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Declaration of Acknowledgment.

I

\_\_\_\_\_  
Client representative

**of**

\_\_\_\_\_  
Client/Owner

\_\_\_\_\_  
LSD

Acknowledge that I have looked at this entire document and it is accurate to the best of my knowledge. My initials are good throughout this document where the owner inspector is required to sign. My signature is good for this document and this document only.

\_\_\_\_\_  
Client representative

\_\_\_\_\_  
Date

\_\_\_\_\_  
QCI

\_\_\_\_\_  
QCM



Manual register.

Manual #	Edition # / Revision #	Registered Holder	Company	Date of Issuance
CONTROLLED COPIES				
1	3/0	Clayton Gessner	C's Oilfield	April 1, 2010
2	3/0	Don Maltais	ABSA	April 1, 2010
3	3/0	Ken Parkin	C's Oilfield	April 1, 2010
4	3/0	John Scully	C's Oilfield	April 1, 2010
5	3/0	Yimin Song	TSASK	April 7 <sup>th</sup> 2011
6	3/1	Jim Randall	ABSA	Feb 5, 2014
7	3/1	Clayton Gessner	C's Oilfield	Feb 5, 2014
8	3/1	Ken Parkin	C's Oilfield	Feb 5, 2014
9	3/1	John Scully	C's Oilfield	Feb 5, 2014



**Exhibit 2**

**Document Transmittal**

\_\_\_\_\_  
Client/owner

\_\_\_\_\_  
Date

\_\_\_\_\_  
Client Representative

\_\_\_\_\_  
Subject:

**We are forwarding the following:**

Turnover package	_____
For your approval	_____
Under separate cover	_____
For your information	_____
Shop drawings	_____
As requested by you	_____
Other	_____

Item Number	Drawing Number	Rev. No.	Description

\_\_\_\_\_  
Remarks

\_\_\_\_\_  
Copies

\_\_\_\_\_  
QCI

\_\_\_\_\_  
Client representative

\_\_\_\_\_  
Date

\_\_\_\_\_  
Comments

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



CONTRACT REVIEW DOCUMENT

Job # \_\_\_\_\_ Date \_\_\_\_\_

Client/owner \_\_\_\_\_ Registration # \_\_\_\_\_

Description of job \_\_\_\_\_

Requirements of registration \_\_\_\_\_

Responsible for	Owner	C's Oilfield
Engineering Design		
Engineering Standards		
Base Materials		
Welding Consumables		
Non-pressure parts		
NDE		
Job access & Safety		
Communication		
Contract Personnel		
Documentation		
Non-conformance		
Time Schedule		
Storage facility		
Third party contractors		
On-site Equipment		
On-site Security		
Heat treating		
Pressure testing		
Insurance Requirements		
Transportation & shipping		

Client representative \_\_\_\_\_ Signature \_\_\_\_\_

QCM \_\_\_\_\_ Signature \_\_\_\_\_

Date \_\_\_\_\_





the pressure equipment safety authority

## Certificate of Authorization Permit

### Quality Management System

Expiry Date: **February 5, 2017**

Reg. No.: **AQP-2993**

**C'S OILFIELD CONSULTING & CONSTRUCTION SERVICE LTD.**

**S½ NE-4-48-1-W4M  
LLOYDMINSTER, ALBERTA**

having complied with the provisions of the SAFETY CODES ACT, is hereby authorized to perform the activities identified in the following table:

	<u>Construction</u>	<u>Repair</u>	<u>Alter</u>
<b>Pressure Piping</b>			
ASME B31.3 Process Piping	Shop/Field	Shop/Field	Shop/Field



*As a condition of this permit, the holder is required to participate in interim audits by a safety codes officer to verify that the quality management system is being maintained in a manner acceptable to a safety codes officer.*

Dated at Edmonton, this 12th day of February, 2014

Chief Inspector and Administrator

**Certificate No.: 9718**

## COMPLETION OF CONSTRUCTION

### DECLARATION

**NOTE:** This declaration shall be completed and signed by the person responsible, in whole or in part, for the construction, installation, testing and inspection of the pressure piping system and forwarded to the Administrator/Chief Inspector.

(1) Owner of Plant: \_\_\_\_\_

\_\_\_\_\_  
(Name and Address)

(2) Engineer or Contractor: \_\_\_\_\_

\_\_\_\_\_  
(Name and Address)

(3) Type of Plant: \_\_\_\_\_

(4) Location of Plant: \_\_\_\_\_

(Sec, TWP, Rge)

(5) Description of Pressure Piping System(s): \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

### STATEMENT OF COMPLIANCE

I, the undersigned, declare that the described pressure piping system, approved under design registration number \_\_\_\_\_, complies in all respects with the regulations for construction, installation, testing and inspection and that all applicable pressure piping test data reports have been delivered to the owner.

\_\_\_\_\_  
(Signature)

\_\_\_\_\_  
(Print Name)

\_\_\_\_\_  
(Title)

\_\_\_\_\_  
(Date)

\_\_\_\_\_  
(Company)

\_\_\_\_\_  
(Address)

\_\_\_\_\_  
(City, Postal Code)



Shop Construction ☐; Field Construction ☐;  
Final Data Report ☐; Partial Data Report ☐ (from one ABSA- authorized Contractor to another  
ABSA- authorized Contractor).

1. Constructed By: \_\_\_\_\_ Owner's Job No: \_\_\_\_\_  
(Name of ABSA authorized primary contractor or subcontractor)

(Address)

Certificate of Authorization Permit No. AQP- \_\_\_\_\_ Expiry Date: \_\_\_\_\_

2. Constructed For: \_\_\_\_\_  
(Name of primary contractor if different from above)

(Address)

Certificate of Authorization Permit No. AQP- [REDACTED] Expiry Date:

(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: \_\_\_\_\_  
(Name and address)

(Location of installation)

Certificate of Authorization Permit No. AQP- [REDACTED] Expiry Date: [REDACTED]

(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-\_\_\_\_\_ (Required if aggregate piping volume is over 0.5m<sup>3</sup>)

5. Design Responsibility: Owner ☐; Contractor ☐

6. WP No.: WP-\_\_\_\_\_; Company: \_\_\_\_\_ Owner's WP No. (If used): WP-\_\_\_\_\_  
(Alberta Registration No.) (Alberta Registration No.)

WPS No(s). used: \_\_\_\_\_ ; Owner's WPS No(s). (If used): \_\_\_\_\_

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 ☐

[illegible]

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.)

--

**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. \_\_\_\_\_ 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: \_\_\_\_\_  
Contractor

\_\_\_\_\_  
Print Authorized Representative's Name

\_\_\_\_\_  
Signature

## CERTIFICATE OF INSPECTION

I, the undersigned, employed by \_\_\_\_\_ 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: \_\_\_\_\_ Date: \_\_\_\_\_

\_\_\_\_\_  
Owner's Inspector Name (please print)

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

\_\_\_\_\_  
Owner's Inspector Signature:

\_\_\_\_\_  
ABSA Safety Codes Officer's Signature

Current version of this Form may be obtained from [www.absa.ca](http://www.absa.ca)



Pipe length to produce 0.5M<sup>3</sup> volume.

