Appendix D

Fuel tank and piping handover package

STS STORAGE TANK SOLUTIONS

BAKER LAKE

STS JOB# 21-03

SYSTEM: TANK #8

2021-August

INSPECTION & TEST PLAN

Tank:	Tank #8 6170TNK43	**Project:**	AEM Baker Lake Fuel Tanks	**Document:**	TK#8 ITP
By:	Inukshuk Construction Ltd.	**Proj. #:**	341	**Revision:**	Orig

Item	Component	Activity	ITP Type	Documentation	Acceptance Criteria	Notes
1	Kick-Off Meeting	Kickoff Meeting	N/A	Meeting Minutes	N/A	
2	Signature Log	Verify	N/A	Signature Log	N/A	
3	Welder Qualification	Verify	N/A	Individual Welder Qualifications / Welder Log	API-650 / ASME IX	
4	Inspector Qualification	Verify	N/A	In house Inspector & 3rd Party Qualifications	API-650	
5	Weld Procedures	Verify	N/A	Approved Weld Procedures	API-650 / ASME IX, CWB W47.1	
6	Welding Consumable	Electrode Storage	N/A	N/A	Manufacturer's Instructions	
7	Foundation	Foundation Survey	DC	Foundation Acceptance Report, Compaction Report & Survey from 3rd Party	API-650 Para 7.5.5	
8	Floor	Materials	FI	MTR Confirmation to Dwg	Drawing & API-650 Sect. 4	MTR issued prior to shipping
		Fit up	VE, DC	As Built Drawing	Drawing	per API-650 5.1.5.4 - bottom plates under the shell shall have the outer ends of the joints fitted and lap-welded
		Welding	VE	Weld Map, Visual Report	API–650 Para 7.2 & 8.5 & WPS	
		Vacuum Test	VB	Vacuum Box Test Report	API-650 Para 7.3.3(a) & 8.6	
9	Shell to Floor Seams	Initial Weld Pass	VE	Weld Map, Visual Report	API-650 Para 8.5, 7.2.4.1	
		Final Weld Pass	VE	Weld Map, Visual Report	API-650 Para 8.5, 7.2.4.1	
		LPT	NDT	Diesel Test Report	API-650 Para 7.2.4.1 d	LPT inside of shell to floor seam
10	Shell	Materials	FI	MTR Confirmation to Dwg	Drawing & API-650 Sect. 4	MTR issued prior to shipping
		Fit up 1st Course	VE, DC	As Built Drawing	Drawing	
		Roundness	DC	Dimension Report	API-650 Para 7.5.3	
		Welding	VE	Weld Map, Visual Report	API–650 Para 7.2, 7.5, 8.5 & WPS	
		Diesel Test	NDT	Diesel Test Report	API-650 Para 7.2.4.1 d	Diesel Test inside of shell butt weld joints
		Tolerance Check – Plumbness & Local Deviations	DC	Dimension Report from 3rd party	API-650 Para 7.5	
		Ultrasonic Testing (ut)	NDT	UT report / Log / Map	API-650 Para 7.2.3 & 8.1	Testing by a qualified independent inspection firm
Item	**Component**	**Activity**	**ITP Type**	**Documentation**	**Acceptance Criteria**	**Notes**
11	Compression Ring	Fit up	VE, DC	As Built Drawing	Drawing	
		Welding	VE	Weld Map, Visual Report	API–650 Para 7.2 & 8.5 & WPS	
12	Roof	Fit up	VE, DC	As Built Drawing	Drawing	
		Welding	VE	Visual Report	API–650 Para 7.2 & 8.5 & WPS	
		Vacuum Test	VB	Vacuum Box Test Report	API-650 Para 7.3.8(b) & 8.6	
13	Roof Structure	Fit up	VE, DC	As Built Drawing	Drawing	
		Column Plumbness	DC	Dimension Report	API–650 Para 7.5.2 b)	
		Welding	VE	Visual Report	API–650 Para 7.2 & 8.5 & WPS	
14	Nozzles	Layout	VE, DC	As Built Drawing	Drawing	
		Fit up	VE, DC	As Built Drawing	Drawing	
		Shop Prep Welding	VE	Weld Map, Visual Report	API–650 Para 7.2 & 8.5 & WPS	
		Welding	VE	Weld Map, Visual Report	API–650 Para 7.2 & 8.5 & WPS	
		Tolerance Check – Plumbness & Local Deviations	DC	Dimension Report	API-650 Para 7.5	
		Shell Nozzle Repad Air test	AT	Leak Test Report	API-650 Para 7.3.5	
		MPI of Shell Nozzles	NDT	MPI Report	API-650 Para 7.2.3.6	All welds of Shell Nozzles
15	Manways	Layout	VE, DC	As Built Drawing	Drawing	

		Fit up	VE, DC	As Built Drawing	Drawing	
		Welding	VE	Weld Map, Visual Report	API–650 Para 7.2 & 8.5 & WPS	
15	Manways	Tolerance Check – Plumbness & Local Deviations	DC	Dimension Report	API-650 Para 7.5	
		Shell Manway Repad Air test	AT	Leak Test Report	API-650 Para 7.3.5	
		MPI	NDT	MPI Report	API-650 Para 7.2.3.6	All welds of Shell Manways
16	Internals	Layout	VE, DC	As Built Drawing	Drawing	
		Fit up	VE, DC	As Built Drawing	Drawing	
		Welding	VE	Visual Report	API–650 Para 7.2 & 8.5 & WPS	
17	Externals	Layout	VE, DC	As Built Drawing	Drawing	
		Fit up	VE, DC	As Built Drawing	Drawing	
		Welding	VE	Visual Report	API–650 Para 7.2 & 8.5 & WPS	
18	Stairs & Platforms	Layout	VE, DC	As Built Drawing	Drawing	
		Fit up	VE, DC	As Built Drawing	Drawing	
		Welding	VE	Visual Report	API–650 Para 7.2 & 8.5 & WPS	
19	Bolts & Nuts	Inspection	VE, DC	As Built Drawing	Drawing	Bolt Torque
Item	**Component**	**Activity**	**ITP Type**	**Documentation**	**Acceptance Criteria**	**Notes**
21	Final	Name Plate Verification	N/A	Scan of Name Plate	Drawings	
		Final Inspection	FI	As Built Drawings, Data Sheet, Manufacturer's Certification (3rd Party), Punch List	Drawings	

DEFINITIONS:

AT - AIR TEST: Specified component and/or installation to be air tested according to specified documentation and specifications.

DC - DIMENSION CHECK: Physical dimensions of component and/or installation to be verified according to specified documentation and specifications.

FI - FINAL INSPECTION: Specified inspection procedures to be executed prior to release of the component and/or installation and verified according to specified documentation and specifications.

NDT - NON DESTRUCTIVE TESTING: Specified component and/or installation to be inspected using a named non destructive testing method according to specified documentation and specifications.

E - VISUAL Examination: Specified component and/or installation to be examined visually according to specified documentation and specification.

B - VACUUM-BOX TEST: Specified component and/or installation to be vacuum box tested according to specified documentation and specifications.

SECTION 1.0

Meeting Minutes

This Section is Not Applicable.

SECTION 2.0

Signature Log

STS STORAGE TANK SOLUTIONS	Signature Log	STS-QF-23 Rev. 1

Name	Signature	Initials	Company	Date
Sebastien Ouellet		S.O.	Storage Tank Solutions	August 13, 2021
Lindsay C Bolton			Storage Tank Solutions	August 13, 2021
Matthew McGuire		M.M.	Storage Tank Solutions.	August 13 2021
Stephane Dubois			AEM	Sept 8th 2021

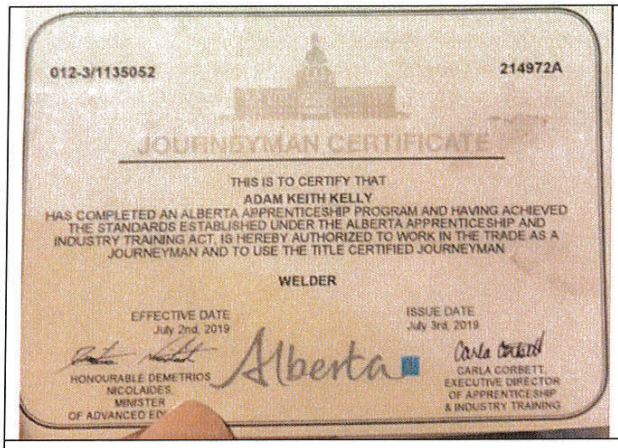
SECTION 3.0

Welder Qualifications

STORAGE TANK SOLUTIONS

Adam Kelly

AKE



012-3/1135052 214972A

JOURNEYMAN CERTIFICATE

THIS IS TO CERTIFY THAT
ADAM KEITH KELLY
HAS COMPLETED AN ALBERTA APPRENTICESHIP PROGRAM AND HAVING ACHIEVED THE STANDARDS ESTABLISHED UNDER THE ALBERTA APPRENTICESHIP AND INDUSTRY TRAINING ACT, IS HEREBY AUTHORIZED TO WORK IN THE TRADE AS A JOURNEYMAN AND TO USE THE TITLE CERTIFIED JOURNEYMAN

WELDER

EFFECTIVE DATE
July 2nd, 2019

ISSUE DATE
July 3rd, 2019

HONOURABLE DEMETRIOS NICOLAIDES
MINISTER
OF ADVANCED ED

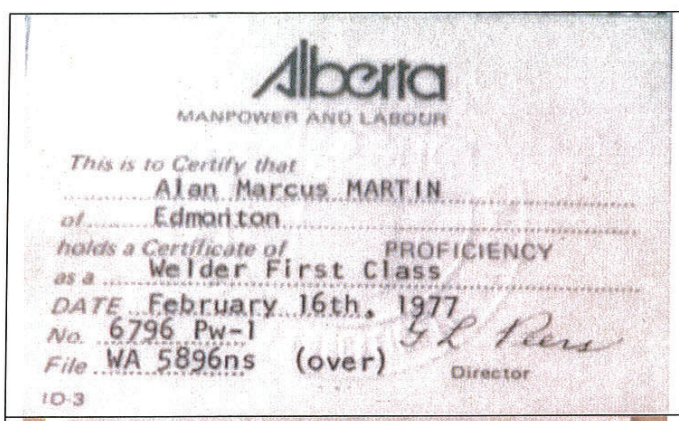
Alberta

CARLA CORBETT
EXECUTIVE DIRECTOR
OF APPRENTICESHIP
& INDUSTRY TRAINING

STS STORAGE TANK SOLUTIONS

Alan Martin

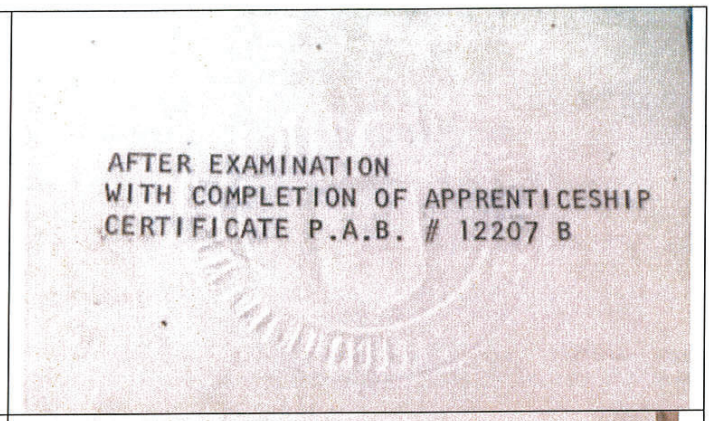
AMA



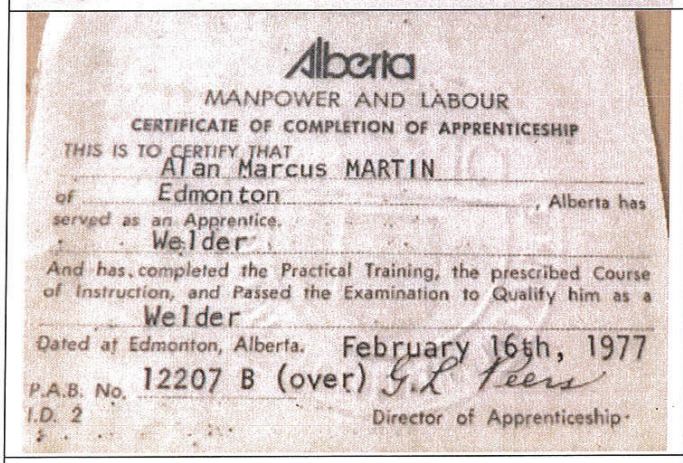
Alberta

MANPOWER AND LABOUR

This is to Certify that
Alan Marcus MARTIN
of Edmonton
holds a Certificate of PROFICIENCY
as a Welder First Class
DATE February 16th, 1977
No. 6796 Pw-1
File WA 5896ns (over) G.L. Peers
Director
ID-3



AFTER EXAMINATION
WITH COMPLETION OF APPRENTICESHIP
CERTIFICATE P.A.B. # 12207 B

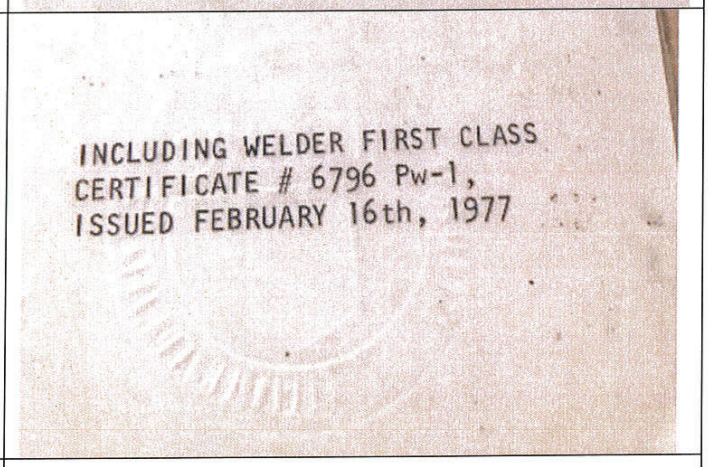


Alberta

MANPOWER AND LABOUR

CERTIFICATE OF COMPLETION OF APPRENTICESHIP

THIS IS TO CERTIFY THAT
Alan Marcus MARTIN
of Edmonton, Alberta has
served as an Apprentice.
Welder
And has completed the Practical Training, the prescribed Course of Instruction, and Passed the Examination to Qualify him as a
Welder
Dated at Edmonton, Alberta. February 16th, 1977
P.A.B. No. 12207 B (over) G.L. Peers
I.D. 2
Director of Apprenticeship

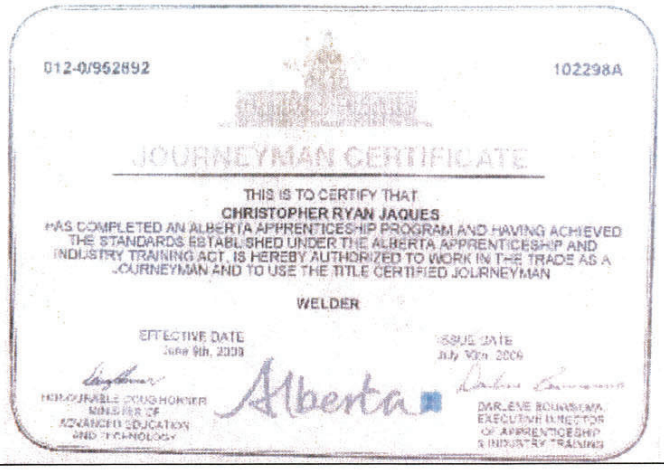


INCLUDING WELDER FIRST CLASS
CERTIFICATE # 6796 Pw-1,
ISSUED FEBRUARY 16th, 1977

STORAGE TANK SOLUTIONS

Christopher Jaques

CJA



012-0/962892 102298A

JOURNEYMAN CERTIFICATE

THIS IS TO CERTIFY THAT
CHRISTOPHER RYAN JAQUES
HAS COMPLETED AN ALBERTA APPRENTICESHIP PROGRAM AND HAVING ACHIEVED THE STANDARDS ESTABLISHED UNDER THE ALBERTA APPRENTICESHIP AND INDUSTRY TRAINING ACT, IS HEREBY AUTHORIZED TO WORK IN THE TRADE AS A JOURNEYMAN AND TO USE THE TITLE CERTIFIED JOURNEYMAN

WELDER

EFFECTIVE DATE
June 9th, 2009

ISSUE DATE
July 10th, 2009

HONOURABLE DOUG HORNER
MINISTER OF
ADVANCED EDUCATION
AND TECHNOLOGY

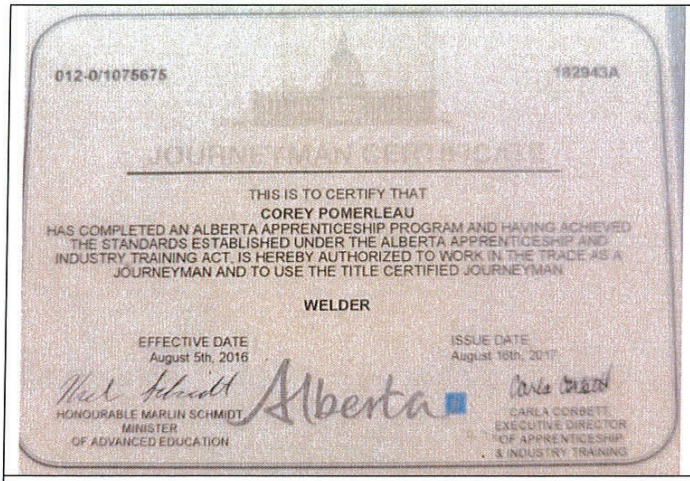
Alberta

DARLENE BOUWSEMA
EXECUTIVE DIRECTOR
OF APPRENTICESHIP
& INDUSTRY TRAINING

STORAGE TANK SOLUTIONS

Corey Pomerleau

CPO



012-0/1075675 182943A

JOURNEYMAN CERTIFICATE

THIS IS TO CERTIFY THAT
COREY POMERLEAU
HAS COMPLETED AN ALBERTA APPRENTICESHIP PROGRAM AND HAVING ACHIEVED THE STANDARDS ESTABLISHED UNDER THE ALBERTA APPRENTICESHIP AND INDUSTRY TRAINING ACT, IS HEREBY AUTHORIZED TO WORK IN THE TRADE AS A JOURNEYMAN AND TO USE THE TITLE CERTIFIED JOURNEYMAN

WELDER

EFFECTIVE DATE
August 5th, 2016

ISSUE DATE
August 16th, 2017

HONOURABLE MARLIN SCHMIDT
MINISTER
OF ADVANCED EDUCATION

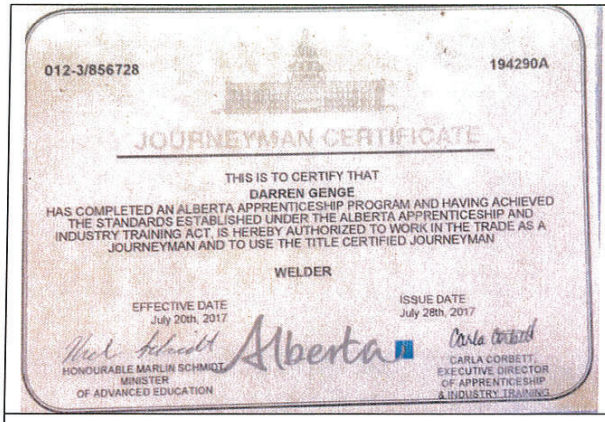
Alberta

CARLA CORBETT
EXECUTIVE DIRECTOR
OF APPRENTICESHIP
& INDUSTRY TRAINING

STORAGE TANK SOLUTIONS

Darren Genge

DGE



012-3/856728 194290A

JOURNEYMAN CERTIFICATE

THIS IS TO CERTIFY THAT
DARREN GENGE
HAS COMPLETED AN ALBERTA APPRENTICESHIP PROGRAM AND HAVING ACHIEVED THE STANDARDS ESTABLISHED UNDER THE ALBERTA APPRENTICESHIP AND INDUSTRY TRAINING ACT, IS HEREBY AUTHORIZED TO WORK IN THE TRADE AS A JOURNEYMAN AND TO USE THE TITLE CERTIFIED JOURNEYMAN

WELDER

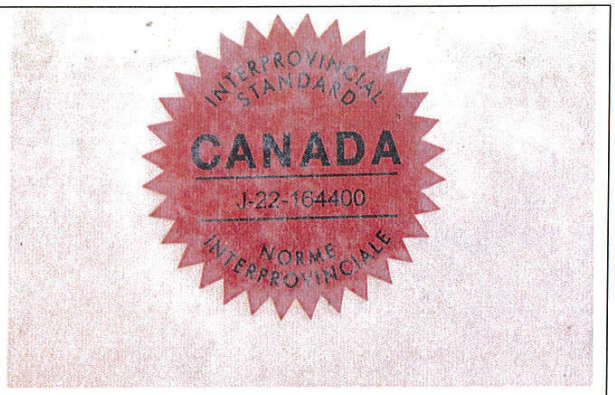
EFFECTIVE DATE
July 20th, 2017

ISSUE DATE
July 28th, 2017

HONOURABLE MARLIN SCHMIDT
MINISTER
OF ADVANCED EDUCATION

Alberta

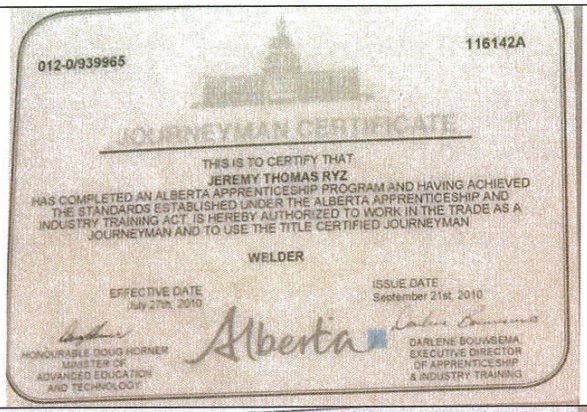
CARLA CORBETT
EXECUTIVE DIRECTOR
OF APPRENTICESHIP
& INDUSTRY TRAINING



STORAGE TANK SOLUTIONS

Jeremy Ryz

JRY



012-0/939965 116142A

JOURNEYMAN CERTIFICATE

THIS IS TO CERTIFY THAT
JEREMY THOMAS RYZ
HAS COMPLETED AN ALBERTA APPRENTICESHIP PROGRAM AND HAVING ACHIEVED THE STANDARDS ESTABLISHED UNDER THE ALBERTA APPRENTICESHIP AND INDUSTRY TRAINING ACT, IS HEREBY AUTHORIZED TO WORK IN THE TRADE AS A JOURNEYMAN AND TO USE THE TITLE CERTIFIED JOURNEYMAN

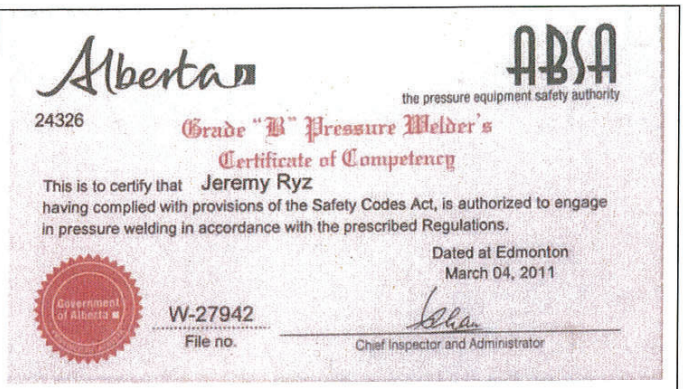
WELDER

EFFECTIVE DATE July 27th, 2010
ISSUE DATE September 21st, 2010

HONOURABLE DOUG HORNER MINISTER OF ADVANCED EDUCATION AND TECHNOLOGY

Alberta

DARLENE BOUWSEMA EXECUTIVE DIRECTOR OF APPRENTICESHIP & INDUSTRY TRAINING



Alberta

ABSA
the pressure equipment safety authority

24326

Grade "B" Pressure Welder's
Certificate of Competency

This is to certify that Jeremy Ryz
having complied with provisions of the Safety Codes Act, is authorized to engage in pressure welding in accordance with the prescribed Regulations.

Dated at Edmonton
March 04, 2011

Government of Alberta

W-27942
File no.

