

WPS NUMBER 102 (Rev. 2)

PQR NUMBER 102A

QUALIFIED FOR

MATERIAL (TYPICAL): P1 to P1 (SA 105, SA 106, SA 516, etc.)

PROCESS: FCAW JOINT DESIGN: Groove & Fillet

POSITION: All DIAMETER: All

AWS CLASSIFICATION: E70T-1

BASE METAL THICKNESS RANGE QUALIFIED:

AS WELDED: 4.8 to 38.1mm (3/16 to 1.5 in.)

ALBERTA LABOUR	
BOILERS & PRESSURE VESSELS ACT WELDING PROCEDURE	
Reg. No. WP	1312.2
Spec No.	#102 (REV. 2)
Weld Process	FCAW
Matt. Gr. P No.	1 to P No. 1
Elec. Gr. F No.	6 A No. 1
Th. Qual. For	38.2 mm Position All
	A.W.
Yr 88 Mo 3 Day 3	Signed R. Roseberg
	R. ROSEBERG, P. ENG. WELDING SPECIALIST

Boilers Branch Registration

WELDING PROCEDURE SPECIFICATION

R.J.V. Gasfield Service Ltd., 4901 - Bruce Rd. Box 295, Vegreville, Alberta T0B 4L0

WELDING PROCEDURE SPECIFICATION NUMBER 102 (Rev. 2) DATE September 23, 1987

REVISIONS "1" July 31, 1981

#2 - re-write to latest addenda - 9/87

SUPPORTING PQR NUMBERS(S) 102A

WELDING PROCESS(ES) FCAW TYPES Semi-automatic

JOINTS (QW-402)

Joint Design See attached sketches

Backing Other

BASE METALS (QW-403)

P-Number 1 to P-Number 1

Thickness Range: Groove 4.8 to 38.1mm (3/16 to 1.5 in.)

Fillet All

Pipe Diameter Ranges: Groove > 50.8mm (2.0 in.)

Fillet > 50.8mm (2.0 in.)

Other

FILLER METALS (QW-404)

Specification No. (SFA) 5.20

AWS No. (Class) E70T-1

F-No. F6

A-No. 1

Size See table next page

Deposited Weld Metal Thickness Range: No single pass with over $\frac{1}{2}$ " (12.7mm) of deposited metal

Groove F6 = 38.1mm (1.50 in.)

Fillet All

Electrode - Flux (Class)

Other

POSITION (QW-405)

Position of Groove All Weld Progression Vertical up when applicable

PREHEAT (QW-406)

Preheat Temp. Min. 93°C (200°F) > 19mm
10°C (50°F) < 19mm

Interpass Temp. Max. Weld build up

Preheat Maintenance

POSTWELD HEAT TREATMENT (QW-407)Temperature N/A Time Range _____GAS (QW-408)Shielding Gas(es) Carbon DioxideFlow Rate 15 - 25 litres/min.. (30 - 50 cfh)Other 99.985% pureELECTRICAL CHARACTERISTICS (QW-409)Current Direct Polarity ReverseAmps See table below Volts _____Tungsten Electrode Size and Type N/AMode of Metal Transfer N/A

Electrode Wire Feed Speed Range _____

Other _____

TECHNIQUE (QW-410)String or Weave Both Travel Speed (Range) _____Initial and Interpass Cleaning Brushing, chipping, grindingMethod of Back Gouging Air carbon arc when requiredMultiple or Single Pass (per side) MultipleMultiple or Single Electrodes Single

Other _____

WELD LAYER	PROCESS	FILLER METAL		CURRENT		VOLTAGE RANGE	T/S RANGE mm/min. (ipm)	OTHER
		CLASS.	DIAMETER mm. (in.)	TYPE POLAR.	AMP RANGE			
A11	FCAW	E70T-1	1.14 (.045)	DCRP	120-230	23-28	75-400 (3-16)	Size of electrode, number of passes, amperage and voltage and travel speed will differ with thickness and joint configuration.
A11	FCAW	E70T-1	1.6 (1/16)	DCRP	200-360	25-36	125-750 (5-30)	
A11	FCAW	E70T-1	2.0 (5/64)	DCRP	240-400	26-34	125-750 (5-30)	
A11	FCAW	E70T-1	2.4 (3/32)	DCRP	300-500	26-34	175-750 (7-30)	