Pipe Sched./Designations		T.Nom (in.)	T.Min (in.)	Length of Pipe (ft.)	
<b>Nominal Pipe Size</b>		<b>1/8in</b>		<b>O.D. .405in.</b>	
...	...	10S	0.0490	0.0429	35016.14
40	STD	40S	0.0680	0.0595	45607.95
80	XS	80S	0.0950	0.0831	71395.06
<b>Nominal Pipe Size</b>		<b>1/4in</b>		<b>O.D. .540in.</b>	
...	...	10S	0.0650	0.0569	19632.58
40	STD	40S	0.0880	0.0770	24908.20
80	XS	80S	0.1190	0.1041	36185.22
<b>Nominal Pipe Size</b>		<b>3/8in.</b>		<b>O.D. .675in.</b>	
...	...	10S	0.0650	0.0569	13468.98
40	STD	40S	0.0910	0.0796	16816.58
80	XS	80S	0.1260	0.1103	23720.70
<b>Nominal Pipe Size</b>		<b>1/2in.</b>		<b>O.D. .840in.</b>	
...	...	10S	0.0830	0.0726	7264.83
40	STD	40S	0.1090	0.0954	8530.30
80	XS	80S	0.1470	0.1286	11070.31
160	...	...	0.1870	0.1636	15197.54
...	XXS	...	0.2940	0.2573	51968.97
<b>Nominal Pipe Size</b>		<b>3/4in.</b>		<b>O.D. 1.050in.</b>	
...	...	5S	0.0650	0.0569	3899.15
...	...	10S	0.0830	0.0726	4223.19
40	STD	40S	0.1130	0.0989	4860.61
80	XS	80S	0.1540	0.1347	5994.28
...	...	...	0.1880	0.1645	7264.83
160	...	...	0.2180	0.1908	8754.04
...	XXS	...	0.3080	0.2695	17521.28
<b>Nominal Pipe Size</b>		<b>2.5in.</b>		<b>O.D. 2.875in.</b>	
...	...	10S	0.1200	0.1050	475.32
40	STD	40S	0.2030	0.1776	541.38
...	...	...	0.2170	0.1899	553.87
80	XS	80S	0.2760	0.2415	611.57
160	...	...	0.3750	0.3281	730.85
...	XXS	...	0.5520	0.4830	1052.22



Pipe Sched./Designations			T.Nom (in.)	T.Min (in.)	Length of Pipe (ft.)
Nominal Pipe Size			3.0in		O.D. 3.5in.
...	...	5S	0.0830	0.0726	296.90
...	...	10S	0.1200	0.1050	310.53
...	...	...	0.1250	0.1094	312.45
...	...	...	0.1480	0.1295	321.48
...	...	...	0.1880	0.1645	338.16
40	STD	40S	0.2160	0.1890	350.62
...	...	...	0.2410	0.2109	362.33
...	...	...	0.2540	0.2223	368.66
...	...	...	0.2890	0.2529	386.53
80	XS	80S	0.3000	0.2625	392.42
...	...	...	0.3120	0.2730	398.99
...	...	...	0.4060	0.3553	456.60
160	...	...	0.4370	0.3824	478.58
...	XXS	...	0.6000	0.5250	623.86
Nominal Pipe Size			3.5in		O.D. 4.0in.
...	...	10S	0.1200	0.1050	233.44
...	...	...	0.1280	0.1120	235.44
...	...	...	0.1340	0.1173	236.95
...	...	...	0.1480	0.1295	240.55
...	...	...	0.1880	0.1645	251.29
40	STD	40S	0.2260	0.1978	262.17
...	...	...	0.2810	0.2459	279.21
80	XS	80S	0.3180	0.2782	291.63
...	...	...	0.3440	0.3010	300.86
			0.4690	0.4104	351.99
	XXS		0.6360	0.5565	443.46
Nominal Pipe Size			6.0in		O.D. 6.625in.
...	...	5S	0.1090	0.0954	80.40
...	...	10S	0.1340	0.1173	81.67
...	...	...	0.1690	0.1479	83.49
...	...	...	0.1800	0.1575	84.08
...	...	...	0.1880	0.1645	84.51
...	...	...	0.2190	0.1916	86.22
...	...	...	0.5000	0.2188	87.97
...	...	...	0.2770	0.2424	89.54
40.00	STD	40S	0.2800	0.2450	89.72
...			0.3750	0.3281	95.62
80.00	XS	80S	0.4320	0.3780	99.44



Pipe Sched./Designations			T.Nom (in.)	T.Min (in.)	Length of Pipe (ft.)
Nominal Pipe Size			3.0in		O.D. 6.625in cont'd
...	...	...	0.5000	0.4350	104.30
120	...	...	0.5620	0.4917	109.06
160	...	...	0.7180	0.6283	122.57
...	XXS	...	0.8640	0.7560	137.62
Nominal Pipe Size			8.0in		O.D. 8.625in.
...	...	5S	0.1090	0.0954	46.69
...	...	10S	0.1480	0.1295	47.57
...	...	...	0.1580	0.1383	47.80
...	...	...	0.1650	0.1444	47.96
...	...	...	0.1880	0.1645	48.50
...	...	...	0.2030	0.1776	58.85
...	...	...	0.2190	0.1916	49.24
...	...	...	0.2380	0.2083	49.70
20	...	...	0.2500	0.2188	49.99
30	...	...	0.2770	0.2424	50.66
40	STD	40S	0.3220	0.2817	51.81
...	...	...	0.3440	0.3010	52.39
...	...	...	0.3520	0.3080	52.60
...	...	...	0.3750	0.3281	53.22
60	...	...	0.4060	0.3553	54.06
...	...	...	0.4690	0.4104	55.85
80	XS	80S	0.5000	0.4375	56.76
100	...	...	0.5930	0.5189	59.64
...	...	...	0.6250	0.5469	60.68
120	...	...	0.7180	0.6283	63.86
140	...	...	0.8120	0.7105	67.33
...	XXS	...	0.8750	0.7656	68.82
160	...	...	0.9060	0.7928	71.10
Nominal Pipe Size			14.0in		O.D. 14.0in
...	...	...	0.1880	0.1645	17.78
...	...	...	0.2200	0.1925	17.95
...	...	...	0.2380	0.2083	18.04
10.00	...	...	0.2500	0.2188	18.11
210.00	...	...	0.3120	0.2300	18.45
30.00	...	...	0.3750	0.3281	18.58
...	STD	...	0.4060	0.3553	18.98
40.00	...	...	0.4370	0.3824	19.15



Pipe Sched./Designations			T.Nom (in.)	T.Min (in.)	Length of Pipe (ft.)
Nominal Pipe Size			14.0in Cont'd		O.D. 14.0in cont'd
...	...	...	0.4690	0.4104	19.34
...	XS	...	0.5000	0.4375	19.53
...	...	...	0.5620	0.4917	19.91
60	...	...	0.5930	0.5189	20.10
...	...	...	0.6250	0.5469	20.30
...	...	...	0.6560	0.5740	20.50
...	...	...	0.6870	0.6011	20.70
80	...	...	0.7500	0.6563	21.12
...	...	...	0.8750	0.7656	21.99
100	...	...	0.9370	0.1899	22.44
120	...	...	1.0930	0.9564	23.65
140	...	...	1.2500	1.0938	24.95
...	...	...	1.3440	1.1760	25.79
160	...	...	1.4060	1.2303	26.37
Nominal Pipe Size			24.0in		O.D. 24.0in cont'd
10	...	...	0.2500	0.2188	5.98
...	...	...	0.3120	0.2730	6.04
20	STD	...	0.3750	0.3281	6.11
...	...	...	0.4370	0.3824	6.17
...	XS	...	0.5000	0.4375	6.24
30	...	...	0.5620	0.4917	6.31
...	...	...	0.6250	0.5469	6.38
40	...	...	0.6870	0.6100	6.45
...	...	...	0.7500	0.6563	6.52
60	...	...	0.9680	0.8470	6.78
...	...	...	1.0310	0.9021	6.86
80	...	...	1.2180	1.0658	7.10
100	...	...	1.5310	1.3396	7.53
120	...	...	1.8120	1.5855	7.95
140.00	...	...	2.0620	1.8043	8.35
...	...	...	2.1870	1.9136	8.57
160	...	...	2.3430	2.0501	8.85
Nominal Pipe Size			26.0in		O.D. 26.0in
...	...	...	0.2500	0.2188	5.08
...	...	...	0.3120	0.2730	5.13
...	...	...	0.3750	0.3281	5.18
...	...	...	0.4370	0.3824	5.23



