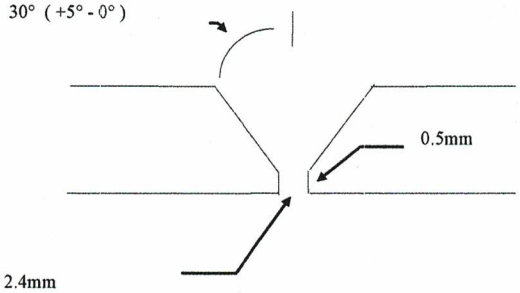
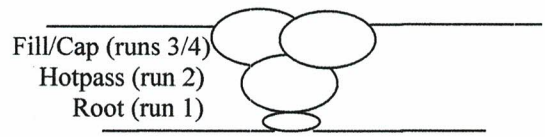
Procedure Qualification Record (PQR)

Company Name:	**Precision Projects & Maintenance Ltd**		
Procedure Qualification Record No:	**PPM –PQR-01**	Date:	**07/06/2022**
WPS No:	**PPM- ASME-01**		
Welding Process:	**GTAW/MMAW**		
Welding Types:	**Manual**		

JOINTS:



Groove Design of Test Coupon.



Run Sequence

BASE METALS:

Material Specification:	**ASTM A106**
Type / Grade:	**Gr B**
P. No: **1**	to P. No: **1**
Thickness of test coupon:	**6.02mm**
Diameter of test Coupon:	**Pipe 112mm OD**
Other: -	

FILLER METALS:

Filler Metal:	**ER70S-6/ E7018-1**
SFA Classification:	**5.18 & 5.1**
F. No.	**6**
Weld Metal Analysis A.No:	**1**
Size of Filler Metal:	**2.4mm & 3.2mm**
Other:	-
Deposited Weld Metal:	**6.02mm**

POSITION:

Position of Groove:	**6G**
Weld Progression:	**Vertical up**
Other:	-

PREHEAT:

Preheat Temperature:	**10°C**
Interpass Temperature:	**N/R**
Other:	-

POSTWELD HEAT TREATMENT:

Temperature:	**N/A**
Time:	**N/A**

GAS:

	Gas(es):	Percent Composition: Mixture:	Flow Rate:
Shielding (GTAW)	**Argon/H**	**98/2%**	**12lpm**
Shielding (GMAW)		-	
Backing:			

ELECTRICAL CHARACTERISTICS:

Current:		**DC**	
Polarity:		**El –ve (GTAW) / El +ve**	
Amps:	**112 & 105**	Volts:	**14 & 21.5**
Tungsten Electrode Size:		**2.4 mm**	
Other:			

TECHNIQUE:

Travel Speed:	**60 & 50 mm/min**
String or Weave Bead:	**String**
Oscillation:	**None**
Multi or Single Pass per side:	**Single side – multi run**
Other:	-

Procedure Qualification Record (PQR)

PQR No: **PPM-01**

Tensile Test: See KMR report 2022-1887

Specimen No:	Width: (mm)	Thickness: (mm)	Area: (mm2)	Ultimate Total Load (lbs)	Ultimate Tensile Strength (MPa)	Type of Failure and Location:
1	18.92	4.69	47.39	-	534	Parent metal
2	18.87	4.43	43.51	-	520	Parent metal

Guided-Bend Tests: See KMR report 2022-1887

Type and Figure	Result:
Face 1 sample	No cracks or flaws in the weld or heat affected zone
Face 2 sample	No cracks or flaws in the weld or heat affected zone
Root 1 sample	No cracks or flaws in the weld or heat affected zone
Root 2 sample	No cracks or flaws in the weld or heat affected zone

Toughness Tests: N/A

Specimen No:	Notch Location:	Notch Type:	Test Temp:	Impact Values:	Lateral Exp:		Drop Weight:	
					% Shear:	Mils:	Break:	No Break:

Fillet-Weld Test: N/A

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

Other Tests:

