. as allowed for within the provisions of ASME. The published relieving capacities have been certified by the National Board of Boiler and Pressure Vessel Inspectors.

Valve Specifications

Model Number :	Taylor Model 8200 Soft Seat	Orifice :	F
Body Size :	1 Inch	Diameter:	0.674 Inches
Part Number :	82F4661341	Area :	0.357 In ²
Body Configuration :	1" MNPT X 1-1/2" FNPT	Temperature :	70 °F
Inlet Connection :		Spring Range :	141-290 PSIG
Outlet Connection :		Set Pressure :	150.0 PSIG
CRN:	0G01316.2C		

Materials

Body :	WCC Carbon Steel	Spring :	MP35N or Equal
Seat Frame :	Carbon Steel	Guide :	304 Stainless Steel
Seat Housing :	316 Stainless Steel	Adj Screw :	Carbon Steel with EN Plating
Trim :	Nace	Options :	None
Seat :	FKM 90d		

Set Pressure Specifications

	ASME Units
Set Pressure :	150.0 psig
ASME High Set Limit :	154.5 psig
ASME Low Set Limit :	145.5 psig

ASME (90%) rated capacity at set pressure for indicated fluid, specific gravity and temperature.

Certifying Fluid : Air 982 SCFM Spec Gravity : 1.00 Temp : 60 °F

Tested by :

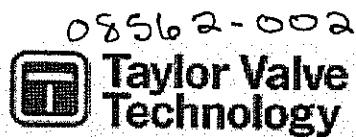
Department : **Manufacturing**

Signed Mason Buerger

Approved by :

Department : **Engineering**

Signed Jay Neill



8300 Southwest 8th Street

Oklahoma City, Oklahoma

Serial #: **022617-4**

telephone: 405.787.0145 facsimile: 405.789.8198

Date: 06-Dec-12

Part#: **82F4661341**

email: info@taylorvalve.com

Sales Order #: 022617

Customer: **NWP INDUSTRIES INC.**

Customer PO #: 710161

4017 - 60th AVE

INNISFAIL, AB

T4G - 1S9

Safety Relief Valve Certification

Taylor Valve Technology, Inc. Safety Relief Valves are designed, manufactured and tested in accordance with the provisions of the ASME Boiler and Pressure Vessel Code, as allowed for within the provisions of ASME. The published relieving capacities have been certified by the National Board of Boiler and Pressure Vessel Inspectors.

Valve Specifications

Model Number :	Taylor Model 8200 Soft Seat	Orifice :	F
Body Size :	1 Inch	Diameter:	0.674 Inches
Part Number :	82F4661341	Area :	0.357 In ²
Body Configuration :	1" MNPT X 1-1/2" FNPT	Temperature :	70 °F
Inlet Connection :		Spring Range :	141-290 PSIG
Outlet Connection :		Set Pressure :	150.0 PSIG
CRN:	0G01316.2C		

Materials

Body :	WCC Carbon Steel	Spring :	MP35N or Equal
Seat Frame :	Carbon Steel	Guide :	304 Stainless Steel
Seat Housing :	316 Stainless Steel	Adj Screw :	Carbon Steel with EN Plating
Trim :	Nace	Options :	None
Seat :	FKM 90d		

Set Pressure Specifications

	ASME Units
Set Pressure :	150.0 psig
ASME High Set Limit :	154.5 psig
ASME Low Set Limit :	145.5 psig

ASME (90%) rated capacity at set pressure for indicated fluid, specific gravity and temperature.

Certifying Fluid : Air 982 SCFM Spec Gravity : 1.00 Temp : 60 °F

Tested by :

Department : **Manufacturing**

Signed Mason Buerger

Approved by :

Department : **Engineering**

Signed Jay Neill

FACTORY SET SWITCH POINT CERTIFICATIONCustomer: NWP Industries IncDate: Oct-30-2012
(Mmm-dd-yyyy)Address: PO BOX 6280Purchase Order: 7099284017 - 60 AveInnisfail, AB T4G 1S9Telematic Work Order: 325072

In accordance to required instructions and specifications, we certify the Pressure Switch furnished on this order has been factory set as follows:

Model Number: 6900GZE12Deadband: 1.2 PSISerial Number: 325072 1012 004Tag No.: N/ASet Point: 14 PSI INCR.Test Equipment No.: TCI055

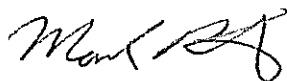
General Features:

Dual Snap, Haz. Area, ½" NPT SST Port &Diaphragm, Viton O-Ring

	PSIG	BAR
Max. System Pressure:	<u>500</u>	<u>34.5</u>
Proof (Test) Pressure:	<u>750</u>	<u>51.7</u>
Adj. Setpoint Range		
- On Increase:	<u>3-20</u>	<u>0.21-1.4</u>
- On Decrease:	<u>1-18</u>	<u>0.07-1.2</u>
Approximate Deadband:	<u>2</u>	<u>0.14</u>
Wetted Parts:	<u>SST Port &</u> <u>Diaphragm</u>	<u>Viton O-Ring</u>

For Telematic Controls Inc.

Technician:



(Digital) Signature

Mark Rietveld

Print Name

FACTORY SET SWITCH POINT CERTIFICATIONCustomer: NWP Industries IncDate: Oct-30-2012*(Mmm-dd-yyyy)*Address: PO BOX 6280Purchase Order: 7099284017 - 60 AveInnisfail, AB T4G 1S9Telematic Work Order: 325072

In accordance to required instructions and specifications, we certify the Pressure Switch furnished on this order has been factory set as follows:

Model Number: 6900GZE12Deadband: 1.7 PSISerial Number: 325072 1012 008Tag No.: N/ASet Point: 4 PSI DECR.Test Equipment No.: TCI055

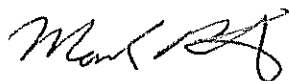
General Features:

Dual Snap, Haz. Area, ½" NPT SST Port &Diaphragm, Viton O-Ring

	PSIG	BAR
Max. System Pressure:	<u>500</u>	<u>34.5</u>
Proof (Test) Pressure:	<u>750</u>	<u>51.7</u>
Adj. Setpoint Range		
- On Increase:	<u>3-20</u>	<u>0.21-1.4</u>
- On Decrease:	<u>1-18</u>	<u>0.07-1.2</u>
Approximate Deadband:	<u>2</u>	<u>0.14</u>
Wetted Parts:	<u>SST Port &</u>	<u>Viton O-Ring</u>
	<u>Diaphragm</u>	

For Telematic Controls Inc.

Technician:



(Digital) Signature

Mark Rietveld

Print Name



3364 - 114 Avenue SE • Calgary, Alberta, Canada • T2Z 3V6
 Phone: +1 403.253.7939 • Fax: +1 403.255.0042
 Email: info@telematic.ca • telematic.ca

FACTORY SET SWITCH POINT CERTIFICATION

Customer: NWP Industries Inc

Date: Nov-13-2012
 (Mmm-dd-yyyy)

Address: Box 6280
4017 - 60th Ave.

Purchase Order: 710162

Innisfail AB, T4G 1S9

Telematic Work Order: 325360

In accordance to required instructions and specifications, we certify the Temperature Switch furnished on this order has been factory set as follows:

Model Number: 6900TE14

Deadband: 2.77°C

Serial Number: 325360-1112-002

Tag No.: N/A

Set Point: 90°C Incr.

Test Equipment No.: TCI014, TCI028, TCI031

General Features:

Dual Snap, Haz. Area, 1/2" NPT 300SS

Direct Mount Probe

	<u>°F</u>	<u>°C</u>
Max. Probe Temperature:	<u>300</u>	<u>149</u>
Adj. Setpoint Range:		
- On Increase:	<u>80-205</u>	<u>27-96</u>
- On Decrease:	<u>60-198</u>	<u>16-92</u>

	<u>°F</u>	<u>°C</u>
Approx. Deadband:		
- At Bottom:	<u>20</u>	<u>11</u>
- At Top:	<u>5</u>	<u>4</u>
Wetted Parts:	<u>300SS</u>	

For Telematic Controls Inc.

Technician:

Thomas

Thomas Hong



VALVES & MEASUREMENT

08562-002-H

Thursday, 13-Sep-2012

From:

Cameron Canada
3707 97 Street
Edmonton, Alberta, Canada
T6E 6J2
Phone : 780-468-2732

To:

Subject:

Serial	2547846	Quantity/Series	250
--------	---------	-----------------	-----

Comments:

Part #: 5A-T3R10S30LZ
Description: BV R10 FNPT NUTRON T3 3000 WOG SOUR LT
Sales Order: N/A
Customer PO: N/A



VALVES & MEASUREMENT

Thursday, 13-Sep-2012

From:

Cameron Canada
3707 97 Street
Edmonton, Alberta, Canada
T6E 6J2
Phone : 780-468-2732

To:

Document Summary Page

The documents are printed in the following order:

#	Heat #	Heat Code	Job/Serial #	Material #	Description
1	L	LOC			Nutron T3, B3, B2, TT Sour Low Temp.
2	Hydro Test	598			API 598
3	U2101				BALL,7/8",ASTM A351 GR CF8M
4	U2071				BALL,7/8",ASTM A351 GR CF8M
5	R4921				STEM,7/8",ASTM A564 17-4 H1150 NACE
6	HN54				CAP,1" RP 4000 WOG FNPT, ASTM A105/LF2
7	322607				BODY,7/8" 4000 WOG,ASTM A105/LF2



VALVES & MEASUREMENT
Cameron Canada Corporation
3707 - 97 Street
Edmonton Alberta Canada T6E 6J2
Phone 780.463.6868
Fax 780.465.1244
www.c-a-m.com

GENERAL LETTER OF COMPLIANCE

for Valve Models:

T3, B3 & B2 & TT

Style 'L': Sour Low Temperature Service

Cameron Valves & Measurement hereby certifies that the design, fabrication, testing and quality control of the above NUTRON brand ball valves for Sour Low Temperature Service have been made in accordance with the following applicable standards (latest edition in effect at time of manufacture): API 598 (1-1/2" and smaller), API 6D (TT only), ASME B16.34, CSA Z245.15 Sour Service (2" FP and larger) and V&M Engineering Standards. As part of compliance to these specifications, the valves have been marked in accordance with MSS SP-25. The valve has also been marked "SOUR" as required by CSA Z245.15 marking requirements for Sour Service.

The materials of construction for this valve conform to the metallurgical requirements of NACE MR0175/ISO 15156:2003 (Parts 1 & 2 for Carbon & Alloy Steels in SSC Region 3 Sour Service and Parts 1 & 3 for CRA's as specified in CSA Z245.15 Chapter 13). According to NACE MR0175-2003/ISO 15156, it is the customer's/user's responsibility to ensure that the valve materials will be satisfactory in the intended service.

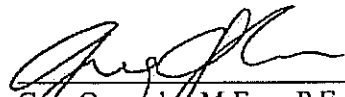
The minimum service temperature of these valves is -46°C/-50°F. Impact testing has been performed in accordance with applicable ASTM requirements and those of CSA Z245.15 for Category II M45C Service.

The 'Z' option code designation at the end of a figure number indicates that the valve meets the requirements of API-607 Fourth Edition, May 1993.

These valves (1-1/2" and larger) conform to the Pressure Equipment Directive requirements and are marked as CE certified (Certificate #8888-001-2002).

The B2 and TT valve models are constructed to be anti-static as standard.

Approved by:


Greg Ogaranko, M.Eng., P.Eng.
Engineering Manager

**VALVES & MEASUREMENT**

Cameron Canada Corporation
3707-97th St.
Edmonton Alberta Canada T6E 6J2
Phone 780.468.2732
www.c-a-m.com

CERTIFICATE OF CONFORMANCE**API 598 Pressure Testing – Carbon and Low Alloy Steel
(2" RP and Smaller)**

COMPLIANCE: These valves are tested in accordance with Cameron Valves & Measurement's standard procedures and API Standard 598, as per the chart below.

Test durations are 15 seconds in length as a minimum. Test duration is defined as the period of inspection after the valve is fully prepared and is under full pressure.

Butt weld end valves shall be tested in accordance with the ANSI rating.

Actual test pressure is rounded to next highest increment on the gauge.

**Carbon & Low Alloy Steel
Shell and Seat Test Pressures**
(Table Based on Rating for Group 1.1 Materials per ANSI B16.34)

Valve Class	Maximum Working Pressure	Hydrostatic Shell Test Pressure (PSI)	Air Seat Test Pressure +/- 10 PSI
150 ANSI	285	450	80
300 ANSI	740	1125	80
600 ANSI	1480	2225	80
800 ANSI	1975	3000	80
900 ANSI	2220	3350	80
1500 ANSI	3705	5575	80
2500 ANSI	6170	9275	80
275 WOG	275	425	80
720 WOG	720	1100	80
1000 WOG	1000	1500	80
1440 WOG	1440	2175	80
1500 WOG	1500	2250	80
2000 WOG	2000	3000	80
2160 WOG	2160	3250	80
3000 WOG	3000	4500	80
3600 WOG	3600	5400	80
4000 WOG	4000	6000	80
5000 WOG	5000	7500	80
6000 WOG	6000	9000	80

Murray Aide, Quality Manager



ISO 9001
No 01 100 029185

原 璋 實 業 有 限 公 司

WON ZONE CORPORATION

3F No. 185 Chung Hwa Road Sec. 2, Chung Li City 320, Taiwan R.O.C.

320 桃園縣中壢市中華路二段185號3樓 統一編號：16879927

Tel: (03)4341 325 Fax: +886-3-4341 525 E-mail: wonzone.taiwan@msa.hinet.net

CERTIFICATE OF CHEMICAL ANALYSIS AND MECHANICAL PROPERTIES						CERTIFICATE NO. 120725- 3 DATE: 25-Jul-12			
To. CAMERON CANADA CORPORATION 3707-97th Street, EDMONTON, AB T6E 6J2, CANADA									
INVOICE NO. WZ-120725A						Your Order No. 4503442572/406503/408736/415485			
Material Specification: ASTM A351 CF8M						Heat Treatment: Solution Annealed			
Q'TY	PART NAME	DRAWING No.	Heat Code	Mechanical Properties					
				T.S.(KSI)	Y.S.(KSI)	ELO.(%)	HBW		
				<u>70 min</u>	<u>30 min</u>	<u>30 min</u>	<u>140-237</u>		
5,040	5A-11501041617 Ball 7/8"	#06002-010	U2101	76.4	41.9	46	145		
5,040	5A-11501041617 Ball 7/8"	#06002-010	S6611	79.6	46.9	44.5	162		
2,016	5A-11501541617 Ball 1½"	#06003-010	S6482	76.7	41.2	46.7	150		
300	5A-11503041617 Ball 3"	#06005-010	U2091	79.8	46.3	36.9	167		
50	5A-21506041220002 Ball 6"	#06024	U2081	78.9	46.0	36.5	161		
100	5A-21504041220002 Ball 4"	#06040-041	S6483	77.3	45.0	35.9	168		
Heat Code	Chemical Composition (%)								
	C	Mn	Si	S	P	Cr	Ni	Mo	
	<u>0.08_{max}</u>	<u>1.5_{max}</u>	<u>1.5_{max}</u>	<u>.040_{max}</u>	<u>.040_{max}</u>	<u>18-21</u>	<u>9-12</u>	<u>2.0-3.0</u>	
U2101	0.0470	0.9700	0.453	0.0085	0.034	18.56	9.30	2.10	
S6611	0.0548	0.7913	0.4771	0.0080	0.0344	18.5197	9.4061	2.1775	
S6482	0.0507	1.0200	0.4040	0.0088	0.0211	18.9400	9.4767	2.1567	
U2091	0.0485	0.8600	1.2050	0.0063	0.0275	18.3500	9.0600	2.0650	
U2081	0.0750	0.9200	1.1700	0.0150	0.0380	18.3900	9.2100	2.0700	
S6483	0.0695	0.8500	1.1550	0.0115	0.0310	18.3300	9.0600	2.0100	
NOTE: <u>CERTIFICATE ACCORDING TO EN 10204/3.1B</u>									
QUALITY CONTROL INSPECTOR						MANAGER			
Sandy Yeh						Grant Hsu			

Cameron Approved

By: Iala Date:08/15/12 8:58

Wen Zone

No. 0 100

原 璋 實 業 有 限 公 司**WON ZONE CORPORATION**

3F No. 185 Chung Hwa Road Sec. 2, Chung Li City 320, Taiwan R.O.C.

320 桃園縣中壢市中華路2段185號3樓 統一編號: 16879927

Tel: (03)4341 325 Fax: +886-3-4341 525 E-mail: wonzone.taiwan@msa.hinet.net

CERTIFICATE OF CHEMICAL ANALYSIS AND MECHANICAL PROPERTIES					CERTIFICATE NO. 120704- 4 DATE: 4-Jul-12				
To. CAMERON CANADA CORPORATION 3707-97th Street, EDMONTON, AB T6E 6J2, CANADA									
INVOICE NO. WZ-120704A					Your Order No. 4503374619				
Material Specification: ASTM A351 CF8M					Heat Treatment: Solution Annealed				
Q'TY	PART NAME	DRAWING No.	Heat Code	Mechanical Properties					
				T.S.(KSI)	Y.S.(KSI)	ELO.(%)	HBW		
				<u>70 min</u>	<u>30 min</u>	<u>30 min</u>	<u>140-237</u>		
5,000	5A-11500541617 Ball 1/2"	#06001-010	S6412	79.0	50.2	47	172		
10,080	5A-11501041617 Ball 7/8"	#06002-010	U2071	76.3	42.1	47	146		
1,536	5A-11501541617 Ball 1½"	#06003-010	S6413	82.5	52.6	47	167		
1,008	5A-11502041617 Ball 2"	#06004-010	S6414	81.1	52.6	47	166		
200	5A-11504041074 Ball 4"	#06011-010	U2072	77.3	39.7	48	155		
Heat Code	Chemical Composition (%)								
	C	Mn	Si	S	P	Cr	Ni	Mo	
	<u>0.08max</u>	<u>1.5max</u>	<u>1.5max</u>	<u>.040max</u>	<u>.040max</u>	<u>18-21</u>	<u>9-12</u>	<u>2.0-3.0</u>	
S6412	0.0614	0.8551	0.9618	0.0087	0.0309	18.3219	9.0845	2.0623	
S6413	0.0474	1.0291	0.5057	0.0075	0.0365	18.5048	9.2315	2.1905	
S6414	0.0551	0.7778	0.4675	0.0070	0.0312	18.5001	9.2520	2.2071	
U2071	0.0510	0.9200	0.438	0.0088	0.034	18.55	9.31	2.13	
U2072	0.0554	0.972	0.6293	0.0128	0.0303	18.515	9.41	2.133	
NOTE: CERTIFICATE ACCORDING TO EN 10204/3.1B									
QUALITY CONTROL INSPECTOR					MANAGER				
Sandy Yeh					Grant Hsu				

Cameron Approved

By: Iala Date:07/16/12 9:25



ISO 9001
No. 01 100 029186

原 璋 實 業 有 限 公 司

WON ZONE CORPORATION

3F No. 185 Chung Hwa Road Sec. 2, Chung Li City 320, Taiwan R.O.C.

320 桃園縣中壢市中華路2段185號3樓 統一編號: 16879927

Tel: (03)4341 325 Fax: +886-3-4341 525 E-mail: wonzone.taiwan@msa.hinet.net

CERTIFICATE OF CHEMICAL ANALYSIS AND MECHANICAL PROPERTIES				CERTIFICATE NO. 120725- 1 DATE: 25-Jul-12						
To: CAMERON CANADA CORPORATION 3707-97th Street, EDMONTON, AB T6E 6J2, CANADA										
INVOICE NO. WZ-120725A				Your Order No. 4503406503/408736/442572						
MATERIAL SPECIFICATION: ASTM A-564 TYPE 630 H1150D										
Q'TY	PART NAME	DRAWING No.	Heat Code	Mechanical Properties						
				Y.S.(KSI)	T.S.(KSI)	ELONG.(%)	HRC	RA (%)	ft-lbf (-75°F)	
				105 min	125 min	16 min	29-33	50 min	15 min	
5,000	5A-11300513617 Stem 1/2"	#02001	R4851	138	145	22	31	72	103/106/99	
6,400	5A-11301013617 Stem 7/8"	#02002	R4921	142	146	20	32	72	106/94/89	
3,891	5A-11301513617005 Stem 1 1/2"	#02122	DW	123	136	22.5	30	72	107/104/108	
2,109	5A-11301513617005 Stem 1 1/2"	#02122	EB	121	136	22	30	70	91/87/108	
660	5A-11302013617005 Stem 2"	#02123	DY	128	140	23	32	73	83/84/82	
240	5A-11303013074 Stem 3"	#02005	DX	106	135	25	29	73	121/130/115	
100	5A-11304013074005 Stem 4"	#02125	DU	117	135	23	29	70	103/100/105	
1,400	5A-11500513617 Ball 1/2"	#06001	S6481	115	136	23	30	72	98/92/93	
108	5A-11502013617 Ball 2"	#06004	S6612	131	141	20	31	70	38/36/36	
Heat Code	Chemical Composition (Ct)									
	C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb+Ta
	0.07max	1.0max	1.0max	0.030max	0.040max	15-17.5	3.0-5.0	0.5 max	3.0-5.0	0.15-0.45
R4851	0.02	0.62	0.44	0.020	0.023	15.19	4.31	0.13	3.43	0.22
R4921	0.02	0.64	0.48	0.024	0.028	15.12	4.34	0.19	3.43	0.22
EB	0.01	0.63	0.44	0.027	0.032	15.28	4.33	0.13	3.47	0.23
DU	0.01	0.63	0.50	0.028	0.028	15.21	4.22	0.13	3.45	0.23
DW	0.01	0.66	0.46	0.021	0.029	15.19	4.18	0.17	3.26	0.22
DX	0.02	0.65	0.46	0.024	0.029	15.45	4.27	0.17	3.50	0.22
DY	0.01	0.65	0.49	0.018	0.028	15.18	4.29	0.23	3.46	0.22
S6612	0.02	0.66	0.49	0.024	0.029	15.05	4.34	0.19	3.34	0.20
S6481	0.02	0.64	0.50	0.024	0.028	15.16	4.22	0.13	3.38	0.22
Solution Treatment: 1900°F for 30 Min/Inch (Minimum of 1 Hour), Fast Air Cooling to below 90°F Double Aged at 1150°F for 4 hours minimum and cooled to below 90°F in air Charpy Impact Test Specimens: 10*10*55mm(Longitudinal)										
NOTE: CERTIFICATE ACCORDING TO EN 10204/3.1B <div style="float: right; border: 1px solid black; padding: 5px; text-align: center;"> Cameron Approved By: lala Date: 08/15/12 8:55 </div>										
QUALITY CONTROL INSPECTOR						MANAGER				
Sandy Yeh						Grant Hsu				

Material Test Report

Specification Notes:

Name	Revision	Grade	Description	Revision Year
ASTM A105/ASTM A350 GR LF2 Cameron			Carbon & Low-Alloy Steel Forgings	2011

Product Information:

Item #	Product Code	Description	Heat Number	Heat Code	PO #
1	5A-1010101032400	CAP, 1" RP 4000 WOG FNPT, ASTM A105/LF2	HNS4		

Chemical Information:

Item #	C	Mn	P	S	Si	Ni	Cr	Mo	Cu	V	CE	Co/Nb	Cu+Ni	Cr+Mo
Min		0.6			0.15									
Max	0.23	1.35	0.035	0.035	0.3	0.4	0.3	0.12	0.4	0.08	0.43	0.02	1.00	0.32
1	.2	.86	.023	.006	.19	.06	.09	.02	.15	.002	0.380	0.0		

Physical Information:

Item #	Tensile (psi)	Yield (psi)	% Elongation	Charpy ft-lb (average of a set)	Charpy Temp (°F)	% Red of Area	Hardness (Brinell)
Min	70000	36000	22	15	-80	30	137
Max	95000				-50		187
1	86305	65269	31	38, 40, 48	-50	72.3	179

Additional Notes:

AUSTENITIZED @ 920°C 80 MIN OIL QUENCHED TEMPERED @ 590-704°C 30MIN/IN Chemical Information Notes: 1. RES 0.322

We certify that the items referenced in this document were manufactured and tested in accordance with Cameron Purchase Order requirements and EIH0204 3.1

M. Aida
 Quality Manager
 Cameron Canada

Material Test Report

Specification Notes:

Name	Revision	Grade	Description	Revision Year
ASTM A105/ASTM A350 GR LF2 Cameron			Carbon & Low-Alloy Steel Forgings	2011

Product Information:

Item #	Product Code	Description	Heat Number	Heat Code	PO #
1	5A-10001032400	BODY, 7/8" 4000 WOG, ASTM A105/LF2	322607		

Chemical Information:

Item #	C	Mn	P	S	Si	Ni	Cr	Mo	Cu	V	CE	Cl/Nb	Cu+Ni	Cr+Mo
Min		0.6			0.15									
Max	0.23	1.35	0.035	0.035	0.3	0.4	0.3	0.12	0.4	0.08	0.43	0.02	1.00	0.32
1	.2	.83	.027	.01	.21	.06	.12	.02	.16	.002	0.380	0.0		

Physical Information:

Item #	Tensile (psi)	Yield (psi)	% Elongation	Charpy ft/lb	Charpy Temp (°F)	% Red of Area	Hardness (Brinell)
Min	70000	36000	22	15	-80	30	137
Max	95000				-50		187
1	85281	64857	28.2	48, 57, 57	-50	68.6	173

Additional Notes:

AUSTENITIZED @920°C 80 MIN OIL QUENCHED
TEMPERED @590-704°C 30MIN/IN

Chemical Information Notes:

1. RES 0.362

We certify that the items referenced
in this document were manufactured
and tested in accordance with
Cameron Purchase Order
requirements and EIH0204 3.1

M. Aida
Quality Manager
Cameron Canada



VALVES & MEASUREMENT

08562-002-H

Thursday, 02-Aug-2012

From:

To:

3707 97 St.
Edmonton, Alberta, Canada
T6E 6J2
Phone : 780-463-6868
Fax : 780-463-6259
Web Site : www.c-a-m.com

Subject:

Serial	2510867	Series	20
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Comments:

Part #: 5A-T3F02S30LZ

Description: BV F02 FNPT NUTRON T3 3000 WOG SOUR LT

Sales Order: N/A

Customer PO: N/A



VALVES & MEASUREMENT

Thursday, 02-Aug-2012

From:

3707 97 St.
Edmonton, Alberta, Canada
T6E 6J2
Phone : 780-463-6868
Fax : 780-463-6259
Web Site : www.c-a-m.com

To:

Document Summary Page

The documents are printed in the following order:

#	Heat #	Heat Code	Job/Serial #	Material #	Description
1	L	LOC	2510867	5A-T3F02S30LZ	Nutron T3, B3, B2, TT Sour Low Temp.
2	Hydro Test	598	2510867	5A-T3F02S30LZ	API 598
3	G28D448		2510867	5A-T3F02S30LZ	BODY,1/2" 6000 WOG,ASTM A105/LF2
4	G28D424		2510867	5A-T3F02S30LZ	BODY,1/2" 6000 WOG,ASTM A105/LF2
5	HN47		2510867	5A-T3F02S30LZ	CAP,1/4" FP 6000 WOG FNPT, ASTM A350 GR
6	R4611		2510867	5A-T3F02S30LZ	STEM,1/2",ASTM A564 17-4 H1150 NACE
7	S6123		2510867	5A-T3F02S30LZ	BALL,1/2", ASTM A351 GR CF8M



VALVES & MEASUREMENT
Cameron Canada Corporation
3707 - 97 Street
Edmonton Alberta Canada T6E 6J2
Phone 780.463.6868
Fax 780.465.1244
www.c-a-m.com

GENERAL LETTER OF COMPLIANCE

for Valve Models:

T3, B3 & B2 & TT

Style 'L': Sour Low Temperature Service

Cameron Valves & Measurement hereby certifies that the design, fabrication, testing and quality control of the above NUTRON brand ball valves for Sour Low Temperature Service have been made in accordance with the following applicable standards (latest edition in effect at time of manufacture): API 598 (1-1/2" and smaller), API 6D (TT only), ASME B16.34, CSA Z245.15 Sour Service (2" FP and larger) and V&M Engineering Standards. As part of compliance to these specifications, the valves have been marked in accordance with MSS SP-25. The valve has also been marked "SOUR" as required by CSA Z245.15 marking requirements for Sour Service.

