PROCEDURE QUALIFICATION RECORD (PQR)

M & M Service Inc.
624 Ennishone Rd.
Grand-Sault/Falls, NB

PQR No.: TSS-04	**REV:** 0
WPS: No.: TWSS-06	**REV:** 0
Page:	1 of 2
Date:	March 26, 2010
Ref. Codes / Standards:	ASME B31.1 & B31.3

Process & Mode 1:	**GTAW** MANUAL	**Process & Mode 2:**	
FILLER METALS (QW-404)			
Spec. No. (SFA):	5.9		
CSA W48 Class.:	ER308L		
AWS No. (Class):	ER308L		
F-No.:	6		
A-No.:	8		
Size of Filler:	3/32"		
Weld Metal Thickness:	3/16"		
Electrode-Flux (Class):	NA		
Flux Trade Name:	NA		

BASE METALS: (QW-403)
SA-312 304/304L to SA-312 304/304L

Thickness of Test Coupon:	3/16"
Diameter of Test Coupons:	6 In. Sch 80 pipe

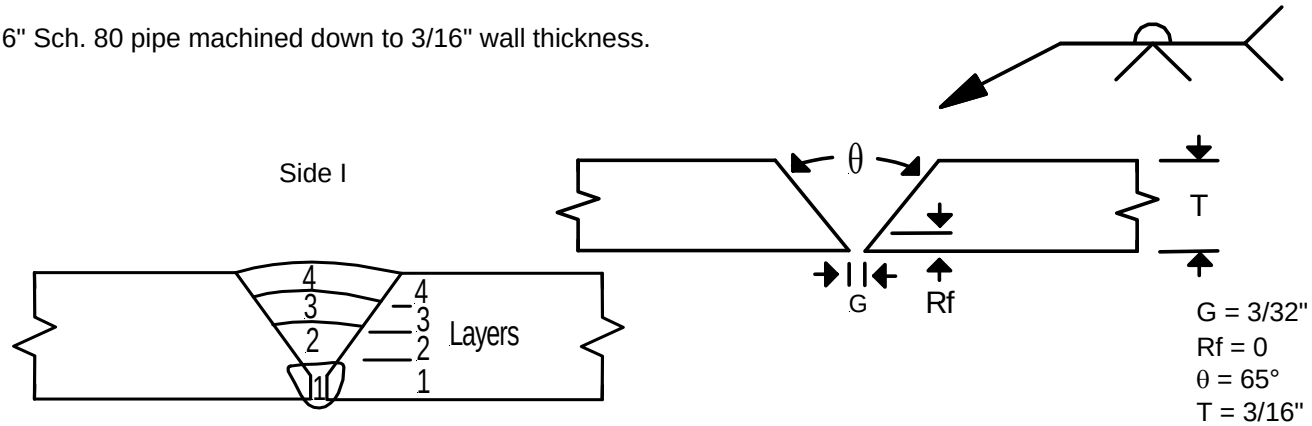
GAS (QW-408)		**Flow Rate**
Shielding:	99.9% ARGON	20 CFH
Trailing:		
Backing:	99.9% ARGON	7 CFH

PREHEAT (QW-406)	
Preheat Temp.:	10ºC
Interpass Temp.:	121ºC
POSTWELD HEAT TREATMENT (QW-407)	
Heating Rate:	NA
Soak Temp.:	NA
Soak Time:	NA
Cooling Rate:	NA
Withdrawal Temp.:	NA

POSITION (QW-405)			
Position of Grove:	5G		
Welding Progression:	VERTICAL UP		
JOINTS: (QW-402)			
Joint Type(s):	BUTT	**Backgouging Method:**	NA
Penetration:	COMPLETE	**Backgouging Purpose:**	NA
		Backgouging Depth:	NA
Preparation Method:	MECHANICAL, PLASMA, GRINDER	**Backing Material:**	NA
		Backing Thickness:	NA

6" Sch. 80 pipe machined down to 3/16" wall thickness.

TSS-04



TECHNIQUE (QW-410) / **ELECTRICAL CHARACTERISTICS (QW-409)**

Process	Interpass Temp.	Side	Layer	Pass	Tungsten Size	Wire Feed Speed	Arc Speed	Current Polarity	Amperes	Volts	Heat Input
GTAW		I		1	3/32"	N/A	2.1	DCEN	87	9	22 KJ/in
		I		2	3/32"	N/A	2.7	DCEN	100	10	22 KJ/in
		I		3	3/32"	N/A	2.8	DCEN	120	10	26 KJ/in
		I		4	3/32"	N/A	1.8	DCEN	120	10	40 KJ/in

String or Weave Bead:	STRING, WEAVE		
Orifice or Gas Cup Size:	3/8"	**Tungsten Size:**	3/32"
Initial and Interpass Cleaning:	GRIND, WIRE BRUSH OR CHIP	**Tungsten Type:**	EWTH-2
Contact Tube to Work Distance:	N/A	**Pulse:**	No
Multiple or Single Electrodes:	SINGLE		

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Tensile Test (QW-150)

Specimen	Width	Thickness	Area	Ultimate Tensile	Max. Load	Type of Failure / Location
	(in)	(in)	(in^2)	(psi)	(lbf)	
A-T1	0.753	0.132	0.099	84,400	8,384	DUCTILE / PARENT METAL
A-T2	0.749	0.147	0.11	88,800	9,739	DUCTILE / PARENT METAL

Toughness Tests (QW-170)

Specimen No.	Notch Location	Specimen Size	Test Temp.	Lateral Expansion	Impact Values		Average Ft-Lbs
					Joules	Ft-Lbs	
		mm	°C	(in)			(Joules)
8838	WC	3.3	-45	0.047	34	25	
8839	WC	3.3	-45	0.058	28	21	24 ft-lb (32 J)
8840	WC	3.3	-45	0.062	34	25	
8841	HAZ	3.3	-45	0.057	56	41	
8842	HAZ	3.3	-45	0.056	42	31	37 ft-lb (50 J)
8843	HAZ	3.3	-45	0.065	53	39	

Comments:

Fillet-Weld Test (QW-180)

Result - Satisfactory: Yes No
Penetration into Parent Metal: Yes No

HARDNESS - Results: PQR TSC-04: VICKERS VALUES 194 - 218. SEE ENCLOSED HARDNESS REPORT

Guided-Bend Tests (QW-160)

Types and Figure No.	ID	Result
FACE BEND 1 - QW462.2		PASS
FACE BEND 2 - QW462.2		PASS
ROOT BEND 1 - QW462.2		PASS
ROOT BEND 2 - QW462.2		PASS

Comments:

Welder's Name: CHARLES GAUDET
Welder's ID No.:
Welder's Stamp No.: WZB

Authorized Inspector (A.I.): DONALD BREBNER
Date: NOVEMBER 20/08

Laboratory Tests conducted by:

RPC
921 College Hill Rd
Fredericton, NB

Laboratory Test No.:

PM/08/J3946R1

Specification Prepared by:

REGISTERED PROFESSIONAL ENGINEER
Province of New Brunswick
#M5693
Danis St-Laurent
Province du Nouveau-Brunswick
INGÉNIEUR IMMATRICULÉ
March 26, 2010
Date

DSL Engineering Inc.

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

Manufacturer: M & M Service Inc.
Signature:
Date: