

Qualification Codes/Standards: LR Material & Qualification Procedures for Ships Book A MQPS 0-1			
Manufacturer's Name: EC Industries Ltd		Manufacturer's Address: Pier 9, Richmond Terminal, 3481 North Marginal Rd, Halifax, Nova Scotia, Canada	
WPS Number and Revision:	Date:	Welding Procedure Qualification Record No (PQR):	PQR Certificate No:
FBB-INH Rev. 0	15 Dec 2003	FBB 1NHQ	HFX 0301080/5

Welding Process: FCAW	Type: Semi-automatic†
Welding Technique: Multi Run	
Welding Positions: Horizontal	

Weld Preparation Details (Sketch)	
Joint Design	Welding Sequences

Base Material Details		
Specification and Grade - side 1: CSA G40.21 GD 50 WT CAT4		
Specification and Grade - side 2: CSA G40.21 GD 50 WT CAT4		
Form: Plate and Pipe	Thickness Range (mm): 12.7-50.8	Pipe Outside Diameter (mm): ≥500

Consumable Details				
Filler Metal:				
Name: Flux Cored Wire E81T1-G		LR Grading: 3S 5Y40S		National Classification (if any): AWS A5-29
NIL				
Filler Metal Sizes (mm): 1.2 mm			Flux Type and Trade Name: Rutile NST Nittetsu SF-3AM	
Gas Composition:		Shielding 75% Ar+25% CO2 Backing N/A	Gas Flow Rate:	Shielding 38 CFH Backing N/A
Tungsten Electrode Type & Size:		N/A		
Backing Strip Type & Size:		N/A		

†Select from dropdown menu

* Delete as appropriate

Form 5206 (2003-06)


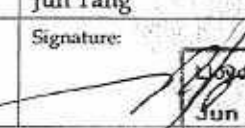
LOWERY HIGGINS GROUP BOOKS

Preheat/Heat Treatment Details:		
Pre Heat Temperature °C (min): 15	Interpass Temperature °C (max): 133	
Post weld Heat Treatment and/or Ageing:		
Method: n/a	Temperature °C: n/a	Time: n/a
Heating and Cooling Rates: n/a		

Technique Details:			
Method of Back Gouging and Cleaning: Arc Air Gouge & Grind Side 2 to sound metal, cleaning done by wire brush and grinding.			
String or Weave Bead:		Weaving (Maximum width of run) n/a	
Oscillations:	Amplitude n/a	Frequency n/a	Dwell time n/a
Contact tube to work distance: n/a			
Pulse Welding Details:			
Base Current: n/a	Base Time: n/a	Peak Current: n/a	Peak Time: n/a

Welding Details								
Run	Process	Size of Filler Metal	Current A	Voltage V	Type of Current/Polarity	Wire Feed Speed	Travel Speed	Heat Input KJ/mm
S1*/1	FCAW	1.2 mm	190	21.7	DCRP	230	156**	1.98
S1/2~ 20	FCAW	1.2 mm	190-200	21.5-22	DCRP	230	187-314	0.82-1.32
S2*/1	FCAW	1.2 mm	200	21.5	DCRP	230	205	1.26
S2/2~ 3	FCAW	1.2 mm	200	21.5	DCRP	230	303-333	0.77-0.85
S1: S2:	side 1 side 2							
* Unit	of travel	speed:	mm/min					

Other Information
Test report PSC 03-20076H refers.

Manufacturer: EC Industries Ltd		Surveyor to Lloyd's Register North America Inc. A member of the Lloyd's Register Group	
Office: Halifax			
Name: Vic De Beer	Date: 30 Mar 2004	Name: Jun Tang	Date: 30 Mar 2004
Signature: 		Signature: 	

1. This WPS is valid only if used by the above manufacturer.
2. The manufacturer is responsible for ensuring that WPS meets the technical requirements for the application.

This card is valid only when employed by a CWB certified company
Transferable Welder

Name: BART SKRODZKI
Employer: Heddle Marine Service Inc., Hamilton, ON
Thickness Range: 3mm & above
Material: Carbon Steel
Process: FCAW/MIGAW
Standard: CSA W47.1
Classification: S
Mode: SEMI-AUTO
Single Electrode Mechanized
Single Electrode Automatic
Class: FLATHORIZONTAL/VERTICAL UP/OVERHEAD

Exp. Date: Aug 17, 2019

See Reverse for Conditions

This card is valid only when employed by a CWB certified company
Transferable Welder

Name: WADY K. POZZI
Employer: Heddle Marine Service Inc., Hamilton, ON
Thickness Range: 3mm & above
Material: Carbon Steel
Process: SMAW
Standard: CSA W47.1
Classification: S
Electrode: F4
Mode: MANUAL
Class: FLATHORIZONTAL/VERTICAL UP/OVERHEAD

Exp. Date: Jan 11, 2019

See Reverse for Conditions

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

Name: JOHN H. BEETHAM
Employer: Heddle Marine Service Inc., Hamilton, ON
Thickness Range: 3mm & above
Material: Carbon Steel
Process: SMAW
Standard: CSA W47.1
Classification: S
Electrode: F4
Mode: MANUAL
Class: FLAT

Exp. Date: Dec 02, 2018

See Reverse for Conditions

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

Name: JOHN H. BEETHAM
Employer: Heddle Marine Service Inc., Hamilton, ON
Thickness Range: 3mm & above
Material: Carbon Steel
Process: FCAW/MIGAW
Standard: CSA W47.1
Classification: S
Mode: SEMI-AUTO
Single Electrode Mechanized
Single Electrode Automatic
Class: FLATHORIZONTAL/VERTICAL UP

Exp. Date: Dec 02, 2018

See Reverse for Conditions

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

Name: DALTON L. COLLISON
Employer: Heddle Marine Service Inc., Hamilton, ON
Thickness Range: 3mm & above
Material: Carbon Steel
Process: SMAW
Standard: CSA W47.1
Classification: S
Electrode: F4
Mode: MANUAL
Class: FLATHORIZONTAL/VERTICAL UP/OVERHEAD

Exp. Date: Jan 31, 2019

See Reverse for Conditions

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

Name: BART SKRODZKI
Employer: Heddle Marine Service Inc., Hamilton, ON
Thickness Range: 3mm & above
Material: Carbon Steel
Process: SMAW
Standard: CSA W47.1
Classification: S
Electrode: F4
Mode: MANUAL
Class: FLATHORIZONTAL/VERTICAL UP/OVERHEAD

Exp. Date: Aug 17, 2019

See Reverse for Conditions

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

Name: ANTONIO H. GORDON
Employer: Heddle Marine Service Inc., Hamilton, ON
Thickness Range: 3mm & above
Material: Carbon Steel
Process: FCAW/MIGAW
Standard: CSA W47.1
Classification: S
Mode: SEMI-AUTO
Single Electrode Mechanized
Single Electrode Automatic
Class: FLATHORIZONTAL/VERTICAL UP/OVERHEAD

Exp. Date: Sep 26, 2018

See Reverse for Conditions

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

Name: ANTONIO S. GORDON
Employer: Heddle Marine Service Inc., Hamilton, ON
Thickness Range: 3mm & above
Material: Carbon Steel
Process: SMAW
Standard: CSA W47.1
Classification: S
Electrode: F4
Mode: MANUAL
Class: FLATHORIZONTAL/VERTICAL UP/OVERHEAD

Exp. Date: Dec 06, 2018

See Reverse for Conditions

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

Name: BOGDAN SKRODZKI
Employer: Heddle Marine Service Inc., Hamilton, ON
Thickness Range: 3mm & above
Material: Carbon Steel
Process: FCAW/MIGAW
Standard: CSA W47.1
Classification: S
Mode: SEMI-AUTO
Single Electrode Mechanized
Single Electrode Automatic
Class: FLATHORIZONTAL/VERTICAL UP/OVERHEAD

Exp. Date: Dec 01, 2018

See Reverse for Conditions

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

Name: BOGDAN SKRODZKI
Employer: Heddle Marine Service Inc., Hamilton, ON
Thickness Range: 3mm & above
Material: Carbon Steel
Process: SMAW
Standard: CSA W47.1
Classification: S
Electrode: F4
Mode: MANUAL
Class: FLATHORIZONTAL/VERTICAL UP/OVERHEAD

Exp. Date: Aug 17, 2019

See Reverse for Conditions



Welder Qualification

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

Transferable Welder

Name: ANDREW MCFARLAND Exp. Date: Sep 29, 2018
 Employer: Heddle Marine Service Inc., Hamilton, ON
 Thickness Range: 3mm & above Material: Carbon Steel
 Process: SMAW
 Mode: MANUAL Standard: CSA W47.1
 Classification: S
 Electrode: F4
 Class: FLAT/HORIZONTAL/VERTICAL UPOVERHEAD

See Reverse for Conditions



Welder Qualification

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

Transferable Welder

Name: ANDREW MCFARLAND Exp. Date: Feb 02, 2019
 Employer: Heddle Marine Service Inc., Hamilton, ON
 Thickness Range: 3mm & above Material: Carbon Steel
 Process: FCAW/MCAW
 Mode: SFMI-AUTO Standard: CSA W47.1
 Single Electrode Mechanized Classification: S
 Single Electrode Automatic
 Class: FLAT/HORIZONTAL/VERTICAL UPOVERHEAD