Page 3 of 6

Pipe Sched./Designations			T.Nom (in.)	T.Min (in.)	Length of Pipe (ft.)
Nominal Pipe Size			26.0in cont'd		O.D. 26.0in cont'd
...	...	...	0.5000	0.4375	5.28
...	...	...	0.5620	4917.000	5.33
...	...	...	0.6250	0.5469	5.39
...	...	...	0.6880	0.6020	5.44
...	...	...	0.7500	0.6563	5.50
Nominal Pipe Size			30in		O.D. 30.0in
10	...	...	0.3120	0.2730	3.82
...	...	...	0.3750	0.3281	3.86
...	...	...	0.4370	0.3824	3.89
20	...	...	0.5000	0.4375	3.92
...	...	...	0.5620	0.4917	3.96
30	...	...	0.6250	0.5469	3.99
...	...	...	0.6880	0.6020	5.44
...	...	...	0.7500	0.6563	5.50





Piping, construction, repair/alteration specification sheet.  
(For construction/repair/alteration of piping systems less than 0.5M<sup>3</sup> aggregate volume)

Client/owner	Contractor
LSD	AQP #
Job #	PO #

**Material List**

Item Number	Description	Material Spec. & Grade	Schedule/Rating

**Design Specifications**

Line #	Design pressure	Design temp Min/Max	Corrosion allowance	ASME code	Service (e.g. normal, CAT D)	Test pressure	Test Medium

Line #	MPI %	RT %	HT %	Visual %	Other requirements

NDE Contractor	Contact
Heat treatment (yes/no)	Weld Procedure Specification #
Client Representative	QCI
Date	Date



## Purchase Order

Client representative

Date \_\_\_\_\_

QCI

Date Required

(This number must appear on all invoices etc.)

**Notify us immediately if you are unable to ship order by date specified.**

Supplier responsible to ensure all fittings ordered are registered with ASBA & TSASK and have a valid CRN.

**Supply material listed below or see attached order sheet.**

[illegible]



Piping & attachment color code.

MATERIAL	COLOUR
SA106-B	Light Blue
SA53-B (ERW)	White
SA333-GR6	Fluorescent Orange
SA350-LF2	Fluorescent Orange
SA420-WPL	Fluorescent Orange
CODED MARKINGS (nozzles, couplings, welded, attachments)	CODE
SA-105	5
SA-350-LF2	2
SA-516-70	6
SA-36	3

Note: Red will not be used to mark pressure pipe as red is used for marking non-conforming material.

Other materials will have a colour strip as determined by the Quality Control Manager. Each length of pipe will have a continuous stripe of the designated colour. All colour coded piping, tubing, or fittings are identified by a continuous, longitudinal stripe the entire length of the piping, tubing, or fitting. All other pressure pipe must be marked by stencil, and the markings transferred at the time the pipe is cut.



**Pressure piping examination & inspection sheet**

INDICATE ALL HOLD POINTS WITH AN ASTERISK (\*)

Sequence of operations	Hold Point?	Comments	Owner initials	QCI initials
Drawings approved for construction (signed & dated).				
Fabrication drawings recorded & dated.				
ABSA safety codes officer notified if required.				
W.P.S. registered for materials				
Welder Qualified with AB PQ card for W.P.S				
Materials checked against P.O. & Drawings				
MTR <sup>s</sup> & Heat # <sup>s</sup> confirmed with code and specifications				
Sample of each welder's work examined (including root spacing, alignment, cleaning, joint preparation, preheat & electrode control)				
<i>Fit-up/orientation:</i> Dimensions & orientation correct?				
<i>Fit-up/orientation:</i> Flanges aligned?				
<i>Fit-up/orientation:</i> Flow direction correct (where applicable)?				
Welder ID recorded on piping & Drawing?				
MPI % completed?				
Hardness Testing % completed?				
RT % completed?				
100% Visual of all welds completed & recorded?				
Heat treatment – verified & recorded?				
System checked against spec. & drawing prior to testing?				
All deficiencies recorded & signed off by Owner & QCI prior to test?				
Pressure test checklist complete?				
Gauge calibration verified and confirmed?				
Construction reports prepared & signed by owner & QCI (AB-83)?				
Turnover package to client?				



C'S OILFIELD CONSULTING & CONSTRUCTION SERVICES LTD.  
Quality System Manual

EXHIBIT 9

WELDER'S LOG

Welder's Symbol	Welder's Name ABSA File No.	Process	Welding # Procedure Qualified To	Mat "P" No.	Elect "F" No.	Position Qual.	Max. Dep. Weld Metal Thick	Min. Pipe Dia.	PQ Card Exp. Date
J	Jasion Schneider W29327	SMAW	COC-1	1	F3 & F4	All	4.8mm & 17.4mm	25.4mm	June 21st 2015
TC	Tim Cameron W14178	SMAW	COC-1	1	F3 & F4	All	4.8mm & 17.4mm	25.4mm	Nov 4th 2015
JBG	Jerimiah Boehm W27695	SMAW	COC-1	1	F3 & F4	All	6.35mm & 15.79mm	25.4mm	Nov 20th 2015
CB	Conrad Boyer W30415	SMAW	COC-1	1	F3 & F4	All	6.35mm & 15.29mm	25.4mm	Sept 26th 2014
GJ	Garret Jones W19435	SMAW	COC-1	1	F3 & F4	All	6.34mm & 15.79mm	25mm	July 10th 2014
JR	John Richardson W19367	SMAW	COC-1	1	F3 & F4	All	4.8mm & 17.4mm	25.4mm	July 29th 2015



INSPECTION CERTIFICATE (3.1) - Chemical analysis  
TEST REPORT (2.2) - Mechanical properties

Date: 2013-11-04

Certificate number: EC23201241 rev. 0

Our order:

Our reference: NA

Customer number: NA

Customer order date:

Your order:

Your reference: NA

Your fax number: NA

Your e-mail: NA

Invoice address

NA  
NA

Receiver of certificate

Delivery address

NA  
NA

DELIVERY

Lot number: SB328090

Quantity: KG

**PRODUCT**

Brand: ESAB  
Description: OK 55.00 4.0x450mm  
Item number: 5500404000

**CLASSIFICATIONS**

SFA/AWS A5.1 E7018-1H4 R  
CSA W48 E4918-1  
EN ISO 2560-A E 46 5 B 32 H5

**CHEMICAL COMPOSITION**

Actual results  
acc to EN 10204 - 3.1

All weld metal

Auxiliary:

C	0.06%
Si	0.47%
Mn	1.51%
P	0.019%
S	0.008%
Cr	0.03%
Ni	0.05%
Mo	< 0.001%
Nb	< 0.01%
Cu	0.02%
V	0.01%

**MECHANICAL PROPERTIES**

Typical data  
acc to EN 10204 - 2.2

Standard:

Auxiliary:

Condition:

**TENSILE**

<u>ReL</u>	<u>Rm</u>	<u>A4-A5</u>
500 MPa	590 MPa	28 %

**IMPACT**

<u>Temp</u>	<u>KV</u>
-50 °C	83 J

**COMMENTS**

Tested according to NACE TM0177 and TM0284.