GROOVE DESIGN

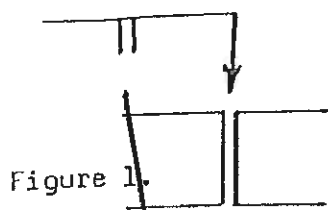


Figure 1.

Single Square Butt

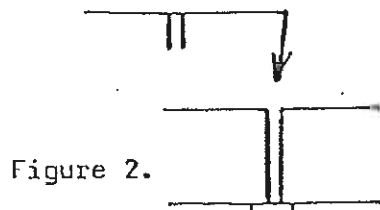


Figure 2.

Single Square Butt with Backing Strip

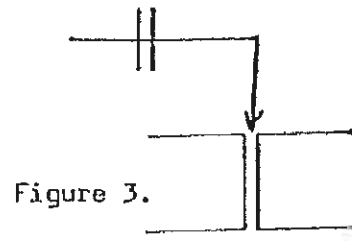


Figure 3.

Double Square Butt

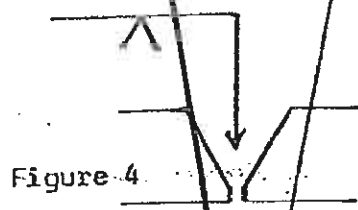


Figure 4.

Single Vee Butt

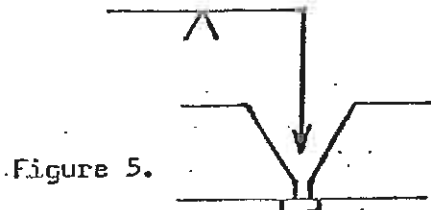


Figure 5.

Single Vee Butt With Backing Strip

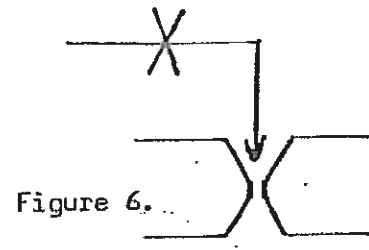


Figure 6.

Double Vee Butt

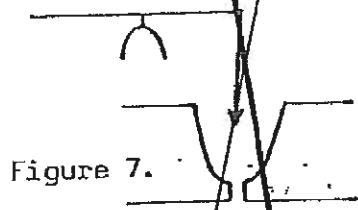


Figure 7.

Single U Butt

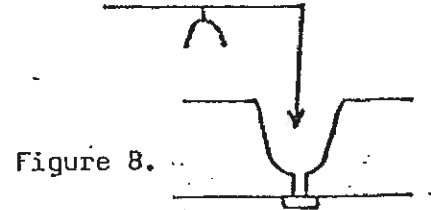


Figure 8.

Single U Butt With Backing Strip

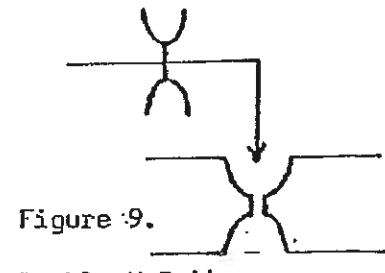


Figure 9.

Double U Butt

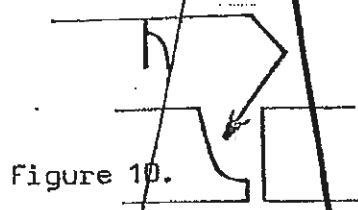


Figure 10.

Single J Butt

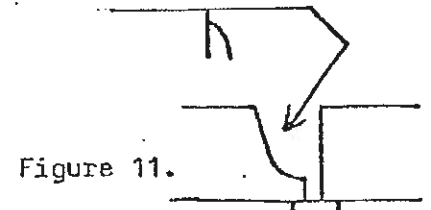


Figure 11.