See Reverse for Conditions



Welder Qualification

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

Transferable Welder

Name: ERIC C. HARBORD Exp. Date: Aug 24, 2018
 Employer: Heddle Marine Service Inc., Hamilton, ON
 Thickness Range: 3mm & above Material: Carbon Steel
 Process: FCAW/MCAW
 Mode: SEMI-AUTO Standard: CSA W47.1
 Single Electrode Mechanized Classification: S
 Single Electrode Automatic
 Class: FLAT/HORIZONTAL

See Reverse for Conditions



Welder Qualification

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

Transferable Welder

Name: ERIC C. HARBORD Exp. Date: Jan 31, 2019
 Employer: Heddle Marine Service Inc., Hamilton, ON
 Thickness Range: 3mm & above Material: Carbon Steel
 Process: SMAW
 Mode: MANUAL Standard: CSA W47.1
 Classification: S
 Electrode: F4
 Class: FLAT/HORIZONTAL/VERTICAL UPOVERHEAD

See Reverse for Conditions



Welder Qualification

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

Transferable Welder

Name: THAI DOAN Exp. Date: Dec 02, 2018
 Employer: Heddle Marine Service Inc., Hamilton, ON
 Thickness Range: 3mm & above Material: Carbon Steel
 Process: FCAW/MCAW
 Mode: SEMI-AUTO Standard: CSA W47.1
 Single Electrode Mechanized Classification: S
 Single Electrode Automatic
 Class: FLAT/HORIZONTAL/VERTICAL UPOVERHEAD

See Reverse for Conditions



Welder Qualification

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

Transferable Welder

Name: THAI DOAN Exp. Date: Nov 24, 2018
 Employer: Heddle Marine Service Inc., Hamilton, ON
 Thickness Range: 3mm & above Material: Carbon Steel
 Process: SMAW
 Mode: MANUAL Standard: CSA W47.1
 Classification: S
 Electrode: F4
 Class: FLAT/HORIZONTAL/VERTICAL UPOVERHEAD

See Reverse for Conditions



Welder Qualification

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

Transferable Welder

Name: EDUARDO L.R. SALAZAR Exp. Date: Sep 04, 2018
 Employer: Heddle Marine Service Inc., Hamilton, ON
 Thickness Range: 3mm & above Material: Carbon Steel
 Process: SMAW
 Mode: MANUAL Standard: CSA W47.1
 Classification: S
 Electrode: F4
 Class: FLAT/HORIZONTAL/VERTICAL UPOVERHEAD

See Reverse for Conditions



Welder Qualification

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

Transferable Welder

Name: EDUARDO L.R. SALAZAR Exp. Date: Sep 24, 2018
 Employer: Heddle Marine Service Inc., Hamilton, ON
 Thickness Range: 3mm & above Material: Carbon Steel
 Process: FCAW/MCAW
 Mode: SEMI-AUTO Standard: CSA W47.1
 Single Electrode Mechanized Classification: S
 Single Electrode Automatic
 Class: FLAT/HORIZONTAL/VERTICAL UPOVERHEAD

See Reverse for Conditions



Welder Qualification

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

Transferable Welder

Name: ROB BROWN Exp. Date: Aug 26, 2016
 Employer: Heddle Marine Service Inc., Hamilton, ON
 Thickness Range: 3mm & above Material: Carbon Steel
 Process: SMAW
 Mode: MANUAL Standard: CSA W47.1
 Classification: S
 Electrode: F4
 Class: FLAT/HORIZONTAL

See Reverse for Conditions



Welder Qualification

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

Transferable Welder

Name: ROB BROWN Exp. Date: Sep 29, 2018
 Employer: Heddle Marine Service Inc., Hamilton, ON
 Thickness Range: 3mm & above Material: Carbon Steel
 Process: FCAW/MCAW
 Mode: SEMI-AUTO Standard: CSA W47.1
 Single Electrode Mechanized Classification: S
 Single Electrode Automatic
 Class: FLAT/HORIZONTAL/VERTICAL UPOVERHEAD

See Reverse for Conditions



Company Code					
H	E	D	D	L	1

CWB Form 108E/2012-1

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REPORT OF WELDERS, WELDING OPERATORS AND TACK WELDERSSTANDARD ☒ W47.1 ☐ W47.2 ☐ W186 ☐ W55.3TOTAL # OF WELDERS
EMPLOYED 12**REPORT FOR**

0	6	2	0	1	8
MONTH		YEAR			

Company Name: HEDDLE MARINE SERVICEAddress: 208 Hillyard St. Hamilton Ontario

For each welder, welding operator and tack welder employed in shop or field welding for the period covered by this report show:

- The full name of each individual
- The type of qualification as indicated by "W" (Welder), "O" (Operator), "T" (Tack Welder), "P" (Probationary Welder)
- The welding process used by the individual. If the person has more than 1 qualification use additional line(s)
- The class such as "F" (Flat), "H" (Horizontal), "V" (Vertical), "VD" (Vertical Down), "O" (Overhead)
- The classifications: T, S, FW and WT.
- The qualification expiry date and the qualifying authority (e.g. CWB, ASME).
- For W55.3, identify the resistance welding process under "Process", with date(s) of training under "Qualifying Authority".