Chief Inspector and Administrator

CWB

Welder Qualification
This card is valid only while employed by a CWB certified company

Test Centre Welder Test Record
Transferable Welder

Exp. Date: Sep 09, 2019

Name: JEREMY T. RYZ
Test Facility: Calgary Welder Test Centre
Thickness Range: 3mm & above

Material: Carbon Steel
Process: SMAW
Standard: CSA W47.1
Classification: S
Electrode: F4

Mode: MANUAL

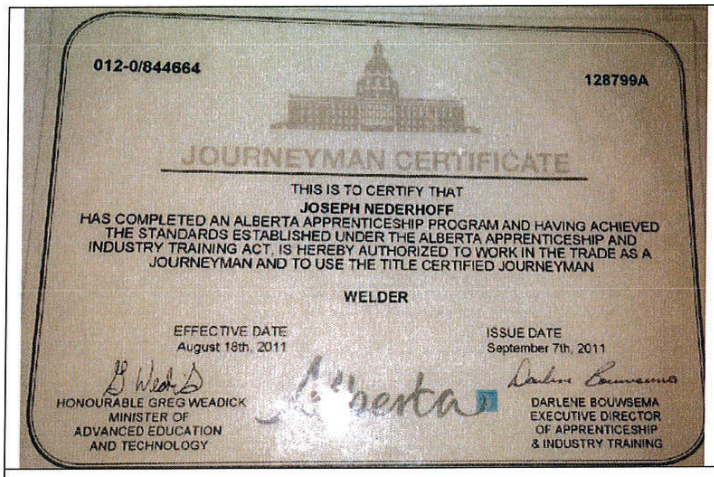
Class: FLAT/HORIZONTAL/VERTICAL UP/OVERHEAD

See Reverse for Conditions

STORAGE TANK SOLUTIONS

Joseph Nederhoff

JNE



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128799A

JOURNEYMAN CERTIFICATE

THIS IS TO CERTIFY THAT
JOSEPH NEDERHOFF
HAS COMPLETED AN ALBERTA APPRENTICESHIP PROGRAM AND HAVING ACHIEVED THE STANDARDS ESTABLISHED UNDER THE ALBERTA APPRENTICESHIP AND INDUSTRY TRAINING ACT, IS HEREBY AUTHORIZED TO WORK IN THE TRADE AS A JOURNEYMAN AND TO USE THE TITLE CERTIFIED JOURNEYMAN

WELDER

EFFECTIVE DATE
August 18th, 2011

ISSUE DATE
September 7th, 2011

HONOURABLE GREG WEADICK
MINISTER OF
ADVANCED EDUCATION
AND TECHNOLOGY

DARLENE BOUWSEMA
EXECUTIVE DIRECTOR
OF APPRENTICESHIP
& INDUSTRY TRAINING

STORAGE TANK SOLUTIONS

Matt Mackenzie

MMA

012-0/891460 105092A

JOURNEYMAN CERTIFICATE

THIS IS TO CERTIFY THAT
MATT JOHN MACKENZIE
HAS COMPLETED AN ALBERTA APPRENTICESHIP PROGRAM AND HAVING ACHIEVED THE STANDARDS ESTABLISHED UNDER THE ALBERTA APPRENTICESHIP AND INDUSTRY TRAINING ACT, IS HEREBY AUTHORIZED TO WORK IN THE TRADE AS A JOURNEYMAN AND TO USE THE TITLE CERTIFIED JOURNEYMAN

WELDER

EFFECTIVE DATE
September 10th, 2009

ISSUE DATE
October 23rd, 2009

HONOURABLE DOUG HORNER
MINISTER OF ADVANCED EDUCATION AND TECHNOLOGY

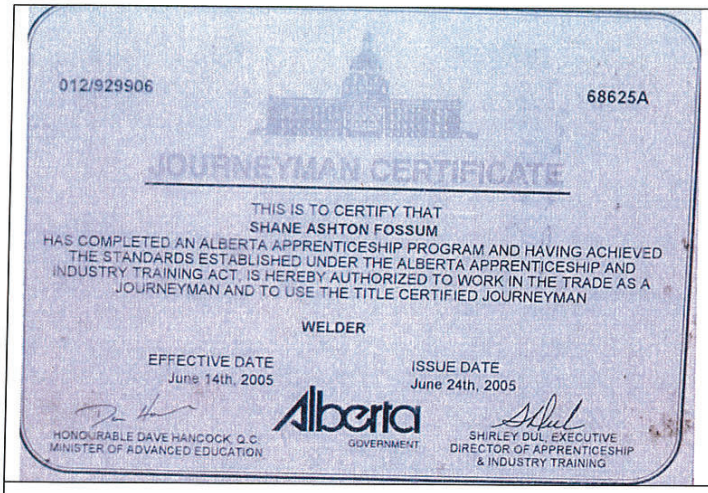
Alberta Government

DARLENE BOUWSEMA, EXECUTIVE DIRECTOR OF APPRENTICESHIP & INDUSTRY TRAINING

STORAGE TANK SOLUTIONS

Shane Fossum

SFO



012/929906 68625A

JOURNEYMAN CERTIFICATE

THIS IS TO CERTIFY THAT
SHANE ASHTON FOSSUM
HAS COMPLETED AN ALBERTA APPRENTICESHIP PROGRAM AND HAVING ACHIEVED THE STANDARDS ESTABLISHED UNDER THE ALBERTA APPRENTICESHIP AND INDUSTRY TRAINING ACT, IS HEREBY AUTHORIZED TO WORK IN THE TRADE AS A JOURNEYMAN AND TO USE THE TITLE CERTIFIED JOURNEYMAN

WELDER

EFFECTIVE DATE
June 14th, 2005

ISSUE DATE
June 24th, 2005

HONOURABLE DAVE HANCOCK, Q.C.
MINISTER OF ADVANCED EDUCATION

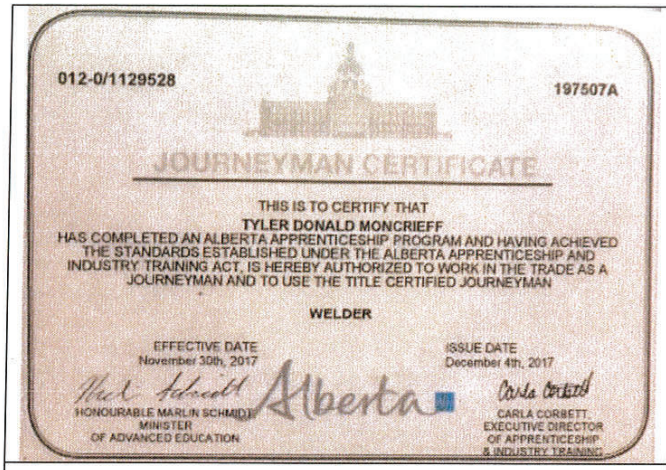
Alberta
GOVERNMENT

SHIRLEY DUL, EXECUTIVE
DIRECTOR OF APPRENTICESHIP
& INDUSTRY TRAINING

STORAGE TANK SOLUTIONS

Tyler Moncrieff

TMO



012-0/1129528

197507A

JOURNEYMAN CERTIFICATE

THIS IS TO CERTIFY THAT
TYLER DONALD MONCRIEFF
HAS COMPLETED AN ALBERTA APPRENTICESHIP PROGRAM AND HAVING ACHIEVED THE STANDARDS ESTABLISHED UNDER THE ALBERTA APPRENTICESHIP AND INDUSTRY TRAINING ACT, IS HEREBY AUTHORIZED TO WORK IN THE TRADE AS A JOURNEYMAN AND TO USE THE TITLE CERTIFIED JOURNEYMAN

WELDER

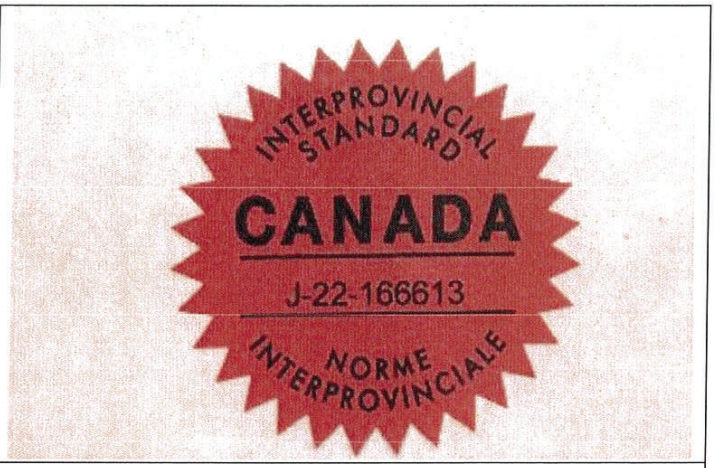
EFFECTIVE DATE
November 30th, 2017

ISSUE DATE
December 4th, 2017

HONOURABLE MARLIN SCHMIDT
MINISTER
OF ADVANCED EDUCATION

Alberta

CARLA CORBETT
EXECUTIVE DIRECTOR
OF APPRENTICESHIP
& INDUSTRY TRAINING



SECTION 4.0

Inspector Qualifications

STORAGE TANK SOLUTIONS

Sebastien Ouellet

SO

American Petroleum Institute
Individual Certification Programs: ICP™

API 653

Certification Number: 83440
Original Certification Date: August 31, 2018
Expiration Date: August 31, 2024

This is to verify that **Sebastien Ouellet**

has successfully met the requirements to be certified under the **API 653 Aboveground Storage Tank Inspector Certification Program**.

Cardholder Signature

Authorized Signature

Lindsay C Bolton

Certified Welding Inspector

LINDSAY CORA BOLTON REG # 9294

is a certified Level 2 welding inspector in accordance with the requirements of CSA W178.2 "Certification of Welding Inspectors".

Valid until August 31, 2023

This certification includes endorsements for the following code(s) and standard(s):

CSA W47.1-09/W59-03, ASME B31.3-2012, CSA Z662-2011, API 650-11th Edition, API 653-5th Edition

Six-year Re-certification Expiry August 31, 2026

NDTCB • OCEND

NRCAN NATIONAL NON-DESTRUCTIVE TESTING CERTIFICATION BODY
ORGANISME DE CERTIFICATION NATIONAL EN ESSAIS NON DESTRUCTIFS DE RNCAN

Name / Nom Lindsay C. Bolton
Reg. Number / No. matricule 15384
Issue Date / Date d'émission 2018/02/05
Corrective lenses for vision required / Verres correctifs pour la vision sont nécessaires Yes / Oui
Colour vision limitation / Limitation de la vision des couleurs No / Non

This certification card does not identify that the stated individual is an employee or representative of Natural Resources Canada, Government of Canada.

Cette carte de certification n'identifie pas l'individu d'être un employé ou un représentant de Ressources naturelles Canada, Gouvernement du Canada

Canada

NDTCB • OCEND

NRCAN NATIONAL NON-DESTRUCTIVE TESTING CERTIFICATION BODY
ORGANISME DE CERTIFICATION NATIONAL EN ESSAIS NON DESTRUCTIFS DE RNCAN

Name / Nom Lindsay Bolton
Reg. Number / No. matricule 15384
Issue Date / Date d'émission 2018/04/18
Corrective lenses for vision required / Verres correctifs pour la vision sont nécessaires Yes / Oui
Colour vision limitation / Limitation de la vision des couleurs No / Non

This certification card does not identify that the stated individual is an employee or representative of Natural Resources Canada, Government of Canada.

Cette carte de certification n'identifie pas l'individu d'être un employé ou un représentant de Ressources naturelles Canada, Gouvernement du Canada

Canada

CWB WELD SPECIALIST
WSM100381

This is to certify that
Lindsay Cora Bolton
Full first, middle, Full last
has completed the
OSSA Basic Safety Orientation (BSO)
Date: 17 - 08 - 2015 LP # 008
Day / Month / Year
Instructor signature & Number: I43
04005

Alberta Construction Safety Association
This is to certify that
LINDSAY BOLTON
met the requirements and has successfully completed the
Construction Safety Training System
"0313-09" includes Generic WHMIS
Reg. # 11237572
Issue Date: 10 / 03 / 2012
Month Day Year
Art Riendeau Program Coordinator, ACSA

Lindsay C Bolton

LCB

ENERGY SAFETY CANADA

Lindsay Bolton

CONFINED SPACE ENTRY AND MONITOR

COMPLETED: 20 May 2021

EXPIRES: 20 May 2024

INSTRUCTOR:

2114586

NZSV4-Y73SP-8EHFK-TRLFJ

ENERGY SAFETY CANADA

LINDSAY BOLTON

FALL PROTECTION

COMPLETED: 16 MAR 2021

EXPIRES: 16 MAR 2024

INSTRUCTOR:

2788918 L2XSS-86N82-WKNIB-NOPN7

ENFORM

Lindsay C. BOLTON

Student ID No: 2954526

H_2S Alive®

Completed: 12 Dec 2017

Expires: 12 Dec 2020

St. John Ambulance Saint-Jean

St. John Ambulance certifies that

LINDSAY C BOLTON

has completed

Standard First Aid - Level C CPR/AED

Expiry Date: Jan 31, 2021

Reference #: 0016594588

Issued By: Alberta Council

CANADIAN QUALITY TRAINING (CQT)

CERTIFICATE OF TRAINING

AWARDED TO

Lindsay Bolton

HAVING SUCCESSULY COMPLETED A 30 HOUR COURSE IN PRESSURE EQUIPMENT QUALITY CONTROL

ISSUED ON THE 06th DAY OF NOVEMBER 2019

Expires on: Nov. 05, 2022

Credit Hours 30

EXAM Code: EE00146002

Trainer: Gordon Canning

SEE REVERSE FOR TRAINING TOPICS

CARD No. 00511

CANADIAN QUALITY TRAINING (CQT)

CERTIFICATE OF TRAINING

AWARDED TO

Lindsay Bolton

HAVING SUCCESSULY COMPLETED A 30 HOUR COURSE IN PRESSURE EQUIPMENT QUALITY CONTROL

ISSUED ON THE 23rd DAY OF OCTOBER 2019

Expires on: October 22, 2022

Credit Hours 30

EXAM Code: EE00145998

Trainer: Gordon Canning

SEE REVERSE FOR TRAINING TOPICS

CARD No. 00507

Lindsay C Bolton

LCB

GLOBAL HazMat Inc

2529912

WHMIS 2015
Course

Midnight Sun Inspection Services Inc.
Company

Lindsay Bolton
Name

30 May 2019
Date Issued

N/A
Expiration Date

Address: RR2 Site10 Box13
Thorsby
Alberta
T0C 2P0

Employer Signature

1682737

WheelsOn

CERTIFICATE OF TRAINING
TDG Clear Language Training

Lindsay Bolton

Has completed training relating to the handling/offering for transportation/transporting dangerous goods, as per reverse, in accordance with the Transportation of Dangerous Goods Act and Regulations (1992).

Company: Midnight Sun Inspection Services In
Address: RR2 Site10 Box13
City: Thorsby
Province: Alberta

Date of Issue 08 Mar 2018

Employer Signature

CICT

This certifies that:

TP# 2134

Lindsay Bolton

has successfully completed a course in

Bear Awareness Training

☑ Practical Completed

Aug 18 2015
Date Completed

Instructor

NOTE: This certificate expires **THREE YEARS** from the date of issue.

CERTIFICATE NUMBER
5002967

THIS CERTIFIES THAT
Lindsay Bolton

HAS SATISFACTORILY COMPLETED

your body Mechanics in Motion

Your Body - Mechanics in Motion
TRAINING COURSE

ISSUED BY

16-May-06
COMPLETION DATE

cwbgroup

Welding Inspector Visual Acuity Record

SECTION 1: **IDENTIFICATION OF APPLICANT (Please print):**

Applicant's Name: Lindsay Bolton Registration #: 9294

☐ Application for Certification ☒ Renewal of Certification

*Email: LINDSAY_BOLTON@HOTMAIL.COM

*I understand that all official communication moving forward will be sent to me via electronic mail (email) and it is my responsibility to advise the CWB Group of any changes in my email address. L.B. initials

SECTION 2: **VISION REQUIREMENTS:**

Evidence of satisfactory vision, as determined by a medical professional, must be provided by all new applicants and certified inspectors who are renewing their certification. The vision examination must have been performed no more than 12 months from the date of receipt of this form by the CWB.

Near vision acuity shall permit reading a minimum of Jaeger number 1 or Times Roman N 4.5 or equivalent letters (having a height of 1.6 mm) at not less than 30 cm with one or both eyes, either corrected or uncorrected.

Submission of a prescription for corrective lenses in lieu of this form is not acceptable.

SECTION 3: **DECLARATION OF EXAMINER:**

This is to certify that I, Dr. J. Chan Tapoveti (Examiner's Name (please print)) administered a test of visual acuity to Lindsay Bolton (Applicant's Name (please print)) on 07/14/2021 (Examination Date (MM / DD / YYYY))

I also certify that the applicant: (check applicable box)

Meets the vision requirements in Section 2 without correction ☒

Meets the vision requirements in Section 2 with correction ☐

Does not meet the vision requirements in Section 2 ☐

Check one of the following:

☒ Optometrist ☐ Ophthalmologist ☐ Medical Doctor ☐ Registered Nurse

Address: Wal-Mart Vision Centre 3657
5302 Discovery Way
Leduc, AB T9E 8J7
Ph: (780) 980-0670

Signature of Examiner: [signature] Tel. #: 07/14/2021

FOR CWB USE ONLY:

Reviewed by: _____ Date: _____

PLEASE ATTACH COMPLETED RECORD TO YOUR APPLICATION AND SEND TO THE CWB.
RETAIN A COPY FOR YOUR FILE.

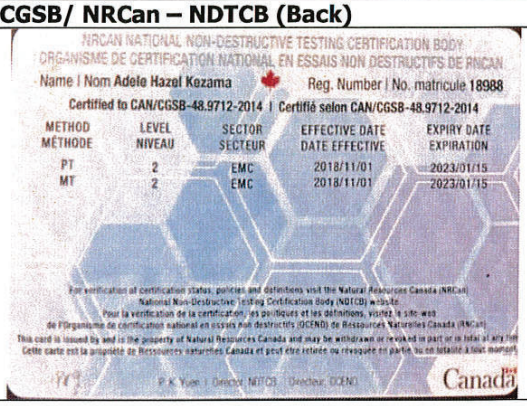
CUSTOM PIPE SERVICES INC.

www.cpsinspection.com
info@cpsinspection.com
Ph: 780-986-5066
Fx: 780-986-8520

Adele Kezma – Technical Certification

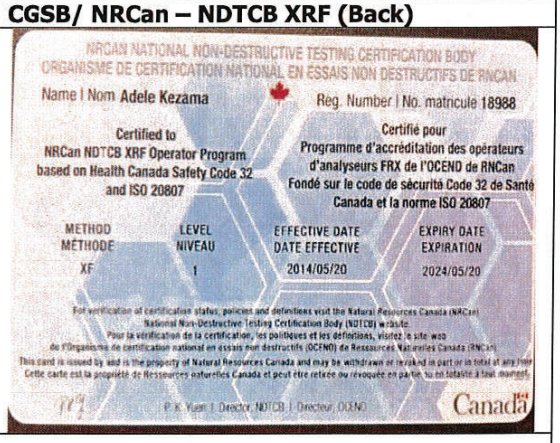
CGSB/ NRCan – NDTCB (Front)

CGSB/ NRCan – NDTCB (Back)



CGSB/ NRCan – NDTCB XRF (Front)

CGSB/ NRCan – NDTCB XRF (Back)



CNSC- CEDO

CUSTOM PIPE SERVICES INC.

www.cpsinspection.com
info@cpsinspection.com
Ph: 780-986-5066
Fx: 780-986-8520

CPS Inspection SNT-TC-1A Front

CUSTOM PIPE SERVICES INC.

Issue Date: July 19, 2021

This card certifies that **Adele Kezma**
is certified in accordance with Custom Pipe Services Inc.
Written Practice WP-SNT Rev 13 and SNT-TC-1A.
Edition 2006 & 2020.

Balwinder Singh.
ASNT NDT Level III# 173719

CPS Inspection SNT-TC-1A -Back

Method	Level	Sector	Expiry Date
MT	II	EMC	15/7/2024
PT	II	EMC	15/7/2024
RT	II	EMC	19/7/2024

This certification card is property of Custom Pipe Services Inc. and the certification is only valid while employed at Custom Pipe Services Inc.

CUSTOM PIPE SERVICES INC.
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info@cpsinspection.com
Ph: 780-986-5066
Fx: 780-986-8520

Adele Kezma

INITIAL CERTIFICATION DATE: July 15, 2021

This is to certify that Adele Kezma has successfully met the initial certification requirements of Custom Pipe Services Inc. Written Practice, in accordance with SNT-TC-1A of ASNT.

Details of his training and examination records duly endorsed by NDE Level III were reviewed and are attached with this certificate.

The requirements for certification have been met for the following methods:

Method	NDE Level	Grade	Method Hours	NDE Hours	Certified By	Certification Date	Expiry Date
MT	II	*	3500 +	9500 +	Balwinder Singh	July 15, 2021	July 15, 2024
PT	II	*	3500 +	9500 +	Balwinder Singh	July 15, 2021	July 15, 2024
RT	II	*	2000+	9500 +	Balwinder Singh	July 19, 2021	July 19, 2024

* CGSB certification is equivalent to an SNT grade level of 80%
** ASNT certification is equivalent to an SNT grade level of 80%
*** PCN certification is equivalent to an SNT grade level of 80%

CUSTOM PIPE SERVICES INC.

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info@cpsinspection.com
Ph: 780-986-5066
Fx: 780-986-8520

Name	Adele Kezma			
Employer	Custom Pipe Services Inc.			
NDT Method	Magnetic Particle Testing	**Level II- EMC**		
Qualification	**Academic** High School		**Experience in Method** 3500+ Hours	
Training Imparted (NAIT)	**Theory & Practical** Level 1& 2 MT Completed Jan 30, 2020 (80 Hrs)			
Result of Examination	**General:** ≥ 80%	**Specific:** 80%	**Practical:** 96%	**Average:** 85%
Vision Test	**Near Vision** J1-Normal ,	**Color Contrast Differentiation** Normal		**Limitation** None
Date of Certification	July 15, 2021	**Date of Recertification**		July 15, 2024
Certification By				
Name	**Level/Designation**	**Signature**	**Date**	**Company**
Balwinder Singh	NDT Level III		July 15, 2021	Custom Pipe Services Inc.

Acting as the company Senior NDE Level III for Custom Pipe Services Inc., I affirm that the above information is true and accurate to the best of my knowledge and the technician is certified to work at qualifications and levels indicated above.

Balwinder Singh		July 15, 2021
Verified By	**Signature**	**Date**

CUSTOM PIPE SERVICES INC.

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info@cpsinspection.com
Ph: 780-986-5066
Fx: 780-986-8520

Name	Adele Kezma			
Employer	Custom Pipe Services Inc.			
NDT Method	Penetrant Testing	**Level II- EMC**		
Qualification	**Academic** High School		**Experience in Method** 3500+ Hours	
Training Imparted (NAIT)	**Theory & Practical** Level 1& 2 PT Completed Jan 30, 2020 (80 Hrs)			
Result of Examination	**General:** 82%	**Specific:** 95%	**Practical:** 96%	**Average:** 91%
Vision Test	**Near Vision** J1-Normal ,	**Color Contrast Differentiation** Normal		**Limitation** None
Date of Certification	July 15, 2021	**Date of Recertification**		July 15, 2024

Certification By				
Name	**Level/Designation**	**Signature**	**Date**	**Company**
Balwinder Singh	NDT Level III		July 15, 2021	Custom Pipe Services Inc.

Acting as the company Senior NDE Level III for Custom Pipe Services Inc., I affirm that the above information is true and accurate to the best of my knowledge and the technician is certified to work at qualifications and levels indicated above.

Balwinder Singh		July 15, 2021
Verified By	**Signature**	**Date**

CUSTOM PIPE SERVICES INC.

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info@cpsinspection.com
Ph: 780-986-5066
Fx: 780-986-8520

Name	Adele Kezma			
Employer	Custom Pipe Services Inc.			
NDT Method	Radiographic Testing	**Level II- EMC**		
Qualification	**Academic** High School		**Experience in Method** 2000+ Hours	
Training Imparted (CINDE)	**Theory & Practical** November 14-15, 2019 (12 Hrs)			
Result of Examination	**General:** ≥ 80%	**Specific:** 85%	**Practical:** 90%	**Average:** 86%
Vision Test	**Near Vision** J1-Normal ,	**Color Contrast Differentiation** Normal		**Limitation** None
Date of Certification	July 19, 2021	**Date of Recertification**		July 19, 2024
Certification By				
Name	**Level/Designation**	**Signature**	**Date**	**Company**
Balwinder Singh	NDT Level III		July 19, 2021	Custom Pipe Services Inc.

Acting as the company Senior NDE Level III for Custom Pipe Services Inc., I affirm that the above information is true and accurate to the best of my knowledge and the technician is certified to work at qualifications and levels indicated above.

Balwinder Singh		July 19, 2021
Verified By	**Signature**	**Date**

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info@cpsinspection.com
Ph: 780-986-5066
Fx: 780-986-8520

Adele Kezma – Annual Vision Examiantion

ANNUAL VISION EXAMINATION

Employee Name: Adele Kezma

Examination Date: July 1, 2021

Expiry Date: July 1, 2022

NEAR VISION ACUITY

Near vision acuity shall ensure natural or corrected near vision acuity in at least one eye such that the employee is capable of reading a minimum of Jaeger Number 1. Times Roman N 4.5, or equivalent type and size of at not less than 30 cm. The ability to perceive an Ortho-Rater minimum of 8 or similar test pattern is also acceptable. This shall be administered annually.

I confirm that the employee:

- [ ] Meets the requirement without correction
- [X] Meets the requirement with correction
- [ ] Does not meet the requirement

COLOUR CONTRAST DIFFERENTIATION

Colour contrast differentiation shall demonstrate the capability of distinguishing and differentiating contrast among colours or shades of gray used in the method as determined by the employer. This shall be administered upon initial certification and at five year intervals thereafter.

I confirm that the employee can distinguish contrast between the colours used in the NDT method(s) concerned:

- [X] Meets the requirement
- [ ] Does not meet the requirement

The above mention annual vision examination is in accordance with ASNT Document: SNT-TC-1A (2006 and 2020 Editions) and CGSB Standard: CAN/CGSB-48.9712-2014/ISO9712:2012.

EXAMINER

Examiner's Name: Balwinder Singh **Examiner's Signature:** BSingh

Appointment/Title: Quality Assurance/ASNT NDT Level III **Examination Date:** July 1, 2021

Form-4.5 Rev.2

CUSTOM PIPE SERVICES INC.

www.cpsinspection.com
info@cpsinspection.com
Ph: 780-986-5066
Fx: 780-986-8520

Adele Kezma – Safety Certifications

CSTS	Elevated Working Platform
	
First Aid	**FORK LIFT OPERATOR**
	

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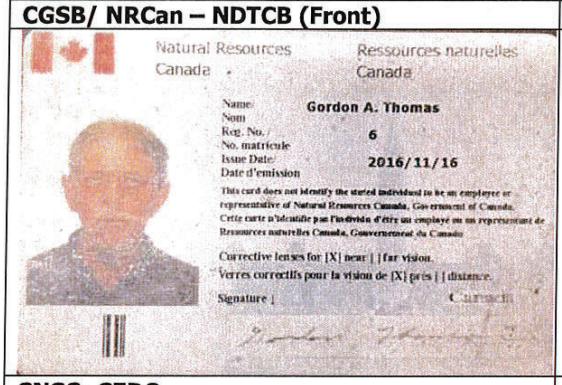
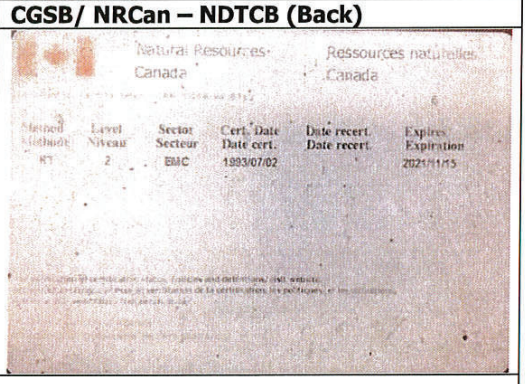
Fx: 780-986-8520

Gordon Thomas – Technical Certification

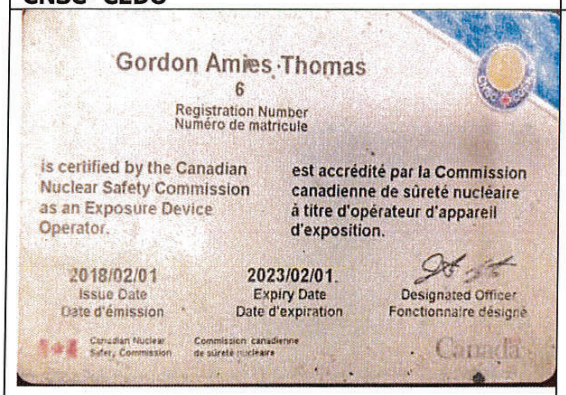
CGSB/ NRCan – NDTCB (Front)



CGSB/ NRCan – NDTCB (Back)



CNSC- CEDO



CPS Inspection SNT-TC-1A Front

CUSTOM PIPE SERVICES INC.

Issue Date: July 15, 2021

This card certifies that Gordon Thomas is certified in accordance with Custom Pipe Services Inc. Written Practice WP-SNT Rev 13 and SNT-TC-1A, Edition 2006 & 2020.

Balwinder Singh,
ASNT NDT Level III# 173719

CPS Inspection SNT-TC-1A -Back

Method	Level	Sector	Expiry Date
RT	II	EMC	15/7/2024

This certfication card is property of Custom Pipe Services Inc. and the certification is only valid while employed at Custom Pipe Services Inc.

CUSTOM PIPE SERVICES INC.

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Ph: 780-986-5066
Fx: 780-986-8520

Gordon Thomas

INITIAL CERTIFICATION DATE: July 15, 2021

This is to certify that Gordon Thomas has successfully met the initial certification requirements of Custom Pipe Services Inc. Written Practice, in accordance with SNT-TC-1A of ASNT.

Details of his training and examination records duly endorsed by NDE Level III were reviewed and are attached with this certificate.

The requirements for certification have been met for the following methods:

Method	NDE Level	Grade	Method Hours	NDE Hours	Certified By	Certification Date	Expiry Date
RT	II	*	25000+	40000+	Balwinder Singh	July15, 2021	July 15, 2024

* CGSB certification is equivalent to an SNT grade level of 80%
** ASNT certification is equivalent to an SNT grade level of 80%
*** PCN certification is equivalent to an SNT grade level of 80%

CUSTOM PIPE SERVICES INC.

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Ph: 780-986-5066
Fx: 780-986-8520

Name	Gordon Thomas			
Employer	Custom Pipe Services Inc.			
NDT Method	Radiographic Testing	**Level II- EMC**		
Qualification	**Academic** High School		**Experience in Method** 25000+Hours	
Training Imparted (Rivest Testing)	**Theory & Practical** August 1980 (80 Hrs)			
Result of Examination	**General:** ≥ 80%	**Specific:** 95%	**Practical:** 96%	**Average:** 90%
Vision Test	**Near Vision** J1-Normal ,	**Color Contrast Differentiation** Normal		**Limitation** None
Date of Certification	July 15, 2021	**Date of Recertification**		July 15, 2024

Certification By				
Name	**Level/Designation**	**Signature**	**Date**	**Company**
Balwinder Singh	NDT Level III		July 15, 2021	Custom Pipe Services Inc.

Acting as the company Senior NDE Level III for Custom Pipe Services Inc., I affirm that the above information is true and accurate to the best of my knowledge and the technician is certified to work at qualifications and levels indicated above.

Balwinder Singh		July 15, 2021
Verified By	**Signature**	**Date**

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Ph: 780-986-5066
Fx: 780-986-8520

Gordon Thomas– Annual Vision Examiantion

ANNUAL VISION EXAMINATION

Employee Name: Gordon Thomas

Examination Date: July 15. 2021

Expiry Date: July 15. 2022

NEAR VISION ACUITY

Near vision acuity shall ensure natural or corrected near vision acuity in at least one eye such that the employee is capable of reading a minimum of Jaeger Number 1. Times Roman N 4.5. or equivalent type and size of at not less than 30 cm. The ability to perceive an Ortho-Rater minimum of 8 or similar test pattern is also acceptable. This shall be administered annually.

I confirm that the employee:

- [ ] Meets the requirement without correction
- [X] Meets the requirement with correction
- [ ] Does not meet the requirement

COLOUR CONTRAST DIFFERENTIATION

Colour contrast differentiation shall demonstrate the capability of distinguishing and differentiating contrast among colours or shades of gray used in the method as determined by the employer. This shall be administered upon initial certification and at five year intervals thereafter.

I confirm that the employee can distinguish contrast between the colours used in the NDT method(s) concerned:

- [X] Meets the requirement
- [ ] Does not meet the requirement

The above mention annual vision examination is in accordance with ASNT Document: SNT-TC-1A (2006 and 2020 Editions) and CGSB Standard: CAN/CGSB-48.9712-2014/ISO9712:2012.

EXAMINER

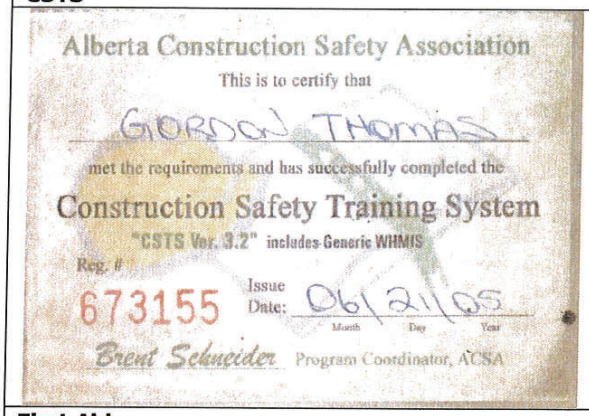
Examiner's Name: Balwinder Singh **Examiner's Signature:** 

Appointment/Title: Quality Assurance/ASNT NDT Level III **Examination Date:** July 15. 2021

Form-4.5 Rev.2

CUSTOM PIPE SERVICES INC.
www.cpsinspection.com
info@cpsinspection.com
Ph: 780-986-5066
Fx: 780-986-8520

Gordan Thomas – Safety Certifications

CSTS	Elevated Working Platform
 Alberta Construction Safety Association This is to certify that GIORDAN THOMAS met the requirements and has successfully completed the Construction Safety Training System "CSTS Ver. 3.2" includes Generic WHMIS Reg. # 673155 Issue Date: 06/21/05 Month Day Year Brent Schneider Program Coordinator, ACSA	
First Aid	**FORK LIFT OPERATOR**

SECTION 5.0

WPS

WELDING PROCEDURE SPECIFICATION NO.: STS-1 (Rev.0)

WELDING PROCEDURE QUALIFICATION RECORD NO.(S): STS-1-1 (Rev.0), STS-1-2 (Rev.0), STS-1-3 (Rev.0), WFL-1-1

QUALIFIED IN ACCORDANCE WITH ASME SECTION IX FOR

Base Metal (Typical): P1 Groups 1 & 2 to P1 Groups 1 & 2
(SA 333 Gr. 6, SA 350 Gr. LF2, SA 420 Gr. WPL6, SA 516 Gr. 70 etc.)
Process(es): SMAW **Weld Types:** GROOVE & FILLET
Position: ALL POSITIONS **Diameter:** ALL DIAMETERS
Filler Metal: E6010, E7018-1

BASE METAL CONDITIONS & GROOVE THICKNESS RANGE QUALIFIED:

NOTCH TOUGHNESS APPLICATIONS TO -50 °F AS WELDED
BASE METAL THICKNESS RANGE 0.116 to 1.750 in. inclusive

COMBINED DEPOSITED WELD METAL THICKNESS
ASME IX 1.750 in. maximum
API 650, 620, 12D, 12F 1.750 in. maximum

PROVINCIAL REGISTRATION

This WPS was prepared to the requirements of ASME Section IX 2017 and includes some of the additional requirements of the construction codes listed. The application of this WPS is outside the work scope of SGS Canada Inc.

Prepared By: Sara Van Roestel
Signed: Sara Van Roestel
Date: April 8, 2019

Reviewed By: Keelan Wolfe, C.E.T.
Signed: Keelan Wolfe
Date: April 8, 2019

(File E19-00104)

QW-482 WELDING PROCEDURE SPECIFICATION (WPS)

Organization Name: Storage Tank Solutions Inc.
Welding Procedure Specification No.: STS-1 (Rev.0) Date: April 8, 2019
Revision(s): Rev. 0: Essential - Addition of PQR No.'s STS-1-1 (Rev.0), STS-1-2 (Rev.0), and STS-1-3 (Rev.0). Updated to current code requirements. WPS No. formerly WFL-1 (Rev.1).
Supporting PQR No.(s): STS-1-1 (Rev.0), STS-1-2 (Rev.0), STS-1-3 (Rev.0), WFL-1-1
Welding Process(es): Shielded Metal Arc Welding (SMAW)

JOINTS (QW-402)

Joint Design: All ASME groove & fillet, reference construction drawing for joint details. Where joint details are not specified, refer to figures 1 to 15 attached
Root Opening: As per attached typical groove designs, see figures 1 to 15 attached
Backing: With or without Retainers: With or without

BASE METALS (QW-403)

P-Number: P1 Groups 1 & 2 To P-Number: P1 Groups 1 & 2
Thickness Range: Groove: 0.116 to 1.750 in. inclusive
Fillet: 0.116 to 8.00 in. inclusive
Pipe Diameter Ranges: Groove: All diameters
Fillet: All diameters
Deposited Weld Metal (Per Pass): E6010: 0.188 in. maximum
E7018-1: 0.188 in. maximum

FILLER METALS (QW-404)

	SMAW	SMAW
Specification No. (SFA)	SFA 5.1	SFA 5.1
AWS No. (Class)	E6010	E7018-1
F-No.	F3	F4
A-No.	A1	A1
Diameter	3/32 to 3/16 in. inclusive	3/32 to 1/4 in. inclusive
Deposited Weld Metal Thickness Range:		
Groove	0.188 in. max. (1)	1.750 in. max. (1)
Fillet	All fillet sizes (2)	All fillet sizes

(1) Deposited weld metal thickness shall not exceed 1.750 in.
(2) E6010 is restricted to a single pass for fillet weld applications requiring an MDMT less than -20 °F.

POSITION (QW-405)

Position of Groove: All positions Position of Fillet: All positions
Weld Progression: E6010: Vertical up or down E7018-1: Vertical up

PREHEAT (QW-406)

Preheat Temperature (Minimum): See attached preheat sheet prior to welding.
Interpass Temperature (Maximum): 500 °F
Preheat Maintenance: See attached preheat sheet prior to welding. Preheat maintenance is not required if welding is interrupted or after the completion of welding unless required by the code of construction.

POSTWELD HEAT TREATMENT (QW-407)

With or Without: Without

Temperature Range: N/A Time Range: N/A

ELECTRICAL CHARACTERISTICS (QW-409)

Current: Direct Polarity: Reverse, electrode positive

Amps: See Table 1 Volts: See Table 1

Maximum Heat Input

Base Metal Thickness Range	E6010 Electrode	E7018-1 Electrode
0.116 - 0.499 in.	29,211 J/in.	44,000 J/in.
0.500 - 0.624 in.	45,625 J/in.	58,667 J/in.
0.625 and greater	51,022 J/in.	63,360 J/in.

TECHNIQUE (QW-410)

Manual or Automatic: Manual

String or Weave: E6010: String E7018-1: String or weave

Initial & Interpass Cleaning: Brushing, chipping or grinding as required

Method of Back Gouging: Air carbon arc, back-grind as required

Multiple or Single Pass Per Side: Multiple

Peening: Not permitted

Use of Thermal Process: N/A

Travel Speed: See Table 1

TABLE 1 - WELDING PARAMETERS

Process	Filler Metal	Diameter in.	Current Type & Polarity	Amperage Range	Voltage Range	Travel Speed i.p.m.
SMAW	E6010	3/32	DCRP	50 - 100	18 - 32	1.1 - 12
SMAW	E6010	1/8	DCRP	60 - 140	19 - 32	1.4 - 14
SMAW	E6010	5/32	DCRP	115 - 250	21 - 32	2.9 - 16
SMAW	E6010	3/16	DCRP	120 - 300	21 - 32	3.0 - 18
SMAW	E7018-1	3/32	DCRP	60 - 110	18 - 26	1.1 - 12
SMAW	E7018-1	1/8	DCRP	90 - 170	19 - 28	1.7 - 14
SMAW	E7018-1	5/32	DCRP	110 - 220	20 - 30	2.1 - 16
SMAW	E7018-1	3/16	DCRP	160 - 320	20 - 30	3.1 - 20
SMAW	E7018-1	7/32	DCRP	240 - 340	20 - 32	4.6 - 22
SMAW	E7018-1	1/4	DCRP	275 - 360	21 - 32	5.5 - 22

Note: Welding parameters shall be adjusted to ensure that the maximum heat input value specified in QW-409 above is not exceeded.
Heat Input (joules per inch) = (Amperage X Voltage X 60) / Travel Speed (i.p.m.)

TYPICAL JOINT DESIGNS

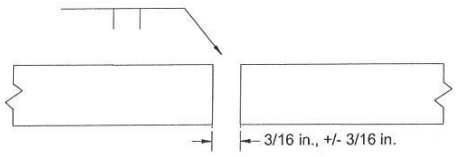


Figure 1
Single Square Butt

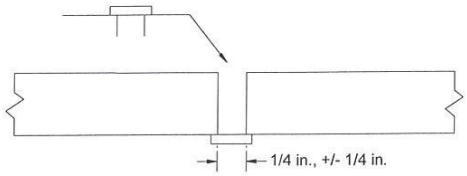


Figure 2
Single Square Butt with Backing Strip

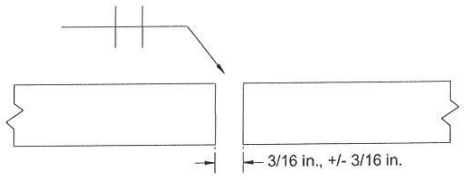


Figure 3
Double Square Butt

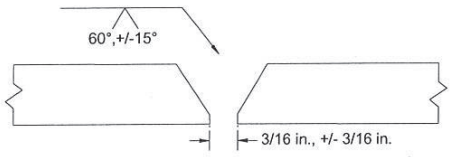


Figure 4
Single Vee Butt

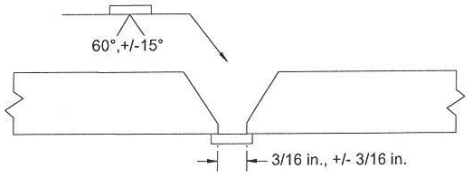


Figure 5
Single Vee Butt with Backing Strip

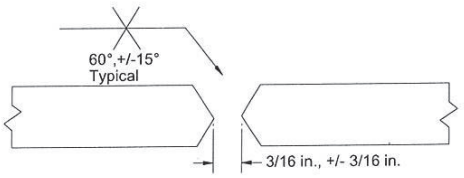


Figure 6
Double Vee Butt

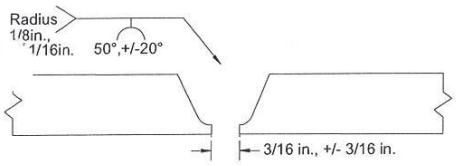


Figure 7
Single U Butt

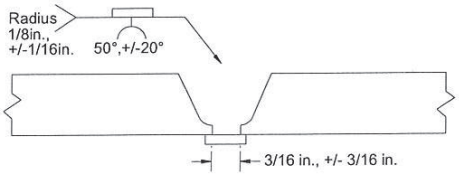


Figure 8
Single U Butt with Backing Strip

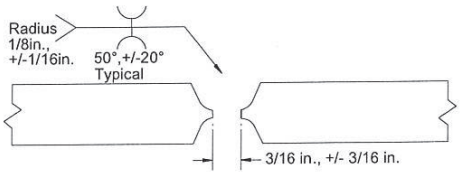


Figure 9
Double U Butt

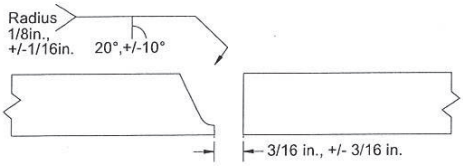


Figure 10
Single J Butt

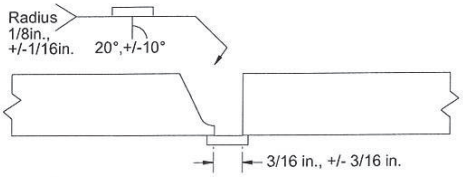


Figure 11
Single J Butt with Backing Strip

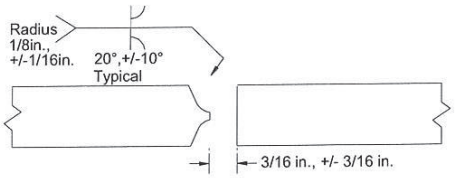


Figure 12
Double J Butt

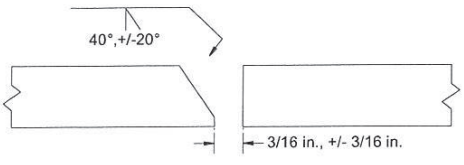


Figure 13
ıgle Bevel Butt

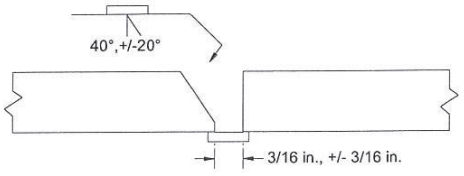


Figure 14
Single Bevel Butt with Backing Strip

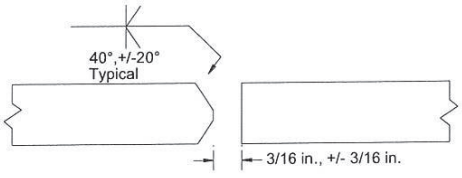


Figure 15
Double Bevel Butt

Additional joint designs and internal misalignment on circumferential welds shall be within the dimensional limits stated on the approved construction drawing and/or the engineering design.

PREHEAT

P-No. 1

LARGE, WELDED, LOW-PRESSURE STORAGE TANKS IN ACCORDANCE WITH API 620 Twelfth Edition

THICKNESS OF THE THICKER PLATE	MINIMUM PREHEAT TEMPERATURE	
	P1 Group 1	P1 Group 2
0 to 1.25 in.	32 °F	50 °F
Greater than 1.25 in to 1.50 in.	200 °F	200 °F
Greater than 1.50 in.	200 °F	200 °F

- No welding of any kind shall be performed when the surfaces to be welded are wet with rain snow or ice; when rain or snow is falling on such surfaces; or during periods of high winds unless the welder and the work are properly shielded.
- Preheat shall be applied when the metal temperature is below the temperature required by Table 6-2 (summarized above). In that case the base metal shall be heated to at least the temperature indicated within 3 in. of the place where welding is to be started and maintained 3 in. ahead of the arc. Material P-Number and Group Number shall be as designated in ASME IX or in API 630 6.7.2 for materials not listed in ASME IX.

WELDED TANKS FOR OIL STORAGE IN ACCORDANCE WITH API 650 Twelfth Edition

THICKNESS OF THE THICKER PLATE	MINIMUM PREHEAT TEMPERATURE	
	Material Group I, II, III, and IIIA	Material Group IV, IVA, V & VI
0 to 1.25 in.	32 °F	50 °F
Greater than 1.25 in to 1.50 in.	200 °F	200 °F
Greater than 1.50 in.	200 °F	200 °F

- No welding of any kind shall be performed when the surfaces to be welded are wet with rain snow or ice; when rain or snow is falling on such surfaces; or during periods of high winds unless the welder and the work are properly shielded.
- Preheat shall be applied when metal temperature is below the temperature required by table 7-1 (summarized above) for the base metals being joined, and metal shall be heated to at least the temperature indicated within 3 in. of the place where welding is to be started and maintained 3 in. ahead of the arc. Material Groups shall be as designated in Table 4.4

WELDED STORAGE TANKS IN ACCORDANCE WITH API 12D Eleventh Edition and API 12F Twelfth Edition

THICKNESS OF THE THICKER PLATE	MINIMUM PREHEAT TEMPERATURE
0 to 1.25 in.	50 °F
Greater than 1.25 in to 1.50 in.	200 °F
Greater than 1.50 in.	200 °F

- No welding of any kind shall be performed when the surfaces to be welded are wet with rain snow or ice; when rain or snow is falling on such surfaces; or during periods of high winds unless the welder and the work are properly shielded.
- Preheat shall be applied when the metal temperature is below the temperature required by the table above. In that case the base metal shall be heated to at least the temperature indicated within 3 in. of the place where welding is to be started and maintained 3 in. ahead of the arc.

QW-483 PROCEDURE QUALIFICATION RECORD (PQR)

Organization Name: Storage Tank Solutions Inc.
Procedure Qualification Record No.: STS-1-1 (Rev.0) Date: February 21, 2019
Welding Process(es): Shielded Metal Arc Welding (SMAW)

JOINTS (QW-402)

Joint Design: Butt joint, single vee groove, see next page
Root Opening: See next page
Backing: Without Retainers: Without

BASE METALS (QW-403)

Material Specification No.: SA 333 to SA 350 Type or Grade: Gr. 6 to Gr. LF2
Heat Treat Condition (1): SA 333 Gr. 6: Quenched/Tempered SA 350 Gr. LF2: Normalized
P-No.: P1 Group 1 To P-No.: P1 Group 2 Thickness: 0.232 in.
Heat Number: 44391 to A50A8 Carbon Equivalent (2): 0.21 to 0.40 (3)
Diameter: 6.625 in. O.D.
Other: Schedule 40 pipe machined to 0.232 in. wall thickness
Deposited Weld Metal (Per Pass): Did not exceed 0.094 in. for E6010, and 0.125 in. for E7018-1

(1) Condition of base metal prior to welding.
(2) Per CSA Z662 Carbon Equivalent formula. See chemical composition of heat / ladle analysis on attached material test reports.

FILLER METALS (QW-404)

	SMAW	SMAW
Specification No. (SFA)	SFA 5.1	SFA 5.1
AWS No. (Class)	E6010 (3)	E7018-1 (4)
F-No.	F3	F4
A-No.	A1	A1
Diameter	See attached sketch	
Deposited Weld Metal Thickness	0.094 in.	0.138 in.

(3) The Lincoln Electric Company: Fleetweld 5P+
(4) ESAB: OK 55.00

POSITION (QW-405)

Position of Groove: 5G Weld Progression: Vertical up

PREHEAT (QW-406)

Preheat Temperature: 50 °F Interpass Temp. (Max.): 400 °F
Preheat Maintenance: Weld was allowed to cool to ambient temperature in still air after welding was completed.

POSTWELD HEAT TREATMENT (QW-407)

With or Without: Without
Temperature: N/A Time: N/A

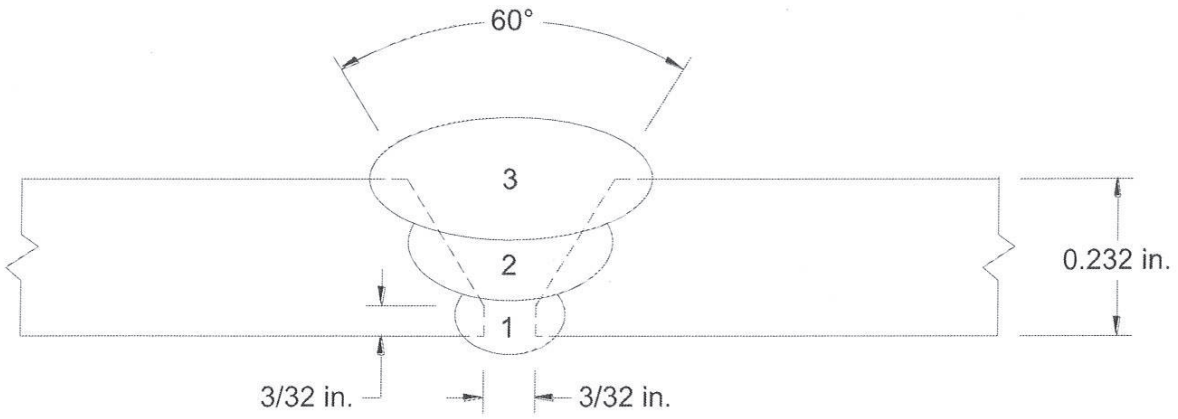
PQR NO. STS-1-1 (Rev.0)

ELECTRICAL CHARACTERISTICS (QW-409)

Current	Direct	Polarity	Reverse, electrode positive
Amps	See below	Volts	See below
Heat Input	E6010: 29,211 J/in. maximum		E7018-1: 44,000 J/in. maximum

TECHNIQUE (QW-410)

Manual or Automatic	Manual	
String or Weave	E6010: String	E7018-1: Weave
Initial & Interpass Cleaning	Brushing, chipping and grinding as required	
Method of Back Gouging	Not conducted	
Multiple or Single Pass Per Side	E6010: Single	E7018-1: Multiple
Peening	Not conducted	
Use of Thermal Process	N/A	
Travel Speed	See below	



Pass	Process	Filler Metal	Diameter in.	Current Type & Polarity	Amperage Range	Voltage Range	Travel Speed i.p.m.
1	SMAW	E6010	1/8	DCRP	72 - 76	24 - 26	3.8
2	SMAW	E7018-1	3/32	DCRP	74 - 78	23 - 25	2.6
3	SMAW	E7018-1	3/32	DCRP	76 - 84	21 - 23	2.4

PQR NO. STS-1-1 (Rev.0)

CHARPY V-NOTCH IMPACT TEST

Type of Test Charpy V-Notch Orientation Transverse

Governing Specification	Notch Location	Specimen Size in.	Test Temperature ° F	Specimen Number	Impact Values ft•lbf
ASME B31.3 - 2016	Weld metal within 1/16 in. of root	0.394 x 0.157	-67	D2.1	17
				D2.2	30
				D2.3	27
ASME B31.3 - 2016	Gr. 6 - HAZ	0.394 x 0.157	-67	D3.1	75
				D3.2	81
				D3.3	53
ASME B31.3 - 2016	Gr. LF2 - HAZ	0.394 x 0.157	-67	D4.1	10
				D4.2	26
				D4.3	20

OTHER TESTS

Vickers Hardness - see attached Laboratory Test Report No.: E19-104.4

Welder's Name Aaron Smedsrud Certificate File No. W-28887
Tests Conducted By SGS Canada Inc.
Laboratory Test No. E19-104.4

We certify 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.

Organization Storage Tank Solutions Inc.

Date January 21, 2021 Print Sebastien Ouellet

Signed

QW-483 PROCEDURE QUALIFICATION RECORD (PQR)

Organization Name: Storage Tank Solutions Inc.
Procedure Qualification Record No.: STS-1-2 (Rev.0) Date: February 22, 2019
Welding Process(es): Shielded Metal Arc Welding (SMAW)

JOINTS (QW-402)

Joint Design: Butt joint, single vee groove, see next page
Root Opening: See next page
Backing: Without Retainers: Without

BASE METALS (QW-403)

Material Specification No.: SA 516 Type or Grade: Gr. 60/70
Heat Treat Condition (1): SA 516 Gr. 60/70: Normalized
P-No.: P1 Groups 1/2 To P-No.: P1 Groups 1/2 Thickness: 0.500 in.
Heat Number: 449291 55060-03 Carbon Equivalent (2): 0.36
Diameter: N/A Other: Plate product form
Deposited Weld Metal (Per Pass): Did not exceed 0.094 in. for E6010, and 0.188 in. for E7018-1

(1) Condition of base metal prior to welding.
(2) Per CSA Z662 Carbon Equivalent formula. See chemical composition of heat analysis on attached material test report

FILLER METALS (QW-404)	SMAW	SMAW
Specification No. (SFA)	SFA 5.1	SFA 5.1
AWS No. (Class)	E6010 (3)	E7018-1 (4)
F-No.	F3	F4
A-No.	A1	A1
Diameter	See attached sketch	
Deposited Weld Metal Thickness	0.094 in.	0.406 in.

(3) The Lincoln Electric Company: Fleetweld 5P+
(4) ESAB: OK 55.00

POSITION (QW-405)

Position of Groove: 3G Weld Progression: Vertical up

PREHEAT (QW-406)

Preheat Temperature: 50 °F Interpass Temp. (Max.): 500 °F
Preheat Maintenance: Weld was allowed to cool to ambient temperature in still air after welding was completed.

POSTWELD HEAT TREATMENT (QW-407)

With or Without: Without
Temperature: N/A Time: N/A

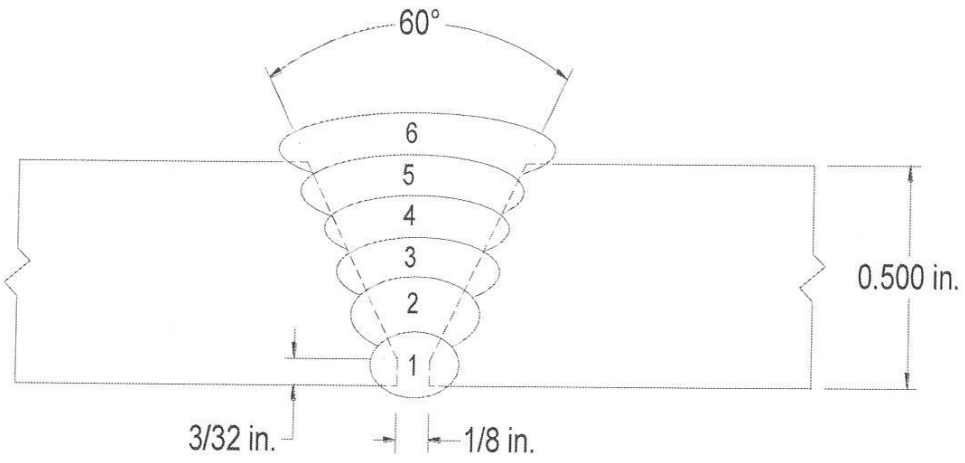
PQR NO. STS-1-2 (Rev.0)

ELECTRICAL CHARACTERISTICS (QW-409)

Current	Direct	Polarity	Reverse, electrode positive
Amps	See below	Volts	See below
Heat Input	E6010: 45,625 J/in. maximum		E7018-1: 58,667 J/in. maximum

TECHNIQUE (QW-410)

Manual or Automatic	Manual	
String or Weave	E6010: String	E7018-1: Weave
Initial & Interpass Cleaning	Brushing, chipping and grinding as required	
Method of Back Gouging	Not conducted	
Multiple or Single Pass Per Side	E6010: Single	E7018-1: Multiple
Peening	Not conducted	
Use of Thermal Process	N/A	
Travel Speed	See below	



Pass	Process	Filler Metal	Diameter in.	Current Type & Polarity	Amperage Range	Voltage Range	Travel Speed i.p.m.
1	SMAW	E6010	1/8	DCRP	68 - 78	24 - 26	2.4
2	SMAW	E7018-1	3/32	DCRP	76 - 80	22 - 24	4.1
3	SMAW	E7018-1	3/32	DCRP	80 - 84	22 - 24	4.0
4	SMAW	E7018-1	3/32	DCRP	90 - 94	22 - 24	3.2
5	SMAW	E7018-1	1/8	DCRP	118 - 122	21 - 23	3.3
6	SMAW	E7018-1	1/8	DCRP	118 - 122	21 - 23	2.7

PQR NO. STS-1-2 (Rev.0)

CHARPY V-NOTCH IMPACT TEST

Type of Test Charpy V-Notch Orientation Transverse

Governing Specification	Notch Location	Specimen Size in.	Test Temperature ° F	Specimen Number	Impact Values ft•lbf
ASME B31.3 - 2016	Weld metal within 1/16 in. of root	0.394 x 0.394	-50	E2.1	51
				E2.2	42
				E2.3	67
ASME B31.3 - 2016	HAZ	0.394 x 0.394	-50	E3.1	63
				E3.2	32
				E3.3	33

OTHER TESTS

Vickers Hardness - see attached Laboratory Test Report No.: E19-104.5

Welder's Name Christopher Jaques Certificate File No. N/A
Tests Conducted By SGS Canada Inc.
Laboratory Test No. E19-104.5

We certify 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.