Single J Butt With Backing Strip

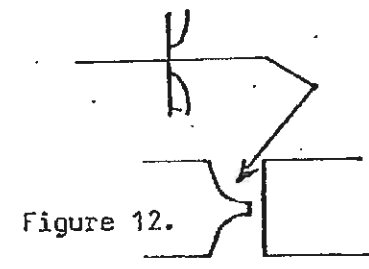


Figure 12.

Double J Butt

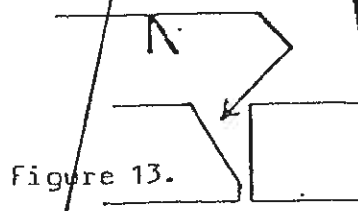


Figure 13.

Single Bevel Butt

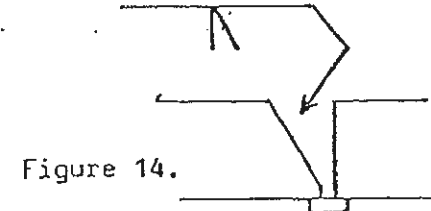


Figure 14.

Single Bevel Butt With Backing Strip

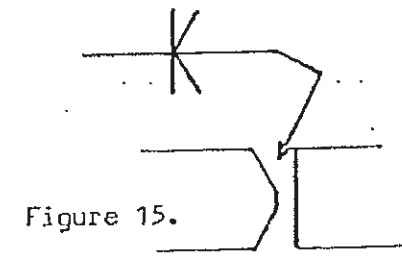


Figure 15.

Double Bevel Butt

PROCEDURE QUALIFICATION RECORD

R.J.V. Gasfield Service Ltd., 4901 - Bruce Rd., Box 295, Vegreville, Alberta T0B 4L0

PROCEDURE QUALIFICATION RECORD NUMBER 102A DATE July 14, 1983

WELDING PROCEDURE SPECIFICATION NUMBER 102 (Rev. 2)

WELDING PROCESS(ES) FCAW TYPES Semi-automatic

JOINTS (QW-402)

Type Butt: single vee

BASE METALS (QW-403)

Material Spec. SA 516 Type or Grade Grade 70

P-No. 1 to P-No. 1 Thickness 19.05 (.750 in.)

Diameter _____ Other Plate

FILLER METALS (QW-404)

SFA Specification 5.20

AWS Classification E70T-1

Filler Metal F-No. 6

Weld Metal Analysis A-No. 1, 1

Size of Filler Metal 2.0mm

Deposited Weld Metal Thickness No single pass with over 1/2" (12.7mm) of deposited metal

Other _____

POSITION (QW-405)

Position of Groove 1G Weld Progression Forward

PREHEAT (QW-406)

Preheat Temp. 15°C (60°F) Interpass Temp. Weld build up

POSTWELD HEAT TREATMENT (QW-407)

Temperature None Time _____

GAS (QW-408)

Type of Gas(es) Carbon Dioxide Composition of Mixtures 99.985%

Other _____

ELECTRICAL CHARACTERISTICS (QW-409)

Current Direct Polarity Reverse

Amps See sketch next page Volts _____

Other _____

TECHNIQUE (QW-410)