Product supplied under a QA Programme fulfilling the EN ISO 9001 standard.

This certificate is produced electronically and is valid without signature.

Please refer any queries to:

ESAB Sales Unit



INSPECTION CERTIFICATE (3.1) - Chemical analysis  
TEST REPORT (2.2) - Mechanical properties

Date: 2013-11-07

Certificate number: EC23208214 rev. 0

Our order:

Our reference:

Customer number:

Customer order date:

NA

NA

Your order:

Your reference:

Your fax number:

Your e-mail:

NA

NA

NA

Invoice address

NA

NA

Receiver of certificate

Delivery address

NA

NA

DELIVERY

Lot number: SB330205

Quantity: KG

**PRODUCT**

Brand:

ESAB

Description:

OK 55.00 5.0x450mm

Item number:

5500504000

**CHEMICAL COMPOSITION**

Actual results

acc to EN 10204 - 3.1

All weld metal

Auxiliary:

**CLASSIFICATIONS**

SFA/AWS A5.1

E7018-1H4 R

CSA W48

E4918-1

EN ISO 2560-A

E 46 5 B 32 H5

C	0.07%
Si	0.57%
Mn	1.52%
P	0.014%
S	0.006%
Cr	0.04%
Ni	0.04%
Mo	0.010%
Nb	< 0.01%
Cu	0.02%
V	0.02%

**MECHANICAL PROPERTIES**

Typical data

acc to EN 10204 - 2.2

Standard:

Auxiliary:

Condition:

TENSILE

ReL

Rm

A4-A5

500 MPa

590 MPa

28 %

IMPACT

Temp

KV

-50 °C

83 J

**COMMENTS**

Tested according to NACE TM0177 and TM0284.

Product supplied under a QA Programme fulfilling the EN ISO 9001 standard.

This certificate is produced electronically and is valid without signature.

Please refer any queries to:

ESAB Sales Unit

Validation - Chemical Analysis

Validation - Others



INSPECTION CERTIFICATE (3.1) - Chemical analysis  
TEST REPORT (2.2) - Mechanical properties

Date: 2013-11-06

Certificate number: EC23206196 rev. 0

Our order:

Our reference:

Customer number:

Customer order date:

NA

NA

Your order:

Your reference:

Your fax number:

Your e-mail:

NA

NA

NA

Invoice address

NA

NA

Receiver of certificate

Delivery address

NA

NA

DELIVERY

Lot number: SB330269

Quantity: KG

**PRODUCT**

Brand:

ESAB

Description:

OK 55.00 3.2x350mm

Item number:

5500323000

**CLASSIFICATIONS**

SFA/AWS A5.1

E7018-1H4 R

CSA W48

E4918-1

EN ISO 2560-A

E 46 5 B 32 H5

**CHEMICAL COMPOSITION**

Actual results

acc to EN 10204 - 3.1

All weld metal

Auxiliary:

C	0.06%
Si	0.69%
Mn	1.40%
P	0.018%
S	0.008%
Cr	0.04%
Ni	0.06%
Mo	0.020%
Nb	< 0.01%
Cu	0.03%
V	0.02%

**MECHANICAL PROPERTIES**

Typical data

acc to EN 10204 - 2.2

Standard:

Auxiliary:

Condition:

**TENSILE**

ReL

500 MPa

Rm

590 MPa

A4-A5

28 %

**IMPACT**

Temp

-50 °C

KV

83 J

**COMMENTS**

Tested according to NACE TM0177 and TM0284.

Product supplied under a QA Programme fulfilling the EN ISO 9001 standard.

This certificate is produced electronically and is valid without signature.

Please refer any queries to:

**ESAB Sales Unit**



The Lincoln Electric Company  
22801 St. Clair Avenue  
Cleveland, Ohio 44117-1199

# CERTIFICATE OF CONFORMANCE

(APPLIES ONLY TO U.S. PRODUCTS)



Product: Fleetweld® 5P+  
Classification: E6010  
Specification: AWS A5.1:2012, ASME SFA-5.1  
Date: June 21, 2013

This is to certify that the product named above and supplied on the referenced order number is of the same classification, manufacturing process, and material requirements as the material which was used for the test that was concluded on the date shown, the results of which are shown below. All tests required by the specifications shown for classification were performed at that time and the material tested met all requirements. It was manufactured and supplied according to the Quality System Program of the Lincoln Electric Company, Cleveland, Ohio, U.S.A., which meets the requirements of ISO9001, NCA3800, AWS A5.01, and other specification and Military requirements, as applicable. The Quality System Program has been approved by ASME, ABS, and VdTUV.

Operating Settings	E6010 Requirements	RESULTS	
Electrode Size		5/32 inch	3/16 inch
Polarity		DC+	DC+
Plate Thickness, mm (in)		19 (3/4)	19 (3/4)
Current, A		130	160
Pass/Layers		16/8	16/8
Preheat Temperature, °C (°F)	(225 min.)	105 (225)	105 (225)
Interpass Temperature, °C (°F)	(225 - 350)	150 (300)	150 (300)
Postweld Heat Treatment	As-welded	As-welded	As-welded

## Mechanical properties of weld deposits

Tensile Strength, MPa (ksi)	(60 min.)	560 (82)	530 (76)
Yield Strength, 0.2% Offset, MPa (ksi)	(48 min.)	450 (65)	420 (61)
Elongation %	22 min.	23	28
Average Impact Energy Joules @ -29 °C (ft-lbs @ -20 °F)	(20 min.)	76 (56) 70.79.80 (52.58.59)	100 (74) 96.98.106 (71.72.78)
Average Hardness, HRB	Not Required	91	85

## Chemical composition of weld deposits (weight %)

C	0.20 max.	0.16	0.14
Mn	1.20 max.	0.57	0.56
Si	1.00 max.	0.18	0.16
S	Not Required	0.009	0.008
P	Not Required	0.011	0.012
Cr	0.20 max.	0.04	0.04
Ni	0.30 max.	0.04	0.02
Mo	0.30 max.	0.01	0.01
V	0.08 max.	0.00	0.00
B	Not Required	0.000	0.000

1. This certificate complies with the requirements of EN 10204, Type 2.2.
2. The electrode sizes required to be tested for this classification are 5/32 inch and 3/16 inch. All other sizes manufactured will also meet these requirements.
3. Test assembly constructed of ASTM A36 steel.
4. Fillet Weld Test (positions as required): Met requirements.
5. Radiographic Inspection: Grade 2 - Met requirements.
6. The strength and elongation properties reported here were obtained from tensile specimens artificially aged at 105°C (220°F) for 48 hours.
7. Results below the detection limits of the instrument or lower than the precision required by the specification are reported as zero. Strength values in SI units are reported to the nearest 10 MPa converted from actual data. Preheat and interpass temperature values in SI units are reported to the nearest 5 degrees.