The materials of construction for this valve conform to the metallurgical requirements of NACE MR0175/ISO 15156:2003 (Parts 1 & 2 for Carbon & Alloy Steels in SSC Region 3 Sour Service and Parts 1 & 3 for CRA's as specified in CSA Z245.15 Chapter 13). According to NACE MR0175-2003/ISO 15156, it is the customer's/user's responsibility to ensure that the valve materials will be satisfactory in the intended service.

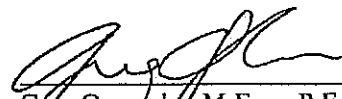
The minimum service temperature of these valves is -46°C/-50°F. Impact testing has been performed in accordance with applicable ASTM requirements and those of CSA Z245.15 for Category II M45C Service.

The 'Z' option code designation at the end of a figure number indicates that the valve meets the requirements of API-607 Fourth Edition, May 1993.

These valves (1-1/2" and larger) conform to the Pressure Equipment Directive requirements and are marked as CE certified (Certificate #8888-001-2002).

The B2 and TT valve models are constructed to be anti-static as standard.

Approved by:


Greg Ogarko, M.Eng., P.Eng.
Engineering Manager

09/13/10

EWR 7463-01 Rev.06.doc

**VALVES & MEASUREMENT**

Cameron Canada Corporation
3707-97th St.
Edmonton Alberta Canada T6E 6J2
Phone 780.468.2732
www.c-a-m.com

CERTIFICATE OF CONFORMANCE**API 598 Pressure Testing – Carbon and Low Alloy Steel
(2" RP and Smaller)**

COMPLIANCE: These valves are tested in accordance with Cameron Valves & Measurement's standard procedures and API Standard 598, as per the chart below.

Test durations are 15 seconds in length as a minimum. Test duration is defined as the period of inspection after the valve is fully prepared and is under full pressure.

Butt weld end valves shall be tested in accordance with the ANSI rating.

Actual test pressure is rounded to next highest increment on the gauge.

**Carbon & Low Alloy Steel
Shell and Seat Test Pressures**
(Table Based on Rating for Group 1.1 Materials per ANSI B16.34)

Valve Class	Maximum Working Pressure	Hydrostatic Shell Test Pressure (PSI)	Air Seat Test Pressure +/- 10 PSI
150 ANSI	285	450	80
300 ANSI	740	1125	80
600 ANSI	1480	2225	80
800 ANSI	1975	3000	80
900 ANSI	2220	3350	80
1500 ANSI	3705	5575	80
2500 ANSI	6170	9275	80
275 WOG	275	425	80
720 WOG	720	1100	80
1000 WOG	1000	1500	80
1440 WOG	1440	2175	80
1500 WOG	1500	2250	80
2000 WOG	2000	3000	80
2160 WOG	2160	3250	80
3000 WOG	3000	4500	80
3600 WOG	3600	5400	80
4000 WOG	4000	6000	80
5000 WOG	5000	7500	80
6000 WOG	6000	9000	80

Murray Aide, Quality Manager

Material Test Report

Specification Notes:

Name	Revision	Grade	Description	Revision Year
ASTM A105/ASTM A350 GR LF2 Cameron			Carbon & Low-Alloy Steel Forgings	2011

Product Information:

Item #	Product Code	Description	Heat Number	Heat Code	PO #
1	5A-10000532600	BODY, 1/2" 6000 WOG, ASTM A105/LF2	G28D448		

Chemical Information:

Item #	C	Mn	P	S	Si	Ni	Cr	Mo	Cu	V	CE	Cl/Nb	Cr+Ni	Cr+Mo
Min		0.6			0.15									
Max	0.23	1.35	0.035	0.035	0.3	0.4	0.3	0.12	0.4	0.08	0.43	0.02	1.00	0.32
1	.19	.88	.017	.012	.26	.01	.02	.01	.01	.06	0.356	.01		

Physical Information:

Item #	Tensile (psi)	Yield (psi)	% Elongation	Charpy ft-lb (average of a set)	Charpy Temp (°F)	% Red of Area	Hardness (Brinell)
Min	70000	36000	22	15	-80	30	137
Max	95000				-50		187
1	74694	53664	31.5	97, 46, 82	-50	72	159

Additional Notes:

QUENCHING @920'C 2HRS @800'C 2HRS
TEMPERING @700'C 2HRS

We certify that the items referenced
in this document were manufactured
and tested in accordance with
Cameron Purchase Order
requirements and EN10204 3.1

M. Ciolek
Quality Manager
Cameron Canada

Material Test Report

Specification Notes:

Name	Revision	Grade	Description	Revision Year
ASTM A105/ASTM A350 GR LF2 Cameron			Carbon & Low-Alloy Steel Forgings	2011

Product Information:

Item #	Product Code	Description	Heat Number	Heat Code	PO #
1	5A-10000532600	BODY, 1/2" 6000 WOG, ASTM A105/LF2	G28D424		

Chemical Information:

Item #	C	Mn	P	S	Si	Ni	Cr	Mo	Cu	V	CE	Co/Nb	Cu+Ni	Cr+Mo
Min		0.6			0.15									
Max	0.23	1.35	0.035	0.035	0.3	0.4	0.3	0.12	0.4	0.08	0.43	0.02	1.00	0.32
1	.19	.88	.017	.012	.26	.01	.02	.01	.01	.06	0.356	.01		

Physical Information:

Item #	Tensile (psi)	Yield (psi)	% Elongation	Charpy ft-lb (average of a set)	Charpy Temp (°F)	% Red of Area	Hardness (Brinell)
Min	70000	36000	22	15	-80	30	137
Max	95000				-50		187
1	80496	62366	33	105, 118, 118	-50	75	164

Additional Notes:

QUENCHING @920°C 2HRS @800°C 2HRS TEMPERING @700°C 2HRS
--

We certify that the items referenced in this document were manufactured and tested in accordance with Cameron Purchase Order requirements and EIH0204 3.1

M. Ciolek
 Quality Manager
 Cameron Canada

Material Test Report

Specification Notes:

Name	Revision	Grade	Description	Revision Year
ASTM A105/ASTM A350 GR LF2 Cameron			Carbon & Low-Alloy Steel Forgings	2010

Product Information:

Item #	Product Code	Description	Heat Number	Heat Code	PO #
1	5A-1020100231600	CAP, 1/4" FP 6000 WOG FNPT, ASTM A350 GR	HN47		

Chemical Information:

Item #	C	Mn	P	S	Si	Ni	Cr	Mo	Al	V	CE	Co/Nb	Cu+Ni	Cr+Mo
Min		0.6			0.10									
Max	0.21	1.35	0.030	0.030	0.3	0.4	0.3	0.12	0.4	0.08	0.43	0.02	1.00	0.32
1	0.21	0.84	0.014	0.009	0.21	0.01	0.02	0	0.02	0.002	0.36			

Physical Information:

Item #	Tensile (psi)	Yield (psi)	% Elongation	Charpy ft/lb	Charpy Temp (°F)	% Red of Area	Hardness (Brinell)
Min	70000	36000	22	15	-80	30	137
Max	95000				-50		197
1	72708	56156	37.4	83, 82, 83	-50	76.2	149

Additional Notes:

Austenitize at 1550-1700°F (843-930°C). Cycle time shall be one hour minimum. (Actual: 920°C, 80 minutes)
 O/Q, Temper @ 1100-1300°F (590-704°C), holding at temp. a minimum of 30 min/in.

Chemical Information Notes:

1. RES. 0.052

We certify that the items referenced in this document were manufactured and tested in accordance with Cameron Purchase Order requirements and EIH0204 3.1

M. Aida
 Quality Manager
 Cameron Canada

Wen Zone

TEL: 0 100

原 璋 實 業 有 限 公 司**WON ZONE CORPORATION**

3F No. 185 Chung Hwa Road Sec. 2, Chung Li City 320, Taiwan R.O.C.

320 桃園縣中壢市中華路2段185號3樓 統一編號: 16879927

Tel: (03)4341 325 Fax: +886-3-4341 525 E-mail: wonzone.taiwan@msa.hinet.net

CERTIFICATE OF CHEMICAL ANALYSIS AND MECHANICAL PROPERTIES				CERTIFICATE NO. 120418- 2 DATE: 18-Apr-12						
TO: COOPER CAMERON CANADA LTD.-NUTRON 2125-64 AVENUE, EDMONTON AB T6P 1Z4, CANADA										
INVOICE NO. WZ-120418A		Your Order No. 4503207352/215246/221590/233955/238892/244917/245030/260239/279724								
MATERIAL SPECIFICATION: ASTM A-564 TYPE 630 H1150D										
Q'TY	PART NAME	DRAWING No.	Heat Code	Mechanical Properties						
				Y.S.(KSI)	T.S.(KSI)	ELO.(%)	HRC	RA (%)	ft-lbf (-75°F)	
				105 min	125 min	16 min	29-33	50 min	15 min	
8,000	5A-11300513617 Stem 1/2"	#02001	R4611	138	145	22	31	72	103/106/99	
2,700	5A-11301513617005 Stem 1/2"	#02122	DS	126	140	23	32	69	96/89/87	
38	5A-11303013370005 Stem 3"	#02124	DN	116	129	22	30	71	78/78/79	
72	5A-11304013074005 Stem 4"	#02125	DP	141	146	20.0	32	71	118/108/109	
1,400	5A-11500513617 Ball 1/2"	#06001	S6121	115	136	23	30	72	98/92/93	
1,260	5A-11501013617 Ball 7/8"	#06002	S6122	117	135	23	29	70	103/100/105	
96	5A-11501513617 Ball 1 1/2"	#06003	S6182	130	142	21.0	31	70	68/79/65	
18	5A-11502013617 Ball 2"	#06004	S6141	131	141	20	31	70	38/36/36	
Heat Code	Chemical Composition (%)									
	C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb+Ta
	0.07max	1.0max	1.0max	.030max	.040max	15-17.5	3.0-5.0	0.5 max	3.0-5.0	0.15-0.45
R4611	0.02	0.62	0.44	0.020	0.023	15.19	4.31	0.13	3.43	0.22
DS	0.03	0.63	0.48	0.026	0.029	15.43	4.24	0.15	3.39	0.21
DN	0.02	0.62	0.45	0.021	0.028	15.13	4.24	0.10	3.41	0.20
DP	0.02	0.61	0.44	0.020	0.027	15.09	4.34	0.21	3.39	0.21
S6121	0.02	0.64	0.50	0.024	0.028	15.16	4.22	0.13	3.38	0.22
S6122	0.01	0.63	0.50	0.028	0.028	15.21	4.22	0.13	3.45	0.23
S6182	0.03	0.63	0.47	0.022	0.031	15.36	4.36	0.16	3.41	0.23
S6141	0.02	0.66	0.49	0.024	0.029	15.05	4.34	0.19	3.34	0.20
Solution Treatment: 1900°F for 30 Min/Inch (Minimum of 1 Hour). Fast Air Cooling to below 90°F										
Double Aged at 1150°F for 4 hours minimum and cooled to below 90°F in air										
Charpy Impact Test Specimens: 10*10*55mm(Longitudinal)										
NOTE: CERTIFICATE ACCORDING TO EN 10204/3.1B										
QUALITY CONTROL INSPECTOR						MANAGER				
Sandy Yeh						Grant Hsu				

Cameron Approved

By: Iala Date: 05/09/12 4:08

Wen Zone

TEL

No. 0 100 325 186

原 璋 實 業 有 限 公 司**WON ZONE CORPORATION**

3F No. 185 Chung Hwa Road Sec. 2, Chung Li City 320, Taiwan R.O.C.

320 桃園縣中壢市中華路2段185號3樓 統一編號: 16879927

Tel: (03)4341 325 Fax: +886-3-4341 525 E-mail: wonzone.taiwan@msa.hinet.net

CERTIFICATE OF CHEMICAL ANALYSIS AND MECHANICAL PROPERTIES					CERTIFICATE NO. 120328- 4 DATE: 28-Mar-12				
To. COOPER CAMERON CANADA LTD.-NUTRON 2125-64 AVENUE, EDMONTON AB T6P 1Z4, CANADA									
INVOICE NO. WZ-120328A					Your Order No. 4503207262				
Material Specification: ASTM A351 CF8M					Heat Treatment: Solution Annealed				
Q'TY	PART NAME	DRAWING No.	Heat Code	Mechanical Properties					
				T.S.(KSI)	Y.S.(KSI)	ELO.(%)	HBW		
				70 min	30 min	30 min	140-237		
5,600	5A-11500541617 Ball 1/2"	#06001-010	S6123	80.4	50.5	46	170		
7,560	5A-11501041617 Ball 7/8"	#06002-010	S6125	79.6	48.3	45	161		
1,116	5A-11502041617 Ball 2"	#06004-010	S6128	81.1	51.2	46	164		
80	5A-21504041220002 Ball 4"	#06040-041	S6129	79.6	46.0	36.2	157		
Heat Code	Chemical Composition (%)								
	C	Mn	Si	S	P	Cr	Ni	Mo	
	<u>0.08_{max}</u>	<u>1.5_{max}</u>	<u>1.5_{max}</u>	<u>.040_{max}</u>	<u>.040_{max}</u>	<u>18-21</u>	<u>9-12</u>	<u>2.0-3.0</u>	
S6123	0.0590	0.6969	1.1067	0.0080	0.0297	18.4841	9.1535	2.1248	
S6129	0.0720	0.7300	1.1500	0.0078	0.0260	18.1200	9.1900	2.0800	
S6125	0.0374	1.0027	0.4578	0.0099	0.0386	18.5585	9.3082	2.2589	
S6128	0.0463	1.0344	0.4178	0.0078	0.0381	18.5509	9.2424	2.2479	
NOTE: <u>CERTIFICATE ACCORDING TO EN 10204/3.1B</u>									
QUALITY CONTROL INSPECTOR					MANAGER				
Sandy Yeh					Grant Hsu				

Cameron Approved

By: LAIA Date:05/03/12 8:23



VALVES & MEASUREMENT

0 8562-002-H

Monday, 07-Nov-2011

From:

Cameron Canada
3707 97 Street
Edmonton, Alberta, Canada
T6E 6J2
Phone : 780-468-2732

To:

Subject:

Serial	2247455	Quantity/Series	50
--------	---------	-----------------	----

Comments:

Part#: 5A-T3R20S30BZ

Description: BV R20 FNPT NUTRON T3 3000 WOG STD

Sales Order#: N/A

Customer PO#: N/A



VALVES & MEASUREMENT

Monday, 07-Nov-2011

From:

Cameron Canada
3707 97 Street
Edmonton, Alberta, Canada
T6E 6J2
Phone : 780-468-2732

To:

Document Summary Page

The documents are printed in the following order:

#	Heat #	Heat Code	Job/Serial #	Material #	Description
1	B	LOC			Nutron T3, B3 Standard
2	Hydro Test	598			API 598
3	S518A				BALL,1-1/2",ASTM A675 GR 70,HARD CHROME
4	KP				STEM,1-1/2",w/O-RING SEAL,ASTM A108 GR
5	110051	DC			CAP,2" RP 4000 WOG FNPT,ASTM A105/LF2
6	A82D314				BODY,1-1/2" 6000 WOG, A105/LF2
7	A84D344				BODY,1-1/2" 6000 WOG, A105/LF2



VALVES & MEASUREMENT
Cameron Canada Corporation
3707 - 97 Street
Edmonton Alberta Canada T6E 6J2
Phone 780.463.6868
Fax 780.465.1244
www.c-a-m.com

GENERAL LETTER OF COMPLIANCE

for Valve Models:

T3 & B3

Style 'B': Standard Service

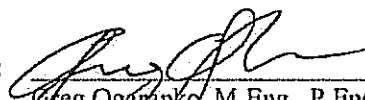
Cameron Valves & Measurement hereby certifies that the design, fabrication, testing and quality control of the above NUTRON brand ball valves for Standard Service have been made in accordance with the following applicable standards (latest edition in effect at time of manufacture): API 598 (1-1/2" and smaller), ASME B16.34, CSA Z245.15 (2" FP and larger) and V&M Engineering Standards. As part of compliance to these specifications, the valves have been marked in accordance with MSS SP-25.

The minimum service temperature of these valves is -29°C/-20°F.

The 'Z' option code designation at the end of a figure number indicates that the valve meets the requirements of API-607 Fourth Edition, May 1993.

These valves (1-1/2" and larger) conform to the Pressure Equipment Directive requirements and are marked as CE certified (Certificate #8888-001-2002).

Approved by:


Greg Ogarko, M.Eng., P.Eng.
Engineering Manager

**VALVES & MEASUREMENT**

Cameron Canada Corporation
3707-97th St.
Edmonton Alberta Canada T6E 6J2
Phone 780.468.2732
www.c-a-m.com

CERTIFICATE OF CONFORMANCE**API 598 Pressure Testing – Carbon and Low Alloy Steel
(2" RP and Smaller)**

COMPLIANCE: These valves are tested in accordance with Cameron Valves & Measurement's standard procedures and API Standard 598, as per the chart below.

Test durations are 15 seconds in length as a minimum. Test duration is defined as the period of inspection after the valve is fully prepared and is under full pressure.

Butt weld end valves shall be tested in accordance with the ANSI rating.

Actual test pressure is rounded to next highest increment on the gauge.

**Carbon & Low Alloy Steel
Shell and Seat Test Pressures**
(Table Based on Rating for Group 1.1 Materials per ANSI B16.34)

Valve Class	Maximum Working Pressure	Hydrostatic Shell Test Pressure (PSI)	Air Seat Test Pressure +/- 10 PSI
150 ANSI	285	450	80
300 ANSI	740	1125	80
600 ANSI	1480	2225	80
800 ANSI	1975	3000	80
900 ANSI	2220	3350	80
1500 ANSI	3705	5575	80
2500 ANSI	6170	9275	80
275 WOG	275	425	80
720 WOG	720	1100	80
1000 WOG	1000	1500	80
1440 WOG	1440	2175	80
1500 WOG	1500	2250	80
2000 WOG	2000	3000	80
2160 WOG	2160	3250	80
3000 WOG	3000	4500	80
3600 WOG	3600	5400	80
4000 WOG	4000	6000	80
5000 WOG	5000	7500	80
6000 WOG	6000	9000	80

Murray Aide, Quality Manager



No. 0 100

原 璋 實 業 有 限 公 司

WON ZONE CORPORATION

3F No. 185 Chung Hwa Road Sec. 2, Chung Li City 320, Taiwan R.O.C.

320 桃園縣中壢市中華路2段185號3樓 統一編號: 16879927

Tel: (03)4341 325 Fax: +886-3-4341 525 E-mail: wonzone.taiwan@msa.hinet.net

CERTIFICATE OF CHEMICAL ANALYSIS AND MECHANICAL PROPERTIES				CERTIFICATE NO. 100908- 5 DATE: 8-Sep-10							
To. COOPER CAMERON CANADA LTD.-NUTRON 2125-64 AVENUE, EDMONTON AB T6P 1Z4, CANADA											
INVOICE NO. WZ-10908A				Your Order No. 4502531251/531252/531254							
Material Specification: ASTM A105N				Heat Treatment: NORMALIZING							
Q'TY	PART NAME	DRAWING No.	Heat Code	Mechanical Properties							
				Y.S.(Mpa)	T.S.(Mpa)	EL.O.(%)	RA (%)	HB			
				<u>250 min</u>	<u>485 min</u>	<u>30 min</u>	<u>30 min</u>	<u>137-187</u>			
1,296	Ball 1-1/2"	#06003-301	S518A	289	490	38	62.3	144			
252	Ball 2"	#06004-301	S518A	289	490	38	62.3	144			
126	Ball 3"	#06005-301	S518A	289	490	38	62.3	144			
Heat Code	Chemical Composition (%)										
	C	Mn	Si	S	P	Cr	Ni	Mo	V	Cu	Nb
S518A	<u>0.35max</u>	<u>0.60-1.05</u>	<u>0.10-0.35</u>	<u>.040max</u>	<u>.035max</u>	<u>.30max</u>	<u>.40max</u>	<u>.12max</u>	<u>.05max</u>	<u>.40max</u>	<u>.02max</u>
	0.210	0.880	0.240	0.006	0.027	0.030	0.010	0.01	0.002	0.010	0
PLATING: NICKEL UNDER CHROME AS PER NATIONAL STANDARD 4157 CNS H3060											
QUALITY CONTROL INSPECTOR				MANAGER							
Lewen Hsu				Grant Hsu							

APPROVED

By Iala at 12:12 pm, 9/30/10

Wen Zone

TUV

No. 0 100 129 80

原 璋 實 業 有 限 公 司**WON ZONE CORPORATION**

3F No. 185 Chung Hwa Road Sec. 2, Chung Li City 320, Taiwan R.O.C.

