ARGO SALES LTD

HUSKY ENERGY

One (1) 16 Cu. M. (100BBL)
2896 DIA (9’-6”) x 2438 HIGH (8’-0”)
Base Skidded Storage Tank

Serial # 13663
PO# 8400899432

Quality Control Data Manual
2015

Serial #: 13663
Tag # T-100

Table of Contents

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NAMEPLATE DATA

ARGO SALES LTD

655-30 Avenue
Nisku AB
Canada
T9E 0R4
(780)-955-8660

API 12F MODIFIED

SERIAL NUMBER:	13663	CUSTOMER TAG #	T-100
YEAR BUILT:	2015	DESIGN PRESSURE	160Z
NOMINAL DIAMETER:	9 FT-6 IN	NOMINAL HEIGHT	8 FT
NOMINAL CAPACITY:	100 BBL	SHIPPING WEIGHT	5880 LBS

	THICKNESS	MATERIAL
ROOF	3/16 IN (4.8mm)	A36
FLOOR	1/4 IN (6.4mm)	A36
SHELL	3/16 in (4.8mm)	A36

INTERNAL FINISH

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Quality Control

Husky Energy — Non Pressure Storage

Husky Purchase Order No. P.O. 8400899432

Data Collected By: Ryan Rirao **Entry Date:** 24-Mar-15

P&ID # :

Equipment Class ❑ Bin ❑ Gas Boot ❑ Pond ❑ Silo ❑ Sump ☒ Tank

Parent Equip # :

Equipment Description: 100BBL skidded tank **Exist. Equip. ID :** 13663 Tag No.: T-100

Unit Yard ea Acquis Value $ **$13,115.00** Acquis Date 2015

Equipment Status: ❑ In-Service Fully Utilized ❑ In Service Under-utilized ❑ Idle ❑ Scrap ❑ Field Idle

Ownership Status: ❑ Leased ❑ Rented ☒ Owned

Manufacturer: Argo Sales **Year Built:** 2015

Equipment Condition: new **Model No.:** 100 BBL **Serial No.:** 13663

Construction: ☒ Skidded ❑ Packaged ❑ Housed ❑ Packaged Portable ❑ Packaged Stationary

Skid Weight: 153/338 Kg / Lbs Skid Size: W 96" x L 126" x H 6" m / ft

Common Characteristics

Fluid Description:		**Service:** ☒ Sweet ❑ Sour		**Volume:**	16 m3 m3 / ft3
MAWP:	16 oz. kPag / psig / oz	**@ Max. Temp:**	80 C °C / °F	MDMT:	-29C °C / °F
Diameter:	2896/ 114 mm /in	**Length/Height (S/S):**	2.438/ 8 m / ft	Depth:	2.438/ 8 m / ft
Shell Mat'l:	A36	**Shell Thickness:**	4.8/ 3/16" mm / in	Shell C.A.:	*0* mm / in
Floor Mat'l:	A36	**Floor Thickness:**	6.4/ 1/4" mm / in	Floor C.A.:	*0* mm / in
Roof Mat'l:	A36	**Roof Thickness:**	4.8/ 3/16" mm / in	Roof C.A.:	*0* mm / in
Nozzle Mat'l:	A105/A106	Nozzle Thickness:	Sch. 40 mm / in	Nozzle Rating:	*150* Ansi
Insulated:	❑ Yes ☒ No	Insulation Type	None	Insulation Thick.:	NIL mm / in
# Manways:	1	**# of Inspection Ports:**		**Painted / Primed:**	☒ Yes ❑ No

Secondary Containment Type: ❑ Earthen Clay ❑ Imperious Synthetic Material ❑ Double Wall ☒ Other

Internals:

Component Types:	N/A	Component Man.	N/A	Component Model:	N/A
Component Romovable:	❑ Yes ❑ No			Component C.A.:	N/A mm / in
Internal Coating:	❑ Yes ☒ No	Int. Coating / Cladding Type:	NIL		

Additional Characteristics for Tank

Tank Type: ❑ Underground ☒ Surface **# Of Walls:** ☒ single ❑ Double

Design Standard: ❑ API 650 ❑ API 620 ☒ API 12F ☒ Other Mod.

Fabrication Type: ☒ Shop ❑ Field

Pressure Protection: ☒ Vent ☒ Thief Hatch ❑ Vacuum Breaker

Vacuum Breaker Manufacturer: N/A

Vacuum Breaker Model: N/A

Fire Tubes Exists: ❑ Yes ☒ No

Vacuum Breaker Service Date: N/A

# of Firetube:	N/A	Firetube S/N:	N/A	Firetube Rating:	N/A Btu/hr
Desand Type:	**N/A**	Desand Connection:	N/A mm / in	Truck Connection:	N/A mm / in
Enviro Vault:	☒ Yes ❑ No	Burner Manufacturer:	N/A		
Sacrificial Anodes:	❑ Yes ☒ No	# of Sacrificial Anodes:			

Additional Characteristics for Gas Boot

Prov.Reg. No.: CRN#

Head Mat'l: **Head Thickness:** mm / in Head C.A.: mm / in

Additional Characteristics for Pond, Silo

Volume: m^3 Liner : ❑ Yes ❑ No Liner Material:

Fluid Description: **Service:** ❑ Sweet ❑ Sour

Diameter: m Depth: mm

Design Min Temp: °C Design Max Temp: °C

Capacity: tonne

Comments

Material Transfer Information

Transfer Recorded by: **Date**

From **LSD** **Sec** **Twp** **Rge** **W/**

Transfer Yard

To **LSD** **Sec** **Twp** **Rge** **W/**

Facility **Receiving AFE:**

ARGO SALES LTD

EXAMINATION & INSPECTION REPORT (TANKS)

Serial #: _____ Tag #: _____ Customer: _____
Description: _____
Size: _____ Drawing Number: _____
P.O. #: _____ LSD: _____ Quote#: _____

Signature of Approval: _____

	Sequence of Operation	Inspection & Test Requirements	Customer Requirements	Accept. Criteria	Hold, Witness & Review Points	
					Customer Hold Points & Insp. Signature (MM/DD/YY)	Argo Sales Ltd. Q.C. Dates & Signature (MM/DD/YY)
1.	Drawings Approved			Client		
2.	Welding Procedures Approved	R/H		Client / CWB ASME SEC IX		
3.	Welders Qualified	R		ASME SEC IX W47.1		
4.	Materials Checked	II / VC		Drawing		
5.	External Dimensional (Layout)	DC		Drawing		
6.	Nozzle Fit-up & Orientation	VI / DC		Drawing		

FOCUS VENDOR DRAWING REVIEW

- ☐ A. Approved. Manufacturing may proceed without changes. Submit Certified As Built Drawing
- ☐ B. Reviewed with comments. Resubmit. Manufacturing may proceed subject to incorporating the changes.
- ☐ C. Reviewed with comments. Resubmit. Proceed with material order only.
- ☐ D. Reviewed with comments. Resubmit DO NOT proceed with manufacturing or material order.
- ☐ E. Information/Certified/As-Built
- ☑ F. Fix. Don't resubmit.

Permission to proceed does not constitute acceptance or approval of design details, calcs analysis, test methods or material developed or selected by the supplier and does not relieve the supplier from compliance with the contract or the purchase order requirements.

DATE Dec. 16 2014 SIGNED _____

II: Incoming Inspection
VC: Verify Color Coding or Marking
DC: Dimensional Check
VI: Visual Inspection
VT: Vacuum Test
AT: Air Test
CI: Cleaning Inspection
SI: Inspection Prior to Shipping
FI: Final Inspection
TR: Test Report
BR: Blast Report
CR: Coating Report
H: Hold – 3rd Party
R: Review – 3rd Party

Argo Sales Q.C.M./Q.C.I. to verify, inspect and/or witness all sequence of operations indicated on this report.

ARGO SALES LTD

EXAMINATION & INSPECTION REPORT (TANKS)

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7.	Platform/Ladder Fit-up & Welding	VI / DC		Drawing		
8.	MPI Floor to Shell Joint	API-650 ASME SEC.V	Inner fillet weld to be inspected prior to performing outer fillet weld.	Drawing ASME Sec VIII		
9.	Radiography	API-650	Spot Radiography	ASME SEC VIII		
10.	Repad Air/Soap Leak Test	AT / VI / TR	Test at 15 PSI	Drawing		
11.	Floor Vacuum Box Test	VT / VI / TR	Test at 3-5 PSI Vacuum	Drawing		
12.	Tank & Repad Air/Soap Leak Test	AT / VI / TR	Test to .75 PSI	Drawing		

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	Sequence of Operation	Inspection & Test Requirements	Customer Requirements	Accept. Criteria	Hold, Witness & Review Points	
					Customer Hold Points & Insp. Signature (MM/DD/YY)	Argo Sales Ltd. Q.C. Dates & Signature (MM/DD/YY)
13.	Sand Blast Inspection(Internal)	VI / BR		Drawing		
14.	Sand Blast Inspection (External)	VI / BR		Drawing		
15.	Internal Coating	CI / VI / CR		Drawing		
16.	Holiday Test (Internal)	VI / CR	Internal coating to be 100% holiday free	Drawing		

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Serial #: _____ Tag #: _____ Customer: _____
Description: _____
Size: _____ Drawing Number: _____
P.O. #: _____ LSD: _____ Quote#: _____

	Sequence of Operation	Inspection & Test Requirements	Customer Requirements	Accept. Criteria	Hold, Witness & Review Points	
					Customer Hold Points & Insp. Signature (MM/DD/YY)	Argo Sales Ltd. Q.C. Dates & Signature (MM/DD/YY)
17.	External Finish	VI / FI / CR		Drawing		
18.	External Finish (Accessories)	VI / FI / CR		Drawing		
19.	Final Inspection for Shipping	VI / SI / FI H	Ship Loose:	Drawing		

Signature of Q.C.M./Q.C.I. _____

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Argo Sales Q.C.M./Q.C.I. to verify, inspect and/or witness all sequence of operations indicated on this report.

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ARGO SALES LTD

EXAMINATION & INSPECTION REPORT (TANKS)

Serial #: 13663 Tag #: T-100 Customer: HUSKY
Description: 100 BBL (64 CU. M.) BASE SKIDDED STORAGE TANK
Size: 9'-6" (2896) Dia. X 8'-0" (2438) High Drawing Number: B-13663-65_OR
P.O. #: 8400899432 LSD: Quote TQ14-1168

Signature of Approval:

	Sequence of Operation	Inspection & Test Requirements	Customer Requirements / Comments	Accept. Criteria	Hold, Review, Verify & Witness Points	
					Customer Hold Points & Insp. Signature (MM/DD/YY)	Argo Sales Ltd. Q.C. Dates & Signature (MM/DD/YY)
1.	Clients approval of ITP			Client		12.02.2014
2.	Drawings Approved		IFC Drawings	Client		12.02.2014
3.	Welding Procedures Approved		WPS/PQRS/WPDS	Client / CWB ASME SEC IX API 650 Sect 9		12.02.2014
4.	Welders Qualified			ASME SEC IX W47.1 API 650 Sect 9		12.02.2014
5.	Materials Checked	II / VC	Material Test Reports	Drawing API 650 Sect 4		01.21.2015
6.	Int./Ext. Dimensional (Layout & Fit-up)	DC / VI		Drawing		01.21.2015
7.	Nozzle Material, Rating, Fit-up & Orientation	VI / DC		Drawing		01.21.2015
8.	Ladder/Skid Fit-up & Welding	VI / DC	Ladder trial fit and all welding of clips completed & checked prior to tank air test.	Drawing		01.21.2015

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Argo Sales Q.C.M. / Q.C.I. to verify, inspect and/or witness all sequence of operations indicated on this report.

ARGO SALES LTD

EXAMINATION & INSPECTION REPORT (TANKS)

Serial #: 13663 Tag #: T-100 Customer: HUSKY
Description: 100 BBL (64 CU. M.) BASE SKIDDED STORAGE TANK
Size: 9'-6" (2896) Dia. X 8'-0" (2438) High Drawing Number: B-13663-65 OR
P.O. #: 8400899432 LSD: Quote TQ14-1168

	Sequence of Operation	Inspection & Test Requirements	Customer Requirements / Comments	Accept. Criteria	Hold, Review, Verify & Witness Points	
					Customer Hold Points & Insp. Signature (MM/DD/YY)	Argo Sales Ltd. Q.C. Dates & Signature (MM/DD/YY)
9.	Final Int./Ext. Welding Inspection	VI		Drawing		BL 01.21.2015
10.	MPI Floor to Shell Joint	API-650 / TR ASME SEC.V	Inner fillet weld to be inspected prior to performing outer fillet weld.	Drawing ASME Sec VIII	**N/A**	**N/A**
11.	Radiography	API-650 / TR	Spot Radiography	ASME SEC VIII	**N/A**	**N/A**
12.	Repad Air/Soap Leak Test	AT / VI / TR	Test at 15 PSI	Drawing	**N/A**	**N/A**
13.	Floor Vacuum Box Test	VT / VI / TR	Test at 3-5 PSI Vacuum	Drawing	**N/A**	**N/A**
14.	Tank & Repads Air/Soap Leak Test.	AT / VI / TR	Test to 1.5 PSI	Drawing		MK 01.21.2015
15.	Sand Blast Inspection (Int.)	VI / BR		Drawing SSPC-VIS 1	**N/A**	**N/A**
16.	Sand Blast Inspection (Ext.)	VI / BR	**SSPC-SP7 Brush Blast:** Shell, Roof, Ladder & Skid.	Drawing SSPC-VIS 1		GT 01.22.2015

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ARGO SALES LTD

EXAMINATION & INSPECTION REPORT (TANKS)

Serial #: 13663 Tag #: T-100 Customer: HUSKY
Description: 100 BBL (64 CU. M.) BASE SKIDDED STORAGE TANK
Size: 9'-6" (2896) Dia. X 8'-0" (2438) High Drawing Number: B-13663-65 OR
P.O. #: 8400899432 LSD: Quote TQ14-1168

	Sequence of Operation	Inspection & Test Requirements	Customer Requirements / Comments	Accept. Criteria	Hold, Review, Verify & Witness Points	
					Customer Hold Points & Insp. Signature (MM/DD/YY)	Argo Sales Ltd. Q.C. Dates & Signature (MM/DD/YY)
17.	Internal Coating	CI / VI / CR		Drawing SSPC-PA2	**N/A**	**N/A**
18.	Holiday Test (Internal)	VI / CR	Internal coating to be 100% holiday free	Drawing NACE RP0188	**N/A**	**N/A**
19.	External Finish	VI / FI / CR	**Shell & Roof:** Argo Grey.	Drawing		(BM) 01.24.2015
20.	External Finish (Accessories)	VI / FI / CR	**Ladder & Skid:** Argo Grey.	Drawing		(BM) 01.24.2015
21.	Final Inspection for Shipping	VI / SI / FI / CI	**Tank Name Plate:** Installed & Verified stamping. **Cleaning:** Tank cleaned out, all openings blanked off and tank is ready for shipping.	Drawing		(TA) 02.02.2015
22.	Ship Loose	VI / SI / FI	(1)6" Gooseneck c/w Gasket & Bolt-ups.	Drawing		02.02.2015
23.	NCRS		All NCRs to be finalized and closed.			(NONE INITIATED) 02.02.2015

Signature of Q.C.M./Q.C.I. _____

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Argo Sales Q.C.M. / Q.C.I. to verify, inspect and/or witness all sequence of operations indicated on this report.

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PNEUMATIC TEST REPORT

Date: Jan. 21/15

Job #: 13663 Tag #: T-100

Customer: HUSKY

Description of Product: 100 BBL (64 CU. M.) SW BASE SKIDDED STORAGE TANK

Size: 9'-6" (2896) OD x 8'-0" (2438) HIGH Test Pressure: 1.5 PSI

Test Conducted By: M. Klatt & M. Saunders

Holding Time at Test Pressure: TEST DURATION

Comments: Air/Soap leak test of all seams, floor, shell, roof, manway, all fitting welds and all attachment welds associated with a single wall storage tank.

Results: Eight (8) leaks were found. Leaks were repaired & retested.
No leaks were observed. Air test found acceptable.
U-Type Manometer used to monitor the air test.

(Customer Inspector – please print)	Mike Klatt (Argo Sales Q.C.M. / Q.C.I. – Please Print)
(Signature of Customer Inspector)	M. Klatt (Argo Sales Q.C.M. / Q.C.I. - Signature)

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Surface Preparation & Inspection Report / By GT SANDBLASTING LTD.

Start Date: Jan 22/15		**Start Time:** 6:00 am	**Foreman:** (please print) Guy Tremblay
Work Order #: 13663	**Tag #** T-100		**Serial #:** 13663-64-65
Fabricator: ARGO SALES Ltd.		**Customer:** Husky	**Hold Point:** (Yes) No
Ambient Temp(C°):	**Rel. Humidity (%):**		**Dew Point (C°):**
(Blast Equipment Air Supply): Source: Kaeser	**Internal Blast SSPC#:**		**Internal Replica Tape:** Place Tape Here
Size: (2) 1500 CFM	**Internal Blasting Profile:**		
Nozzle Size: 6 7 (8) other ____	**External Blast SSPC#:**	7	**External Replica Tape:** non-applicable if SP7
Nozzle Pressure (PSI): 90 100 105 (110) 120 other ____	**External Blasting Profile:**		
Product Description & Accessories: 3 X 100 BBL w/ skid vents			
Measurement Equipment: Hypodermic Needle Gauge ☐		Line Pressure Gauge ☑	**Air Dryer:** (Yes) No
Completion Date: Jan 22/15		**Completion Time:** 11:00 AM	**Blaster(s):** (please print) Justin Tremblay, Kyle Mackowsky
Ambient Temp(C°)	**Rel. Humidity (%):**		**Dew Point (C°):**
Abrasive Used: S170	**Final Acceptance:** Guy Tremblay		**Signature:**

ARGO SALES LTD

Paint & Coating Report

Date:	JAN 23/15	**Serial #:**	B6663	**Tag #:**	T-100
Customer:	HUSKY				
Description:	100 BBL				
Surface Preparation:	**Internal:**		**External:**	SP-7	

Application Equipment							
Application Method:	AIRLESS	**Pump Size:**	60-1	**Tip Size:**	519	**Inline Heater Temp:**	

Internal Coating							
1st Coat:		**Batch# Base:**		**Batch # Catalyst:**		**Color:**	
2nd Coat:		**Batch# Base:**		**Batch # Catalyst:**		**Color:**	
3rd Coat:		**Batch# Base:**		**Batch # Catalyst:**		**Color:**	
4th Coat:		**Batch# Base:**		**Batch # Catalyst:**		**Color:**	

Internal Coating Conditions										
1st Coat:	**Ambient Temp:**	°F	**Substrate Temp:**	°F	**R.H.**	%	**D.P.**	°F	**Date:**	
2nd Coat:	**Ambient Temp:**	°F	**Substrate Temp:**	°F	**R.H.**	%	**D.P.**	°F	**Date:**	
3rd Coat:	**Ambient Temp:**	°F	**Substrate Temp:**	°F	**R.H.**	%	**D.P.**	°F	**Date:**	
4th Coat:	**Ambient Temp:**	°F	**Substrate Temp:**	°F	**R.H.**	%	**D.P.**	°F	**Date:**	

ARGO SALES LTD

Paint & Coating Report

External Coating								Serial #: 13663
1st Coat:	CLOVERDALE T-101	Batch# Base:	C14J5892	Batch # Catalyst:		Color:	GRAY	
2nd Coat:	CLOVERDALE 74001	Batch# Base:	S14G9512	Batch # Catalyst:		Color:	ARGO GRAY.	
3rd Coat:		Batch# Base:		Batch # Catalyst:		Color:		
4th Coat		Batch# Base:		Batch # Catalyst:		Color:		

External Coating Conditions											
1st Coat:	Ambient Temp:	70 °F	Substrate Temp:	70 °F	R.H.	30 %	D.P.	36 °F	Date:	JAN 23/15	
2nd Coat:	Ambient Temp:	70 °F	Substrate Temp:	70 °F	R.H.	30 %	D.P.	36 °F	Date:	JAN 23/15	
3rd Coat:	Ambient Temp:	°F	Substrate Temp:	°F	R.H.	%	D.P.	°F	Date:		
4th Coat:	Ambient Temp:	°F	Substrate Temp:	°F	R.H.	%	D.P.	°F	Date:		

Internal Inspection & Testing									
1st Coat:	Min:		Max:		Avg:		Nozzles		Comments	
2nd Coat:	Min:		Max:		Avg:		Nozzles		Comments	
3rd Coat:	Min:		Max:		Avg:		Nozzles		Comments	
4th Coat:	Min:		Max:		Avg:		Nozzles		Comments	

Holiday Testing							
Test standard:		Tested By:		Date:		Area Tested	
Discon. & Loc'n Comments:							

ARGO SALES LTD

Paint & Coating Report

Internal Repair Coating								Serial #: 13663
1st Repair:		Batch# Base:		Batch # Catalyst:		Color:		
2nd Repair:		Batch# Base:		Batch # Catalyst:		Color:		
3rd Repair:		Batch# Base:		Batch # Catalyst:		Color:		

Internal Coating Conditions										
1st Repair:	Ambient Temp:	°F	Substrate Temp:	°F	R.H.	%	D.P.	°F	Date:	
2nd Repair:	Ambient Temp:	°F	Substrate Temp:	°F	R.H.	%	D.P.	°F	Date:	
3rd Repair:	Ambient Temp:	°F	Substrate Temp:	°F	R.H.	%	D.P.	°F	Date:	

Cure History											
Temp. Range:	°F	From:		to		Total Hrs:		Ambient Air:		Forced Cured:	

Final Acceptance				
Visual By:	Bob Marsik		Date:	JAN 24/15
	(Please Print)	(Signature)		

ARGO SALES LTD

Final Fit Out Traveler

Customer:	HUSKY				
Job #:	13663	Tag #:	T-100	Tank Size:	100 BBL.

Internal:	Initials
Check for Down Comer(s)/Riser(s) are correct length(s)	TC
Check all internals/lengths, gasket(s), bolt(s), stud(s) as per drawing	TC
Check internals for Teflon/nylon washers on coated flanges	N/A
Visual inspection for cleanliness prior to installing manway cover	TC
Final holiday test completed	N/A
External:	
Manway bolted on complete ✓ 6 bolt _____	JC
All openings blanked off (caulk weep holes if applicable)	JC
Blind flange(s) are coated as per drawing, and installed as per drawing	N/A
Check gauge system & decals	JC
Paint/insulation check for damages/misses	JC
Record Heater Serial Number:	N/A
Heater Piping & Tubing Leak Tested:	N/A
Heater Electrical Tested:	N/A
Correct nameplate installed	TC
Accessories:	
Accessories accounted for & coated.	JC

Platforms	[N/A]	Safety Gates	[N/A]	Grating Installed	[N/A]
Ladders	[TC]	Fall Arrest	[N/A]	Brackets	[N/A]

Final Dressout Complete **Date:** Feb 02/2015

Print Name TREVOR ANDERSON (Signature) TC

ARGO
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WELDERS' QUALIFICATIONS

GRB ENTERPRISES LTD. 9712 - 54 Ave. EDMONTON ALBERTA T6E 0A9 2" sch xxh

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

Welder's Name: **Randal Gagnier** ABSA File No.: W- **09208** Stamp No.: "X"

Identification of WPS followed by welder during welding of test coupon: ASL-1-AW (rev 0) W.P. Reg. # WP- **983.2**

Base material(s) welded: **SA 106 GR B** Thickness: **0.436"** ☒ Test Coupon ☐ Prod. Weld

Testing Variables and Qualification Limits

Welding Variables (QW-350)	**Actual Values**		**Range Qualified**	
Welding Process(es) Used:	SMAW	SMAW	SMAW	SMAW
Type of Welding (manual, semi-automatic) Used:	Manual	Manual	Manual	Manual
Base Metal P Number to P Number:	P1	P1	P1	P1
Plate ☐ Pipe ☒ enter diameter:	NPS 2	NPS 2	1" OD Min.	1" OD Min.
Backing (metal, weld metal, double weld etc.):	None / Weld	Weld Metal	Without / With	With
Filler Metal or Electrode Specification(s) SFA#:	5.1	5.1		
Filler Metal or Electrode Classification(s):	E6010	E7018-1		
Filler Metal or Electrode F - number(s):	F3	F4	F3	F4
Filler Type (solid metal, or flux cored/powder) GTAW or PAW:	N/A	N/A	N/A	N/A
Consumable Insert for GTAW or PAW:	N/A	N/A	N/A	N/A
Deposit Thickness for each process, electrode type, etc. (in.):	0.094"	0.342"	0.188"	0.684"
Process/Electrode 1: 3 layers minimum Yes ☐ No ☒	Process/Electrode 2: 3 layers minimum Yes ☐ No ☒			
Welding position (2G, 5G, 6G, 3F, etc.):	6G	6G	All	All
Progression (Uphill or Downhill):	Uphill	Uphill	Uphill	Uphill
Inert Gas backing for GTAW, PAW, GMAW:	N/A	N/A	N/A	N/A
Transfer Mode (spray/globular or pulse to short circuit):	N/A	N/A	N/A	N/A
GTAW Current Type/ Polarity (AC, DCEP, DCEN):	DCEP	DCEP	DCEP	DCEP

Results

Visual Examination of Fit-Up Root Gap: **3/32"** Tack Welds: **Bridge** Length: **0.5"** Number: **3**

Root Pass (Describe Discontinuity if Unacceptable): **OK**

Complete Weld (Describe Defects if Unacceptable): **OK**

Bend Test

☒ Transverse Root and Face QW-462.3a ☐ Longitudinal Root and Face QW-462.3b

☐ Pipe Bend Specimen, corrosion-resistant overlay QW-462.5c ☐ Plate Bend Specimen, corrosion-resistant overlay QW-462.5d

☐ Side Bend QW-462.2 ☐ Macro Test for Fusion QW-462.5b ☐ Macro Test for Fusion QW-462.5e

Bend Type	Result	Bend Type	Result	Bend Type	Result	Bend Type	Result
# 1 Root	Pass	# 3 Root	Pass				
# 2 Face	Pass	# 4 Face	Pass				

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

Radiographic Results: **N/A**

Fillet Weld-Fracture Test (QW-180): **N/A** Length and Percent of Defects: **N/A**

Macro Examination (QW-184): **N/A** Fillet Legs Size (in.): **N/A** X **N/A** Concavity/Convexity (in.): **N/A**

Other Tests: **N/A**

Record Information

Film or Specimens Evaluated by: **G.R.Bellehumeur** Company: **GRB Enterprises Ltd.**

Welding Test Conducted by: **G.R.Bellehumeur**

Mechanical Tests Conducted by: **GRB Enterprises Ltd.** Laboratory Test no.: **N/A**

Welding Supervised by: **Argo Sales Ltd. Representative: Rob Irvine**

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

Accredited Organization: GRB ENTERPRISES LTD. AOQP No: 7107(C) Expiry Date: **May 21 2015**

Certified by: **Bruce Cormier** W.E.File: **E-00252** Date: **February 19, 2013**

PQ Card No. (When Issued): **18683** Performance Test Reference No.: **13-02-19-01**

Test Coupon ID No.: **Welder Name** Date Coupon is Retained To: **N/A**

GRB Enterprises Ltd
Edmonton Alberta

AOQP 7107(C)

WELDER PERFORMANCE QUALIFICATION CARD

RANDAL
Name GAGNIER W- 09208
Name ABSA File Number

This card is issued pursuant to the Safety Codes Act and the Pressure Welders Regulation. The performance qualification is in accordance with Section IX of the ASME BPV Code and subject to the limitations on the reverse side.