Type of Test: **Radiography – See report H8590A**
Deposit Analysis: -
Other: -

Welders Name: **Anthony Powell** Clock No: N/A Stamp No: **AP**

Tests Conducted By: **Southern QA Ltd/KMR Ltd** Laboratory Test No: **H8590/KMR2022 -1887**

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: **PPM**

Date: **29/06/2022** By: D Aldridge CBIP CWI

Kiwi Mechanical Laboratory Ltd
Product and Materials Testing

TEST REPORT

CUSTOMER: Southern QA Ltd
PO Box 15120
Christchurch 8643

CUSTOMER REFERENCE: H8590

DATE OF TEST: 27 June 2022

TEST SPECIFICATION: ASME IX 2021 Welding, Brazing and Fusion Qualifications
Tension test Clause QW-150
Guided bend test Clause QW-162

ITEMS TESTED: One (1) Butt-welded pipe sample

ID:	PQR 01
Section size:	Ø114.3x6.02
Material type:	ASTM A106
Heat No.:	2002772
Process:	GTAW/MMAW

RESULTS: Refer to the body of this report

It is estimated that the uncertainty associated with the reported measurements is 2%. This report shall not be reproduced except in full, without written approval of this laboratory.

TESTED BY:
W P Morris

SIGNATORY:
A L Carson

RESULTS:

Tension test

Table 1

Sample ID	Sample width (mm)	Sample thickness (mm)	Ultimate tensile load (kN)	Ultimate tensile strength (MPa)	Fracture location
1	18.92	4.69	47.39	534	Parent metal
2	18.87	4.43	43.51	520	Parent metal

Guided bend test - Transverse

Table 2

Sample ID	Sample width (mm)	Sample thickness (mm)	Former diameter (mm)	Comments
Face 1	19.1	5.6	21.3	No cracks or flaws in the weld or heat effected zone.
Face 2	19.0	5.7	21.3	No cracks or flaws in the weld or heat effected zone.
Root 1	19.2	5.5	21.3	No cracks or flaws in the weld or heat effected zone.
Root 2	19.0	5.6	21.3	No cracks or flaws in the weld or heat effected zone.

Kiwi Mechanical Laboratory Ltd

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TianjinYoufa International Trade Co.,Ltd.

RM 1502~1509, 15F, NO. 4 Anshun Building, Dafeng Road (Aqua City) Hongqiao Distr., Tianjin City, China

MILL TEST CERTIFICATE

(ACCORDING TO EN10204)

TO:	SANWA PTY LTD	P.O NO	37159	CERTIFICATE NO.:	YF20210905	DATE:	2021-9-5
GOODS	HOT FINISHED SEAMLESS PIPE			DELIVERY CONDITION	HOT ROLLED		
SPECIFICATIONS	ASTM A106	GRADE		B	HEAT TREATMENT		
SHIPPING MARK:	SANWA/37159/AUCKLAND						

SPECIFICATIONS				QUALITY																				
								CHEMICAL COMPOSITION(%)													MECHANICAL PROPERTIES				
																					TENSION TEST				
SN	SIZE (MM)	Wall Thickness	LENGTH (M)	QUANTITY WEIGHT (MT)	PCS	BDLS	Heat No	C	Cr	Mo	Mn	Si	Cu	Ni	P	Nb	Ti	V	S	CE	TENSILE STRENGTH (N/mm2)	ELONGATION (%)	BENDING TEST	FLATTING TEST	YIELD POINT (Mpa)
1	21.3	2.77	6	0.304	40	1	1102714	0.2	0.06	0.06	0.45	0.26	0.02	0.02	0.01	0.001	0.001	0.03	0.02	0.31	475	31	GOOD	-	281
2	33.4	3.38	6	0.300	20	1	3013096	0.18	0.05	0.07	0.49	0.25	0.02	0.02	0.01	0.001	0.001	0.02	0.02	0.29	482	32	GOOD	-	265
3	42.2	3.56	6	0.407	20	1	3101093	0.19	0.05	0.01	0.49	0.25	0.02	0.02	0.01	0.002	0.001	0.03	0.02	0.29	484	30	GOOD	-	275
4	48.3	3.68	6	0.729	30	1	3010247	0.2	0.06	0.01	0.48	0.26	0.02	0.02	0.01	0.001	0.001	0.04	0.02	0.30	472	30	GOOD	-	280
5	60.3	3.91	6	1.957	60	1	1004076	0.2	0.06	0.02	0.45	0.26	0.02	0.02	0.01	0.002	0.002	0.01	0.02	0.30	475	30	GOOD	-	283
6	21.3	4.78	6	1.355	10	1	1102712	0.2	0.06	0.02	0.45	0.26	0.02	0.02	0.01	0.001	0.001	0.01	0.02	0.30	473	31	GOOD	-	283
7	33.4	6.35	6	1.628	10	1	3100759	0.19	0.05	0.01	0.49	0.25	0.02	0.02	0.02	0.001	0.002	0.04	0.02	0.29	484	33	GOOD	-	265
8	42.2	6.35	6	4.822	10	1	1006469	0.21	0.05	0.01	0.51	0.24	0.02	0.02	0.02	0.001	0.001	0.05	0.02	0.32	485	31	GOOD	-	277
9	21.3	3.73	6	3.391	30	1	1102714	0.18	0.05	0.07	0.49	0.25	0.02	0.02	0.01	0.001	0.001	0.02	0.02	0.29	481	32	GOOD	-	265
10	33.4	4.55	6	0.291	70	1	3013096	0.2	0.06	0.06	0.45	0.26	0.02	0.02	0.01	0.001	0.002	0.03	0.02	0.31	473	29	GOOD	-	281
11	73	7.01	6	1.360	10	1	1001560	0.18	0.05	0.07	0.49	0.25	0.02	0.02	0.01	0.001	0.001	0.02	0.02	0.29	481	32	-	GOOD	265
12	88.9	7.62	6	0.684	20	1	1001560	0.19	0.05	0.01	0.49	0.25	0.02	0.02	0.01	0.002	0.001	0.03	0.02	0.29	485	30	-	GOOD	275
13	88.9	11.12	6	1.833	5	1	2000246	0.2	0.06	0.06	0.45	0.26	0.02	0.02	0.01	0.001	0.001	0.03	0.02	0.31	473	30	-	GOOD	281
14	88.9	5.49	6	2.554	20	1	2900457	0.19	0.05	0.01	0.49	0.25	0.02	0.02	0.02	0.001	0.002	0.04	0.02	0.29	484	29	-	GOOD	265
15	101.6	5.74	6	0.117	20	1	2909710	0.21	0.05	0.01	0.51	0.24	0.02	0.02	0.02	0.001	0.001	0.05	0.02	0.32	486	31	-	GOOD	277
16	114.3	6.02	6	0.254	50	3	2002772	0.2	0.06	0.06	0.45	0.26	0.02	0.02	0.01	0.002	0.001	0.03	0.02	0.31	472	30	-	GOOD	281
17	168.3	7.11	6	0.337	20	2	1001069	0.2	0.06	0.06	0.45	0.26	0.02	0.02	0.01	0.002	0.001	0.03	0.02	0.31	476	31	-	GOOD	281
18	168.3	10.97	6	0.640	10	2	3003579	0.2	0.06	0.01	0.48	0.26	0.02	0.02	0.01	0.001	0.002	0.04	0.02	0.30	475	30	-	GOOD	280
TOTAL:				22.963	455	22																			

NOTES: H-HEAT ANALYSES P-PRODUCT ANALYSIS CE-EQUICALENT CARBON R-RATIO R1=CA /S R2-Al /N R3=Mn /C

DEIIW=C+Mn/6+(Cr+Mo+V)/5+(Cu+Ni)/15 CEPCM-C+Si/30+(Mn+Ci+Cu)/20+Ni/60+Mo/15+V/10+5*B SUM1=Ci+Cu+Mo+Ni+V SUM2=Nb+V SUM3=Nb+V+Ti

