Table of Contents

C's OILFIELD CONSULTING & CONSTRUCTION SERVICE LTD.

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

C's OILFIELD CONSULTING & CONSTRUCTION SERVICE LTD.

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 7th 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

C's OILFIELD CONSULTING & CONSTRUCTION SERVICE LTD.

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

_____

_____

_____

_____

C's OILFIELD CONSULTING & CONSTRUCTION SERVICE LTD.

Exhibit 3

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

C's OILFIELD
CONSULTING & CONSTRUCTION
SERVICE LTD.

Q.C. Report.

_____
Client/owner

_____
LSD

_____
AFE #

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PO #

_____
Client representative

_____
Date

_____
Job #

Job Description:

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Technical Safety Authority of Saskatchewan

Boiler and Pressure Vessel Safety

QUALITY CONTROL PROGRAM
CERTIFICATE OF REGISTRATION

C's Oilfield Consulting & Construction Service Ltd.

PO Box 1155
LLOYDMINSTER, AB
T9V 1G1

This certificate authorizes the holder listed above to perform the work as shown in the scope below in accordance with *The Boiler & Pressure Vessel Act, 1999*

SCOPE

ASME B31.3 Process Piping - Construct, Repair and Alteration (Field Only)

Manual: Edition 3, Revision 1.

Within Saskatchewan controlled from the above address.

AUTHORIZED: April 19, 2014

EXPIRES: April 19, 2017

CERTIFICATE NO.: QCP - 0052 - 0002

Chief Inspector

Technical Safety Authority of Saskatchewan

Contractor Licence

Licence Number: 3173

This is to certify that:

This licence will expire on April 19, 2017 unless sooner revoked, cancelled, or suspended.

C's Oilfield Consulting & Construction Service Ltd.
Box 1155
LLOYDMINSTER AB T9V 1G1

is licenced in accordance with the provisions of ***The Boiler and Pressure Vessel Act, 1999*** and is authorized to engage in business in the Province of Saskatchewan.

Quality Control Program Certificate of Registration Number: 0052

All accidents involving bodily injury and/or equipment damage must be reported to the Authority. Regina Office: 306-798-7111; Toll free in SK: 1-866-530-8599; Email: incident@tsask.ca

2023A14 — Cash Number

February 26, 2014 — Date

Chief Inspector

Technical Safety Authority of Saskatchewan

RECEIPT
Keep for your records

QCP Licence Number: 3173
QCP Contractor Fee: $530.00

C's Oilfield Consulting & Construction Service
Box 1155
LLOYDMINSTER AB T9V 1G1

C's Oilfield Consulting & Construction Service Ltd.
Box 1155
LLOYDMINSTER AB T9V 1G1

2023A14 — Cash Number

February 26, 2014 — Date

Technical Safety Authority of Saskatchewan

2202 2nd Ave.
Regina, SK S4R 1K3
PH: (306)798-7112 Toll Free: (866)530-8599
FAX: (306)787-9273
Toll Free: (866)760-9255
Email: boilerpermits@tsask.ca
Website: www.tsask.ca

Completion of Construction

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

TSK-1001

I. Owner's Information

Company: _____

Address: _____
(Apt/Street) *(City)* *(Prov)* *(Postal Code)*

Phone: ( ) _____ ***Fax:*** ( ) _____

Contact Name: _____ ***Contact Phone #:*** ( ) _____

Email: _____ ***Contact Fax #:*** ( ) _____

II. Engineering Contractor's Information

Company: _____

Address: _____
(Apt/Street) *(City)* *(Prov)* *(Postal Code)*

Phone: ( ) _____ ***Fax:*** ( ) _____

Contact Name: _____ ***Contact Phone #:*** ( ) _____

Email: _____ ***Contact Fax #:*** ( ) _____

III. Plant Information

Type of Plant: ☐ ***Boiler*** ☐ ***Pressure Vessel*** ☐ ***Refrigeration Plant***

Location of Plant: _____
(Sec., TWP., Rge.) _____
_____

Description of Pressure Piping System: _____
_____
_____

IV. Statement of Compliance

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

Signature: _____ Title: _____ Date: _____
(MM DD YYYY)

Company: _____

Address: _____
(Apt/Street) *(City)* *(Prov)* *(Postal Code)*

Technical Safety Authority of Saskatchewan

2202 2nd Ave.
Regina, SK S4R 1K3
PH: (306)798-7112 Toll Free: (866)530-8599
FAX: (306)787-9273
Toll Free: (866)760-9255
Email: boilerpermits@tsask.ca
Website: www.tsask.ca