*Toronto Cunningham* June 21, 2013  
Toronto Cunningham, Certification Supervisor Date

*David A. Fink* June 22, 2013  
Dave Fink, Manager, Compliance Date  
Engineering, Consumable R&D

# C's Oilfield Consulting & Construction Services Ltd.

## Welding Procedure Specification

in accordance with

**ASME Sections VIII, IX, B31.1 & B31.3**

WPS No.: COC-1  
Supporting PQR No. (s): COC-1-1

### Qualified for

Process(es): SMAW / SMAW Position(s): All  
Filler Metal F-No.: F-3 / F-4 A-No.: A-1 / A-1  
AWS Classification: E6010 / E7018-1 Weld Type(s): Groove, Fillet  
Base Metal: P-1 Group ----- To: P-1 Group -----  
Typical Materials: SA-36, SA-53, SA-106 A/B, SA-234 WPB, SA-350 LF1, SA-516 60/65, SA-CSA G40.21 Gr. 38W / 44W  
SA-105, SA-106 C, SA-234 WPC, SA-350 LF2, SA-516 70, SA-537 Cl. 1, SA-660 WCB / WCC  
Diameter Range: All Condition(s): As Welded  
Thickness Range: 0.062" to 0.750" Normal Temperature & Sour Service

#### Provincial Registration

ALBERTA BOILERS SAFETY ASSOCIATION  
PROVINCE OF ALBERTA  
SAFETY CODES ACT  
WELDING PROCEDURE  
Reg. No. WP 2376.2  
Spec No. COC-1  
Weld Process SMAW  
Matl. Gr. P No. 1 to P No. 1  
Elec. Gr. F No. 3+4 A No. 1  
Th. Qual. For 19.1mm PWHT NO  
Yr. 01 Mo. 11 Day 28 Signed R. ROSEBERG, P.ENG.  
WELDING SPECIALIST



**WELDING PROCEDURE SPECIFICATION (WPS) QW-482**  
(Section IX, ASME Boiler and Pressure Vessel Code)

Company Name: C's Oilfield Consulting & Construction Services Ltd.  
WPS No.: COC-1 Date: November 08, 2001  
Revision No: ----- Revision Date: -----  
Supporting PQR No(s): COC-1-1  
Welding Process(es): SMAW / SMAW Type(s): Manual / Manual

JOINTS QW-402		Joint Details	
Joint Design:	Butt, Tee, Lap, Corner, etc.	All ASME joint designs. Reference construction	
Backing:	F-3 electrodes with or without backing. F-4 electrodes with backing only.	drawings for joint details. Where joint details are not specified, refer to typical joint detail sheet provided.	
Backing Material (Type): Similar base or weld metal as required. No Retainers.			
BASE METALS QW-403			
P-No:	1	Group No:	-----
OR		to P-No:	1
Spec. type & grade:	N/A	to Spec. type & grade:	N/A
OR			
Chem. Analysis & Mech. Prop.:	N/A	to Chem. Analysis & Mech. Prop.:	N/A
Base Metal Thickness Range			
Groove:		0.062" to 0.750" – Sour Service	Fillet: All
Pipe Dia Range:	Groove:	Unlimited	Fillet: All
Other:	Maximum thickness of any weld layer shall not exceed .500"		
FILLER METALS QW-404			
Process:	SMAW	SMAW	
Spec No. (SFA):	5.1	5.1	
AWS No. (Class):	E6010	E7018-1	
F-No.:	F-3	F-4	
A-No.:	A-1	A-1	
Size of Filler Metals:	3/32", 1/8", 5/32"	3/32", 1/8", 5/32", 3/16", 1/4"	
Weld Metal Thickness			
Range - Groove:	to: (max.) 0.200"	to: (max.) 0.550"	
- Fillet:	unlimited	unlimited	
Electrode-Flux (Class):	N/A	N/A	
Flux Trade Name:	N/A	N/A	
Consumable Insert:	N/A	N/A	
Other:	Covered Electrode	Covered Electrode	



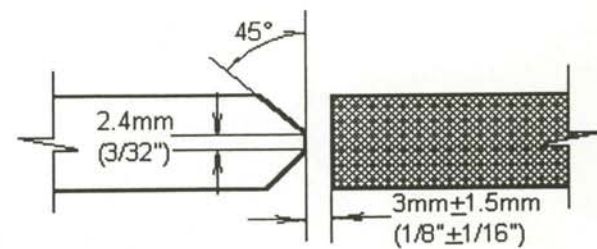
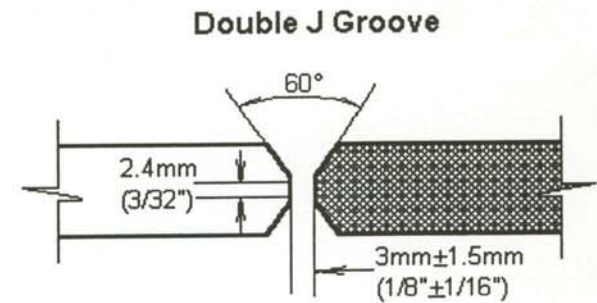
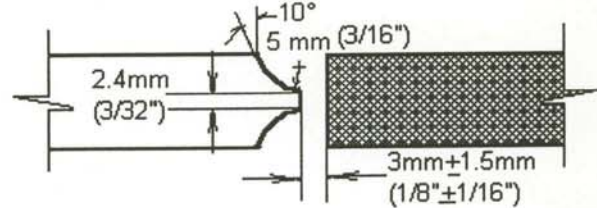
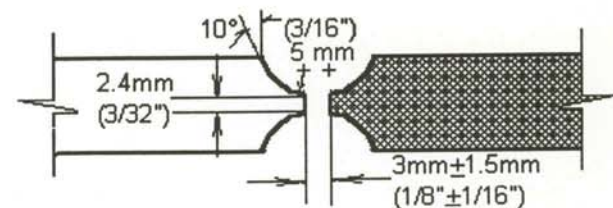
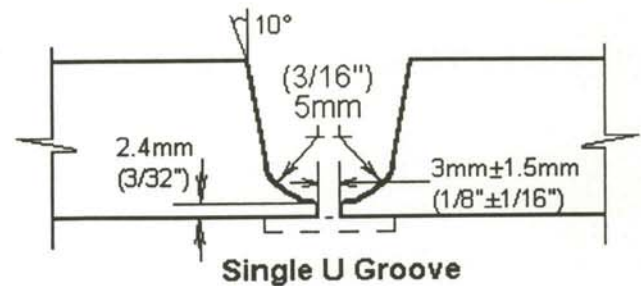
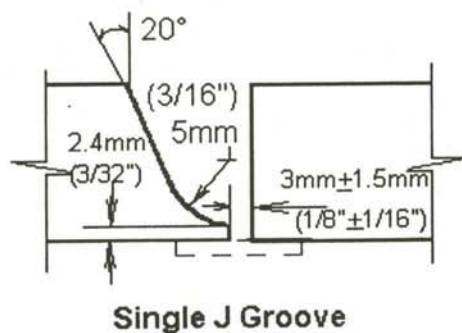
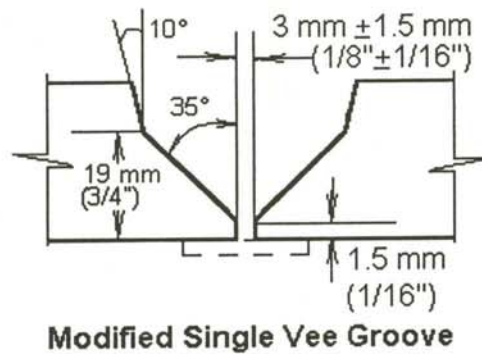
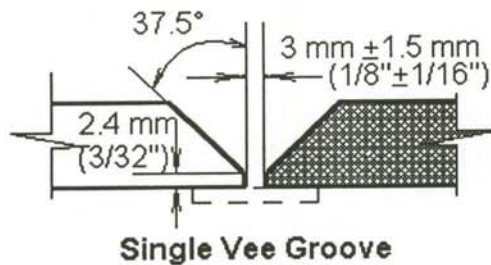
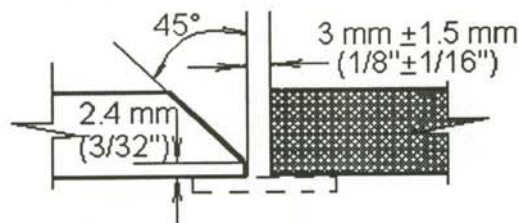
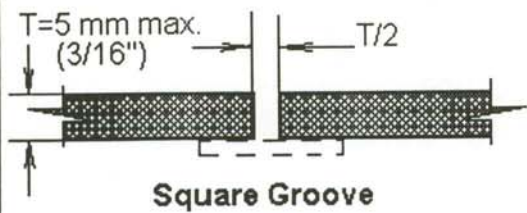
**WELDING PROCEDURE SPECIFICATION (WPS) QW-482**  
(Section IX, ASME Boiler and Pressure Vessel Code)