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Tel: (03)4341 325 Fax: +886-3-4341 525 E-mail: wonzone.taiwan@msa.hinet.net

**CERTIFICATE OF CHEMICAL ANALYSIS
AND MECHANICAL PROPERTIES****CERTIFICATE NO. 110720- 2****DATE: 20-Jul-11****To. COOPER CAMERON CANADA LTD.-NUTRON****2125-64 AVENUE, EDMONTON AB T6P 1Z4, CANADA****INVOICE NO. WZ-110720A****Your Order No. 4502961290/956946****MATERIAL SPECIFICATION: ASTM A108 GR 12L14**

Q'TY	PART NAME	DRAWING No.	Heat Code	Mechanical Properties				
				Y.S.(KSI)	T.S.(KSI)	ELO.(%)	RA (%)	HRB
381	Stem 1-1/2"	#02122	KP	72.9	78.6	18.1	48.8	165
219	Stem 1-1/2"	#02122	KS	74.8	80.1	16.8	37.2	178
396	Stem 2"	#02123	KR	72.2	78.5	19.0	49.0	165

Heat Code	Chemical Composition (%)				
	C	Mn	P	S	Pb
	<u>0.15max</u>	<u>0.85-1.15</u>	<u>0.04-0.09</u>	<u>0.26-0.35</u>	<u>0.15-0.35</u>
KP	0.06	1.04	0.061	0.327	0.28
KS	0.06	1.04	0.061	0.327	0.28
KR	0.07	0.97	0.057	0.308	0.26

NOTE: CERTIFICATE ACCORDING TO EN 10204/3.1B**QUALITY CONTROL INSPECTOR****MANAGER***Sandy Yeh**Grant Hsu***APPROVED**

By laia at 11:21 am, 8/6/11



Material Test Report

Specification Notes:

Name	Revision	Grade	Description	Revision Year
ASTM A105/ASTM A350 GR LF2 Cameron			Carbon & Low-Alloy Steel Forgings	2010

Product Information:

Item #	Product Code	Description	Heat Number	Heat Code	PO #
1	5A-1010102032400	CAP, 2" RP 4000 WOG FNPT, ASTM A105/LF2	110051	DC	

Chemical Information:

Item #	C	Mn	P	S	Si	Ni	Cr	Mo	Cu	V	CE	Cb/Nb	Cu+Ni	Cr+Mo
Min		0.6			0.10									
Max	0.21	1.35	0.030	0.030	0.3	0.4	0.3	0.12	0.4	0.08	0.43	0.02	1.00	0.32
1	.21	.93	.013	.024	.24	.07	.095	.017	.19	.036	0.412	.004		

Physical Information:

Item #	Tensile (psi)	Yield (psi)	% Elongation	Charpy ft/lb	Charpy Temp (°F)	% Red of Area	Hardness (Brinell)
Min	70000	36000	22	15	-80	30	137
Max	95000				-50		197
1	78000	61600	30	25, 52, 19	-50	71	163

Additional Notes:

QUENCHED AND TEMPERED

We certify that the items referenced in this document were manufactured and tested in accordance with Cameron Purchase Order requirements and EIH0204 3.1

M. Aiello
Quality Manager
Cameron Canada

Material Test Report

Specification Notes:

Name	Revision	Grade	Description	Revision Year
ASTM A105/ASTM A350 GR LF2 Cameron			Carbon & Low-Alloy Steel Forgings	2010

Product Information:

Item #	Product Code	Description	Heat Number	Heat Code	PO #
1	5A-10001532600	BODY,1-1/2" 6000 WOG, A105/LF2	A82D314		

Chemical Information:

Item #	C	Mn	P	S	Si	Ni	Cr	Mo	Cu	V	CE	Ch/Nb	Cu+Ni	Cr+Mo
Min		0.6			0.10									
Max	0.21	1.35	0.030	0.030	0.3	0.4	0.3	0.12	0.4	0.08	0.43	0.02	1.00	0.32
1	.18	.9	.009	.007	.22	.048	.11	.009	.083	.046	0.3717	.012		

Physical Information:

Item #	Tensile (psi)	Yield (psi)	% Elongation	Charpy ft/lb	Charpy Temp (°F)	% Red of Area	Hardness (Brinell)
Min	70000	36000	22	15	-80	30	137
Max	95000				-50		197
1	74694	52214	32.5	107, 107, 107	-50	73	161

Additional Notes:

QUENCHING @920°C 2HRS @800°C 2HRS
TEMPERING @700°C 2HRS

We certify that the items referenced in this document were manufactured and tested in accordance with Cameron Purchase Order requirements and EN10204 3.1

M. Aida
Quality Manager
Cameron Canada

Material Test Report

Specification Notes:

Name	Revision	Grade	Description	Revision Year
ASTM A105/ASTM A350 GR LF2 Cameron			Carbon & Low-Alloy Steel Forgings	2010

Product Information:

Item #	Product Code	Description	Heat Number	Heat Code	PO #
1	5A-10001532600	BODY, 1-1/2" 6000 WOG, A105/LF2	A84D344		

Chemical Information:

Item #	C	Mn	P	S	Si	Ni	Cr	Mo	Cu	V	CE	Cb/Nb	Cu+Ni	Cr+Mo
Min		0.6			0.10									
Max	0.21	1.35	0.030	0.030	0.3	0.4	0.3	0.12	0.4	0.08	0.43	0.02	1.00	0.32
1	.2	.91	.01	.006	.24	.043	.12	.009	.082	.045	0.3948	.017		

Physical Information:

Item #	Tensile (psi)	Yield (psi)	% Elongation	Charpy ft/lb	Charpy Temp (°F)	% Red of Area	Hardness (Brinell)
Min	70000	36000	22	15	-80	30	137
Max	95000				-50		197
1	74694	49313	29.5	107, 107, 107	-50	70.5	171

Additional Notes:

QUENCHING @920°C 2HRS @800°C 2HRS TEMPERING @700°C 2HRS
--

We certify that the items referenced in this document were manufactured and tested in accordance with Cameron Purchase Order requirements and EIH0204 3.1

M. Aida
 Quality Manager
 Cameron Canada

08562-002-H



VALVES & MEASUREMENT

Tuesday, 26-Jul-2011

From:

Cameron Canada
3707 97 Street
Edmonton, Alberta, Canada
T6E 6J2
Phone : 780-468-2732

To:

Subject:

Serial #	2142539	Quantity/Series	50
----------	---------	-----------------	----

Comments:

Part# 5A-T3F02S30BZ

Description: BV F02 FNPT NUTRON T3 3000 WOG STD

Sales Order#: N/A

Customer PO#: N/A



VALVES & MEASUREMENT

Tuesday, 26-Jul-2011

From:

Cameron Canada
3707 97 Street
Edmonton, Alberta, Canada
T6E 6J2
Phone : 780-468-2732

To:

Document Summary Page

The documents are printed in the following order:

#	Heat #	Heat Code	Job/Serial #	Material #	Description
1	B	LOC			Nutron T3, B3 Standard
2	Hydro Test	598			API 598
3	S5644				BALL,1/2", ASTM A351 GR CF8M
4	R4101				STEM,1/2",ASTM A564 17-4 H1150 NACE
5	HN38				CAP,1/4" FP 6000 WOG FNPT, ASTM A350 GR
6	G57D110				BODY,1/2" 6000 WOG,from BRSTK,ASTM A479
7	G57D228				BODY,1/2" 6000 WOG,ASTM A105/LF2
8	G57D116				BODY,1/2" 6000 WOG,ASTM A105/LF2



VALVES & MEASUREMENT
Cameron Canada Corporation
3707 - 97 Street
Edmonton Alberta Canada T6E 6J2
Phone 780.463.6868
Fax 780.465.1244
www.c-a-m.com

GENERAL LETTER OF COMPLIANCE

for Valve Models:

T3 & B3

Style 'B': Standard Service

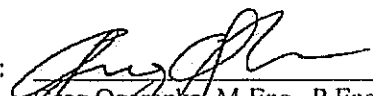
Cameron Valves & Measurement hereby certifies that the design, fabrication, testing and quality control of the above NUTRON brand ball valves for Standard Service have been made in accordance with the following applicable standards (latest edition in effect at time of manufacture): API 598 (1-1/2" and smaller), ASME B16.34, CSA Z245.15 (2" FP and larger) and V&M Engineering Standards. As part of compliance to these specifications, the valves have been marked in accordance with MSS SP-25.

The minimum service temperature of these valves is -29°C/-20°F.

The 'Z' option code designation at the end of a figure number indicates that the valve meets the requirements of API-607 Fourth Edition, May 1993.

These valves (1-1/2" and larger) conform to the Pressure Equipment Directive requirements and are marked as CE certified (Certificate #8888-001-2002).

Approved by:


Greg Ogarko, M.Eng., P.Eng.
Engineering Manager



VALVES & MEASUREMENT
Cameron Canada Corporation
3707-97th St.
Edmonton Alberta Canada T6E 6J2
Phone 780.468.2732
www.c-a-m.com

CERTIFICATE OF CONFORMANCE

API 598 Pressure Testing – Carbon and Low Alloy Steel (2" RP and Smaller)

COMPLIANCE: These valves are tested in accordance with Cameron Valves & Measurement's standard procedures and API Standard 598, as per the chart below.

Test durations are 15 seconds in length as a minimum. Test duration is defined as the period of inspection after the valve is fully prepared and is under full pressure.

Butt weld end valves shall be tested in accordance with the ANSI rating.

Actual test pressure is rounded to next highest increment on the gauge.

**Carbon & Low Alloy Steel
Shell and Seat Test Pressures**
(Table Based on Rating for Group 1.1 Materials per ANSI B16.34)

Valve Class	Maximum Working Pressure	Hydrostatic Shell Test Pressure (PSI)	Air Seat Test Pressure +/- 10 PSI
150 ANSI	285	450	80
300 ANSI	740	1125	80
600 ANSI	1480	2225	80
800 ANSI	1975	3000	80
900 ANSI	2220	3350	80
1500 ANSI	3705	5575	80
2500 ANSI	6170	9275	80
275 WOG	275	425	80
720 WOG	720	1100	80
1000 WOG	1000	1500	80
1440 WOG	1440	2175	80
1500 WOG	1500	2250	80
2000 WOG	2000	3000	80
2160 WOG	2160	3250	80
3000 WOG	3000	4500	80
3600 WOG	3600	5400	80
4000 WOG	4000	6000	80
5000 WOG	5000	7500	80
6000 WOG	6000	9000	80

Murray Aide, Quality Manager



ISO 9001
No. 01 100 029188

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WON ZONE CORPORATION

3F No. 185 Chung Hwa Road Sec. 2, Chung Li City 320, Taiwan R.O.C.

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Tel: (03)4341 325 Fax: +886-3-4341 525 E-mail: wonzone.taiwan@msa.hinet.net

CERTIFICATE OF CHEMICAL ANALYSIS AND MECHANICAL PROPERTIES					CERTIFICATE NO. 110608- 4 DATE: 8-Jun-11				
To. COOPER CAMERON CANADA LTD.-NUTRON 2125-64 AVENUE, EDMONTON AB T6P 1Z4, CANADA									
INVOICE NO. WZ-110608A					Your Order No. 4502877267/878558				
Material Specification: ASTM A351 CF8M					Heat Treatment: Solution Annealed				
Q'TY	PART NAME	DRAWING No.	Heat Code	Mechanical Properties					
				T.S.(KSI)	Y.S.(KSI)	ELO.(%)	HB		
				<u>70 min</u>	<u>30 min</u>	<u>30 min</u>	<u>183 max</u>		
2,100	Ball 1/2"	#06001-010	S5644	79.2	49.6	52	172		
1,080	Ball 7/8"	#06002-010	S5645	78.9	44.8	44	163		
2,976	Ball 1-1/2"	#06003-010	S5646	76.5	42.1	46	149		
594	Ball 2"	#06004-010	S5647	76.8	51.9	45	166		
3	Ball 4"	#06040-041	S5648	75.1	46.5	39.4	160		
Heat Code	Chemical Composition (%)								
	C	Mn	Si	S	P	Cr	Ni	Mo	
	<u>0.08max</u>	<u>1.5max</u>	<u>1.5max</u>	<u>.040max</u>	<u>.040max</u>	<u>18-21</u>	<u>9-12</u>	<u>2.0-3.0</u>	
S5644	0.0450	1.0588	0.5062	0.0059	0.0315	18.6619	9.0723	2.0811	
S5645	0.0561	0.8643	0.4459	0.0095	0.0344	18.4965	9.3286	2.1623	
S5646	0.0430	1.0133	0.0443	0.0113	0.0300	18.4567	9.3167	2.1300	
S5647	0.0557	0.9085	0.4434	0.0083	0.0334	18.4506	9.2969	2.2314	
S5648	0.0567	0.8533	1.1700	0.0106	0.0290	18.1767	9.2067	2.0533	
NOTE: CERTIFICATE ACCORDING TO EN 10204/3.1B									
QUALITY CONTROL INSPECTOR					MANAGER				
Sandy Yeh					Grant Hsu				

APPROVED

By Iai at 2:07 pm, 6/21/11

Wen Zone

No. 0 100

原 璋 實 業 有 限 公 司**WON ZONE CORPORATION**

31 No. 185 Chung Hwa Road Sec. 2, Chung Li City 320, Taiwan R.O.C.

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Tel: (03)4341 325 Fax: +886-3-4341 525 E-mail: wonzone.taiwan@msa.hinet.net

CERTIFICATE OF CHEMICAL ANALYSIS AND MECHANICAL PROPERTIES				CERTIFICATE NO. 110511- 1 DATE: 11-May-11						
To: COOPER CAMERON CANADA LTD.-NUTRON 2125-64 AVENUE, EDMONTON AB T6P 1Z4, CANADA										
INVOICE NO. WZ-110511A				Your Order No. 4502836671						
MATERIAL SPECIFICATION: ASTM A-564 TYPE 630 H1150D										
Q'TY	PART NAME	DRAWING No.	Heat Code	Mechanical Properties						
				Y.S.(KSI)	T.S.(KSI)	EL.O.(%)	HRC	RA (%)	ft-lbf (-75°F)	
				105 min	125 min	16 min	24-33	50 min	15 min	
3,000	Stem 1/2"	#02001	R4101	123	137	21	32	70	108/108/105	
7,680	Stem 7/8"	#02002	R4102	113	136	21.5	30	76	137/140/136	
1,500	Stem 1-1/2"	#02122	DG	124	139	22	31	71	83/78/77	
660	Stem 2"	#02123	DD	119	137	22	30.0	70	111/106/104	
120	Stem 3"	#02005	DE	129	138	25	32	75	122/127/120	
700	Ball 1/2"	#06001	S5602	115	136	23	30.0	72	98/92/93	
1,200	Ball 7/8"	#06002	S5603	113	131	22	30	71	108/114/111	
336	Ball 1-1/2"	#06003	S5604	126	138	21	32	68	82/77/79	
Heat Code	Chemical Composition (%)									
	C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb+Ta
	0.07max	1.0max	1.0max	0.030max	0.040max	15-17.5	3.0-5.0	0.5 max	3.0-5.0	0.15-0.45
R4101	0.02	0.64	0.50	0.024	0.028	15.16	4.22	0.13	3.38	0.22
R4102	0.02	0.63	0.46	0.001	0.027	15.14	4.40	0.15	3.31	0.21
DD	0.03	0.65	0.44	0.021	0.030	15.39	4.29	0.16	3.31	0.22
DE	0.03	0.66	0.47	0.027	0.029	15.26	4.15	0.19	3.35	0.21
DG	0.02	0.64	0.50	0.024	0.028	15.16	4.22	0.13	3.38	0.22
S5602	0.02	0.64	0.50	0.024	0.028	15.16	4.22	0.13	3.38	0.22
S5603	0.02	0.63	0.41	0.026	0.030	15.42	4.31	0.14	3.31	0.23
S5604	0.03	0.66	0.47	0.027	0.029	15.26	4.15	0.19	3.35	0.21
Solution Treatment: 1900°F for 30 Min/Inch (Minimum of 1 Hour), Fast Air Cooling to below 90°F										
Double Aged at 1150°F for 4 hours minimum and cooled to below 90°F in air										
NOTE: CERTIFICATE ACCORDING TO EN 10204/3.1B										
QUALITY CONTROL INSPECTOR						MANAGER				
Sandy Yeh						Grant Hsu				

APPROVED

By LAIA at 10:36 am, 5/20/11

Material Test Report

Specification Notes:

Name	Revision	Grade	Description	Revision Year
ASTM A105/ASTM A350 GR LF2 Cameron			Carbon & Low-Alloy Steel Forgings	

Product Information:

Item #	Product Code	Description	Heat Number	Heat Code	PO #
1	5A-1020100231600	CAP, 1/4" FP 6000 WOG FNPT, ASTM A350 GR	HN38		

Chemical Information:

Item #	C	Mn	P	S	Si	Ni	Cr	Mo	Cu	V	CE	Cb/Nb	Cu+Ni	Cr+Mo
Min		0.6			0.10									
Max	0.21	1.35	0.030	0.030	0.3	0.4	0.3	0.12	0.4	0.08	0.43	0.02	1.00	0.32
1	.21	.86	.016	.006	.21	.02	.02	0.0	.02	.001	0.360	0.0		

Physical Information:

Item #	Tensile (psi)	Yield (psi)	% Elongation	Charpy ft/lb	Charpy Temp (°F)	% Red of Area	Hardness (Brinell)
Min	70000	36000	22	15	-80	30	137
Max	95000				-50		197
1	72552	51231	37.5	82, 102, 97	-50	76	143

Additional Notes:

AUSTENITIZED @920°C 80 MIN OIL QUENCHED
TEMPERED @590-704°C 30MIN/IN

Chemical Information Notes:
1. RES 0.061

We certify that the items referenced
in this document were manufactured
and tested in accordance with
Cameron Purchase Order
requirements and EIH0204 3.1

M. Aida

Quality Manager
Cameron Canada

Material Test Report

Specification Notes:

Name	Revision	Grade	Description	Revision Year
ASTM A105/ASTM A350 GR LF2 Cameron			Carbon & Low-Alloy Steel Forgings	

Product Information:

Item #	Product Code	Description	Heat Number	Heat Code	PO #
1	5A-10000523600	BODY, 1/2" 6000 WOG, from BRSTK, ASTM A479	G57D110		

Chemical Information:

Item #	C	Mn	P	S	Si	Ni	Cr	Mo	Cu	V	CE	Co/Nb	Cu+Ni	Cr+Mo
Min		0.6			0.10									
Max	0.21	1.35	0.030	0.030	0.3	0.4	0.3	0.12	0.4	0.08	0.43	0.02	1.00	0.32
1	.18	.88	.013	.004	.23	.01	.01	.007	.01	.001	0.3316	.003		

Physical Information:

Item #	Tensile (psi)	Yield (psi)	% Elongation	Charpy ft/lb	Charpy Temp (°F)	% Red of Area	Hardness (Brinell)
Min	70000	36000	22	15	-80	30	137
Max	95000				-50		197
1	83397	65267	27	18, 134, 142	-50	77	155

Additional Notes:

QUENCHING @920°C 2HRS @800°C 2HRS TEMPERING @700°C 2HRS
--

We certify that the items referenced in this document were manufactured and tested in accordance with Cameron Purchase Order requirements and EIH0204 3.1

M. Ciele
 Quality Manager
 Cameron Canada

Material Test Report

Specification Notes:

Name	Revision	Grade	Description	Revision Year
ASTM A105/ASTM A350 GR LF2 Cameron			Carbon & Low-Alloy Steel Forgings	

Product Information:

Item #	Product Code	Description	Heat Number	Heat Code	PO #
1	5A-10000532600	BODY, 1/2" 6000 WOG, ASTM A105/LF2	G57D228		

Chemical Information:

Item #	C	Mn	P	S	Si	Ni	Cr	Mo	Cu	V	CE	Co/Nb	Cr+Ni	Cr+Mo
Min		0.6			0.10									
Max	0.21	1.35	0.030	0.030	0.3	0.4	0.3	0.12	0.4	0.08	0.43	0.02	1.00	0.32
1	.18	.88	.013	.004	.23	.01	.01	.007	.01	.001	0.3316	.003		

Physical Information:

Item #	Tensile (psi)	Yield (psi)	% Elongation	Charpy ft/lb	Charpy Temp (°F)	% Red of Area	Hardness (Brinell)
Min	70000	35000	22	15	-80	30	137
Max	95000				-50		197
1	79046	58740	29.5	107, 107, 107	-50	77	162

Additional Notes:

QUENCHING @920°C 2HRS @800°C 2HRS TEMPERING @700°C 2HRS
--

We certify that the items referenced in this document were manufactured and tested in accordance with Cameron Purchase Order requirements and EIH0204 3.1

M. Aida
 Quality Manager
 Cameron Canada

Material Test Report



Specification Notes:

Name	Revision	Grade	Description	Revision Year
ASTM A105/ASTM A350 GR LF2 Cameron			Carbon & Low-Alloy Steel Forgings	

Product Information:

Item #	Product Code	Description	Heat Number	Heat Code	PO #
1	5A-10000532600	BODY, 1/2" 6000 WOG T3	G57D116		

Chemical Information:

Item #	C	Mn	P	S	Si	Ni	Cr	Mo	Cu	V	CE	Cl/Nb	Cu+Ni	Cr+Mo
Min		0.6			0.10									
Max	0.21	1.35	0.030	0.030	0.3	0.4	0.3	0.12	0.4	0.08	0.43	0.02	1.00	0.32
1	0.18	0.88	0.013	0.004	0.23	0.01	0.01	0.007	0.01	0.001	0.3316	0.003		

Physical Information:

Item #	Tensile (psi)	Yield (psi)	% Elongation	Charpy ft/lb	Charpy Temp (°F)	% Red of Area	Hardness (Brinell)
Min	70000	36000	22	15	-80	30	137
Max	95000				-50		197
1	71793	50763	32.3	179, 202, 168	-51	75.5	152

Additional Notes:

QUENCHED @920°C, 2HRS @800°C, 2HRS. TEMPERED @700°C, 2HRS.

We certify that the items referenced in this document were manufactured and tested in accordance with Cameron Purchase Order requirements and E110204 3.1

M. Aida
 Quality Manager
 Cameron Canada

08563-002H



VALVES & MEASUREMENT

Wednesday, 23-Nov-2011

From:

3707 97 St.
Edmonton, Alberta, Canada
T6E 6J2
Phone : 780-463-6868
Fax : 780-463-6259
Web Site : www.c-a-m.com

To:

CAMERON -- STOCK
3707-97 St.
Edmonton, Alberta, Canada
T6E6J2

Subject:

Serial 2253361 Quantity/Series 350

Comments:

Part#: 5A-T3F05S30BZ

Description: BV F05 FNPT NUTRON T3 3000 WOG STD

Sales Order#: N/A

Customer PO#: N/A



VALVES & MEASUREMENT

Wednesday, 23-Nov-2011

From:

3707 97 St.
Edmonton, Alberta, Canada
T6E 6J2
Phone : 780-463-6868
Fax : 780-463-6259
Web Site : www.c-a-m.com

To:

CAMERON -- STOCK
3707-97 St.
Edmonton, Alberta, Canada
T6E6J2

Document Summary Page

The documents are printed in the following order:

#	Heat #	Heat Code	Job/Serial #	Material #	Description
1	B	LOC			Nutron T3, B3 Standard
2	Hydro Test	598			API 598
3	S5792				BALL,1/2", ASTM A351 GR CF8M
4	R4183				STEM,1/2",ASTM A564 17-4 H1150 NACE
5	R4131				STEM,1/2",ASTM A564 17-4 H1150 NACE
6	318064				BODY,1/2" 6000 WOG,ASTM A105/LF2
7	Z74D345				CAP,1/2" FP 4000 WOG FNPT,ASTM A350 GR
8	Z74D342				CAP,1/2" FP 4000 WOG FNPT,ASTM A350 GR



VALVES & MEASUREMENT

Cameron Canada Corporation
3707 - 97 Street
Edmonton Alberta Canada T6E 6J2
Phone 780.463.6868
Fax 780.465.1244
www.c-a-m.com

GENERAL LETTER OF COMPLIANCE

for Valve Models:

T3 & B3

Style 'B': Standard Service

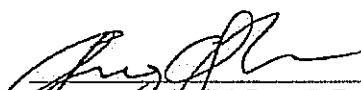
Cameron Valves & Measurement hereby certifies that the design, fabrication, testing and quality control of the above NUTRON brand ball valves for Standard Service have been made in accordance with the following applicable standards (latest edition in effect at time of manufacture): API 598 (1-1/2" and smaller), ASME B16.34, CSA Z245.15 (2" FP and larger) and V&M Engineering Standards. As part of compliance to these specifications, the valves have been marked in accordance with MSS SP-25.

The minimum service temperature of these valves is -29°C/-20°F.

The 'Z' option code designation at the end of a figure number indicates that the valve meets the requirements of API-607 Fourth Edition, May 1993.

These valves (1-1/2" and larger) conform to the Pressure Equipment Directive requirements and are marked as CE certified (Certificate #8888-001-2002).

Approved by:


Greg Ogarko, M.Eng., P.Eng.
Engineering Manager

**VALVES & MEASUREMENT**

Cameron Canada Corporation
3707-97th St.
Edmonton Alberta Canada T6E 6J2
Phone 780.468.2732
www.c-a-m.com

CERTIFICATE OF CONFORMANCE**API 598 Pressure Testing – Carbon and Low Alloy Steel
(2" RP and Smaller)**

COMPLIANCE: These valves are tested in accordance with Cameron Valves & Measurement's standard procedures and API Standard 598, as per the chart below.

Test durations are 15 seconds in length as a minimum. Test duration is defined as the period of inspection after the valve is fully prepared and is under full pressure.

Butt weld end valves shall be tested in accordance with the ANSI rating.

Actual test pressure is rounded to next highest increment on the gauge.

**Carbon & Low Alloy Steel
Shell and Seat Test Pressures**
(Table Based on Rating for Group 1.1 Materials per ANSI B16.34)

Valve Class	Maximum Working Pressure	Hydrostatic Shell Test Pressure (PSI)	Air Seat Test Pressure +/- 10 PSI
150 ANSI	285	450	80
300 ANSI	740	1125	80
600 ANSI	1480	2225	80
800 ANSI	1975	3000	80
900 ANSI	2220	3350	80
1500 ANSI	3705	5575	80
2500 ANSI	6170	9275	80
275 WOG	275	425	80
720 WOG	720	1100	80
1000 WOG	1000	1500	80
1440 WOG	1440	2175	80
1500 WOG	1500	2250	80
2000 WOG	2000	3000	80
2160 WOG	2160	3250	80
3000 WOG	3000	4500	80
3600 WOG	3600	5400	80
4000 WOG	4000	6000	80
5000 WOG	5000	7500	80
6000 WOG	6000	9000	80

Murray Aide, Quality Manager



NO. 0 100 111

原 璋 實 業 有 限 公 司

WON ZONE CORPORATION

3F No. 185 Chung Hwa Road Sec. 2, Chung Li City 320, Taiwan R.O.C.