Construction Data Report for Piping Systems

TSK-1002

I. Construction Information

O **Field Construction** O **Shop Construction** Our Reference Number: _____

Constructed by: _____

Address: _____
(Apt/Street) (City, Prov) (Postal Code)

Constructed for: _____ **Job No.:** _____

Owner: _____ **Location of Install:** _____

Provincial Q.C. Program Reg. No.: _____ **Expiry Date:** _____
(MM / DD / YYYY)

Provincial Reg. WPS. Nos. and Company WPS Nos. Used: _____

Code ANSI/ASME O **B31.1** O **B31.3** O **B31.5** O **Other** _____

II. Piping System Information

Dwg. No. and Line No.	Process (Air/Stm, etc.)	Des. Press. kPa	Des. Temp. ºC	Test Pressure	Test Medium	Mat'l Spec & Grade	Pipe Dia. & Sch.	Flange Rating	H.T. / Preheat Temp	R.T. %	Other NDE

Shop Constructed Data Reports are available on file for all items which form part of above piping system(s).

III. Certificate of Compliance

We certify the statements in this Data Report to be correct and that piping described in this Data Report was constructed in accordance with the Provincial *Boiler and Pressure Vessel Act* and Regulations, and applicable ANSI/AME Piping Code(s).

Date: _____ _____ by _____
(MM / DD / YYYY) *(Contractor)* *(Authorized Representative)*

III. Certificate of Inspection

I, the undersigned, employed by _____ have inspected the piping described in this Construction Data Report and state that, to the best of my knowledge and belief, the Contractor has constructed this piping in accordance with the applicable Sections of the ANSI/ASME Piping Codes and Provincial *Boiler and Pressure Vessel Act* and *Regulations.*

Date: _____ _____
(MM / DD / YYYY) *Owner's / Client's Inspector*

Date: _____ _____
(MM / DD / YYYY) *AUTHORITY INSPECTOR (Boiler External Piping Only)*

C's OILFIELD CONSULTING & CONSTRUCTION SERVICE LTD.

Exhibit 4

Pipe length to produce 0.5M³ volume.

Pipe Sched./Designations		T.Nom (in.)	T.Min (in.)		Length of Pipe (ft.)
Nominal Pipe Size		**1/8in**			**O.D. .405in.**
...	...	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
Nominal Pipe Size		**1/4in**			**O.D. .540in.**
...	...	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
Nominal Pipe Size		**3/8in.**			**O.D. .675in.**
...	...	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
Nominal Pipe Size		**1/2in.**			**O.D. .840in.**
...	...	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
Nominal Pipe Size		**3/4in.**			**O.D. 1.050in.**
...	...	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
Nominal Pipe Size		**2.5in.**			**O.D. 2.875in.**
...	...	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

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

C's OILFIELD CONSULTING & CONSTRUCTION SERVICE LTD.

Exhibit 5

Piping, construction, repair/alteration specification sheet.
(For construction/repair/alteration of piping systems less than 0.5M³ 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

C's OILFIELD CONSULTING & CONSTRUCTION SERVICE LTD.

Exhibit 6

Purchase Order

_____ Client/owner	_____ Client representative
_____ LSD	_____ Date
_____ Job #	_____ QCI
_____ PO # (This number must appear on all invoices etc.)	_____ Date Required

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.

Quantity	Product description	Material Grade & spec	

Exhibit 7

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.

C's OILFIELD CONSULTING & CONSTRUCTION SERVICE LTD.

Exhibit 8

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's & Heat #'s confirmed with code and specifications				
Sample of each welder's work examined (including root spacing, alignment, cleaning, joint preparation, preheat & electrode control)				
Fit-up/orientation: Dimensions & orientation correct?				
Fit-up/orientation: Flanges aligned?				
Fit-up/orientation: 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?				

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 & F 4	All	4.8mm & 17.4mm	25.4mm	June 21st 2015
TC	Tim Cameron W14178	SMAW	COC-1	1	F3 & F 4	All	4.8mm & 17.4mm	25.4mm	Nov 4th 2015
JBG	Jerimiah Boehm W27695	SMAW	COC-1	1	F3 & F 4	All	6.35mm & 15.79mm	25.4mm	Nov 20th 2015
CB	Conrad Boyer W30415	SMAW	COC-1	1	F3 & F 4	All	6.35mm & 15.29mm	25.4mm	Sept 26th 2014
GJ	Garret Jones W19435	SMAW	COC-1	1	F3 & F 4	All	6.34mm & 15.79mm	25mm	July 10th 2014
JR	John Richardson W19367	SMAW	COC-1	1	F3 & F 4	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:		Your order:	
Our reference:	NA	Your reference:	NA
Customer number:	NA	Your fax number:	NA
Customer order date:		Your e-mail:	NA