		QUALIFICATION								
#	First and Last Name	Type	Process	Class	Classifi- cation	Expiry Date			Qualifying Authority	Shop (S) Field (F)
						MM	DD	YY		
1	Andrew Mcfarland	W	SMAW	F/H/V/O	S	9	29	2018	CWB	S
1	Andrew Mcfarland	W	FCAW	F/H/V/O	S	2	2	2019	CWB	S
2	John H. Beetham	W	SMAW	F	S	12	2	2018	CWB	S
2	John H. Beetham	W	FCAW	F/H/V	S	12	9	2018	CWB	S
3	Thai Doan	W	SMAW	F/H/V/O	S	11	24	2018	CWB	S
3	Thai Doan	W	FCAW	F/H/V/O	S	12	2	2018	CWB	S
4	Dalton Collison	W	SMAW	F/H/V/O	S	7	19	2018	CWB	S
4	Dalton Collison	W	FCAW	F/H/V/O	S	4	15	2019	CWB	S
5	Eric C. Harbord	W	SMAW	F/H/V/O	S	1	31	2019	CWB	S
5	Eric C. Harbord	W	FCAW	F/H	S	1	31	2019	CWB	S
6	Mark k. Poss	W	SMAW	F/H/V/O	S	6	11	2018	CWB	S
7	Bogdan Skrodzki	W	FCAW	F/H/V/O	S	12	1	2018	CWB	S
8	Antonio R. Godin	W	SMAW	F/H/V/O	S	12	9	2018	CWB	S
8	Antonio R. Godin	W	FCAW	F/H/V/O	S	9	29	2018	CWB	S
9	Rob Brown	W	FCAW	F/H/V/O	S	9	29	2018	CWB	S
10	Rob Istok	W	FCAW	F/H/V/O	S	9	21	2018	CWB	S
11	Bartosz Skrodski	W	SMAW	F	S	1	31	2019	CWB	S
12	Guy F Williams JR	W	SMAW	F/H/V/O	S	3	9	2019	CWB	S
12	Guy F Williams JR	W	FCAW	F/H/V/O	S	3	9	2019	CWB	S

Note: This form is to be completed monthly. Please retain in your file for review by a CWB Representative during visits and audits.

Welding Supervisor's Signature



REPORT FOR	0	6	2	0	1	8
	MONTH		YEAR			

Company Code					
H	E	D	D	L	1

CWB Form 108E/2012-1

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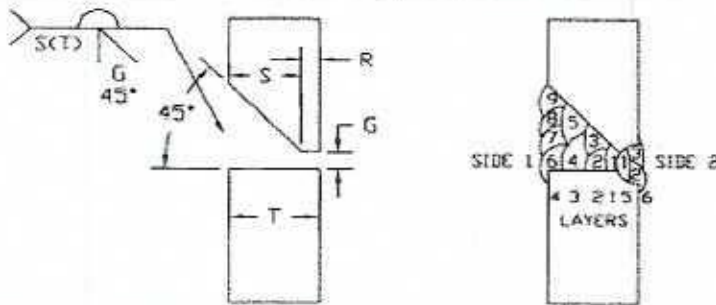
		QUALIFICATION								
#	First and Last Name	Type	Process	Class	Classifi- cation	Expiry Date			Qualifying Authority	Shop (S) Field (F)
						MM	DD	YY		
13	John Mens	P	FCAW	F/H/V/O	S	8	31	18	CWB	S
13	John Mens	P	SMAW	F/H/V/O	S	8	31	18	CWB	S
14	Frank Donohoe	P	FCAW	F/H/V/O	S	8	31	18	CWB	S
14	Frank Donohoe	P	SMAW	F/H/V/O	S	8	31	18	CWB	S
15	Mike Gallo	P	FCAW	F/H/V/O	S	8	31	18	CWB	S
15	Mike Gallo	P	SMAW	F/H/V/O	S	8	31	18	CWB	S
16	Tim Martel	P	FCAW	F/H/V/O	S	8	31	18	CWB	S
16	Tim Martel	P	SMAW	F/H/V/O	S	8	31	18	CWB	S
17	Doug Martel	P	FCAW	F/H/V/O	S	8	31	18	CWB	S
17	Doug Martel	P	SMAW	F/H/V/O	S	8	31	18	CWB	S
18	Bruce Mitchell	P	FCAW	F/H/V/O	S	8	31	18	CWB	S
18	Bruce Mitchell	P	SMAW	F/H/V/O	S	8	31	18	CWB	S
19	Kerry Langlois	P	FCAW	F/H/V/O	S	8	31	18	CWB	S
19	Kerry Langlois	P	SMAW	F/H/V/O	S	8	31	18	CWB	S
20	Anthony Tarrasio	P	FCAW	F/H/V/O	S	8	31	18	CWB	S
20	Anthony Tarrasio	P	SMAW	F/H/V/O	S	8	31	18	CWB	S
21	George Moore	P	FCAW	F/H/V/O	S	8	31	18	CWB	S
21	George Moore	P	SMAW	F/H/V/O	S	8	31	18	CWB	S
22	Brian siex	P	FCAW	F/H/V/O	S	8	31	18	CWB	S
22	Brian siex	P	SMAW	F/H/V/O	S	8	31	18	CWB	S
23	Jessie Williams	P	FCAW	F/H/V/O	S	8	31	18	CWB	S
23	Jessie Williams	P	SMAW	F/H/V/O	S	8	31	18	CWB	S
24	Hank Williams	P	FCAW	F/H/V/O	S	8	31	18	CWB	S
24	Hank Williams	P	SMAW	F/H/V/O	S	8	31	18	CWB	S
25	McKenzie Dyck	P	FCAW	F/H/V/O	S	8	31	18	CWB	S
25	McKenzie Dyck	P	SMAW	F/H/V/O	S	8	31	18	CWB	S
26	Robert Holierhoke	P	FCAW	F/H/V/O	S	8	31	18	CWB	S
26	Robert Holierhoke	P	SMAW	F/H/V/O	S	8	31	18	CWB	S
27	Randy Goheen	P	FCAW	F/H/V/O	S	8	31	18	CWB	S