FEB 19. 2013 _____
Date of Test Welder Signature

BRUCE CORMIER 18683
Welding Examiner (Print/Type) GRB Card No.

Performance Qualification GRB Card No. 18683

Process(es)	SMAW	Materials (P.No.)	P1
Filler Metal (F.No)	F3 F4	Min. Outside Pipe Diameter	1" OD
Max Deposited Weld Metal	0.188" 0.684"	Position(s) Qualified	ALL
Backing	WITHOUT WITH WITH	Backing Gas	NONE
Progression	UPHILL		#E00252 Examiner File No.

FEB 19. 2015 _____
P.Q. Expiry Date Welding Examiner Signature

GRB ENTERPRISES LTD. 9712 - 54 Ave. EDMONTON ALBERTA T6E 0A9 **2" sch xxh**

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

Welder's Name: **Randal Gagnier** ABSA File No.: W- **09208** Stamp No.: "X"

Identification of WPS followed by welder during welding of test coupon: **ASL-8 (rev 0)** W.P. Reg. # WP- **983.2**

Base material(s) welded: **SA 106 GR B** Thickness: **0.436"** ☒ Test Coupon ☐ Prod. Weld

Testing Variables and Qualification Limits

Welding Variables (QW-350)	**Actual Values**		**Range Qualified**	
Welding Process(es) Used:	GMAW	SMAW	GMAW	SMAW
Type of Welding (manual, semi-automatic) Used:	Semi-Automatic	Manual	Semi-Automatic	Manual
Base Metal P Number to P Number:	P1	P1	P1	P1
Plate ☐ Pipe ☒ enter diameter:	NPS 2	NPS 2	1" OD Min.	1" OD Min.
Backing (metal, weld metal, double weld etc.):	None / Weld	Weld Metal	Without / With	With
Filler Metal or Electrode Specification(s) SFA#:	5.18	5.1		
Filler Metal or Electrode Classification(s):	ER70S-6	E7018-1		
Filler Metal or Electrode F - number(s):	F6	F4	F6	F4
Filler Type (solid metal, or flux cored/powder) GTAW or PAW:	Solid	N/A	Solid	N/A
Consumable Insert for GTAW or PAW:	N/A	N/A	N/A	N/A
Deposit Thickness for each process, electrode type, etc. (in.):	0.125"	0.311"	0.1375"	0.622"
Process/Electrode 1: 3 layers minimum Yes ☐ No ☒	Process/Electrode 2: 3 layers minimum Yes ☐ No ☒			
Welding position (2G, 5G, 6G, 3F, etc.):	SP	1G	Flat/SP	Flat
Progression (Uphill or Downhill):	N/A	N/A	N/A	N/A
Inert Gas backing for GTAW, PAW, GMAW:	N/A	N/A	N/A	N/A
Transfer Mode (spray/globular or pulse to short circuit):	Short Circuit	N/A	Short Circuit	N/A
GTAW Current Type/ Polarity (AC, DCEP, DCEN):	DCEP	DCEP	DCEP	DCEP

Results

Visual Examination of Fit-Up Root Gap: **5/32"** Tack Welds: **Bridge** Length: **0.5"** Number: **3**

Root Pass (Describe Discontinuity if Unacceptable): **OK**

Complete Weld (Describe Defects if Unacceptable): **OK**

Bend Test

☒ Transverse Root and Face QW-462.3a ☐ Longitudinal Root and Face QW-462.3b

☐ Pipe Bend Specimen, corrosion-resistant overlay QW-462.5c ☐ Plate Bend Specimen, corrosion-resistant overlay QW-462.5d

☐ Side Bend QW-462.2 ☐ Macro Test for Fusion QW-462.5b ☐ Macro Test for Fusion QW-462.5e

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

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

Radiographic Results: **N/A**

Fillet Weld-Fracture Test (QW-180): **N/A** Length and Percent of Defects: **N/A**

Macro Examination (QW-184): **N/A** Fillet Legs Size (in.): **N/A** X **N/A** Concavity/Convexity (in.): **N/A**

Other Tests: **Special Position: 30 degrees from top dead center**

Record Information

Film or Specimens Evaluated by: **Bruce Cormier** Company: **GRB Enterprises Ltd.**

Welding Test Conducted by: **Bruce Cormier**

Mechanical Tests Conducted by: **GRB Enterprises Ltd.** Laboratory Test no.: **N/A**

Welding Supervised by: **Argo Sales Ltd. Representative: Rob Irvine**

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

Accredited Organization: GRB ENTERPRISES LTD. AOQP No: 7107(C) Expiry Date: **May 21 2015**

Certified by: **Bruce Cormier** W.E.File: **E-00252** Date: **May 07, 2012**

PQ Card No. (When Issued): **17753** Performance Test Reference No.: **12-05-07-03**

Test Coupon ID No.: **Welder Name** Date Coupon is Retained To: **N/A**

GRB Enterprises Ltd
Edmonton Alberta

AOQP 7107(C)

WELDER PERFORMANCE QUALIFICATION CARD

RANDAL
Name
GAGNIER
Name

W-09208
ABSA File Number

This card is issued pursuant to the Safety Codes Act and the Pressure Welders Regulation. The performance qualification is in accordance with Section IX of the ASME BPV Code and subject to the limitations on the reverse side.

MAY 7. 2012
Date of Test

Welder Signature

BRUCE CORMIER
Welding Examiner (Print/Type)

17753
GRB Card No.

Performance Qualification GRB Card No. 17753

Process(es)	GMAW	SMAW	
Filler Metal (F.No)	F6	F4	
Max Deposited Weld Metal	0.1375"	0.622"	
Backing	WITHOUT- WITH	WITH	
Progression	N/A	N/A	

Materials (P.No.) P1

Min. Outside Pipe Diameter 1" OD

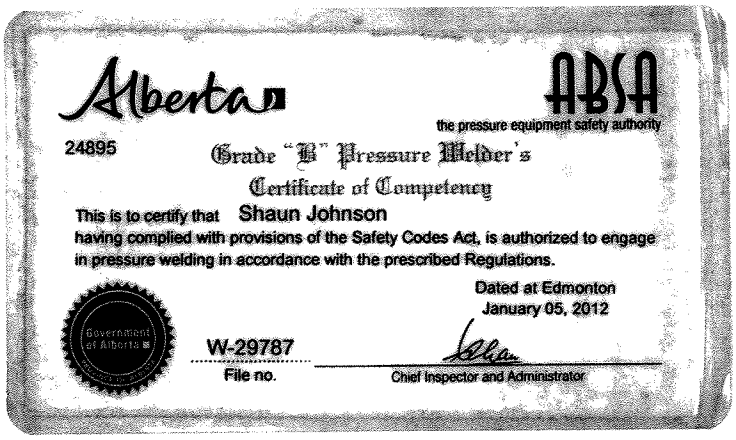
Position(s) Qualified F6: SP/F
F4: FLAT

Backing Gas NONE

#E00 252
Examiner File No.

MAY 7. 2014
P.Q. Expiry Date

Welding Examiner Signature



Alberta

ABSA
the pressure equipment safety authority

24895

Grade "B" Pressure Welder's
Certificate of Competency

This is to certify that **Shaun Johnson**
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
January 05, 2012

Government of Alberta

W-29787
File no.

Chief Inspector and Administrator

STAMP "S"

GRB Enterprises Ltd
Edmonton Alberta

AOQP 7107(C)

WELDER PERFORMANCE QUALIFICATION CARD

Shaun Johnson — Name

W-29787 — ABSA File Number

This card is issued pursuant to the Safety Codes Act and the Pressure Welders Regulation. The performance qualification is in accordance with Section IX of the ASME BPV Code and subject to the limitations on the reverse side.

23 Oct 2014 — Date of Test

Steve Jones — Welding Examiner (Print/Type)

Welder Signature

21300 — GRB Card No.

Performance Qualification GRB Card No. 21300

Process(es)	SMAW SMAW	Materials (P.No.)	P1 to P1 & P5F
Filler Metal (F.No)	F3 F4	Min. Outside Pipe Diameter	1" OD
Max Deposited Weld Metal	188" 500"	Position(s) Qualified	ALL
Backing	Without/with with	Backing Gas	N/A
Progression	Uphill Uphill	#E00 339 Examiner File No.	

23 Oct 2016 — P.Q. Expiry Date

Welding Examiner Signature

GRB ENTERPRISES LTD. 9712 - 54 Ave. EDMONTON ALBERTA T6E 0A9 2" sch 160

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

Welder's Name: **Shaun Johnson** ABSA File No.: W-**29787** Stamp No.: **S**

Identification of WPS followed by welder during welding of test coupon: **GRB-01 (rev 5)** W.P. Reg. # WP- **1361.2**

Base material(s) welded: **SA 106 GR B** Thickness: **0.344"** ☒ Test Coupon ☐ Prod. Weld

Testing Variables and Qualification Limits

Welding Variables (QW-350)	**Actual Values**		**Range Qualified**	
Welding Process(es) Used:	SMAW	SMAW	SMAW	SMAW
Type of Welding (manual, semi-automatic) Used:	Manual	Manual	Manual	Manual
Base Metal P Number to P Number:	P1	P1	P1through P15F	P1through P15F
Plate ☐ Pipe ☒ enter diameter:	NPS 2	NPS 2	1" OD Min.	1" OD Min.
Backing (metal, weld metal, double weld etc.):	None / Weld	Weld Metal	Without / With	With
Filler Metal or Electrode Specification(s) SFA#:	5.1	5.1		
Filler Metal or Electrode Classification(s):	E6010	E7018-1		
Filler Metal or Electrode F - number(s):	F3	F4	F3	F4
Filler Type (solid metal, or flux cored/powder) GTAW or PAW:	N/A	N/A	N/A	N/A
Consumable Insert for GTAW or PAW:	N/A	N/A	N/A	N/A
Deposit Thickness for each process, electrode type, etc. (in.):	0.094"	0.250"	0.188"	0.500"
Process/Electrode 1: 3 layers minimum Yes ☐ No ☒	Process/Electrode 2: 3 layers minimum Yes ☐ No ☒			
Welding position (2G, 5G, 6G, 3F, etc.):	6G	6G	All	All
Progression (Uphill or Downhill):	Uphill	Uphill	Uphill	Uphill
Inert Gas backing for GTAW, PAW, GMAW:	N/A	N/A	N/A	N/A
Transfer Mode (spray/globular or pulse to short circuit):	N/A	N/A	N/A	N/A
GTAW Current Type/ Polarity (AC, DCEP, DCEN):	DCEP	DCEP	DCEP	DCEP

Results

Visual Examination of Fit-Up Root Gap: **3/32"** Tack Welds: **Bridge** Length: **0.5"** Number: **3**

Root Pass (Describe Discontinuity if Unacceptable): **OK**

Complete Weld (Describe Defects if Unacceptable): **OK**

Bend Test

☒ Transverse Root and Face QW-462.3a ☐ Longitudinal Root and Face QW-462.3b

☐ Pipe Bend Specimen, corrosion-resistant overlay QW-462.5c ☐ Plate Bend Specimen, corrosion-resistant overlay QW-462.5d

☐ Side Bend QW-462.2 ☐ Macro Test for Fusion QW-462.5b ☐ Macro Test for Fusion QW-462.5e

Bend Type	Result	Bend Type	Result	Bend Type	Result	Bend Type	Result
# 1 Root	Pass	# 3 Root	Pass				
# 2 Face	Pass	# 4 Face	Pass				

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

Radiographic Results: **N/A**

Fillet Weld-Fracture Test (QW-180): **N/A** Length and Percent of Defects: **N/A**

Macro Examination (QW-184): **N/A** Fillet Legs Size (in.): **N/A** X **N/A** Concavity/Convexity (in.): **N/A**

Other Tests: **N/A**

Record Information

Film or Specimens Evaluated by: **Steve Jones** Company: **GRB Enterprises Ltd.**

Welding Test Conducted by: **Gerald Bellehumeur**

Mechanical Tests Conducted by: **GRB Enterprises Ltd.** Laboratory Test no.: **N/A**

Welding Supervised by: **Photo ID by : GRB Enterprises Ltd**

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

Accredited Organization: GRB ENTERPRISES LTD. AOQP No: 7107(C) Expiry Date: **May 21 2015**

Certified by: **Steve Jones** W.E.File: **E-00339** Date: **October 23, 2014**

PQ Card No. (When Issued): **21300** Performance Test Reference No.: **14-10-23-3**

Test Coupon ID No.: **Welder Name** Date Coupon is Retained To: **N/A**

ABSA
the pressure equipment safety authority

WELDER QUALIFICATION RECORD (WQR)

AB-76A 2010-09

Welder's Name: Shaun Johnson ABSA File No.: N/A Stamp No.: SJ

Identification of WPS followed by welder during welding of test coupon: ASL-13 W.P. Reg. # WP-983.2

Base material(s) welded: SA-36 Thickness: 0.375" ☒ Test Coupon ☐ Prod. Weld

Testing Conditions and Qualification Limits

Welding Variables (QW-350)	Actual Values		Range Qualified	
Welding Process(es) Used:	SMAW	SMAW	SMAW	SMAW
Type of Welding (i.e., Manual, Semi-Automatic) Used:	MANUAL	MANUAL	MANUAL	MANUAL
Base Metal P Number: P To P Number:	P1		P1-P1	
☒ Plate ☐ Pipe (enter diameter if pipe or tube):	N/A		N/A	
Backing (metal, weld metal, double-welded, etc.):	without	with	without/with	with
Filler Metal or Electrode Specification(s) (SFA) (info only):	5.1	5.1		
Filler Metal or Electrode Classification(s) (info only):	E6010	E7018-1		
Filler Metal or Electrode F-Number(s):	F3	F4	F3	F4
Filler Type (solid/metal or flux cored/powder) (GTAW or PAW):	N/A	N/A	N/A	N/A
Consumable Insert for GTAW or PAW:	N/A	N/A	N/A	N/A
Deposit Thickness for each process or electrode type, etc. (in.):	0.125"	0.250"	0.250"	0.500"
Process/Electrode 1: 3 layers minimum ☐ Yes ☒ No			Process/Electrode 2: 3 layers minimum ☐ Yes ☒ No	
Welding Position (2G, 6G, 3F, etc.):	3G	3G	1G, 3G	1G, 3G
Vertical Progression (Uphill or Downhill):	downhill	downhill	downhill	downhill
Fuel Gas for OFW or Inert Gas Backing for GTAW, PAW, GMAW:	N/A	N/A	N/A	N/A
Transfer Mode (spray/globular or pulse to short circuit- GMAW):	N/A	N/A	N/A	N/A
GTAW Current Type/Polarity (AC, DCEP, DCEN):	DCEP	DCEP	DCEP	DCEP

Results

Visual Examination of Fit-Up; Root Gap: OK Tack Welds: OK (Length: 1/2" Number: 2)

Root Pass (Describe Discontinuity if Unacceptable): OK

Completed Weld (Describe defects if unacceptable): OK

Bend Test: ☐ Transverse Root and Face [QW-462.3(a)] ☐ Longitudinal Root and Face [QW-462.3(b)] ☐ Side [QW-462.2]

☐ Pipe Bend Specimen, corrosion-resistant overlay [QW-462.5(c)] ☐ Plate Bend Specimen, corrosion-resistant overlay [QW-462.5(d)]

☐ Macro Test for Fusion [QW-462.5(b)] ☐ Macro Test for Fusion [QW-462.5(e)]

Type	Result	Type	Result	Type	Result

(For alternative qualification of groove welds by volumetric examination to QW-191)

R.T. Results: PASS U.T. Results: N/A

Fillet Weld - Fracture Test (Describe location, nature and size of any crack or tearing of specimen): N/A

Length and Per Cent of Defects: N/A inches N/A

Macro Test-Fusion: N/A

Appearance-Fillet Size (leg.): N/A X N/A inch. Convexity: N/A inch. or Concavity: N/A inch.

Other Tests: N/A

Record Information

Film or Specimens Evaluated by: Keri Wanlin Company: Canada Inspection

Welding supervised by: Rob Irvine

Mechanical tests conducted by: N/A Laboratory test no.: N/A

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

ACCREDITED ORGANIZATION: N/A AOQP No.: N/A Expiry Date: N/A

Certified by: Rob Irvine Examiner File No. N/A Date: September 13, 2011

P.Q. Card No. (When issued): N/A Performance Test Reference No.: ASL-13

Test Coupon I.D. No.: Welder Name Date Coupon is to be retained to: December 13, 2011

ABSA
the pressure equipment safety authority

WELDER QUALIFICATION RECORD (WQR)

AB-76A 2010-09

Welder's Name: Shaun Johnson ABSA File No.: N/A Stamp No.: SJ

Identification of WPS followed by welder during welding of test coupon: ASL-9 W.P. Reg. # WP- 983.2

Base material(s) welded: SA-36 Thickness: 0.375" ☒ Test Coupon ☐ Prod. Weld

Testing Conditions and Qualification Limits

Welding Variables (QW-350)	Actual Values	Range Qualified
Welding Process(es) Used:	SMAW	SMAW
Type of Welding (i.e., Manual, Semi-Automatic) Used:	MANUAL	MANUAL
Base Metal P Number: P To P Number:	P1	P1-P8
☒ Plate ☐ Pipe (enter diameter if pipe or tube):	N/A	N/A
Backing (metal, weld metal, double-welded, etc.):	without	without/with
Filler Metal or Electrode Specification(s) (SFA) (info only):	5.4	
Filler Metal or Electrode Classification(s) (info only):	E309-15	
Filler Metal or Electrode F-Number(s):	F5	F5
Filler Type (solid/metal or flux cored/powder) (GTAW or PAW):	N/A	N/A
Consumable Insert for GTAW or PAW:	N/A	N/A
Deposit Thickness for each process or electrode type, etc. (in.):	0.375"	0.750"
Process/Electrode 1: 3 layers minimum ☐ Yes ☒ No	Process/Electrode 2: 3 layers minimum ☐ Yes ☒ No	
Welding Position (2G, 6G, 3F, etc.):	3G, 4G	1G, 3G, 4G,
Vertical Progression (Uphill or Downhill):	N/A	N/A
Fuel Gas for OFW or Inert Gas Backing for GTAW, PAW, GMAW:	N/A	N/A
Transfer Mode (spray/globular or pulse to short circuit- GMAW):	N/A	N/A
GTAW Current Type/Polarity (AC, DCEP, DCEN):	DCEP	DCEP

Results

Visual Examination of Fit-Up; Root Gap: OK Tack Welds: OK (Length: 1/2" Number: 2)

Root Pass (Describe Discontinuity if Unacceptable): OK

Completed Weld (Describe defects if unacceptable): OK

Bend Test: ☐ Transverse Root and Face [QW-462.3(a)] ☐ Longitudinal Root and Face [QW-462.3(b)] ☐ Side [QW-462.2]

☐ Pipe Bend Specimen, corrosion-resistant overlay [QW-462.5(c)] ☐ Plate Bend Specimen, corrosion-resistant overlay [QW-462.5(d)]

☐ Macro Test for Fusion [QW-462.5(b)] ☐ Macro Test for Fusion [QW-462.5(e)]

Type	Result	Type	Result	Type	Result

(For alternative qualification of groove welds by volumetric examination to QW-191)

R.T. Results: PASS U.T. Results: N/A

Fillet Weld - Fracture Test (Describe location, nature and size of any crack or tearing of specimen): N/A

Length and Per Cent of Defects: N/A inches N/A

Macro Test-Fusion: N/A

Appearance-Fillet Size (leg.): N/A X N/A inch. Convexity: N/A inch. or Concavity: N/A inch.

Other Tests: N/A

Record Information

Film or Specimens Evaluated by: Keri Wanlin Company: Canada Inspection

Welding supervised by: Rob Irvine

Mechanical tests conducted by: N/A Laboratory test no.: N/A

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

ACCREDITED ORGANIZATION: N/A AOQP No.: N/A Expiry Date: N/A

Certified by: Rob Irvine Examiner File No. N/A Date: October 26, 2011

P.Q. Card No. (When issued): N/A Performance Test Reference No.: ASL-9

Test Coupon I.D. No.: Welder Name Date Coupon is to be retained to: January 26, 2012

ABSA
the pressure equipment safety authority

WELDER QUALIFICATION RECORD (WQR)

AB-76A 06/02

Welder's Name: Shaun Johnson ABSA File No.: NA Stamp No.: SJ

Identification of WPS followed by welder during welding of test coupon: ASL-2 W.P. Reg. # WP- 983.2

Base material(s) welded: SA36 Thickness: 0.375" ☒ Test Coupon ☐ Prod. Weld

Testing Conditions and Qualification Limits

Welding Variables (QW-350)	Actual Values		Range Qualified	
Welding Process(es) Used:	SMAW	SMAW	SMAW	SMAW
Type of Welding (i.e., Manual, Semi-Automatic) Used:	MANUAL	MANUAL	MANUAL	MANUAL
Base Metal P- or S-Number: P To P- or S-Number:	P1-P1		P1-P1	
☒ Plate ☐ Pipe (enter diameter if pipe or tube):	NA		NA	
Backing (metal, weld metal, double-welded, etc.):	NONE	WELD METAL	with / without	with
Filler Metal or Electrode Specification(s) (SFA) (info only):	5.1	5.1		
Filler Metal or Electrode Classification(s) (info only):	E6010	E7024		
Filler Metal or Electrode F-Number(s):	F3	F1	F3	F1
Filler Type (solid/metal or flux cored/powder) (GTAW or PAW):	N/A	N/A	N/A	N/A
Consumable Insert for GTAW or PAW:	N/A	N/A	N/A	N/A
Deposit Thickness for each process or electrode type, etc. (in.):	0.125"	0.250"	0.250"	0.500"
Process/Electrode 1: GMAW 3 layers minimum ☐ Yes ☒ No			Process/Electrode 2: SMAW 3 layers minimum ☐ Yes ☒ No	
Welding Position (2G, 6G, 3F, etc.):	1G	1G	1G, 1F, 2F	1G, 1F, 2F
Vertical Progression (Uphill or Downhill):	N/A	N/A	N/A	N/A
Fuel Gas for OFW or Inert Gas Backing for GTAW, PAW, GMAW:	N/A	N/A	N/A	N/A
Transfer Mode (spray/globular or pulse to short circuit- GMAW):	NA	N/A	NA	N/A
GTAW Current Type/Polarity (AC, DCEP, DCEN):	DCEP	DCEP	DCEP	DCEP

Results

Visual Examination of Fit-Up; Root Gap: 1/8" Tack Welds: BRIDGE (Length: 1/2" Number: 2)

Root Pass (Describe Discontinuity if Unacceptable): OK

Completed Weld (Describe defects if unacceptable): OK

Bend Test: ☒ Transverse Root and Face [QW-462.3(a)] ☐ Longitudinal Root and Face [QW-462.3(b)] ☐ Side [QW-462.2]

☐ Pipe Bend Specimen, corrosion-resistant overlay [QW-462.5(c)] ☐ Plate Bend Specimen, corrosion-resistant overlay [QW-462.5(d)]

☐ Macro Test for Fusion [QW-462.5(b)] ☐ Macro Test for Fusion [QW-462.5(e)]

Type	Result	Type	Result	Type	Result
ROOT	PASS				
FACE	PASS				

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

Radiographic Results: N/A

Fillet Weld - Fracture Test (Describe location, nature and size of any crack or tearing of specimen): N/A

Length and Per Cent of Defects: N/A inches N/A

Macro Test-Fusion: N/A

Appearance-Fillet Size (leg.): N/A X N/A inch. Convexity: N/A inch. or Concavity: N/A inch.

Other Tests: N/A

Record Information

Film or Specimens Evaluated by: Company:

Welding supervised by: Rob Irvine

Mechanical tests conducted by: Rob Irvine Laboratory test no.: N/A

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

ACCREDITED ORGANIZATION: NA AOQP No.: NA Expiry Date: NA

Certified by: Rob Irvine Examiner File No. N/A Date: February 12, 2012

P.Q. Card No. (When issued): NA Performance Test Reference No.: ASL-2

Test Coupon I.D. No.: Welder Name Date Coupon is to be retained to: May 12, 2012

ABSA
the pressure equipment safety authority

WELDER QUALIFICATION RECORD (WQR)

AB-76A 2010-09

Welder's Name: Shaun Johnson ABSA File No.: N/A Stamp No.: SJ

Identification of WPS followed by welder during welding of test coupon: ASL-16 W.P. Reg. # WP- 983.2

Base material(s) welded: SA-36 Thickness: 0.375" ☒ Test Coupon ☐ Prod. Weld

Testing Conditions and Qualification Limits

Welding Variables (QW-350)	Actual Values	Range Qualified
Welding Process(es) Used:	SMAW	SMAW
Type of Welding (i.e., Manual, Semi-Automatic) Used:	MANUAL	MANUAL
Base Metal P Number: P To P Number:	P1	P1-P1
☒ Plate ☐ Pipe (enter diameter if pipe or tube):	N/A	N/A
Backing (metal, weld metal, double-welded, etc.):	without	with/without
Filler Metal or Electrode Specification(s) (SFA) (info only):	5.1	
Filler Metal or Electrode Classification(s) (info only):	E6010	
Filler Metal or Electrode F-Number(s):	F3	F3
Filler Type (solid/metal or flux cored/powder) (GTAW or PAW):	N/A	N/A
Consumable Insert for GTAW or PAW:	N/A	N/A
Deposit Thickness for each process or electrode type, etc. (in.):	0.375"	0.750"
Process/Electrode 1: 3 layers minimum ☐ Yes ☒ No	Process/Electrode 2: 3 layers minimum ☐ Yes ☒ No	
Welding Position (2G, 6G, 3F, etc.):	3G	1G, 3G
Vertical Progression (Uphill or Downhill):	downhill	downhill
Fuel Gas for OFW or Inert Gas Backing for GTAW, PAW, GMAW:	N/A	N/A
Transfer Mode (spray/globular or pulse to short circuit- GMAW):	N/A	N/A
GTAW Current Type/Polarity (AC, DCEP, DCEN):	DCEP	DCEP

Results

Visual Examination of Fit-Up; Root Gap: OK Tack Welds: OK (Length: 1/2" Number: 2)

Root Pass (Describe Discontinuity if Unacceptable): OK

Completed Weld (Describe defects if unacceptable): OK

Bend Test: ☐ Transverse Root and Face [QW-462.3(a)] ☐ Longitudinal Root and Face [QW-462.3(b)] ☐ Side [QW-462.2]

☐ Pipe Bend Specimen, corrosion-resistant overlay [QW-462.5(c)] ☐ Plate Bend Specimen, corrosion-resistant overlay [QW-462.5(d)]

☐ Macro Test for Fusion [QW-462.5(b)] ☐ Macro Test for Fusion [QW-462.5(e)]

Type	Result	Type	Result	Type	Result

(For alternative qualification of groove welds by volumetric examination to QW-191)

R.T. Results: PASS U.T. Results: N/A

Fillet Weld - Fracture Test (Describe location, nature and size of any crack or tearing of specimen): N/A

Length and Per Cent of Defects: N/A inches N/A

Macro Test-Fusion: N/A

Appearance-Fillet Size (leg.): N/A X N/A inch. Convexity: N/A inch. or Concavity: N/A inch.

Other Tests: N/A

Record Information

Film or Specimens Evaluated by: Keri Wanlin Company: Canada Inspection

Welding supervised by: Rob Irvine

Mechanical tests conducted by: N/A Laboratory test no.: N/A

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

ACCREDITED ORGANIZATION: N/A AOQP No.: N/A Expiry Date: N/A

Certified by: Rob Irvine Examiner File No. N/A Date: July 31, 2012

P.Q. Card No. (When issued): N/A Performance Test Reference No.: ASL-16

Test Coupon I.D. No.: Welder Name Date Coupon is to be retained to: October 31, 2012

ABCS
Alberta BC Safety

Confined Space Entry / Monitor
OSSA # 20110414-24
STS # CSE/M2010

Terry Lee Johnson
Candidate Name (Print - Full First, Full Middle, Full Last)

Apr 25/13
Date Issued

DOUG CHISHOLM
Authorization (Print)

Authorization (Signature)

Apr 25/16
Expiry Date
(3 years from date issued)

☒ Initial
☐ Renewal

ABCS #: 503917

CANADIAN RED CROSS

Name Terry Johnson Is Certified In

STANDARD FIRST AID CPR/AED Level ☒ A ☐ C ☐ HCP

This card is invalid if more than one level of CPR is checked.

June 2, 2012
Date of Issue

60184263
Instructor I.D.#

June 2, 2015
Expiry Date

Instructor

YOU MAY RECERTIFY SOONER IF REQUIRED FOR EMPLOYMENT

012/045210 78011A

JOURNEYMAN CERTIFICATE

THIS IS TO CERTIFY THAT
TERRY LEE JOHNSON
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 7th, 2000

ISSUE DATE
October 11th, 2006

Alberta Government

SHIRLEY DILL, EXECUTIVE DIRECTOR OF APPRENTICESHIP & INDUSTRY TRAINING

Welder Qualification

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

Transferable Welder

Name: **TERRY L. JOHNSON**
Exp. Date: **Feb 17, 2016**
Employer: **Argo Sales Ltd., Nisku Plant, Nisku, AB**
Thickness Range: **3mm & above**
Material: **Carbon Steel**
Process: **FCAW/MCAW**
Standard: **CSA W47.1**
Mode: **SEMI-AUTO**
Single Electrode Mechanized
Single Electrode Automatic
Classification: **FW**
Class: **FLAT/HORIZONTAL/VERTICAL UP**

See Reverse for Conditions

Welder Qualification

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

Transferable Welder

Name: **TERRY L. JOHNSON**
Exp. Date: **Feb 14, 2016**
Employer: **Argo Sales Ltd., Nisku Plant, Nisku, AB**
Thickness Range: **3mm & above**
Material: **Carbon Steel**
Process: **FCAW/MCAW**
Standard: **CSA W47.1**
Mode: **SEMI-AUTO**
Single Electrode Mechanized
Single Electrode Automatic
Classification: **S**
Class: **FLAT**

See Reverse for Conditions

Welder Qualification

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

Transferable Welder

Name: **TERRY L. JOHNSON**
Exp. Date: **Feb 12, 2016**
Employer: **Argo Sales Ltd., Nisku Plant, Nisku, AB**
Thickness Range: **3mm & above**
Material: **Carbon Steel**
Mode of Transfer: **Spray/Globular/Pulsed**
Process: **GMAW**
Mode: **SEMI-AUTO**
Standard: **CSA W47.1**
Single Electrode Mechanized
Classification: **FW**
Single Electrode Automatic
Class: **FLAT/HORIZONTAL**

See Reverse for Conditions

ABSA
the pressure equipment safety authority

WELDER QUALIFICATION RECORD (WQR)

AB-76A 2010-09

Welder's Name: Terry Johnson ABSA File No.: N/A Stamp No.: TJ

Identification of WPS followed by welder during welding of test coupon: ASL-1-AW W.P. Reg. # WP- 983.2

Base material(s) welded: SA-36 Thickness: 0.375" ☒ Test Coupon ☐ Prod. Weld

Testing Conditions and Qualification Limits

Welding Variables (QW-350)	Actual Values		Range Qualified	
Welding Process(es) Used:	SMAW	SMAW	SMAW	SMAW
Type of Welding (i.e., Manual, Semi-Automatic) Used:	MANUAL	MANUAL	MANUAL	MANUAL
Base Metal P Number: P To P Number:	P1		P1-P1	
☒ Plate ☐ Pipe (enter diameter if pipe or tube):	N/A		N/A	
Backing (metal, weld metal, double-welded, etc.):	without	with	without/with	with
Filler Metal or Electrode Specification(s) (SFA) (info only):	5.1	5.1		
Filler Metal or Electrode Classification(s) (info only):	E6010	E7018-1		
Filler Metal or Electrode F-Number(s):	F3	F4	F3	F4
Filler Type (solid/metal or flux cored/powder) (GTAW or PAW):	N/A	N/A	N/A	N/A
Consumable Insert for GTAW or PAW:	N/A	N/A	N/A	N/A
Deposit Thickness for each process or electrode type, etc. (in.):	0.125"	0.250"	0.250"	0.500"
Process/Electrode 1: 3 layers minimum ☐ Yes ☒ No			Process/Electrode 2: 3 layers minimum ☐ Yes ☒ No	
Welding Position (2G, 6G, 3F, etc.):	3G	3G	1G, 3G, 1F, 2F, 3F	1G, 3G, 1F, 2F, 3F
Vertical Progression (Uphill or Downhill):	Uphill	Uphill	Uphill	Uphill
Fuel Gas for OFW or Inert Gas Backing for GTAW, PAW, GMAW:	N/A	N/A	N/A	N/A
Transfer Mode (spray/globular or pulse to short circuit- GMAW):	N/A	N/A	N/A	N/A
GTAW Current Type/Polarity (AC, DCEP, DCEN):	DCEP	DCEP	DCEP	DCEP

Results

Visual Examination of Fit-Up; Root Gap: OK Tack Welds: OK (Length: 0.5" Number: 2)

Root Pass (Describe Discontinuity if Unacceptable): OK

Completed Weld (Describe defects if unacceptable): OK

Bend Test: ☐ Transverse Root and Face [QW-462.3(a)] ☐ Longitudinal Root and Face [QW-462.3(b)] ☐ Side [QW-462.2]

☐ Pipe Bend Specimen, corrosion-resistant overlay [QW-462.5(c)] ☐ Plate Bend Specimen, corrosion-resistant overlay [QW-462.5(d)]

☐ Macro Test for Fusion [QW-462.5(b)] ☐ Macro Test for Fusion [QW-462.5(e)]

Type	Result	Type	Result	Type	Result

(For alternative qualification of groove welds by volumetric examination to QW-191)

R.T. Results: PASS U.T. Results: N/A

Fillet Weld - Fracture Test (Describe location, nature and size of any crack or tearing of specimen): N/A

Length and Per Cent of Defects: N/A inches N/A

Macro Test-Fusion: N/A

Appearance-Fillet Size (leg.): N/A X N/A inch. Convexity: N/A inch. or Concavity: N/A inch.

Other Tests: N/A

Record Information

Film or Specimens Evaluated by: Frank Meisinger Company: IRIS NDT

Welding supervised by: Rob Irvine

Mechanical tests conducted by: N/A Laboratory test no.: N/A

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

ACCREDITED ORGANIZATION: N/A AOQP No.: N/A Expiry Date: N/A

Certified by: Rob Irvine Examiner File No. N/A Date: July 16, 2013

P.Q. Card No. (When issued): N/A Performance Test Reference No.: ASL-1-AW

Test Coupon I.D. No.: Welder Name Date Coupon is to be retained to: N/A

ABSA
the pressure equipment safety authority

WELDER QUALIFICATION RECORD (WQR)

AB-76A 2010-09

Welder's Name: Terry Johnson ABSA File No.: N/A Stamp No.: TJ

Identification of WPS followed by welder during welding of test coupon: ASL-8 W.P. Reg. # WP- 983.2

Base material(s) welded: A106 Grade B Thickness: 0.436" ☒ Test Coupon ☐ Prod. Weld

Testing Conditions and Qualification Limits

Welding Variables (QW-350)	Actual Values		Range Qualified	
Welding Process(es) Used:	GMAW	SMAW	GMAW	SMAW
Type of Welding (i.e., Manual, Semi-Automatic) Used:	Semi-Auto	MANUAL	Semi-Auto	MANUAL
Base Metal P Number: P To P Number:	P1		P1-P1	
☐ Plate ☒ Pipe (enter diameter if pipe or tube):	2.375" OD		1" OD Min.	
Backing (metal, weld metal, double-welded, etc.):	without	with	without/with	with
Filler Metal or Electrode Specification(s) (SFA) (info only):	5.18	5.1		
Filler Metal or Electrode Classification(s) (info only):	ER70S-2	E7018-1		
Filler Metal or Electrode F-Number(s):	F6	F4	F6	F4
Filler Type (solid/metal or flux cored/powder) (GTAW or PAW):	Solid	N/A	Solid	N/A
Consumable Insert for GTAW or PAW:	N/A	N/A	N/A	N/A
Deposit Thickness for each process or electrode type, etc. (in.):	0.125"	0.311"	0.137"	0.622"
Process/Electrode 1: 3 layers minimum ☐ Yes ☒ No			Process/Electrode 2: 3 layers minimum ☐ Yes ☒ No	
Welding Position (2G, 6G, 3F, etc.):	FLAT	FLAT	FLAT	FLAT
Vertical Progression (Uphill or Downhill):	N/A	N/A	N/A	N/A
Fuel Gas for OFW or Inert Gas Backing for GTAW, PAW, GMAW:	N/A	N/A	N/A	N/A
Transfer Mode (spray/globular or pulse to short circuit- GMAW):	Short Circuit	N/A	Short Circuit	N/A
GTAW Current Type/Polarity (AC, DCEP, DCEN):	DCEP	DCEP	DCEP	DCEP

Results

Visual Examination of Fit-Up; Root Gap: OK Tack Welds: OK (Length: 0.5" Number: 3)

Root Pass (Describe Discontinuity if Unacceptable): OK

Completed Weld (Describe defects if unacceptable): OK

Bend Test: ☒ Transverse Root and Face [QW-462.3(a)] ☐ Longitudinal Root and Face [QW-462.3(b)] ☐ Side [QW-462.2]

☐ Pipe Bend Specimen, corrosion-resistant overlay [QW-462.5(c)] ☐ Plate Bend Specimen, corrosion-resistant overlay [QW-462.5(d)]

☐ Macro Test for Fusion [QW-462.5(b)] ☐ Macro Test for Fusion [QW-462.5(e)]

Type	Result	Type	Result	Type	Result
FACE	PASS				
ROOT	PASS				

(For alternative qualification of groove welds by volumetric examination to QW-191)

R.T. Results: N/A U.T. Results: N/A

Fillet Weld - Fracture Test (Describe location, nature and size of any crack or tearing of specimen): N/A

Length and Per Cent of Defects: N/A inches N/A

Macro Test-Fusion: N/A

Appearance-Fillet Size (leg.): N/A X N/A inch. Convexity: N/A inch. or Concavity: N/A inch.

Other Tests: N/A

Record Information

Film or Specimens Evaluated by: Rob Irvine Company: Argo Sales Ltd.

Welding supervised by: Randy Gagnier

Mechanical tests conducted by: Argo Sales Ltd. Laboratory test no.: N/A

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

ACCREDITED ORGANIZATION: N/A AOQP No.: N/A Expiry Date: N/A

Certified by: Rob Irvine Examiner File No. N/A Date: October 15, 2013

P.Q. Card No. (When issued): N/A Performance Test Reference No.: ASL-8

Test Coupon I.D. No.: Welder Name Date Coupon is to be retained to: January 15, 2014

ABSA
the pressure equipment safety authority

WELDER QUALIFICATION RECORD (WQR)

AB-76A 2010-09

Welder's Name: Terry Johnson ABSA File No.: N/A Stamp No.: TJ

Identification of WPS followed by welder during welding of test coupon: ASL-10 W.P. Reg. # WP- 983.2

Base material(s) welded: SA-36 Thickness: 0.375" ☒ Test Coupon ☐ Prod. Weld

Testing Conditions and Qualification Limits

Welding Variables (QW-350)	Actual Values	Range Qualified
Welding Process(es) Used:	SMAW	SMAW
Type of Welding (i.e., Manual, Semi-Automatic) Used:	MANUAL	MANUAL
Base Metal P Number: P To P Number:	P1	P1-P8
☒ Plate ☐ Pipe (enter diameter if pipe or tube):	N/A	N/A
Backing (metal, weld metal, double-welded, etc.):	without	without/with
Filler Metal or Electrode Specification(s) (SFA) (info only):	5.4	
Filler Metal or Electrode Classification(s) (info only):	E309-15	
Filler Metal or Electrode F-Number(s):	F5	F5
Filler Type (solid/metal or flux cored/powder) (GTAW or PAW):	N/A	N/A
Consumable Insert for GTAW or PAW:	N/A	N/A
Deposit Thickness for each process or electrode type, etc. (in.):	0.375"	0.750"
Process/Electrode 1: 3 layers minimum ☐ Yes ☒ No	Process/Electrode 2: 3 layers minimum ☐ Yes ☒ No	
Welding Position (2G, 6G, 3F, etc.):	2G	1G, 2G, 1F-2F
Vertical Progression (Uphill or Downhill):	N/A	N/A
Fuel Gas for OFW or Inert Gas Backing for GTAW, PAW, GMAW:	N/A	N/A
Transfer Mode (spray/globular or pulse to short circuit- GMAW):	N/A	N/A
GTAW Current Type/Polarity (AC, DCEP, DCEN):	DCEP	DCEP

Results

Visual Examination of Fit-Up; Root Gap: OK Tack Welds: OK (Length: 1/2" Number: 2)

Root Pass (Describe Discontinuity if Unacceptable): OK

Completed Weld (Describe defects if unacceptable): OK

Bend Test: ☐ Transverse Root and Face [QW-462.3(a)] ☐ Longitudinal Root and Face [QW-462.3(b)] ☐ Side [QW-462.2]

☐ Pipe Bend Specimen, corrosion-resistant overlay [QW-462.5(c)] ☐ Plate Bend Specimen, corrosion-resistant overlay [QW-462.5(d)]

☐ Macro Test for Fusion [QW-462.5(b)] ☐ Macro Test for Fusion [QW-462.5(e)]

Type	Result	Type	Result	Type	Result

(For alternative qualification of groove welds by volumetric examination to QW-191)

R.T. Results: PASS U.T. Results: N/A

Fillet Weld - Fracture Test (Describe location, nature and size of any crack or tearing of specimen): N/A

Length and Per Cent of Defects: N/A inches N/A

Macro Test-Fusion: N/A

Appearance-Fillet Size (leg.): N/A X N/A inch. Convexity: N/A inch. or Concavity: N/A inch.

Other Tests: N/A

Record Information

Film or Specimens Evaluated by: Jianguo (Peter) Wang Company: IRIS NDT

Welding supervised by: Rob Irvine

Mechanical tests conducted by: N/A Laboratory test no.: N/A

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

ACCREDITED ORGANIZATION: N/A AOQP No.: N/A Expiry Date: N/A

Certified by: Rob Irvine Examiner File No. N/A Date: October 31, 2013

P.Q. Card No. (When issued): N/A Performance Test Reference No.: ASL-10

Test Coupon I.D. No.: Welder Name Date Coupon is to be retained to: N/A

ABSA
the pressure equipment safety authority

WELDER QUALIFICATION RECORD (WQR)

AB-76A 2010-09

Welder's Name: Terry Johnson ABSA File No.: N/A Stamp No.: TJ

Identification of WPS followed by welder during welding of test coupon: BM-19 W.P. Reg. # WP- 983.2

Base material(s) welded: A106 Grade B Thickness: 0.436" ☒ Test Coupon ☐ Prod. Weld

Testing Conditions and Qualification Limits

Welding Variables (QW-350)	Actual Values		Range Qualified	
Welding Process(es) Used:	GMAW-rmd	GMAW-MC	GMAW-RMD	GMAW-MC
Type of Welding (i.e., Manual, Semi-Automatic) Used:	Semi-Auto	Semi-Auto	Semi-Auto	Semi-Auto
Base Metal P Number: P To P Number:	P1		P1-P1	
☐ Plate ☒ Pipe (enter diameter if pipe or tube):	2.375" OD		1" OD Min.	
Backing (metal, weld metal, double-welded, etc.):	without	with	without/with	with
Filler Metal or Electrode Specification(s) (SFA) (info only):	5.18	5.18		
Filler Metal or Electrode Classification(s) (info only):	ER70S-2	E70C-6M		
Filler Metal or Electrode F-Number(s):	F6	F6	F6	F6
Filler Type (solid/metal or flux cored/powder) (GTAW or PAW):	Solid	Metal Core	Solid	Metal Core
Consumable Insert for GTAW or PAW:	N/A	N/A	N/A	N/A
Deposit Thickness for each process or electrode type, etc. (in.):	0.110"	0.326"	0.121"	0.652"
Process/Electrode 1: 3 layers minimum ☐ Yes ☒ No	Process/Electrode 2: 3 layers minimum ☐ Yes ☒ No			
Welding Position (2G, 6G, 3F, etc.):	FLAT	FLAT	FLAT	FLAT
Vertical Progression (Uphill or Downhill):	N/A	N/A	N/A	N/A
Fuel Gas for OFW or Inert Gas Backing for GTAW, PAW, GMAW:	N/A	N/A	N/A	N/A
Transfer Mode (spray/globular or pulse to short circuit- GMAW):	RMD	Pulse	RMD	Pulse
GTAW Current Type/Polarity (AC, DCEP, DCEN):	DCEP	DCEP	DCEP	DCEP

Results

Visual Examination of Fit-Up; Root Gap: OK Tack Welds: OK (Length: 0.375" Number: 3)

Root Pass (Describe Discontinuity if Unacceptable): OK

Completed Weld (Describe defects if unacceptable): OK

Bend Test: ☒ Transverse Root and Face [QW-462.3(a)] ☐ Longitudinal Root and Face [QW-462.3(b)] ☐ Side [QW-462.2]

☐ Pipe Bend Specimen, corrosion-resistant overlay [QW-462.5(c)] ☐ Plate Bend Specimen, corrosion-resistant overlay [QW-462.5(d)]

☐ Macro Test for Fusion [QW-462.5(b)] ☐ Macro Test for Fusion [QW-462.5(e)]

Type	Result	Type	Result	Type	Result
FACE	PASS				
ROOT	PASS				

(For alternative qualification of groove welds by volumetric examination to QW-191)

R.T. Results: N/A U.T. Results: N/A

Fillet Weld - Fracture Test (Describe location, nature and size of any crack or tearing of specimen): N/A

Length and Per Cent of Defects: N/A inches N/A

Macro Test-Fusion: N/A

Appearance-Fillet Size (leg.): N/A X N/A inch. Convexity: N/A inch. or Concavity: N/A inch.

Other Tests: N/A

Record Information

Film or Specimens Evaluated by: Rob Irvine Company: Argo Sales Ltd.

Welding supervised by: Randy Gagnier

Mechanical tests conducted by: Argo Sales Ltd. Laboratory test no.: N/A

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

ACCREDITED ORGANIZATION: N/A AOQP No.: N/A Expiry Date: N/A

Certified by: Rob Irvine Examiner File No. N/A Date: December 1, 2014

P.Q. Card No. (When issued): N/A Performance Test Reference No.: BM-19

Test Coupon I.D. No.: Welder Name Date Coupon is to be retained to: March 1, 2014

ARGO
SALES LTD

MATERIAL SPECIFICATION & TEST REPORTS

ARGO
SALES LTD

MATERIAL TEST REPORTS (TANKS)

Serial Number: 13663 Customer: HUSKY
Description: 100 BBL. (64 CU. M.) BASE SKIDDED STANDARD STORAGE TANK
Tag Number: _____ Drawing Number: B –13663-65 Size: 9'-6"OD x 8'-0" HIGH

MARK	DESCRIPTION	HEAT NUMBER
1	A36 1/4" PL. FLAT BOTTOM	918582
2	A36 3/16" PL. SHELL	N01299
3	A36 3/16" PL. CONED ROOF	920388
M1	A36 24" x 36" MANWAY FRAME	W300111
N1	3" A105 CL.150 RFSO FLG.	YD120038
	3" A106 STD. SMLS. PIPE	1426857
N2	3" A105 CL.150 RFSO FLG.	YD120038
	3" A106 STD. SMLS. PIPE	1426857
N3	4" A105 CL.150 RFSO FLG.	014086001
	4" A106 STD. SMLS. PIPE	1336716
N4	3" A105 CL.150 RFSO FLG.	YD120038
	3" A106 STD. SMLS. PIPE	1426857
N5	6" A105 CL.150 RFSO FLG.	733
	6" A106 STD. SMLS. PIPE	ZD14206001
N6	4" A105 CL.150 RFSO FLG.	133018
	4" A106 STD. SMLS. PIPE	1336716
C1	1 1/4" A105 CL3000 FULL CPLG	3610
C2	1" A105 CL3000 FULL CPLG	4105
C3	1 1/4" A105 CL3000 FULL CPLG	3610

918582 (100BBL FL)

PO# 77627

28

New Zealand Steel Limited
A BlueScope Steel Company
131 Mission Bush Road, Glenbrook, South Auckland
Postal: Private Bag 92121, Auckland 1142, New Zealand
Telephone: (09) 375 8111 Auckland
Fax (09) 375 8959

TEST CERTIFICATE

CUSTOMER	Wilkinson Steel & Metals -Vancouver	SPECIFICATION	ASTMA36(2012)	CERTIFICATE No	TC292247
CUSTOMER O/N	107204 USER REF P31029EM003V	PRODUCT	HOT ROLLED COIL	DATE	27 December 2013
MILL O/N	1005220	DIMENSIONS	0.238" × 60" × Coil		

PACK NUMBER	HEAT No	CHEMICAL COMPOSITION PERCENT (TEST METHOD - ASTM E415 & JIS G1253)															MECHANICAL TEST (TEST METHOD - ASTMA370)						
		C	Si	Mn	P	S	Cu	Ni	Cr	Mo	V	Nb	Ti	Al	B	N2	CE(A)	BEND	YIELD (B) psi	T.S. psi	%ELONG G.L.= F	HARDNESS		LENGTH (feet)
		x100			x1000										x10000		x100							
HH-E28832-00	918434	18	TR	64	12	14	12	17	25	TR	11	TR	1	45	TR	50	28	NA	51300	69200	25	NA		643
HH-E29833-00	918439	18	TR	62	12	15	13	17	27	1	12	TR	1	34	TR	50	29	NA	51500	70100	24	NA		679
HH-E28833-00	918439	18	TR	62	12	15	13	17	27	1	12	TR	1	34	TR	50	29	NA	51300	69500	22	NA		610
HH-E28835-00	918579	17	TR	60	11	13	13	17	31	TR	12	TR	1	39	TR	40	27	NA	51600	68500	26	NA		705
HH-E28834-00	918579	17	TR	60	11	13	13	17	31	TR	12	TR	1	39	TR	40	27	NA	51600	68500	26	NA		702
HH-E28839-00	918581	17	TR	59	15	15	13	16	32	1	14	TR	1	36	TR	40	27	NA	47900	68900	24	NA		597
* HH-E28841-00	918582	18	TR	59	12	13	12	16	31	TR	11	TR	1	32	TR	40	28	NA	45100	64400	23	NA		600
HH-E28840-00	918582	18	TR	59	12	13	12	16	31	TR	11	TR	1	32	TR	40	28	NA	45100	64400	23	NA		600
HH-E28838-00	918582	18	TR	59	12	13	12	16	31	TR	11	TR	1	32	TR	40	28	NA	45100	64400	23	NA		604
HH-E28837-00	918582	18	TR	59	12	13	12	16	31	TR	11	TR	1	32	TR	40	28	NA	45100	64400	23	NA		597

CHEM COMP %		YIELD	GAUGE LENGTH (G.L.)			IMPACT TEST		CARBON EQUIVALENT VALUE (CE)	
Si (TR) < 0.01%	Ti (TR) < 0.001%	(A)=0.2% PROOF STRESS	(A)=200mm	(C)=80mm	(E)=2"	(A)=10mm x 10mm	(C)=5mm x 5mm	(A)=C+Mn/6	(C)=C+Mn/6+Si/24
Mo (TR) < 0.001%	B (TR) < 0.0001%	(B)=LOWER YIELD STRESS	(B)=50mm	(D)=5.65√So	(F)=6"	(B)=7.5mm x 10mm	(D)=2.5mm x 10mm (E)=5mm x 10mm	(B)=C+Mn/6+(Cr+V+Mo)/5+(Cu+Ni)/15	

1. Steel produced through the basic oxygen steelmaking process by New Zealand Steel.
2. Heat analyzed from ladle.
3. Results relate to test on a representative sample of the items covered in this test certificate.
4. This certificate may not be reproduced except in full.
5. New Zealand Steel, Chemical Laboratory IANZ Accreditation Number 101, KTP Mr David Sherle.
6. New Zealand Steel, Mechanical Laboratory IANZ Accreditation Number 985, Approved Signatory Mr Schalk Bester.
7. New Zealand Steel Laboratories are accredited by International Accreditation New Zealand (IANZ), a signatory to the International Laboratory Accreditation Cooperation - Mutual Recognition Agreement.

WE HEREBY CERTIFY THAT THE MATERIAL DESCRIBED HEREIN HAS BEEN TESTED AND INSPECTED WITH SATISFACTORY RESULTS IN ACCORDANCE WITH THE REQUIREMENTS OF THE ABOVE SPECIFICATION

APPROVED Andrew Mackay
SENIOR METALLURGIST

B 430815/819/820

N01299(.188x96)

PO#77849

38.

EVRAZ | EVRAZ INC. NA
Evraz Oregon Steel 14400 N. Rivergate Blvd., Portland, Oregon 97203

REPORT OF CHEMICAL/PHYSICAL TESTS

CERTIFICATE NO.	DATE	PAGE
1351476	Jan 29, 2014	1

ISO 9001 REGISTERED U.S. PLATE PRODUCER

SOLD TO

WILKINSON STEEL & METALS INC [VANC]
ATTN: ACCOUNTS PAYABLE
888 SE MARINE DR
VANCOUVER, BC V5X 2V3
CANADA

WILKINSON STEEL AND METALS INC-VANC
888 SE MARINE DR
VANCOUVER, BC V5X 2V3
CANADA

MILL ORDER NO.	DATE
271707	

CUSTOMER ORDER NO.: P31212EM001V

JOB/REQ. NO.:

SHIPPING NO.	DATE
1351476	01/29/2014

CARRIER: BURLINGTON NORTHERN

CAR/TRUCK NO.: BN686052

THIS MATERIAL HAS BEEN MANUFACTURED, TESTED AND FOUND TO MEET THE SPECIFICATIONS AND PURCHASE ORDER REQUIREMENTS
STRUCTURAL QUALITY COIL FOR CONVERSION TO CSA G40.21-04 GRADE 38W/44W / ASTM A36/ASME SA36-10/11 ADD. MEETING MATERIAL REQUIREMENTS OF API650 GROUP III(12TH EDITION). KILLED FINE GRAIN PRACTICE.

PHYSICAL PROPERTIES

ITEM NO	DESCRIPTION	HEAT NO.	SLAB	YIELD PSI X 100	TENSILE PSI X 100	% ELONG 8"	% ELONG 2"	% RA	HARDNESS BHN	BEND TEST	IMPACTS
1	0.1780 X 96.000ME X COIL .178 MIN GAUGE SCHEDULE B: 7208.38.00.00										
	1 PC 74290 LBS ^	N01297		545	725	21			+ (OUTER)		
	SCHEDULE B: 7208.38.00.00										
	1 PC 74330 LBS ^	N01299		498	705	22			+ (OUTER)		
				560	715	23			+ (OUTER)		
	2 PCS 148620 LBS TOTALS										

CHEMICAL ANALYSIS

HEAT NO.	C	Mn	P	S	Si	Cu	Ni	V	Cb	Al	Cr	Mo	Ti	B	N	Ca	CE	McQuaid Ehn Grain Size
N01297	.13	.84	.011	.007	.26	.02	.04	.002	.005	.044	.03	.00	.002		.0037			
N01299	.13	.85	.014	.008	.21	.01	.05	.004	.000	.041	.02	.00	.002		.0030			

HEATS INDICATED WITH (+) WERE MELTED & MANUFACTURED IN THE USA. HEATS INDICATED WITH (^) WERE ROLLED IN THE USA.

..... END OF REPORT .....

I certify the above to be correct as contained in the records of EVRAZ INC. NA By _____ Richard Deschand Quality Coordinator

920388(100B82RF)

PO#77627

New Zealand Steel Limited
A BlueScope Steel Company
131 Mission Bush Road, Glenbrook, South Auckland
Postal: Private Bag 92121, Auckland 1142, New Zealand
Telephone: (09) 375 8111 Auckland
Fax: (09) 375 8959

TEST CERTIFICATE

CUSTOMER	Wilkinson Steel & Metals -Vancouver			SPECIFICATION	ASTMA36(2012)
CUSTOMER O/N	107463	USER REF	P40123EM002V	PRODUCT	HOT ROLLED COIL
MILL O/N	1022957			DIMENSIONS	0.178" × 60" × Coil

CERTIFICATE No	TC299909
DATE	01 April 2014

PACK NUMBER	HEAT No	CHEMICAL COMPOSITION PERCENT (TEST METHOD - ASTM E415 & JIS G1253)																MECHANICAL TEST (TEST METHOD - ASTMA370)						
		C	Si	Mn	P	S	Cu	Ni	Cr	Mo	V	Nb	Ti	Al	B	N2	CE(A)	BEND	YIELD (B) psi	T.S. psi	%ELONG G.L.= F	HARDNESS	TEST DIR	LENGTH (feet)
		x100			x1000										x10000		x100							
HN-E38326-01	920388	17	TR	63	23	18	13	17	29	1	11	TR	1	46	TR	50	27	NA	46800	65000	28	NA		8
HN-E38324-01	920388	17	TR	63	23	18	13	17	29	1	11	TR	1	46	TR	50	27	NA	46800	65000	28	NA		5
HN-E38330-01	920389	18	TR	62	24	19	12	17	26	TR	11	TR	1	32	TR	50	28	NA	47100	67000	20	NA		8
HN-E38328-01	920389	18	TR	62	24	19	12	17	26	TR	11	TR	1	32	TR	50	28	NA	47100	67000	20	NA		5
HN-E38327-01	920389	18	TR	62	24	19	12	17	26	TR	11	TR	1	32	TR	50	28	NA	47100	67000	20	NA		5
HN-E39852-01	920564	17	TR	62	14	15	12	17	23	TR	7	TR	1	45	TR	50	27	NA	45400	65400	21	NA		8

CHEM COMP % Nb (TR) < 0.001%
Si (TR) < 0.01% Ti (TR) < 0.001%
Mo (TR) < 0.001% B (TR) < 0.0001%

YIELD
(A)=0.2% PROOF STRESS
(B)=LOWER YIELD STRESS

GAUGE LENGTH (G.L.)
(A)=200mm (C)=80mm (E)=2"
(B)=50mm (D)=5.65 √ So (F)=8"

IMPACT TEST
(A)=10mm x 10mm (C)=5mm x 5mm
(B)=7.5mm x 10mm (D)=2.5mm x 10mm
(E)=5mm x 10mm

CARBON EQUIVALENT VALUE (CE)
(A)=C+Mn/6
(B)=C+Mn/6+(Cr+V+Mo)/5+(Cu+Ni)/15
(C)=C+Mn/6+Si/24

TEST DIR : L=Longitudinal, T=Transverse

1. Steel produced through the basic oxygen steelmaking process by New Zealand Steel.
2. Heat analyzed from ladle.
3. Results relate to test on a representative sample of the items covered in this test certificate.
4. This certificate may not be reproduced except in full.
5. New Zealand Steel, Chemical Laboratory IANZ Accreditation Number 101, KTP Mr David Sherie.
6. New Zealand Steel, Mechanical Laboratory IANZ Accreditation Number 985, Approved Signatory Mr Schalk Bester.
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WE HEREBY CERTIFY THAT THE MATERIAL DESCRIBED HEREIN HAS BEEN TESTED AND INSPECTED WITH SATISFACTORY RESULTS IN ACCORDANCE WITH THE REQUIREMENTS OF THE ABOVE SPECIFICATION

APPROVED Andrew Mackay
SENIOR METALLURGIST

PO#65615

W300111 (5x3x.25 ANGLE)
(MW FRAME)

GERDAU

WHITBY STEEL MILL
HOPKINS STREET SOUTH
WHITBY ON L1N 5T1 CAN
(905) 668-8811

Chemical and Physical Test Report
MADE IN CANADA

W-122909

Customer Name ARGO SALES LTD
Customer PO# 65615
Shipper No 368187
Heat Number W300111

SHIP TO	INVOICE TO	SHIP DATE / CUST. ACCOUNT NO
VARSTEEL LTD - CALGARY C/O CALGARY DISTRIBUTION CTR 5200 84TH STREET SE CALGARY, AB T2P 2G7	VARSTEEL LTD ACCTS PAYABLE 220 4TH ST. S. STE-330 LETHBRIDGE, AB T1J 4J7	12/20/11 60123213

PRODUCED IN: WHITBY

SHAPE + SIZE	GRADE	SPECIFICATION	SALES ORDER	CUST P.O. NUMBER
A5 X 3 X 1/4	44W	A36/44W/50W/A529GR50;ASTM A36-05;A529GR50 M-05;CSA:G40.21-04 44W/50W	1094919-01	CY-945338-01

HEAT I.D.	C	Mn	P	S	Si	Cu	Ni	Cr	Mo	V	Nb	B	N	Sn	Al	Ti	Zn	C Eqv
W300111	.20	.95	.012	.023	.16	.36	.10	.13	.024	.000	.004	.0009	.0000	.010	.291	.00400	.01700	.421

Mechanical Test: Yield 53372 PSI, 367.99 MPA Tensile: 74200 PSI, 511.59 MPA %El: 25.0/8in, 25.0/200MM
Customer Requirements CASTING: STRAND CAST
Mechanical Test: Yield 52865 PSI, 364.49 MPA Tensile: 75000 PSI, 517.11 MPA %El: 24.4/8in, 24.4/200MM
Customer Requirements CASTING: STRAND CAST

PRODUCED IN: WHITBY

SHAPE + SIZE	GRADE	SPECIFICATION	SALES ORDER	CUST P.O. NUMBER
C10 X 15.3#	44W	A36/44W/50W/A572GR50; ASTM:A36-05;A572GR50 M-06;CSAG40.21-04 44W/50W	1085535-04	CY-942665-04

HEAT I.D.	C	Mn	P	S	Si	Cu	Ni	Cr	Mo	V	Nb	B	N	Sn	Al	Ti	Zn	C Eqv
W300226	.15	.80	.009	.030	.18	.32	.07	.06	.020	.000	.013	.0009	.0000	.010	.146	.00400	.01200	.329

Mechanical Test: Yield 54378 PSI, 374.92 MPA Tensile: 70638 PSI, 487.03 MPA %El: 22.5/8in, 22.5/200MM
Customer Requirements CASTING: STRAND CAST
Mechanical Test: Yield 54955 PSI, 378.9 MPA Tensile: 71680 PSI, 494.22 MPA %El: 22.5/8in, 22.5/200MM
Customer Requirements CASTING: STRAND CAST

Customer Notes

NO WELD REPAIRMENT PERFORMED. STEEL NOT EXPOSED TO MERCURY.
This material, including the billets, was melted and manufactured in Canada

Bhaskar Yalamanchili
Quality Director
Gerdau

THE ABOVE FIGURES ARE CERTIFIED CHEMICAL AND PHYSICAL TEST RECORDS AS CONTAINED IN THE PERMANENT RECORDS OF COMPANY.

Metallurgical Services Manager
WHITBY STEEL MILL

YD120038(3RFS0150)

48988

PO#78697

DINGXIANG BEICHENG FLANGE CO.,LTD

Yangfang Development Area Dingxiang Shanxi P.R. China

Inspection Certificate
Abnahmepruefzeugnis

EN10204-3.1

Certified in accordance to Pressure Equipment Directive 97/23/EC,
Annex1,Paragraph 4.3 by TÜV Anlagentechnik Gmbh
(Notified Body Identification NO.0035)

Zertifiziert nach Druckgeraete-Richtlinie 97/23/EG,
Anhang 1,Abschnitt 4.3 durch TÜV Anlagentechnik Gmbh
(Benannte Stelle Kenn-Nr.0035)

Certificate No.: BC-14-Y120 Page: 38/89
Pruef-Nr. Seite

Customer/Besteller: ALBERTA PIPE FITTINGS LTD

Order No./Bestell Nr.:	dated/vom	Works No/Werks Nr.	Material/Werkstoff	according to/entsprechend
APF/2014/222	2014-7-16	2014-Y120	A/SA105N	ASTM SA105 CSAZ245.12-09 GR290

Article/Gegenstand:	Hot Forged Flange/geschmiedeter Flansch	Specification/Anforderung:	ASME B16.5-03 NACE MR0175-05
State of delivery/Lieferzustand:	HOT FORGED	Melting process/Erschmelzungsart:	
Marking/Kennzeichnung:	BC A/SA105N B16.5 CSA Z245.12 CAT I 248 SS SIZE TYPE CLASS SCH Heat-No.		
Stamp of Manufacturer/Herstellerzeichen:	BC	Inspector's stamp/Pruefstempel:	

Content of the Delivery/Lieferumfang:

NO.	Pieces/stueckzahl	Description/Bezeichnung	Heat No/Schmelze-Nr	Test No/ProbeNr
38	1052	150# SO RF 3"	YD120038	BC14Y12001

Chemical analysis/Chemische Analyse:

NO.	Heat No.	%C	%Si	%Mn	%P	%S	%Cr	%Mo	%Ni	%Ti	%Ta	%Nb	%Co	%Cu	%Al	%V	%CE
38	YD120038	0.19	0.20	0.95	0.014	0.010	0.028	0.001	0.009					0.052		0.002	0.36

Mechanical tests/Mechanische Pruefungen:

NO.	Test No/ProbeNr	Yield Strength N/mm²	Tensile Strength N/mm²	Elong %	Red of Area %	Charpy-impact Test, ISO-V Specimen Kerbschlagversuch,ISO-V-Probe J	Σ/N	Hardness Haerte HB
38	BC14Y12001	345	515	31.5	69.0			140 141 143

Visual and dimensional inspection/Besichtigung und Ausmessung: without complaint/ohne Beanstandung

Place/Ort: DINGXIANG Date/Datum: 2014-9-20 Works Inspector/Werkssachverstaendiger

DINGXIANG BEICHENG FLANGE CO.,LTD

3" 150# RFSO

1426857 (3 INSTD PIPE)

PO#78273

48074

ORIGINAL

江阴市无缝钢管总厂
JIANGYIN CITY SEAMLESS STEEL TUBE FACTORY

产品质量证明书 MILL TEST CERTIFICATE EN10204 3.1

江苏省江阴市夏港镇镇澄路375号
No.375,Zhencheng Rd.Xiagang Town Jiangyin City
Jiangsu Province, China (214442)
Tel:86-510-66286698 Fax:86-510-66286690

总捆数Total Bundles	5	总支数Total Pieces	141	总重量(t)Total Weight	10.191	日期Date: 2014-07-08	№: 140708WM065-2
发货单位 Consignee	ALBERTA PIPE FITTINGS LTD.					合同编号 Contract No.	2014CJWM065
产品名称 Product	SEAMLESS CARBON STEEL PIPE		技术标准 Spec.	ASME/ASTM SA/A106 B; API 5L B		许可证号 License No.	0503
尺寸SizeO.D×W.T×L (m)	3"*SCH40*6.4M	钢级Grade	B	牌号 Steel Type		交货状态 Delivery Status	HOT ROLLING

序号 NO.	炉号 Heat No	批号 Batch No	捆数 Bundle	支数 Pcs	重量 (MT) Weight	拉伸试验 Tensile Test					冲击试验Impact Test				硬度试验 Hardness Valu
						尺寸 Dimen-sion	标距长度 Gauge Length (mm)	屈服强度 Y.S Mpa	抗拉强度 T.S Mpa	伸长率 E.L (%)	尺寸 Dimen-sion (*4)	温度 (℃) Temper-ature	冲击值(J)Impact Value 横向冲击 Ak__ Transverse	冲击值(J)Impact Value 纵向冲击 Ak__ Longitudinal	硬度值 Hardness Value
1	1426857	1407090	5	141	10.191	*1-A2	50	260/275	465/475	29/27					
2															
3															
4															
5															

序号 NO.	类别 Type *5	化学成分(%)Chemical Composition										低倍组织(级) M.S			金相分析 Metallogical Analysis					
		C	Si	Mn	P	S	Cr	Ni	Cu	Mo	V	一般疏松 Ordinary Porosity	中心疏松 Central Porosity	偏析 Segregation	显微组织*6 Microstucture	夹杂物 Inclusion A	B	C	D	带状组织(级) B.S	脱碳 (mn D.
1	C	.200	.240	.470	.018	.009	.017	.021	.020	.009	.005										
2	C																				
3	C																				
4	C																				
5	C																				

压扁 Flattening	冷弯 Cold Bending	扩口 Flaring	超声检验 U.T	涡流检验 E.T	磁粉检验 M.P.I	漏磁检验 L.M.T	通径 N.D	表面&尺寸 S&D	水压 Hydro Test (≥5s)			
OK				OK				OK		1	17.5	Mpa
										2		Mpa
										3		Mpa
										4		Mpa
										5		Mpa

注释 Notes: *1:纵向条状Longitudinal Strip: A1-12.7mm, A2-19.05mm A3-25.4mm A4-38.1mm,F-全截面Full-section *2棒状Clubbed:B1=12.7mm,B2=8.9mm,B3=8mm,B4=10mm *3:横向条状 TiansverseStrip:C1-12.7mm, C2-19.05mm C3-25.4mm C4-38.1mm, *4:D1=10×10×55mm D2=10×7.5×55mm D3=10×5×55mm *5:C-成品成分Product composition R-熔炼成分 Melting composition *6:F-铁素体Ferrite B-贝氏体Bainite P-珠光体Pearlite S-回火索氏体 Tempered Sorbite M-马氏体Martensite

备注 Remark: 1.AT THEORETICAL WEIGHT BASIS; 2.MANUFACTURED FROM FULLY KILLED CARBON STEEL. 3.TOLERANCE ON MEASUREMENT MENTION IN ACC.TO ANSI B36.10.

声明:本质证书以原件为准，复印无效。
Remark:No duplicate will be accepted.

质量管理部负责人 Quality Manager: 丁云峰

审核人: Auditor: 丁云峰

制证人：高叶 Certification-maker:

014086001 (4RFS0150) PO# 78697

ORIGINAL

47840

DINGXIANG HAOKUN FORGED STAINLESS FLANGES CO., LTD

NIUTAI VILLAGE, DINGXIANG COUNTY,035400 SHANXI PROVINCE,CHINA
TEL: +86-351-7856257 FAX: +86-351-7856258

TÜV

MILL TEST CERTIFICATE

Management System as per ISO 9001 : 2000 Certificate Registration NO.04 100 062393

CERTIFICATE OF ANALYSIS: 3.1 EN-10204

PURCHASER: ALBERTA PIPE FITTINGS LTD. TEST NO.140587 PLACE:DINGXIANG DATE:30th-JUNE-2014 CERT NO: XT14063001001

ODRER NO APF/2014/ 214	CONTRACT NO.	MATERIAL GRADE	STANDARD	WORK NO.
	HKX28-270514	ASTM/ASME/ASA SA105N CL2 CSA-Z245.12-09 CAT I – 290SS; NACE MR0175-2005	ANSI B16.5 2003	140587

ITEM	SIZE INCH	HEAT NO.	DESCRIPTION	QTY	INSPECTION SATISFACTORY		NORMALIZING IN 900℃
							Hot Forging
1	4"	014086001	150# SORF A105N	3000			
1	4"	014086	150# SORF A105N	3000	Visual inspection:	SATISFACTORY	MANUFACTURING METHOD
					Dimensional inspection:	SATISFACTORY	
					Ultrasonic test:		Hot Forging
							MELTING PROCESS
							E
							Manufacturer's brand H.K
							stamp of the testing engineer

	CHEMICAL COMPOSITION %											MECHANICAL PROPERTIES					
ITEM	HEAT NO.	C %	Si %	Mn %	P %	S %	Cr %	Ni %	Mo %	V %	Cu %	BRINELL HARDNESS NUMBER	TENSILE STRENGTH MPA	YIELD STRENGTH 0.2% offset MPA	ELONGATION in 2 inch, %	REDUCTION OFAREA,MIN %	CHARPY-IMPACT TEST(J)
	MIN		0.10	0.60								143	485	228	22	30	
	MAX	0.35	0.35	1.05	0.035	0.040	0.30	0.44	0.12	0.05	0.400	185					
1	014086001	0.200	0.27	0.79	0.015	0.008	0.015	0.011	0.005	0.012	0.020	159/164/158	546	315	38	62	
1	014086	0.200	0.27	0.79	0.015	0.008	0.015	0.011	0.005	0.012	0.020	159/164/158	546	315	38	62	

MARKING: 08A/SA105N B16.5-09 CAT1 CSA Z245.12-09 HK SIZE CLASS TYPE FACE SCHEDULE 290 SS 014086001

APPR... Section:

We hereby certify that the product described herein has been made in accordance with the requirements of PED97/23/EC

Quality Dept.

4" 150# RFSO

1336716(4INSTDPIPE)

46933

PO#76059

HENGYANG VALIN STEEL TUBE CO.,LTD

MILL TEST CERTIFICATE

(ACCORDING TO EN10204 3.1B)

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

CUSTOMER	R + R TRADING CO.,LTD	CERTIFICATE NO.	C201400238-1
CONTRACT-ITEM NO.	2211001753- 02	P.O.NO.	404583
PRODUCT	SEAMLESS STEEL LINE PIPE	DATE:	2014-1-3
SPECIFICATION	SEE SPECIFICATION NOTE	DELIVERY CONDITION	HR
GRADE	B,GR 241	HEAT TREATMENT	
TOTAL BUNDLES:	12	TOTAL PIECES: 210	DIMENSIONS: 4"×STD×21FT
TOTAL LENGTH:	1344.000 m	TOTAL WEIGHT:	21.596 mt

NO.	LOT No.	HEAT No.	BUNDLES	PIECES	LENGTH m	WEIGHT mt W1	TENSILE TEST ASTM A370 SAMPLE TYPE/ ORIENTATION / SIZE(mm/GAUGE LENGTH(mm):SU\25\50 TS(MPa)	YS(MPa)	Rt0.5	EL(%)	R.A. (%)	YS/TS	
1	310Y0901A	1336716	6	105	672.000	10.798	465	322		34.5		0.69	ACCEPTABLE
2	310Y0901B	1336716	6	105	672.000	10.798	447	323		33.5		0.72	ACCEPTABLE

NO.	IMPACT TEST NOTCH TYPE/ORIENTATION/TEMPERATURE(℃)/SIZE (mm): III				III				NON METALIC INCLUSION	GRAIN SIZE	HARDNESS TEST NACE MR0175 HB	
	AK1 (J)	Av.(J)	% SHEAR AREA	LE	AK2 (J)	Av.(J)	% SHEAR AREA	LE				
1	/				/						158.0	
2	/				/						159.7	

NOTES:

W1--THEORETICAL WEIGHT
W2--ACTUAL WEIGHT
NR--NORMALIZING ROLLED
AK1--ABSORB ENERGY FOR THE FIRST SET
SAMPLE ORIENTATION : L--LONGITUDINAL T--TRANSVERSE
SAMPLE TYPE: S---STRIP C-- CLUBBED F--FULL-SECTION
Q&T--QUENCHING AND TEMPERING
AK2--ABSORB ENERGY FOR THE SECOND SET
N--NORMALIZING
A--ANNEALING
Av.--AVERAGE
LE--SIDE EXPANSION
HE--HOT EXPANDED
HR--HOT ROLLED
N&T--NORMALIZING AND TEMPERING

HENGYANG VALIN STEEL TUBE CO.,LTD 衡阳华菱钢管有限公司 HUNAN CHINA

正本 ORIGINAL

4" Std A106 B Sm/s Pipe

HENGYANG VALIN
STEEL TUBE CO.,LTD

MILL TEST CERTIFICATE

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

(ACCORDING TO EN10204 3.1B)

CUSTOMER	R + R TRADING CO..LTD	CERTIFICATE NO.	C201400238-1
CONTRACT-ITEM NO.	2211001753- 02	P.O.NO.	404583
PRODUCT	SEAMLESS STEEL LINE PIPE	DATE:	2014-1-3
SPECIFICATION	SEE SPECIFICATION NOTE	HEAT TREATMENT	DELIVERY CONDITION: HR
GRADE	B,GR 241		
TOTAL BUNDLES: 12	TOTAL PIECES: 210	TOTAL LENGTH: 1344.000 m	DIMENSIONS: 4"×STD×21FT
TOTAL WEIGHT: 21.596 mt			PAGE: 2/3

NO.	HEAT No. / LOT No.	Type	CHEMICAL COMPOSITION (%) C *100	Si	Mn	Cr	Mo	W	Cu	Ni	P	Al	Sn	As	Pb	Sb	Nb	Ti	Zr	N	Bi	S	V	B *10000	Ca	CE *100	SUM1	SUM2	SUM3 *1000	R1	R2	R3
		P	*1000																												
1	1336716	H	14	26	98	51	13		95	31	15	28					1	1														
	310Y0901A	P	13	24	94	41	7		95	27	15	27					1	1				50	22	1		31	192.2	3.2	4.2			
	310Y0901A	P	14	24	95	41	7		98	27	16	27					1	1				69	19	2		28	171.9	2.9	3.9			
2	1336716	H	14	26	98	51	13		95	31	15	28					1	1				76	19	1		30	174.9	2.9	3.9			
	310Y0901B	P	13	24	95	41	7		97	28	16	27					1	1				50	22	1		31	192.2	3.2	4.2			
	310Y0901B	P	13	24	94	40	7		95	27	16	27					1	1				66	20	2		28	175	3	4			
		H															1	1				68	19	1		28	170.9	2.9	3.9			
		P																													
		P																													
		H																													
		P																													
		P																													
		H																													
		P																													
		P																													

NON-DESTRUCTIVE TEST

POSITION	PIPE BODY	PIPE END	END SURFACE(GROOVE)	BE
NDT Type(Level)	EMI	UT		ACCEPTABLE
LAMINAR				VISUAL & DIMENSION
TEST RESULT	ACCEPTABLE	ACCEPTABLE	N/A	ACCEPTABLE
RESIDUAL MAGNETISM		ACCEPTABLE		COATING
UT THICKNESS MEASUREMENT		N/A		
HYDROSTATIC TEST Min(psi/s)	2200/6	ACCEPTABLE		ACCEPTABLE

NOTES: H--HEAT ANALYSIS P--PRODUCT ANALYSIS CE--EQUIVALENT CARBON R--RATIO R1=Ca /S R2=Al /N R3=Mn/C
CEIIW=C+Mn/6+(Cr+Mo+V)/5+(Cu+Ni)/15 CEPCM=C+Si/30+(Mn+Cr+Cu)/20+Ni/60+Mo/15+V/10+5*B SUM1=Cr+Cu+Mo+Ni+V SUM2=Nb+V SUM3=Nb+V+Ti
ET-ASTM E309 UT-ASTM E213 EMI-ASTM E570 MPI-ASTM E709
LA/L3/L2--ACCEPT LEVEL LA/L3/L2,NOTCH DEPTH IS 12.5%/10%/5% THE SPECIFIED WALL THICKNESS.

正本
ORIGINAL

HENGYANG VALIN
STEEL TUBE CO.,LTD

MILL TEST CERTIFICATE

(ACCORDING TO EN10204 3.1B)

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

CUSTOMER	R + R TRADING CO.,LTD		CERTIFICATE NO.	C201400238-1	
CONTRACT-ITEM NO.	2211001753-02	P.O.NO. 404583	DATE:	2014-1-3	PAGE: 3/3
PRODUCT	SEAMLESS STEEL LINE PIPE		DELIVERY CONDITION	HR	
SPECIFICATION	SEE SPECIFICATION NOTE	HEAT TREATMENT			
GRADE	B,GR 241		DIMENSIONS	4"×STD×21FT	
TOTAL BUNDLES: 12	TOTAL PIECES: 210		TOTAL LENGTH: 1344.000 m	TOTAL WEIGHT: 21.596 mt	

REMARK : 1.ORIGIN:MADE IN CHINA;2.ALL ELEMENTS TO BE LISTED;

SPECIFICATION NOTE	API 5L(45th) PSL1+ASTM/ASME A/SA 106+CSA Z245.1 CAT I

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

This certificate is issued by a computerized system and it is valid with electronic signature. In case the owner of the certificate would release a copy of it ,he must attest its conformity to the original one taking upon himself the responsibility for any unlawful or not allowed use.

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

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

CUSTOMER THIRD PARTY

Quality Manager: 0

Certificate-maker: 刘年亚

正 本
ORIGINAL

733 (6RF50150)

PO#76028

SUDHIR FORGINGS (P) LTD.

SUDHIR FORGINGS PVT.LTD
KANGANWAL ROAD,P.O.JUGIANA,
G.T.ROAD,LUDHIANA (INDIA)

Control No. TC/01
Rev. 01
Eff Date 01.07.2009

TEST CERTIFICATE

(in accordance with EN 10204 3.1 B)

ITEM	6" 150 SORF (6875236)	CERTIFICATE No.	SF/FLANGE/01029/013 DATED 26-Feb-2014
QUANTITY	300 PCS	LAB Ref. No.	733
FINISH	BLACK PAINT	CUSTOMER NAME	CCTF CORPORATION
MAT. SPECIFICATION	ASME SA 105N-10 / ASTM A105N-03	INVOICE No.	SF/2013-14/064
P.O. No.	4032912 DATED 7-Feb-2014	INVOICE DATE	26-Feb-2014

Heat No.	Supplier Heat No.	Description	Chemical Analysis										
			C%	Mn%	P%	S%	Si%	Cu%	Ni%	Cr%	Mo%	V%	C.E %
733	A-73	Specified	0.25 max	0.60 - 1.05	0.035 max	0.040 max	0.10 - 0.35	0.40 max	0.40 max	0.30 max	0.12 max	0.08 max	0.47 max
		Observed	0.230	0.890	0.035	0.032	0.200	0.130	0.049	0.096	0.001	0.000	0.414

Heat No.	Supplier Heat No.	Description	Physical / Mechanical Properties				
			UTS N / MM^2	YIELD N / MM^2	Elongation%	R.A.%	Hardness (BHN)
733	A-73	Specified	485 min	250 min	22 min	30 min	187 max
		Observed	580.61	347.16	36.80	36.00	156

HEAT TREATMENT PROCESS :- TEMP. 870°C - 910°C
SOAKING TIME :- 2.00 HOURS

REMARKS.

- Material is in accordence with NACE STD, MR-0175/ISO-15156
- Flanges are forged steel and manufactured in strict accordance with ASTM A/SA 105 & ANSI B16.5
- The flange have been normalized in accordance with ASTM A961.
- We certify that the Material Suits the Requirement of P.O./Relevant specifications.
- Flanges have serrated face as per MSS-SP-6 within the limit of 125 - 250 RMS.
- Flanges are painted with black paint & Marked as. SF 6 SORF 150 A105N B16.5 733 INDIA

FOR SUDHIR FORGINGS PVT. LTD

for. T Singh
Q.C. Engg.

Q.C. Mgr

ZD14206001(6INSTRPIPE)

PO# 78188

YANGZHOU LONTRIN STEEL TUBE CO.,LTD.

MILL TEST REPORT (EN10204-3.1)

No. 1 Xinggang Road, Developing the Area Along the River
Daqiao Town, Jiangdu City, Jiangsu Province, China
Tel: 86-514-86435896 Fax: 86-514-86430033

SL-0506

CUSTOMER :

PRODUCT: PRIME SEAMLESS STEEL PIPE

SPEC: ASTM(2014) A106 GR.B/ASME(2013) SA106 GR.B/ASTM(2012)A53 GR.B/ASME(2013) SA53 GR.B/API 5L(45th) GR.B/CSA Z245.1 GR241 CAT I/NACE MR-01-75(2009)/MR-01-03(2003) AND ISO15156(Hardness Only)

ISO. REGISTRATION NO: 44 100 072544

CONTRACT NO:

CERTIFICATE NUMBER: 14EX06314-2-01

Material conforms to ANSI B36.10.

Normalizing temperature: 900℃ to 930℃

TOTAL: 90 BUNDLES 869 PIECES 117057 KG PACKING IN BUNDLES

NO.	HEAT NO.	LOT	STEEL GRADE	SIZE (MM)	PCS	WEIGHT Kg	CHEMICAL COMPOSITION (Ladle Analysis)%											
							C	Si	Mn	P	S	Cr	Ni	Cu	Mo	V	Ti	Al
1	ZD14107006	14072AR0100	GR.B	6.000NOMX0.280NOMESX21FT	196	35448	0.21	0.22	0.48	0.011	0.006	0.06	0.05	0.08	0.010	0.010	—	—
2	ZD14206001	14072AR0101	GR.B	6.000NOMX0.280NOMESX21FT	94	17001	0.19	0.22	0.48	0.015	0.011	0.06	0.03	0.09	0.010	0.010	—	—
3	ZD14207018	14072AR0097	GR.B	6.000NOMX0.280NOMESX40FT	130	44818	0.18	0.23	0.50	0.012	0.004	0.05	0.05	0.11	0.010	0.010	—	—
4	ZD14107181	14072AR0098	GR.B	6.000NOMX0.280NOMESX40FT	22	7585	0.19	0.24	0.59	0.024	0.013	0.05	0.02	0.08	0.010	0.010	—	—
5	14-207737	14071B0280	GR.B	1.250NOMX0.191NOMESX21FT	384	10976	0.20	0.22	0.49	0.028	0.007	0.03	0.01	0.01	0.010	0.010	—	—
6	14-207737	14071B0281	GR.B	1.250NOMX0.191NOMESX21FT	43	1229	0.20	0.22	0.49	0.028	0.007	0.03	0.01	0.01	0.010	0.010	—	—

NO.	MECHANICAL PROPERTIES				TECHNOLOGICAL PROPERTIES			H.T 10S	NONDESTRUCTIVE TEST		SURFACE QUALITY		DIMENSION TOLERANCE	
	ReL (MPa) YIELD STRENGTH	Rm (MPa) TENSILE STRENGTH	ELONGATION A%	HARDNESS HRB	FLATTENING TEST	FLARING TEST	BENDING		ET	UT	IN	OUT	O.D.	W.T.
1	325	478	34	77	Satisfactory	—	—	1800PSI	Satisfactory	—	Satisfactory	Satisfactory	Satisfactory	Satisfactory
2	317	491	36	78	Satisfactory	—	—	1800PSI	Satisfactory	—	Satisfactory	Satisfactory	Satisfactory	Satisfactory
3	353	520	34	78	Satisfactory	—	—	1800PSI	Satisfactory	—	Satisfactory	Satisfactory	Satisfactory	Satisfactory
4	324	503	35	80	Satisfactory	—	—	1800PSI	Satisfactory	—	Satisfactory	Satisfactory	Satisfactory	Satisfactory
5	354	452	48	74	—	—	Satisfactory	2500PSI	Satisfactory	—	Satisfactory	Satisfactory	Satisfactory	Satisfactory
6	329	460	50	73	—	—	Satisfactory	2500PSI	Satisfactory	—	Satisfactory	Satisfactory	Satisfactory	Satisfactory

REMARKS:

We certify that the material was manufactured, tested and inspected in accordance with the material specifications and the purchase order and was found to meet the requirements.

1) No weld repairs were performed.

2) Pipes are free of mercury contamination.

QC MANAGER: Wang Pengzhan

STAMPER: LONTRIN STEEL TUBE TEST CERTIFICATE

DATE: August 25, 2014

133018 (4RFS0150)

PO# 76023 46869

DINGXIANG HAOKUN FORGED STAINLESS FLANGES CO., LTD

NIUTAI VILLAGE, DINGXIANG COUNTY,035400 SHANXI PROVINCE,CHINA
TEL +86-351-7856257 FAX: +86-351-7856258

ORIGINAL

MILL TEST CERTIFICATE

Management System as per ISO 9001 : 2000 Certificate Registration NO.04 100 062393

CERTIFICATE OF ANALYSIS: 3.1 EN-10204

FOR: ALBERTA PIPE FITTINGS LTD TEST NO: 133018 PLACE:DINGXIANG DATE:19th-DEC-2013 CERT NO: XT13121905

ORDER NO: APF/2013/174	CONTRACT NO: HKXS-341114 Rev.2	MATERIAL GRADE: ASTM/ASME A/SA 182/F, CL2 CSA-Z245.12-09 CAT I – 290SS, NACE MR0175-2005	STANDARD: ANSI B16.5-2003	WORK NO: 130878

ITEM	SIZE INCH	HEAT NO	DESCRIPTION	QTY	INSPECTION SATISFACTORY	
11	4"	133018	150# SORF A105N	500		
12	6"	133018	150# SORF A105N	200	Visual inspection:	SATISFACTORY
13	12"	133018	150# SORF A105N	50	Dimensional inspection:	SATISFACTORY
14	4"	133018	150# THDRF A105N	200	Ultrasonic test:	
15	6"	133018	150# THDRF A105N	100		
16	2"	133018	150# BLRF A105N	250		
17	3"	133018	150# BLRF A105N	250		
18	4"	133018	150# BLRF A105N	400		
19	3"	133018	300# WNRF STD A105N	500		
20	2"	133018	300# WNRF XH A105N	250		

NORMALIZING IN 900℃
Hot Forging

MANUFACTURING METHOD
Hot Forging
MELTING PROCESS
Manufacturer's brand
stamp of the testing engineer

CHEMICAL COMPOSITION %

ITEM	HEAT NO	C %	Si %	Mn %	P %	S %	Cr %	Ni %	Mo %	V %	Cu %
	MIN		0.10	0.60							
	MAX	0.35	0.35	1.05	0.035	0.040	0.30	0.40	0.12	0.08	0.400
1	133018	0.190	0.27	0.81	0.016	0.012	0.011	0.008	0.020	0.020	0.015

MECHANICAL PROPERTIES

BRINELL HARDNESS NUMBER	TENSILE STRENGTH MPA	YIELD STRENGTH 0.2% offset MPA	ELONGATION in 2 inch %	REDUCTION OF AREA,MIN%	CHARPY-IMPACT TEST(J)
143	485	220	22	30	
185					
159/161/160	545	290	40.0	54.2	

MARKING: ANSA105N S15 5.0M CAT1 CSA Z245.12-09 HK SIZE CLASS TYPE SCH 290 SS 133018

We hereby certify that the product described herein has been made in accordance with the requirements of PED97/23/EC

APPROVED Chief of InspectionSection:

DINGXIANG HAOKUN FORGED STAINLESS FLANGES CO. 鼎翔县昊坤不锈钢法兰锻造有限公司 Quality Dept.

3610 (1.25 IN 3000)

PO# 71939

ANVIL INTERNATIONAL, INC.

CANVIL Simcoe, Ontario
Edmonton, Alberta
Montreal, Quebec

Certificate of Test

Part Number: 0366710267 Description: 11/4 3M THRD CPLG 105N
Heat Code: 3610
Reference No.: 120169
Part Specification: Y

Starting Material: 0366710267 Description: 11/4 3M THRD CPLG 105N
Specification: ASTM/ASME A/SA105N-10/ ASME SA105
NACE MRO175/ISO 15156-2:2003 TC1/2005 ANNEX A
Fitting Trademark: Anvil Intl

Chemical Analysis %

Heat No.	C	Mn	P	S	Si	Cu	Ni	Cr	Mo	V	Cb/Nb
322972	0.21	0.86	0.024	0.014	0.20	0.17	00.07	00.09	0.02	< 0.01	< 0.01

CE (LONG FORMULA) = 0.397

Mechanical Properties

Yield Strength		Tensile Stength		Elongation %	Reduction Area	Hardness BHN
psi	54,534	psi	75,565	34.00	64.00	141
MPa	376	MPa	521			

Heat Treatment: N Normalized

Z HT# 322972

We certify that this is a true and correct copy of the mill certificate, issued by the manufacturer of the steel employed or the laboratory which has determined it, as retained in the records of the company. We make no representation beyond those of the manufacturer or its agent.

4105 (1IN3000THRD)

PO# 73630

ANVIL INTERNATIONAL, INC.

CANVIL

Simcoe, Ontario
Edmonton, Alberta
Montreal, Quebec

Certificate of Test

Part Number: 0366710259 Description: 1 3M THRD CPLG 105N
Heat Code: 4105
Reference No.: 131424
Specification: ASTM/ASME A/SA105N-12/ ASME SA105
NACE MRO175/ISO 15156-2:2003 TC1/2005 ANNEX A
Fitting Trademark: Anvil Intl

Chemical Analysis %

Heat No.	C	Mn	P	S	Si	Cu	Ni	Cr	Mo	V	Cb/Nb
0093200	0.19	0.94	0.017	0.006	0.19	0.19	00.07	00.11	0.01	< 0.01	0.00

CE (LONG FORMULA) = 0.394

Mechanical Properties

Yield Strength		Tensile Stength		Elongation %	Reduction Area	Hardness BHN
psi	52,939	psi	75,275	34.00	67.00	144
MPa	365	MPa	519			

Heat Treatment: N Normalized

Z HT# 0093200

We certify that this is a true and correct copy of the mill certificate, issued by the manufacturer of the steel employed or the laboratory which has determined it, as retained in the records of the company. We make no representation beyond those of the manufacturer or its agent.

ARGO
SALES LTD

MISCELLANEOUS TANK EQUIPMENT SPECIFICATIONS

ENARDO MODEL 660

THIEF HATCH

SPRING-LOADED

The series 660 spring loaded thief hatch is designed with a round base and cover. It is intended for use on steel and fiberglass tanks which require a vapor tight seal.

SERIES 660: Standard 4 oz. pressure setting with 4/10 oz. vacuum relief

BOLTING PATTERN: 10-3/8" Circle API, for nominal 8" tank opening

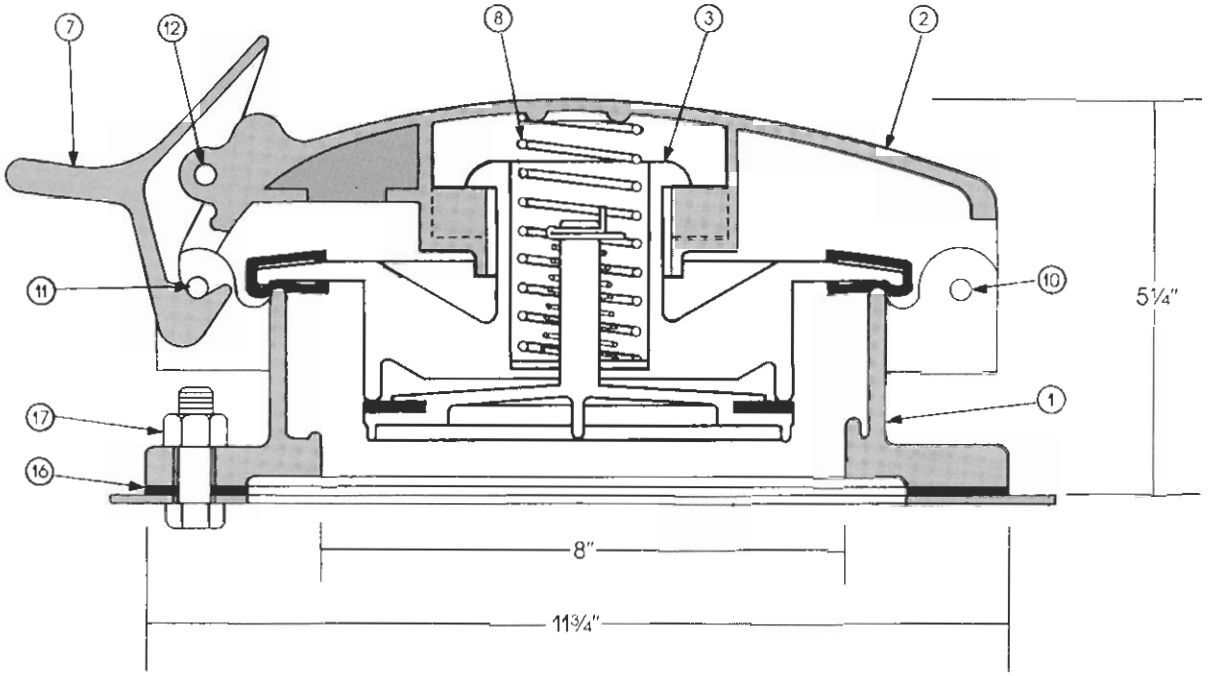
CONSTRUCTION: Iron and aluminum castings (non-sparking)

OPTIONAL EQUIPMENT:
1. Plastic Trim (PT)
2. Pressure Setting (2, 4, 6, 8, 12, 16 or 24 oz.)
3. Base Gasket
4. Bolt Set
5. Non-Corrosive Coating

ORDERING INFORMATION:
1. Give series number (660 or 660PT)
2. State desired pressure setting
3. Indicate options desired

SHIPPING WEIGHT: (approximately) 25 lbs.

ENARDO MANUFACTURING CO.
Post Office Box 266
Tulsa, Oklahoma 74101
(918) 835-6974
(800) 336-2736 U.S. and Canada
FAX (918) 835-0044



SERIES 660

Ref.	Part No.	Part Name	Material	Quantity
1	61	Base	Cast Iron	1
2	63	Cover	Cast Aluminum	1
3	72SA	Center (see Center Assy)	Assembly	1
*3	72SA1-PT	Center (see Center Assy)	Plastic Assembly	1
7	9	Latch	Cast Aluminum	1
8	660-PS-4	4 oz. Pressure Spring	Pltd. (green coded)	1
+8	660-PS-2	2 oz. Pressure Spring	Pltd. (black coded)	1
+8	660-PS-6	6 oz. Pressure Spring	Pltd. (brown coded)	1
+8	660-PS-8	8 oz. Pressure Spring	Pltd. (orange coded)	1
+8	660-PS-12	12 oz. Pressure Spring	Pltd. (pink coded)	1
+8	660-PS-16	16 oz. Pressure Spring	Pltd. (blue coded)	1
+8	660-PS-24	24 oz. Pressure Spring	Pltd. (red coded)	1
10	5-0	Cover Hinge Pin	CRS Pltd.	1
11	5-F	Latching Pin	CRS Pltd.	1
12	5-C	Latch Pin	CRS Pltd.	1
+16	660 BG	Base Gasket	Tank Packing	1
+17	1/2-13 x 1-1/2	Bolt, Hex	Pltd.	16
+17	1/2-13	Nut, Hex	Pltd.	16
19	HCP-148	Hinge Pin Clip	Pltd.	6

*Plastic Trim Series
+Furnished upon Request only

NOTE: Inconel Springs will be furnished upan request

ENARDO Thief Hatches are divided into two categories:

- Dead Weight Series
- Spring-Loaded Series

DEAD WEIGHT SERIES

ENARDO Dead Weight Thief Hatches are generally used on low pressure, steel & fiberglass tanks. They are available with 1, 2, 3 or 4-ounce pressure settings and have a standard 4/10-ounce vacuum relief. Round base dead weight hatches have an API standard 10-3/8-inch bolt circle for a nominal 8-inch tank opening. Oblong base units have a 10-3/8 by 20-3/8-inch API bolt pattern for a nominal 8 by 18-inch tank opening. A thief shelf will be furnished as standard equipment on all oblong base hatches. The oblong base hatch is not recommended for tanks with decks heavier than 10-gauge metal since a vapor tight installation is less likely to be achieved.

SPRING-LOADED SERIES

ENARDO Spring-Loaded Thief Hatches are generally used on low pressure steel & fiberglass tanks. They are available in 2, 4, 8, 16 and 24-ounce pressure settings and have a standard 4/10-ounce vacuum relief. Spring-loaded hatches have a round base with an API standard 10-3/8-inch bolt circle for a nominal 8-inch tank opening. Models designated by the letter "L" will have a long basin which acts as the thief shelf.

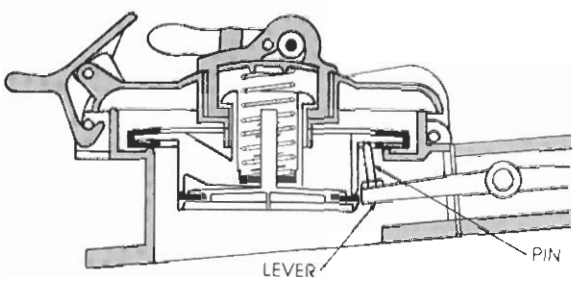
BLEEDER MODELS

ENARDO Thief Hatches having the bleeder attachment are designed to manually pre-release tank pressure which eliminates the spray that would otherwise be discharged when the hatch cover is opened. Bleeder attachments are recommended for tanks with pressures in excess of 4 ounces. They are designated by the letter "B" in the thief hatch model number.

COMBINATION THIEF HATCH WITH BYPASS

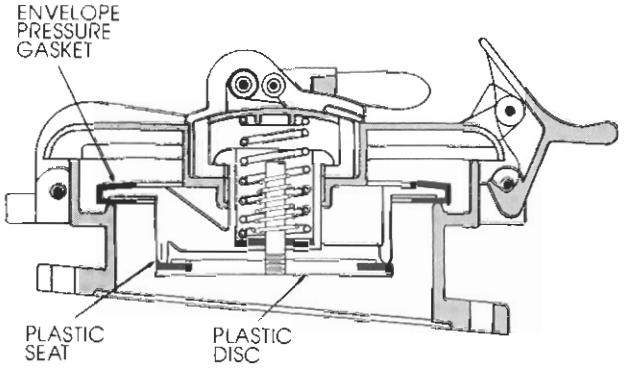
ENARDO Thief Hatches are available in a combination unit consisting of a spring-loaded thief hatch with an automatic bypass vapor valve mounted on its body. In a vapor control system, the vent line is connected to the bypass. When a tank is opened, it seals off the vent line, isoloting the tank from the remaining tanks in a battery. When the hatch is closed, the vent line is open, equalizing the vapor pressure in all tanks. As a result, only the pressure and vapor in the tank being gauged or thieved is lost.

The valve in the bypass is controlled by a lever which is activated by the hatch center. Any bypass adjustments should be made at the level adjusting pin.



PLASTIC TRIM

For adaption to sour gas applications, all ENARDO Thief Hatches are available with a plastic trim kit which includes a plastic seat and vacuum disc with fluorocarbon gaskets. In the spring-loaded series, springs are wound with corrosive-resistant Inconel wire. When ordering, simply add the letters "PT" to the thief hatch series number (Example: 660LB-PT).



This sectional view of the Model 660LB-PT shows the plastic vacuum disc and valve seat used on all Plastic Trim (PT) models.

ENVELOPE PRESSURE GASKETS

Patented ENARDO Envelope Gaskets are used on all spring-loaded type hatches. As depicted in the accompanying illustrations, tiny spacers are situated evenly around the inner surfaces of the gasket resting against the center pressure disc. These spacers are designed to hold the gasket away from the lower metal surface. All tank pressure is therefare exerted against the inner surface of the gasket, causing the gasket to be pressed against the seat with a wrap-around contact that creates a positive seal with the machined valve seat. The gasket fits tight around the machined outer edge of the disc and will effectively hold pressures in excess of 24 ounces.

While conventional flat gaskets do not seal tightly and constantly leak vapor pressure, the ENARDO Pressure Gasket maintains a relatively high pressure differential around the outer rim of the valve seat to effectively maintain pressure levels.

STANDARD PRESSURE SETTINGS

Pressure settings are available in 2, 4, 8, 16 and 24 ounces. Savings in gravity and volume may be achieved by using higher pressures on the thief hatch for tanks designed to withstand such pressures. These higher pressures are obtained by using stronger or heavier springs in the pressure valve. Pressure settings on the hatch can easily be changed by removing the existing spring and replacing it with another of the desired pressure.

Pressure settings should always be in accordance with the tank manufacturers' specifications. To prevent the hatch from opening, the pressure setting an the hatch should be from 2 to 4 ounces greater than that an the vent valve in the vapor line.

HATCH USE

Unless gauging or thieving, tank thief hatches should be kept closed to prevent loss of gravity and valume. ENARDO Pressure Relief Valves and Thief Hatches are capable of relieving the pressures generated when tanks are being filled at rates of as much as 1,750 barrels per hour.

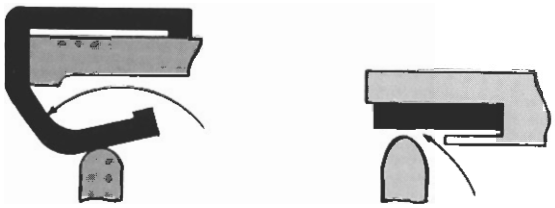
For added safety, stop plugs are incorporated to prevent the hatch cover from striking the tank and causing a spark while being opened. Hatches should be opened slowly and allowed to drop back against the stop plugs easily. When closing the hatch, the cover should be lowered easily and never allowed to drop down with it's full weight.

HATCH MAINTENANCE

ENARDO Hatches will provide for long, trouble-free operation if properly maintained. Pressure and vacuum seats, as well as discs, should be wiped clean each time the tank is thieved.

HOW THE ENARDO ENVELOPE GASKET WORKS

Pressure created within the tank energizes the ENARDO Envelope Gasket as shown above left, forcing it down around the outer edge of the seat to form a wide contact area. By contrast, the conventional flat gasket maintains only "line" contact with its seat.



As tank pressure mounts, it forces the thin, flat gasket of the conventional hatch to lift, breaking its seat. The ENARDO, on the other hand, continues to keep its seat as the hatch assembly rises.

When the rated pressure of the valve has been reached, the disc with the envelope gasket snaps back into its original shape. The valve has attained an immediate full-open, creating a sudden release of pressure whose escape velocity blows the seat and gasket clean.

As tank pressures fall, the disc and envelope gasket falls into position against the seat, once again to create a tight seal.

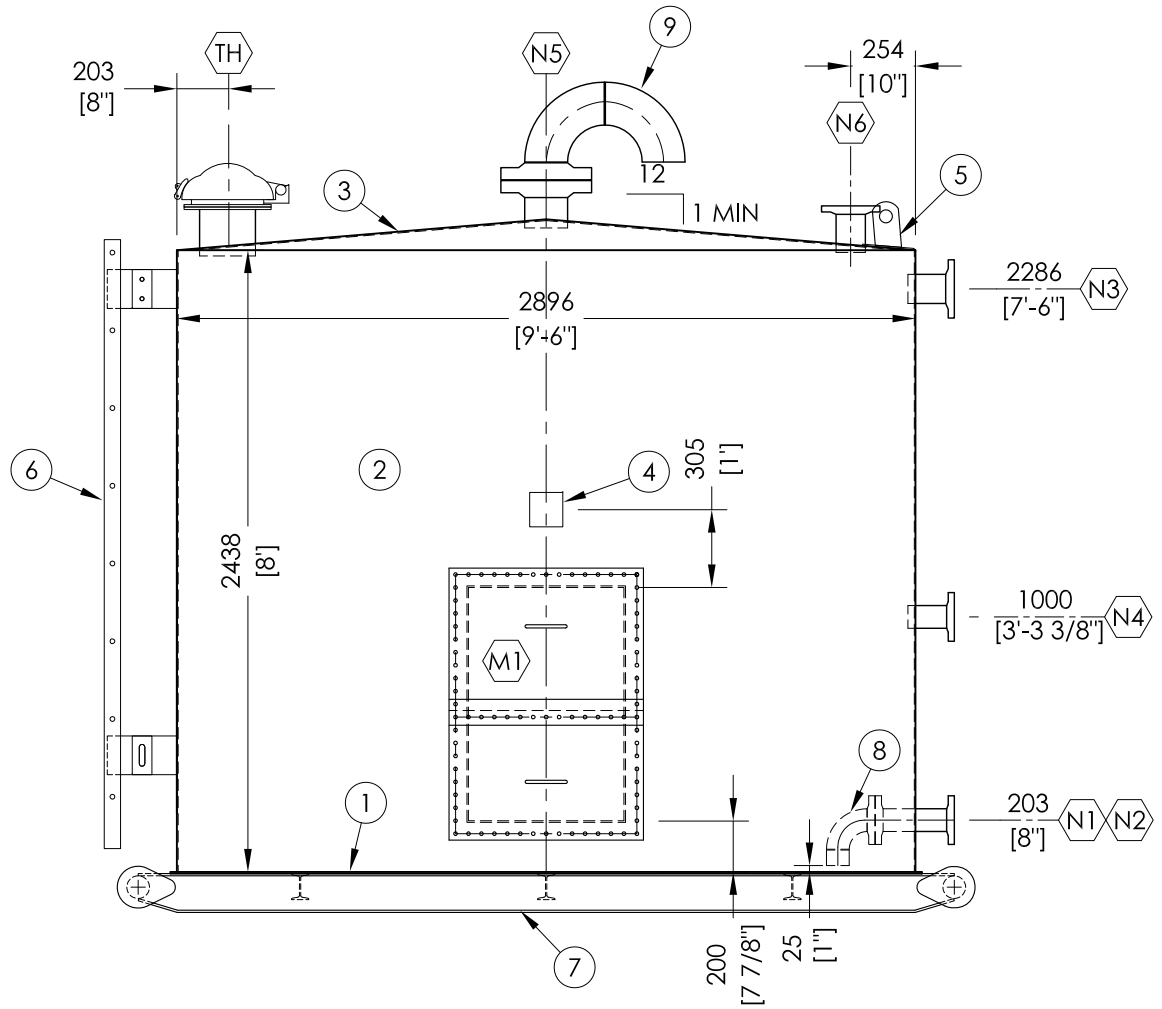
In contrast, the gasket of the conventional hatch takes longer to recover its seat. As a result, a metering action occurs which prevents the valve from seating firmly and from holding tank pressures effectively.

ARGO
SALES LTD

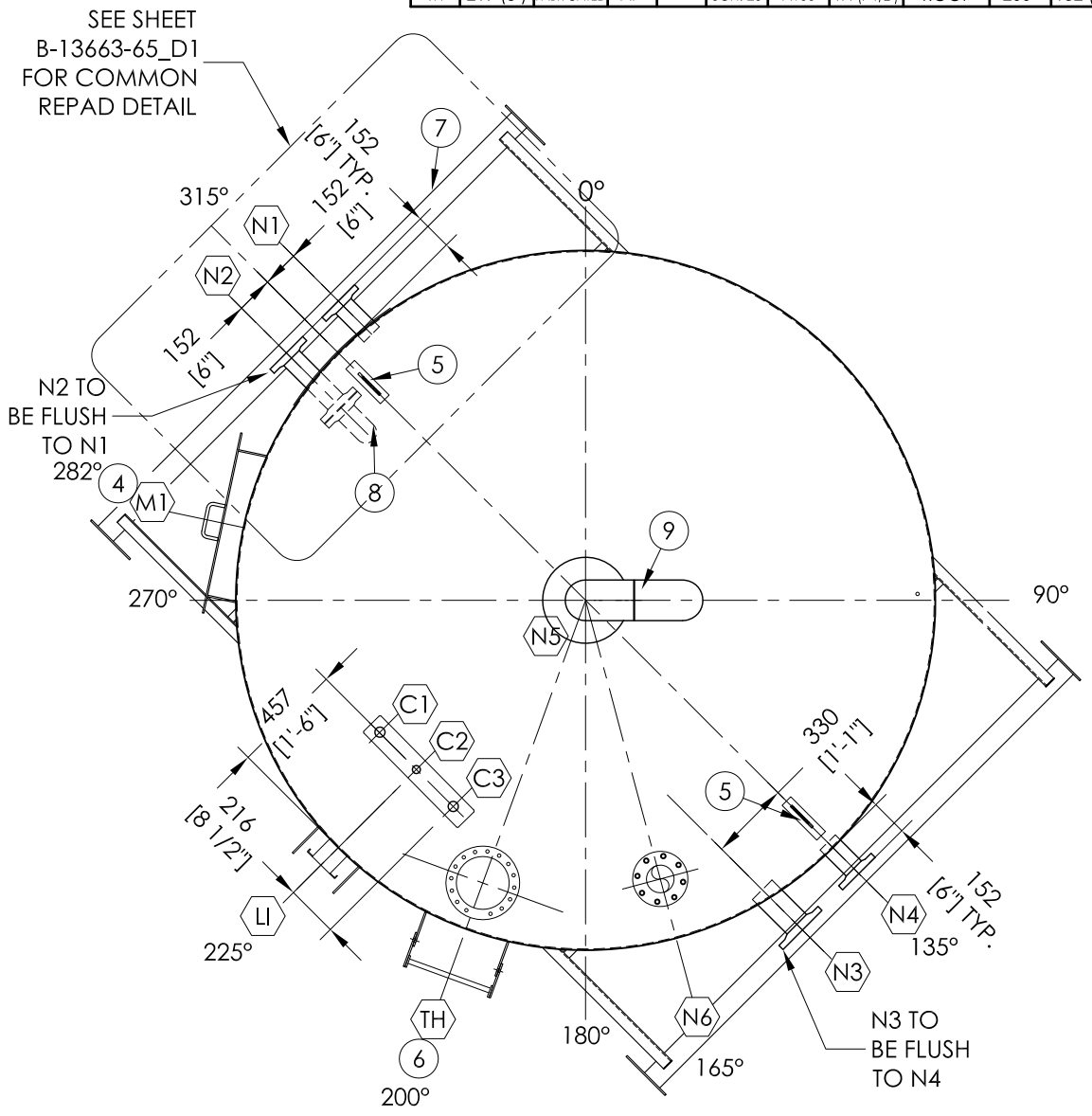
AS BUILT DRAWINGS

SHIPPING INFORMATION:
HEIGHT: APPROX. 2988mm (9-9 5/8") WIDTH: 3006mm (9'-10 3/8") LENGTH: 3461mm (11'-4 1/4") WEIGHT: APPROX. 5880 LBS (2671 KG)
SHIPPED LOOSE ITEMS
(1) 6" GOOSENECK c/w BOLTUPS

NOZZLES SCHEDULE													
MARK	SIZE	RATING	FLANGE EXT.	FLANGE INT.	SCH.	MTL.	CUT LENGTH	ELEV.	ORIENT.	PROJECTION EXT.	PROJECTION INT.	SERVICE	ITEM No.	DETAIL DWG
N1	89 (3")	CL150	RFSO	-	SCH. 40	A105	180 (7 1/8")	203	SEE DWG	DWG	25 (1")	INLET	A,D,H	D1
N2	89 (3")	CL150	RFSO	RFSO	SCH. 40	A105	288 (11 5/16")	203	SEE DWG	DWG	152 (6")	TRUCK OUT	A,D,H	D1
N3	114 (4")	CL150	RFSO	-	SCH. 40	A105	221 (8 11/16")	2286	SEE DWG	DWG	25 (1")	VENT INLET	B,E	-
N4	89 (3")	CL150	RFSO	-	SCH. 40	A105	167 (6 5/8")	1000	135°	152 (6")	25 (1")	DRAIN INLET	A,D	-
N5	168 (6")	CL150	RFSO	-	SCH. 40	A105	171 (6 11/16")	ROOF	CENTER	152 (6")	25 (1")	VENT c/w GOOSENECK	C,F	D1
N6	114 (4")	CL150	RFSO	-	SCH. 40	A105	183 (7 3/16")	ROOF	165°	152 (6")	25 (1")	LIT	B,E	-
C1	42 (1 1/4")	3000#	FNPT	-	FULL	A105	-	ROOF	225°	MAX.	MIN.	CABLE GUIDE CONNECTION	H	-
C2	33 (1")	3000#	FNPT	-	FULL	A105	-	ROOF	225°	MAX.	MIN.	LEVEL INDICATOR	G	-
C3	42 (1 1/4")	3000#	FNPT	-	FULL	A105	-	ROOF	225°	MAX.	MIN.	CABLE GUIDE CONNECTION	H	-
						-								
M1	24"x36"	FABRICATED	-	-	-	A36	-	SEE DWG	282°	MAX.	N/A	SHELL MANWAY	M1	MW
TH	219 (8")	FABRICATED	API	-	SCH. 20	A106	191 (7 1/2")	ROOF	200°	152 (6")	25 (1")	THIEF HATCH	TH	D1



ELEVATION



ORIENTATION

TESTING NOTES:

1) TANK TO BE AIR/LEAK TESTED TO 1.5 PSI

THIRD PARTY INSPECTION: YES

1. INTERNAL FINISH:
BLAST: NO INTERNAL FINISH

2. EXTERNAL FINISH:
BLAST: SSPC-SP7 BRUSH BLAST
PRIMER: 1.5 - 2.0 MILS DFT OF CLOVERDALE T-101 PRIMER
INSULATION: NONE
PAINT: 1.5 - 2.0 MILS DFT OF CLOVERDALE **(ARGO GREY : CC425 ENAMEL)**

3. EXTERNAL BOTTOM FINISH:
BLAST: NO BOTTOM FINISH

REVISIONS

REV.	DESCRIPTION	DATE	BY	CHK	APP
2	AS BUILT	03.24.15	CP		
1	REVISED GOOSENECK, ADDED N6 AND REORIENTED LI & TH	12.24.14	CGC		
0	ISSUED FOR FABRICATION	12.02.14	CP		
B	ISSUED FOR APPROVAL	11.12.14	MG		
A	ISSUED FOR REVIEW/MARKUP	10.23.14	CP	CGC	

CUSTOMER: HUSKY

PO #: 8400899432 LSD. XX-XX-XXX-XX WXM

TITLE: ONE (1) 16 CU.M. (100BBL)
2896mm (9'-6") DIA. X 2438mm (8'-0") HIGH
100 BBL BASE SKIDDED STORAGE TANK
ORIENTATION DRAWING

ARGO SALES LTD

DWG BY: CP	QUOTE #: TQ14-116B	SCALE: 1:50	CUSTOMER TAG #: T-100			
PROJ. MANAGER: RR		SHEET:	SERIAL #:	DWG TAG:	SHEET:	REV.
ARGO DRAWING NO.:		B	13663-65	OR	1 of 7	2

BILL OF MATERIALS

MARK	QTY	PART NAME	DESCRIPTION	LENGTH	MATERIAL
				-	
1	1	FLAT BOTTOM	PLATE 6.4 x 2946 DIA. (1/4" x 9'-8" DIA)	-	A36
2	1	CAN	PLATE 4.8x 2438x 2896 DIA, ROLLED (3/16"x 8'-0"x 9'-6")	9098 (29'-10 3/16")	A36
3	1	CONED ROOF	PLATE 4.8x 2918 O.D. (3/16"x 9'-7"), (1:12)SLOPE	-	A36
4	1	NAME PLATE	PLATE & BRACKET	-	-
5	2	SMALL LIFT LUG	12.7 (1/2") LANYARD TIE-DOWN c/w 6.4 (1/4") REPAD	D1 (SHT 3)	A36
6	1	LADDER	FIXED LADDER, 2396mm (7'-10 3/8")	CL (SHT 5)	A36/44W
7	1	SKID	BASE SKID, 2286 x 3200 (7'-6" X 10'-6")	SK (SHT 6)	A36
8	1	INTERNAL PIPING	N2-TRUCK OUT DOWNCOMER	D1	-
9	1	GOOSENECK	N5 - GOOSENECK	D1	-
M1	1	MANWAY	SPLIT RECTANGULAR, 24"x 36" (610x 914)	MW (SHT 4)	A36
LI	1	LEVEL GAUGE SYS	ARGO STANDARD GAUGE SYSTEM	-	-
			w/ METRIC LEVEL BOARD	-	
TH	1	THIEF HATCH EXT.	ARGO BUILT THIEF HATCH EXTENSION	D1 (SHT 3)	A36
TH	1	THIEF HATCH	219 DIA. (8") ENARDO 660 SWEET SERVICE THIEF HATCH	-	
			SET @ 16oz PRESS./0.4oz VAC		
				-	
			NOZZLE COMPONENTS	-	
A	4	FLANGE	89 DIA. (3") - CL150, RFSO	-	A105
B	1	FLANGE	114 DIA. (4") - CL150, RFSO	-	A105
C	1	FLANGE	168 DIA. (6") - CL150, RFSO	-	A105
D	1	PIPE	89 DIA (3") SCH 40 SMLS	635 (2'-1 1/16")	A106
E	1	PIPE	114 DIA (4") SCH 40 SMLS	404 (15 3/4")	A106
F	1	PIPE	168 DIA (6") SCH 40 SMLS	171 (6 11/16")	A106
G	1	FULL CPLG	33 DIA. (1") 3000# NPT	-	A105
H	2	FULL CPLG	42 DIA. (1 1/4") 3000# NPT	-	A105
I	1	REPAD	COMMON REPAD: 6.4x265x570(1/4"x10 3/8"x7 7/16")	D1	A36

DESIGN NOTES

1. TANK TO BE BUILT AND TESTED TO **API-12F** SPECS. MODIFIED (NON LABELED).
2. DESIGN PRESSURE **16.0 oz./IN²** (6.9 KPA)/DESIGN VACUUM -**0.5 OZ./IN²** (-0.25 KPA)
3. DESIGN TEMPERATURE: **80°C**
4. MDMT: **-29°C**
5. CORROSION ALLOWANCE: **NIL**
6. REFER TO ORIENTATION DRAWING FOR PROPER LOCATION OF ALL NOZZLES, COUPLINGS, ETC.
7. ALL DIMENSIONS ARE IN mm (INCHES).
8. ALL ELEVATIONS TAKEN FROM TOP OF TANK FLOOR.
9. STUDS/NUTS/GASKETS - ANSI FLANGES : **B7 / 2H / 316SS FLEX**
10. FASTENERS/GASKETS - MANWAYS & TH: **GRADE 5 / NEOPRENE**
11. ROOF SHELL JOINT NOT BACKWELDED
12. ALL CONNECTIONS SHIPPED WITH PLUGS AND PVC PROTECTORS UNLESS NOTED OVERWISE
13. RECORD ALL MATERIAL HEAT NUMBERS AND MTR'S.**(1 CD+ HARD COPY OF DATA BOOK)**
14. RECTANGULAR MANWAY TO BE RAISED 200mm ABOVE THE FLOOR.

ARGO SALES LTD
655-30 Avenue
Nisku AB
Canada T9E 0R4
(780)-955-8660

API 12F MODIFIED

SERIAL NUMBER:	13663-65	CUSTOMER TAG #	
YEAR BUILT:	2015	DESIGN PRESSURE	6.9 kPa(16.0oz/in2)
NOMINAL DIAMETER:	2896mm (9'-6")	NOMINAL HEIGHT	2438mm (8'-0")
NOMINAL CAPACITY:	16cu.M (100BBL)	SHIPPING WEIGHT	2671kg (5880 lbs)

	THICKNESS	MATERIAL
ROOF	4.8mm (3/16")	A36
FLOOR	6.4mm (1/4")	A36
SHELL	4.8mm (3/16")	A36

INTERNAL FINISH

None

REVISIONS

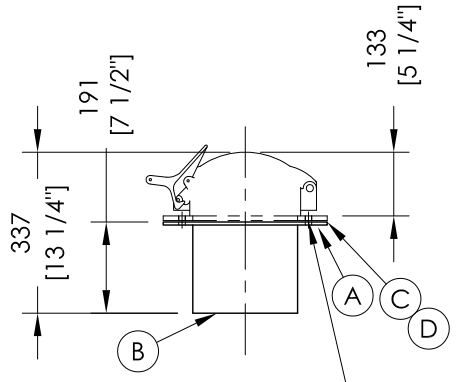
REV.	DESCRIPTION	DATE	BY	CHK	APP
2	AS BUILT	03.24.15	CP		
1	REVISED GOOSENECK AND ADDED N6	12.24.14	CGC		
0	ISSUED FOR FABRICATION	12.02.14	CP		
B	ISSUED FOR ISSUED FOR APPROVAL	11.12.14	MG		
A	ISSUED FOR REVIEW/MARKUP	10.23.14	CP	CGC	

CUSTOMER: HUSKY

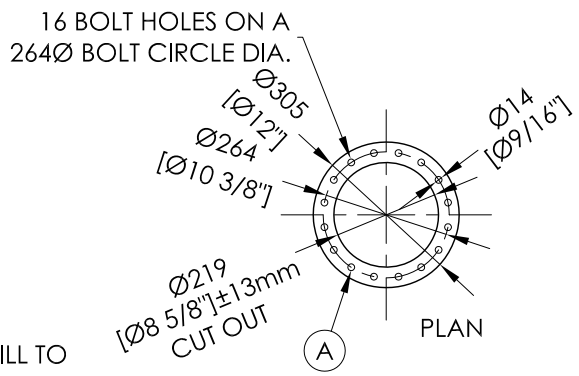
PO #: 8400899432 LSD. XX-XX-XXX-XX WXM

TITLE: ONE (1) 16 CU.M. (100BBL)
2896mm (9'-6") DIA. X 2438mm (8'-0") HIGH
100 BBL BASE SKIDDED STORAGE TANK
BILL OF MATERIAL

DWG BY: CP	QUOTE #: TQ14-116B	SCALE: NTS	CUSTOMER TAG #: T-100			
PROJ. MANAGER: RR	SHEET:	SERIAL #:	DWG TAG:	SHEET:		REV.
ARGO DRAWING NO.:	B	13663-65	BOM	2 of 7		2



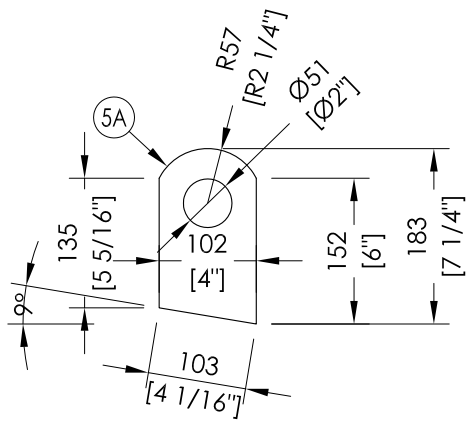
ELEVATION



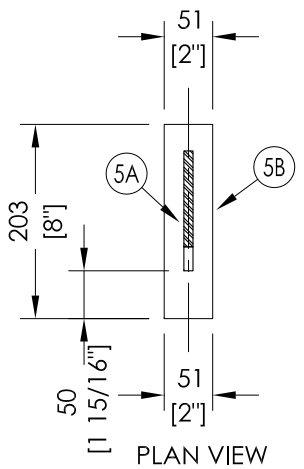
PLAN

BOLT HOLES DRILL TO
API PATTERN FOR ½" BOLTS 17/32

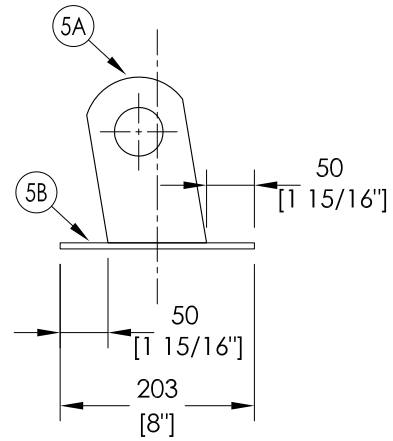
TH - THIEF HATCH EXTENSION



LUG DETAIL

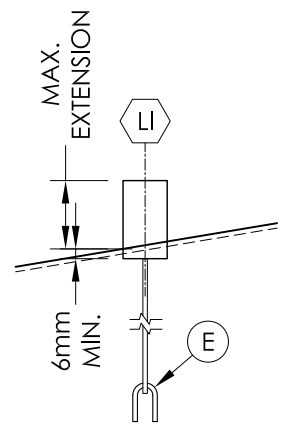


PLAN VIEW



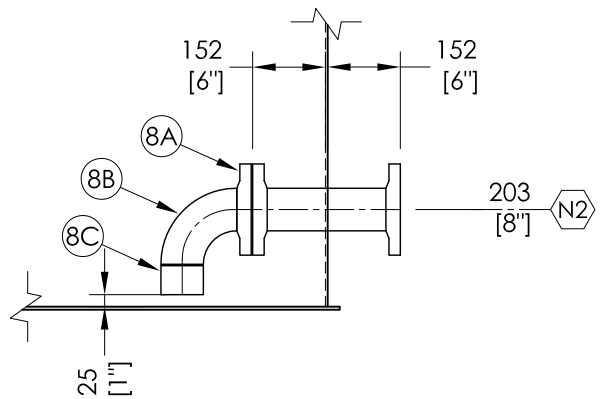
ELEVATION

ITEM 11 - SMALL LIFT LUG

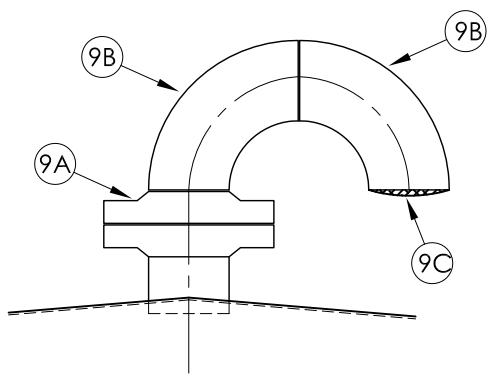


LEVEL INDICATOR

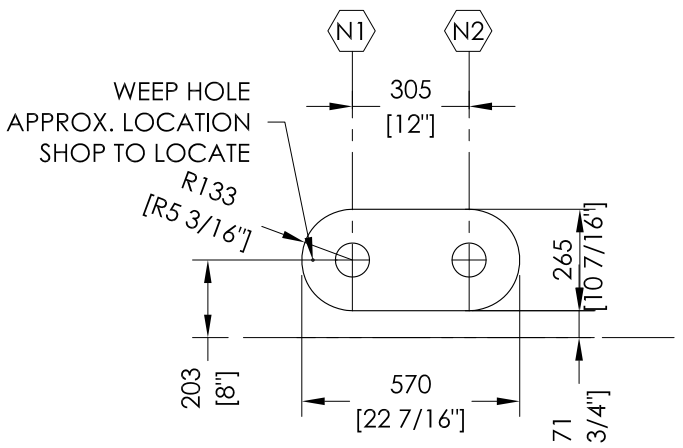
BILL OF MATERIALS					
MARK	QTY	PART NAME	DESCRIPTION	LENGTH	MATERIAL
			LANYARD TIE -DOWN	-	
5A	2	SMALL LIFT LUG	PLATE, 12.7x 102x 183 (1/2"x 4"x 7 1/4")	-	A36
5B	2	REPAD	FLAT BAR, 6.4x 51x 203 LG (1/4"x 2"x 8")	-	A36
				-	
			TH- THIEF HATCH EXTENSION	-	
A	1	FAB. FLANGE	PLATE, 6.4x 305x 219 LG (1/4"x 12"x 8")	-	A36
B	1	TH EXTENSION	PIPE, SMLS, 219 (8"), SCH 20 x 191 (7 1/2") LONG	-	A106
C	1	GASKET	219x 3mm THK (8"x 1/8")	-	NEOPRENE
D	16	BOLTS/NUTS	BOLTS w/ NUTS, 1/2" x 1 1/2" LG	-	GRADE 5 PLATED
				-	
			LEVEL INDICATOR	-	
E	2	CABLE ANCHOR	ROUND BAR, 3/8" x 3 1/2" LG. BENT @ 1 7/8" RAD.	-	316SS
				-	
			N2 - TRUCK OUT DETAIL	-	
8A	1	FLANGE	89 DIA. (3") - CL150, RFSO	-	A105
8B	2	ELBOW	89 DIA. (3") SCH. STD. 90° LRWE	-	A234
8C	1	PIPE	89 DIA. (3") SCH. 40 SMLS	61 (2 3/8")	A106
				-	
			N5 - VENT C/W GOOSENECK	-	
9A	1	FLANGE	168 DIA. (6") - CL150, RFSO	-	A105
9B	1	ELBOW	168 DIA. (6") SCH. STD. 90° LRWE	-	A234
9C	1	-	EXPANDED METAL (SHOP TO FIT)	-	A36
				-	
RP1			**COMMON REPAD COMPONENT**		
	1	REPAD	6.4x265 (1/4"x10 3/8") COMMON REPAD	570 (22 7/16")	A36



N2 - TRUCK OUT DETAIL



N5 - VENT



RP1 - COMMON REPAD

ROLL TO TANK O.D. - INCLUDE WEEP HOLES

DESIGN NOTES:

1. REFER TO ORIENTATION DRAWING FOR PROPER LOCATION OF ALL NOZZLES, COUPLINGS, ETC
2. ALL DIMENSIONS ARE IN mm (INCHES).

REVISIONS					
2	AS BUILT	03.24.15	CP		
1	REVISED GOOSENECK AND ADDED N6	12.24.14	CGC		
0	ISSUED FOR FABRICATION	12.02.14	CP		
B	ISSUED FOR APPROVAL	11.12.14	MG		
A	ISSUED FOR REVIEW/MARKUP	10.23.14	CP	CGC	
REV.	DESCRIPTION	DATE	BY	CHK	APP

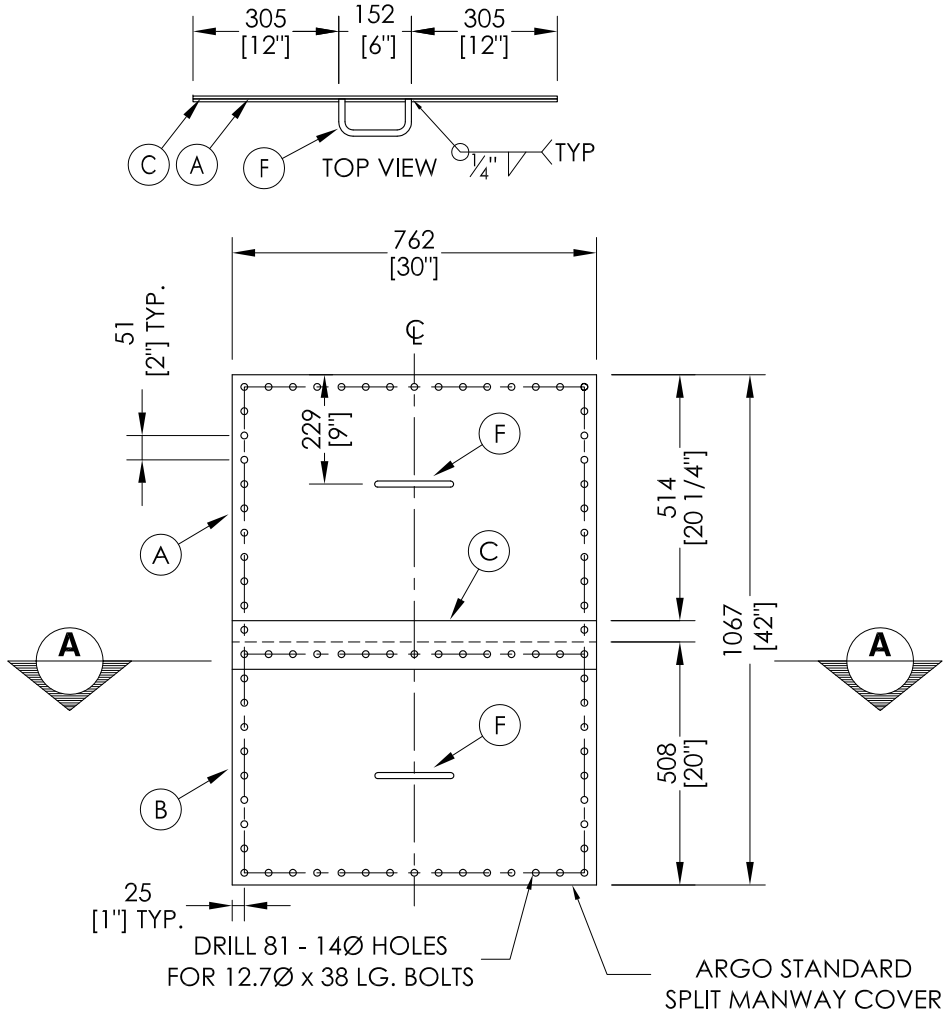
CUSTOMER: HUSKY

PO #: 8400899432 LSD. XX-XX-XXX-XX WXM

TITLE: ONE (1) 16 CU.M. (100BBL)
2896mm (9'-6") DIA. X 2438mm (8'-0") HIGH
100 BBL BASE SKIDDED STORAGE TANK
TANK COMPONENT DETAILS

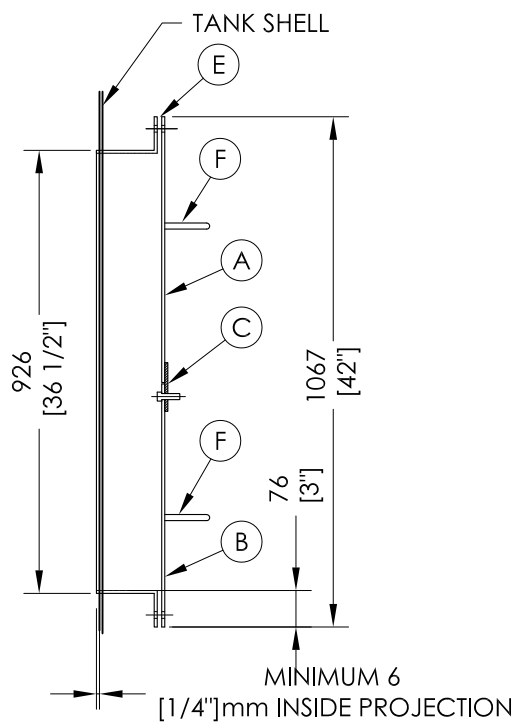
ARGO SALES LTD

DWG BY: CP	QUOTE #: TQ14-116B	SCALE: -	CUSTOMER TAG #: T-100			
PROJ. MANAGER: RR		SHEET:	SERIAL #:	DWG TAG:	SHEET:	REV.
ARGO DRAWING NO.:		B	13663-65	D1	3 of 7	2

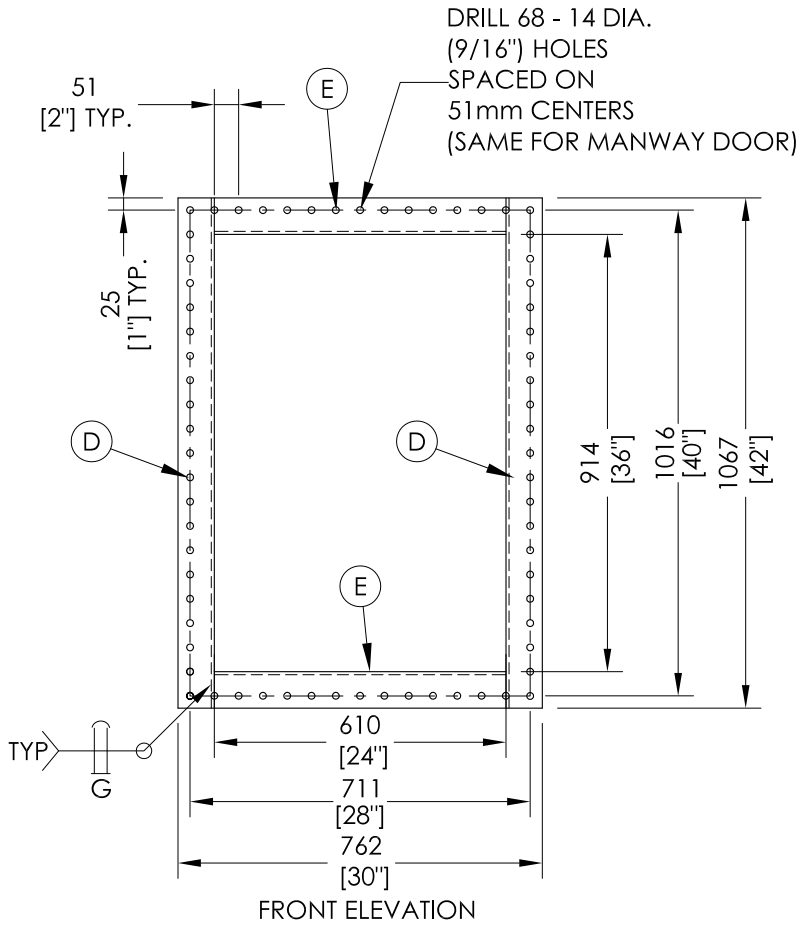


SPLIT MANWAY COVER DETAIL

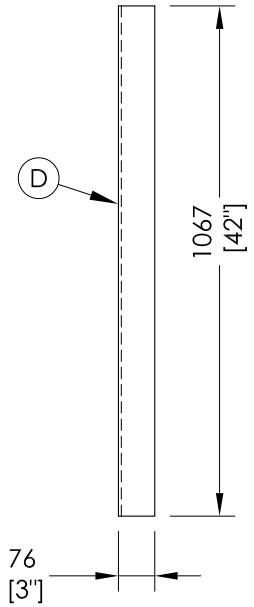
ITEM - M1



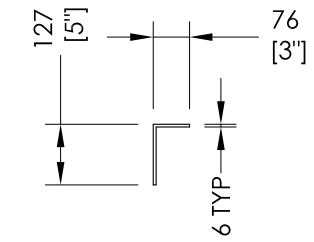
SIDE ELEVATION



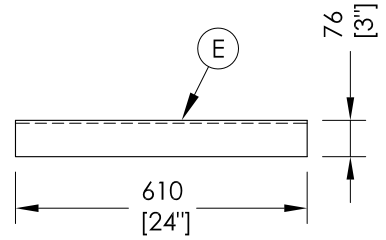
FRONT ELEVATION



SIDE FLANGE
(2) REQ'D



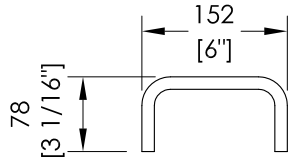
FLANGE ANGLE
PROFILE



TOP/BTM FLANGE
(2) REQ'D

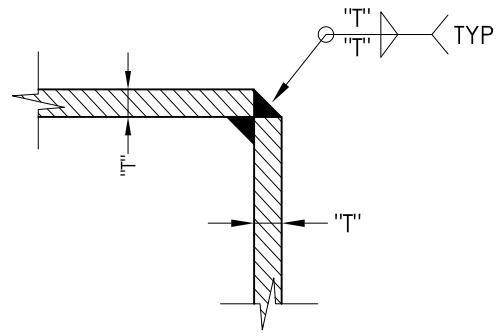
ARGO STD. MANWAY FLANGE DETAIL

ITEM - M1



HANDLE DETAIL

SCALE: 1:8



FOR REFERENCE ONLY

BILL OF MATERIALS

MARK	QTY	PART NAME	DESCRIPTION	LENGTH	MATERIAL
A	1	TOP MW COVER	PLATE, 6.4x 762x 559 LG (1/4"x 30"x 22" LG)	-	A36
B	1	BOTTOM MW COVER	PLATE, 6.4x 762x 508 LG (1/4"x 30"x 20" LG)	-	A36
C	1	LAP COVER	PLATE, 6.4x 762x 102 LG (1/4"x 30"x 4" LG)	-	A36
D	2	SIDE FLANGE	ANGLE, L127x76x6.4 (L5x3x 1/4")	1067 (42")	A36
E	2	TOP/BTM FLANGE	ANGLE, L127x 76x 6.4 (L5x 3x 1/4")	610 (24")	A36
F	1	MW HANDLE	ROUND BAR, 1/2" (12.7)	-	A36
G	1	MW GASKET	STRIP GASKET, 1/8"x 2" (3mm x 51)	CUT TO FLG LENGTH	NEOPRENE
H	8	MW GASKET	RADIUS GASKET, 1/8" (3mm)	-	NEOPRENE
I	81	BOLTS/NUTS	BOLTS w/ NUTS, 1/2" x 1 1/2" LG	-	GRADE 5 PLATED

WELDING NOTES:

1) ALL SHARP EDGES AND BURRS TO BE REMOVED.
2) ALL WELDING TO BE DONE TO LATEST REVISON OF CWB WPDS.
3) CWB SHOP SUPERVISOR TO SPECIFY WELDING PROCESS

BOLTING:

1. ALL BOLTING TO BE 16mm (⅝") GRADE 5 OR EQUIVALENT.

DESIGN NOTES:

1. ALL DIMENSIONS ARE IN mm/INCH.
2. REFER TO ORIENTATION DRAWING FOR PROPER LOCATION.
3. FOR INSTALLING INTO TANK, All SQUARE MANWAYS WILL BE COMPLETED WITH THREE (3) PASS FILLET ON EXTERNAL CORNERS. THE SQUARE STYLE MANWAYS WILL BE WELDED INTO THE TANKS WITH TWO (2) EXTRA WRAP PASSES THAT WILL BE AT LEAST FOUR (4") INCHES IN LENGTH WITH THE CENTER OF THE WELD AT THE CORNER OF THE MANWAY. THEY WILL BE THE SAME SIZE AS THE INITIAL PASS AND ON THE TOP OF THE INITIAL FILLET PASS.
4. HOLES ARE TO BE DRILLED THROUGH COVER AND FLANGE AT THE SAME TIME, TO ENSURE HOLES MATCH UP PERFECTLY.

REVISIONS

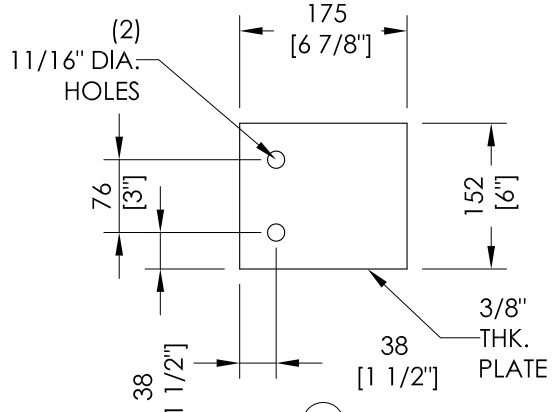
REV.	DESCRIPTION	DATE	BY	CHK	APP
1	AS BUILT	03.24.15	CP		
0	ISSUED FOR FABRICATION	12.02.14	CP		
B	ISSUED FOR APPROVAL	11.12.14	MG		
A	ISSUED FOR REVIEW/MARKUP	10.23.14	CP	CGC	

CUSTOMER: HUSKY

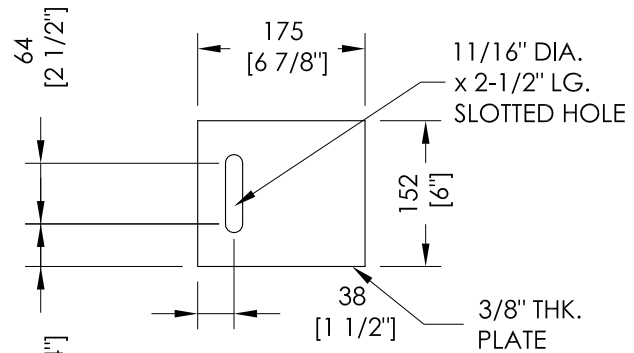
PO #: 8400899432 LSD. XX-XX-XXX-XX WXM

TITLE: ONE (1) 16 CU.M. (100BBL)
2896mm (9'-6") DIA. X 2438mm (8'-0") HIGH
100 BBL BASE SKIDDED STORAGE TANK
ARGO STANDARD MANWAY DETAIL

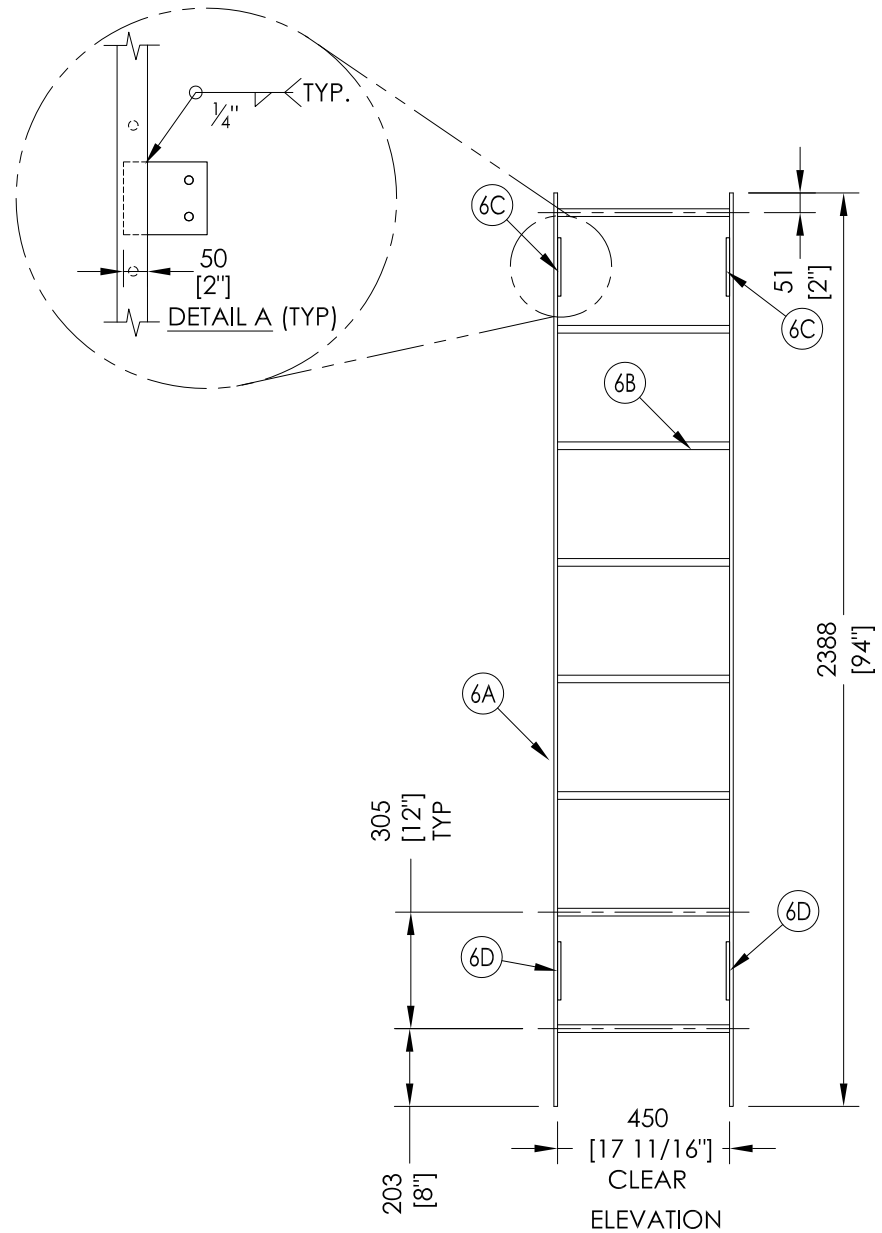
DWG BY: CP	QUOTE #: TQ14-116B	SCALE: -	CUSTOMER TAG #: T-100		
PROJ. MANAGER: RR	SHEET:	SERIAL #:	DWG TAG:	SHEET:	REV.
ARGO DRAWING NO.:	B	13663-65	MW	4 of 7	1



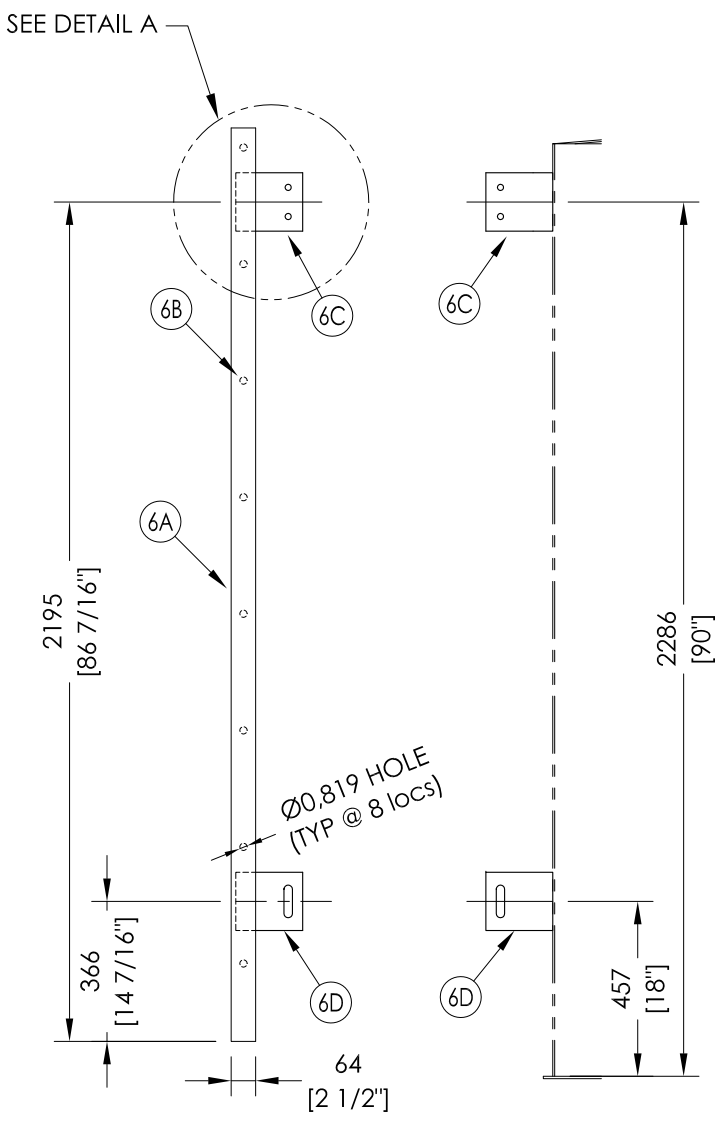
ITEM (6C)
2 HOLES LADDER CLIPS



ITEM (6D)
SLOTTED LADDER CLIPS



ELEVATION



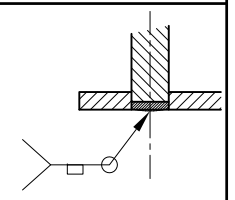
SIDE VIEW

FIXED LADDER

BILL OF MATERIALS

MARK	QTY	PART NAME	DESCRIPTION	LENGTH	MATERIAL
6A	2	LADDER RUNNER	FLAT BAR, 9.5x 64 (3/8" x 2 1/2")	2388 (94")	A36/44W
6B	8	LADDER RUNG	ROUND BAR, 19mm (3/4") DIA	462 (18 3/16")	A36/44W
6C	2	LADDER CLIP	PLATE 9.5x 152x 175 LG (3/8" x 6" x 6 7/8"), 2 HOLE	-	A36/44W
6D	8	LADDER CLIP	PLATE 9.5x 152x 175 LG (3/8" x 6" x 6 7/8"), SLOTTED	-	A36/44W
6E	12	BOLTS/NUTS	BOLTS c/w NUTS, 5/8"x 1 1/2" LG	-	GRADE 5 PLATED
				-	
				-	

RUNG TO RUNNER LADDER



DESIGN NOTES:
1. ALL DIMENSIONS ARE IN mm/INCH.
2. ESTIMATED SHIPPING WEIGHT IS 112 LBS.(51 KGS).

BOLTING:
1. ALL BOLTING TO BE 16mm (5/8") GRADE 5 OR EQUIVALENT.

CAGE LADDER FINISH:
BLAST: SSPC-SP7 BRUSH BLAST
PRIMER: 1.5 - 2.0 MILS DFT OF CLOVERDALE T-101 PRIMER
PAINT: 1.5 - 2.0 MILS DFT OF CLOVERDALE (ARGO GREY CC425 ENAMEL)

WELDING NOTES:
1) ALL SHARP EDGES AND BURRS TO BE REMOVED.
2) ALL WELDING TO BE DONE TO LATEST REVISON OF CWB WPDS.
3) CWB SHOP SUPERVISOR TO SPECIFY WELDING PROCESS.

REVISIONS

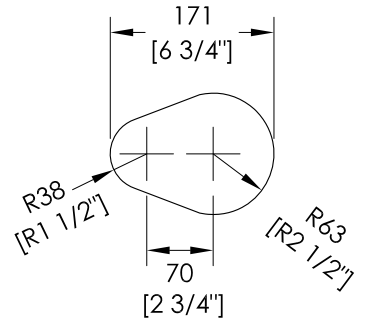
REV.	DESCRIPTION	DATE	BY	CHK	APP
1	AS BUILT	03.24.15	CP		
0	ISSUED FOR FABRICATION	12.02.14	CP		
B	ISSUED FOR APPROVAL	11.12.14	MG		
A	ISSUED FOR REVIEW/MARKUP	10.23.14	CP	CGC	

CUSTOMER: HUSKY
PO #: 8400899432 LSD. XX-XX-XXX-XX WXM

TITLE: ONE (1) 16 CU.M. (100BBL)
2896mm (9'-6") DIA. X 2438mm (8'-0") HIGH
100 BBL BASE SKIDDED STORAGE TANK
CAGE LADDER DETAIL

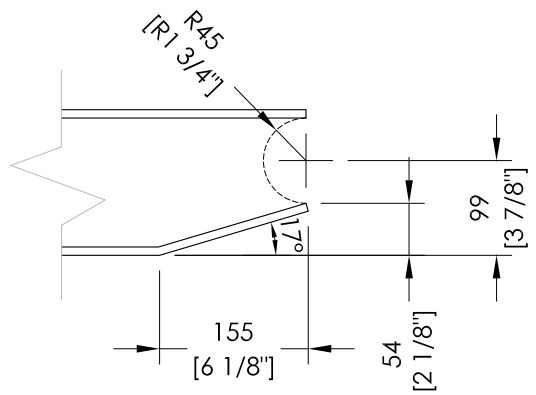
ARGO SALES LTD

DWG BY: CP	QUOTE #: TQ14-116B	SCALE: -	CUSTOMER TAG #: T-100		
PROJ. MANAGER: RR	SHEET:	SERIAL #:	DWG TAG:	SHEET:	REV.
ARGO DRAWING NO.:	B	13663-65	CL	5 of 7	1



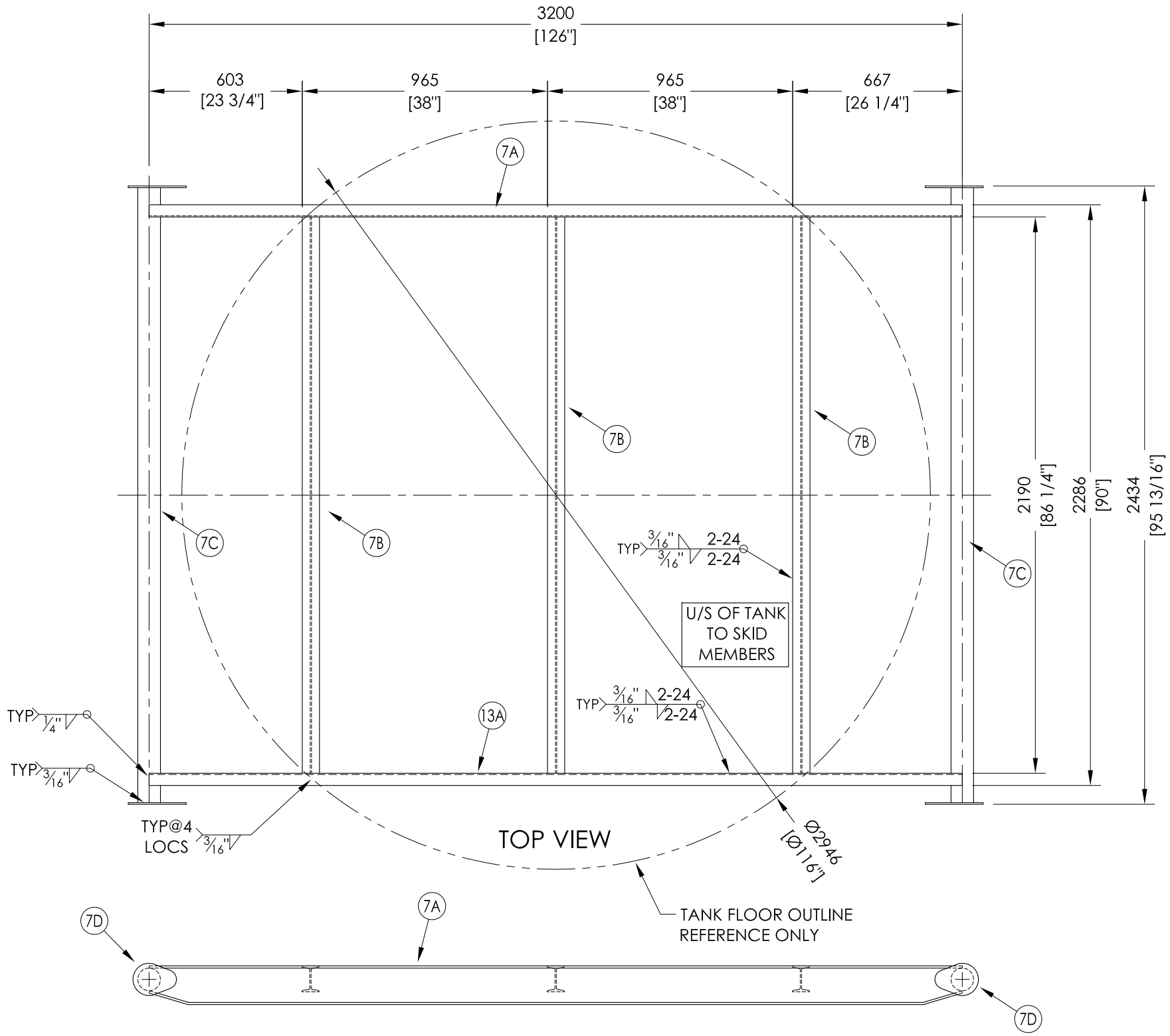
3" TEAR DROP DETAIL

SCALE: 1 TO 8



PULL BAR DETAIL

SCALE: 1:8



ELEVATION VIEW

BILL OF MATERIALS

MARK	QTY	PART NAME	DESCRIPTION	LENGTH	MATERIAL
7A	2	MAIN MEMBERS	CHANNEL, C150x12 (C6x8.2)	3200 (126")	A36
7B	3	CROSS MEMBERS	WIDE FLANGE, S100x11 (S4x7.7)	2190 (86 1/4")	A36
7C	2	PULL BAR	PIPE, ERW, 89 DIA (3") SCH.40	2421 (95 5/16")	A53B
7D	4	3" TEARDROP	PLATE, 6.4x 228x 165 (1/4"x 9"x 8 3/8")	-	A36

DESIGN/WELDING NOTES:

1) ALL DIMENSIONS ARE IN mm/INCHES.
2) APPROXIMATE WEIGHT: 338 LBS (153 KG)
3) WIDE FLANGES ARE TO BE COPE FITTED WHERE APPLICABLE.
3) ALL WELDS ON THE TOP OF SKID TO BE GROUND SMOOTH.
5) ALL WELDING TO BE DONE TO LATEST REVISON OF CWB WPDS.
6) CWB SHOP SUPERVISOR TO SPECIFY WELDING PROCESS
7) SEE ARGO INTERNAL DRAWING ASL-SKID-FAB SKID WELDING FOR FURTHER WELDING AND COPING DETAILS.

SKID FINISH:

BLAST: SSPC-SP7 BRUSH BLAST
PRIMER: 1.5 - 2.0 MILS DFT OF CLOVERDALE T-101 PRIMER
PAINT: 1.5 - 2.0 MILS DFT OF CLOVERDALE (ARGO GREY CC425 ENAMEL)

REVISIONS

REV.	DESCRIPTION	DATE	BY	CHK	APP
1	AS BUILT	03.24.15	CP		
0	ISSUED FOR FABRICATION	12.02.14	CP		
B	ISSUED FOR APPROVAL	11.12.14	MG		
A	ISSUED FOR REVIEW/MARKUP	10.23.14	CP	CGC	

CUSTOMER: HUSKY

PO #: 8400899432 LSD. XX-XX-XXX-XX WXM

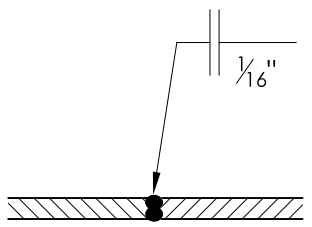
TITLE: ONE (1) 16 CU.M. (100BBL)
2896mm (9'-6") DIA. X 2438mm (8'-0") HIGH
100 BBL BASE SKIDDED STORAGE TANK
SKID DETAIL DRAWING

ARGO SALES LTD

DWG BY: CP	QUOTE #: TQ14-116B	SCALE: -	CUSTOMER TAG #: T-100		
PROJ. MANAGER: RR	SHEET:	SERIAL #:	DWG TAG:	SHEET:	REV.
ARGO DRAWING NO.:	B	13663-65	SK	6 of 7	1

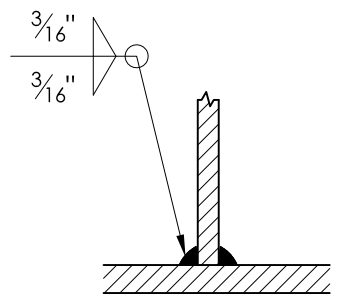
FLOOR JOINTS

ARGO WPS: ASL-1-AW OR ASL-13



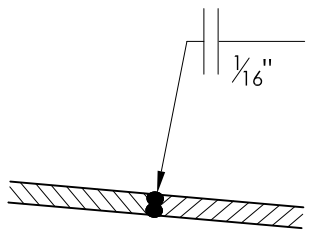
SHELL TO FLOOR JOINT

ARGO WPS: ASL-1-AW OR ASL-13



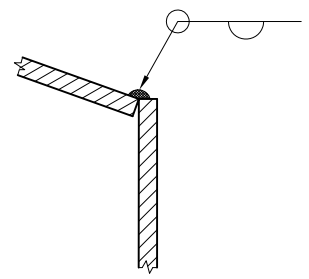
ROOF JOINT

ARGO WPS: ASL-1-AW OR ASL-13



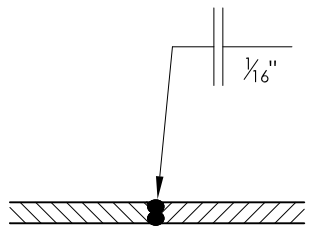
ROOF TO SHELL JOINT

ARGO WPS: ASL-1-AW OR ASL-13



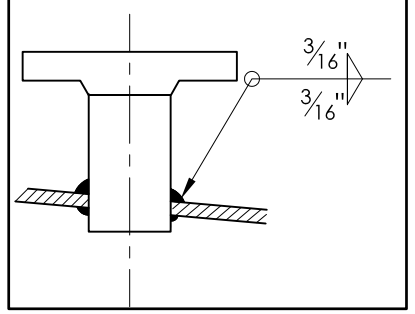
SHELL JOINT - VERT.

ARGO WPS:ASL-1-AW OR ASL-13



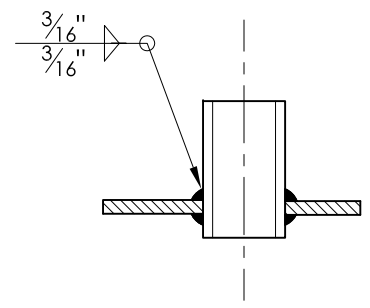
NOZZLE ON ROOF

ARGO WPS: ASL-13



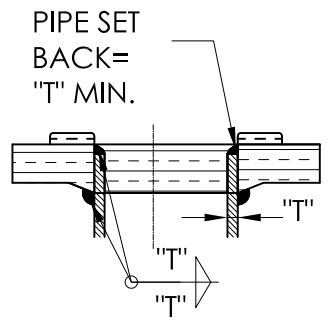
CPLG. ON ROOF

ARGO WPS:ASL-1-AW OR ASL-13



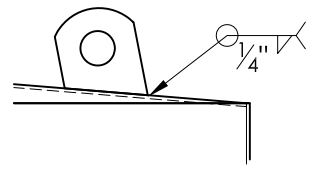
PIPE TO NOZZLE (RFSO)

ARGO WPS:ASL-1- AW



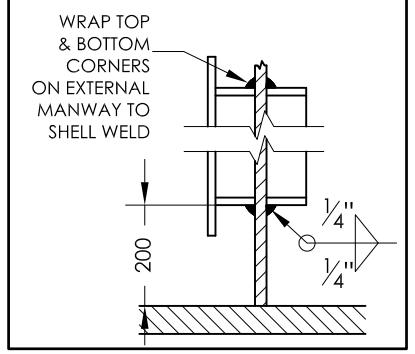
ROOF LIFT LUG

ARGO WPS: ASL-1- AW



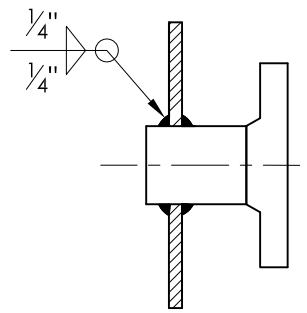
MANWAY TO TANK SHELL

ARGO WPS: ASL-13



SHELL NOZZLE

ARGO WPS:ASL-13



WELDING NOTES:

1) ALL SHARP EDGES AND BURRS TO BE REMOVED.
2) E7024 WELDING ROD HAS BEEN PROHIBITED.
3) **E7018 ROD USED ON ALL FLAT SURFACE WELDING, E6010 & E 7018 ROD USED ON ALL REMAINING WELDS.**
4) **ALL STRUCTURAL CLIPS AND OTHERS ATTACHEMENTS TO THE INTERIOR AND EXTERIOR TANK SURFACES SHALL BE WELDED WITH A CONTINUOUS FILLET WELD ALL AROUND.**
5) FILLET WELD SIZES ARE DETERMINE BY THE SMALLEST THICKNESS OF THE TWO ITEMS WELDED TOGETHER UNLESS OTHERWISE NOTED.
6) ALL ATTACHMENT WELDS TO BE 1/4" FILLET UNLESS OTHERWISE NOTED

REVISIONS

REV.	DESCRIPTION	DATE	BY	CHK	APP
1	AS BUILT	03.24.15	CP		
0	ISSUED FOR FABRICATION	12.02.14	CP		
B	ISSUED FOR APPROVAL	11.12.14	MG		
A	ISSUED FOR REVIEW/MARKUP	10.23.14	CP	CGC	

CUSTOMER: HUSKY

PO #: 8400899432 LSD. XX-XX-XXX-XX WXM

TITLE: ONE (1) 16 CU.M. (100BBL)
2896mm (9'-6") DIA. X 2438mm (8'-0") HIGH
100 BBL BASE SKIDDED STORAGE TANK
WELD DETAILS

ARGO SALES LTD

DWG BY: CP	QUOTE #: TQ14-116B	SCALE: NTS	CUSTOMER TAG #: T-100			
PROJ. MANAGER: RR		SHEET:	SERIAL #:	DWG TAG:	SHEET:	REV.
ARGO DRAWING NO.:		B	13663-65	WD	7 of 7	1