Invoice address	Receiver of certificate	Delivery address
NA		NA
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

MECHANICAL PROPERTIES

Typical data
acc to EN 10204 - 2.2

Standard:
Auxillary:
Condition:

TENSILE

ReL	Rm	A4-A5
500 MPa	590 MPa	28 %

IMPACT

Temp	KV
-50 °C	83 J

CHEMICAL COMPOSITION

Actual results
acc to EN 10204 - 3.1

All weld metal
Auxillary:

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%

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: 2013-11-07

Certificate number: **EC23208214 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: SB330205 Quantity: KG

PRODUCT

Brand: ESAB
Description: OK 55.00 5.0x450mm
Item number: **5500504000**

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	0.07%
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:		Your order:	
Our reference:	NA	Your reference:	NA
Customer number:	NA	Your fax number:	NA
Customer order date:		Your e-mail:	NA

Invoice address	Receiver of certificate	Delivery address
NA		NA
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

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

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%

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

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

CERTIFICATE OF CONFORMANCE

(APPLIES ONLY TO U.S. PRODUCTS)

LINCOLN ELECTRIC
THE WELDING EXPERTS®
[1Year]

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 Engineering, Consumable R&D Date

Cert. No. 30055

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 19.1 mm 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.	drawings for joint details. Where joint details are not
	F-4 electrodes with backing only.	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:** ----- **to P-No:** 1 **Group No:** -----
OR
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 tempilstiks or other suitable method.	**Gas Backing:**	N/A
		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

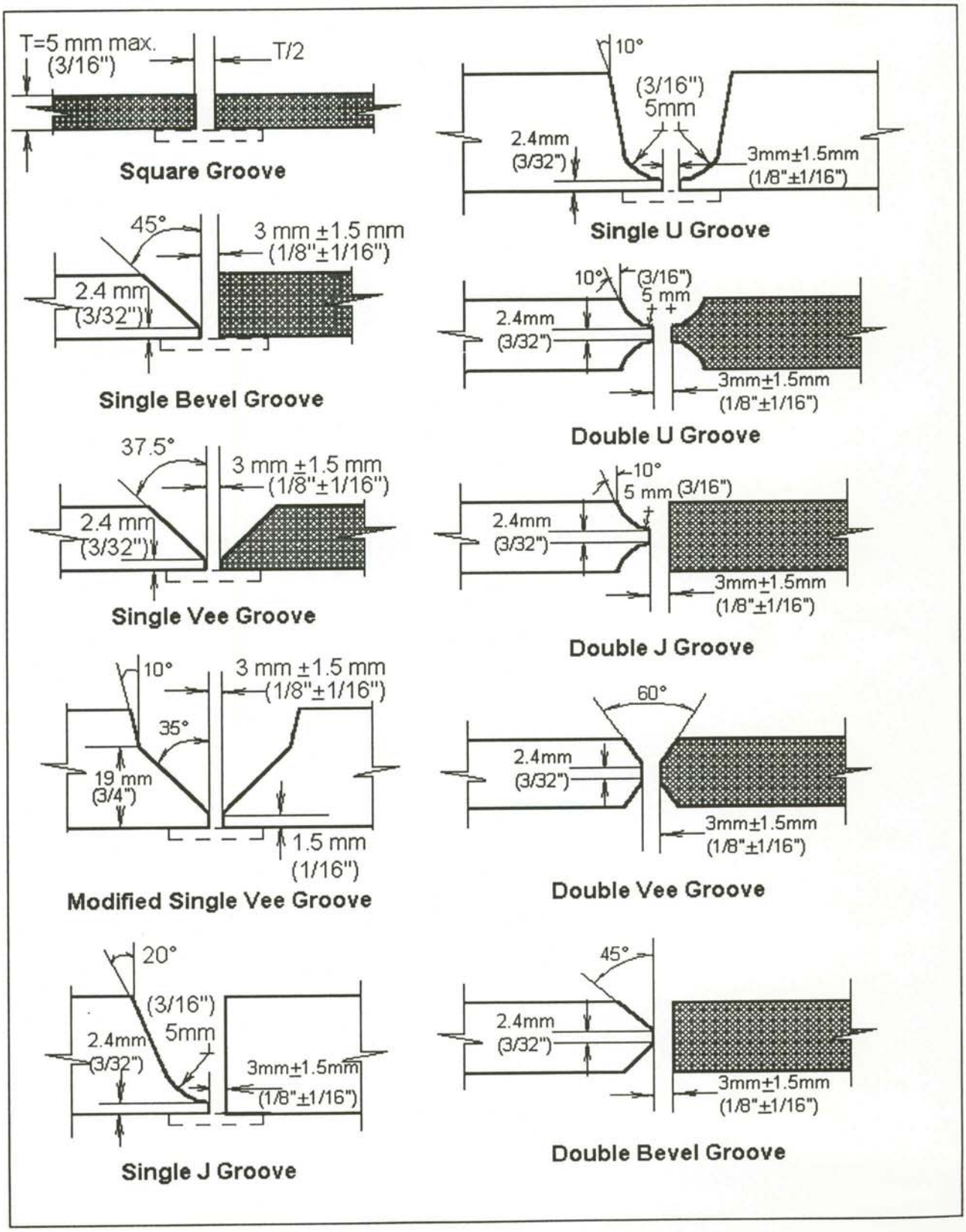
Process	Filler Metal		Current		Volt Range	Travel Speed (IPM)
	AWS Classification	Diameter (in)	Type & Polarity	Amp Range		
SMAW	E6010	3/32	DC EP	50 - 120	20 - 30	2 - 12
SMAW	E6010	1/8	DC EP	70 - 180	20 - 32	3 - 14
SMAW	E6010	5/32	DC EP	80 - 220	22 - 34	4 - 16
SMAW	E7018-1	3/32	DC EP	60 - 130	18 - 24	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.