Organization Storage Tank Solutions Inc.

Date January 21, 2021 Print Sebastien Ouelelt

Signed

QW-483 PROCEDURE QUALIFICATION RECORD (PQR)

Organization Name: Storage Tank Solutions Inc.
Procedure Qualification Record No.: STS-1-3 (Rev.0) Date: February 22, 2019
Welding Process(es): Shielded Metal Arc Welding (SMAW)

JOINTS (QW-402)

Joint Design: Butt joint, single vee groove, see next page
Root Opening: See next page
Backing: Without Retainers: Without

BASE METALS (QW-403)

Material Specification No.: SA 516 Type or Grade: Gr. 60/70
Heat Treat Condition (1): SA 516 Gr. 60/70: Normalized
P-No.: P1 Groups 1/2 To P-No.: P1 Groups 1/2 Thickness: 0.875 in.
Heat Number: 449291 55060-03 Carbon Equivalent (2): 0.37
Diameter: N/A Other: Plate product form
Deposited Weld Metal (Per Pass): Did not exceed 0.094 in. for E6010, and 0.125 in. for E7018-1

(1) Condition of base metal prior to welding.
(2) Per CSA Z662 Carbon Equivalent formula. See chemical composition of heat analysis on attached material test report

FILLER METALS (QW-404)	SMAW	SMAW
Specification No. (SFA)	SFA 5.1	SFA 5.1
AWS No. (Class)	E6010 (3)	E7018-1 (4)
F-No.	F3	F4
A-No.	A1	A1
Diameter	See attached sketch	
Deposited Weld Metal Thickness	0.094 in.	0.781 in.

(3) The Lincoln Electric Company: Fleetweld 5P+
(4) ESAB: OK 55.00

POSITION (QW-405)

Position of Groove: 3G Weld Progression: Vertical up

PREHEAT (QW-406)

Preheat Temperature: 50 °F Interpass Temp. (Max.): 500 °F
Preheat Maintenance: Weld was allowed to cool to ambient temperature in still air after welding was completed.

POSTWELD HEAT TREATMENT (QW-407)

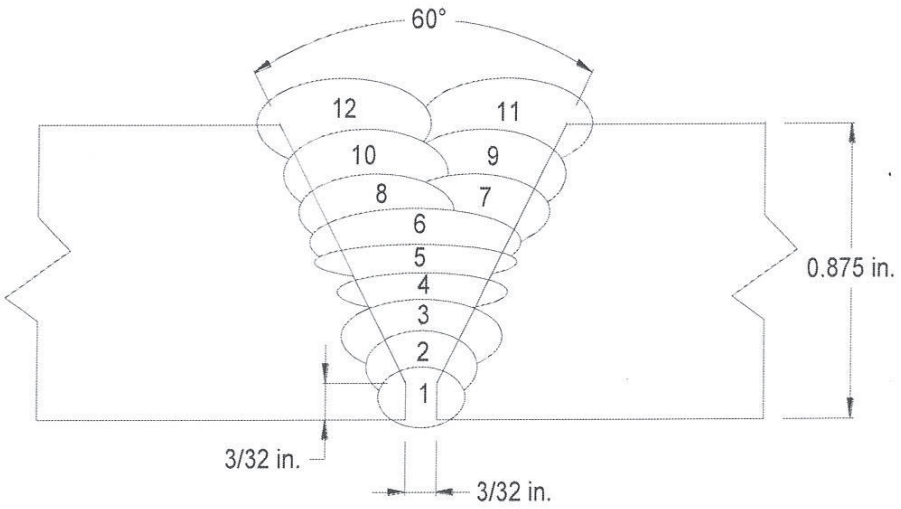
With or Without: Without
Temperature: N/A Time: N/A

ELECTRICAL CHARACTERISTICS (QW-409)

Current	Direct	Polarity	Reverse, electrode positive
Amps	See below	Volts	See below
Heat Input	E6010: 51,022 J/in. maximum		E7018-1: 63,360 J/in. maximum

TECHNIQUE (QW-410)

Manual or Automatic	Manual	
String or Weave	E6010: String	E7018-1: Weave
Initial & Interpass Cleaning	Brushing, chipping and grinding as required	
Method of Back Gouging	Not conducted	
Multiple or Single Pass Per Side	E6010: Single	E7018-1: Multiple
Peening	Not conducted	
Use of Thermal Process	N/A	
Travel Speed	See below	



Pass	Process	Filler Metal	Diameter in.	Current Type & Polarity	Amperage Range	Voltage Range	Travel Speed i.p.m.
1	SMAW	E6010	1/8	DCRP	80 - 84	27 - 29	2.7
2	SMAW	E7018-1	3/32	DCRP	78 - 82	20 - 22	3.2
3	SMAW	E7018-1	3/32	DCRP	88 - 92	20 - 22	3.7
4	SMAW	E7018-1	1/8	DCRP	120 - 124	21 - 23	3.3
5	SMAW	E7018-1	1/8	DCRP	120 - 124	21 - 23	2.9
6	SMAW	E7018-1	1/8	DCRP	120 - 124	21 - 23	2.7
7	SMAW	E7018-1	1/8	DCRP	116 - 120	22 - 24	5.1
8	SMAW	E7018-1	1/8	DCRP	118 - 122	21 - 23	5.1
9	SMAW	E7018-1	1/8	DCRP	118 - 122	21 - 23	4.6
10	SMAW	E7018-1	1/8	DCRP	118 - 122	21 - 23	3.6
11	SMAW	E7018-1	1/8	DCRP	118 - 122	21 - 23	3.3
12	SMAW	E7018-1	1/8	DCRP	118 - 122	21 - 23	2.5

PQR NO. STS-1-3 (Rev.0)

TENSILE TEST (QW-150)

Sample No.	Width in.	Thickness in.	Area sq. in.	Ultimate Load lbf	Ultimate Stress psi	Fracture Type & Location
T1	0.748	0.799	0.598	46,500	77,800	Partial Cup & Cone Parent Metal
T2	0.748	0.807	0.604	47,300	78,300	Partial Cup & Cone Parent Metal

GUIDED BEND TEST (QW-160)

Type & Figure No.	Result	Type & Figure No.	Result
QW-462.2, TSB - S1	Pass	QW-462.2, TSB - S3	Pass
QW-462.2, TSB - S2	Pass	QW-462.2, TSB - S4	Pass

CHARPY V-NOTCH IMPACT TEST

Type of Test Charpy V-Notch Orientation Transverse

Governing Specification	Notch Location	Specimen Size in.	Test Temperature ° F	Specimen Number	Impact Values ft•lbf
ASME B31.3 - 2016	Weld metal within 1/16 in. of root	0.394 x 0.394	-50	F2.1	60
				F2.2	79
				F2.3	51
ASME B31.3 - 2016	HAZ	0.394 x 0.394	-50	F3.1	194
				F3.2	154
				F3.3	101

OTHER TESTS

Vickers Hardness - see attached Laboratory Test Report No.: E19-104.6

Welder's Name Christopher Jaques & Matthew MacKenzie Certificate File No. N/A
Tests Conducted By SGS Canada Inc.
Laboratory Test No. E19-104.6

We certify 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.

Organization Storage Tank Solutions Inc.

Date January 21, 2021 Print Sebastien Ouellet

Signed 

QW-483 PROCEDURE QUALIFICATION RECORD (PQR)

Woodside Fabricators Ltd.

Procedure Qualification Record No. WFL-1-1 Date February 26, 2007
Welding Procedure Specification No. WFL-1
Welding Process(es) SMAW Type(s) Manual

JOINTS (QW-402)

Type Butt joint, single vee groove, see next page

BASE METALS (QW-403)

Material Spec. SA 516 to SA 516 Type or Grade Gr. 60N to Gr. 70N
P-No. P1 Grp.1 To P-No. P1 Grp.2 Thickness 6.32 mm (0.249 in.)
Diameter N/A - Plate Heat No. 44410-34383
Deposited Weld Metal (Per pass) Did not exceed 12.7 mm (0.500 in.)

FILLER METALS (QW-404)

Specification No. (SFA)	SFA 5.1	SFA 5.1
AWS No. (Class)	E6010	E7018-1
Filler Metal F-No.	F3	F4
Filler Metal A-No.	A1	A1
Size of Electrode	See attached sketch	
Deposited Weld Metal Thickness	2.39 mm (0.094 in.)	3.94 mm (0.155 in.)

POSITION (QW-405)

Position of Groove 3G
Weld Progression Vertical Up

PREHEAT (QW-406)

Preheat Temperature 10°C (50°F) Interpass Temp. (Max.) 232°C (450°F)

POSTWELD HEAT TREATMENT (QW-407)

Temperature None Time N/A

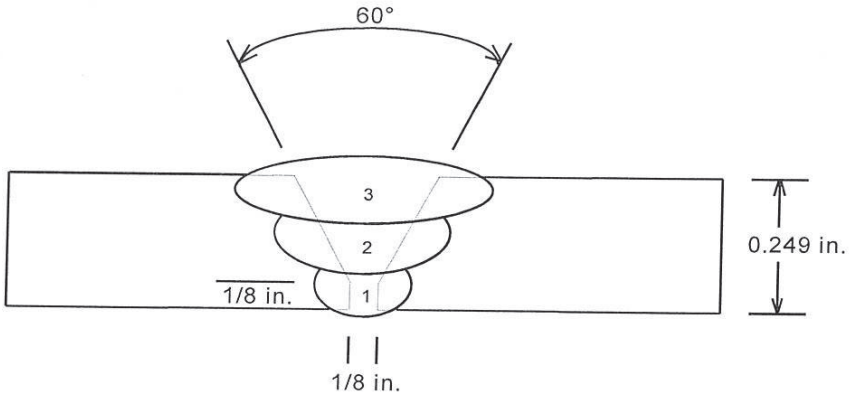
ELECTRICAL CHARACTERISTICS (QW-409)

Current Direct Polarity Reverse, electrode positive
Amps See next page Volts See next page
Heat Input F3: 34,327 J/in. F4: 45,688 J/in.

TECHNIQUE (QW-410)

String or Weave F3: String F4: Weave Travel Speed See next page
Multiple or Single Pass Per Side Multiple
Multiple or Single Electrodes Single

PQR NO. WFL-1-1



Pass	Process	Filler Metal	Diameter mm (in.)	Current & Polarity	Amperage Range	Voltage Range	Travel Speed mm/min (ipm.)
1	SMAW	E6010	3.2 (1/8)	DCRP	85 - 90	25 - 26	99 (3.9)
2	SMAW	E7018-1	2.4 (3/32)	DCRP	85 - 95	21 - 23	97 (3.8)
3	SMAW	E7018-1	2.4 (3/32)	DCRP	80 - 90	21 - 22	61 (2.4)

PQR NO. WFL-1-1

TENSILE TEST (QW-150)

Specimen No.	Width mm (in.)	Thickness mm (in.)	Area Sq. mm (Sq. in.)	Ultimate Load N (lbs.)	Ultimate Stress Mpa (Psi)	Character & Fracture Location
T1	19.1	5.30	101	54 300	536	Partial cup & cone
	(0.752)	(0.209)	(0.157)	(12,200)	(77,800)	Parent metal (Gr. 70N)
T2	19.0	5.62	107	56 300	527	Partial cup & cone
	(0.748)	(0.221)	(0.116)	(12,700)	(76,500)	Parent metal (Gr. 70N)

GUIDED BEND TEST (QW-160)

Type & Figure No.	Result	Type & Figure No.	Result
QW-462.3a, TFB - F1	Pass	QW-462.3a, TRB - R1	Pass
QW-462.3a, TFB - F2	Pass	QW-462.3a, TRB - R2	Pass

CHARPY IMPACT TOUGHNESS

Type of Test Charpy V-Notch Orientation Transverse
Test Temperature -48°C (-55°F) Specimen Size 10 x 5 mm

Specimen No.	Notch Location	Impact Values J (ft. lbs)
T2.1	Weld Metal	37.3 (27.5)
T2.2	within 1/16"	29.6 (21.8)
T2.3	of root	41.4 (30.5)
T3.1	Gr. 60N - HAZ	17.2 (12.7)
T3.2	Gr. 60N - HAZ	63.7 (47.0)
T3.3	Gr. 60N - HAZ	77.3 (57.0)
U3.1	Gr. 70N - HAZ	19.3 (14.2)
U3.2	Gr. 70N - HAZ	31.0 (22.9)
U3.3	Gr. 70N - HAZ	12.9 (9.5)

OTHER TESTS

Vickers Hardness - see attached laboratory test report # C07-300.1

Welders Name Keith Breedon Certificate File No. W-17343
Tests Conducted By Ludwig & Associates Ltd.
Laboratory Test No. C07-300.1

We certify 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 WOODSIDE FABRICATORS LTD.

Date March 10, 2007 Signed

CHARPY V-NOTCH IMPACT TEST

Customer: **Storage Tank Solutions Inc.**
9 Well Head Street
Devon, Alberta
T9G 1Z6

Laboratory Test No.: E19-104.4
Date: March 15, 2019

Attention: Sebastien Ouellet

PQR No.:	STS-1-1 (Rev.0)	**Material Heat No.:**	44391 to A50A8
Material:	SA 333 Gr. 6 to SA 350 Gr. LF2		
Material Size:	168.3 mm (6.625 in.) O.D. x 5.89 (0.232 in.) w.t.		
Thermal Condition:	As Welded		

Specimen Size:	*10 x 4 mm (0.394 x 0.157 in.)*	*Machine:*	*Satec SI-1K3, S/N: 1503*
Orientation:	*Transverse*	*Capacity:*	*407 J (300 ft·lbf)*
Test Temperature:	*-55 °C (-67 °F)*	*Verified Range:*	*3.4-325 J (2.5-240 ft·lbf)*
Governing Spec.:	*ASME B31.3-2016*	*Calibration Date:*	*March 19, 2018*

Specimen Number	Notch Location	Impact Values Joules	(ft·lbf)
D2.1	Weld Metal within 1.5mm (1/16") of root	23	(17)
D2.2		41	(30)
D2.3		37	(27)
D3.1	Gr. 6 - HAZ	102	(75)
D3.2		110	(81)
D3.3		72	(53)
D4.1	Gr. LF2 - HAZ	13	(10)
D4.2		35	(26)
D4.3		27	(20)

Note: Metric values calculated by direct conversion.

Test Conducted By: Mohamed Botan (Edmonton)

Certified By: _____
Eric Dacyk, C.E.T.

ANAB ACCREDITED ISO/IEC 17025 TESTING LABORATORY Certification # L2057.01-1

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Member of the SGS Group (SGS SA)

HARDNESS TEST

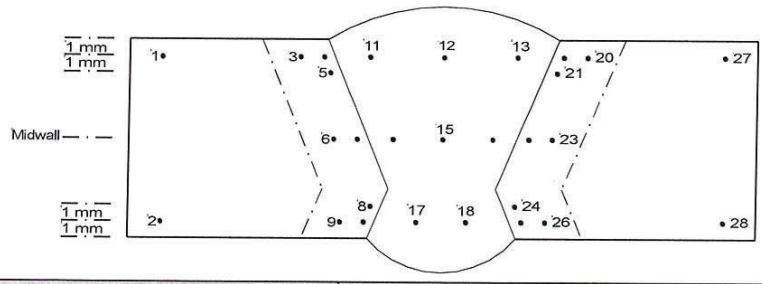
Customer: **Storage Tank Solutions Inc.**
9 Well Head Street
Devon, Alberta
T9G 1Z6

Laboratory Test No.: E19-104.4
Date: March 15, 2019

Attention: Sebastien Ouellet

PQR No.:	STS-1-1 (Rev.0)	**Material Heat No.:**	44391 to A50A8
Material:	SA 333 Gr. 6 to SA 350 Gr. LF2		
Material Size:	168.3 mm (6.625 in.) O.D. x 5.89 (0.232 in.) w.t.		
Thermal Condition:	As Welded		

Type of Test:	*Vickers 10 kg (HV10)*	*Instrument:*	*Buehler 5112*
Governing Spec.:	*ASTM E92 - 17 & ANSI/NACE MR0175/ISO 15156:2015*	*Calibration Date:*	*July 27, 2018*



SA 350 Gr. LF2				Weld Metal		SA 333 Gr. 6			
Parent Metal		HAZ				HAZ		Parent Metal	
1	143	*3*	164	*11*	193	*19*	196	*27*	137
2	164	*4*	190	*12*	195	*20*	154	*28*	169
		5	183	*13*	193	*21*	184		
		6	170	*14*	164	*22*	175		
		7	179	*15*	165	*23*	160		
		8	177	*16*	165	*24*	176		
		9	173	*17*	162	*25*	174		
		10	186	*18*	157	*26*	171		

Test Conducted By: Ibrahim Mohamoud (Edmonton)

Certified By: _____
Eric Dacyk, C.E.T.

ANAB ACCREDITED ISO/IEC 17025 TESTING LABORATORY Certification # L2057.01-1

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CHARPY V-NOTCH IMPACT TEST

Customer: **Storage Tank Solutions Inc.**
9 Well Head Street
Devon, Alberta
T9G 1Z6

Laboratory Test No.: E19-104.5
Date: March 15, 2019

Attention: Sebastien Ouellet

PQR No.:	STS-1-2 (Rev.0)	**Material Heat No.:**	449291 55060-03
Material:	SA 516 Gr. 60/70		
Material Thickness:	12.7 mm (0.500 in.)		
Thermal Condition:	As Welded		

Specimen Size:	*10 x 10 mm (0.394 x 0.394 in.)*	*Machine:*	*Satec SI-1K3, S/N: 1503*
Orientation:	*Transverse*	*Capacity:*	*407 J (300 ft·lbf)*
Test Temperature:	*-46 °C (-50 °F)*	*Verified Range:*	*3.4-325 J (2.5-240 ft·lbf)*
Governing Spec.:	*ASME B31.3-2016*	*Calibration Date:*	*March 19, 2018*

Specimen Number	Notch Location	Impact Values Joules	(ft·lbf)
E2.1	Weld Metal within 1.5mm (1/16") of root	69	(51)
E2.2		57	(42)
E2.3		91	(67)
E3.1	HAZ	85	(63)
E3.2		43	(32)
E3.3		45	(33)

Note: Metric values calculated by direct conversion.

Test Conducted By: Mohamed Botan (Edmonton)

Certified By: _____
Eric Dacyk, C.E.T.

ANAB ACCREDITED ISO/IEC 17025 TESTING LABORATORY Certification # L2057.01-1

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Member of the SGS Group (SGS SA)

HARDNESS TEST

Customer: **Storage Tank Solutions Inc.**
9 Well Head Street
Devon, Alberta
T9G 1Z6

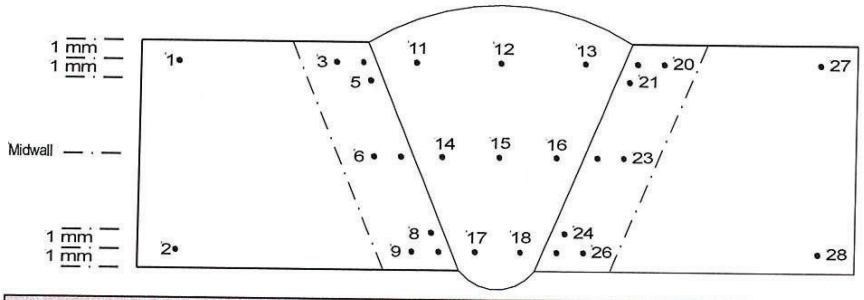
Laboratory Test No.: E19-104.5
Date: March 12, 2019

Attention: Sebastien Ouellet

PQR No.:	STS-1-2 (Rev.0)	**Material Heat No.:**	449291 55060-03
Material:	SA 516 Gr. 60/70		
Material Thickness:	12.7 mm (0.500 in.)		
Thermal Condition:	As Welded		

Type of Test: *Vickers 10 kg (HV10)*
Governing Spec.: *ASTM E92 - 17 &*
ANSI/NACE MR0175/ISO 15156:2015

Instrument: *Buehler 5112*
Calibration Date: *July 27, 2018*



Parent Metal		HAZ		Weld Metal		HAZ		Parent Metal	
1	153	3	152	11	203	19	210	27	166
2	150	4	183	12	205	20	170	28	156
		5	199	13	202	21	211		
		6	157	14	170	22	173		
		7	165	15	168	23	160		
		8	171	16	167	24	166		
		9	164	17	162	25	168		
		10	170	18	162	26	162		

Test Conducted By: Ibrahim Mohamoud (Edmonton)

Certified By: _____
Eric Dacyk, C.E.T.

ANAB ACCREDITED ISO/IEC 17025 TESTING LABORATORY Certification # L2057.01-1

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TENSILE / BEND TEST

Customer: **Storage Tank Solutions Inc.**
9 Well Head Street
Devon, Alberta
T9G 1Z6

Laboratory Test No.: E19-104.6
Date: March 15, 2019

Attention: Sebastien Ouellet

PQR No.:	STS-1-3 (Rev.0)	**Material Heat No.:**	454840 27789-02
Material:	SA 516 Gr. 60/70		
Material Thickness:	22.2 mm (0.875 in.)		
Thermal Condition:	As Welded		

Governing Spec.: *ASME Section IX - 2017*

Instrument: *Tinius Olsen S/N: 133660*

SAMPLE NO.(QW-150)	T1		T2	
WIDTH mm (in.)	19.0	(0.748)	19.0	(0.748)
THICKNESS mm (in.)	20.3	(0.799)	20.5	(0.807)
AREA sq. mm (sq. in.)	386	(0.598)	390	(0.604)
ULTIMATE LOAD N (lbf)	206 937	(46,500)	210 305	(47,300)
ULTIMATE STRESS MPa (psi)	537	(77,800)	540	(78,300)
FRACTURE TYPE	Partial Cup & Cone		Partial Cup & Cone	
FRACTURE LOCATION	Parent Metal		Parent Metal	

Note: Imperial values calculated by direct conversion.

SAMPLE TYPE(QW-462.2)	Side Bend	Side Bend	Side Bend	Side Bend
SAMPLE NO.	S1	S2	S3	S4
RESULTS	Pass	Pass	Pass	Pass

Test Conducted By: Mohamed Botan (Edmonton)

Certified By: _____
Eric Dacyk, C.E.T.

ANAB ACCREDITED ISO/IEC 17025 TESTING LABORATORY Certification # L2057.01-1

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CHARPY V-NOTCH IMPACT TEST

Customer: **Storage Tank Solutions Inc.**
9 Well Head Street
Devon, Alberta
T9G 1Z6

Laboratory Test No.: E19-104.6
Date: March 15, 2019

Attention: Sebastien Ouellet

PQR No.:	STS-1-3 (Rev.0)	**Material Heat No.:**	454840 27789-02
Material:	SA 516 Gr. 60/70		
Material Thickness:	22.2 mm (0.875 in.)		
Thermal Condition:	As Welded		

Specimen Size:	*10 x 10 mm (0.394 x 0.394 in.)*	*Machine:*	*Satec SI-1K3, S/N: 1503*
Orientation:	*Transverse*	*Capacity:*	*407 J (300 ft·lbf)*
Test Temperature:	*-46 °C (-50 °F)*	*Verified Range:*	*3.4-325 J (2.5-240 ft·lbf)*
Governing Spec.:	*ASME B31.3-2016*	*Calibration Date:*	*March 19, 2018*

Specimen Number	Notch Location	Impact Values Joules	(ft·lbf)
F2.1	Weld Metal within 1.5mm (1/16") of root	81	(60)
F2.2		107	(79)
F2.3		69	(51)
F3.1	HAZ	263	(194)
F3.2		209	(154)
F3.3		137	(101)

Note: Metric values calculated by direct conversion.

Test Conducted By: Mohamed Botan (Edmonton)

Certified By: _____
Eric Dacyk, C.E.T.

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Member of the SGS Group (SGS SA)

HARDNESS TEST

Customer: **Storage Tank Solutions Inc.**
9 Well Head Street
Devon, Alberta
T9G 1Z6

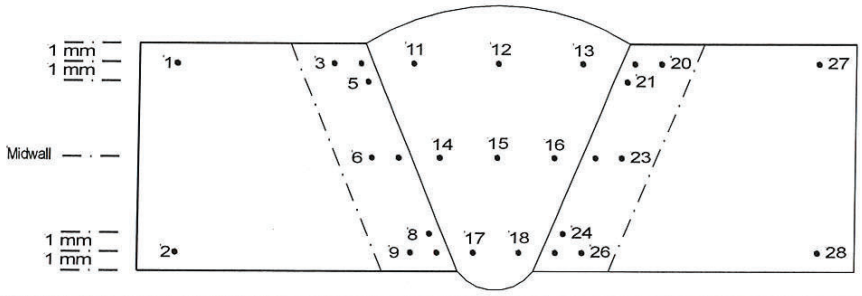
Laboratory Test No.: E19-104.6
Date: March 15, 2019

Attention: Sebastien Ouellet

PQR No.:	STS-1-3 (Rev.0)	**Material Heat No.:**	454840 27789-02
Material:	SA 516 Gr. 60/70		
Material Thickness:	22.2 mm (0.875 in.)		
Thermal Condition:	As Welded		

Type of Test: *Vickers 10 kg (HV10)*
Governing Spec.: *ASTM E92 - 17 &*
ANSI/NACE MR0175/ISO 15156:2015

Instrument: *Buehler 5112*
Calibration Date: *July 27, 2018*



Parent Metal		HAZ		Weld Metal		HAZ		Parent Metal	
1	149	3	178	11	206	19	220	27	149
2	153	4	209	12	196	20	172	28	151
		5	226	13	206	21	199		
		6	188	14	198	22	195		
		7	199	15	191	23	179		
		8	171	16	199	24	169		
		9	175	17	167	25	174		
		10	171	18	169	26	173		

Test Conducted By: Ibrahim Mohamoud (Edmonton)

Certified By: _____
Eric Dacyk, C.E.T.

ANAB ACCREDITED ISO/IEC 17025 TESTING LABORATORY Certification # L2057.01-1

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7925 Davies Road Edmonton, AB T6E 4N1 t +1 (780) 468-3030 f +1 (780) 468-3032 www.sgs.com

LUDWIG & ASSOCIATES LTD.

Materials and Welding Consulting

LABORATORY ACCREDITATION BUREAU
ISO/IEC 17025 ACCREDITED
Certificate Number L2057

LABORATORY TEST REPORT

CUSTOMER: **Woodside Fabrications Ltd.**
6124 - 39th Avenue
Camrose, Alberta
T4V 3B1

Laboratory Test No.: C07-300.1
Date: March 7, 2007

Attention: Douglas French

PQR Number: WFL-1-1 **Process:** SMAW
Material: SA 516 Gr. 60N to SA 516 Gr. 70N (Heat No.: 44410 - 34383)
Thickness: 6.32 mm (0.249 in.)
Thermal Condition: As Welded

TENSILE TEST QW-150

SAMPLE NUMBER	T1 QW-462.1(a)		T2 QW-462.1(a)	
WIDTH mm (in)	19.1	(0.752)	19.0	(0.748)
THICKNESS mm (in)	5.30	(0.209)	5.62	(0.221)
AREA sq mm (sq in)	101	(0.157)	107	(0.116)
ULT. LOAD N (lbs)	54 300	(12,200)	56 300	(12,700)
UTS MPa (psi)	536	(77,800)	527	(76,500)
FRACTURE TYPE	Partial Cup and Cone		Partial Cup and Cone	
FRACTURE LOCATION	Parent Metal (SA 516 Gr. 70N)		Parent Metal (SA 516 Gr. 70N)	

GUIDED-BEND TEST QW-160

SAMPLE WIDTH: 38.1 mm (1.50 in.) SAMPLE THICKNESS: 6.32 mm (0.249 in.)
PLUNGER SIZE: 25.1 mm (0.990 in.) YOKE SIZE: 41.1 mm (1.62 in.)