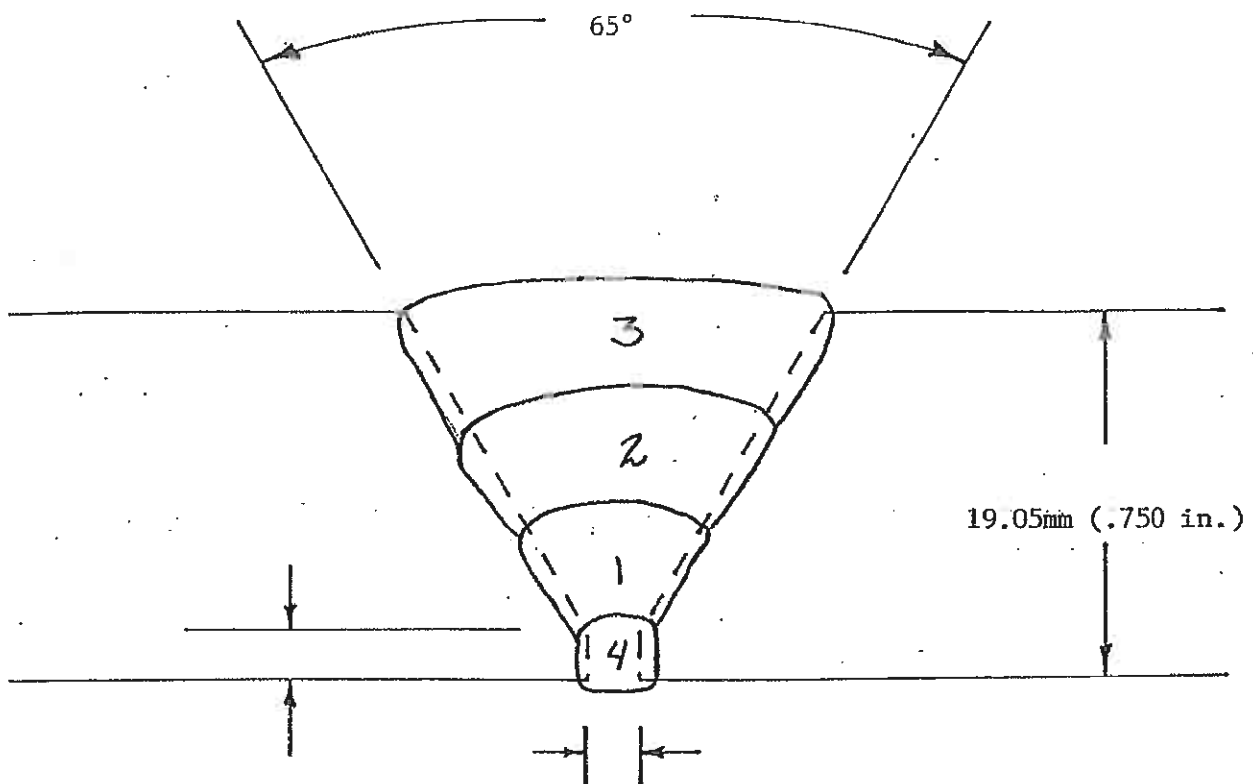
Travel Speed _____

Multipass or Single Pass (per side) Multipass

Single or Multiple Electrodes Single

Stringing or Weave Bead Both

Other _____



Pass #1: 2mm (5/64 in.), E70T-1, DCRP, 280-310 amps, 20-22 volts.

Pass #2 - #4: 2mm (5/64 in.), E70T-1, DCRP, 320-360 amps, 23-26 volts.

TENSILE TEST

Specimen Number	Width mm (in.)	Thick. mm (in.)	Area sq.mm (sq.in.)	Ultimate Load N (lbs.)	Ultimate Stress MPa (psi)	Character & Location of Failure
T-1	26.9	18.8	507	267,100	527	Base metal
	(1.061)	(.741)	(.786)	(60,100)	(76,400)	
T-2	26.9	19.1	514	271,300	528	Base metal
	(1.059)	(.750)	(.794)	(61,050)	(76,900)	

GUIDED BEND TEST

Type and Figure Number	Result	Type and Figure Number	Result
TSB S-1	PASS	TSB S-3	PASS
TSB S-2	PASS	TSB S-4	PASS

Welder's Name Dale LanuikCertificate Number W-6537Tests Conducted by Hanson Materials Engineering (Western) Ltd.Per: Gilles Perreault, C.E.T.Laboratory Test Number E84-5-645

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 Boiler and Pressure Vessel Code.

Signed R.J.V. Gasfield Service Ltd.Date June 14, 1983By 