L4/L3/L2-ACCEPT LEVEL L4/L3/L2,NOTCH DEPTH IS 12.5%/10%/5% THE SPECIFIED WALL THICKNESS

PQR 01

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

The 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 certification,please do not hesitate to contact Tianjin Youfa Internaitonal Trade Co., Ltd. E-mail:Suzy@youfasteelpipe.com

CUSTOMER THIRD

TIANJIN YOUFA INTERNATIONAL TRADE CO.,LTD

李新环

GENERAL MANAGER

Certifi cate maker: 杨露露 Inspector（检验员）： 边胜元 Quality Manager:

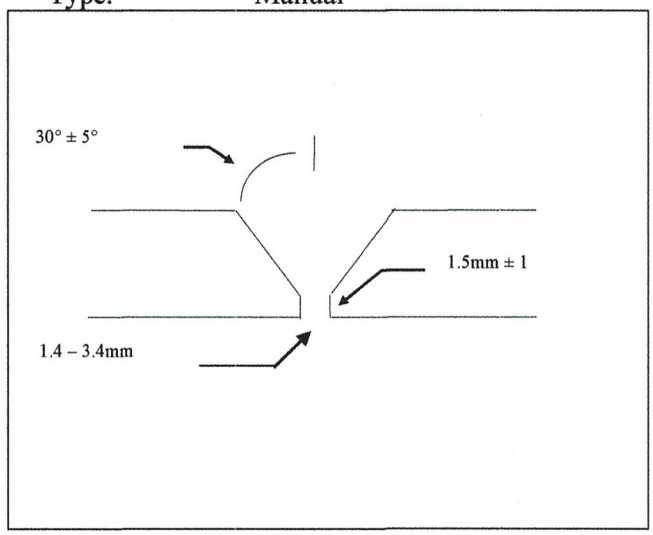
Precision Projects & Maintenance Ltd

WPS No.: PPM-ASME01 **Page 1 of 2**

Company Name: **PPM Ltd** By: **D Aldridge**
WPS No.: **PPM-ASME-01** Date: **29/06/2022** Supporting PQRs **PPM -01**
Rev. No.: 0 Date: -
Welding Processes **GTAW/MMAW** Type: Manual

Joints:
Design: Single V
Backing: None
Backing Material: N/A*

*- GTAW acts as backing for MMAW.



Base Metals

P-No.:	**1**	Gr. No.:	**1**	To P-No.: **1**	Gr. No.:	**1**
Specification type & grade			**ASTM A106 GrB**			
to Specification type & grade			**ASTM A106 GrB**			
Chemical analysis & mech. prop.			**As per 3.1 mill certificates**			
to Chemical analysis & mech. prop.			**As per 3.1 mill certificates**			
Thickness Range:	Base Metal		Groove: **1.5 mm to 12 mm**		Fillet:	**All**
Pipe dia. range:			Groove: **All**		Fillet:	**All**
Filler Metals:			**Root & Hotpass**		**Fill & Cap**	
Spec. No. (SFA):			**5.18**		**5.1**	
AWS No. (class)			**ER70S-6**		**E7018-1 H8**	
F-No.:			**6**		**6**	
A-No.:			**1**		**1**	
Size Ø:			**2.4 mm**		**3.2 mm**	
Weld Metal Thickness Range						
Groove			**Up to 9 mm**		**3mm**	
Fillet			**All**		**All**	
Flux (class)			N/A		N/A	
Flux trade name			N/A		N/A	
Cons. insert			N/A		N/A	
Other	Gas:		**Argon98%/ Hydrogen**		N/A	

Precision Projects & Maintenance Ltd

WPS No.: PPM-ASME -01	Page 2 of 2

Positions

Position of Groove	**All**
Progression	**Vertical up**
Position of Fillet	**All except vert. down**