QW-462.3(a)	Root Bend	Root Bend	Face Bend	Face Bend
SAMPLE NUMBER(S)	R1	R2	F1	F2
RESULTS	Pass	Pass	Pass	Pass

We certify the test results in this report and that the specimen(s) were prepared and tested in accordance with the requirements of ASME Section IX, 2004 *edition and latest addenda. The information regarding material identification (i.e. size, thickness, heat number, etc.) has been provided by the customer whose name appears on this report.* ***Samples associated with this report will be discarded in 45 days.***

Laboratory Test Conducted By: _____
Inderjit Rai / Steve Rieberger, C.E.T.

LUDWIG & ASSOCIATES LTD.

Materials and Welding Consulting

LABORATORY ACCREDITATION BUREAU
ISO/IEC 17025 ACCREDITED
Certificate Number L2057

LABORATORY TEST REPORT

CUSTOMER: **Woodside Fabrications Ltd.**
6124 - 39th Avenue
Camrose, Alberta
T4V 3B1

Laboratory Test No.: C07-300.1
Date: March 7, 2007

Attention: Douglas French

PQR Number: WFL-1-1 **Process:** SMAW
Material: SA 516 Gr. 60N to SA 516 Gr. 70N (Heat No.: 44410 - 34383)
Thickness: 6.32 mm (0.249 in.)
Thermal Condition: As Welded

NOTCH-TOUGHNESS TEST

TYPE OF TEST: Charpy V-Notch
TEST TEMPERATURE: -48°C (-55°F)
ORIENTATION: Transverse
SPECIMEN SIZE: 10 x 5 mm

Specimen Number	Notch Location	Impact Values Joules	(ft.lbs)
T2.1	Weld Metal	37.3	(27.5)
T2.2	within 1/16 in.	29.6	(21.8)
T2.3	of root	41.4	(30.5)
T3.1	Gr. 60N - HAZ	17.2	(12.7)
T3.2	Gr. 60N - HAZ	63.7	(47.0)
T3.3	Gr. 60N - HAZ	77.3	(57.0)
U3.1	Gr. 70N - HAZ	19.3	(14.2)
U3.2	Gr. 70N - HAZ	31.0	(22.9)
U3.3	Gr. 70N - HAZ	12.9	(9.5)

We certify the test results in this report and that the specimen(s) were prepared and tested in accordance with the requirements of ASME Section VIII, Div. 1, UG-84 – 2004 *edition and latest addenda. The information regarding material identification (i.e. size, thickness, heat number, etc.) has been provided by the customer whose name appears on this report.* ***Samples associated with this report will be discarded in 45 days.***

Laboratory Test Conducted By: _____
Charles Ugarenko / Steve Rieberger, C.E.T.

LUDWIG & ASSOCIATES LTD.

Materials and Welding Consulting

LABORATORY ACCREDITATION BUREAU
ISO/IEC 17025 ACCREDITED
Certificate Number L2057

LABORATORY TEST REPORT

CUSTOMER: **Woodside Fabrications Ltd.**
6124 - 39th Avenue
Camrose, Alberta
T4V 3B1

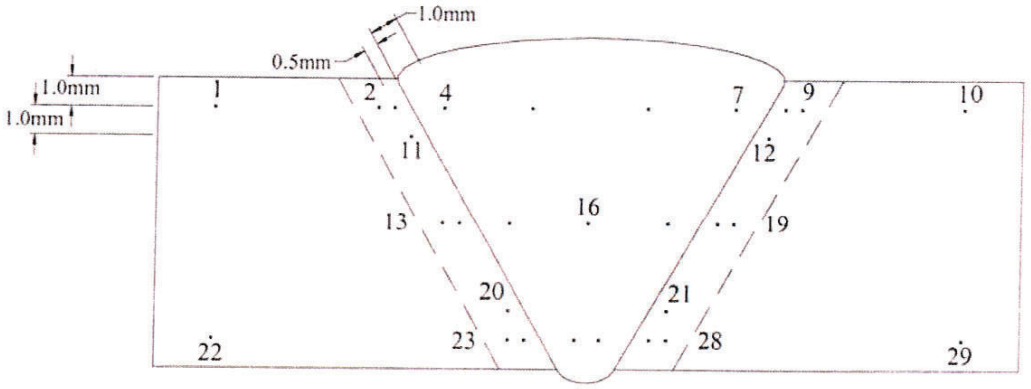
Laboratory Test No.: C07-300.1
Date: March 5, 2007

Attention: Douglas French

PQR Number: WFL-1-1 **Process:** SMAW
Material: SA 516 Gr. 60N to SA 516 Gr. 70N (Heat No.: 44410 - 34383)
Thickness: 6.32 mm (0.249 in.)
Thermal Condition: As Welded

HARDNESS TEST

TYPE OF TEST: Vickers LOAD: 10 kg
INSTRUMENT TYPE: Mitutoyo AVK-C1



SA 516 Gr. 70N SA 516 Gr. 60N

1)	161 HV	7)	215 HV	13)	187 HV	19)	196 HV	25)	181 HV
2)	195 HV	8)	207 HV	14)	192 HV	20)	187 HV	26)	187 HV
3)	197 HV	9)	196 HV	15)	189 HV	21)	183 HV	27)	184 HV
4)	199 HV	10)	160 HV	16)	189 HV	22)	161 HV	28)	187 HV
5)	191 HV	11)	198 HV	17)	186 HV	23)	184 HV	29)	167 HV
6)	200 HV	12)	202 HV	18)	199 HV	24)	188 HV		

We certify the test results in this report and that the specimen(s) were prepared and tested in accordance with the requirements of ASTM E92 - 82 (Reapproved 2003)$^{\varepsilon 2}$. *The information regarding material identification (i.e. size, thickness, heat number, etc.) has been provided by the customer whose name appears on this report.* ***Samples associated with this report will be discarded in 45 days.***

Laboratory Test Conducted By: _____
Andrew Vessey / Steve Rieberger, C.E.T.

4027 - 14 Street, S.E., CALGARY, ALBERTA T2G 3K6 PHONE: (403) 262-7072 FAX: (403) 266-3169

INSPECTION CERTIFICATE

(BS EN 10204 3.1: 2004 - ISO 10474 3.1: 2013)

Number / Número: 853076 | Page / Página: 1 / 8

Date / Día: July 21, 2017

S.Jerez S.A.I.C
Dr Jorge A. Simini 250
(B830MHA) Campana
Buenos Aires, Argentina
(54) 3489 433103 tel
(54) 3489 433403 fax

Customer / Cliente: VAN LEEUWEN PIPE & TUBE (CANADA) INC.

Customer's Order Item / Orden Cliente - Item: 45001803-00008

Customer's Reference / Ref. del Cliente: N/A

Manufacturer's Works Order N° / Confirmación de Venta: 51938/08

Manufacturing Process / Proceso de Manufactura: SEAMLESS HOT ROLLED

Product Type / Tipo de Producto: CARBON STEEL FOR LOW TEMPERATURE SERVICE

Surface / Superficie: INT BARE /EXT VARNISHED

Standard or Specification / Normas o Especificaciones: ASTM/ASME A/SA333-10+CSA Z245.1-14 CATII-SS+PSP00374+NACE MR0175/103+IPRO LP-006

Steel Grade / Grado de acero: 1/6/359 CAT II SS

Ends / Extremos: BEVELLED AT 30 DEG. ASTM

Dimensions / Dimensiones: 6 5/8 X 0.280 INCH; 168.30 X 7.11 MM

Schedule / Cédula: 040

Length / Longitud: 11.0/11.8 m

Quantity / Cantidad: 83 Pcs/pz; 3157.94 FT; 962.54 MTS; 59747 LB; 27101 KG

Nominal Weight / Peso Nominal: 18.97 LB/FT; 28.26 KG/M

TENSILE TEST / ENSAYO DE TENSION

Heat N° / Colada N°	Sample N° / Muestra N°	Zone / Zona	Lot N° / Lote N°	Pipe N° / Tubo N°	Specimen condition / Condición de la probeta: Ls	Sc	Type / Tipo	Ori	Specimen dimensions / Dimensiones de la probeta: Size / Tamaño (in)	Area / Sección (in2)	Test temp / Temp. ensayo (°F)	Y.S. Eul 0.50 % Min: 52 Max: -- (ksi)	U.T.S. Req. Min: 66 Max: 91 (ksi)	Y.S./U.T.S Eul 0.50 % Req. Max. 0.93	Elongation / Alargamiento: Lo 2" / mm	Min. %	Obt. %
44391	2836324	E1	71971	20	B	AM	Ss	L	0.999 x 0.278	0.279	RT	57.2	71.1	0.80	50,8	28.0	36.6
44391	2836325	E2	71971	40	B	AM	Ss	L	0.995 x 0.279	0.279	RT	58.1	72.0	0.81	50,8	28.0	36.7
44391	2836326	E1	71971	60	B	AM	Ss	L	0.999 x 0.283	0.284	RT	60.0	73.1	0.82	50,8	28.0	39.1
44391	2836327	E2	71972	80	B	AM	Ss	L	0.999 x 0.279	0.280	RT	62.2	75.9	0.82	50,8	28.0	40.9
44391	2836329	E2	71973	1	B	AM	Ss	L	1. x 0.276	0.278	RT	59.3	73.3	0.81	50,8	28.0	36.1
44391	2836335	E1	71974	20	B	AM	Ss	L	0.994 x 0.277	0.277	RT	56.7	70.5	0.80	50,8	28.0	38.5
44391	2836339	E2	71974	40	B	AM	Ss	L	0.994 x 0.279	0.278	RT	60.3	73.5	0.82	50,8	28.0	38.5
44391	2836343	E1	71974	60	B	AM	Ss	L	0.999 x 0.279	0.280	RT	60.9	73.3	0.83	50,8	28.0	39.0
44391	2836341	E2	71975	80	B	AM	Ss	L	0.999 x 0.283	0.284	RT	59.2	73.4	0.81	50,8	28.0	38.9
44391	2837409	E1	71971	17	B	AM	Ss	L	0.995 x 0.274	0.274	RT	64.2	76.8	0.84	50,8	28.0	31.6
44391	2837410	E1	71975	85	B	AM	Ss	L	0.993 x 0.265	0.264	RT	58.2	73.6	0.79	50,8	28.0	28.8
44391	2842966	E1	71972	93	B	AM	Ss	L	0.994 x 0.278	0.277	RT	58.1	72.2	0.81	50,8	28.0	36.9
44391	2842967	E1	71973	14	B	AM	Ss	L	0.997 x 0.282	0.282	RT	59.2	73.4	0.81	50,8	28.0	38.6

JF September 18, 2017
SA 333 Gr. 6 / CSA Z245.1 Gr 35
Sch 40
6.625 OD x 0.280 w.t.
Heat # 44391 E6-20
PO# 186973

AM: As manufactured / Según proceso de fabricación
B: Body / Cuerpo
E1 / E2: Ends of Sampling / Extremos de Muestra
L: Longitudinal / Longitudinal
Lo: Initial length / Longitud inicial
Ls: Location of sample / Ubicación de la muestra
Max: Maximum / Máximo
Min: Minimum / Mínimo
Obt: Obtained / Obtenido
Ori: Orientation / Orientación
Req. Max: Required maximum / Máximo requerido
Req: Required / Requerido
RT: Room temperature / Temperatura ambiente
Sc: Specimen condition / Condición de la probeta
Ss: Strip specimen / Muestra rectangular
U.T.S: Ultimate tensile strength / Resistencia
Y.S: Yield strength / Fluencia

Tenaris

INSPECTION CERTIFICATE

(BS EN 10204 3.1: 2004 - ISO 10474 3.1: 2013)

Number / Número:	Page / Página:
853076	2 / 8

Date / Día: July 21, 2017

Siderca S.A.I.C.
Dr Jorge A. Simini 250
(B2804MHA) Campana
Buenos Aires, Argentina
(54) 3489 433100 tel
(54) 3489 433405 fax

Customer / Cliente: VAN LEEUWEN PIPE & TUBE (CANADA) INC.	Customer's Order Item / Orden Cliente - Item: 45001803-00008	Customer's Reference / Ref. del Cliente: N/A	Manufacturer's Works Order N° / Confirmación de Venta: 51938/08
Manufacturing Process / Proceso de Manufactura: SEAMLESS HOT ROLLED	Product Type / Tipo de Producto: CARBON STEEL FOR LOW TEMPERATURE SERVICE		Surface / Superficie: INT BARE /EXT VARNISHED
Standard or Specification / Normas o Especificaciones: ASTM/ASME A/SA333-10+CSA Z245.1-14 CATII-SS+PSP00374+NACE MR0175/103+IPRO LP-006		Steel Grade / Grado de acero: 1/6/359 CAT II SS	Ends / Extremos: BEVELLED AT 30 DEG. ASTM
Dimensions / Dimensiones: 6 5/ 8 X 0.280 INCH 168.30 X 7.11 MM	Schedule / Cédula: 040	Length / Longitud: 11.0/11.8 m	Quantity / Cantidad: 83 Pcs/pz 3157.94 FT 59747 LB 962.54 MTS 27101 KG	Nominal Weight / Peso Nominal: 18.97 LB/FT 28.26 KG/M

CHEMICAL COMPOSITION / COMPOSICION QUIMICA

Composition % / Composición %

Heat N° / Colada N°	Sample N° / Muestra N°	Lot N° / Lote N°	Pipe N° / Tubo N°		C	Mn	Si	Cr	Mo	Al sol	Cu	P	Ni	V	Al	Sn	As	Nb	Ti	Pb	Sb	Co	S	Zr	Bi	Ca	B	N	Mg	W	Ce.1	Ce.2
				H Max	25	135	50	30	12	--	40	25	400	80	--	--	--	20	110	--	--	--	100	--	--	--	10	--	--	--	42	40
				H Min	--	40	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
				P Max	25	135	50	30	12	--	40	25	400	80	--	--	--	20	110	--	--	--	100	--	--	--	10	--	--	--	42	40
				P Min	--	40	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
44391				H	8	105	23	9	4	2	16	12	70	4	15	11	4	14	3	1	2	7	9	10	20	12	1	43	7	20	30	21
44391	2836335	71971	40	P	9	105	23	9	4	1	17	12	74	3	16	10	4	14	3	1	3	7	10	20	22	16	2	50	4	20	31	23
44391	2836324	71971	20	P	9	105	23	9	4	2	16	13	72	4	18	10	4	16	3	1	3	7	11	20	22	16	2	48	5	20	31	23
44391	2836326	71971	60	P	10	105	23	9	4	1	17	12	73	3	15	10	4	14	2	1	3	7	7	20	22	12	2	45	4	20	32	25
44391	2837409	71971	17	P	9	106	24	9	4	2	16	13	69	5	16	10	4	15	3	1	3	7	10	20	22	11	2	41	4	20	31	23
44391	2836329	71973	1	P	8	105	23	9	4	1	17	12	70	3	15	10	4	14	3	1	3	7	10	20	22	12	2	45	4	20	30	21
44391	2836327	71972	80	P	8	105	22	9	4	1	17	12	73	3	15	10	3	14	2	1	3	7	10	20	22	12	2	44	3	20	30	21
44391	2836343	71974	60	P	8	105	23	9	4	1	17	11	69	4	16	10	3	14	3	1	3	7	5	20	22	11	2	50	5	20	30	21
44391	2836344	71975	80	P	8	105	22	9	4	2	17	12	66	5	16	10	3	14	3	1	2	7	9	20	22	12	2	44	4	20	30	21
44391	2837410	71975	85	P	9	105	23	9	4	1	16	12	70	5	17	10	4	15	3	1	3	7	9	20	22	12	2	44	4	20	30	21
44391	2836339	71974	40	P	10	105	23	9	4	1	17	12	74	4	15	10	4	14	3	1	3	7	10	20	22	12	2	44	4	20	31	23
44391	2836335	71974	20	P	10	105	23	9	4	1	17	12	75	3	15	10	4	16	3	1	3	7	9	20	22	14	2	45	4	20	32	25

Ce.1: C+(MN/6)+(CR+MO+V)/5+(NI+CU)/15

Ce.2: C+F((MN/6)+(SI/24)+(CU/15)+(NI/20)+(CR+MO+V+NB)/5+(5*B))

H: Heat / Colada

Max: Maximum / Máximo

Min: Minimum / Mínimo

P: Product / Producto

CLIENTE / Customer / Client

VAN LEEUWEN PIPE AND TUBE -CAN
2875-64TH AVENUE
EDMONTON - ALBERTA T6P 1R1
CANADA
CAN

CERTIFICADO DE INSPECCION

Inspection Certificate - Certificat de Réception

UNE EN 10204:05 / 3.1
ISO 10474:15 / 3.1

FECHA / Date: 24/05/2018 — N.º / No. 195241 — HOJA / Page: 4

ISO 14001 CERTIFIED SGI 1922164 · ISO 9001 CERTIFIED SGI 6000236 · OHSAS 18001 CERTIFIED SGI 6009987

ULMA

ULMA FORJA, S.COOP.
Management Systems certified by LRQAE
Certified acc. PED 97/23/EC+AD2000-W0
PED 14/68/UE
by TÜV Rheinland
N.º 01 202 E/O 02 7443
Bª Zubillaga, 3 - Apdo. 14
20560 OÑATI (Gipuzkoa) SPAIN
Tel.: 34 - 943 780552
Fax: 34 - 943 781606
E-mail: ulma@ulmapiping.com

PRODUCTO / Article - Produit: **FLANGES**

SU PEDIDO N.º / Your Order No. / Votre Cde. N.º: **45001896**

DE / of. - de: **10/01/2018**

NORMAS APLICABLES / Requirements - Normes Applicables: **ASME B16.5-17**

MATERIAL CORRESPONDIENTE / Material Correspondent - Qualité: **ASME SA350LF2CL1-2-17, ASTM A350LF2CL1-2-17**
ASME SA105M-17, ASTM A105M-14

MODO DE FUSION (*) / Steel Making - Elaboration de l'acier: **NACE MR0175/ISO15156-02/03-15 & NACE MR0103/ISO17495-15**
Clause 7.2.1.4, Annex A.2 and SSC Region 3.
E - Elec. Y - Oxigeno básico: **CSA-Z245.12-17 GR248 CAT II-SS (WN & BLIND FLANGES ONLY)**

MARCA DEL FABRICANTE / Mark of factory / Marque du fabricant

Packing 139834

DEPARTAMENTO / Section / Département: **QUALITY ASSURANCE**

PARTIDA / Item / Poste	CANTIDAD / Quantity / Quantité	DESCRIPCION / Description / Description	LOTE	OBSERVACIONES / Remarks / Observations (*)	COLADA N.º / Heat No. / N.º Coulée	RESISTENCIA / T.Strength / Resist Rupt N/mm2	LIMITE ELAST / Y.Strength 0.2 % N/mm2	ALARGAM / Elongation / Allongement Lo=50mm/4d %	ESTRICCION / Red. Area / Striction %	RESILIENCIA / Impact test / Résilience Joules			MEDIA / Average / Moyenne	°C	DUREZA / Hardness / Durete HBW	
48 24738	20	WN 4 1500LB XXS RTJ A350LF2	18M18E	NE	A18A8	521	307	32,10	67,40	56	58	61	58	-50	148	151
54 24625	6	WN 4 600LB XXS RF A350LF2	12A18F	NE	A41A8	513	305	29,70	57,90	68	68	66	67	-50	148	151
54 24625	19	WN 4 600LB XXS RF A350LF2	29O17	NE	B73A7	524	317	28,10	61,40	46	51	42	46	-50	150	155
56 22171	67	WN 6 150LB STD/40 RF A350LF2	15Y806	NE	A50A8	517	309	29,80	50,60	53	68	73	68	-50	150	151
56 22171	3	WN 6 150LB STD/40 RF A350LF2	29A804	NE	A50A8	519	311	31,20	59,80	65	54	59	59	-50	149	150
45 24672	5	BLIND 8 600LB RF A350LF2	17A817	NE	A58A8	507	295	28,20	59,40	54	61	56	58	-50	147	149

COLADA N.º / Heat No. / N.º Coulée	COMPOSICION QUIMICA - STEEL MAKER'S LADLE ANALYSIS - ANALYSE CHIMIQUE														
	C %	Si %	Mn %	P %	S %	Cr %	Ni %	Mo %	Nb %	V %	Cu %	Al %	Ti %	B %	CEq %
B73A7	0,190	0,230	0,980	0,009	0,003	0,090	0,080	0,010	0,004	0,006	0,190	0,035	0,002	0,0004	0,39
A50A8	0,190	0,250	1,080	0,006	0,004	0,050	0,070	0,010	0,003	0,004	0,180	0,031	0,001	0,0002	0,40
A18A8	0,190	0,190	1,080	0,007	0,005	0,070	0,070	0,012	0,002	0,006	0,220	0,025	0,002	0,0005	0,41
A41A8	0,180	0,210	1,060	0,011	0,005	0,060	0,060	0,013	0,003	0,010	0,180	0,043	0,001	0,0002	0,39
A58A8	0,190	0,180	1,060	0,009	0,001	0,100	0,090	0,021	0,004	0,003	0,180	0,040	0,001	0,0005	0,41

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

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

EL INSPECTOR
Works Inspector - L'Inspecteur

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

(*) OBSERVACIONES / Remarks / Observations: N_NORMALIZED AT 900 C AND ALLOWED TO COOL IN STILL AIR.

SA 350 LF2
6.625" O.D. x 0.280 w.t.
W/N 150 RF 6 STD
HT# A50A8
Internal PO# E20170
External PO# 203177

Recieved By: Jessie Springett
12/09/18

CLIENTE / Custo... Client

VAN LEEUWEN PIPE AND TUBE -CAN
2875-64TH AVENUE
EDMONTON - ALBERTA T6P 1R1
CANADA
CAN

CERTIFICADO DE INSPECCION

Inspection Certificate - Certificat de Réception

UNE EN 10204:06 / 3.1
ISO 10474:15 / 3.1

FECHA: Date: 15/12/2017 05/02/2018

N.º No. 192002 Rev.01

HOJA: Page: 6

SGI 1922164 SGI 6000236 SGI 6009987

ULMA FORJA, S.COOP.
Management Systems certified by LRQAE
Certified acc. PED 97/23/EC+AD2000-W0
PED 14/68/UE
by TÜV Rheinland
N.º 01 202 E/O 02 7443

Bº Zubillaga, 3 - Apdo. 14
20560 OÑATI (Gipuzkoa) SPAIN
Tel.: 34 - 943 780562
Fax: 34 - 943 781808
E-mail: ulma@ulmapiping.com

Packing 136413

PRODUCTO / Article - Produit: FLANGES

SU PEDIDO N.º / Your Order No. / Votre Cde. N.º: 45001856

DE / of. - de: 03/11/2017

NORMAS APLICABLES / Requirements - Normes Applicables: ASME B16.5-17

MATERIAL CORRESPONDIENTE / Material Correspondent - Qualité: ASME SA350LF2CL1-2-17, ASTM A350LF2CL1-2-17
ASME SA105M-17, ASTM A105M-14
NACE MR0175/ISO15156-02/03-15 & NACE MR0103/ISO17495-15
Clause 7.2.1.4, Annex A.2 and SSC Region 3.
CSA-Z245.12-13 GR248 CAT II-SS (WN & BLIND FLANGES ONLY)

MODO DE FUSION (*) / Steel Making - Elaboration de l'acier: E = Elec. Y = Oxígeno básico

MARCA DEL FABRICANTE / Mark of factory / Marque du fabricant

DEPARTAMENTO / Section / Département: QUALITY ASSURANCE

PARTIDA Item Poste	CANTIDAD Quantity Quantité	DESCRIPCION Description Description	LOTE	OBSERVACIONES Remarks Observations (*)	COLADA N.º Heat No N.ºCoulée	RESISTENCIA T.Strength Resist Rupt N/mm2	LIMITE CLAST. Y.Strength 0.2 % N/mm2	ALARGAM. Elongation Allongement Lo:50mm/4o %	ESTRICCION Red. Area Striction %	RESILIENCIA Impact test Résilience Joules			CHARPY V 10x10mm MEDIA Average Moyenne	°C	DUREZA Hardness Dureté HBW
47 37010	7	WN 3 2500LB XXS RTJ A350LF2	07N17	NE	B73A7	505	298	35,60	72,50	41	48	46	45	-50	144 150
47 37010	3	WN 3 2500LB XXS RTJ A350LF2	27O17	NE	B73A7	526	319	27,30	60,10	54	53	38	48	-50	151 157
51 22170	13	WN 4 150LB XS/80 RF A350LF2	05Y17	NE	43AV7	519	312	25,40	55,60	47	55	51	51	-50	155 159
51 22170	2	WN 4 150LB XS/80 RF A350LF2	27S17	NE	A14A7	495	302	33,40	66,70	59	54	52	55	-50	154 156
56 22202	70	WN 4 600LB XS/80 RF A350LF2	21O17	NE	B47A7	501	301	30,20	62,00	47	51	40	46	-50	140 146
59 22171	2	WN 6 150LB STD/40 RF A350LF2	19N17	NE	A63A7	505	298	31,00	64,10	57	56	49	54	-50	158 163
59 22171	18	WN 6 150LB STD/40 RF A350LF2	17N17	NE	B63A7	506	290	33,60	65,90	40	43	46	43	-50	140 149
60 22172	5	WN 6 150LB XS/80 RF A350LF2	10O17	NE	A48A7	522	315	28,50	59,90	48	55	53	52	-50	153 157
63 24627	2	WN 6 600LB XXS RF A350LF2	27S17	NE	A64A7	505	298	35,00	70,00	49	47	44	47	-50	154 157
66 22174	4	WN 8 150LB XS/80 RF A350LF2	24N17	NE	B55A7	486	289	36,00	70,90	39	45	47	43	-50	138 145

COMPOSICION QUIMICA - STEEL MAKER'S LADLE ANALYSIS - ANALYSE CHIMIQUE

COLADA N.º Heat No N.ºCoulée	C %	Si %	Mn %	P %	S %	Cr %	Ni %	Mo %	Nb %	V %	Cu %	Al %	Ti %	CEq %
43AV7	0,192	0,240	1,020	0,015	0,005	0,096	0,094	0,022	0,001	0,000	0,253	0,035	0,003	0,41
A14A7	0,180	0,190	1,020	0,008	0,004	0,060	0,060	0,009	0,005	0,005	0,120	0,041	0,002	0,38
A48A7	0,190	0,160	1,020	0,009	0,004	0,050	0,070	0,010	0,007	0,007	0,140	0,036	0,001	0,39
A63A7	0,193	0,230	1,030	0,015	0,002	0,100	0,098	0,029	0,001	0,000	0,239	0,041	0,003	0,41
A64A7	0,180	0,240	1,030	0,015	0,005	0,065	0,091	0,024	0,001	0,000	0,205	0,042	0,002	0,39
B47A7	0,200	0,210	1,030	0,012	0,001	0,060	0,050	0,010	0,005	0,006	0,170	0,034	0,002	0,40
B55A7	0,180	0,180	0,990	0,012	0,004	0,060	0,060	0,009	0,003	0,005	0,190	0,030	0,001	0,38
B63A7	0,180	0,230	1,010	0,010	0,003	0,060	0,070	0,010	0,005	0,003	0,180	0,028	0,001	0,38
B73A7	0,190	0,230	0,980	0,009	0,003	0,090	0,080	0,010	0,004	0,006	0,190	0,035	0,002	0,39

(*) OBSERVACIONES: Remarks Observations: N_NORMALIZED AT 900 C AND ALLOWED TO COOL IN STILL AIR.

- 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.

EL INSPECTOR
Works Inspector - L'Inspecteur

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

QM-System: Certification as per ISO 9001

Erläuterungen siehe Rückseite/Explications voir au verso/See reverse for explanations (www.dillinger.de/certificate)

DILLINGER

A02 INSPECTION CERTIFICATE 3.1 AS PER EN 10204:2004
INSPECTION CERTIFICATE 3.1 AS PER ISO 10474:2013
MATERIAL TEST REPORT (MTR)

A10 Advice of dispatch No./ Date of dispatch: 611114-07.09.17

A08/ Manufacturer's order/ A03 Certificate No.: 427758-001 Sheet: 1/...