QW-483 PROCEDURE QUALIFICATION RECORDS (PQR)

(See QW-200.2 Section IX, ASME Boiler and Pressure Vessel Code)

Company Name: MARENER INDUSTRIES INC.
 Procedure Qualification Record No.: FC-SBG-2G Date: November 1, 2006
 WPS No.: FC-SBG-2G
 Welding Process(es): FCAW
 Types (Manual, Automatic, Semi-Auto.): Semi-automatic

JOINTS (QW-402)



Groove Design of Test Coupon

(For combination qualification, the deposited weld metal thickness shall be recorded for each filler metal or process used)

BASE METAL (QW-403)

Material Spec. CSA G40.21
 Type or Grade 350WT (35J @ -20°C)
 P-No. to P-No.
 Thickness of Coupon 16 mm
 Diameter of Coupon
 Other Edges were ground to clean metal

POSTWELD HEAT TREATMENT (QW-407)

Temperature No PWHT
 Time
 Other

FILLER METAL (QW-404)

SFA Specification 5.21
 AWS Classification E81T-1G
 Filler Metal F-No. 6
 Weld Metal A-No. 1
 Size of Filler Metal 0.045"
 Other
 Weld Thickness

GAS (QW-408)

	Percent of Composition		
	Gas(es)	(Mixture)	Flow rate
Shielding	Blueshield 8	75%Ar 25% CO2	35 CFM
Trailing	-	-	-
Backing	-	-	-

ELECTRICAL CHARACTERISTICS (QW-409)

Current DC
 Polarity Reverse Polarity
 Amps. 205 - 263 AMPS Volts. 20 - 24 Volts
 Tungsten Electrode Size N/A
 Other

POSITION (QW-405)

Position or Groove Horizontal (2G)
 Weld Progression
 Other

TECHNIQUE (QW-410)

Travel Speed 213 - 620 mm/min
 String or Weave Bead Stringer
 Oscillation None
 Multipass or Single Pass per side Multiple
 Single or Multiple Electrodes Single
 Other 12 mm stickout
Backgouged (air arc gouging) to depth of 6mm

PREHEAT (QW-406)

Preheat Temp. 10°C
 Interpass Temp. 150°C
 Other

QW-483

PQR No. FC-SBG-2G**Tensile Test (QW-150)**

Specimen No.	Width	Thickness	Area	Ultimate Total Load N	Ultimate Unit Stress MPa	Type of Failure & Location
T1	26.71	15.37	410.5	222098	541	Ductile Failure in Base Metal
T2	26.64	15.13	403.1	217251	539	Ductile Failure in Base Metal

Guided-Bend Test (QW-160)

Type and Figure	Result

Toughness Test (QW-170)

Specimen No.	Notch Location	Specimen Size	Test Temp.	Impact Values			Drop Weight Break (Y/N)
				J	% Shear	Mils	
1	Weld Centre	10 mm x 10 mm	-20°C	112			
1		10 mm x 10 mm	-20°C	100			
1		10 mm x 10 mm	-20°C	113			
1	Fusion Line	10 mm x 10 mm	-20°C	86			
1		10 mm x 10 mm	-20°C	112			
1		10 mm x 10 mm	-20°C	33			
1	Fusion Line + 2 mm	10 mm x 10 mm	-20°C	205			
1		10 mm x 10 mm	-20°C	179			
1		10 mm x 10 mm	-20°C	73			
1	Fusion Line + 5 mm	10 mm x 10 mm	-20°C	232			
1		10 mm x 10 mm	-20°C	173			
1		10 mm x 10 mm	-20°C	233			

Comments: _____

Fillet-Weld Test (QW-180)

Result-Satisfactory Yes _____ No _____ Penetration Into Parent Metal Yes _____ No _____

Macro - Results _____

Other TestType of Test Hardness Testing, Vickers (BM 177, HAZ 230-279, WM 210-225, HAZ 219-262, BM 160)

Deposit Analysis _____

Other Macro examination satisfactoryWelder's Name Michael Jessome Clock No. _____ Stamp No. _____
Tests Conducted By: Atlantic Metallurgical Consulting Ltd. Laboratory Test No. 2006-AMC-339 Rev A

We certify that the statement in this record are correct and the test welds were prepared, welded and tested in accordance with the requirements of XB-M00-Y-0002-00-C6 & EEMUA 158

Manufacturer MARENEA INDUSTRIESDate Nov 2, 2006

Lloyd's Register
North America Inc.
Mark Horswill
Halifax Office

By [Signature]

[illegible]

WELD PROCEDURE DATA SHEET (WPDS)				WPDS No.	FBV-3PV	Date	Feb. 17, 2005				
Company		EC Industries Limited		WPQR	Prequalified	Rev.	0				
Address		Halifax, Nova Scotia		Specification	CSA W47.1; W59/AWS D1.1						
WELDING DETAILS		Special Req's									
Weld Process(es) / Type(s)		FCAW/Semi Automatic									
Filler Metal Specification(s)		CSA W48 D1; (AWS A5.20)									
Electrode (Group)/ Flux Class		E491T-1/1/9/12; H/4(E71T-1/1/9/12)									
Manufacturer & Designation		All manufacturers with above certified wire classifications.									
Postweld Treatment		Store wire reels in protective plastic wrapping under warm, dry conditions.									
Shielding Gas/ Flow Rate		75%Ar-25%CO ₂ 11/35-50 cfh		WELD JOINT DETAILS & PASS SEQUENCE 							
Welding Electrode Class / Dia.		N/A									
Electrode Extension		15 - 30 mm									
Gas Cup Size		15 - 20 mm									
Weld Type		Complete Penetration Butt Weld									
Joint Design		Double Vee									
Backing/Material		N/A									
Back Gouging/Method		Arc Air Gouge & Grind to Sound Metal									
Weld Position		Vertical Up (3G)									
Welding Technique		String & Weave									
Finishing		Chip, File, Wire Brush, Grind, as req'd.									
BASE MATERIALS		SPECIFICATION/GRADE		THICKNESS/DIA. RANGE		PREHEAT TEMP. °C					
1 & 2	CSA W59 Table 11-1; AWS D1.1 Table 4.1; WES Table M-1		T - 19 mm		CSA W59 Table 5.3						
							AWS D1.1 Table 4.3				
WELDING PARAMETERS				Interpass Temp. °C		Min.: Per Preheat Max.:					
Thickness/ Weld Size (mm)	Side/ Layer No. (1)	Pass No. (2)	Weld Process	FILLER METAL		Polarity	Amps	Volts	Travel Speed (mm/min)	Wire Feed Speed (mm/min)	Heat Input (KJ/mm)
				Class	Dia. (mm)						
19 ⁽²⁾	1/1	1	FCAW	E71T-1	1.2	DCRP	160-200	20-23	75-200	5500-7000	-
	1/2-N	1/2-n	FCAW	E71T-1	1.2	DCRP	170-200	20-23	125-300	5500-7000	-
	2/B1-BN	B1-Bn	FCAW	E71T-1	1.2	DCRP	170-200	20-23	125-300	5500-7000	-
Post Weld Heat Treatment			N/A								
NOTES:											
1) Procedure is also applicable for CO ₂ shielding gas, at a voltage range up to 25V.											
2) Weld sizes represent effective weld throat thickness.											
3) Multipass/split layers typically employed after deposition of 3 rd layer.											
						On the Basis of PREVIOUS TESTS ACCUMULATED BY THE CWB					
						APPROVAL Welding Procedure Data Sheet Accepted to CSA W47.1 JUN 20 2005 Acceptance valid only when Welding Constants certified by C.W.B. (C-11.1, CSA W47.1)					

WELD PROCEDURE DATA SHEET (WPDS)				WPDS No.	FBV-3PF	Date	May 12, 2003						
Company	EC Industries Limited			WPQR	Prequalified	Rev.	0						
Address	Dartmouth, Nova Scotia			Specification	CSA W47.1; W59/AWS D1.1								
WELDING DETAILS				Special Req'ments									
Weld Process(es) / Type(s)				FCAW/Semi Automatic									
Filler Metal Specification(s)				CSA W48.5-M; (AWS A5.20)									
Electrode (Group)/ Flux Class				E4801T-9-CH; (E71T-1/-9)									
Manufacturer & Designation				All manufacturers with above certified wire classifications.									
Consumable Treatment				Store wire reels in protective plastic wrapping under warm, dry conditions.									
Shielding Gas/ Flow Rate				75%Ar-25%CO ₂ ⁽¹⁾ /35-50 cfh									
Tungsten Electrode Class / Dia.				N/A									
Electrode Extension				15 - 30 mm									
Gas Cup Size				15 - 20 mm									
Weld Type				Complete Penetration Butt Weld									
Joint Design				Double Vee									
Backing/Material				N/A									
Back Gouging/Method				Arc Air Gouge & Grind to Sound Metal									
Weld Position				Flat (1G)									
Welding Technique				String & Weave									
Cleaning				Chip, File, Wire Brush, Grind, as req'd.									
				WELD JOINT DETAILS & PASS SEQUENCE									
BASE MATERIALS		SPECIFICATION/GRADE		THICKNESS/DIA. RANGE		PREHEAT TEMP. °C							
1 & 2	CSA W59 Table 11-1; AWS D1.1 Table 4.1; WES Table M-1		T ≥ 19 mm		CSA W59 Table 5.3								
						AWS D1.1 Table 4.3							
WELDING PARAMETERS						Interpass Temp. °C		Min.:		Per Preheat		Max.:	
Thick-ness/ Weld Size (mm)	Side/ Layer No. (2)	Pass No. (3)	Weld Process	FILLER METAL		Polarity	Amps	Volts	Travel Speed (mm/min)	Wire Feed Speed (mm/min)	Heat Input (KJ/ mm)		
				Class	Dia. (mm)								
≥ 19 ⁽²⁾	1/1-N	1-n	FCAW	E71T-1	1.2	DCRP	180-220	22-26		5500-7000	-		
	1/1-N	1-n	FCAW	E71T-1	1.6	DCRP	220-280	22-26		5500-7500	-		
	2/B1-BN	B1-Bn	FCAW	E71T-1	1.2	DCRP	180-220	22-26		5500-7000	-		
	2/B1-BN	B1-Bn	FCAW	E71T-1	1.6	DCRP	220-280	22-26		5500-7500	-		
Post Weld Heat Treatment			N/A										
NOTES:								APPROVAL Welding Procedure Data Sheet GWS Accepted to CSA W47.1 JUN 11 2003 Acceptance valid only when Welding Consumables certified by C.W.B. (C18.2.2.1, CSA W47.1)					
1) Procedure is also applicable for CO ₂ shielding gas. 2) Weld sizes represent effective weld throat thickness. 3) Multipass/split layers typically employed after deposition of 3 rd layer.													



WELD DATA SHEET

Quality Form Number QF - 13

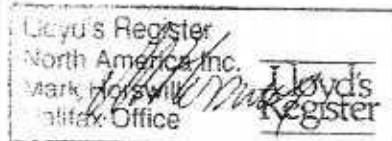
Lloyd's Register
North America Inc.
Mark Hotelling
Halifax Office

Job No.AME01005001		Ref. Standard CSA W47.1;W59/AWS D1.1 & EEMUA 158; XB-M00-Y-15-0002-00-C6		WPDS No. FC-SBG-2G									
Welding Process		Pulsed: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		Pulsed: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>									
Shielding gas type:		FCAW Ar/CO ₂											
Positions:		Vertical Up		Joint configuration & pass/layer sequence									
Process Mode:		Manual <input type="checkbox"/> Semi-auto <input checked="" type="checkbox"/> Machine <input type="checkbox"/> Auto <input type="checkbox"/>											
Joint Type:		Butt <input checked="" type="checkbox"/> Tee <input checked="" type="checkbox"/> Corner <input type="checkbox"/> Lap <input type="checkbox"/> Edge <input type="checkbox"/>											
Penetration:		Complete <input checked="" type="checkbox"/> Partial (ETT=) <input type="checkbox"/> Fillet <input type="checkbox"/>											
Backing:		Material: Thickness:											
Backgouging:		Yes <input checked="" type="checkbox"/> Method Air Carbon Arc No <input type="checkbox"/> Depth 5mm											
Electrode extension:		1/2 + 1/8 in.											
Nozzle diameter:		1/2 in.											
Flux classification													
Tungsten electrode		Type: Diameter:											
Cleaning procedures		Wire brush & chipping hammer											
DSA W186 rebar splice type:		Direct splice <input type="checkbox"/> Indirect splice <input type="checkbox"/> Lap splice <input type="checkbox"/> Rebar to structural member only <input type="checkbox"/>											
Identification of Base Material: (for CSA 186 indicate carbon equivalent, max. Phosphorus & sulphur content)													
Part	Specification & Grade		Thickness or Dia.	Special requirements									
I	CSA 350WT Cat 5 (35J@-40c)		0.625	Ht#A6D132 CEV.32									
II	ASTM A572 Gr.50S (35J@-40c)		0.625	Ht#244106 CEV.35									
Identification of filler material:													
Process	Trade Name		Classification	Lot #									
FCAW	Nittetsu SF-3AM (E81T1-G)		E81T1-G	3V761GP960									
Welding Parameters													
Thick- ness ()	Weld size/E TT	Layer	Pass#	Welding process	Dia. (in.)	Wire Feed speed (in./min)	Current A	Vol V	Current polarity	Welding speed mm./min	Burn-off rate ()	G as flow rate (ft3/hr)	Heat Input (Kj/min)
16 mm:5/ 8 in.		1	1	FCAW	.045	315	222	25	DCRP	248		35	1.2
		2	2&3	FCAW	.045	310	231	24.8	DCRP	435		35	0.96
		3	4&5	FCAW	.045	310	225	23.7	DCRP	309		35	.85
		4	6-9	FCAW	.045	310	Avg. 220	22	DCRP	465		35	.71 avg.
		Sd2 Lyl	1	FCAW	.045	305	228	24.2	DCRP	457		35	0.80
		2	2-3	FCAW	.045	305	220	22.2	DCRP	536		35	0.50
Heat Treatment													
Preheat min.: 10c						Interpass temp. max.:250c				Company Authorization 11/02/06			
Remarks:						Interpass temp. min.:75							
						Date	Month	Day	Year				