320 桃園縣中壢市中華路2段185號3樓 統一編號: 16879927

Tel: (03)4341 325 Fax: +886-3-4341 525 E-mail: wonzone.taiwan@msa.hinet.net

CERTIFICATE OF CHEMICAL ANALYSIS AND MECHANICAL PROPERTIES					CERTIFICATE NO. 110914-3 DATE: 14-Sep-11				
To: COOPER CAMERON CANADA LTD.-NUTRON 2125-64 AVENUE, EDMONTON AB T6P 1Z4, CANADA									
INVOICE NO. WZ-110914A					Your Order No. 4502990586/3047672				
Material Specification: ASTM A351 CF8M					Heat Treatment: Solution Annealed				
Q'TY	PART NAME	DRAWING No.	Heat Code	Mechanical Properties					
				T.S.(KSI)	Y.S.(KSI)	ELO.(%)	HB		
				<u>70 min</u>	<u>30 min</u>	<u>30 min</u>	<u>183 max</u>		
6,300	Ball 1/2"	#06001-010	S5792	80.0	48.9	55	171		
8,100	Ball 7/8"	#06002-010	S5793	76.8	47.6	45.5	163		
666	Ball 2"	#06004-010	S5873	76.8	48.3	44.0	165		
400	Ball 3"	#06005-010	U1941	73.3	46.5	37.8	157		
28	Ball 3"	#06005-010	U1942	75.1	43.7	35.2	159		
18	Ball 6"	#06024	U1953	74.5	44.2	34.8	162		
Heat Code	Chemical Composition (%)								
	C	Mn	Si	S	P	Cr	Ni	Mo	
	<u>0.08max</u>	<u>1.5max</u>	<u>1.5max</u>	<u>.040max</u>	<u>.040max</u>	<u>18-21</u>	<u>9-12</u>	<u>2.0-3.0</u>	
S5792	0.0640	0.7759	0.8518	0.0055	0.0272	18.4510	9.1608	2.0772	
S5793	0.0614	0.8029	0.5221	0.0071	0.0379	18.5300	9.3242	2.1904	
S5873	0.0545	0.8490	0.5217	0.0063	0.0385	18.7006	9.2707	2.1354	
U1941	0.0580	0.6050	1.1250	0.0110	0.0295	18.1050	9.1850	2.0050	
U1942	0.0740	0.6600	1.1300	0.0120	0.0270	18.1400	9.1000	2.0500	
U1953	0.0690	0.7600	1.1900	0.0110	0.0260	18.3400	9.0100	2.0700	
NOTE: CERTIFICATE ACCORDING TO EN 10204/3.1B									
QUALITY CONTROL INSPECTOR					MANAGER				
Sandy Yeh					Grant Hsu				

APPROVED

By Iaia at 2:24 pm, 9/23/11



ISO 9001
No. 01 100 029166

原 璋 實 業 有 限 公 司

WON ZONE CORPORATION

3F No. 185 Chung Hwa Road Sec. 2, Chung Li City 320, Taiwan R.O.C.
320 桃園縣中壢市中華路2段185號3樓 統一編號: 16879927
Tel: (03)4341 325 Fax: +886-3-4341 525 E-mail: wonzone.taiwan@msa.hinet.net

CERTIFICATE OF CHEMICAL ANALYSIS AND MECHANICAL PROPERTIES				CERTIFICATE NO. 110803- 1						
				DATE: 3-Aug-11						
To. COOPER CAMERON CANADA LTD.-NUTRON 2125-64 AVENUE, EDMONTON AB T6P 1Z4, CANADA										
INVOICE NO. WZ-110803A				Your Order No. 4502918444/956946/990586						
MATERIAL SPECIFICATION: ASTM A-564 TYPE 630 H1150D										
Q'TY	PART NAME	DRAWING No.	Heat Code	Mechanical Properties						
				Y.S.(KSI)	T.S.(KSI)	ELO.(%)	HRC	RA (%)	ft-lbf (-75°F)	
				<u>105 min</u>	<u>125 min</u>	<u>16 min</u>	<u>24-33</u>	<u>50 min</u>	<u>15 min</u>	
5,000	Stem 1/2"	#02001	R4183	125	138	23	30	70	92/92/89	
7,040	Stem 7/8"	#02002	R4184	126	140	20	30	70	97/98/96	
2,700	Stem 1-1/2"	#02122	DJ	122	137	22.5	31	72	112/115/113	
240	Stem 3"	#02005	DE	129	138	25	32	75	122/127/120	
700	Ball 1/2"	#06001	S5751	115	136	23	30	72	98/92/93	
1,620	Ball 7/8"	#06002	S5752	130	140	20.5	30	70	103/98/102	
108	Ball 1-1/2"	#06003	S5753	126	138	21	32	68	82/77/79	
306	Ball 2"	#06004	S5791	131	141	20	31	70	38/36/36	
Heat Code	Chemical Composition (%)									
	C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb+Ta
	<u>0.07max</u>	<u>1.0max</u>	<u>1.0max</u>	<u>0.030max</u>	<u>0.040max</u>	<u>15-17.5</u>	<u>3.0-5.0</u>	<u>0.5 max</u>	<u>3.0-5.0</u>	<u>0.15-0.45</u>
R4183	0.02	0.62	0.45	0.021	0.028	15.13	4.24	0.10	3.41	0.20
R4184	0.02	0.62	0.45	0.021	0.028	15.13	4.24	0.10	3.41	0.20
DJ	0.02	0.64	0.49	0.002	0.028	15.24	4.35	0.11	3.32	0.23
DE	0.03	0.66	0.47	0.027	0.029	15.26	4.15	0.19	3.35	0.21
S5751	0.02	0.64	0.50	0.024	0.028	15.16	4.22	0.13	3.38	0.22
S5752	0.02	0.62	0.45	0.021	0.028	15.13	4.24	0.10	3.41	0.20
S5753	0.03	0.66	0.47	0.027	0.029	15.26	4.15	0.19	3.35	0.21
S5791	0.02	0.66	0.49	0.024	0.029	15.05	4.34	0.19	3.34	0.20
Solution Treatment: 1900°F for 30 Min/Inch (Minimum of 1 Hour), Fast Air Cooling to below 90°F Double Aged at 1150°F for 4 hours minimum and cooled to below 90°F in air NOTE: CERTIFICATE ACCORDING TO EN 10204/3.1B										
QUALITY CONTROL INSPECTOR						MANAGER				
<i>Sandy Yeh</i>						<i>Grant Hsu</i>				

APPROVED

By lala at 11:41 am, 8/22/11



ISO 9001
No. 01 100 029186

原 璋 實 業 有 限 公 司

WON ZONE CORPORATION

3F No. 185 Chung Hwa Road Sec. 2, Chung Li City 320, Taiwan R.O.C.

320 桃園縣中壢市中華路2段185號3樓 統一編號: 16879927

Tel: (03)4341 325 Fax: +886-3-4341 525 E-mail: wonzone.taiwan@msa.hinet.net

CERTIFICATE OF CHEMICAL ANALYSIS AND MECHANICAL PROPERTIES				CERTIFICATE NO. 110608-1 DATE: 8-Jun-11						
To. COOPER CAMERON CANADA LTD.-NUTRON 2125-64 AVENUE, EDMONTON AB T6P 1Z4, CANADA										
INVOICE NO. WZ-110608A				Your Order No. 4502877267/878558/836671						
MATERIAL SPECIFICATION: ASTM A-564 TYPE 630 H1150D										
Q'TY	PART NAME	DRAWING No.	Heat Code	Mechanical Properties						
				Y.S.(KSD)	T.S.(KSD)	ELC.(%)	HRC	RA (%)	ft-lbf (-75°F)	
				105 min	125 min	16 min	24~33	50 min	15 min	
5,000	Stem 1/2"	#02001	R4131	122	136	21	32	68	84/83/83	
2,560	Stem 7/8"	#02002	R4132	113	136	21.5	30	76	137/140/136	
2,850	Stem 1-1/2"	#02122	DG	124	139	22	31	71	83/78/77	
526	Stem 2"	#02123	DH	113	131	22	30	71	108/114/111	
134	Stem 2"	#02123	DD	119	137	22	30	70	111/106/104	
180	Stem 3"	#02005	DE	129	138	25	32	75	122/127/120	
1,400	Ball 1/2"	#06001	S5641	115	136	23	30	72	98/92/93	
2,220	Ball 7/8"	#06002	S5642	106	132	22.5	30	71	130/131/130	
144	Ball 1-1/2"	#06003	S5643	126	138	21	32	68	82/77/79	
Heat Code	Chemical Composition (%)									
	C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb+Ta
	0.07max	1.0max	1.0max	0.030max	0.040max	15-17.5	3.0-5.0	0.5 max	3.0-5.0	0.15-0.45
R4131	0.03	0.62	0.43	0.019	0.026	15.23	4.36	0.13	3.30	0.20
R4132	0.02	0.63	0.46	0.001	0.027	15.14	4.40	0.15	3.31	0.21
DD	0.03	0.65	0.44	0.021	0.030	15.39	4.29	0.16	3.31	0.22
DE	0.03	0.66	0.47	0.027	0.029	15.26	4.15	0.19	3.35	0.21
DG	0.02	0.64	0.50	0.024	0.028	15.16	4.22	0.13	3.38	0.22
DH	0.02	0.63	0.41	0.023	0.030	15.42	4.31	0.14	3.31	0.23
S5641	0.02	0.64	0.50	0.024	0.028	15.16	4.22	0.13	3.38	0.22
S5642	0.02	0.62	0.45	0.021	0.028	15.13	4.24	0.10	3.41	0.20
S5643	0.03	0.66	0.47	0.027	0.029	15.26	4.15	0.19	3.35	0.21
Solution Treatment: 1900°F for 30 Min/Inch (Minimum of 1 Hour), Fast Air Cooling to below 90°F										
Double Aged at 1150°F for 4 hours minimum and cooled to below 90°F in air										
NOTE: CERTIFICATE ACCORDING TO EN 10204/3.1B										
QUALITY CONTROL INSPECTOR						MANAGER				
Sandy Yeh						Grant Hsu				
						<div style="border: 2px solid black; padding: 5px; display: inline-block;"> APPROVED By Iai at 2:05 pm, 6/21/11 </div>				

Material Test Report

Specification Notes:

Name	Revision	Grade	Description	Revision Year
ASTM A105/ASTM A350 GR LF2 Cameron			Carbon & Low-Alloy Steel Forgings	

Product Information:

Item #	Product Code	Description	Heat Number	Heat Code	PO #
1	5A-10000532600	BODY, 1/2" 6000 WOG, ASTM A105/LF2	318064		

Chemical Information:

Item #	C	Mn	P	S	Si	Ni	Cr	Mo	Cu	V	CE	Cl/Nb	Cu+Ni	Cr+Mo
Min		0.6			0.10									
Max	0.21	1.35	0.030	0.030	0.3	0.4	0.3	0.12	0.4	0.08	0.43	0.02	1.00	0.32
1	.19	.83	.016	.014	.2	.07	.07	.01	.25	.002	0.370	0.0		

Physical Information:

Item #	Tensile (psi)	Yield (psi)	% Elongation	Charpy ft/lb	Charpy Temp (°F)	% Red of Area	Hardness (Brinell)
Min	70000	36000	22	15	-80	30	137
Max	95000				-50		197
1	79891	58826	31.7	87, 84, 95	-50	75.3	171

Additional Notes:

AUSTENITIZED @920°C 80 MIN OIL QUENCHED TEMPERED @590-704°C 30MIN/IN Chemical Information Notes: 1. RES 0.402
--

We certify that the items referenced in this document were manufactured and tested in accordance with Cameron Purchase Order requirements and EIH0204 3.1



Quality Manager
Cameron Canada

Material Test Report

Specification Notes:

Name	Revision	Grade	Description	Revision Year
ASTM A350 GR LF2 Cameron		LF2 Class 1	Carbon & Low-Alloy Steel Forgings	2010

Product Information:

Item #	Product Code	Description	Heat Number	Heat Code	PO #
1	5A-1020100531400	CAP, 1/2" FP 4000 WOG FNPT, ASTM A350 GR	Z74D345		

Chemical Information:

Item #	C	Mn	P	S	Si	Ni	Cr	Mo	Cu	V	CE	Cb/Nb
Min		0.6			0.15							
Max	0.23	1.35	0.035	0.035	0.3	0.4	0.3	0.12	0.4	0.08	0.43	0.02
1	.19	.88	.016	.009	.22	.03	.021	.015	.071	.061	0.3628	

Physical Information:

Item #	Tensile (psi)	Yield (psi)	% Elongation	Charpy ft/lb	Charpy Temp (°F)	% Red of Area	Hardness (Brinell)
Min	70000	36000	22	15	-80	30	137
Max	95000				-50		197
1	73244	52214	31	104, 107, 107	-50	77.5	164

Additional Notes:

QUENCHING @920°C 2HRS @800°C 2RHS TEMPERING @700°C 2HRS
--

We certify that the items referenced in this document were manufactured and tested in accordance with Cameron Purchase Order requirements and EN10204 3.1



Quality Manager
Cameron Canada

Material Test Report

Specification Notes:

Name	Revision	Grade	Description	Revision Year
ASTM A350 GR LF2 Cameron		LF2 Class 1	Carbon & Low-Alloy Steel Forgings	2010

Product Information:

Item #	Product Code	Description	Heat Number	Heat Code	PO #
1	5A-1020100531400	CAP, 1/2" FP 4000 WOG FNPT, ASTM A350 GR	Z74D342		

Chemical Information:

Item #	C	Mn	P	S	Si	Ni	Cr	Mo	Cu	V	CE	Cb/Nb
Min		0.6			0.15							
Max	0.23	1.35	0.035	0.035	0.3	0.4	0.3	0.12	0.4	0.08	0.43	0.02
1	.19	.88	.016	.009	.22	.03	.021	.015	.071	.061	0.3628	.013

Physical Information:

Item #	Tensile (psi)	Yield (psi)	% Elongation	Charpy ft/lb	Charpy Temp (°F)	% Red of Area	Hardness (Brinell)
Min	70000	36000	22	15	-80	30	137
Max	95000				-50		197
1	70343	45687	32	104, 107, 107	-50	69.5	163

Additional Notes:

QUENCHING @920°C 2HRS @800°C 2HRS TEMPERING @700°C 2HRS
--

We certify that the items referenced in this document were manufactured and tested in accordance with Cameron Purchase Order requirements and EIH0204 3.1

M. Aida
 Quality Manager
 Cameron Canada

08563-002-H



VALVES & MEASUREMENT

Thursday, 08-Dec-2011

From:

To:

3707 97 St.
Edmonton, Alberta, Canada
T6E 6J2
Phone : 780-463-6868
Fax : 780-463-6259
Web Site : www.c-a-m.com

Subject:

Serial 2275413 Series 360

Comments:

Part#: 5A-T3F05S30BZ

Description: BV F05 FNPT NUTRON T3 3000 WOG STD

Sales Order#: N/A

Customer PO#: N/A



VALVES & MEASUREMENT

Thursday, 08-Dec-2011

From:

3707 97 St.
Edmonton, Alberta, Canada
T6E 6J2
Phone : 780-463-6868
Fax : 780-463-6259
Web Site : www.c-a-m.com

To:

Document Summary Page

The documents are printed in the following order:

#	Heat #	Heat Code	Job/Serial #	Material #	Description
1	B	LOC	2275413	5A-T3F05S30BZ	Nutron T3, B3 Standard
2	Hydro Test	598	2275413	5A-T3F05S30BZ	API 598
3	1TS70		2275413	5A-T3F05S30BZ	BODY,1/2" 6000 WOG,ASTM A105/LF2
4	G55D112		2275413	5A-T3F05S30BZ	BODY,1/2" 6000 WOG,ASTM A105/LF2
5	G68D311		2275413	5A-T3F05S30BZ	CAP,1/2" FP 4000 WOG FNPT,ASTM A350 GR
6	G68D319		2275413	5A-T3F05S30BZ	CAP,1/2" FP 4000 WOG FNPT,ASTM A350 GR
7	G56D223		2275413	5A-T3F05S30BZ	CAP,1/2" FP 4000 WOG FNPT,ASTM A350 GR
8	G55C272		2275413	5A-T3F05S30BZ	CAP,1/2" FP 4000 WOG FNPT,ASTM A350 GR
9	G55C276		2275413	5A-T3F05S30BZ	CAP,1/2" FP 4000 WOG FNPT,ASTM A350 GR
10	G55C277		2275413	5A-T3F05S30BZ	CAP,1/2" FP 4000 WOG FNPT,ASTM A350 GR
11	G55C275		2275413	5A-T3F05S30BZ	CAP,1/2" FP 4000 WOG FNPT,ASTM A350 GR
12	G55C281		2275413	5A-T3F05S30BZ	CAP,1/2" FP 4000 WOG FNPT,ASTM A350 GR
13	R4221		2275413	5A-T3F05S30BZ	STEM,1/2",ASTM A564 17-4 H1150 NACE
14	S5792		2275413	5A-T3F05S30BZ	BALL,1/2", ASTM A351 GR CF8M



VALVES & MEASUREMENT

Cameron Canada Corporation
3707 - 97 Street
Edmonton Alberta Canada T6E 6J2
Phone 780.463.6868
Fax 780.465.1244
www.c-a-m.com

GENERAL LETTER OF COMPLIANCE

for Valve Models:

T3 & B3

Style 'B': Standard Service

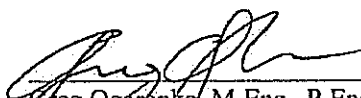
Cameron Valves & Measurement hereby certifies that the design, fabrication, testing and quality control of the above NUTRON brand ball valves for Standard Service have been made in accordance with the following applicable standards (latest edition in effect at time of manufacture): API 598 (1-1/2" and smaller), ASME B16.34, CSA Z245.15 (2" FP and larger) and V&M Engineering Standards. As part of compliance to these specifications, the valves have been marked in accordance with MSS SP-25.

The minimum service temperature of these valves is -29°C/-20°F.

The 'Z' option code designation at the end of a figure number indicates that the valve meets the requirements of API-607 Fourth Edition, May 1993.

These valves (1-1/2" and larger) conform to the Pressure Equipment Directive requirements and are marked as CE certified (Certificate #8888-001-2002).

Approved by:


Greg Ogarko, M.Eng., P.Eng.
Engineering Manager



VALVES & MEASUREMENT
Cameron Canada Corporation
3707-97th St.
Edmonton Alberta Canada T6E 6J2
Phone 780.468.2732
www.c-a-m.com

CERTIFICATE OF CONFORMANCE

API 598 Pressure Testing – Carbon and Low Alloy Steel (2" RP and Smaller)

COMPLIANCE: These valves are tested in accordance with Cameron Valves & Measurement's standard procedures and API Standard 598, as per the chart below.

Test durations are 15 seconds in length as a minimum. Test duration is defined as the period of inspection after the valve is fully prepared and is under full pressure.

Butt weld end valves shall be tested in accordance with the ANSI rating.

Actual test pressure is rounded to next highest increment on the gauge.

**Carbon & Low Alloy Steel
Shell and Seat Test Pressures**
(Table Based on Rating for Group 1.1 Materials per ANSI B16.34)

Valve Class	Maximum Working Pressure	Hydrostatic Shell Test Pressure (PSI)	Air Seat Test Pressure +/- 10 PSI
150 ANSI	285	450	80
300 ANSI	740	1125	80
600 ANSI	1480	2225	80
800 ANSI	1975	3000	80
900 ANSI	2220	3350	80
1500 ANSI	3705	5575	80
2500 ANSI	6170	9275	80
275 WOG	275	425	80
720 WOG	720	1100	80
1000 WOG	1000	1500	80
1440 WOG	1440	2175	80
1500 WOG	1500	2250	80
2000 WOG	2000	3000	80
2160 WOG	2160	3250	80
3000 WOG	3000	4500	80
3600 WOG	3600	5400	80
4000 WOG	4000	6000	80
5000 WOG	5000	7500	80
6000 WOG	6000	9000	80

Murray Aide, Quality Manager

Material Test Report

Specification Notes:

Name	Revision	Grade	Description	Revision Year
ASTM A105/ASTM A350 GR LF2 Cameron			Carbon & Low-Alloy Steel Forgings	

Product Information:

Item #	Product Code	Description	Heat Number	Heat Code	PO #
1	5A-10000532600	BODY, 1/2" 6000 WOG, ASTM A105/LF2	1TS70		

Chemical Information:

Item #	C	Mn	P	S	Si	Ni	Cr	Mo	Cu	V	CE	Cb/Nb	Cu+Ni	Cr+Mo
Min		0.6			0.10									
Max	0.21	1.35	0.030	0.030	0.3	0.4	0.3	0.12	0.4	0.08	0.43	0.02	1.00	0.32
1	0.19	0.84	0.025	0.01	0.2	0.06	0.13	0.01	0.24	0.002	0.38			

Physical Information:

Item #	Tensile (psi)	Yield (psi)	% Elongation	Charpy ft/lb	Charpy Temp (°F)	% Red of Area	Hardness (Brinell)
Min	70000	36000	22	15	-80	30	137
Max	95000				-50		197
1	71087	49894	36.9	151,144, 159	-50	76.1	144

Additional Notes:

Chemical Information Notes:
1. Residue 0.442

We certify that the items referenced in this document were manufactured and tested in accordance with Cameron Purchase Order requirements and EIH0204 3.1

M. Aida
Quality Manager
Cameron Canada

Material Test Report

Specification Notes:

Name	Revision	Grade	Description	Revision Year
ASTM A105/ASTM A350 GR LF2 Cameron			Carbon & Low-Alloy Steel Forgings	

Product Information:

Item #	Product Code	Description	Heat Number	Heat Code	PO #
1	5A-10000532600	BODY, 1/2" 6000 WOG, ASTM A105/LF2	G55D112		

Chemical Information:

Item #	C	Mn	P	S	Si	Ni	Cr	Mo	Cu	V	CE	Cb/Nb	Cu+Ni	Cr+Mo
Min		0.6			0.10									
Max	0.21	1.35	0.030	0.030	0.3	0.4	0.3	0.12	0.4	0.08	0.43	0.02	1.00	0.32
1	.21	.94	.015	.011	.26	.01	.01	.006	.01	.001	0.3714	.001		

Physical Information:

Item #	Tensile (psi)	Yield (psi)	% Elongation	Charpy ft/lb	Charpy Temp (°F)	% Red of Area	Hardness (Brinell)
Min	70000	36000	22	15	-80	30	137
Max	95000				-50		197
1	73969	54389	28.5	158, 153, 198	-50	77.5	152

Additional Notes:

QUENCHING @920°C 2HRS @800°C 2HRS TEMPERING @700°C 2HRS
--

We certify that the items referenced in this document were manufactured and tested in accordance with Cameron Purchase Order requirements and EIH0204 3.1

M. Aida
 Quality Manager
 Cameron Canada

Material Test Report

Specification Notes:

Name	Revision	Grade	Description	Revision Year
ASTM A350 GR LF2 Cameron		LF2 Class 1	Carbon & Low-Alloy Steel Forgings	2010

Product Information:

Item #	Product Code	Description	Heat Number	Heat Code	PO #
1	5A-1020100531400	CAP, 1/2" FP 4000 WOG FNPT, ASTM A350 GR	G68D311		

Chemical Information:

Item #	C	Mn	P	S	Si	Ni	Cr	Mo	Cu	V	CE	Cb/Nb
Min		0.6			0.15							
Max	0.23	1.35	0.035	0.035	0.3	0.4	0.3	0.12	0.4	0.08	0.43	0.02
1	.16	.96	.011	.006	.26	.03	.03	.01	.08	.05	0.3453	.01

Physical Information:

Item #	Tensile (psi)	Yield (psi)	% Elongation	Charpy ft/lb	Charpy Temp (°F)	% Red of Area	Hardness (Brinell)
Min	70000	36000	22	15	-80	30	137
Max	95000				-50		197
1	73969	51488	28	107, 107, 107	-50	70	151

Additional Notes:

QUENCHING @920°C 2HRS @800°C 2HRS TEMPERING @700°C 2HRS
--

We certify that the items referenced in this document were manufactured and tested in accordance with Cameron Purchase Order requirements and EIH0204 3.1

M. Aida
 Quality Manager
 Cameron Canada

Material Test Report

Specification Notes:

Name	Revision	Grade	Description	Revision Year
ASTM A350 GR LF2 Cameron		LF2 Class 1	Carbon & Low-Alloy Steel Forgings	2010

Product Information:

Item #	Product Code	Description	Heat Number	Heat Code	PO #
1	5A-1020100531400	CAP, 1/2" FP 4000 WOG FNPT, ASTM A350 GR	G68D319		

Chemical Information:

Item #	C	Mn	P	S	Si	Ni	Cr	Mb	Cu	V	CE	Cb/Nb
Min		0.6			0.15							
Max	0.23	1.35	0.035	0.035	0.3	0.4	0.3	0.12	0.4	0.08	0.43	0.02
1	0.16	0.96	0.011	0.006	0.26	0.03	0.03	0.01	0.08	0.05	0.3453	0.01

Physical Information:

Item #	Tensile (psi)	Yield (psi)	% Elongation	Charpy ft/lb	Charpy Temp (°F)	% Red of Area	Hardness (Brinell)
Min	70000	36000	22	15	-80	30	137
Max	95000				-50		197
1	76870	52938.77	31.7	106	-50	68.5	157

Additional Notes:

Quenching @ 920° C / 2 HRS, 800° C / 2 HRS, TEMPERING 700° C / 2 HRS
--

We certify that the items referenced in this document were manufactured and tested in accordance with Cameron Purchase Order requirements and EIH0204 3.1

M. Aida
Quality Manager
Cameron Canada

Material Test Report

Specification Notes:

Name	Revision	Grade	Description	Revision Year
ASTM A350 GR LF2 Cameron		LF2 Class 1	Carbon & Low-Alloy Steel Forgings	2010

Product Information:

Item #	Product Code	Description	Heat Number	Heat Code	PO #
1	5A-1020100531400	CAP, 1/2" FP 4000 WOG FNPT, ASTM A350 GR	G56D223		

Chemical Information:

Item #	C	Mn	P	S	Si	Ni	Cr	Mo	Cu	V	CE	Cb/Nb
Min		0.6			0.15							
Max	0.23	1.35	0.035	0.035	0.3	0.4	0.3	0.12	0.4	0.08	0.43	0.02
1	.18	.88	.012	.016	.19	.01	.01	.005	.01	.002	0.3314	.002

Physical Information:

Item #	Tensile (psi)	Yield (psi)	% Elongation	Charpy ft/lb	Charpy Temp (°F)	% Red of Area	Hardness (Brinell)
Min	70000	36000	22	15	-80	30	137
Max	95000				-50		197
1	79046	55840	28	107, 107, 107	-50	71.5	162

Additional Notes:

QUENCHING @920°C 2HRS @800°C 2HRS TEMPERING @700°C 2HRS
--

We certify that the items referenced in this document were manufactured and tested in accordance with Cameron Purchase Order requirements and EIH0204 3.1

M. Aida
 Quality Manager
 Cameron Canada

Material Test Report

Specification Notes:

Name	Revision	Grade	Description	Revision Year
ASTM A105/ASTM A350 GR LF2 Cameron			Carbon & Low-Alloy Steel Forgings	2010

Product Information:

Item #	Product Code	Description	Heat Number	Heat Code	PO #
1	5A-1020100531400	CAP, 1/2" FP 4000 WOG FNPT, ASTM A350 GR	G55C272		

Chemical Information:

Item #	C	Mn	P	S	Si	Ni	Cr	Mo	Cu	V	CE	Ca/Nb	Cu+Ni	Cr+Mo
Min		0.6			0.10									
Max	0.21	1.35	0.030	0.030	0.3	0.4	0.3	0.12	0.4	0.08	0.43	0.02	1.00	0.32
1	0.21	0.94	0.015	0.011	0.26	0.01	0.01	0.006	0.01	0.001	0.3714	0.001	0.01	0.01

Physical Information:

Item #	Tensile (psi)	Yield (psi)	% Elongation	Charpy ft/lb	Charpy Temp (°F)	% Red of Area	Hardness (Brinell)
Min	70000	36000	22	15	-80	30	137
Max	95000				-50		197
1	77595.19	52213.59	36	106	-50	74	162

Additional Notes:

QUENCHING 920°C @ 2 HRS, 800°C @ 2 HRS TEMPERING 700°C @ 2 HRS

We certify that the items referenced in this document were manufactured and tested in accordance with Cameron Purchase Order requirements and EIH0204 3.1

M. Aida
 Quality Manager
 Cameron Canada

Material Test Report

Specification Notes:

Name	Revision	Grade	Description	Revision Year
ASTM A105/ASTM A350 GR LF2 Cameron			Carbon & Low-Alloy Steel Forgings	

Product Information:

Item #	Product Code	Description	Heat Number	Heat Code	PO #
1	5A-1020100531400	CAP, 1/2" FP 4000 WOG FNPT, ASTM A350 GR	G55C276		

Chemical Information:

Item #	C	Mn	P	S	Si	Ni	Cr	Mo	Cu	V	CE	Cl/Nb	Cu+Ni	Cr+Mo
Min		0.6			0.10									
Max	0.21	1.35	0.030	0.030	0.3	0.4	0.3	0.12	0.4	0.08	0.43	0.02	1.00	0.32
1	.21	.94	.015	.011	.26	.01	.01	.006	.01	.001	0.3714	.001		

Physical Information:

Item #	Tensile (psi)	Yield (psi)	% Elongation	Charpy ft/lb	Charpy Temp (°F)	% Red of Area	Hardness (Brinell)
Min	70000	36000	22	15	-80	30	137
Max	95000				-50		197
1	77595	53664	31	107, 107, 107	-50	74	165

Additional Notes:

QUENCHING @920°C @800°C 2HRS TEMPERING @700°C 2HRS

We certify that the items referenced in this document were manufactured and tested in accordance with Cameron Purchase Order requirements and EIH0204 3.1

M. Aida
 Quality Manager
 Cameron Canada

Material Test Report

Specification Notes:

Name	Revision	Grade	Description	Revision Year
ASTM A105/ASTM A350 GR LF2 Cameron			Carbon & Low-Alloy Steel Forgings	

Product Information:

Item #	Product Code	Description	Heat Number	Heat Code	PO #
1	5A-1020100531400	CAP, 1/2" FP 4000 WOG FNPT, ASTM A350 GR	G55C277		

Chemical Information:

Item #	C	Mn	P	S	Si	Ni	Cr	Mo	Cu	V	CE	Cb/Nb	Cu+Ni	Cr+Mo
Min		0.6			0.10									
Max	0.21	1.35	0.030	0.030	0.3	0.4	0.3	0.12	0.4	0.08	0.43	0.02	1.00	0.32
1	.21	.94	.015	.011	.26	.01	.01	.006	.01	.001	0.3714	.001		

Physical Information:

Item #	Tensile (psi)	Yield (psi)	% Elongation	Charpy ft/lb	Charpy Temp (°F)	% Red of Area	Hardness (Brinell)
Min	70000	36000	22	15	-80	30	137
Max	95000				-50		197
1	76870	53664	31.5	107, 107, 107	-50	75.5	163

Additional Notes:

QUENCHING @920°C 2HRS @800°C 2HRS TEMPERING @700°C 2HRS
--

We certify that the items referenced in this document were manufactured and tested in accordance with Cameron Purchase Order requirements and EIH0204 3.1

M. Aida
 Quality Manager
 Cameron Canada

Material Test Report

Specification Notes:

Name	Revision	Grade	Description	Revision Year
ASTM A350 GR LF2 Cameron		LF2 Class 1	Carbon & Low-Alloy Steel Forgings	2010

Product Information:

Item #	Product Code	Description	Heat Number	Heat Code	PO #
1	5A-1020100531400	CAP, 1/2" FP 4000 WOG FNPT, ASTM A350 GR	G55C275		

Chemical Information:

Item #	C	Mn	P	S	Si	Ni	Cr	Mo	Cu	V	CE	Cb/Nb
Min		0.6			0.15							
Max	0.23	1.35	0.035	0.035	0.3	0.4	0.3	0.12	0.4	0.08	0.43	0.02
1	0.21	0.94	0.015	0.011	0.26	0.01	0.01	0.006	0.01	0.001	0.3714	0.001

Physical Information:

Item #	Tensile (psi)	Yield (psi)	% Elongation	Charpy ft/lb	Charpy Temp (°F)	% Red of Area	Hardness (Brinell)
Min	70000	36000	22	15	-80	30	137
Max	95000				-50		197
1	76145	52939	32	107	-50	68	163

Additional Notes:

QUENCHING 920°C @ 2 HRS, 800°C @ 2 HRS TEMPERPING 700°C @ 2 HRS
--

We certify that the items referenced in this document were manufactured and tested in accordance with Cameron Purchase Order requirements and EIH0204 3.1

M. Ciele
 Quality Manager
 Cameron Canada

Material Test Report

Specification Notes:

Name	Revision	Grade	Description	Revision Year
ASTM A105/ASTM A350 GR LF2 Cameron			Carbon & Low-Alloy Steel Forgings	

Product Information:

Item #	Product Code	Description	Heat Number	Heat Code	PO #
1	5A-1020100531400	CAP, 1/2" FP 4000 WOG FNPT, ASTM A350 GR	G55C281		

Chemical Information:

Item #	C	Mn	P	S	Si	Ni	Cr	Mo	Cu	V	CE	Cl/Nb	Cu+Ni	Cr+Mo
Min		0.6			0.10									
Max	0.21	1.35	0.030	0.030	0.3	0.4	0.3	0.12	0.4	0.08	0.43	0.02	1.00	0.32
1	0.21	0.94	0.015	0.011	0.26	0.01	0.01	0.006	0.01	0.001	0.3714	0.001		

Physical Information:

Item #	Tensile (psi)	Yield (psi)	% Elongation	Charpy ft/lb	Charpy Temp (°F)	% Red of Area	Hardness (Brinell)
Min	70000	36000	22	15	-80	30	137
Max	95000				-50		197
1	76145	52214	33.5	140, 137, 173	-51	75.5	164

Additional Notes:

QUENCHED@ 920°C, 2HRS QUENCHED@ 800°C, 2HRS TEMPERED@ 700°C, 2HRS

We certify that the items referenced in this document were manufactured and tested in accordance with Cameron Purchase Order requirements and EIH0204 3.1

M. Aida
 Quality Manager
 Cameron Canada



TUV

No. 0 100 1234567

原 璋 實 業 有 限 公 司

WON ZONE CORPORATION

3F No. 185 Chung Hwa Road Sec. 2, Chung Li City 320, Taiwan R.O.C.

320 桃園縣中壢市中華路2段185號3樓 統一編號: 16879927

Tel: (03)4341 325 Fax: +886-3-4341 525 E-mail: wonzone.taiwan@msa.hinet.net

CERTIFICATE OF CHEMICAL ANALYSIS AND MECHANICAL PROPERTIES						CERTIFICATE NO. 110914- 1 DATE: 14-Sep-11					
To: COOPER CAMERON CANADA LTD.-NUTRON 2125-64 AVENUE, EDMONTON AB T6P 1Z4, CANADA											
INVOICE NO. WZ-110914A						Your Order No. 4502956946/3001543/3044466/3047672					
MATERIAL SPECIFICATION: ASTM A-564 TYPE 630 H1150D											
Q'TY	PART NAME	DRAWING No.	Heat Code	Mechanical Properties							
				Y.S.(KSI)	T.S.(KSI)	EL.O.(%)	HRC	RA (%)	ft-lbf (-75°F)		
				105 min	125 min	16 min	24~33	50 min	15 min		
6,000	Stem 1/2"	#02001	R4221	125	138	23	30	70	92/92/89		
10,240	Stem 7/8"	#02002	R4311	126	140	20	30	70	97/98/96		
594	Stem 2"	#02123	DH	113	131	22	30	71	108/114/111		
100	Stem 3"	#02124	DE	129	138	25	32	75	122/127/120		
180	Stem 3"	#02005	DE	129	138	25	32	75	122/127/120		
720	Ball 1-1/2"	#06003	S5811	127	142	21	32	68	61/58/58		
Heat Code	Chemical Composition (%)										
	C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb+Ta	
	0.07max	1.0max	1.0max	0.030max	0.040max	15-17.5	3.0-5.0	0.5 max	3.0-5.0	0.15-0.45	
R4221	0.02	0.62	0.45	0.021	0.028	15.13	4.24	0.10	3.41	0.20	
R4311	0.02	0.62	0.45	0.021	0.028	15.13	4.24	0.10	3.41	0.20	
DH	0.02	0.63	0.41	0.023	0.030	15.42	4.31	0.14	3.31	0.23	
DE	0.03	0.66	0.47	0.027	0.029	15.26	4.15	0.19	3.35	0.21	
S5811	0.03	0.65	0.48	0.025	0.029	15.39	4.29	0.14	3.47	0.22	
Solution Treatment: 1900°F for 30 Min/Inch (Minimum of 1 Hour), Fast Air Cooling to below 90°F											
Double Aged at 1150°F for 4 hours minimum and cooled to below 90°F in air											
NOTE: CERTIFICATE ACCORDING TO EN 10204/3.1B											
QUALITY CONTROL INSPECTOR						MANAGER					
Sandy Yeh						Grant Hsu					

APPROVED

By Iala at 2:19 pm, 9/23/11



No. 0 100

原 璋 實 業 有 限 公 司

WON ZONE CORPORATION

3F No. 185 Chung Hwa Road Sec. 2, Chung Li City 320, Taiwan R.O.C.

320 桃園縣中壢市中華路二段185號3樓 統一編號: 16879927

Tel: (03)4341 325 Fax: +886-3-4341 525 E-mail: wonzone.taiwan@msa.hinet.net

CERTIFICATE OF CHEMICAL ANALYSIS AND MECHANICAL PROPERTIES					CERTIFICATE NO. 110914-3 DATE: 14-Sep-11				
To, COOPER CAMERON CANADA LTD.-NUTRON 2125-64 AVENUE, EDMONTON AB T6P 1Z4, CANADA									
INVOICE NO. WZ-110914A					Your Order No. 4502990586/3047672				
Material Specification: ASTM A351 CF8M					Heat Treatment: Solution Annealed				
Q'TY	PART NAME	DRAWING No.	Heat Code	Mechanical Properties					
				T.S.(KSI)	Y.S.(KSI)	ELO.(%)	HB		
				<u>70 min</u>	<u>30 min</u>	<u>30 min</u>	<u>183 max</u>		
6,300	Ball 1/2"	#06001-010	S5792	80.0	48.9	55	171		
8,100	Ball 7/8"	#06002-010	S5793	76.8	47.6	45.5	163		
666	Ball 2"	#06004-010	S5873	76.8	48.3	44.0	165		
400	Ball 3"	#06005-010	U1941	73.3	46.5	37.8	157		
28	Ball 3"	#06005-010	U1942	75.1	43.7	35.2	159		
18	Ball 6"	#06024	U1953	74.5	44.2	34.8	162		
Heat Code	Chemical Composition (%)								
	C	Mn	Si	S	P	Cr	Ni	Mo	
	<u>0.08max</u>	<u>1.5max</u>	<u>1.5max</u>	<u>.040max</u>	<u>.040max</u>	<u>18-21</u>	<u>9-12</u>	<u>2.0-3.0</u>	
S5792	0.0640	0.7759	0.8518	0.0055	0.0272	18.4510	9.1608	2.0772	
S5793	0.0614	0.8029	0.5221	0.0071	0.0379	18.5300	9.3242	2.1904	
S5873	0.0545	0.8490	0.5217	0.0063	0.0385	18.7006	9.2707	2.1354	
U1941	0.0580	0.6050	1.1250	0.0110	0.0295	18.1050	9.1850	2.0050	
U1942	0.0740	0.6600	1.1300	0.0120	0.0270	18.1400	9.1000	2.0500	
U1953	0.0690	0.7600	1.1900	0.0110	0.0260	18.3400	9.0100	2.0700	
NOTE: CERTIFICATE ACCORDING TO EN 10204/3.1B									
QUALITY CONTROL INSPECTOR					MANAGER				
Sandy Yeh					Grant Hsu				

APPROVED

By Iai at 2:24 pm, 9/23/11



VALVES & MEASUREMENT

08563-002-H

Monday, 04-Jun-2012

From:

Cameron Canada
3707 97 Street
Edmonton, Alberta, Canada
T6E 6J2
Phone : 780-468-2732

To:

Subject:

Serial	2448662	Quantity/Series	8
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Comments:

Part #: 5A-T3F02S30LZ

Description: BV F02 FNPT NUTRON T3 3000 WOG SOUR LT

Sales Order#: N/A

Customer PO#: N/A



VALVES & MEASUREMENT

Monday, 04-Jun-2012

From:

Cameron Canada
3707 97 Street
Edmonton, Alberta, Canada
T6E 6J2
Phone : 780-468-2732

To:

Document Summary Page

The documents are printed in the following order:

#	Heat #	Heat Code	Job/Serial #	Material #	Description
1	L	LOC			Nutron T3, B3, B2, TT Sour Low Temp.
2	Hydro Test	598			API 598
3	S6114				BALL,1/2", ASTM A351 GR CF8M
4	R4421				STEM,1/2",ASTM A564 17-4 H1150 NACE
5	A83D443				CAP,1/4" FP 6000 WOG FNPT, ASTM A350 GR
6	D70456	HE			BODY,1/2" 6000 WOG,ASTM A105/LF2



VALVES & MEASUREMENT
Cameron Canada Corporation
3707 - 97 Street
Edmonton Alberta Canada T6E 6J2
Phone 780.463.6868
Fax 780.465.1244
www.c-a-m.com

GENERAL LETTER OF COMPLIANCE

for Valve Models:

T3, B3 & B2 & TT

Style 'L': Sour Low Temperature Service

Cameron Valves & Measurement hereby certifies that the design, fabrication, testing and quality control of the above NUTRON brand ball valves for Sour Low Temperature Service have been made in accordance with the following applicable standards (latest edition in effect at time of manufacture): API 598 (1-1/2" and smaller), API 6D (TT only), ASME B16.34, CSA Z245.15 Sour Service (2" FP and larger) and V&M Engineering Standards. As part of compliance to these specifications, the valves have been marked in accordance with MSS SP-25. The valve has also been marked "SOUR" as required by CSA Z245.15 marking requirements for Sour Service.

The materials of construction for this valve conform to the metallurgical requirements of NACE MR0175/ISO 15156:2003 (Parts 1 & 2 for Carbon & Alloy Steels in SSC Region 3 Sour Service and Parts 1 & 3 for CRA's as specified in CSA Z245.15 Chapter 13). According to NACE MR0175-2003/ISO 15156, it is the customer's/user's responsibility to ensure that the valve materials will be satisfactory in the intended service.

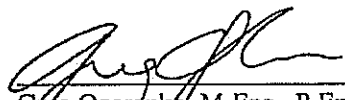
The minimum service temperature of these valves is -46°C/-50°F. Impact testing has been performed in accordance with applicable ASTM requirements and those of CSA Z245.15 for Category II M45C Service.

The 'Z' option code designation at the end of a figure number indicates that the valve meets the requirements of API-607 Fourth Edition, May 1993.

These valves (1-1/2" and larger) conform to the Pressure Equipment Directive requirements and are marked as CE certified (Certificate #8888-001-2002).

The B2 and TT valve models are constructed to be anti-static as standard.

Approved by:


Greg Ogaranko, M.Eng., P.Eng.
Engineering Manager



VALVES & MEASUREMENT
Cameron Canada Corporation
3707-97th St.
Edmonton Alberta Canada T6E 6J2
Phone 780.468.2732
www.c-a-m.com

CERTIFICATE OF CONFORMANCE

API 598 Pressure Testing – Carbon and Low Alloy Steel (2" RP and Smaller)

COMPLIANCE: These valves are tested in accordance with Cameron Valves & Measurement's standard procedures and API Standard 598, as per the chart below.

Test durations are 15 seconds in length as a minimum. Test duration is defined as the period of inspection after the valve is fully prepared and is under full pressure.

Butt weld end valves shall be tested in accordance with the ANSI rating.

Actual test pressure is rounded to next highest increment on the gauge.

Carbon & Low Alloy Steel Shell and Seat Test Pressures (Table Based on Rating for Group 1.1 Materials per ANSI B16.34)

Valve Class	Maximum Working Pressure	Hydrostatic Shell Test Pressure (PSI)	Air Seat Test Pressure +/- 10 PSI
150 ANSI	285	450	80
300 ANSI	740	1125	80
600 ANSI	1480	2225	80
800 ANSI	1975	3000	80
900 ANSI	2220	3350	80
1500 ANSI	3705	5575	80
2500 ANSI	6170	9275	80
275 WOG	275	425	80
720 WOG	720	1100	80
1000 WOG	1000	1500	80
1440 WOG	1440	2175	80
1500 WOG	1500	2250	80
2000 WOG	2000	3000	80
2160 WOG	2160	3250	80
3000 WOG	3000	4500	80
3600 WOG	3600	5400	80
4000 WOG	4000	6000	80
5000 WOG	5000	7500	80
6000 WOG	6000	9000	80

Murray Aide, Quality Manager

Wen Zone

No. 0 100

原 璋 實 業 有 限 公 司**WON ZONE CORPORATION**

3F No. 185 Chung Hwa Road Sec. 2, Chung Li City 320, Taiwan R.O.C.

320 桃園縣中壢市中華路2段185號3樓 統一編號: 16879927

Tel: (03)4341 325 Fax: +886-3-4341 525 E-mail: wonzone.taiwan@msa.hinet.net

CERTIFICATE OF CHEMICAL ANALYSIS AND MECHANICAL PROPERTIES					CERTIFICATE NO. 120229- 1 DATE: 29-Feb-12				
To: COOPER CAMERON CANADA LTD.-NUTRON 2125-64 AVENUE, EDMONTON AB T6P 1Z4, CANADA									
INVOICE NO. WZ-120229A					Your Order No. 4503194451/205888				
Material Specification: ASTM A351 CF8M					Heat Treatment: Solution Annealed				
Q'TY	PART NAME	DRAWING No.	Heat Code	Mechanical Properties					
				T.S.(KSI)	Y.S.(KSI)	ELO.(%)	HBW		
4,200	5A-11500541617 Ball 1/2"	#06001-010	S6114	<u>70 min</u> 79.2	<u>30 min</u> 50.0	<u>30 min</u> 48	<u>140-237</u> 170		
30	5A-21503041220 Ball 3"	#5A-06029	S6115	72.6	31.0	47.5	171		
30	5A-21504041220002 Ball 4"	#06040-041	S6117	76.6	44.7	37.0	159		
Heat Code	Chemical Composition (%)								
	C	Mn	Si	S	P	Cr	Ni	Mo	
S6114	0.08 _{max} 0.0652	1.5 _{max} 0.8437	1.5 _{max} 0.9549	.040 _{max} 0.0098	.040 _{max} 0.0318	18-21 18.3670	9-12 9.0911	2.0-3.0 2.0788	
S6115	0.061	0.87	0.97	0.012	0.032	18.21	9.21	2.08	
S6117	0.0605	0.7100	1.1550	0.0066	0.0255	18.1950	9.1850	2.0400	
NOTE: CERTIFICATE ACCORDING TO EN 10204/3.1B									
QUALITY CONTROL INSPECTOR <i>Sandy Yeh</i>					MANAGER <i>Grant Hsu</i>				

Cameron Approved

By: laia Date:03/09/12 2:22



ISO 9001
No. 01 100 000108

原 璋 實 業 有 限 公 司

WON ZONE CORPORATION

3F No. 185 Chung Hwa Road Sec. 2, Chung Li City 320, Taiwan R.O.C.

320 桃園縣中壢市中華路2段185號3樓 統一編號: 16879927

Tel: (03)4341 325 Fax: +886-3-4341 525 E-mail: wonzone.taiwan@msa.hinet.net

CERTIFICATE OF CHEMICAL ANALYSIS AND MECHANICAL PROPERTIES					CERTIFICATE NO. 111214- 1 DATE: 14-Dec-11					
To. COOPER CAMERON CANADA LTD.-NUTRON 2125-64 AVENUE, EDMONTON AB T6P 1Z4, CANADA										
INVOICE NO. WZ-111214A					Your Order No. 4503130699/130702/131676					
MATERIAL SPECIFICATION: ASTM A-564 TYPE 630 H1150D ✓										
Q'TY	PART NAME	DRAWING No.	Heat Code	Mechanical Properties						
				Y.S.(KSI) 105 min	T.S.(KSI) 125 min	ELC.(%) 16 min	HRC 24~33	RA (%) 50 min	R ₁ -bf (-75°F) 15 min	
3,000	Stem 1/2" ✓	#02001	R4421	130	138	20.5	32	74	120/114/107	
3,840	Stem 7/8" ✓	#02002	R4422	105	138	22	29	73	109/110/114	
1,500	Stem 1-1/2" ✓	#02122	DL	120	133	23	30	74	89/103/94	
180	Stem 3" ✓	#02005	DK	136	144	19	33	70	35/38/36	
900	Ball 7/8" ✓	#06002	S5972	128	139	21	32	71	99/111/111	
288	Ball 1-1/2" ✓	#06003	S5973	118	138	24	30	69	75/71/76	
Heat Code	Chemical Composition (%)									
	C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb+Ta
✓ R4421	0.07max	1.0max	1.0max	0.030max	0.040max	15-17.5	3.0-5.0	0.5 max	3.0-5.0	0.15-0.45
✓ R4422	0.02	0.65	0.46	0.024	0.029	15.45	4.27	0.17	3.50	0.22
✓ DL	0.02	0.62	0.45	0.021	0.028	15.13	4.24	0.10	3.41	0.20
✓ DK	0.02	0.66	0.49	0.024	0.029	15.05	4.34	0.19	3.34	0.20
✓ S5972	0.02	0.61	0.44	0.020	0.027	15.09	4.34	0.21	3.39	0.21
✓ S5973	0.02	0.66	0.49	0.022	0.024	15.06	4.39	0.13	3.41	0.22
Solution Treatment: 1900°F for 30 Min/Inch (Minimum of 1 Hour), Fast Air Cooling to below 90°F										
Double Aged at 1150°F for 4 hours minimum and cooled to below 90°F in air										
NOTE: CERTIFICATE ACCORDING TO EN 10204/3.1B										
QUALITY CONTROL INSPECTOR					MANAGER					
Sandy Yeh					Grant Hsu					

CAMERON

DEC 27 2011

Q.C. APPROVED



Material Test Report

Specification Notes:

Name ASTM A105/ASTM A350 GR LF2 Cameron	Revision	Grade	Description Carbon & Low-Alloy Steel Forgings	Revision Year 2011
--	----------	-------	--	-----------------------

Product Information:

Item #	Product Code	Description	Heat Number	Heat Code	PO #
1	5A-1020100231600	CAP, 1/4" FP 6000 WOG FNPT, ASTM A350 GR	A83D443		

Chemical Information:

Item #	C	Mn	P	S	Si	Ni	Cr	Mo	Qr	V	CE	Cl/Nb	Cr+Ni	Cr+Mo
Min		0.6			0.15									
Max	0.23	1.35	0.035	0.035	0.3	0.4	0.3	0.12	0.4	0.08	0.43	0.02	1.00	0.32
1	0.19	0.89	0.01	0.006	0.23	0.046	0.13	0.006	0.081	0.041	0.3822	0.009		

Physical Information:

Item #	Tensile (psi)	Yield (psi)	% Elongation	Charpy ft-lb (average of a set)	Charpy Temp (°F)	% Red of Area	Hardness (Brinell)
Min	70000	36000	22	15	-80	30	137
Max	95000				-50		187
1	73244	52939	30.5	69	-50	68.5	170.33

Additional Notes:

QUENCHING 920°C @ 2HRS, 800°C @ 2HRS TEMPERING 700°C @ 2HRS
--

We certify that the items referenced in this document were manufactured and tested in accordance with Cameron Purchase Order requirements and EIH0204 3.1

M. Aida
Quality Manager
Cameron Canada

Material Test Report

Specification Notes:

Name	Revision	Grade	Description	Revision Year
ASTM A105/ASTM A350 GR LF2 Cameron			Carbon & Low-Alloy Steel Forgings	2010

Product Information:

Item #	Product Code	Description	Heat Number	Heat Code	PO #
1	5A-10000532600	BODY, 1/2" 6000 WOG, ASTM A105/LF2	D70456	HE	

Chemical Information:

Item #	C	Mn	P	S	Si	Ni	Cr	Mo	Cu	V	CE	Co/Nb	Cu+Ni	Cr+Mo
Min		0.6			0.10									
Max	0.21	1.35	0.030	0.030	0.3	0.4	0.3	0.12	0.4	0.08	0.43	0.02	1.00	0.32
1	.2	1.21	.009	.018	.21	.04	.05	.01	.110	0.0		.014		

Physical Information:

Item #	Tensile (psi)	Yield (psi)	% Elongation	Charpy ft/lb	Charpy Temp (°F)	% Red of Area	Hardness (Brinell)
Min	70000	36000	22	15	-80	30	137
Max	95000				-50		197
1	76300	49700	34	83, 57, 87	-50	71	148

Additional Notes:

NORMALIZED AS PER ASTM A105

We certify that the items referenced in this document were manufactured and tested in accordance with Cameron Purchase Order requirements and EIH0204 3.1

M. Aida
Quality Manager
Cameron Canada

Issuing Authority: Marvin J. (Ty) DeBelser		Quality Control
Date of Issue: March 13, 2008		QCFO Final Inspection Release Certificate R00

FINAL INSPECTION RELEASE CERTIFICATE

CUSTOMER:	NWP STOCK	SALES ORDER#:	NA
PRODUCT:	Scrubber, Vertical Vessel, 8-5/8" x 23" x 285#, 1/8 CA, 100F to -50F, Radiography	WO#:	08500
Qty 5	None	DATE:	<i>Oct 05/12</i>

FINAL INSPECTION DOCUMENTATION

REVIEWED BY:	ACCEPTED:	REJECTED:
STANDARD DOCUMENTATION REQUIREMENTS: (SEE DOCUMENT REQUIREMENT LIST)		
ADDITIONAL DOCUMENT REQUIREMENTS: (TO BE RECORDED HERE IF APPLICABLE I.E. DOCUMENT PACKAGE REQUIRED BY CUSTOMER ETC.)		