WPS # \_\_\_\_\_ COC-1

POSITIONS QW-405		POSTWELD HEAT TREATMENT QW-407				
Position(s) of Groove:	All	Temperature Range:				
Welding Progression: Up:	F-4 Electrodes	Time Range:	Not Applicable			
Up or Down:	F-3 Electrodes					
Position(s) of Fillet:	All					
PREHEAT QW-406		GAS QW-408				
Preheat Temp Min:	50°F	Shielding Gas(es):	N/A			
Interpass Temp Max:	550°F	Percent Composition:	N/A			
Interpass Temp Min:	50°F	Flow Rate:	N/A			
Preheat Maintenance:	Monitor using pyrometer	Gas Backing:	N/A			
	tempilstiks or other suitable method.	Trailing Shielding Gas Composition:	N/A			
ELECTRICAL CHARACTERISTICS QW-409						
Current Type:	F-3: Direct (DC)	F-4: Direct (DC)				
Polarity:	F-3: Reverse (EP)	F-4: Reverse (EP)				
Volts (Range):	F-3: 20 - 34	F-4: 18 - 32				
Amps (Range):	F-3: 60 - 220	F-4: 60 - 360				
Max Heat Input:	N/A					
Electrode Wire feed speed range:	N/A					
Tungsten Electrode Size & Type:	N/A					
Mode of Metal Transfer for GMAW:	N/A					
TECHNIQUE QW-410						
String or Weave Bead:	Either. Weave size shall be controlled to prevent weld defects.					
Orifice or Gas Cup Size:	N/A					
Initial cleaning:	Base material must be thoroughly cleaned of grease, rust, mill scale, dirt, etc., at least 1" back on each side of the joint prior to welding					
Interpass cleaning:	Perform by power brushing, grinding, etc. after each weld layer.					
Method of Back Gouging:	Arc air, gouge, etc., grind to clean metal if required.					
Oscillation:	N/A					
Contact Tube to Work Distance:	N/A					
Multiple or Single pass (per side):	Single or Multiple					
Multiple or Single Electrodes:	Single					
Travel Speed (Range):	2 - 16 IPM					
Peening:	Not allowed					
TYPICAL WELDING PARAMETERS						
Process	Filler Metal		Current		Volt Range	Travel Speed (IPM)
	AWS Classification	Diameter (in)	Type & Polarity	Amp Range		
SMAW	E6010	3/32	DC EP	50 - 120	20 - 30	2 - 12
SMAW	E6010	1/8	DC EP	70 - 180	20 - 32	3 - 14
SMAW	E6010	5/32	DC EP	80 - 220	22 - 34	4 - 16
SMAW	E7018-1	3/32	DC EP	60 - 130	18 - 24	2 - 10
SMAW	E7018-1	1/8	DC EP	70 - 150	20 - 24	4 - 12
SMAW	E7018-1	5/32	DC EP	120 - 190	20 - 26	5 - 14
SMAW	E7018-1	3/16	DC EP	150 - 270	22 - 28	6 - 16
SMAW	E7018-1	1/4	DC EP	180 - 360	24 - 32	8 - 16
Notes:	Number of weld layers and size of filler metal may vary with thickness of base material and position of weld. 3/16" & 1/4" E7018 electrodes limited to flat (1G) position only.					

# Typical Joint Details QW-482

Prepared by: QC INSPECTION SERVICES LTD.



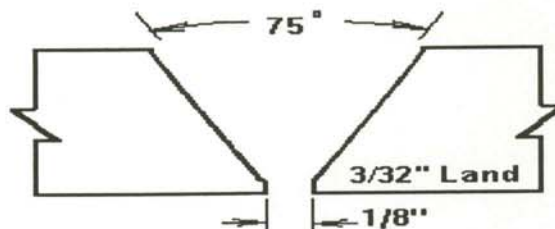
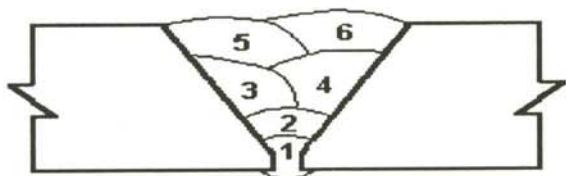


# PROCEDURE QUALIFICATION RECORD (PQR) QW-483

(Section IX, ASME Boiler and Pressure Vessel Code)

Company Name: C's Oilfield Consulting & Construction Ltd.  
PQR No: COC-1-1 Date: November 08, 2001  
Revision No.: ----- Revision Date: -----  
WPS No: COC-1  
Welding Process(es): SMAW / SMAW  
Types: Manual / Manual

## JOINTS QW-402



<b>BASE METALS QW-403</b>		<b>POSTWELD HEAT TREATMENT QW-407</b>	
Material Spec.: SA-516	SA-516	Temperature:	
Type or Grade: Grade 70	to Grade 70	Time:	Not Applicable
P-Number: P-1	P-1	Other:	
Thickness of Test Coupon: 0.375"			
Diameter of Test Coupon: Plate			
Other: Heat No.: 68400, C.E.: 0.38			
<b>FILLER METALS QW-404</b>		<b>GAS QW-408</b>	
Process: SMAW	SMAW	Type or Gas(es):	N/A
SFA Spec No: 5.1	5.1	Gas Composition:	N/A
AWS Class. No: E6010	E7018-1	Flow Rate:	N/A
F-No: F-3	F-4	Gas Backing Rate:	N/A
A-No: A-1	A-1	Other:	N/A
Size of Filler Metal: 3/32"	1/8"	<b>ELECTRICAL CHARACTERISTICS QW-409</b>	
Dep. Weld Metal: 0.100"	0.275"	Current: F-3: Direct	F-4: Direct
Other: Covered Electrode	Covered Electrode	Polarity: F-3: Reverse	F-4: Reverse
		Volts: F-3: 26 - 30	F-4: 22 - 26
		Amps: F-3: 60 - 75	F-4: 110 - 135
		Heat Input: F-3: N/A	F-4: N/A
<b>POSITION QW-405</b>		Tungsten Electrode Size: N/A	
Position of Groove: 1G		<b>TECHNIQUE QW-410</b>	
Weld Progression: Flat		Travel Speed: 2.2 - 5.8 ipm	
<b>PREHEAT QW-406</b>		String or Weave Bead: String & Weave	
Preheat Temp Min.: 50°F		Oscillation: N/A	
Interpass Temp Max.: 450°F		Multiple or Single Pass: Multiple	
Interpass Temp Min.: 50°F		Single or Multiple Electrodes: Single	
Temperature monitored using Infrared Pyrometer.		Other: N/A	

**PROCEDURE QUALIFICATION RECORD (PQR) QW-483**  
(Section IX, ASME Boiler and Pressure Vessel Code)

PQR # \_\_\_\_\_ COC-1

**Tensile Test**  
QW-462

Specimen No.	Width in	Thickness in	Area in <sup>2</sup>	Ultimate Total Load Lb	Ultimate Unit Stress psi	Type of Failure & Location
			See Attached Report			

**Guided Bend Tests**  
QW-462

Type and Figure No.	Result
See Attached Report	

**Toughness Tests**  
QW-170

Specimen No.	Notch Location	Notch Type	Test Temp	Impact Values	Lateral Exp % Shear	Mils	Drop Weight Break	No Brk
				Not Applicable				

**Fillet-Weld Tests**  
Not Applicable

Result-Satisfactory: Yes _____ No _____	Pen. into Parent Material: Yes _____ No _____
Macro-Results:	

**Other Tests**

Type of Test:	10 kg Vickers microhardness testing in accordance with the requirements of NACE
Other:	

Welder's Name: Ross Hugo Clock No.: W-8138 Stamp No.: AA  
Tests Conducted By: QC Inspection Services Ltd. Lab. Test No.: 630-01001

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

Manufacturer: C's Oilfield Consulting & Construction Services Ltd.

Date: November 08, 2001

By: Clayton Gessner, C.E.T. / A.Sc.T.

*[Signature]*



## MECHANICAL TEST REPORT

for Procedure Qualification Record # COC-1-1

<b>Client:</b>	C's Oilfield Consulting & Construction Ltd.	<b>Job Number:</b>	630-01001
<b>Address:</b>	P.O Box 1155 Lloydminster, Alberta T9V 1G1	<b>Date:</b>	November 08, 2001
<b>Materials:</b>	SA-516 Grade 70		
<b>Size:</b>	0.375" wt. plate	<b>Condition:</b>	As Welded
<b>Test Specification:</b>	ASME Section IX		

### Tensile Tests QW-462.1(a)

<b>Sample Identification:</b>	AAT1	AAT2
<b>Sample Size - inch:(W x T)</b>	0.750" x 0.372"	0.751" x 0.374"
<b>Least X-Sect. Area - in<sup>2</sup>:</b>	0.279	0.281
<b>Ultimate Load - lbs:</b>	23 400	23 200
<b>Ult. Ten. Strength - ksi:</b>	83.9	82.6
<b>Character of Failure:</b>	Ductile	Ductile
<b>Location of Failure:</b>	Base Metal	Base Metal
<b>Req'd Tensile Strength - ksi:</b>	70.0	70.0
<b>Pass or Fail:</b>	Passed	Passed
<b>Remarks:</b>		

### \* Bend Test QW-462.2

<b>Sample Identification:</b>	AAB1	AAB2	AAB3	AAB4
<b>Type of Bend Test:</b>	TSB	TSB	TSB	TSB
<b>Pass or Fail:</b>	Pass	Pass	Pass	Pass
<b>Remarks:</b>				

\* Types of Bend Tests

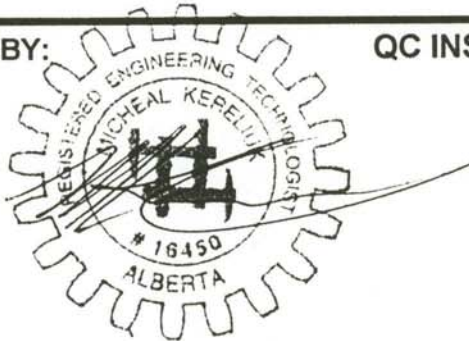
TSB, TFB, TRB = transverse side, face or root bend

LSB, LFB, LRB = longitudinal side, face or root bend

We certify that the statements in this record are acceptable, in accordance with the requirements of ASME Section IX.

TEST RESULTS CERTIFIED BY:

QC INSPECTION SERVICES LTD.



An Alberta Company  
 Certified by the Canadian Welding Bureau & Alberta Boilers Safety Association;  
 Registered as an Alberta Professional Engineering consulting firm  
 with engineers registered in Alberta and British Columbia  
 Visit us at our website: [www.qcisl.com](http://www.qcisl.com)



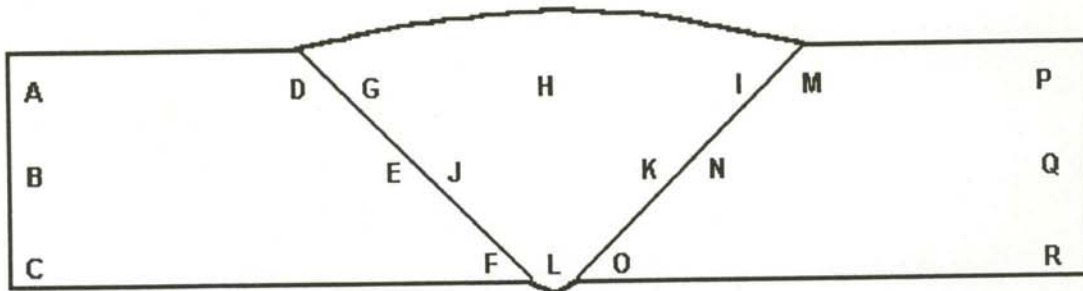
"A Quality Job depends on Qualified Certified People"



## HARDNESS TEST REPORT

for Procedure Qualification Record # COC-1-1

<b>Client:</b>	C's Oilfield Consulting & Construction Ltd.	<b>Job Number:</b>	630-01001
<b>Address:</b>	P.O Box 1155 Lloydminster, Alberta T9V 1G1	<b>Date:</b>	November 08, 2001
<b>Materials:</b>	SA-516 Grade 70		
<b>Size:</b>	0.375" wt. plate	<b>Condition:</b>	As Welded
<b>Test Method:</b>	Hardness testing performed in accordance with ASTM E-92 using a Vickers Hardness Tester with a 10 kg load. (HV10)		
<b>Equipment:</b>	Matsuzawa Seiki Co. Ltd. Vickers Hardness Tester S/N: 7193M		
<b>Calibration:</b>	<b>Test Block :</b> 197 $\pm$ 6 DPH	<b>Act. Reading:</b>	197 DPH



### Hardness Values

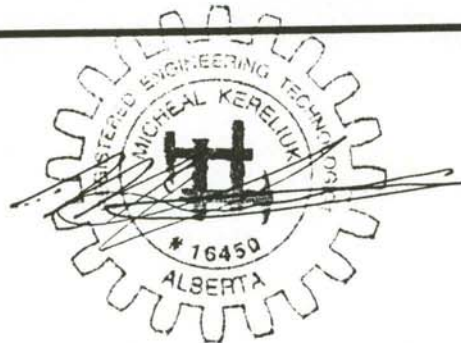
<b>A</b>	174	<b>D</b>	196	<b>G</b>	204	<b>J</b>	194	<b>M</b>	198	<b>P</b>	171
<b>B</b>	168	<b>E</b>	194	<b>H</b>	202	<b>K</b>	188	<b>N</b>	191	<b>Q</b>	172
<b>C</b>	171	<b>F</b>	189	<b>I</b>	207	<b>L</b>	193	<b>O</b>	191	<b>R</b>	169

These hardness values do not exceed 210 HV10 in the weld and 248 HV10 in the base metal

*We certify that the statements in this record are acceptable, in accordance with the requirements of ASME Section IX.*

Test Results Certified by:

QC INSPECTION SERVICES LTD.