WELD DATA SHEET

Quality Form Number QF - 13



Job No. AME01005001		Ref. Standard CSA W47.1:W59/AWS D1.1 & EEMUA 158:XB-M00-Y-15-0002-00-C6		WPDS No. FC-SBG-3G									
Welding Process	1	Pulsed: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		2	Pulsed: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>								
		FCAW Ar/CO ₂											
Shielding gas type:													
Positions:		Vertical Up											
Process Mode:		Manual <input type="checkbox"/> Semi-auto <input checked="" type="checkbox"/> Machine <input type="checkbox"/> Auto <input type="checkbox"/>											
Joint Type:		Butt <input checked="" type="checkbox"/> Tee <input checked="" type="checkbox"/> Corner <input type="checkbox"/> Lap <input type="checkbox"/> Edge <input type="checkbox"/>											
Penetration:		Complete <input checked="" type="checkbox"/> Partial (ETT=) <input type="checkbox"/> Fillet <input type="checkbox"/>											
Backing:		Material: Thickness:											
Backgouging:		Yes <input checked="" type="checkbox"/> Method Air Carbon Arc No <input type="checkbox"/> Depth 5mm											
Electrode extension:		1/2 ± 1/8 in.											
Nozzle diameter:		1/2 in.											
Flux classification													
Tungsten electrode		Type: Diameter:											
Cleaning procedures		Wire brush & chipping hammer											
DSA W186 rebar splice type:		Direct splice <input type="checkbox"/> Indirect splice <input type="checkbox"/> Lap splice <input type="checkbox"/> Rebar to structural member only <input type="checkbox"/>											
Identification of Base Material: (for CSA 186 indicate carbon equivalent, max. Phosphorus & sulphur content)													
Part	Specification & Grade		Thickness or Dia.	Special requirements									
I	CSA 350WT Cat 5 (35J@-40c)		0.625	Ht#A6D132 CEV 0.32									
II	ASTM A572 Gr.50S (35J@-40c)		0.625	Ht#244106 CEV 0.35									
Identification of filler material:													
Process	Trade Name		Classification	Lot #									
FCAW	Nittetsu SF-3AM (E81T1-G)		E81T1-G	3V761GP960									
Welding Parameters													
Thick- ness ()	Weld size/E TT	Layer	Pass#	Welding process	Dia. (in.)	Wire Feed speed (in./min)	Current A	Vol V	Current polarity	Welding speed mm./min	Burn-off rate ()	G as flow rate (ft3/hr)	Heat Input (Kj/mm)
16 mm.5/ 8 in.		1	1	FCAW	.045	240	180	21	DCRP	120		35	1.4
		2	2&3	FCAW	.045	295	218	21	DCRP	275		35	0.96
		3	4&5	FCAW	.045	295	215	22	DCRP	310		35	.85
		4	6-7	FCAW	.045	290	Avg. 205	22	DCRP	330		35	.90 avg.
		Sd2 Lyl	1	FCAW	.045	290	220	22	DCRP	222		35	1.15
		2	2-3	FCAW	.045	290	207	22.2	DCRP	318		35	0.85
Heat Treatment													
Preheat min.: 10c		Interpass temp. max.:250c				Company Authorization 11/02/06							
Remarks:		Interpass temp. min.:85											
		Date		Month		Day		Year					