Q.C. FILE CLOSURE BY: <i>Kasha Joz</i>	DATE: <i>Oct 5 2012</i>
--	-------------------------

LOOSE COMPONENTS REQUIRED / PREPARED

ITEMS REQUIRED:	NO. OF BOXES OR PKGS. _____
<i>8" O.D. x 23" S/S FUEL GAS SCRUBBERS QTY-5</i>	
ADDITIONAL HARDWARE OR FASTENERS REQUIRED	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>

PREPARATION FOR SHIPMENT / STORAGE

PREPARATION NEEDED / COMPLETED
<i>RELEASE TO NEXT PROCESS</i>


S/N #	NWP-08500-1 TO NWP-08500-5
INVENTORY TAGS ATTACHED	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>

SHIPPING INSTRUCTIONS

CUSTOMER P.O. REVIEWED	YES <input type="checkbox"/> N/A <input checked="" type="checkbox"/>
------------------------	--

CONTACT PERSON AUTHORIZED TO RELEASE PRODUCT:	_____
PHONE:	FAX:

RELEASED TO INVENTORY:	<i>Roy Smith</i>	DATE:	<i>Oct 05/12</i>
RELEASED TO CUSTOMER:		DATE:	

NWP Industries Inc™		Website: www.nwp.ca
PO Box 6280		Phone: (403) 227-4100
4017-60 Ave.		
T4G 1S9		Fax: (403) 227-4102

HYDROSTATIC TEST AFFIDAVIT

Customer: NWP Industries Inc JO# 08500
 Project: 8" OD x 23" S/S Fuel Gas Scrubbers Project#
 Test Pressure: 371 PSI Hold Time: 15 Min
 Code Requirements: ASME Sec VIII Div 1 2010 Edition, 2011a Addenda

All Personnel Advised of Test ☒ All Signs & Flagging Posted ☒
 Prior to Filling – Fitting/Hoses & Component Meet Required Test Pressure
 Sign-Off Supervisor: Tester: Date:

Product Description:

5 vertical-fuel gas scrubbers

50% Test Pressure Leak/Systems Check Completed ☒

186 PSI

Equipment Drained & Flushed to Prevent Freezing: Yes: ☐ No: ☐

Start Time:	Finish Time:

Test Gauge Identification #	Pressure Range	Calibration Date
NWPG- 1000- <u>77</u>	0-1000 PSI	<u>07 MAR 2013</u>
NWPG- 1000- <u>#1004</u>	0-1000 PSI	<u>17 SEP 2013</u>
NWPG-	PSI	
NWPG-	PSI	
NWPG-	PSI	
NWPG-	PSI	
NWPG-	PSI	
NWPG-	PSI	

Test By: <u>Matt Alexander</u>	Date: <u>Oct 5/12</u>
Approved By: <u>[Signature]</u>	Date: <u>OCT 5/12</u>

ALBERTA MUNICIPAL AFFAIRS

ABSA, the pressure equipment safety authority
9410 – 20th Avenue
Edmonton, AB T6N 0A4

MANUFACTURER'S DATA REPORT
FOR MINIATURE PRESSURE VESSEL
DÉCLARATION DE CONFORMITÉ DU CONSTRUCTEUR
D'APPAREILS SOUS PRESSION

Upon shipment of a pressure vessel, this form fully and correctly filled in must be mailed to the office of the Chief Inspector in the province of installation in accordance with the regulations under the Act, governing the construction and installation of pressure vessels.

Au moment de l'expédition d'un appareil sous pression, ce formulaire complété correctement, doit être envoyé au bureau de l'inspecteur en chef de la province d'installation tel que prévu dans les règlements de la loi sur les appareils sous pression.

Manufactured by Construit par	Name and address of Manufacturer/ Nom et adresse du constructeur NWP Industries Inc 4017 60 th Ave Innisfail AB T4G 1S9
Manufactured for Construit pour	Name and address of Purchaser or Consignee/ Nom et adresse du client ou de son représentant NWP Industries 4017 60 th Ave Innisfail AB T4G 1S9
Ultimate owner Utilisateur	Name and address/ Nom et adresse NWP Industries Inc 4017 60 th Ave Innisfail AB T4G 1S9
Location of installation Lieu d'installation	Name and address/ Nom et adresse Stock

Pressure vessel/ Appareil

Type/ Genre Vertical Fuel Gas Scrubber	Overall Length/Longueur totale 23"	Serial No./ N° de série NWP-08500-1 to NWP-08500-5	Year built/Année de fabrication 2012
Provincial Registration No. – C.R.N./N° d'enregistrement provincial - N.E.C. OH09319.213			Drawing No./ N° de dessin 2959.01A Rev 1, 2959.01B Rev1

The chemical and physical properties of all parts meet the requirements of material specifications of the A.S.M.E. Code.

Les propriétés chimiques et physiques de toutes les composantes respectent les exigences des spécifications de matériaux de code ASME.

The design, construction and workmanship conform to CSA B51. La conception, la construction et la façon sont conformes à ACNOR B51.	ASME Section VIII	Division 1	Addenda/Supplément 2011A	Code case No. N° de cas NA
Manufacturer's partial data reports properly identified and signed by authorized inspectors have been furnished for the following items of the report, and attached to this report: Les rapports partiels du constructeur adéquatement identifiés et signés par les inspecteurs autorisés ont été produits pour les items suivants du rapport, et attachés à ce rapport:				
Names of parts/ Nom de la composante NA	Item No./ N° d'item NA	Manufacturer's Name/ Nom du constructeur NA	Identifying Stamp/ Estampe d'identification NA	
NA	NA	NA	NA	

Shell/ Virole

Description	Material Matériau	Thickness Épaisseur	Corr. Allow. Surépais. de corr.	Diameter Diamètre	Longitudinal Joints Joints longitudinaux			P.W.H.T. Traitement therm		Girth Joints Joints de circonférence		Number of courses Nombre de sections
					Type	R.T. Radiog.	Efficiency Efficacité	Temp.	Time Durée	Type	R.T. Radiog.	
Shell	SA-106B	0.322"	1/8"	8 5 / 8"	NA	NA	1.0	NA	NA	1	NA	1

Heads/ Têtes

Description	Material Matériau	Min. Thicken. Épais min.	Corr. Allow Surép. Corr.	Crown. Radius Rayon couron.	Knuckle Radius Petit rayon	Ellipse Ratio Rapp. ellipse	Conical Apex Angle Angle conique	Hemisph. Radius Ray. Hémisph	Flat Diameter Diam. plat	Side to pressure Côté sous pression
Weld Cap	SA-234-WPB	.282"	1/8"	NA	NA	NA	NA	NA	NA	Concave
Weld Cap	SA-234-WPB	.282"	1/8"	NA	NA	NA	NA	NA	NA	Concave
Removable bolts used (describe other fastenings) Boulons amovible utilisés (décrire tout autre attache) NA					Mat'l Spec./ Spéc. du mat. NA			Grade NA		Size/ Dimension NA

Pressure - Temperature/ Pression - température

Pressure Vessel Part Partie de l'appareil	Constructed for max. allowable working pressure Construit pour une pression maximale de marche permise	At max. temp. A une temp. max.	Minimum design metal temp. Temp. min.	Test pressure (hydro-pneumatic or combination) Pression d'épreuve (hydro-pneumatique ou combinaison)
Full Vessel	285 PSI	100 F	-50 F	371 PSI

Tube Section/ Faisceau tubulaire

Tubesheet/ Plaque tubulaire	Material/ Matériau	Diameter/ Diamètre	Nominal Thickness Épaisseur nominale	Corr. Allow. Surépais. corrosion	Attachment Mode d'attachement
NA	NA	NA	NA	NA	NA
Tube material/ Matériau des tubes	Diameter/ Diamètre	Nominal Thickness (gauge) Épaisseur nominale (calibre)	Number/ Nbre	Type (Straight or U) Type (Droit ou U)	Heating Surface Surface de chauffe
NA	NA	NA	NA	NA	NA

Jacket/ Chemise

Type of jacket/ Genre de chemise	Jacket closure Fermeture de chemise	Proof Test Pression d'épreuve	Heating Surface Surface de chauffe	Sketch/ Schéma
NA	NA	NA	NA	NA

Safety Valve Outlets/ Soupapes de sûreté

Number/ Nombre	Dimension	Location/ Endroit
NA	NA	NA

Nozzles and Openings/ Tubulures et ouvertures

Purpose/ But	Number Nombre	Dimension	Type	Material Matériau	Nominal Thickness Épaisseur nominale	Reinforcement material Matériau de renfort	How attached Genre d'attaches	Location/ Endroit
C1 Outlet / Inspection	1	2" NPT	Half Coupling	SA-105N	CL 3000	Weld	UW 16.1 C	Top Cap
C2 Inlet	1	1" NPT	TOL	SA-105N	CL 3000	Weld	UW 16.1 A	Shell
C3 HOR. Drain/ Inspection	1	3/4" NPT	TOL	SA-105N	CL 6000	Weld	UW 16.1 A	Bottom Cap

Supports/ Supports

Skirt/ Jupe Yes/ Oui No/ Non <input checked="" type="checkbox"/> <input type="checkbox"/>	Lugs/ Oreilles No./ Nbre NA	Legs/ Pieds No./ Nbre NA	Other/ Autres (Description) NA	Attached/ Attaches (Where and How/ Méthode et endroit) By Welding
---	-----------------------------------	--------------------------------	-----------------------------------	---

Remarks/ Observations (Cubical capacity/ Volume)

Construction Drawing SCR823-1 Rev2
Impact Test Exempt Per UCS-66B (Figure UCS-66.1)
Radiography None per UW11C Hydrotested in Vertical Position
Weight Empty 145 lbs JO# 08500

Certificate of Compliance/ Certificat de conformité

We certify that the statements made in this data report are correct and that the said vessel has been constructed in accordance with the Provincial Registered design below and the requirements of standard CSA B51.

Nous certifions que les données de la déclaration de conformité sont correctes et que l'appareil a été construit en accord avec l'enregistrement provincial ci-dessous et les exigences de la norme ACNOR B51.

Provincial Registered Design
Enregistrement provincial OH09319.213

Manufacturer
Constructeur NWP Industries Inc.

Signature RW/ L. L. L. Date OCT 05/12
(Representative)

Signature _____ Date _____
(Certified Individual)

TRAVEL SHEET (FRONT)

DO NOT START CONSTRUCTION WITHOUT AI REVIEW						TRAVEL SHEET REVISION NO.:			
AI REVIEW:					REVIEW DATE:				
SERIAL NO. NWP-08500-5		JOB NO.: 08500		VESSEL TYPE: 8 5/8" OD X 23" S/S 285 PSI, SCRUBBER					
DRAWING NO. SCR823-1		DWG. REVISION NO.: 2		TRAVEL SHEET INITIATION BY: <i>[Signature]</i>					
Seq.	Item	Comments	Q.C.I.	Date	A.I. Hold Points	A.I.	Date	Owner	Date
1.	Calculations in File		<i>RA/R</i>	<i>AUG 07/12</i>					
2.	Release of App'd Dwg.		<i>RA/R</i>	<i>AUG 07/12</i>					
3.	Materials Examined		<i>RA/R</i>	<i>7/13/12</i>					
4.	Heat Numbers Recorded		<i>RA/R</i>	<i>8/13/12</i>					
5.	MTRs Checked		<i>RA/R</i>	<i>SEP 27/12</i>					
6.	W.P.S. Checked		<i>RA/R</i>	<i>8/13/12</i>					
7.	Welder (s) Qualified		<i>RA/R</i>	<i>7/13/12</i>					
8.	Thicknesses Verified & Recorded		<i>RA/R</i>	<i>SEP 27/12</i>					
9.	Shell(s) & Head(s) Fit-up Inspection <i>HOLD</i>		<i>KB</i>	<i>AUG 21/12</i>					
10.	Nozzles & Fittings Fit-up Inspection		<i>KB</i>	<i>AUG 21/12</i>					
11.	Nozzle Orientation <i>HOLD</i>		<i>RA/R</i>	<i>8/13/12</i>					
12.	Nozzle & Flange Rating Checked		<i>RA/R</i>	<i>7/13/12</i>					
13.	Impact Tests <i>NA</i>								
14.	Internals Checked		<i>RA/R</i>	<i>8/28/12</i>					
15.	Final Internal Inspection	Shell Side Tube Side	<i>RA/R</i>	<i>8/27/12</i>					
16.	Weld Size Checked		<i>RA/R</i>	<i>8/21/12</i>					
17.	Welder I.D. Checked		<i>RA/R</i>	<i>8/21/12</i>					
18.	Final External Inspection		<i>RA/R</i>	<i>8/21/12</i>					
19.	Radiography <i>NA</i>								
20.	Other N.D.E. <i>NA</i>								
21.	Final Ext. Prior to P.W.H.T. <i>NA</i>								
22.	PWHT Chart Checked <i>NA</i>								
23.	Hydrostatic Test <i>HOLD</i>	Shell Side Tube Side	<i>RA/R</i>	<i>OCT 05/12</i>					
24.	CRN Drawing	CRN# <i>0169319.213T</i>	<i>RA/R</i>	<i>AUG 07/12</i>					
25.	N.C.R. #								
26.	Nameplate Stamping		<i>08/21/12</i>	<i>08/21/12</i>					
27.	Manuf. Data Report		<i>11/01/12</i>	<i>08/25/12</i>					
28.	Nameplate Installation								

The Authorized Inspector shall be presented with the Travel Sheet prior to construction so that he can designate additional inspection points and/or Hold Points. Any revisions shall be marked with a delta symbol with revision number and described at the bottom of this page.

* Denotes an A.I. Inspection Point ** Denotes an A.I. Hold Point

TRAVEL SHEET (BACK)

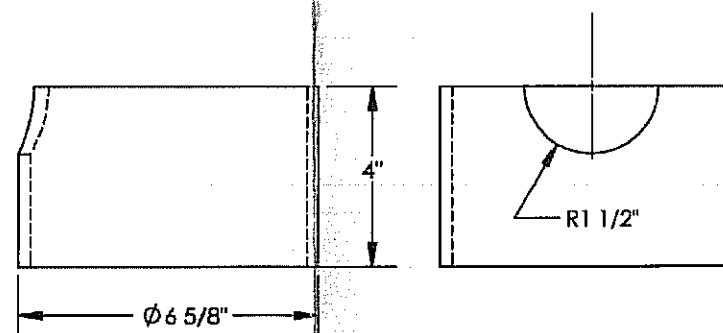
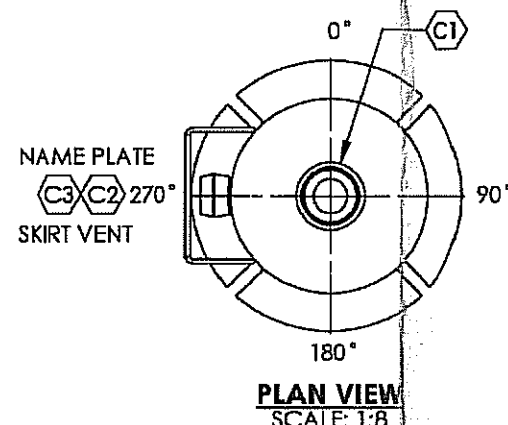
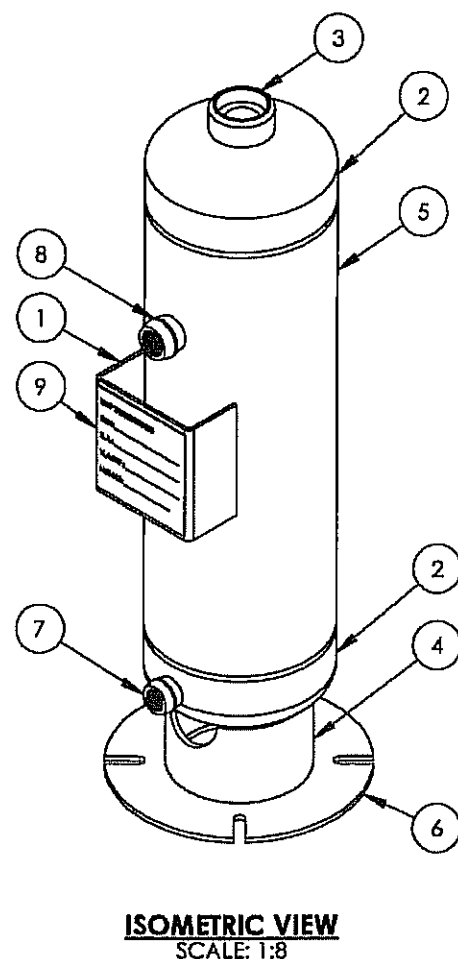
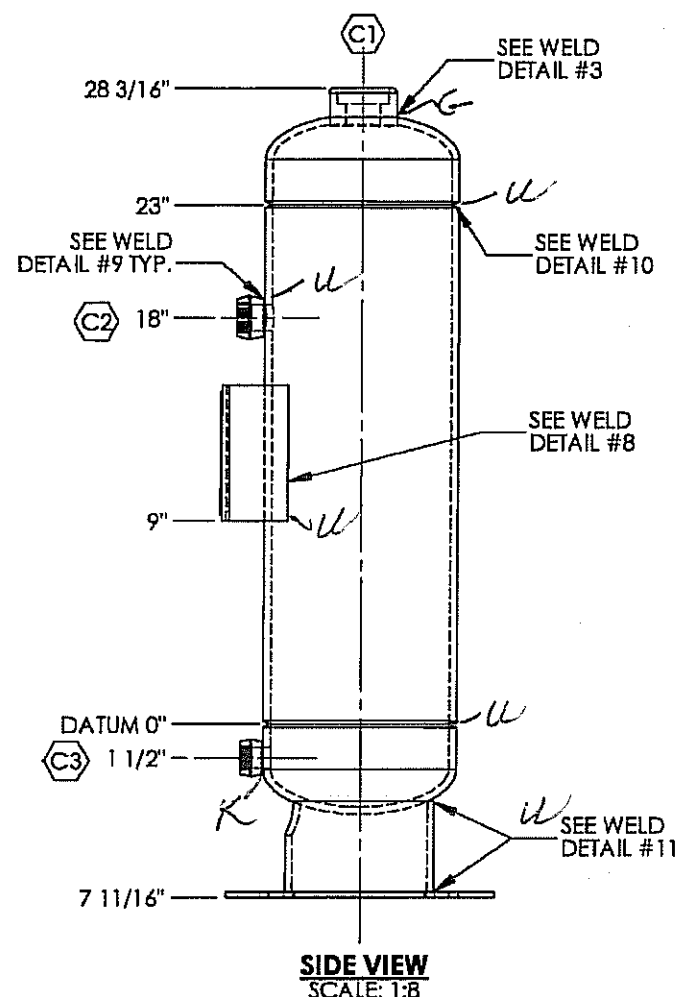
MATERIAL THICKNESS VERIFICATION AND IDENTIFICATION				WELD I.D. / WELDER SYMBOLS / FIT-UP						
Description	Thickness	Material Spec. & Grade	Heat & Slab Number or I.D. Number	Weld I.D.	Welder Symbol	Fit-Up Exam	Weld I.D.	Welder Symbol	Fit-Up Exam	Verify Type 1 Joint
Shell #1		SA106B	370541	L-			C-			
Shell #2				L-			C-			
Shell #3				L-			C-			
Shell #4				L-			C-			
Shell #5				L-			C-			
Shell #6				L-			C-			
Head #1		SA234WPB	5627				C- U		Ken	
Head #2		SA234WPB	5627				C- U		Ken	
Head #3							C-			
Head #4							C-			
Boot #1 Shell				L-			C-			
Boot #1 Head	SK14	SA106B	PL11105900				C- U		Ken	
Boot #2 Shell				L-			C-			
Boot #2 Head							C-			
Cone				L-			C-			

ATTACHMENT AND / OR NOZZLE MATERIAL THICKNESS VERIFICATION AND IDENTIFICATION						WELDER SYMBOLS / FIT-UP			
Mark	Mat. I.D.	Neck	Fitting	Flange	Repad or Attachment	Cat. B	Cat. C	Cat. D	Pad OD
C1	Spec.-Grd.		SA105N					Ken	
	Thk./Rating		3000					Ken	
	Heat# or ID		49112						
C2	Spec.-Grd.		SA105N				U		
	Thk./Rating		3000				Ken		
	Heat# or ID		58562						
C3	Spec.-Grd.		SA105N				K		
	Thk./Rating		6000				Ken		
	Heat# or ID		58614						
	Spec.-Grd.								
	Thk./Rating								
	Heat# or ID								
	Spec.-Grd.								
	Thk./Rating								
	Heat# or ID								
	Spec.-Grd.								
	Thk./Rating								
	Heat# or ID								
	Spec.-Grd.								
	Thk./Rating								
	Heat# or ID								

NOZZLE SCHEDULE										
MARK	SIZE	SCH	CLASS	TYPE	SERVICE	WELD	A	B	C	D MIN.
C1	2"	NPT	3000	CPLG	OUTLET / INSPECTION	3	9/16	-	-	-
C2	1"	NPT	3000	TOL	INLET	9	1/4	-	-	-
C3	3/4"	NPT	6000	TOL	HOR. DRAIN / INSP.	9	1/4	-	-	-

SEPARATION CHART			
SIZE	3/4"	1" NPT	2" CPLG
MAX OPENING	1.050" CUT-OUT	1.315" CUT-OUT	
3/4"	6 1/2"		
1" NPT	7 1/4"	7 7/8"	
2" CPLG	4 1/4"	4 1/2"	5 3/4"

ITEM	PART #	DESCRIPTION	MTR #	LENGTH	QTY.
1	BRACKET-NAME-1	TANK/VESSEL NAME PLATE BRACKET SA36/44W	625044		1
2	CAP8Y40GC	WELD CAP 8" SCH STD/40 BW SA234-WPB	SL27		2
3	COH2GYEE	Coupling Half 2" 3M THRD SA105N	4416		1
4	PIP640A	6" SCH. STD/40 PIPE (0.280" NOM) SA-106B	PI1105100	4" / 2	1
5	PIP840A	VESSEL SHELL 8" SCH STD/40 (0.322" NOM.) x 23" S/S SA106B	370548	23"	1
6	SCR-BP8-1	BASEPLATE FOR 8" OD SCRUBBER SA36/44W	NW4706		1
7	TOL75H1.536E	THREDOLET 3/4" 6M (1 1/2"-36") SA105N	58614		1
8	TOL1G336E	THREDOLET 1" 3M (3"-36") SA105N	58582		1
9	VES-NAMEPLATE-1	VESSEL NAME PLATE BLACK/SILVER DEEP ETCHED			1



NOTES

1. EXPOSED INSIDE EDGES OF NOZZLES OR OPENINGS SHALL BE ROUNDED PER UG-76C.
2. VESSEL TO BE CLEANED WITH ALL OPENINGS PLUGGED BEFORE SHIPMENT.
3. USED WELD PROCEDURE NWP-1 OR NWP-3 FOR ALL TACK WELDS.
4. PRIME AND PAINT: AS PER CLIENT SPECIFICATIONS.
5. SURFACE PREPARATION: HAND TOOL CLEAN (MIN.).

VESSEL DESIGN DATA	
DESIGN AND FABRICATE TO:	ASME SECTION VIII, DIVISION 1 2010 EDITION, 2011a ADDENDA
MAX. ALLOWABLE WORKING PRESSURE (MAWP):	285 PSI
DESIGN TEMPERATURE:	100 °F
MIN. DESIGN METAL TEMPERATURE (MDMT):	-50 °F
IMPACT TEST:	EXEMPT PER UCS-66b (FIG UCS-66.1)
RADIOGRAPHY:	NONE PER UW-11c
POST WELD HEAT TREATMENT:	NONE
HYDROSTATIC TEST PRESSURE:	371 PSI
CORROSION ALLOWANCE:	1/8"
PRE-HEAT:	50 °F
HEAD THICKNESS MIN.:	0.282"
WEIGHT EMPTY:	145LBS
WEIGHT FULL:	200LBS
CAPACITY:	0.87 CU FT
QUALITY CONTROL PROGRAM:	AQP-1253
WELDING PROCEDURE REGISTRATION NO.:	1604.2
WELD PROCEDURES:	NWP-1 REV 4, NWP-3 REV 3
SERVICE:	HYDROCARBONS
CRN NO.:	OH09319.213
DESIGN REGISTRATION DRAWINGS:	2959.01A REV 1, 2959.01B REV 1
REFERENCE CALCULATIONS:	08-2-0285-2959-R0

STANDARD TOLERANCES	
FABRICATION:	
GENERAL DEVIATION:	±1/8"
OVERALL LENGTH:	±1/4"
ANGULAR:	±1°
WELD PREPARATION:	
LAND:	1/16" ±1/32"
ROOT GAP:	1/8" ±1/16"
ANGULAR:	±15°

WELD DETAIL #3	WELD DETAIL #8	WELD DETAIL #9	WELD DETAIL #10	WELD DETAIL #11
 WPS NWP-1	 WPS NWP-1	 WPS NWP-1	 WPS NWP-3	 WPS NWP-1

DOCUMENT NO.	DESCRIPTION	REV	DATE	BY	CHK	APP	DRAWING REVISIONS
		2	2012.01.26	JHK	GH	DF	RFDC #0076B REVISE 6" PIPE LENGTH
		1	2012.01.06	JHK	GH	DF	RFDC #00711 REVISE DESIGN DATA
		0	2011.08.26	DJ	GH	DF	ISSUED FOR CONSTRUCTION

ISSUED FOR CONSTRUCTION
SIGNED: *[Signature]*
DATE: JUL 19 2012
W.O.: 8500
S.O.: *[Signature]*
ALL DIMENSIONS IN INCHES

NWP INDUSTRIES INC.
Total oilfield supply.
P.O. BOX 6280, INNISFAIL, AB T4G 1S9
PH: (403) 227-4100 FAX: (403) 227-4102
THIS DRAWING IS PROPERTY OF NWP INDUSTRIES INC. AND MAY NOT BE REPRODUCED WITHOUT PERMISSION. THIS DRAWING MUST BE RETURNED UPON REQUEST.