An Alberta Company  
 Certified by the Canadian Welding Bureau & Alberta Boilers Safety Association;  
 Registered as an Alberta Professional Engineering consulting firm  
 with engineers registered in Alberta and British Columbia  
 Visit us at our website: [www.qcisl.com](http://www.qcisl.com)



*"A Quality Job depends on Qualified Certified People"*

**HOLD TAG**

<b>HOLD....DO NOT USE</b>	
Signed: _____	Date: _____
THIS ITEM OR PART IS NOT TO BE USED FOR THE REASONS LISTED ON THE BACK.	
NONCONFORMANCE REPORT NO.: _____	
<b>TO BE REMOVED ONLY BY AUTHORITY OF QUALITY CONTROL MANAGER</b>	
(FRONT SIDE)	
<b>REASONS FOR HOLD</b>	
<div style="border-bottom: 1px solid black; height: 15px; width: 100%;"></div> <div style="border-bottom: 1px solid black; height: 15px; width: 100%;"></div> <div style="border-bottom: 1px solid black; height: 15px; width: 100%;"></div>	
QUALITY CONTROL INSPECTOR: _____	
DATE: _____	
(BACK SIDE)	



## Non-conformance report

NCR #

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Line #/ drawing #/ serial #

Identification details:

Description of Non-conformance:

Proposed disposition of repairs &amp; method of identification:

Date \_\_\_\_\_

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Date \_\_\_\_\_

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Date

**Non-conformance rectified & approved:**

Date \_\_\_\_\_

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Date \_\_\_\_\_

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Date



Pressure Test Report

Date \_\_\_\_\_ Job # \_\_\_\_\_

Client/owner \_\_\_\_\_ LSD \_\_\_\_\_

CRN # \_\_\_\_\_

Test Gauge # 1 Make \_\_\_\_\_ Test Gauge # 2 Make \_\_\_\_\_

Serial Number \_\_\_\_\_ Serial Number \_\_\_\_\_

Test conducted by \_\_\_\_\_

Type of test \_\_\_\_\_ Pressure source \_\_\_\_\_

Medium Used \_\_\_\_\_ Holding time at pressure \_\_\_\_\_

Test Location \_\_\_\_\_

Client representative \_\_\_\_\_ Date \_\_\_\_\_

Line Number	Test code	Min. Design Temp	Test Temp	Design Pressure (as stated on drawing)	Test Pressure (as stated on drawing)

Comments \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_



Pressure test check list

**Examination prior to test:**

Item	Activity	Complies (QCI Initials)	Needs repair	See remarks
1	Pipe Material: size, schedule & material correct			
2	Flanges: rating, size, schedule & material correct			
3	Fittings (tee's, reducers, o-lets etc.) rating, schedule & material correct.			
4	Valves: Identification, nametag etc. correct			
5	Valves: Installed correctly, flow direction, rising stem free from obstruction.			
6	Lubrications fittings & drains installed correctly			
7	Bolts, Studs, Nuts: length & material correct. Identification visible (max. thread exposure beyond nut should be about 2 threads.).			
8	Gaskets: material, size & type correct.			
9	All welding traceable to welder's symbol.			
10	All attachment welds satisfactory			
11	NDE complete & filed			
12	Guide anchors/shoes installed for high temp lines			
13	Line support adequate & checked against drawings			
14	Spring hangers: type & installation correct.			
15	Lines have adequate allowance for expansion.			
16	Expansion joints: type & pressure rating correct.			
17	Required cold spring applied.			
18	Orifice runs have specified straight run of pipe & located correctly.			
19	All heat treatment performed and reports filed.			
20	Deficiencies recorded on punch list.			



Pressure test check list

**Pressure test preparation:**

Item	Activity	Complies (QCI Initials)	Needs repair	See remarks
21	All authorized personnel, responsibilities & test supervisor listed in section below.			
22	All deficiencies from Punch list have been corrected.			
23	Piping isolated or correct test blinds installed.			
24	Items which could be damaged have been removed or isolated (PSV's, control valves etc.).			
25	Equipment with internals have been isolated or removed (i.e. Filters).			
26	Vents & drains correctly installed.			
27	Open/close position of all valves verified.			
28	Shipping bars in place.			
29	Hanger stops in place.			
30	Safety relief valve verified & installed for test.			
31	Test manifold and temporary piping tested to equal of PSV in item 30.			
32	Adequate ventilation allowed for in enclosed space.			
33	Minimum of 2 pressure gauges calibrated to a range $\geq 1.5$ times & $\leq 4$ times the final test pressure will be used to monitor test.			
34	Test site isolated.			
35	Rope or ribbon barriers in place.			
36	Safety watch personnel assigned to monitor test perimeter.			
37	All unauthorized personnel removed from test area.			

**NOTE: NO UNAUTHORIZED PERSONNEL WITHIN 15M/50' OF TEST LOCATION.  
NO PERSONNEL WITHIN TEST AREA DURING PRESSURIZATION.**

\_\_\_\_\_  
Test supervisor.

\_\_\_\_\_  
Test personnel # 1.

\_\_\_\_\_  
Test personnel # 2

\_\_\_\_\_  
Test personnel # 3

\_\_\_\_\_  
Date



Pressure test check list

**Pressure test:**

Item	Activity	Complies (QCI Initials)	Needs repair	See remarks
38	Gradually pressurize system to test pressure.			
39	Minimum H <sub>2</sub> O temp to be at least 30° F above MDMT.			
40	H <sub>2</sub> O & metal temp will not be below MDMT.			
41	Hold for at least 10 minutes for piping systems.			
42	Inspect all joints and connections. This inspection will be when the pressure is not less than $\frac{2}{3}$ of required test pressure.			
43	Mark any leaks for repair.			
45	Depressurize system, repair any leaks.			
46	Repeat steps 38 to 45 until no leaks are found.			

**Pressure test completion:**

Item	Activity	Complies (QCI Initials)	Needs repair	See remarks
47	Depressurize system.			
48	Replace test gaskets with correct gaskets.			
49	Remove shipping bars from bellows if required.			
50	Install safety valves and any removed item from system.			
51	Install screens for pumps and compressors.			
52	Complete pressure test report.			

**Remarks/Comments:**

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\_\_\_\_\_  
Client representative

\_\_\_\_\_  
Date

\_\_\_\_\_  
QCI

\_\_\_\_\_  
Date

\_\_\_\_\_  
LSD

\_\_\_\_\_  
Job #