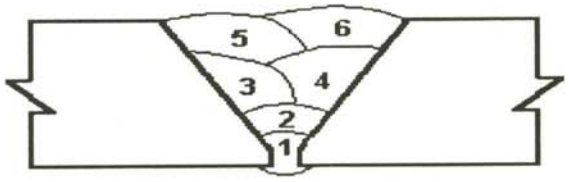


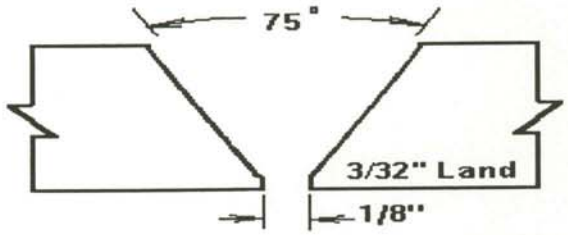
PROCEDURE QUALIFICATION RECORD (PQR) QW-483

(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





BASE METALS QW-403

Material Spec.:	SA-516		SA-516
Type or Grade:	Grade 70	to	Grade 70
P-Number:	P-1		P-1

Thickness of Test Coupon: 0.375"

Diameter of Test Coupon: Plate

Other: Heat No.: 68400, C.E.: 0.38

FILLER METALS QW-404

Process	SMAW	SMAW
SFA Spec No:	5.1	5.1
AWS Class. No:	E6010	E7018-1
F-No:	F-3	F-4
A-No:	A-1	A-1
Size of Filler Metal:	3/32"	1/8"
Dep. Weld Metal:	0.100"	0.275"
Other:	Covered Electrode	Covered Electrode

POSITION QW-405

Position of Groove: 1G

Weld Progression: Flat

PREHEAT QW-406

Preheat Temp Min.: 50°F

Interpass Temp Max.: 450°F

Interpass Temp Min.: 50°F

Temperature monitored using Infrared Pyrometer.

POSTWELD HEAT TREATMENT QW-407

Temperature:

Time: *Not Applicable*

Other:

GAS QW-408

Type or Gas(es): N/A

Gas Composition: N/A

Flow Rate: N/A

Gas Backing Rate: N/A

Other: N/A

ELECTRICAL CHARACTERISTICS QW-409

Current:	**F-3:**	Direct	**F-4:**	Direct
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

Tungsten Electrode Size: N/A

TECHNIQUE QW-410

Travel Speed: 2.2 – 5.8 ipm

String or Weave Bead: String & Weave

Oscillation: N/A

Multiple or Single Pass: Multiple

Single or Multiple Electrodes: Single

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 in²	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	Lateral Exp Mils	Drop Weight Break	Drop Weight 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 ServicesLtd.

Date: November 08, 2001 **By:** Clayton Gessner, C.E.T. / A.Sc.T.