NWP INDUSTRIES LTD
VERTICAL SCRUBBER
8 5/8" OD x 23" S/S x 285 PSI
1/8" C.A., 100 °F, -50 °F
FULL GAS SCRUBBER ASSEMBLY
DWN: DJ CHK: GH APP: DF
DATE: 2011.08.02 DATE: 2011.09.01 DATE: 2011.09.01
SCALE: 1:8 DWG: SCR823-1 REV: 2
SHEET: 1 OF 1

CERTIFIED BY



MADE IN CANADA

8" OD X 23" S S FUEL GAS SCHEIDT

MAWP 285 PSI AT 100 °F

MAEWP PSI AT °F

MDMT °F AT 285 PSI

S/N. NWP-08500-4 YEAR BUILT 2012

CRN 1053121

08500-4

NWP Industries
Job Order Paperwork



Order: 08089-D

Item: BRACKET-NAME-1

Description Tank/Vessel Name Plate Bracket

Ordered: 85.00

Qty To Mfg: 85.00

Entered: 04/16/12

Delv Req: 04/23/12

Customer: STOCK

Name: STOCK

Customer PO:

Contact:

Parent Order: 08089

Drawing: BRACKET-NAME-1

OPER	S	WORK CENTER	QTY	SETUP	RUN	START/END	DESCRIPTION	U/M	QTY
------	---	-------------	-----	-------	-----	-----------	-------------	-----	-----

10		CNC	85.00	0.00	8.50				
----	--	-----	-------	------	------	--	--	--	--

Plasma/Shear/Brk

OPER:



WC:



Structural Welding As Per CSA W47.1 and W59

Employee Identification:

GRUS HARKONEN

MTR

Stock HT # 6251049

Fabrication:

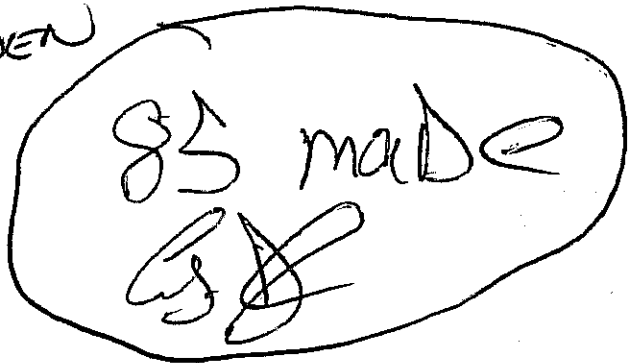
C.N.C

Date:

April 20 / 2012

Quality:

Date:



PLAA60120A

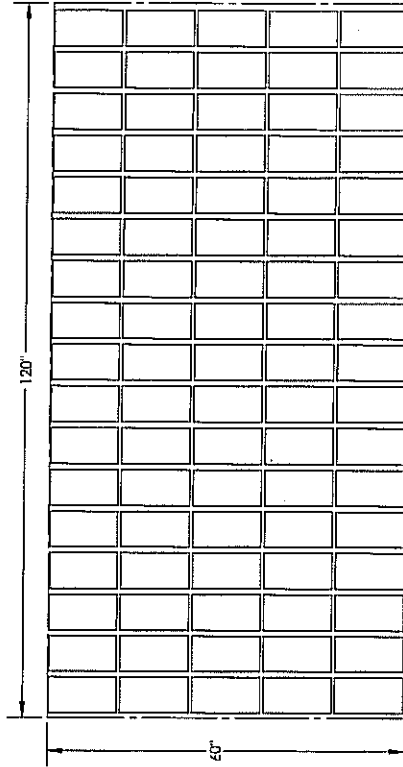
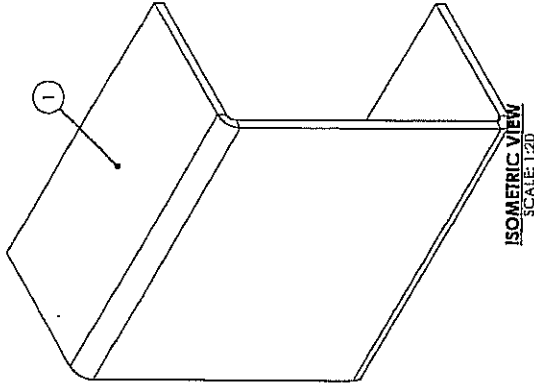
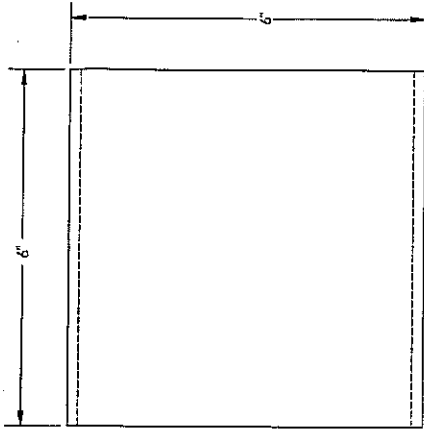
Each

1.02

Plate 3/16" x 60" x 120" SA36/44W



ITEM	PART #	DESCRIPTION	AMT #	LENGTH	QTY.
1	PLAA60120A	PLATE 3/16" x 60" x 120" SA36/44W			1



ISSUED FOR CONSTRUCTION

- NOTES**
1. HEAT NUMBER TO BE CLEARLY MARKED ON EACH PIECE WITH PAINT PEN AS A MINIMUM.
 2. ALL DOCUMENTATION MUST ACCOMPANY SHIPMENT OF PARTS IF PART IS OUTSOURCED.
 3. ALL DIMENSIONS TO HAVE A TOLERANCE OF $\pm 1/8"$ UNLESS OTHERWISE SPECIFIED.
 4. DEBURR AND RADIUS ALL SHARP EDGES.

ISSUED FOR CONSTRUCTION SIGNED: <i>[Signature]</i> DATE: <i>APR 17/12</i> W.O. <i>08089-D</i> S.O.: <i>---</i>		NWP INDUSTRIES INC. TANK/VESSEL NAME PLATE BRACKET 6" x 6" x 3" x 3/16" THK FORMED PART DRAWING DWG: JHK CHK: <i>[Signature]</i> DATE: 2011.03.16 SCALE: 1:2 SHEET: 1 OF 1	
P.O. BOX 6980, INNESVILLE, VIC 3150 PH: (03) 227-4100 FAX: (03) 227-4102 THIS DRAWING IS PROPERTY OF NWP INDUSTRIES INC. AND MAY NOT BE REPRODUCED WITHOUT PERMISSION. THIS DRAWING MUST BE RETURNED UPON REQUEST.		NWP INDUSTRIES INC. TANK/VESSEL NAME PLATE BRACKET 6" x 6" x 3" x 3/16" THK FORMED PART DRAWING DWG: JHK CHK: <i>[Signature]</i> DATE: 2011.03.16 SCALE: 1:2 SHEET: 1 OF 1	
ALL DIMENSIONS IN INCHES DRAWING REVISIONS		NWP INDUSTRIES INC. TANK/VESSEL NAME PLATE BRACKET 6" x 6" x 3" x 3/16" THK FORMED PART DRAWING DWG: JHK CHK: <i>[Signature]</i> DATE: 2011.03.16 SCALE: 1:2 SHEET: 1 OF 1	



EVRAZ INC. NA

8250 130th Street, Surrey, BC, V3V 8J9

Test Certificate

Form TCT: Revision 1: Date 31 Oct 2000

Customer:
VARSTEEL LTD.
330-220 4TH STREET
LETHBRIDGE
AB T1J 4J7

Customer P.O. No.: RD-943813

Mail Order No.: 41-242722-01

Shipping Manifest: ST048151

Product Description: CSA G40.21(200M)435W/30MW / ASTM A36(05)
A709(01A)36(ASME SA36(01ED))

Ship Date: 24 Oct 11
Cert Date: 24 Oct 11

Cert No: 011131457
(Page 1 of 1)

Size: 0.188 X 60.00 X 120.0 (IN)

Tested Pieces

Tensiles

Charpy Impact Tests

Heat Id	Piece Id	Piece Dimensions	Tst Loc	YS (PSI)	UTS (PSI)	%RA	Elong 2in	Elong 8in	Tst Dir	Average Hardness	Abs. Energy 1	2	3	Avg	Tst 1	% Shear 2	3	Avg	Tst Tamp	Tst Dir	Tst Siz (mm)	BDWTT Tamp	%Shr
6251049	1H4F1961	0.188 X 60.00 (CUT)	L	54000	71000	✓	27	✓	T														
			C	56000	69000	✓	31	✓	T														
			L	60000	73000	✓	30	✓	T														
			C	59000	72000	✓	25	✓	T														
6251049	1H4F1965	0.188 X 60.00 (CUT)																					

Chemical Analysis

Heat Id	C	Min	P	S	Si	Tot Al	Cu	Ni	Cr	Mo	Co	V	Ti	B	N	ORGN
6251049	.15	1.00	.022	.013	.01	.030	.03	.02	.02	.00	.001	.003	.002	.0000	.0038	AU

MATERIAL MARKED WITH AN ASSERISK IS PRODUCED FROM COIL
* 6251049 1H4F1965 PCES: 20, NGT: 7678

"Conforms with ASME

Sec II Part A, 2010 edition
2011a addenda""Conforms with ASME
Sec II, Part A, 2010 edition"APPROVED
By Ceri Steen at 9:10 am, Apr 19, 2012

Cust Part # :

WE HEREBY CERTIFY THAT THIS MATERIAL
WAS TESTED IN ACCORDANCE WITH THE
APPROPRIATE SPECIFICATION

Greg Balsdon

CHECKED BY

NWP Industries
Job Order Paperwork



Order: 08491-A

Item: SCR-BP8-1

Description: Baseplate for 8" OD Scrubber

Ordered: 45.00

Qty To Mfg: 45.00

Entered: 07/13/12

Delv Req: 07/20/12

Customer: STOCK

Name: STOCK

Customer PO:

Contact:

Parent Order: 08491

Drawing: 438529

OPER	S	WORK CENTER	QTY	SETUP	RUN	START/END	DESCRIPTION	U/M	QTY
------	---	-------------	-----	-------	-----	-----------	-------------	-----	-----

10		CNC	45.00	0.00	3.75				
----	--	-----	-------	------	------	--	--	--	--

Plasma/Shear/Brk

OPER:



WC:



Structural Welding As Per CSA W47.1 and W59

Employee Identification:

CYRUS MARKONEN

MTR

HT# NW4706

HT# 2804m

HT# 0054m

HT# 488386

Fabrication:

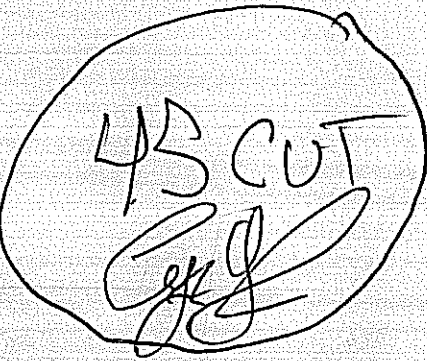
C.N.C

Date:

JUL 19 2012

Quality:

Date:



PLAB60120A

Each

0.999

Plate 1/4" x 60" x 120" SA36/44W



all N.I
Plate used



EVRAZ INC. NA

Test Certificate

Form TCI: Revision 1: Date 31 Oct 2000

Customer:
WILKINSON
A DIVISION OF PREMETAL CO INC.
6125 51ST ST. S.E.
CALGARY
AB T2C3V2

Customer P.O. No.: P20117ME001C

Mill Order No.: 41-244124-03

Shipping Manifest: C1031508

Product Description: CSA G40.21(2004)44W/300W / ASTM A36(05)

A709(01A)36/ASME SA36(01ED)

Ship Date: 22 Feb 12
Cert Date: 22 Feb 12
Cert No: 051061366
(Page 1 of 1)

Size: 0.250 X 72.00 X 150.0 (IN)

Tested Pieces			Tensiles				Charpy Impact Tests								
Heat Id	Piece Id	Piece Dimensions	Tst Loc	YS (PSI)	UTS (PSI)	%RA	Elong % 2in 8in	Tst Dir	Average Hardness	Abs. Energy(FTLB) 1 2 3 Avg	% Shear 1 2 3 Avg	Tst Temp	Tst Dir	Tst Siz (mm)	BDWT Temp %Sht
488386	B0011	0.245 X 72.00 (CUT)	L	67000	76000	✓	35✓17	T							
488386	B0014	0.308 X 72.00 (CUT)	C	62000	73000	✓	45✓22	T							
			L	66000	75000	✓	43✓22	T							
			C	60000	72000	✓	46✓25	T							

Chemical Analysis																ORGN
Heat Id	C	Mn	P	S	Si	Al	Cu	Ni	Cr	Mo	Co	V	Ti	B	N	CAN
488386	0.05	0.73	0.015	0.005	0.25	0.029	0.39	0.12	0.19	0.05	0.024	0.002	0.018	0.001	0.0078	

MERCURY IS NOT A METALLURGICAL COMPONENT OF THE STEEL AND NO MERCURY WAS INTENTIONALLY ADDED DURING THE MANUFACTURE OF THIS PRODUCT
MATERIAL MARKED WITH AN ASTERISK IS PRODUCED FROM COIL
* 488386 B0012 PCS: 43, WGT: 32924

"Conforms with ASME
Sec II, Part A, 2010 edition,
2014a addenda"

60138112
[Signature]

(9) Cust Part # :

WE HEREBY CERTIFY THAT THIS MATERIAL
WAS TESTED IN ACCORDANCE WITH THE
APPROPRIATE SPECIFICATION

Jason Wall
Checked by

ESSAR Steel Alberta Inc.

105 West Street, Sault Ste. Marie, Ontario Canada P6A 7B4

CUSTOMER PURCHASE ORDER NUMBER 15302-B5	ENTRY DATE 2011/12/19	CREATE DATE 2012/01/30	INVENTORY NUMBER 261477	SHIPPER'S NO. -	CARRIER CP
CHARACTER TO CUSTOMER NAME AND ADDRESS ALBERTA INDUSTRIAL METALS LTD 4821 - 78TH STREET RED DEER ALBERTA T4P 1N5			SHIP TO CUSTOMER NAME AND ADDRESS ALBERTA INDUSTRIAL METALS LTD 7660 49TH AVENUE CALGARY, ALBERTA T4P 4G6		

MILL TEST REPORTS

CUSTOMER SPECIFICATION
HOT ROLLED STEEL SHEET - HSLA - TO CHEM OF ASTM A36/CSA G40.21 44W (05) - TO THE CHEM OF CSA G40.21 38W - TOP SEMI-CRITICAL SURFACE - STANDARD SHAPE - HSLA - CUT EDGE ACCEPTABLE - RESTRICTED GAUGE 1/2 TOL. - T/R INFO ONLY-COIL
END 1/HEAT

SUPPLEMENTARY INSTRUCTIONS

TEST CERT 1: BRADABIM.CA TEST CERT 2: PLATE TEST COUPON:

TEST REPORTS REQUIRED

TEST VETTED RESALE
2000212222 DS
2012/01/31 10:59

K. UGHADPAGA

MANAGER METALLURGICAL SERVICES

THIS MILL TEST REPORT MAY NOT BE REPRODUCED EXCEPT IN FULL WITHOUT WRITTEN APPROVAL OF ESSAR STEEL ALBERTA INC. IF YOU RECEIVE THIS DOCUMENT AND ARE NOT THE INTENDED RECEIVER, PLEASE CALL (705) 945-2624 FOR INSTRUCTIONS ON METHOD OF DISPOSAL OF DOCUMENT.

MEETS EN 10204:2004 TYPE 3.1 CERTIFICATES AVAILABLE AT WWW.ESSARSTEELALBERTA.COM
ISO QUALITY AND ENVIRONMENTAL HEATS INDICATED WITH (+) MADE IN CANADA WITH DOMESTIC AND NORTH AMERICAN MATERIALS

CUSTOMER ITEM 00007 OUR ITEM 003 DIMENSIONS 240 MIN X 60 X COIL

COIL NUMBER	HEAT-MS	PIECES	NO. WEIGHT	COIL NUMBER	HEAT-MS	PIECES	NO. WEIGHT
60411004	2804M-53	1	37711	60411005	2804M-04	1	38084

TENSILE TESTS:

HEAT	GAUGE	COND	METH	DIR	YIELD	TENSILE	% ELONG
2804M	DSPC	2400	AR	2	59.0	73.0	31(2%)

HEAT	(WT %)	C	MN	P	S	SI	CR	NI	CU	MO	AL	CB	V	B
2804M	+	0.18	0.89	0.008	0.008	0.02	0.02	0.02	0.05	0.01	0.030	0.016	<0.008	

Conforms with ASME

Section 1, Part A, 2010 edition,

2014 addenda

WARNING

THE TEST RESULTS AND VALUES REPORTED HEREIN INDICATE ONLY THAT (1) THE PARTICULAR STEEL FOR WHICH THIS CERTIFICATE IS ISSUED MEETS THE MINIMUM SPECIFIED YIELD STRENGTH AND (2) THE CHEMICAL ANALYSIS AND PHYSICAL PROPERTIES OF SUCH STEEL ARE IN CONFORMANCE WITH THE REQUIREMENTS OF THE SPECIFICATION INDICATED. THE RESULTS OR VALUES REPORTED HEREIN CAN NOT BE USED TO QUALIFY THE STEEL FOR ANY SPECIFICATION OTHER THAN THE ONE INDICATED AND CAN NOT BE RELIED UPON FOR ANY PURPOSE (INCLUDING DESIGN OR CALCULATIONS) AS REPRESENTING THE ACTUAL STRENGTH OF SUCH STEEL.

2011/12/19

ESSAR Steel Algoma Inc.

105 West Street, Sault Ste. Marie, Ontario Canada P6A 7B4

CUSTOMER PURCHASE ORDER NUMBER 15063-BS
 ENTRY DATE 2011/10/05
 CREATE DATE 2011/11/20
 TALLY NUMBER 251758
 SHIPPER'S NO. -
 CARRIER NOXL

CHARGE TO CUSTOMER NAME AND ADDRESS
 ALBERTA INDUSTRIAL METALS LTD
 4821 - 78TH STREET
 RED DEER ALBERTA
 T4P 1N5

SHIP TO CUSTOMER NAME AND ADDRESS
 ALBERTA INDUSTRIAL METALS LTD
 7660 49TH AVENUE
 CALGARY, ALBERTA
 T4P 4G6

-380828

MILL TEST REPORTS

ESSAR STEEL ALGOMA INC. HEREBY CERTIFIES THAT THE MATERIAL HEREIN DESCRIBED WAS MADE AND TESTED IN ACCORDANCE WITH THE RULES OF THE SPECIFICATION SHOWN. ALL RESULTS ARE RETAINED IN ACCORDANCE WITH THE COMPANY'S STANDARD RECORD KEEPING PRACTICES.

K. UGHADPAGA

MANAGER METALLURGICAL SERVICES

THIS MILL TEST REPORT MAY NOT BE REPRODUCED EXCEPT IN FULL WITHOUT WRITTEN APPROVAL OF ESSAR STEEL ALGOMA INC. IF YOU RECEIVE THIS DOCUMENT AND ARE NOT THE INTENDED RECEIVER, PLEASE CALL (705) 945-2624 COLLECT FOR INSTRUCTIONS ON METHOD OF DISPOSAL OF DOCUMENT.

SUPPLEMENTARY INSTRUCTIONS

TEST CERT 1: BRADGABIM.CA TEST CERT 2: PLATE TEST COUPON:

WSP T/M TEST REPORTS REQUIRED
 USE VETTED RESALE

"Conforms with ASME Sec II, Part A, 2010 edition,
 2011/11/21 19:02

MEETS EN 10204:2004 TYPE 3.1
 ISO QUALITY AND ENVIRONMENTAL CERTIFICATES AVAILABLE AT WWW.ESSARSTEELALGOMA.COM
 HEATS INDICATED WITH (+) MADE IN CANADA WITH DOMESTIC AND NORTH AMERICAN MATERIALS

CUSTOMER ITEM 00004 OUR ITEM 004 DIMENSIONS .240 MIN X 72 X COIL

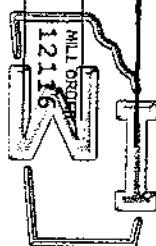
COIL NUMBER	HEAT-MS	PIECES	NO. WEIGHT	COIL NUMBER	HEAT-MS	PIECES	NO. WEIGHT
446011000	0054M-03	1	39480	446013000	0054M-05	1	39100
446015000	0054M-54	1	38750				

TENSILE TESTS:

HEAT	0054M	SAMPLE	SRCE	GAUGE	COND	TEST	METH	DIR	YIELD	TENSILE	% ELONG
HEAT	0054M	106"	.2400	AR	.2	64.2	77.2	26(2")			
HEAT	0054M	(WT %)	C	TI	MN	SN	P	S	SI	CR	Ni
			16	.87	.010	.007	.02	.02	.04	.01	.032
			.001						.022	.000	

WARNING

THE TEST RESULTS AND VALUES REPORTED HEREIN INDICATE ONLY THAT (1) THE PARTICULAR STEEL FOR WHICH THIS CERTIFICATE IS ISSUED MEETS THE MINIMUM SPECIFIED YIELD STRENGTH AND (2) THE CHEMICAL ANALYSIS AND PHYSICAL PROPERTIES OF SUCH STEEL ARE IN CONFORMANCE WITH THE REQUIREMENTS OF THE SPECIFICATION INDICATED. THE RESULTS OR VALUES REPORTED HEREIN CAN NOT BE USED TO QUALIFY THE STEEL FOR ANY SPECIFICATION OTHER THAN THE ONE INDICATED AND CAN NOT BE RELIED UPON FOR ANY PURPOSE INCLUDING DESIGN OR CALCULATIONS AS REPRESENTING THE ACTUAL STRENGTH OF SUCH STEEL.



JUN 11 2012



Form TC1: Revision 1: Date 31 Oct 2000

**EVRAZ**

EVRAZ INC. NA

8250 130th Street, Surrey, BC, V3W 8J9

Test Certificate

Customer: RUSSEL METALS INC - CALGARY 5724 40TH STREET S.E. CALGARY AB T2C1A1			Customer P.O. No.: M64036048			Mill Order No.: 41-245688-01			Shipping Manifest: ST050443								
Product Description: CSA G40.21(2004)44W/300W / ASTM A36(05) A709(01A)36/ASME SA36(01ED)			Ship Date: 08 Jan 12			Cert No: 011139794 (Page 1 of 1)											
Size: 0.250 X 96.00 X 288.0 (IN)																	
Tested Pieces			Tensiles					Charpy Impact Tests									
Heat Id	Piece Id	Piece Dimensions	Tst Loc	YS (PSI)	UTS (PSI)	%RA	Elong 2in 8in	Tst Dir	Average Hardness	Abs. Energy (FTLb)			% Shear	Tst Temp	Tst Dir	Tst Size	BDWTT Temp %Shr
NW4702	A86681AA	0.250 X 96.00 (CUT)	L	62000	78000		25	T									
NW4706	A86689AA	0.250 X 96.00 (CUT)	C	60000	77000		26	T									
			L	61000	79000		24	T									
			C	61000	79000		22	T									
Chemical Analysis																	
Heat Id	C	Mn	P	S	SI	Tot Al	Cu	Ni	Cr	Mo	Co	V	Ti	B	N	ORGN	
NW4702	.14	.87	.011	.004	.26	.032	.02	.05	.03	.00	.005	.007	.002	.0000	.0052	CAN	
NW4706	.15	.86	.011	.004	.25	.043	.02	.05	.03	.00	.005	.006	.005	.0000	.0040	CAN	
MATERIAL MARKED WITH AN ASTERISK IS PRODUCED FROM COIL * NW4702 A06681AA PCES: 22, WGT: 43124 * NW4706 A86689AA PCES: 23, WGT: 45085																	
<p>"Conforms with ASME Sec II, Part A, 2010 edition, 2011a addenda"</p> <p><i>June 26/12</i></p>																	
Cust Part # :									WE HEREBY CERTIFY THAT THIS MATERIAL WAS TESTED IN ACCORDANCE WITH THE APPROPRIATE SPECIFICATION								
									Greg Balodan CHECKED BY								

HEAT NUMBER : 370548
TRANS AM PIPING PRODUCTS - REV'D BY: 2
Shipmnet/Seq #: S 9 - 1144

8" STD SEAMLESS STEEL PIPE
A106 GR B B.E. (S.R.L.)

"Conforms with ASME
Sec II, Part A, 2010 edition,
2011a addenda" 370548
R Aug. 9/12



烟台鲁宝钢管有限责任公司

YANTAI LUBAO STEEL PIPE CO., LTD.

V.T. 318

产品质量证明书
MILL TEST CERTIFICATE

(EN10204 3.1)

PN 244347

烟台市幸福中路185号
NO. 185 XINGFU MIDDLE ROAD, YANTAI, CHINA
TEL: 0535 535 68439-16/6854750 FAX:
HTTP://WWW.LUBAOSTEELPIPE.COM

PAGE 1 OF 1

订购单位 PURCHASER		TRANS AM PIPING PRODUCTS LTD.										产品名称 DESCRIPTION OF GOODS		8" STD SEAMLESS STEEL PIPE																																																	
尺寸标准 DIMENSION STANDARD		ASME B36.10										客户代号 CUSTOMER'S NO.		100108					证书号 CERTIFICATE NO.					BQTYG0902200001600																																							
材料规格 MATERIAL SPECIFICATION		ASTM A106-B, ASME SA106-B, API 5L H										交货日期 DATE OF DELIVERY		20090920					订货合同号 SUB CONTRACT NO.					G9C69026-14																																							
		CSA Z245.1 Gr. 211 Cat 1										客户订单编号 P.O. NO.							签发日期 DATE OF ISSUE					20090220																																							
		NACE MR0175/ISO 15156										工厂检验员 STAMP OF MILL INSPECTOR																																																			
总长度 Total Length		219.1mm		壁厚 W.T.		8.18mm		长度 Length		5.8-6.7M		总重量 Total Weight		248.238		交货状态 Delivery Condition		As-Rolled		制造方法 Making Method		热轧无缝 Hot Finished Seamless		重量 Weight		260.00吨																																					
总根数 Total Pieces		886		化学成分 Chemical Composition		<table border="1"> <tr> <th></th> <th>C</th> <th>Si</th> <th>Mn</th> <th>P</th> <th>S</th> <th>Cu</th> <th>NI</th> <th>Cr</th> <th>V</th> <th>Mo</th> <th>CE</th> </tr> <tr> <td>0.22</td> <td>0.1</td> <td>0.29</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0.15</td> </tr> </table>											C	Si	Mn	P	S	Cu	NI	Cr	V	Mo	CE	0.22	0.1	0.29	0	0	0	0	0	0	0	0	0.15	试验号 Lot No.		9201773		拉伸试验 Tensile Test		屈服 Y.S.		抗拉 T.S.		伸长 E.L.		断面 EXT.		冲击试验 Impact Test		硬度 Hardness Test		支数 Pieces		重量 Weight		MT	
	C	Si	Mn	P	S	Cu	NI	Cr	V	Mo	CE																																																				
0.22	0.1	0.29	0	0	0	0	0	0	0	0	0.15																																																				
最小 MIN		0		0.1		0.29		0		0		0		0		0		0		0		0		0		0		0																																			
最大 MAX		0.22		0.1		0.29		0.035		0.035		0.10		0.10		0.09		0.15		210		415		22.0		163		886																																			
370548		H		0.19		0.21		0.54		0.008		0.095		0.07		0.04		0.03		0		0.01		0.29		9201773		P 1 2		305		500		25.0		163		886		248.238																							
100		100		100		100		100		100		100		100		100		100		100		100		100		100		100		100		100		100																													
管流 E.T.		管端 E.M.I.		管身 U.T.		管口 M.P.T.		外观尺寸 Visual & Dimensions		涂层 Coating		通体检验 Drift Test		静水压力 Hydrostatic Pressure		静水时间 Duration of Time																																															
GOOD		GOOD		GOOD		GOOD		GOOD		GOOD		GOOD		GOOD		GOOD		GOOD		GOOD		GOOD		GOOD		GOOD		GOOD		GOOD																																	
环状 Expansion		环状 Ring Expansion		环状 Ring Tensile		环状 Flattening		弯曲 Bending		卷边 Flanging		SSCC		Macrostructure		Heat Treatment																																															
注释 NOTES		2* 化学成分 Chemical Composition H: Heat (Ladle) Analysis 3* P=管体 Pipe Body; 1* 纵向 Longitudinal 5* 2=弧长试样 Script X 20mm; G.L.=Gauge Length																																																													
备注 Remarks		L.C. NO.: DPCRCV920603																																																													
公称 SURVEYOR		兹证明本厂所生产之产品, 均按标准规定制造, 取样, 试验和检验, 并符合标准要求及合同要求。 WE HEREBY CERTIFY THAT THE MATERIAL HEREIN DESCRIBED HAS BEEN MANUFACTURED, SAMPLED, TESTED AND INSPECTED IN ACCORDANCE WITH THE REQUIREMENTS OF ABOVE SPECIFICATIONS AND PURCHASE ORDER, AND MET THE REQUIREMENTS.																																																													
		质量检验部 DEPT. OF QUALITY CONTROL																																																													

MILL TEST & INSPECTION CERTIFICATE

ACCORDING TO EN 10204 : 2004 3.1

CUSTOMER : SEYBOLD INTERNATIONAL CORP.

CERT. NO : 121507

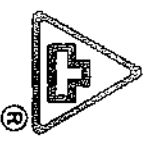
ORDER NO : 7005116

INVOICE NO : B0011001151A

DATE : 05/16/2012

PAGE : 5

ORIGIN : TAIWAN



台灣鐵工股份有限公司
 高雄市仁武區烏林里仁心路 303 號
BOTW-WEI STEEL FITTINGS CO., LTD.
 NO.303, JEN-HSIN ROAD JEN-WU DISTRICT
 KAOHSIUNG CITY, TAIWAN R.O.C. (81460)
 TEL: 886-7-371-0497, 371-1536, 372-0260
 web site: <http://www.botwell.com.tw> e-mail: botwell@botwell.com.tw



An ISO 9001:2008 Registered Manufacturer

ITEM	HT. CD.	RAW MATERIAL	DESCRIPTION	QUANTITY	MATERIAL	SPECIFICATION FOR	INSPECTION
030	2907	302144	HALF CPLG 3/8" 3000# NPT	250 PC	ASTM A105N -05	FITTING	SURFACE
034	3161	307562	HALF CPLG 1-1/4" 3000# NPT	20 PC	ASME SA105N -A08		DIM.
034	3671	324696	HALF CPLG 1-1/4" 3000# NPT	80 PC			
036	3766	327259	HALF CPLG 2" 3000# NPT	144 PC			
036	3797	328439	HALF CPLG 2" 3000# NPT	656 PC			

MN:C=4.05

ITEM	HT. CD.	C	Si	Mn	P	S	Cu	Cr	Ni	Mo	V	Co(Nb)	N	Al	Ti	Zr	CE
030	2907	0.190	0.230	0.830	0.011	0.013	0.150	0.080	0.060	0.010	0.002	0.001	-	-	-	-	0.430
034	3161	0.190	0.230	0.830	0.014	0.013	0.160	0.090	0.050	0.010	0.002	0.001	-	-	-	-	0.361
034	3671	0.190	0.200	0.820	0.015	0.008	0.170	0.180	0.070	0.020	0.002	0.001	-	-	-	-	0.363
036	3766	0.190	0.190	0.860	0.011	0.011	0.130	0.050	0.040	0.010	0.003	0.001	-	-	-	-	0.383
036	3797	0.200	0.200	0.810	0.012	0.008	0.060	0.080	0.030	0.010	0.001	0.001	-	-	-	-	0.350

ITEM	HT. CD.	T. S.	Y. S.	EL.	R of A	Hardness	Charpy Impact	HEAT TREATMENT	ADDITIONAL TESTS
030	2907	75.0	51.6	33.8	65.8	144	142	NORMALIZED	CONFORMS TO NACE MR0175-09 / N0103-10
034	3161	76.2	54.1	33.2	63.7	143	142		STEEL MAKING PROCESS : ELECTRIC FURNACE
034	3671	72.7	49.7	35.4	66.4	144	144		CONFORMS TO NACE ISO15156-3 2009
036	3766	74.9	47.4	33.8	62.6	145	145		"Conforms with ASME
036	3797	74.1	49.2	35.4	66.4	143	145		Sec II, Part A, 2010 edition

WE HEREBY CERTIFY, THAT THE MATERIAL DESCRIBED ABOVE HAS BEEN TESTED AND COMPLIES WITH THE TERMS OF THE ORDER CONTRACT.

MATERIAL CONFORMS TO CUSTOMER SPECIFICATIONS	AS PER P.O. REQUIREMENTS	INSPECTOR
		YUAN YAO CHANG

ENCANA

ENCANA

Name: *Chen Chen*
 Date: *June 15/12*
Encana
Encana
Encana

C.C. Huang

Y.Y. Chang

2011a addenda

CERTIFIED MILL TEST REPORT



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LOG NO. F00000000017351

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 07/29/2011

CUSTOMER

BONNEY ORDER NO. B000101590

ORDER NO.: S759118576

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

"Conforms with ASME
Sec II, Part A, 2010 edition"
2011a addenda

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

20	950	4916	2 3000 A105N HCP T	SA/A105N
18C10966			Al 0.022 C 0.200 ✓ Co 0.004 Cr 0.040 ✓ Cu 0.130 ✓ Mn 1.020 ✓ Mo 0.010 ✓ N 0.005 ✓ Nb 0.014 Ni 0.040 ✓ P 0.006 ✓ S 0.015 ✓ Si 0.200 ✓ V 0.003 ✓ CE(Long Formula) = 0.39 T/S(Psi) 74,375 ✓ Y/S(Psi) 51,500 ✓ EL(%) 32.80 ✓ RA(%) 63.25 Brinell 132 BHN 132 BHN	
22	25	58288	3/4X3/4X 1/2 3000 A105N TEE T	SA/A105N
18C11116			Al 0.022 C 0.190 Co 0.005 Cr 0.040 Cu 0.210 Mn 1.050 Mo 0.010 N 0.005 Nb 0.015 Ni 0.060 P 0.007 S 0.019 Si 0.200 V 0.004 CE(Long Formula) = 0.39 T/S(Psi) 73,750 Y/S(Psi) 51,250 EL(%) 31.90 RA(%) 67.00 Brinell 135 BHN 137 BHN	
23	120	58414	1X1X1/2 3M A105N TEE T	SA/A105N
18C11128			C 0.200 Cb 0.000 Co 0.003 Cr 0.060 Cu 0.100 Mn 0.990 Mo 0.010 Ni 0.030 P 0.009 S 0.018 Si 0.190 V 0.004 CE(Long Formula) = 0.39 T/S(Psi) 75,000 Y/S(Psi) 52,500 EL(%) 32.25 RA(%) 65.60 Brinell 135 BHN 132 BHN	
26	75	58259	1 3M A105N STEEL T	SA/A105N
18C11263			Al 0.022 C 0.190 Cb 0.000 Co 0.004 Cr 0.040 Cu 0.100 Mn 1.020 Mo 0.010 N 0.005 Nb 0.012 Ni 0.040 P 0.007 S 0.016 Si 0.180 V 0.004 CE(Long Formula) = 0.38 T/S(Psi) 76,875 Y/S(Psi) 52,500 EL(%) 33.55 RA(%) 66.10 Brinell 137 BHN 137 BHN	

MN:C= 5.1

ENCANA

MATERIAL CONFORMS TO CUSTOMER SPECS

By ceris at 11:46:09 AM, 4/4/2012

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

CERTIFIED MILL TEST REPORT



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LOG NO. F00000000017351

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 07/29/2011

CUSTOMER

ORDER NO.: S759118576

BONNEY ORDER NO. B000101590

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 A105-10 / ASME SA105-10 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 UNIT OF MEASURE FOR TENSILE AND YIELD (0.2%) STRENGTH ARE IN REPORTED IN PSI.
12. 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

CERTIFIED MILL TEST REPORT



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LOG NO. F00000000013522

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 04/20/2011

CUSTOMER

BONNEY ORDER NO. B000095208

ORDER NO.: S759104356

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

"Conforms with ASME
Sec II, Part A, 2010 edition,
2011a addenda"

Jan 27/12
[Signature]

ITEM	QUANTITY	LOT NO.	GRADE OR SPECIFICATION NO. CHEMICAL ANALYSIS, PHYSICAL PROPERTIES, REMARKS:
175 18C13549	25	58012	21/2-11/4X3/4 6M A105N THRD T SA/A105N A10.026 C 0.200 Cb 0.000 Co 0.003 Cr 0.030 Cu 0.090 Mn 1.070 Mo 0.010 Nb 0.015 Ni 0.030 P 0.008 S 0.024 Si 0.210 Sn 0.010 V 0.003 CE(Long Formula) = 0.39 T/S(Psi) 72,500 Y/S(Psi) 51,250 EL(%) 34.45 RA(%) 65.40 Brinell 132 BHN 135 BHN
176 18C13552	47	58332	10-3 X 3/4 6000 A105N THRD T SA/A105N A10.018 C 0.200 Co 0.003 Cr 0.030 Cu 0.140 Mn 1.030 Mo 0.010 N 0.006 Nb 0.016 Ni 0.040 P 0.008 S 0.017 Si 0.200 V 0.004 CE(Long Formula) = 0.39 T/S(Psi) 73,125 Y/S(Psi) 48,750 EL(%) 31.80 RA(%) 62.30 Brinell 130 BHN 130 BHN <i>MRC = 5.15</i> <i>[Signature]</i>
18C13552		58268	10-3 X 3/4 6000 A105N THRD T SA/A105N A10.023 C 0.200 Cb 0.000 Co 0.003 Cr 0.040 Cu 0.170 Mn 1.040 Mo 0.010 N 0.005 Nb 0.013 Ni 0.040 P 0.008 S 0.019 Si 0.200 V 0.004 CE(Long Formula) = 0.40 T/S(Psi) 71,125 Y/S(Psi) 48,775 EL(%) 34.90 RA(%) 67.25 Brinell 132 BHN 132 BHN
177 18C13561	50	58181	21/2-2 X1 6000 A105N THRD T SA/A105N A10.021 C 0.200 Co 0.004 Cr 0.030 Cu 0.080 Mn 1.040 Mo 0.010 N 0.004 Nb 0.014 Ni 0.020 P 0.008 S 0.019 Si 0.220 V 0.004 CE(Long Formula) = 0.39 T/S(Psi) 78,375 Y/S(Psi) 50,000 EL(%) 34.95 RA(%) 65.85 Brinell 135 BHN 135 BHN MATERIAL CONFORMS TO CUSTOMER SPECIFICATIONS AS PER P.O. REQUIREMENTS Name: <i>C. Steele</i> Date: <i>Jan 27/12</i> <i>[Signature]</i> <i>[Signature]</i>

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

CERTIFIED MILL TEST REPORT



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LOG NO. F00000000013522

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

www.bonneyforge.com

CUSTOMER: MRC MIDFIELD

DATE 04/20/2011

CUSTOMER

BONNEY ORDER NO. B000095208

ORDER NO.: S759104356

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. THE MATERIAL SUPPLIED IDENTIFIED AS A105N WAS NORMALIZED IN ACCORDANCE WITH ASTM A105 HEAT TREATING REQUIREMENTS.
3. THE MATERIAL SUPPLIED AS A105N MEETS THE REQUIREMENTS OF BOTH NACE MRO103-2007 AND NACE MRO175/ISO 15156-2. ✓
4. CERTIFYING ASTM A105-09 / ASME SA105-07 EDITION.
5. THE PRODUCT SUPPLIED WAS INSPECTED IN ACCORDANCE WITH EN 10204:2004 EDITION TYPE 3.1 INSPECTION DOCUMENT. (EUROPEAN STANDARD)
6. THE MATERIAL SUPPLIED IDENTIFIED AS A105QT WAS QUENCHED AND TEMPERED IN ACCORDANCE WITH ASTM A105 HEAT TREATING REQUIREMENTS.
7. THE UNIT OF MEASURE FOR TENSILE AND YIELD (0.2%) STRENGTH ARE IN REPORTED IN PSI.
8. 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



Manufacturer of Piping and Pressure Vessel Components

4407 Haygood St - Houston, TX 77022

Phone: 713-695-3633 Fax: 713-695-3528

A Booney Forge Company

Page 8 of 8

Sold To: TRANS AM PIPING PRODUCTS
 LTD
 9335 ENDEAVOR DRIVE S.E.
 CALGARY AB T3S 0A1

MTR #: 220,759

PO #: CI-11-645

Sales Order #: C001115274

Date: 12/16/2011

Certified Material Test Report

Heat Code: 58582

This product has not come in direct contact with mercury or any of its compounds, nor with any mercury-containing device employing a single boundary of containment. No welding performed.

We certify that the contents of this report are correct and accurate, and that all test results and operations performed by WFI or its subcontractors are in compliance with the material specification and requirements of the referenced code or standard, and that the material conforms to the dimensional requirements of the order. This document is in accordance with EN10204 3.1.

Material: A/SA105N 09

Item	Description
11	36 - 3 X 1 3M THP SHIP AND BACKORDER A/SA105N

**"Conforms with ASME
 Sec II Part A, 2010 edition
 2011a addenda"**

Chemical Composition

Ladle	C	CR	CU	MN	MO	NB	NI	P
	0.200	0.03	0.050	1.04	0.000	0.014	0.02	0.005
	S	SI	V					
	0.023	0.23	0.003	0.39				
Carbon Equivalency:	Ladle							

APPROVED

By Ceri Steen at 11:32 am, Apr 17, 2012

mn:c= 5.2

Product	C	CR	CU	MN	MO	NI	P	S
	0.000	0.00	0.000	0.00	0.000	0.00	0.000	0.000
SI	V							
	0.00	0.000						

Product	Tensile PSI	Yield PSI	Elong %	RA %	Hardness
Normalized	72,758	47,951	36.70	62.56	137 BHN

IAW NACE MR0175/ISO 15156- 2009

**MATERIAL CONFORMS
 TO CUSTOMER
 SPECIFICATIONS
 AS PER P.O.
 REQUIREMENTS**

Encana

Marie Dehmer
 Quality Assurance Representative



Manufacturer of Piping and Pressure Vessel Components

4407 Haygood St - Houston, TX 77022

Phone: 713-695-3633 Fax: 713-695-3528

A Donney Forge Company

Page 1 of 1

Sold To: TRANS AM PIPING PRODUCTS
 LTD
 9335 ENDEAVOR DRIVE S.E.
 CALGARY AB T3S 0A1

MTR #: 222,961

PO #: CI-11-645

Sales Order #: C001115274

Date: 01/26/2012

This product has not come in direct contact with mercury or any of its compounds, nor with any mercury-containing device employing a single boundary of containment. No welding performed.

We certify that the contents of this report are correct and accurate, and that all test results and operations performed by WFI or its subcontractors are in compliance with the material specification and requirements of the referenced code or standard, and that the material conforms to the dimensional requirements of the order. This document is in accordance with EN10204 3.1.

Certified Material Test Report

Heat Code: 58614

MATERIAL CONFORMS
 TO CUSTOMER
 SPECIFICATIONS
 AS PER P.O.
 REQUIREMENTS

Material: A/SA105N 09

Item Description
 15 36 - 1 1/2 X 3/4 6M THP
 A/SA105N

MN:C= 4.63

Paramount
 Encana

Chemical Composition

Ladle	C	CR	CU	MN	MO	NB	NI	P
	0.220	0.03	0.040	1.02	0.000	0.014	0.02	0.007
B	SI	V						
	0.021	0.19	0.004					

Carbon Equivalency: 0.40

Product	Tensile PSI	Yield PSI	Elong %	RA %	Hardness
	74,320	45,333	31.20	61.09	130 BHN

Normalized

IAW NACE MR0175/ ISO 15156- 2009

"Conforms with ASME
 Sec II, Part A, 2010 edition,
 2011a addenda"
 May 10.12

Marie Delmer
 Quality Assurance Representative



燁輝企業股份有限公司
YIEH PHUI ENTERPRISE CO., LTD.

品質證明書 INSPECTION CERTIFICATE

台灣省高雄市楠梓區芋寮里字寮路369號
No. 369, Yuliao Road, Qiaotou District
Kaohsiung City 82544, Taiwan (R.O.C.)
TEL:+886(0)7 6117181 FAX:+886(0)7 6126355

客戶名稱 CLIENT	STEMCOR USA INC. 350 FIFTH AVENUE, SUITE-1526 NY10118 NEW YORK U.S.A.	證明書編號 CERTIFICATE NO.	P113136	證明書開立日期 ISSUE DATE	20110329
商品名稱 COMMODITY	PRIME NEWLY MANUFACTURED E.R.W. PIPE IN ACCORDANCE WITH YPS OR ASTM A53-2007 GRADE A OR B AS APPLICABLE. NX2986/4644701	訂單號碼 ORDER ITEM NO.	PRP93A1	發票號碼 INVOICE NO.	PRP93A1
		產品名稱 PRODUCT	HOT-ROLLED STEEL PLAIN END E.R.W. PIPE		
		產品規格 SPECIFICATION	ASTM A53-2007 GRADE B / ASME SA53-2004 GRADE B, ELECTRIC-RESISTANCE WELDED, PLAIN END, BLACK STEEL PIPE.		

2513005

序號 SEQ NO.	批號 HT NO.	訂單尺寸 ORDERED DIMENSIONS			MECHANICAL PROPERTIES AND OTHERS							化學成分 CHEMICAL COMPOSITION wt%																		
		管徑*厚度*長度 OD*THICK*LENGTH	數量(支) Q'TY/PCS	重量 WEIGHT(KG)	TENSILE TEST			彎曲 BEND TEST	壓扁 FLATT EN TEST	水壓 LEAK TEST	溫度 TEMP E.T	衝擊試驗 IMPACT TEST	鍍鋅試驗 ZINC COATING	BASIC OXYGEN FURNACE & CONTINUOUS CASTING - A1-KILLED STEEL																
					屈服強度 YIELD	抗拉強度 TENSILE	伸長率 EL(%)							C	Mn	Si	P	S	Cu	Ni	Cr	Mo	V	Al	Nb	Ti	CEV			
					N/mm ²	N/mm ²	%							X10 ²	X10 ³	X10 ²	X10 ³	X10 ³	X10 ³	X10 ³	X10 ³	X10 ³	X10 ³	X10 ³	X10 ³	X10 ³	X10 ³			
規格值 SPECIFICATION		240 min	415 min	24 min	2/30 1/30																									
1	P11105600	6"x0.280"x21.00'	294	59184	378	437	33.6	OK	OK	OK																				
2	P11360300	6"x0.280"x21.00'	56	10130	370	438	31.0	OK	OK	OK																				
		重量: 63314 TOTAL WEIGHT: 63314																												
		"Conforms with ASME Sec II, Part A, 2010 edition,				"Conforms with ASME Sec II, Part A, 2010 edition" Sept - Oct - 2011																								

"Conforms with ASME
Sec II, Part A, 2010 edition,

"Conforms with ASME
Sec II, Part A, 2010 edition"
Sept - Oct - 2011

2011a addenda"
LR Aug 9, 2012

無放射性污染證明 NON-RADIOACTIVE CONTAMINATION CERTIFICATION	SUBSCRIPTION
茲證明上述產品符合「放射性污染建築物事件防範及處理辦法」之規定，無放射性污染現象。原子能委員會合格証號：鋼構偵字第三一號。 THIS IS TO CERTIFY THE PRODUCT(S) THAT LISTED ABOVE COMPLIES WITH THE RULE OF "REGULATIONS FOR PREVENTION AND MANAGEMENT OF INCIDENT OF RADIOACTIVE CONTAMINATED BUILDINGS" AND NO RADIO CONTAMINATION PHENOMENON WAS FOUND. CERTIFICATE OF ATOMIC ENERGY COUNCIL: DOCUMENT NO. 131.	Chang-Hsin Ming
茲證明本表所列製品，均依材料規格製造及試驗，並符合規格之要求。 WE HEREBY CERTIFY THAT MATERIAL DESCRIBED HEREIN HAS BEEN MANUFACTURED AND TESTED WITH SATISFACTORY RESULTS IN ACCORDANCE WITH THE REQUIREMENT OF THE ABOVE MATERIAL SPECIFICATION.	技術部協理 ASSISTANT VICE PRESIDENT-TECHNOLOGY DIVISION

2789440-09

1505000

Encana



INSPECTION CERTIFICATE

Paramount

MATERIAL CONFORMS
 TO CUSTOMER
 SPECIFICATIONS
 AS PER P.O.
 REQUIREMENTS

Customer: TRANS AM PIPING PRODUCTS LTD.
 Product: SEAMLESS CARBON STEEL BUTT WELD FITTINGS
 Spec: ASME SA/ASTM A234 WPB-058
 GSA A245 11-96 Gr 241 CAP 11 NACE MR0175-03

17 TUNG LI ROAD HSIAO KANG
 KAOHSIUNG, TAIWAN R.O.C.
 TEL: (07) 831-9157
 FAX: (07) 831-2942, 821-7500

Certificate No.: 09900116-0116
 Order No: C110547
 Date: 2011/06/27

(MILL TEST)
 CHUP HSIN ENTERPRISE CO., LTD.

Specification for Raw Material		Specification for Inspection		Visual Examination		Dimensional Inspection	
ASME SA516 GR. 70		ASME B16.9-2003		GOOD		GOOD	
Item	Description	Quantity	Heat ID	Heat No.	Raw Material Mfg	Raw Certificate NO.	
7	CAP STD SEAMLESS	50	G689	6C689	C.S.C.	9701E10056	
10	CAP STD SEAMLESS	125	W921	5W921	C.S.C.	970202H0077	
11	CAP STD SEAMLESS	100	S627	2S627	C.S.C.	950728A0240	

"Conforms with ASME
Sec II, Part A, 2010 edition,
2011a addenda" *May 30/12*

Specification	Chemical Composition %											Tension Test		HARDNESS TEST	Heat Treatment	Magnetic Particle Exam	Remarks
	C	Si	Mn	P	S	CU	NI	Cr	Mo	V	Nb	C.E.	YS PSI				
MIN	100	10	25	50	58	40	40	40	15	80	20	50	35000	60000	17	197	
MAX	30	24	88	24	4	2	1	3	0	3	10	36	49769	74726	41	144	
7	21	24	88	24	4	2	1	3	0	3	10	36	49769	74726	41	144	S.R. 650 C
10	17	12	85	18	8	3	2	1	1	3	10	36	47448	68342	23	138	X0.5HR
11	22	25	109	16	1	1	1	3	1	4	11	41	55428	80385	23	144	
			✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓		

MN:C= 4.95

[DIN 50049/31B]	
EN10204 3.1	

"Conforms with ASME
 Sec II, Part A, 2010 edition,
 2011e addenda" *May 30, 12*

Chemical Composition %														Tension Test			
Specifi- cation	C	Si	Mn	P	S	Cu	Ni	Cr	Mo	V	Nb	C.E.	Y.S.	T.S.	E	HARD NESS	Heat Treatment
MIN	100	10	29	50	58	40	40	70	15	80	20	50	35000	60000	17	197	
MAX	30	24	88	24	4	2	1	3	0	3	10	36	49769	74726	41	144	S.R. 650°C
	10	12	85	18	8	3	2	1	1	3	10	32	47448	68342	23	138	X0.5HR
	11	22	109	16	1	1	1	3	1	4	11	41	55428	80385	23	144	

MN:C= 4.95

C.B.=C+Mn/6+(Cr+Mo+V)/5+(Ni+Cu)/15
 We hereby certify that the material herein described has been manufactured,
 sampled, tested and inspected in accordance with the requirements of above
 specifications and purchaser's order.

Chief of Quality Assurance Section

L.S. Tsai