A05 Established Inspecting body: DH

A06 Purchaser: EDMONTON STEEL,EDMON A07.1 No. ED10715-J1010ER

Final receiver: EDMONTON STEEL,EDMON A07.2 No.

B01 Product: HEAVY PLATES.

B02/ Steel design. SA516-70 SA20-S5

B03 Any suppl. requirements: ASME-IIA:2015
DIL-HUE-1:R34-2016-08-19

21070

B01-B99 Description of the product

B14 Item No.	B08 Number of pieces	B09 Thickness	B10 Width	B11 Length	B12 Theoretical mass KG	B04 Product delivery condition	B07.2 Heat No.	B07.1 Rolled plate No./ Test No.	A09 Purchaser article number
			INCH						
01	1	0,5000 x	96,50000 x	480,00000	2979	N	449291	55053-01	ITEM001
01	1	0,5000 x	96,50000 x	480,00000	2979	N	449291	55053-02	ITEM001
01	1	0,5000 x	96,50000 x	480,00000	2979	N	449291	55053-03	ITEM001
01	1	0,5000 x	96,50000 x	480,00000	2979	N	449291	55054-01	ITEM001
01	1	0,5000 x	96,50000 x	480,00000	2979	N	449291	55054-02	ITEM001
01	1	0,5000 x	96,50000 x	480,00000	2979	N	449291	55054-03	ITEM001
01	1	0,5000 x	96,50000 x	480,00000	2979	N	449291	55056-01	ITEM001
01	1	0,5000 x	96,50000 x	480,00000	2979	N	449291	55056-02	ITEM001
01	1	0,5000 x	96,50000 x	480,00000	2979	N	449291	55056-03	ITEM001
01	1	0,5000 x	96,50000 x	480,00000	2979	N	449291	55060-01	ITEM001
01	1	0,5000 x	96,50000 x	480,00000	2979	N	449291	55060-02	ITEM001
**	12				35748		449291	55060-03	ITEM001
***	12				35748				

EPL-243
SA 516 Gr. 60/70
0.50"
HT# 449291 55060 03
PO# 203847
Internal PO# E20207
Recieved: 26/09/2018
Recieved by: Jessie Springett

B04 Product delivery condition

ITEM NO.: 01
N: HT: 1670 GR.F +36 -27 GR.F
SOAKING TIME TO ATTAIN THE TARGET TEMPERATURE OVER THE WHOLE SECTION: 1-1,75 MIN/MM (25-45 MIN/INCH)
COOLING IN STILL AIR

A04 D H Manufacturer's mark

Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

B. BALDAUF
Test House Manager

A H B Inspector's stamp

Date 08.09.17

A01 AG der Dillinger Hüttenwerke
Postfach 1580, D-66748 Dillingen/Saar
Inspection department

PP 1

QM-System: Certification as per ISO 9001

Erläuterungen siehe Rückseite/Explications voir au verso/See reverse for explanations (www.dillinger.de/certificate)

DILLINGER

A02 INSPECTION CERTIFICATE 3.1 AS PER EN 10204:2004
INSPECTION CERTIFICATE 3.1 AS PER ISO 10474:2013
MATERIAL TEST REPORT (MTR)

A10 Advice of dispatch No./ Date of dispatch: 611114-07.09.17

A08/ Manufacturer's order/ A03 Certificate No.: 427758-001 Sheet: 2/...

A05 Established Inspecting body: DH

A06 Purchaser: EDMONTON STEEL, EDMON A07.1 No. ED10715-J1010ER

Final receiver: EDMONTON STEEL, EDMON A07.2 No.

B01 Product: HEAVY PLATES

B02/ Steel design.: SA516-70

B03 Any suppl. requirements: ASME-IIA:2015 SA20-S5
DIL-HUE-1:R34-2016-08-19

B06 Marking of the product

ITEM NO.: 01
STEEL DESIGNATION SA516 70 MTLTV SA516 60 MTLTV
HEAT NO. / TRADEMARK / ROLLED PLATE NO.-TEST NO. / INSPECTOR'S STAMP

B07-B99 Further information about the product

ITEM NO.: 01
THICKNESS REDUCTION RATIO >= 3,0 IS FULFILLED - CF. A/SA20(M) PAR. 5.3

C10-C29 Tensile test

B14 Item No.	B07.2 Heat No.	B07.1 Rol.plate/ Test No.	B05 Reference (heat) treatment	C01	C02/ C01	C03 Temp. GR.F	C10 C11 KSI RP02	C12 RM	C13 A % L0=8IN	C14-C15
01	449291	55053		K1	Q	RT	49,9	73,8	26	
01	449291	55054		K1	Q	RT	50,0	73,8	24	
01	449291	55056		K1	Q	RT	50,2	73,4	27	
01	449291	55060		K1	Q	RT	50,2	74,0	27	

C30-C39 Hardness test

B14 Item. No.	B07.2 Heat No.	B07.1 Rol.plate/ Test No.	B05 Reference (heat) treatment	C01	C02/C01	C03 Temp. GR.F	C30 Method of test	C35 C31 Individual values			C32 Mean value
01	449291	55053		K1	O	RT	HBW 10/3000	HB 139	138	139	139
01	449291	55054		K1	O	RT	HBW 10/3000	HB 139	138	137	138
01	449291	55056		K1	O	RT	HBW 10/3000	HB 139	139	139	139
01	449291	55060		K1	O	RT	HBW 10/3000	HB 139	139	139	139

A04 D H Manufacturer's mark

Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

B. BALDAUF
Test House Manager

AHB Inspector's stamp

Date 08.09.17

AG der Dillinger Hüttenwerke
Postfach 1580, D-66748 Dillingen/Saar
Inspection department

A01

PP 1

QM-System: Certification as per ISO 9001

Erläuterungen siehe Rückseite/Explications voir au verso/See reverse for explanations (www.dillinger.de/certificate)

DILLINGER

A02 INSPECTION CERTIFICATE 3.1 AS PER EN 10204:2004
INSPECTION CERTIFICATE 3.1 AS PER ISO 10474:2013
MATERIAL TEST REPORT (MTR)

A10 Advice of dispatch No./ Date of dispatch: 611114-07.09.17

A08/ Manufacturer's order/ A03 Certificate No.: 427758-001 Sheet: 3/...

A05 Established Inspecting body: DH

A06 Purchaser: EDMONTON STEEL, EDMON A07.1 No. ED10715-J1010ER

Final receiver: EDMONTON STEEL, EDMON A07.2 No.

B01 Product: HEAVY PLATES

B02/ Steel design. SA516-70 SA20-S5

B03 Any suppl. requirements ASME-IIA:2015
DIL-HUE-1:R34-2016-08-19

C40-C49 Impact test

B14 Item No.	B07.2 Heat No.	B07.1 Rol.plate/ Test No.	B05 Reference (heat) treatment	C01	C02/ C01	C03 Temp. GR.F	C41 Width of test piece	C40 Type of test piece	C44 Testing method	C46 Energy	C45	C42 Individual values AV=FT.LBF			C43 Mean value
01	449291	55053		K1	LV	-51		CHP-V			AV 8	212	193	147	184
01	449291	55054		K1	LV	-51		CHP-V			AV 8	131	189	195	172
01	449291	55056		K1	LV	-51		CHP-V			AV 8	228	134	203	188
01	449291	55060		K1	LV	-51		CHP-V			AV 8	206	198	223	209

C70-C99 Chemical composition % - Heat analysis

B07.2 Heat	C70	C	SI	MN	P	S	N	CU	MO	NI	CR	V	NB	SN	TI
449291	Y	0,161	0,358	1,160	0,010	0,0013	0,0066	0,026	0,005	0,027	0,033	0,000	0,000	0,0009	0,002

B07.2 Heat	C70	B	CA	AL-T
449291	Y	0,0001	0,0021	0,029

C94 Heat analysis Carbon equivalent / Alloying restrictions

B07.2 Heat											
449291	FO-02=	0,37	FO-51=	0,000	FO-55=	0,09	FO-78=	0,04	FO-91=	7,2	

C95 Ladle treatment

ITEM NO.: 01
HEAT OF THE INDICATED ITEM: VACUUM DEGASSED / SULPHIDE SHAPE CONTROL

C95 Further information about ladle treatment

ITEM NO.: 01
CALCIUM TREATED

A04 D H Manufacturer's mark

Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

B. BALDAUF
Test House Manager

A H B Inspector's stamp

A01 AG der Dillinger Hüttenwerke
Postfach 1580, D-66748 Dillingen/Saar
Inspection department

Date 08.09.17

PP 1

QM-System: Certification as per ISO 9001

Erläuterungen siehe Rückseite/Explications voir au verso/See reverse for explanations (www.dillinger.de/certificate)

DILLINGER

A02 INSPECTION CERTIFICATE 3.1 AS PER EN 10204:2004
INSPECTION CERTIFICATE 3.1 AS PER ISO 10474:2013
MATERIAL TEST REPORT (MTR)

A10 Advice of dispatch No./ Date of dispatch: 611114-07.09.17

A08/ Manufacturer's order/ A03 Certificate No.: 427758-001 Sheet: 4

A05 Established Inspecting body: DH

A06 Purchaser: EDMONTON STEEL,EDMON A07.1 No. ED10715-J1010ER

Final receiver: EDMONTON STEEL,EDMON A07.2 No.

B01 Product: HEAVY PLATES

B02/ Steel design.: SA516-70 SA20-S5

B03 Any suppl. requirements: ASME-IIA:2015
DIL-HUE-1:R34-2016-08-19

C70-C99 Chemical composition % - Product analysis

B07.2 Heat	B07.1 Test No.	C01	C	SI	MN	P	S	N	CU	MO	NI	CR	V	NB	SN	TI
449291	55053	K1	0,160	0,354	1,16	0,010	0,0010	0,0057	0,025	0,003	0,027	0,031	0,000	0,000	0,000	0,001

B07.2 Heat	B07.1 Test No.	C01	B	CA	AL-T
449291	55053	K1	0,0000	0,0020	0,029

C94 Product analysis Carbon equivalent / Alloying restrictions

B07.2 Heat	B07.1 Test No.	C01					
449291	55053	K1	FO-02=	0,36	FO-51=	0,000	FO-55= 0,09

C94 Carbon equivalent formula / Alloying restrictions

FO-02 = C+(MN/6)+(CR+MO+V)/5+(NI+CU)/15
FO-51 = V +NB
FO-55 = CU+MO+NI+CR
FO-78 = CR+MO
FO-91 = MN/C

D01 Marking and identification, surface appearance, shape and dimensional properties

ITEM NO.: 01
EXAMINATION OF MARKING, SURFACE, SHAPE AND DIMENSIONS: THE RESULTS MEET THE REQUIREMENTS.
SURFACE AS PER ASME-SA20
THICKNESS AS PER ASME-SA20
LENGTH AND WIDTH AS PER ASME-SA20

MTR APPROVED EDMONTON EXCHANGER

A04 D H Manufacturer's mark

Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

B. BALDAUF
Test House Manager

AHB Inspector's stamp

AG der Dillinger Hüttenwerke
Postfach 1580, D-66748 Dillingen/Saar
Inspection department

A01

Date 08.09.17 PP 1

QM-System: Certification as per ISO 9001

Erläuterungen siehe Rückseite/Explications voir au verso/See reverse for explanations (www.dillinger.de/certificate)

DILLINGER

A02 INSPECTION CERTIFICATE 3.1 AS PER EN 10204:2004
INSPECTION CERTIFICATE 3.1 AS PER ISO 10474:2013
MATERIAL TEST REPORT (MTR)

A10 Advice of dispatch No./ Date of dispatch: 611114-07.09.17

A08/ Manufacturer's order/ A03 Certificate No.: 427758-001 Sheet: 1/...

A05 Established inspecting body: DH

A06 Purchaser: EDMONTON STEEL, EDMON A07.1 No.: ED10715-J1010ER

Final receiver: EDMONTON STEEL, EDMON A07.2 No.:

B01 Product: HEAVY PLATES

B02/ Steel design.: SA516-60 SA20-S5

B03 Any suppl. requirements: ASME-IIA:2015
DIL-HUE-1:R34-2016-08-19

21071

B01-B99 Description of the product

B14 Item No.	B08 Number of pieces	B09 Thickness	B10 Width	B11 Length	B12 Theoretical mass KG	B04 Product delivery condition	B07.2 Heat No.	B07.1 Rolled plate No./ Test No.	A09 Purchaser article number
			INCH						
01	1	0,5000 x	96,50000 x	480,00000	2979	N	449291	55053-01	ITEM001
01	1	0,5000 x	96,50000 x	480,00000	2979	N	449291	55053-02	ITEM001
01	1	0,5000 x	96,50000 x	480,00000	2979	N	449291	55053-03	ITEM001
01	1	0,5000 x	96,50000 x	480,00000	2979	N	449291	55054-01	ITEM001
01	1	0,5000 x	96,50000 x	480,00000	2979	N	449291	55054-02	ITEM001
01	1	0,5000 x	96,50000 x	480,00000	2979	N	449291	55054-03	ITEM001
01	1	0,5000 x	96,50000 x	480,00000	2979	N	449291	55056-01	ITEM001
01	1	0,5000 x	96,50000 x	480,00000	2979	N	449291	55056-02	ITEM001
01	1	0,5000 x	96,50000 x	480,00000	2979	N	449291	55056-03	ITEM001
01	1	0,5000 x	96,50000 x	480,00000	2979	N	449291	55060-01	ITEM001
01	1	0,5000 x	96,50000 x	480,00000	2979	N	449291	55060-02	ITEM001
**	12				35748		449291	55060-03	ITEM001
***	12				35748				

B04 Product delivery condition

ITEM NO.: 01
N: HT: 1670 GR.F +36 -27 GR.F
SOAKING TIME TO ATTAIN THE TARGET TEMPERATURE OVER THE WHOLE SECTION: 1-1,75 MIN/MM (25-45 MIN/INCH)
COOLING IN STILL AIR

A04 D H Manufacturer's mark

Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

B. BALDAUF
Test House Manager

A H B Inspector's stamp

A01 AG der Dillinger Hüttenwerke
Postfach 1580, D-66748 Dillingen/Saar
Inspection department

Date 08.09.17

PP 1

QM-System: Certification as per ISO 9001

DILLINGER

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A02 INSPECTION CERTIFICATE 3.1 AS PER EN 10204:2004
INSPECTION CERTIFICATE 3.1 AS PER ISO 10474:2013
MATERIAL TEST REPORT (MTR)

A10 Advice of dispatch No./ Date of dispatch: 611114-07.09.17

A08/ Manufacturer's order/ A03 Certificate No.: 427758-001 Sheet: 2/...

A05 Established Inspecting body: DH

A06 Purchaser: EDMONTON STEEL, EDMON A07.1 No. ED10715-J1010ER

Final receiver: EDMONTON STEEL, EDMON A07.2 No.

B01 Product: HEAVY PLATES

B02/ Steel design.: SA516-60 SA20-S5

B03 Any suppl. requirements: ASME-IIA:2015
DIL-HUE-1:R34-2016-08-19

B06 Marking of the product

ITEM NO.: 01
STEEL DESIGNATION **SA516 70 MTLTV SA516 60 MTLTV**
HEAT NO. / TRADEMARK / ROLLED PLATE NO.-TEST NO. / INSPECTOR'S STAMP

B07-B99 Further information about the product

ITEM NO.: 01
THICKNESS REDUCTION RATIO >= 3,0 IS FULFILLED - CF. A/SA20(M) PAR. 5.3

C10-C29 Tensile test

B14 Item No.	B07.2 Heat No.	B07.1 Rol.plate/ Test No.	B05 Reference (heat) treatment	C01	C02/ C01	C03 Temp. GR.F	C10 C11 KSI RP02	C12 RM	C13 A % L0=8IN	C14-C15
01	449291	55053		K1	Q	RT	49,9	73,8	26	
01	449291	55054		K1	Q	RT	50,0	73,8	24	
01	449291	55056		K1	Q	RT	50,2	73,4	27	
01	449291	55060		K1	Q	RT	50,2	74,0	27	

C30-C39 Hardness test

B14 Item. No.	B07.2 Heat No.	B07.1 Rol.plate/ Test No.	B05 Reference (heat) treatment	C01	C02/C01	C03 Temp. GR.F	C30 Method of test	C35	C31 Individual values			C32 Mean value
01	449291	55053		K1	O	RT	HBW 10/3000	HB	139	138	139	139
01	449291	55054		K1	O	RT	HBW 10/3000	HB	139	138	137	138
01	449291	55056		K1	O	RT	HBW 10/3000	HB	139	139	139	139
01	449291	55060		K1	O	RT	HBW 10/3000	HB	139	139	139	139

A04 D H Manufacturer's mark

Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

B. BALDAUF
Test House Manager

A H B Inspector's stamp

Date 08.09.17

A01 AG der Dillinger Hüttenwerke
Postfach 1580, D-66748 Dillingen/Saar
Inspection department

PP 1

QM-System: Certification as per ISO 9001

DILLINGER

Erläuterungen siehe Rückseite/Explications voir au verso/See reverse for explanations (www.dillinger.de/certificate)

A02 INSPECTION CERTIFICATE 3.1 AS PER EN 10204:2004
INSPECTION CERTIFICATE 3.1 AS PER ISO 10474:2013
MATERIAL TEST REPORT (MTR)

A10 Advice of dispatch No./ Date of dispatch: 611114-07.09.17

A08/ Manufacturer's order/ A03 Certificate No.: 427758-001 Sheet: 3/...

A05 Established Inspecting body: DH

A06 Purchaser: EDMONTON STEEL, EDMON A07.1 No. ED10715-J1010ER

Final receiver: EDMONTON STEEL, EDMON A07.2 No.

B01 Product: HEAVY PLATES

B02/ Steel design.: SA516-60 SA20-S5

B03 Any suppl. requirements: ASME-IIA:2015
DIL-HUE-1:R34-2016-08-19

C40-C49 Impact test

B14 Item No.	B07.2 Heat No.	B07.1 Rol.plate/ Test No.	B05 Reference (heat) treatment	C01	C02/ C01	C03 Temp. GR.F	C41 Width of test piece	C40 Type of test piece	C44 Testing method	C46 Energy	C45	C42 Individual values AV=FT.LBF			C43 Mean value
01	449291	55053		K1	LV	-51		CHP-V			AV 8	212	193	147	184
01	449291	55054		K1	LV	-51		CHP-V			AV 8	131	189	195	172
01	449291	55056		K1	LV	-51		CHP-V			AV 8	228	134	203	188
01	449291	55060		K1	LV	-51		CHP-V			AV 8	206	198	223	209

C70-C99 Chemical composition % - Heat analysis

B07.2 Heat	C70	C	SI	MN	P	S	N	CU	MO	NI	CR	V	NB	SN	TI
449291	Y	0,161	0,358	1,160	0,010	0,0013	0,0066	0,026	0,005	0,027	0,033	0,000	0,000	0,0009	0,002

B07.2 Heat	C70	B	CA	AL-T
449291	Y	0,0001	0,0021	0,029

C94 Heat analysis Carbon equivalent / Alloying restrictions

B07.2 Heat											
449291	FO-02=	0,37	FO-51=	0,000	FO-55=	0,09	FO-78=	0,04	FO-91=	7,2	

C95 Ladle treatment

ITEM NO.: 01
HEAT OF THE INDICATED ITEM: VACUUM DEGASSED / SULPHIDE SHAPE CONTROL

C95 Further information about ladle treatment

ITEM NO.: 01
CALCIUM TREATED

A04 D H Manufacturer's mark

Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

B. BALDAUF
Test House Manager

AHB Inspector's stamp

A01 AG der Dillinger Hüttenwerke
Postfach 1580, D-66748 Dillingen/Saar
Inspection department

Date 08.09.17 PP 1

QM-System: Certification as per ISO 9001

Erläuterungen siehe Rückseite/Explications voir au verso/See reverse for explanations (www.dillinger.de/certificate)

DILLINGER

A02 INSPECTION CERTIFICATE 3.1 AS PER EN 10204:2004
INSPECTION CERTIFICATE 3.1 AS PER ISO 10474:2013
MATERIAL TEST REPORT (MTR)

A10 Advice of dispatch No./ Date of dispatch: 611114-07.09.17

A08/ Manufacturer's order/ A03 Certificate No.: 427758-001

Sheet: 4

A05 Established Inspecting body: DH

A06 Purchaser: EDMONTON STEEL, EDMON — A07.1 No.: ED10715-J1010ER

Final receiver: EDMONTON STEEL, EDMON — A07.2 No.:

B01 Product: HEAVY PLATES

B02/ Steel design.: SA516-60 SA20-S5

B03 Any suppl. requirements: ASME-IIA:2015
DIL-HUE-1:R34-2016-08-19

C70-C99 Chemical composition % - Product analysis

B07.2 Heat	B07.1 Test No.	C01	C	SI	MN	P	S	N	CU	MO	NI	CR	V	NB	SN	TI
449291	55053	K1	0,160	0,354	1,16	0,010	0,0010	0,0057	0,025	0,003	0,027	0,031	0,000	0,000	0,000	0,001

B07.2 Heat	B07.1 Test No.	C01	B	CA	AL-T
449291	55053	K1	0,0000	0,0020	0,029

C94 Product analysis Carbon equivalent / Alloying restrictions

B07.2 Heat	B07.1 Test No.	C01					
449291	55053	K1	FO-02=	0,36	FO-51=	0,000	FO-55= 0,09

C94 Carbon equivalent formula / Alloying restrictions

FO-02 = C+(MN/6)+(CR+MO+V)/5+(NI+CU)/15
FO-51 = V +NB
FO-55 = CU+MO+NI+CR
FO-78 = CR+MO
FO-91 = MN/C

D01 Marking and identification, surface appearance, shape and dimensional properties

ITEM NO.: 01
EXAMINATION OF MARKING, SURFACE, SHAPE AND DIMENSIONS: THE RESULTS MEET THE REQUIREMENTS.
SURFACE AS PER ASME-SA20
THICKNESS AS PER ASME-SA20
LENGTH AND WIDTH AS PER ASME-SA20

MTR APPROVED EDMONTON EXCHANGER

A04 D H Manufacturer's mark

Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

B. BALDAUF
Test House Manager

AHB Inspector's stamp

A01 AG der Dillinger Hüttenwerke
Postfach 1580, D-66748 Dillingen/Saar
Inspection department

Date 08.09.17 PP 1

QM-System: Certification as per ISO 9001

DILLINGER

Erläuterungen siehe Rückseite/Explications voir au verso/See reverse for explanations (www.dillinger.de/certificate)

A02 INSPECTION CERTIFICATE 3.1 AS PER EN 10204:2004
INSPECTION CERTIFICATE 3.1 AS PER ISO 10474:2013
MATERIAL TEST REPORT (MTR)

A10 Advice of dispatch No./ Date of dispatch: 626272-10.02.18

A08/ Manufacturer's order/ A03 Certificate No.: 431792-001 Sheet: 12/...

A05 Established Inspecting body: DH

A06 Purchaser: EDMONTON STEEL,EDMON A07.1 No.: ED10722-J1010ER

Final receiver: EDMONTON STEEL,EDMON A07.2 No.:

B01 Product: HEAVY PLATES

B02/ Steel design.: SA516-70 SA20-S5

B03 Any suppl. requirements: ASME-IIA:2015
DIL-HUE-1:R34-2016-08-19

C70-C99 Chemical composition % - Product analysis

B07.2 Heat	B07.1 Test No.	C01	C	SI	MN	P	S	N	CU	MO	NI	CR	V	NB	SN	TI
454461	64437	K1	0,167	0,366	1,16	0,011	0,0007	0,0076	0,025	0,006	0,050	0,029	0,001	0,002	0,001	0,002
454836	27699	K1	0,170	0,368	1,16	0,010	0,0007	0,0061	0,033	0,007	0,027	0,038	0,000	0,001	0,001	0,003
454836	27706	K1	0,177	0,369	1,16	0,010	0,0006	0,0059	0,033	0,007	0,027	0,038	0,001	0,001	0,001	0,003
454837	27740	K1	0,166	0,369	1,16	0,009	0,0005	0,0060	0,026	0,005	0,023	0,028	0,001	0,001	0,001	0,002
454837	27783	K1	0,179	0,373	1,17	0,008	0,0005	0,0060	0,024	0,004	0,022	0,024	0,001	0,001	0,001	0,001
454840	27789	K1	0,167	0,369	1,17	0,009	0,0004	0,0060	0,023	0,004	0,022	0,023	0,001	0,001	0,000	0,002
454840	27796	K1	0,164	0,371	1,17	0,009	0,0005	0,0064	0,023	0,004	0,022	0,023	0,001	0,001	0,000	0,002
454840	27809	K1	0,165	0,365	1,15	0,009	0,0005	0,0054	0,023	0,010	0,024	0,038	0,001	0,001	0,000	0,002
454843	27952	K1	0,145	0,358	1,14	0,009	0,0004	0,0053	0,023	0,014	0,025	0,045	0,001	0,000	0,000	0,002

B07.2 Heat	B07.1 Test No.	C01	B	CA	AL-T
454461	64437	K1	0,0001	0,0013	0,034
454836	27699	K1	0,0001	0,0018	0,031
454836	27706	K1	0,0001	0,0019	0,032
454837	27740	K1	0,0000	0,0015	0,030
454837	27783	K1	0,0000	0,0014	0,029
454840	27789	K1	0,0001	0,0011	0,031
454840	27796	K1	0,0000	0,0011	0,031
454840	27809	K1	0,0000	0,0012	0,035
454843	27952	K1	0,0000	0,0011	0,038

A04 D H Manufacturer's mark

Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

B. BALDAUF
Test House Manager

AHB Inspector's stamp

Date 12.02.18

A01 AG der Dillinger Hüttenwerke
Postfach 1580, D-66748 Dillingen/Saar
Inspection department

PP 1

QM-System: Certification as per ISO 9001

Erläuterungen siehe Rückseite/Explications voir au verso/See reverse for explanations (www.dillinger.de/certificate)

DILLINGER

A02 INSPECTION CERTIFICATE 3.1 AS PER EN 10204:2004
INSPECTION CERTIFICATE 3.1 AS PER ISO 10474:2013
MATERIAL TEST REPORT (MTR)

A10 Advice of dispatch No./ Date of dispatch: 626272-10.02.18

A08/ Manufacturer's order/ A03 Certificate No.: 431792-001 Sheet: 12/...

A05 Established inspecting body: DH

A06 Purchaser: EDMONTON STEEL,EDMON A07.1 No. ED10722-J1010ER

Final receiver: EDMONTON STEEL,EDMON A07.2 No.