Preheat

Preheat Temp. (min.)	**10°C**
Interpass Temp. (max.)	**N/A**
Method	

Post Weld Heat Treatment

Temp. Range	**None**
Time Range	**N/A**

Gas

	Gas	Mix	Flow (lpm)
Shielding	**Argon/H**	**98/2%**	**12**
Trailing	**None**		
Backing			

Technique

String or Weave: **String**
Orifice or Gas cup size: **10 mm**
Initial and Interpass cleaning: **Brush and grind as required.**
Method of Backgouge: **N/A**
Oscillation: **N/A**
Contact tube to work distance: **N/A**
Multi / Single Pass (each side): **Single side – multi pass**
Travel Speed: **Manual (GTAW) 54-68 mm/min (MMAW) 40-55mm/min**
Peening: **Not required.**
Other: **N/A**

Electrical Characteristics

Tungsten Electrode: **Ceriated**
Mode of metal transfer for GMAW: **N/A**
Electrode wire feed speed range: **N/A**

Weld Layers	Process	Filler Material Class	Dia.	Current Polarity	Amp. (A) Range	Volt (V) Range	Travel Speed Range	Heat input (Kj/mm)
1 (Root)	GTAW	ER70S-6	2.4	DC-ve	110-120	13 - 15	54 - 65	1.32-2.0
2 (H/pass)	GTAW	ER70S-6	2.4	DC-ve	110-120	13 - 15	55 - 68	1.26-1.9
3&4 (Fill/cap)	MMAW	ER7018-1	3.2	DC+ve	100-110	20 - 23	40 - 55 mm/min	2.2-3.8

All dimensions in millimetres, unless otherwise stated.

Welding Operator Qualification Tests (WPQ)

Welders Name: **Anthony Powell** Welders Number: **AP**

Welding Process used: **GTAW / MMAW** Type: **Manual**

Weld Procedure Specification (WPS): PPM-ASME-01

Base material welded: ASTM A106 GrB Thickness: **6.02 mm**

Thickness range qualified: **Up to 12.04 mm**

		Actual values:	Range qualified:
Backing:	GTAW MMAW	**None** **GTAW as backing**	**May add** **Must have**
ASME P.No.....to ASME P.No:		**1 to 1**	**P1 – 15F,34,41-49**
( ) Plate (x) Pipe		**112mm OD**	**73mm OD & over**
Filler metal specification (SFA): Classification.		**5.18&5.1**	**5.18&5.1**
Filler metal F-No:		**6**	**6**
Consumable insert for GTAW:		**None**	**Not permitted**
Weld thickness deposited for each process	GTAW MMAW	**4.5mm** **1.5mm**	**Up to 2t** **Up to 2t**
Welding position:		**6G**	**All**
Progression:		**Vertical up**	**Vertical up**
Shielding gas:		**Argon/H**	**All inert gases**
GTAW welding current type / polarity:		**DC El -ve**	**DC El -ve**

Visual examination results: Complies: D Aldridge
Radiographic test results: Refer report ref.: **SQA H8590A**
(For alternative qualification of groove welds by radiography)

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: 2021

Inspector: D Aldridge Date: **29/06/2022** SQA Hamilton

NEW ZEALAND CERTIFIED cbip No 2395 WELDING INSPECTOR

ASME IX Welder Qualification Record (Roll-over)

This form records the welding of (Name) ..... (Mark *) ..... in accordance with paragraph QW-322, and interpretations: IX-92-22 & IX-92-23, for the purpose of maintaining the Welder Operator Performance Qualification.

Date of welding	WPS used (or processes)	Authorized Signatory	NDT Report Reference *	Independent Signatory *

Notes

* Optional - Not required to maintain qualification record in accordance with ASME IX.

1 This form may be used for maintenance of qualification, not initial qualification.

2 Roll-over dates may not be more than 6-months apart to maintain qualification.

3 WPS used must be same welding process(es) and type to maintain qualification.

4 Authorized Signatory shall be a representative of the employer.

5 Attach copy of NDT report referenced, if required.

6 Independent Signatory may be required by contract / end-user.