• 7817 CORONET ROAD, EDMONTON, AB T6E 4N7 (780) 469-5870 • FAX (780) 465-5829
• CALGARY (403) 278-9862 • FAX (403) 465-5829

MECHANICAL TEST REPORT

for Procedure Qualification Record # COC-1-1

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

Tensile Tests QW-462.1(a)

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

*Bend Test QW-462.2

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

*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.**

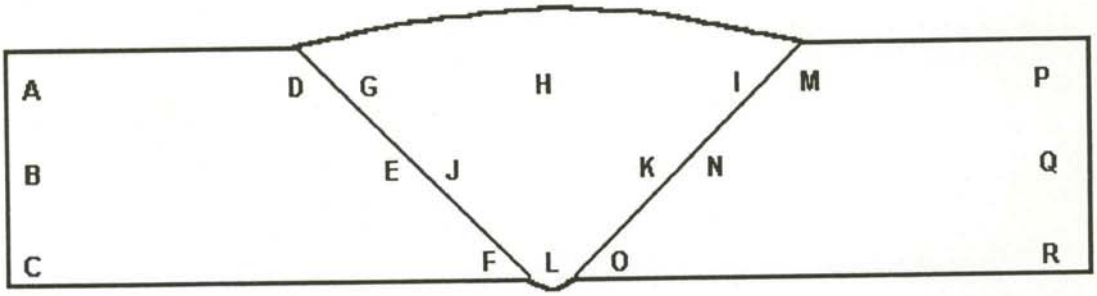
REGISTERED ENGINEERING TECHNOLOGIST MICHEAL KERELUK # 16450 ALBERTA

• 7817 CORONET ROAD, EDMONTON, AB T6E 4N7 (780) 469-5870 • FAX (780) 465-5829
• CALGARY (403) 278-9862 • FAX (403) 465-5829

HARDNESS TEST REPORT

for Procedure Qualification Record # COC-1-1

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



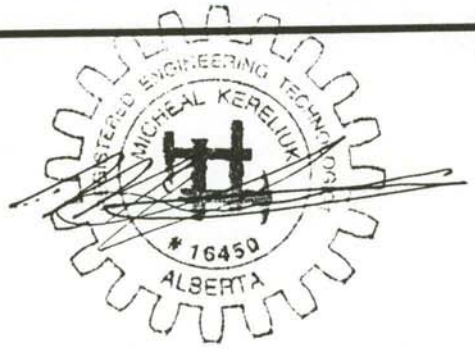
Hardness Values

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

C's OILFIELD CONSULTING & CONSTRUCTION SERVICE LTD.

EXHIBIT 10

HOLD TAG

HOLD....DO NOT USE

Signed: _____ Date: _____

THIS ITEM OR PART IS NOT TO BE USED FOR THE REASONS LISTED ON THE BACK.

NONCONFORMANCE REPORT NO.: _____

TO BE REMOVED ONLY BY AUTHORITY OF QUALITY CONTROL MANAGER

(FRONT SIDE)

REASONS FOR HOLD

_____

_____

_____

QUALITY CONTROL INSPECTOR: _____

DATE: _____

(BACK SIDE)

C's OILFIELD CONSULTING & CONSTRUCTION SERVICE LTD.

Exhibit 11

Non-conformance report

_____ _____

Job # NCR #

_____

Line #/ drawing #/ serial #

Identification details:

_____

_____

_____

_____

Description of Non-conformance:

_____

_____

_____

Proposed disposition of repairs & method of identification:

_____

_____

_____

_____

_____

_____ _____

QCM Date

_____ _____

Client representative Date

_____ _____

ABSA Safety Codes Officer Approval Date

Non-conformance rectified & approved:

_____ _____

QCM Date

_____ _____

Client representative Date

_____ _____

ABSA Safety Codes Officer Approval Date

C's OILFIELD CONSULTING & CONSTRUCTION SERVICE LTD.

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 _____
_____
_____
_____
_____
_____

C's OILFIELD CONSULTING & CONSTRUCTION SERVICE LTD.

Exhibit 13

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.			

C's OILFIELD CONSULTING & CONSTRUCTION SERVICE LTD.

Exhibit 13

Pressure test check list

Pressure test preparation:

Item	Activity	Complies (QCI Initials)	Needs repair	See remarks
21	All authorized personnel, responsibilities & test supervisor listed is 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 ≥ 1.5 times & ≤ 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

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Exhibit 13

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_2O temp to be at least 30° F above MDMT.			
40	H_2O & 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 $^2/_3$ 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:

_____
_____
_____
_____
_____

_____ _____
Client representative Date

_____ _____
QCI Date

_____ _____
LSD Job #