B01 Product: HEAVY PLATES

B02/ Steel design. SA516-60 SA20-S5

B03 Any suppl. requirements ASME-IIA:2015
DIL-HUE-1:R34-2016-08-19

C70-C99 Chemical composition % - Product analysis

B07.2 Heat	B07.1 Test No.	C01	C	SI	MN	P	S	N	CU	MO	NI	CR	V	NB	SN	TI
454461	64437	K1	0,167	0,366	1,16	0,011	0,0007	0,0076	0,025	0,006	0,050	0,029	0,001	0,002	0,001	0,002
454836	27699	K1	0,170	0,368	1,16	0,010	0,0007	0,0061	0,033	0,007	0,027	0,038	0,000	0,001	0,001	0,003
454836	27706	K1	0,177	0,369	1,16	0,010	0,0006	0,0059	0,033	0,007	0,027	0,038	0,001	0,001	0,001	0,003
454837	27740	K1	0,166	0,369	1,16	0,009	0,0005	0,0060	0,026	0,005	0,023	0,028	0,001	0,001	0,001	0,002
454837	27783	K1	0,179	0,373	1,17	0,008	0,0005	0,0060	0,024	0,004	0,022	0,024	0,001	0,001	0,001	0,001
454840	27789	K1	0,167	0,369	1,17	0,009	0,0004	0,0060	0,023	0,004	0,022	0,023	0,001	0,001	0,000	0,002
454840	27796	K1	0,164	0,371	1,17	0,009	0,0005	0,0064	0,023	0,004	0,022	0,023	0,001	0,001	0,000	0,002
454840	27809	K1	0,165	0,365	1,15	0,009	0,0005	0,0054	0,023	0,010	0,024	0,038	0,001	0,001	0,000	0,002
454843	27952	K1	0,145	0,358	1,14	0,009	0,0004	0,0053	0,023	0,014	0,025	0,045	0,001	0,000	0,000	0,002

B07.2 Heat	B07.1 Test No.	C01	B	CA	AL-T
454461	64437	K1	0,0001	0,0013	0,034
454836	27699	K1	0,0001	0,0018	0,031
454836	27706	K1	0,0001	0,0019	0,032
454837	27740	K1	0,0000	0,0015	0,030
454837	27783	K1	0,0000	0,0014	0,029
454840	27789	K1	0,0001	0,0011	0,031
454840	27796	K1	0,0000	0,0011	0,031
454840	27809	K1	0,0000	0,0012	0,035
454843	27952	K1	0,0000	0,0011	0,038

A04 D H Manufacturer's mark

Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

B. BALDAUF
Test House Manager

AHB Inspector's stamp

Date 12.02.18

A01 AG der Dillinger Hüttenwerke
Postfach 1580, D-66748 Dillingen/Saar
Inspection department

PP 1

WELDING PROCEDURE SPECIFICATION NO.: STS-2 (Rev.0)

WELDING PROCEDURE QUALIFICATION RECORD NO.(S): STS-2-1 (Rev.0), STS-2-3 (Rev.0), STS-2-4 (Rev.0), WFL-2-1 (Rev.1)

QUALIFIED IN ACCORDANCE WITH ASME SECTION IX FOR

Base Metal (Typical): P1 Groups 1 & 2 to P1 Groups 1 & 2 (SA 333 Gr. 6, SA 350 Gr. LF2, SA 420 Gr. WPL6, SA 516 Gr. 70 etc.)
Process(es): SAW **Weld Types:** GROOVE & FILLET
Position: FLAT & HORIZONTAL **Diameter:** ALL DIAMETERS
Filler Metal: F7A6-EM12K

BASE METAL CONDITIONS & GROOVE THICKNESS RANGE QUALIFIED:

NOTCH TOUGHNESS APPLICATIONS TO -50 °F AS WELDED
BASE METAL THICKNESS RANGE 0.125 to 1.750 in. inclusive

COMBINED DEPOSITED WELD METAL THICKNESS
ASME IX 1.750 in. maximum
API 650, 620, 12D, 12F 1.750 in. maximum

PROVINCIAL REGISTRATION

This WPS was prepared to the requirements of ASME Section IX 2017 and includes some of the additional requirements of the construction codes listed. The application of this WPS is outside the work scope of SGS Canada Inc.

Prepared By: Sara Van Roestel
Signed:
Date: July 8, 2019

Reviewed By: Keelan Wolfe, C.E.T.
Signed:
Date: July 8, 2018

(File E19-285)

QW-482 WELDING PROCEDURE SPECIFICATION (WPS)

Organization Name: Storage Tank Solutions Inc.
Welding Procedure Specification No.: STS-2 (Rev.0) Date: July 8, 2019
Supporting PQR No.(s): STS-2-1 (Rev.0), STS-2-3 (Rev.0), STS-2-4 (Rev.0), WFL-2-1 (Rev.1)
Welding Process(es): Submerged Arc Welding (SAW)

JOINTS (QW-402)

Joint Design: All ASME groove & fillet, reference construction drawing for joint details.
Where joint details are not specified, refer to figures 1 to 15 attached
Root Opening: As per attached typical groove designs, see figures 1 to 15 attached
Backing: With Retainers: With or without

BASE METALS (QW-403)

P-Number: P1 Groups 1 & 2 To P-Number: P1 Groups 1 & 2
Thickness Range: Groove: 0.125 to 1.750 in. inclusive (1)
Fillet: 0.125 to 8.00 in. inclusive
Pipe Diameter Ranges: Groove: All diameters
Fillet: All diameters
Deposited Weld Metal (Per Pass): 0.250 in. maximum
(1) Reference thickness limitations for tests on welds in fabrication or assembly in ASME B31.3 Table 323.3.1 - Impact Testing Requirements for metals.

FILLER METALS (QW-404)

	SAW
Specification No. (SFA)	SFA 5.17
Flux / Wire Classification	F7A6-EM12K
F-No.	F6
A-No.	A1
Diameter	5/64 to 3/16 in. inclusive
Supplemental Filler Metal	Without
Flux Type	Neutral
Flux Designation	Lincolnweld 882 (2)
Alloy Elements	Without
Alloy Flux	Without
Recrushed Slag	Without
Deposited Weld Metal Thickness Range:	
Groove	1.750 in. max. (3)
Fillet	All fillet sizes

(2) Other flux trade names may be used provided they meet an F7A6 classification
(3) Deposited weld metal thickness shall not exceed 1.750 in.

POSITION (QW-405)

Position of Groove: Flat & Horizontal Position of Fillet: Flat & Horizontal
Weld Progression: N/A

PREHEAT (QW-406)

Preheat Temperature (Minimum) See attached preheat sheet prior to welding.
Interpass Temperature (Maximum) 500 °F
Preheat Maintenance See attached preheat sheet prior to welding. Preheat maintenance is not required if welding is interrupted or after the completion of welding unless required by the code of construction.

POSTWELD HEAT TREATMENT (QW-407)

With or Without Without
Temperature Range N/A Time Range N/A

ELECTRICAL CHARACTERISTICS (QW-409)

Current Direct Polarity Reverse, electrode positive
Amps See Table 1 Volts See Table 1
Maximum Heat Input

Base Metal Thickness Range	SAW
0.125 to 0.499 in.	28,174 J/in.
0.500 to 0.624 in.	53,438 J/in.
0.625 in. and greater	59,492 J/in.

TECHNIQUE (QW-410)

Manual or Automatic Machine
String or Weave String
Initial & Interpass Cleaning Brushing, chipping or grinding as required
Method of Back Gouging Air carbon arc, back-grind as required
Oscillation N/A
Contact Tube to Work Distance 0.500 in. - 1.75 in.
Multiple or Single Pass Per Side Multiple
Single or Multiple Electrodes Single
Electrode Spacing N/A
Peening Not permitted
Use of Thermal Process N/A
Travel Speed See Table 1

TABLE 1 - WELDING PARAMETERS

Process	Filler Metal	Diameter in.	Current Type& Polarity	Amperage Range	Voltage Range	Travel Speed i.p.m.	Wire Feed Speed i.p.m.
SAW	F7A6-EM12K	5/64	DCRP	200 - 500	25 - 34	5.1 - 30	60 - 245
SAW	F7A6-EM12K	3/32	DCRP	250 - 600	25 - 35	6.4 - 32	60 - 245
SAW	F7A6-EM12K	1/8	DCRP	250 - 700	26 - 35	6.6 - 35	45 - 180
SAW	F7A6-EM12K	5/32	DCRP	370 - 800	26 - 36	9.8 - 40	45 - 180
SAW	F7A6-EM12K	3/16	DCRP	500 - 1000	28 - 38	14.2 - 50	30 - 100

Note: Welding parameters shall be adjusted to ensure that the maximum heat input value specified in QW-409 above is not exceeded.
Heat Input (joules per inch) = (Amperage X Voltage X 60) / Travel Speed (i.p.m.)

TYPICAL JOINT DESIGNS

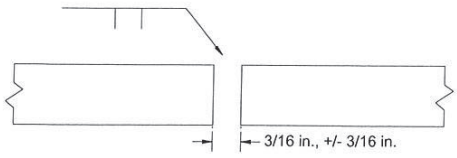


Figure 1
Single Square Butt

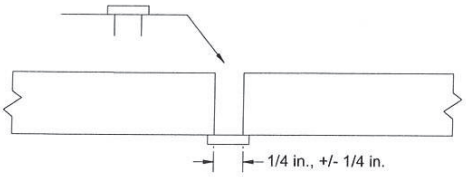


Figure 2
Single Square Butt with Backing Strip

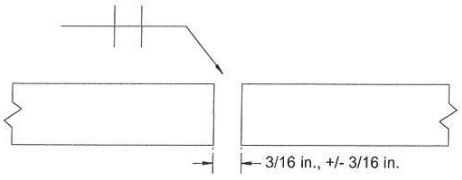


Figure 3
Double Square Butt

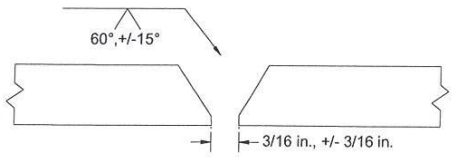


Figure 4
Single Vee Butt

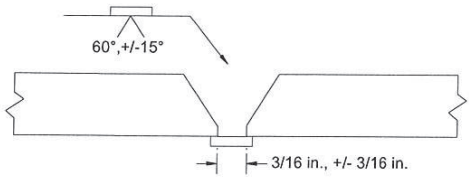


Figure 5
Single Vee Butt with Backing Strip

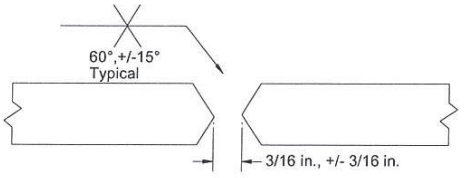


Figure 6
Double Vee Butt

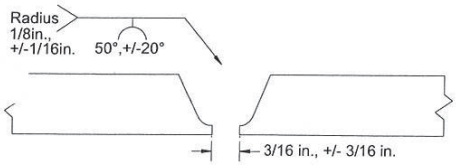


Figure 7
Single U Butt

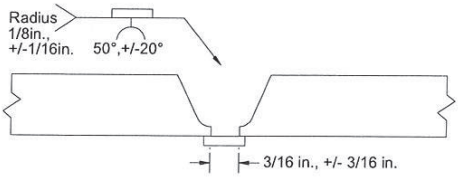


Figure 8
Single U Butt with Backing Strip

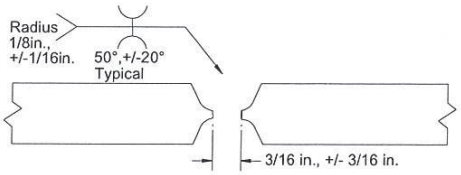


Figure 9
Double U Butt

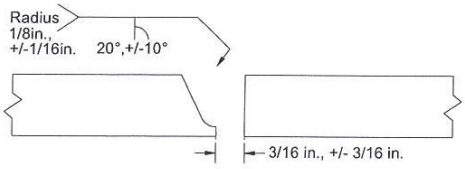


Figure 10
Single J Butt

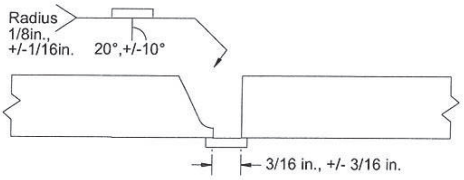


Figure 11
Single J Butt with Backing Strip

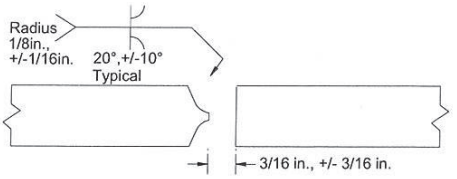


Figure 12
Double J Butt

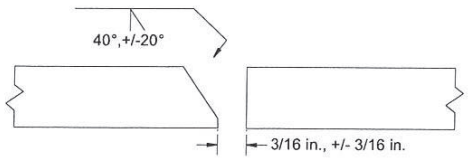


Figure 13
Single Bevel Butt

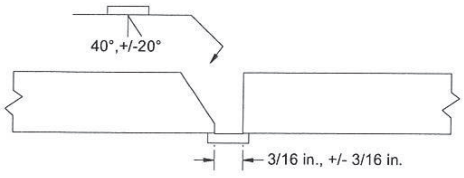


Figure 14
Single Bevel Butt with Backing Strip

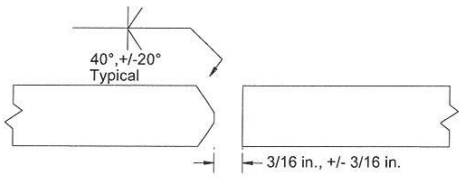


Figure 15
Double Bevel Butt

Additional joint designs and internal misalignment on circumferential welds shall be within the dimensional limits stated on the approved construction drawing and/or the engineering design.

PREHEAT
P-No. 1

LARGE, WELDED, LOW-PRESSURE STORAGE TANKS IN ACCORDANCE WITH API 620 Twelfth Edition, Addendum 1

THICKNESS OF THICKER PLATE	MINIMUM PREHEAT TEMPERATURE	
	P1 Group 1	P1 Group 2
Less than or equal to 1.25 in.	32 °F	50 °F
Greater than 1.25 in to 1.50 in.	50 °F	100 °F
Greater than 1.50 in.	200 °F	200 °F

- No welding of any kind shall be performed when the surfaces to be welded are wet with rain snow or ice; when rain or snow is falling on such surfaces; or during periods of high winds unless the welder and the work are properly shielded.
- Preheat shall be applied when the metal temperature is below the temperature required by Table 6-2 (summarized above). In that case the base metal shall be heated to at least the temperature indicated within 3.0 in. of the place where welding is to be started and maintained 3.0 in. ahead of the arc. Material P-Number and Group Number shall be as designated in ASME IX or in API 630 6.7.2 for materials not listed in ASME IX.

WELDED TANKS FOR OIL STORAGE IN ACCORDANCE WITH API 650 Twelfth Edition, Addendum 2

THICKNESS OF THICKER PLATE	MINIMUM PREHEAT TEMPERATURE	
	Material Group I, II, III, and IIIA	Material Group IV, IVA, V & VI
Less than or equal to 1.25 in.	32 °F	50 °F
Greater than 1.25 in to 1.50 in.	50 °F	100 °F
Greater than 1.50 in.	200 °F	200 °F

- No welding of any kind shall be performed when the surfaces to be welded are wet with rain, snow or ice; when rain or snow is falling on such surfaces; or during periods of high winds unless the welder and the work are properly shielded.
- Preheat shall be applied when metal temperature is below the temperature required by table 7-1 (summarized above) for the base metals being joined, and metal shall be heated to at least the temperature indicated within 3.0 in. of the place where welding is to be started and maintained 3.0 in. ahead of the arc. Material Groups shall be as designated in Table 4.4

QW-483 PROCEDURE QUALIFICATION RECORD (PQR)

Organization Name: Storage Tank Solutions Inc.
Procedure Qualification Record No.: STS-2-1 (Rev.0) Date: February 22, 2019
Welding Process(es): Submerged Arc Welding (SAW)

JOINTS (QW-402)

Joint Design: Butt joint, square groove, see page 2
Root Opening: See page 2
Backing: Without Retainers: Without

BASE METALS (QW-403)

Material Specification No.: SA 516 Type or Grade: Gr. 60/70
Heat Treat Condition (1): SA 516 Gr. 60/70: Normalized
P-No.: P1 Groups 1/2 To P-No.: P1 Groups 1/2 Thickness: 0.250 in.
Heat Number: 429693 29249-03 Carbon Equivalent (2): 0.37
Diameter: N/A Other: Plate product form m/c to 0.250 in.
Deposited Weld Metal (Per Pass): Did not exceed 0.125 in.

(1) Condition of base metal prior to welding.
(2) Per CSA Z662 Carbon Equivalent formula. See chemical composition of heat analysis on attached material test report

FILLER METALS (QW-404)

	SAW
Specification No. (SFA)	SFA 5.17
Flux / Wire Classification	F7A6-EM12K (3)
F-No.	F6
A-No.	A1 (4)
Diameter	See attached sketch
Supplemental Filler Metal	Without
Flux Type	Neutral
Flux Designation	F7A6
Flux Trade Name	Lincolnweld 882
Alloy Elements	Without
Alloy Flux	Without
Recrushed Slag	Without
Deposited Weld Metal Thickness	0.250 in.

(3) The Lincoln Electric Company: Lincolnweld 882M Flux / L-61 Electrode Lot No. 15135168
(4) F7A6-EM12K A-No. established from chemical analysis of SAW weld cap deposit. See attached Laboratory Test Report No.: E19-104.9

POSITION (QW-405)

Position of Groove: 2G Weld Progression: N/A

PREHEAT (QW-406)

Preheat Temperature: 50 °F Interpass Temp. (Max.): 400 °F
Preheat Maintenance: Weld was allowed to cool to ambient temperature in still air after welding was completed.

POSTWELD HEAT TREATMENT (QW-407)

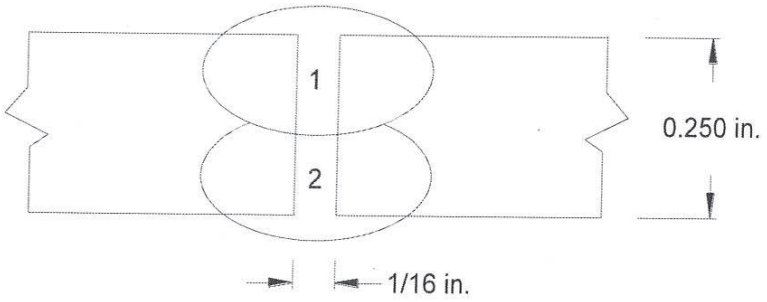
With or Without: Without
Temperature: N/A Time: N/A

ELECTRICAL CHARACTERISTICS (QW-409)

Current: Direct Polarity: Reverse, electrode positive
Amps: See below Volts: See below
Heat Input: 28,174 J/in. maximum

TECHNIQUE (QW-410)

Manual or Automatic: Machine
String or Weave: String
Initial & Interpass Cleaning: Brushing, chipping and grinding as required
Method of Back Gouging: Ground to sound metal with an abrasive grinding disc
Oscillation: N/A
Contact Tube to Work Distance: 0.750 in. - 1.00 in.
Multiple or Single Pass Per Side: Single
Single or Multiple Electrodes: Single
Electrode Spacing: N/A
Peening: Not conducted
Use of Thermal Process: N/A
Travel Speed: See below



Pass	Process	Filler Metal	Diameter in.	Current Type & Polarity	Amperage Range	Voltage Range	Travel Speed i.p.m.
1	SAW	F7A6-EM12K	3/32	DCRP	350 - 370	29 - 31	23.0
2	SAW	F7A6-EM12K	3/32	DCRP	300 - 320	27 - 29	23.5

PQR NO. STS-2-1 (Rev.0)

CHARPY V-NOTCH IMPACT TEST

Type of Test Charpy V-Notch Orientation Transverse

Governing Specification	Notch Location	Specimen Size in.	Test Temperature ° F	Specimen Number	Impact Values ft•lbf
ASME VIII Div.1 - 2017 & ASME B31.3 - 2016	Weld metal within 1/16 in. of root	0.394 x 0.197	-60	G2.1	11
				G2.2	24
				G2.3	11
ASME VIII Div.1 - 2017 & ASME B31.3 - 2016	HAZ @ Middle 1/2t	0.394 x 0.197	-60	G3.1	32
				G3.2	15
				G3.3	19

OTHER TESTS

Vickers Hardness - see attached Laboratory Test Report No.: E19-104.7
Chemical Analysis (SAW Cap) - see attached Laboratory Test Report No.: E19-104.9

Welder's Name Matthew MacKenzie & Christopher Jaques
Certificate File No. N/A
Tests Conducted By SGS Canada Inc.
Laboratory Test No. E19-104.7

We certify 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.

Organization Storage Tank Solutions Inc.

Date January 21, 2021 Print Sebastien Ouellet

Signed 

QW-483 PROCEDURE QUALIFICATION RECORD (PQR)

Organization Name: Storage Tank Solutions Inc.
Procedure Qualification Record No.: STS-2-3 (Rev.0) Date: February 22, 2019
Welding Process(es): Submerged Arc Welding (SAW)

JOINTS (QW-402)

Joint Design: Butt joint, double bevel groove, see page 2
Root Opening: See page 2
Backing: Without Retainers: Without

BASE METALS (QW-403)

Material Specification No.: SA 516 Type or Grade: Gr. 60/70
Heat Treat Condition (1): SA 516 Gr. 60/70: Normalized
P-No.: P1 Groups 1/2 To P-No.: P1 Groups 1/2 Thickness: 0.875 in.
Heat Number: 454840 27789-02 Carbon Equivalent (2): 0.37
Diameter: N/A Other: Plate product form
Deposited Weld Metal (Per Pass): Did not exceed 0.188 in.
(1) Condition of base metal prior to welding.
(2) Per CSA Z662 Carbon Equivalent formula. See chemical composition of heat analysis on attached material test report

FILLER METALS (QW-404)

	SAW
Specification No. (SFA)	SFA 5.17
Flux / Wire Classification	F7A6-EM12K (3)
F-No.	F6
A-No.	A1 (4)
Diameter	See attached sketch
Supplemental Filler Metal	Without
Flux Type	Neutral
Flux Designation	F7A6
Flux Trade Name	Lincolnweld 882
Alloy Elements	Without
Alloy Flux	Without
Recrushed Slag	Without
Deposited Weld Metal Thickness	0.875 in.

(3) The Lincoln Electric Company: Lincolnweld 882M Flux / L-61 Electrode Lot No. 15135168
(4) F7A6-EM12K A-No. established from chemical analysis of SAW weld cap deposit. See attached Laboratory Test Report No.: E19-104.9

POSITION (QW-405)

Position of Groove: 2G Weld Progression: N/A

PREHEAT (QW-406)

Preheat Temperature: 50 °F Interpass Temp. (Max.): 500 °F
Preheat Maintenance: Weld was allowed to cool to ambient temperature in still air after welding was completed.

POSTWELD HEAT TREATMENT (QW-407)

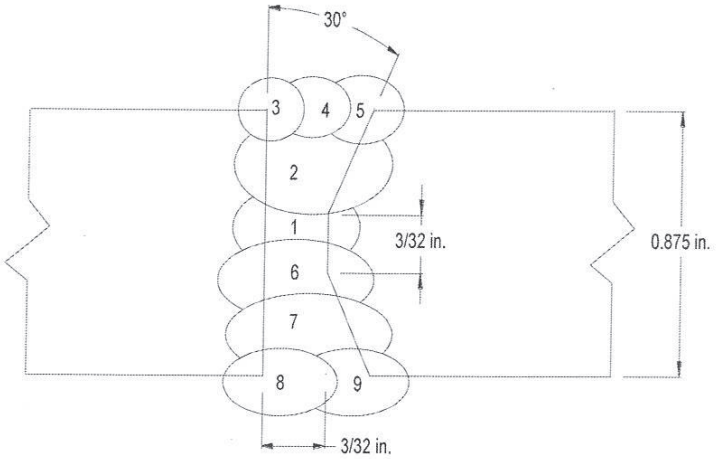
With or Without: Without
Temperature: N/A Time: N/A

ELECTRICAL CHARACTERISTICS (QW-409)

Current: Direct Polarity: Reverse, electrode positive
Amps: See below Volts: See below
Heat Input: 59,492 J/in. maximum

TECHNIQUE (QW-410)

Manual or Automatic: Machine
String or Weave: String
Initial & Interpass Cleaning: Brushing, chipping and grinding as required
Method of Back Gouging: Ground to sound metal with an abrasive grinding disc
Oscillation: N/A
Contact Tube to Work Distance: 0.50 in. - 0.750 in.
Multiple or Single Pass Per Side: Multiple
Single or Multiple Electrodes: Single
Electrode Spacing: N/A
Peening: Not conducted
Use of Thermal Process: N/A
Travel Speed: See below



Pass	Process	Filler Metal	Diameter in.	Current Type & Polarity	Amperage Range	Voltage Range	Travel Speed i.p.m.
1	SAW	F7A6-EM12K	3/32	DCRP	340 - 350	30 - 32	12.2
2	SAW	F7A6-EM12K	3/32	DCRP	380 - 390	29 - 31	13.6
3	SAW	F7A6-EM12K	3/32	DCRP	390 - 410	30 - 32	16.7
4	SAW	F7A6-EM12K	3/32	DCRP	380 - 390	30 - 32	17.1
5	SAW	F7A6-EM12K	3/32	DCRP	380 - 390	30 - 32	18.0
6	SAW	F7A6-EM12K	3/32	DCRP	300 - 320	28 - 30	11.8
7	SAW	F7A6-EM12K	3/32	DCRP	390 - 420	29 - 31	12.6
8	SAW	F7A6-EM12K	3/32	DCRP	380 - 400	29 - 31	11.8
9	SAW	F7A6-EM12K	3/32	DCRP	360 - 370	28 - 30	14.1

PQR NO. STS-2-3 (Rev.0)

TENSILE TEST (QW-150)

Sample No.	Width in.	Thickness in.	Area sq. in.	Ultimate Load lbf	Ultimate Stress psi	Fracture Type & Location
T1	0.750	0.833	0.625	47,800	76,500	Partial Cup & Cone Parent Metal
T2	0.749	0.833	0.624	47,900	76,800	Partial Cup & Cone Parent Metal

GUIDED BEND TEST (QW-160)

Type & Figure No.	Result	Type & Figure No.	Result
QW-462.2, TSB - S1	Pass	QW-462.2, TSB - S3	Pass
QW-462.2, TSB - S2	Pass	QW-462.2, TSB - S4	Pass

CHARPY V-NOTCH IMPACT TEST

Type of Test Charpy V-Notch Orientation Transverse

Governing Specification	Notch Location	Specimen Size in.	Test Temperature ° F	Specimen Number	Impact Values ft•lbf
ASME B31.3 - 2016	Weld metal within 1/16 in. of root	0.394 x 0.394	-50	I2.1	117
				I2.2	92
				I2.3	96
ASME B31.3 - 2016	HAZ	0.394 x 0.394	-50	I3.1	156
				I3.2	191
				I3.3	152

OTHER TESTS

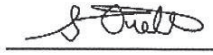
Vickers Hardness - see attached Laboratory Test Report No.: E19-104.9
Chemical Analysis (SAW Cap) - see attached Laboratory Test Report No.: E19-104.9

Welder's Name Matthew MacKenzie & Christopher Jaques
Certificate File No. N/A
Tests Conducted By SGS Canada Inc.
Laboratory Test No. E19-104.9

We certify 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.

Organization Storage Tank Solutions Inc.

Date January 21, 2021 Print Sebastien Ouellet

Signed 

QW-483 PROCEDURE QUALIFICATION RECORD (PQR)

Organization Name: Storage Tank Solutions Inc.
Procedure Qualification Record No.: STS-2-4 (Rev.0) Date: June 11, 2019
Welding Process(es): Submerged Arc Welding (SAW)

JOINTS (QW-402)

Joint Design: Butt joint, single bevel groove, see page 2
Root Opening: See page 2
Backing: Without Retainers: Without

BASE METALS (QW-403)

Material Specification No.: SA 516 Type or Grade: Gr. 60/70
Heat Treat Condition (1): SA 516 Gr. 60/70: Normalized
P-No.: P1 Groups 1/2 To P-No.: P1 Groups 1/2 Thickness: 0.500 in.
Heat Number: 459852 56930-01 Carbon Equivalent (2): 0.38
Diameter: N/A Other: Plate product form
Deposited Weld Metal (Per Pass): Did not exceed 0.188 in.

(1) Condition of base metal prior to welding.
(2) Per CSA Z662 Carbon Equivalent formula. See chemical composition of heat analysis on attached material test report

FILLER METALS (QW-404)

	SAW
Specification No. (SFA)	SFA 5.17
Flux / Wire Classification	F7A6-EM12K (3)
F-No.	F6
A-No.	A1 (4)
Diameter	See attached sketch
Supplemental Filler Metal	Without
Flux Type	Neutral
Flux Designation	F7A6
Flux Trade Name	Lincolnweld 882
Alloy Elements	Without
Alloy Flux	Without
Recrushed Slag	Without
Deposited Weld Metal Thickness	0.500 in.

(3) The Lincoln Electric Company: Lincolnweld 882M Flux / L-61 Electrode Lot No. 15135168
(4) F7A6-EM12K A-No. established from chemical analysis of SAW weld cap deposit. See attached Laboratory Test Report No.: E19-104.9

POSITION (QW-405)

Position of Groove: 2G Weld Progression: N/A

PREHEAT (QW-406)

Preheat Temperature: 50 °F Interpass Temp. (Max.): 500 °F
Preheat Maintenance: Weld was allowed to cool to ambient temperature in still air after welding was completed.

POSTWELD HEAT TREATMENT (QW-407)

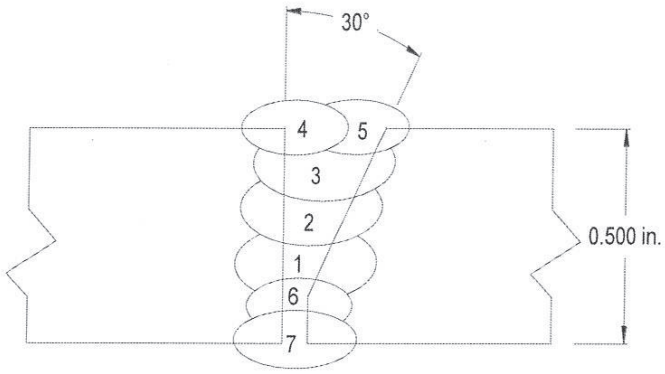
With or Without: Without
Temperature: N/A Time: N/A

ELECTRICAL CHARACTERISTICS (QW-409)

Current: Direct Polarity: Reverse, electrode positive
Amps: See below Volts: See below
Heat Input: 53,438 J/in. maximum

TECHNIQUE (QW-410)

Manual or Automatic: Machine
String or Weave: String
Initial & Interpass Cleaning: Brushing, chipping and grinding as required
Method of Back Gouging: Ground to sound metal with an abrasive grinding disc
Oscillation: N/A
Contact Tube to Work Distance: 0.50 to 0.750 in.
Multiple or Single Pass Per Side: Single
Single or Multiple Electrodes: Single
Electrode Spacing: N/A
Peening: Not conducted
Use of Thermal Process: N/A
Travel Speed: See below



Pass	Process	Filler Metal	Diameter in.	Current Type & Polarity	Amperage Range	Voltage Range	Travel Speed i.p.m.
1	SAW	F7A6-EM12K	3/32	DCRP	360 - 390	27 - 30	12.0
2	SAW	F7A6-EM12K	3/32	DCRP	390 - 410	27 - 30	15.0
3	SAW	F7A6-EM12K	3/32	DCRP	390 - 410	27 - 30	15.0
4	SAW	F7A6-EM12K	3/32	DCRP	370 - 390	27 - 30	15.9
5	SAW	F7A6-EM12K	3/32	DCRP	370 - 390	27 - 30	15.9
6	SAW	F7A6-EM12K	3/32	DCRP	375 - 400	27 - 30	15.9
7	SAW	F7A6-EM12K	3/32	DCRP	380 - 405	27 - 30	15.9

Note: Monitored parameters provided by Storage Tank Solutions Inc.

PQR NO. STS-2-4 (Rev.0)

CHARPY V-NOTCH IMPACT TEST

Type of Test Charpy V-Notch Orientation Transverse

Governing Specification	Notch Location	Specimen Size in.	Test Temperature ° F	Specimen Number	Impact Values ft•lbf
ASME VIII Div.1 - 2017 & ASME B31.3 - 2016	Weld metal within 1/16 in. of root	0.394 x 0.394	-50	C2.1	28
				C2.2	72
				C2.3	69
ASME VIII Div.1 - 2017 & ASME B31.3 - 2016	HAZ @ Middle 1/2t	0.394 x 0.394	-50	C3.1	72
				C3.2	46
				C3.3	88

OTHER TESTS

Vickers Hardness - see attached Laboratory Test Report No.: E19-285.3
Chemical Analysis (SAW Cap) - see attached Laboratory Test Report No.: E19-104.9

Welder's Name Matthew MacKenzie Certificate File No. N/A
Tests Conducted By SGS Canada Inc.
Laboratory Test No. E19-285.3

We certify 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.

Organization Storage Tank Solutions Inc.

Date January 21, 2021 Print Sebastien Ouellet

Signed

QW-483 PROCEDURE QUALIFICATION RECORD (PQR)

Company Name: Woodside Fabricators Ltd.
Procedure Qualification Record No.: WFL-2-1 (Rev.1) Date: May 10, 2006
Revision(s): Rev. 1 - Editorial - Addition of alloy elements, alloy flux, flux designation, contact tube to work distance, peening and oscillation. Corporate name change, formerly Woodside Fabricators Ltd. Update to manufacturer's certifying statement. PQR, No. formerly WFL-2-1, revision date July 8, 2019.
Welding Process(es): SAW Type(s): Machine

JOINTS (QW-402)

Type: Butt joint, single vee groove, welded from both side, see next page

BASE METALS (QW-403)

Material Spec.	SA 516 to SA 516	Type or Grade	Gr. 60N to Gr. 70N
P-No.	P1 Grp.1	To P-No. P1 Grp.2	Thickness 6.32 mm (0.249 in.)
Diameter	N/A - Plate	Heat No.	44410-34383
Deposited Weld Metal (Per pass)	Did not exceed 12.7 mm (0.500 in.)		

FILLER METALS (QW-404)

	SAW
Specification No. (SFA)	SFA 5.17
Flux / Wire Classification	F7A6-EM12K (3)
F-No.	F6
A-No.	A1
Diameter	See attached sketch
Supplemental Filler Metal	Without
Flux Type	Neutral
Flux Designation	F7A6
Flux Trade Name	Lincolnweld 882
Alloy Elements	Without
Alloy Flux	Without
Recrushed Slag	Without
Deposited Weld Metal Thickness	0.249 in.

(3) The Lincoln Electric Company: Lincolnweld 882M Flux / L-61 Electrode

POSITION (QW-405)

Position of Groove: 1G
Weld Progression: N/A

PREHEAT (QW-406)

Preheat Temperature: 10°C (50°F) Interpass Temp. (Max.): 232°C (450°F)

POSTWELD HEAT TREATMENT (QW-407)

Temperature: None Time: N/A

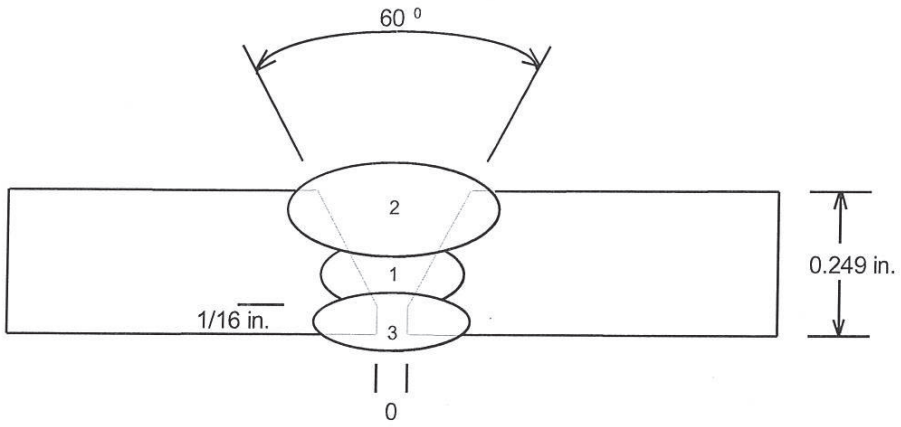
ELECTRICAL CHARACTERISTICS (QW-409)

Current: Direct Polarity: Reverse, electrode positive
Amps: See next page Volts: See next page
Maximum Heat Input: 43,400 J/in.

PQR NO. WFL-2-1 (Rev.1)

TECHNIQUE (QW-410)

Manual or Automatic	Machine
String or Weave	String
Initial & Interpass Cleaning	Not recorded
Method of Back Gouging	Not recorded
Oscillation	N/A
Contact Tube to Work Distance	Not recorded
Multiple or Single Pass Per Side	Multiple
Single or Multiple Electrodes	Single
Electrode Spacing	N/A
Peening	Not conducted
Use of Thermal Process	N/A
Travel Speed	See below



Note: Back gouged to sound metal prior depositing pass No. 3

Pass	Process	Filler Metal	Diameter mm (in.)	Current & Polarity	Amperage Range	Voltage Range	Travel Speed mm/min (ipm.)
1	SAW	F7A6-EM12K	2.4 (3/32)	DCRP	300	30	533 (21)
2	SAW	F7A6-EM12K	2.4 (3/32)	DCRP	350	30 - 32	381 (15)
3	SAW	F7A6-EM12K	2.4 (3/32)	DCRP	300	30	533 (21)

PQR NO. WFL-2-1 (Rev.1)

TENSILE TEST (QW-150)

Specimen No.	Width mm (in.)	Thickness mm (in.)	Area Sq. mm (Sq. in.)	Ultimate Load N (lbs.)	Ultimate Stress MPa (psi)	Character & Fracture Location
T1	19.0	5.62	107	59 200	554	Partial cup & cone
	(0.748)	(0.221)	(0.166)	(13,300)	(80,400)	Parent metal (SA 516 Gr. 70N)
T2	19.2	5.80	114	60 200	540	Partial cup & cone
	(0.756)	(0.228)	(0.173)	(13,500)	(78,400)	Parent metal (SA 516 Gr. 70N)

GUIDED BEND TEST (QW-160)

Type & Figure No.	Result	Type & Figure No.	Result
QW-462.3a, TFB - F1	Pass	QW-462.3a, TRB - R1	Pass
QW-462.3a, TFB - F2	Pass	QW-462.3a, TRB - R2	Pass

CHARPY IMPACT TOUGHNESS

Type of Test Charpy V-Notch Orientation Transverse
Test Temperature -48°C (-55°F) Specimen Size 10 X 5 mm

Specimen No.	Notch Location	Impact Values J (ft. lbs)
V2.1	Weld Metal	30.1 (22.2)
V2.2	within 1/16"	35.1 (25.9)
V2.3	of root	33.9 (25.0)
V3.1	Gr. 60N - HAZ	32.5 (24.0)
V3.2	Gr. 60N - HAZ	30.1 (22.2)
V3.3	Gr. 60N - HAZ	14.2 (10.5)
W3.1	Gr. 70N - HAZ	28.5 (21.0)
W3.2	Gr. 70N - HAZ	9.5 (7.0)
W3.3	Gr. 70N - HAZ	25.8 (19.0)

OTHER TESTS

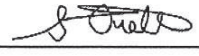
Vickers Hardness - see attached laboratory test report # C07-300.2

Welders Name Keith Breedon Certificate File No. W-17343
Tests Conducted By Ludwig & Associates Ltd.
Laboratory Test No. C07-300.2

We hereby recertify that the statements in this record have been revised in accordance with Paragraph QW-200.2 and that the test welds were prepared, welded and tested in accordance with the requirements of Section IX of the ASME Code.

Organization Storage Tank Solutions

Date January 21, 2021 Print Sebastien Ouellet

Signed 

CHARPY V-NOTCH IMPACT TEST

Customer: **Storage Tank Solutions Inc.**
9 Well Head Street
Devon, Alberta
T9G 1Z6

Laboratory Test No.: E19-104.7
Date: March 15, 2019

Attention: Sebastien Ouellet

PQR No.:	STS-2-1 (Rev.0)	**Material Heat No.:**	42963 29249-03
Material:	SA 516 Gr. 60/70	**Weld Type:**	Double Sided
Material Thickness:	6.35 mm (0.250 in.)		
Welding Process:	SAW		
Weld Thickness:	6.35 mm (0.250 in.)		
Thermal Condition:	As Welded		

Specimen Size:	*10 x 5 mm (0.394 x 0.197 in.)*	*Machine:*	*Satec SI-1K3, S/N: 1503*
Orientation:	*Transverse*	*Capacity:*	*407 J (300 ft·lbf)*
Test Temperature:	*-51 °C (-60 °F)*	*Verified Range:*	*3.4-325J (2.5-240 ft·lbf)*
Governing Spec.:	*ASME Section VIII, Div. I, UG-84 – 2017 & ASME B31.3-2016*	*Calibration Date:*	*March 19, 2018*

Specimen Number	Notch Location	Impact Values Joules	(ft·lbf)
G2.1	Weld Metal within 1.5mm (1/16") of root	15	(11)
G2.2		33	(24)
G2.3		15	(11)
G3.1	HAZ @ Middle 1/2t	43	(32)
G3.2		20	(15)
G3.3		26	(19)

Note: Metric values calculated by direct conversion.

Test Conducted By: Tong Zhao (Edmonton)

Certified By: _____
Eric Dacyk, C.E.T.

ANAB ACCREDITED ISO/IEC 17025 TESTING LABORATORY Certification # L2057.01-1

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HARDNESS TEST

Customer: **Storage Tank Solutions Inc.**
9 Well Head Street
Devon, Alberta
T9G 1Z6

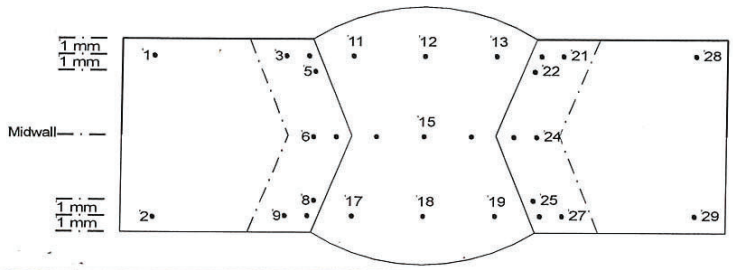
Laboratory Test No.: E19-104.7
Date: March 15, 2019

Attention: Sebastien Ouellet

PQR No.:	STS-2-1 (Rev.0)	**Material Heat No.:**	42963 29249-03
Material:	SA 516 Gr. 60/70	**Weld Type:**	Double Sided
Material Thickness:	6.35 mm (0.250 in.)		
Welding Process:	SAW		
Weld Thickness:	6.35 mm (0.250 in.)		
Thermal Condition:	As Welded		

Type of Test: *Vickers 1 0kg (HV10)*
Governing Spec.: *ASTM E92 - 17 & ANSI/NACE MR0175/ISO 15156:2015*

Instrument: *Buehler 5112*
Calibration Date: *July 27, 2018*



Parent Metal		HAZ		Weld Metal		HAZ		Parent Metal	
1	156	*3*	162	*11*	181	*20*	179	*28*	159
2	151	*4*	178	*12*	173	*21*	159	*29*	149
		5	187	*13*	182	*22*	183		
		6	177	*14*	183	*23*	195		
		7	184	*15*	180	*24*	173		
		8	182	*16*	189	*25*	199		
		9	157	*17*	184	*26*	183		
		10	189	*18*	183	*27*	159		
				19	188				

Test Conducted By: Ibrahim Mohamoud (Edmonton)

Certified By: _____
Eric Dacyk, C.E.T.

ANAB ACCREDITED ISO/IEC 17025 TESTING LABORATORY Certification # L2057.01-1

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SGS

TENSILE / BEND TEST

Customer: **Storage Tank Solutions Inc.**
9 Well Head Street
Devon, Alberta
T9G 1Z6

Laboratory Test No.: E19-104.9
Date: March 15, 2019

Attention: Sebastien Ouellet

PQR No.:	STS-2-3 (Rev.0)	**Material Heat No.:**	454840 27789-02
Material:	SA 516 Gr.60/70		
Material Thickness:	22.2 mm (0.875 in.)		
Welding Process:	SAW		
Weld Thickness:	22.2 mm (0.875 in.)		
Thermal Condition:	As Welded		

Governing Spec.: ASME Section IX - 2017

Instrument: Tinius Olsen S/N: 133660

SAMPLE NO.(QW-150)	T1		T2	
WIDTH mm (in.)	19.0	(0.750)	19.0	(0.749)
THICKNESS mm (in.)	21.2	(0.833)	21.2	(0.833)
AREA sq. mm (sq. in.)	403	(0.625)	402	(0.624)
ULTIMATE LOAD N (lbf)	212 694	(47,800)	213 054	(47,900)
ULTIMATE STRESS MPa (psi)	528	(76,500)	529	(76,800)
FRACTURE TYPE	Partial Cup & Cone		Partial Cup & Cone	
FRACTURE LOCATION	Parent Metal		Parent Metal	

Note: Imperial values calculated by direct conversion.

SAMPLE TYPE(QW-462.2)	Side Bend	Side Bend	Side Bend	Side Bend
SAMPLE NO.	S1	S2	S3	S4
RESULTS	Pass	Pass	Pass	Pass

Test Conducted By: Mohamed Botan (Edmonton)

Certified By: _____
Eric Dacyk, C.E.T.

ANAB ACCREDITED ISO/IEC 17025 TESTING LABORATORY Certification # L2057.01-1

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CHARPY V-NOTCH IMPACT TEST

Customer: **Storage Tank Solutions Inc.**
9 Well Head Street
Devon, Alberta
T9G 1Z6

Laboratory Test No.: E19-104.9
Date: March 15, 2019

Attention: Sebastien Ouellet

PQR No.:	STS-2-3 (Rev.0)	**Material Heat No.:**	454840 27789-02
Material:	SA 516 Gr.60/70		
Material Thickness:	22.2 mm (0.875 in.)		
Welding Process:	SAW		
Weld Thickness:	22.2 mm (0.875 in.)		
Thermal Condition:	As Welded		

Specimen Size:	*10 x 10 mm (0.394 x 0.394 in.)*	*Machine:*	*Satec SI-1K3, S/N: 1503*
Orientation:	*Transverse*	*Capacity:*	*407 J (300 ft·lbf)*
Test Temperature:	*-46 °C (-50 °F)*	*Verified Range:*	*3.4-325J (2.5-240 ft·lbf)*
Governing Spec.:	*ASME B31.3-2016*	*Calibration Date:*	*March 19, 2018*

Specimen Number	Notch Location	Impact Values Joules	(ft·lbf)
I2.1	Weld Metal within 1.5mm (1/16") of root	159	(117)
I2.2		125	(92)
I2.3		130	(96)
I3.1	HAZ	212	(156)
I3.2		259	(191)
I3.3		206	(152)

Note: Metric values calculated by direct conversion.

Test Conducted By: Tong Zhao (Edmonton)

Certified By: _____
Eric Dacyk, C.E.T.

ANAB ACCREDITED ISO/IEC 17025 TESTING LABORATORY Certification # L2057.01-1

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HARDNESS TEST

Customer: **Storage Tank Solutions Inc.**
9 Well Head Street
Devon, Alberta
T9G 1Z6

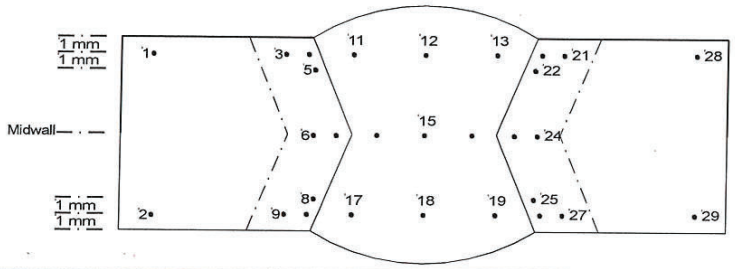
Laboratory Test No.: E19-104.9
Date: March 15, 2019

Attention: Sebastien Ouellet

PQR No.:	STS-2-3 (Rev.0)	**Material Heat No.:**	454840 27789-02
Material:	SA 516 Gr.60/70		
Material Thickness:	22.2 mm (0.875 in.)		
Welding Process:	SAW		
Weld Thickness:	22.2 mm (0.875 in.)		
Thermal Condition:	As Welded		

Type of Test: *Vickers 10 kg (HV10)*
Governing Spec.: *ASTM E92 - 17 &*
ANSI/NACE MR0175/ISO 15156:2015

Instrument: *Leco S/N1594*
Calibration Date: *July 27, 2018*



Parent Metal		HAZ		Weld Metal		HAZ		Parent Metal	
1	153	*3*	184	*11*	176	*20*	206	*28*	147
2	156	*4*	221	*12*	153	*21*	178	*29*	150
		5	225	*13*	184	*22*	215		
		6	172	*14*	175	*23*	198		
		7	183	*15*	187	*24*	173		
		8	223	*16*	184	*25*	195		
		9	186	*17*	171	*26*	199		
		10	219	*18*	178	*27*	178		
				19	155				

Test Conducted By: Tong Zhao (Edmonton)

Certified By: _____
Eric Dacyk, C.E.T.

ANAB ACCREDITED ISO/IEC 17025 TESTING LABORATORY Certification # L2057.01-1

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CHEMICAL ANALYSIS

Customer: **Storage Tank Solutions Inc.**
9 Well Head Street
Devon, Alberta
T9G 1Z6

Laboratory Test No.: E19-104.9
Date: March 15, 2019

Attention: Sebastien Ouellet

PQR No.:	STS-2-3 (Rev.0)	**Material Heat No.:**	454840 27789-02
Material:	SA 516 Gr.60/70		
Material Thickness:	22.2 mm (0.875 in.)		
Welding Process:	SAW		
Weld Thickness:	22.2 mm (0.875 in.)		
Thermal Condition:	As Welded	**Location:**	Weld Cap

Instrument: *Shimadzu PDA-7000 Optical Emission Spectrometer*
Governing Spec.: *ASTM E415-17*

	% by Weight
Carbon	0.08
Manganese	1.12
Sulphur	0.006
Phosphorus	0.009
Silicon	0.40
Chromium	0.04
Nickel	0.02
Molybdenum	0.01
Copper	0.05
Niobium	<0.01
Vanadium	0.01
Aluminum	0.02
Titanium	<0.01
Boron	<0.0004

Test Conducted By: Kamaldeep Brar (Calgary)

Certified By: _____
Eric Dacyk, C.E.T.

ANAB ACCREDITED ISO/IEC 17025 TESTING LABORATORY Certification # L2057-1

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CHARPY V-NOTCH IMPACT TEST

Customer: **Storage Tank Solutions Inc.**
9 Well Head Street
Devon, Alberta
T9G 1Z6

Laboratory Test No.: E19-00285.3
Date: June 26, 2019

Attention: Sebastien Ouellet

PQR No.:	STS-2-4 (Rev. 0)	**Material Heat No.:**	459852 56930-01
Material:	SA 516 Gr. 60/70	**Weld Type:**	Double Sided
Material Thickness:	12.7 mm (0.500 in.)		
Welding Process:	SAW		
Weld Thickness:	12.7 mm (0.500 in.)		
Thermal Condition:	As Welded		

Specimen Size:	*10 x 10 mm (0.394 x 0.394 in.)*	*Machine:*	*Satec SI-1K3,S/N: 1503*
Orientation:	*Transverse*	*Capacity:*	*407 J (300 ft·lbf)*
Test Temperature:	*-46 °C (-50 °F)*	*Verified Range:*	*3.4-325 J (2.5-240 ft·lbf)*
Governing Spec.:	*ASME B31.3 - 2016 &*	*Calibration Date:*	*March 19, 2019*
	ASME Section VIII, Div. I, UG-84 - 2017		

Specimen Number	Notch Location	Impact Values Joules	(ft·lbf)
C2.1	Weld Metal within 1.5mm (1/16") of root	38	(28)
C2.2		98	(72)
C2.3		94	(69)
C3.1	HAZ @ Middle 1/2t	98	(72)
C3.2		62	(46)
C3.3		119	(88)

Note: Metric values calculated by direct conversion.

Test Conducted By: Mohamed Botan (Edmonton)

Certified By: _____
Eric Dacyk, C.E.T.

ANAB ACCREDITED ISO/IEC 17025 TESTING LABORATORY Certification # L2057.01-1

SGS Canada Inc. | 4027 - 14 Street S.E. Calgary, AB T2G 3K6 t +1 (403) 262-7072 f +1 (403) 266-3169
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HARDNESS TEST

Customer: **Storage Tank Solutions Inc.**
9 Well Head Street
Devon, Alberta
T9G 1Z6

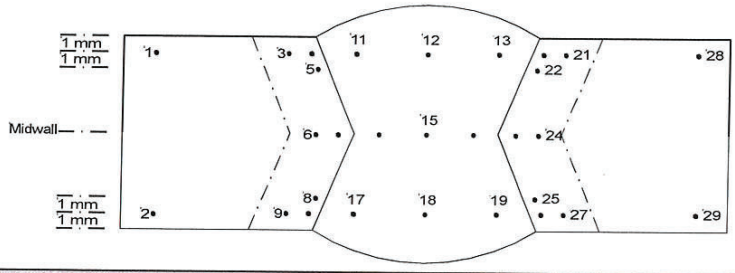
Laboratory Test No.: E19-00285.3
Date: June 27, 2019

Attention: Sebastien Ouellet

PQR No.:	STS-2-4 (Rev. 0)	**Material Heat No.:**	459852 56930-01
Material:	SA 516 Gr. 60/70	**Weld Type:**	Double Sided
Material Thickness:	12.7 mm (0.500 in.)		
Welding Process:	SAW		
Weld Thickness:	12.7 mm (0.500 in.)		
Thermal Condition:	As Welded		

Type of Test: *Vickers 10 kg (HV10)*
Governing Spec.: *ASTM E92 - 17 & ANSI/NACE MR0175/ISO 15156:2015*

Instrument: *Buehler 5112*
Calibration Date: *July 27, 2018*



Parent Metal		HAZ		Weld Metal		HAZ		Parent Metal	
1	154	3	180	11	197	20	220	28	163
2	161	4	217	12	187	21	177	29	163
		5	215	13	200	22	226		
		6	178	14	176	23	172		
		7	188	15	170	24	166		
		8	199	16	163	25	218		
		9	186	17	163	26	229		
		10	207	18	184	27	185		
				19	172				

Test Conducted By: Ibrahim Mohamoud (Edmonton)

Certified By: _____
Eric Dacyk, C.E.T.

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LUDWIG & ASSOCIATES LTD.

Materials and Welding Consulting

LABORATORY ACCREDITATION BUREAU
ISO/IEC 17025 ACCREDITED
Certificate Number L2057

LABORATORY TEST REPORT

CUSTOMER: **Woodside Fabrications Ltd.**
6124 - 39th Avenue
Camrose, Alberta
T4V 3B1

Laboratory Test No.: C07-300.2
Date: March 7, 2007

Attention: Douglas French

PQR Number:	WFL-2-1 **Process:** SAW
Material:	SA 516 Gr. 60N to SA 516 Gr. 70N (Heat No.: 44410 - 34383)
Thickness:	6.32 mm (0.249 in.)
Thermal Condition:	As Welded

TENSILE TEST QW-150

SAMPLE NUMBER	T1 QW-462.1(a)		T2 QW-462.1(a)	
WIDTH mm (in)	19.0	(0.748)	19.2	(0.756)
THICKNESS mm (in)	5.62	(0.221)	5.80	((0.228)
AREA sq mm (sq in)	107	(0.166)	114	(0.173)
ULT. LOAD N (lbs)	59 200	(13,300)	60 200	(13,500)
UTS MPa (psi)	554	(80,400)	540	(78,400)
FRACTURE TYPE	Partial Cup and Cone		Partial Cup and Cone	
FRACTURE LOCATION	Parent Metal (SA 516 Gr. 70N)		Parent Metal (SA 516 Gr. 70N)	

GUIDED-BEND TEST QW-160

SAMPLE WIDTH: 38.1 mm (1.50 in.) SAMPLE THICKNESS: 6.32 mm (0.249 in.)
PLUNGER SIZE: 25.1 mm (0.990 in.) YOKE SIZE: 41.1 mm (1.62 in.)

QW-462.3(a)	Root Bend	Root Bend	Face Bend	Face Bend
SAMPLE NUMBER(S)	R1	R2	F1	F2
RESULTS	Pass	Pass	Pass	Pass

We certify the test results in this report and that the specimen(s) were prepared and tested in accordance with the requirements of ASME Section IX, 2004 *edition and latest addenda. The information regarding material identification (i.e. size, thickness, heat number, etc.) has been provided by the customer whose name appears on this report.* ***Samples associated with this report will be discarded in 45 days.***

Laboratory Test Conducted By: _____
Stephanie Liu / Steve Rieberger, C.E.T.

4027 - 14 Street, S.E., CALGARY, ALBERTA T2G 3K6 PHONE: (403) 262-7072 FAX: (403) 266-3169
7925 Davies Road, EDMONTON, ALBERTA T6E 4N1 PHONE: (780) 468-3030 FAX: (780) 468-3032