



WELDING PROCEDURE SPECIFICATION

WPS - 1000-Rebar/4140 **REV. NO.: 0** **DATE: 9/15/2006** ****APPLICABILITY****
WELDING PROCESS: SMAW- and SMAW- **ASME: AWS: X OTHER:**
SUPPORTING PQR: 1000-R/4140

JOINT: This WPS shall be used in conjunction with the General Welding Standards (GWS) and Welding Fabrication Procedure (WFP) sections and criteria for joint details, repairs, NDE, inspection etc.

Weld Joint Type: Flare Bevel	Class:	Partial Penetration
See GWS 1-06 and WFP's for joint details	Preparation:	Remove loose rust and scale
Root Opening: N/A	Backing:	Metal
Backgrind root: N/A	Backing Mat.:	Rebar or splice plate
Bkgrd Method: N/A	GTAW Flux: N/A	Backing Retainer: N/A

FILLER METALS:	Class:	E8018	and	E9018
A No:	SFA Class: 5.5 and 5.5	F No: 4 and 4	Size: 3/32	1/8 1/8
Insert: N/A	Insert Desc.: N/A		Weld Metal Thickness Ranges:	
Flux: Type: N/A	Size: N/A	AWS Root Pass:	.0125	thru 0.187
Filler Metal Note:		AWS Balance:	0.221	thru 1.250
		ASME Root Pass:		thru
		ASME Balance:		thru

BASE MATERIAL	P/S No. N/A	Gr No.	to: P/S No. N/A	Gr No.
Spec. A-706 Grade 60 Rebar	Grade:	to: Spec. A-193 Grade B7/AISI 4140	Grade:	
Qualified Pipe Dia. Range: ≥	AWS: 0	ASME:		
Qualified Thickness Range:	AWS: 0.250	thru 1.125	ASME:	thru

QUALIFIED POSITIONS:	AWS: 2G, 3G, 4G,	ASME:	Vert. Prog.:	Vertical Up
Preheat Min. Temp.: 500 °F	GAS: Shielding:	N/A	or	N/A
Interpass Max. Temp.: 700 °F	Gas Composition:	/ /	%	/ / %
Preheat Maintenance: 500 °F	Gas Flow Rate cfh:	to		to
PWHT: Time @ °F Temp. *	Backing Gas/Comp:	N/A		%
Temp. Range:	* °F Backing Gas Flow cfh:	to		
to * °F	Trailing Gas/Comp:	N/A		0 %

APPROVAL: Signatures on file at ENG **DATE:** 9/15/2006

WELDING CHARACTERISTICS:

Current: DCEP and DCEP **Tungsten Type:** N/A **Transfer Mode:** N/A
Ranges: Amps 75 to 150 **Tungsten Dia.:** N/A **Pulsing Cycle:** N/A to N/A
Volts 14 to 24 **Background Current:** N/A
Fuel Gas: N/A **Flame:** N/A **Braze temp. °F** N/A to N/A

WELDING TECHNIQUE: For fabrication specific requirements such as fittup, cleaning, grinding, PWHT and inspection criteria refer to Volume 2, Welding Fabrication Procedures

Technique: Manual **Cleaning Method:** Grind, Chip, Wire brush
Single Pass or Multi Pass: M **Stringer or Weave bead (S/W):** S or S **Oscillation:** N/A
GMAW Gun Angle °: to **Forehand or Backhand for GMAW (F/B):** N/A
No Pass >1/2": True **GMAW/FCAW Tube to work distance:** N/A
Maximum K/J Heat Input: N/A **Travel speed:** Varies **Gas Cup Size:** N/A

PROCEDURE QUALIFIED FOR:

Charpy "V" Notch: N/A **Nil-Ductil Transition Temperature:** N/A **Dynamic Tear:** N/A

Comments: * Immediately after completion of welding, heat the weld and 1 inch each side to 650 °F hold for 5 minutes, then cool slowly until temperature is 300 °F.

Weld Layer	Manual Process	Filler Metals	Size	Amp Range	Volt Range	Travel/ipm	Nozzle Angle	Other
1	SMAW-	E8018	3/32	75 to 100	14 to 18	4 to 6	to	
2	SMAW-	E9018	1/8	98 to 120	16 to 20	5 to 7		
3	SMAW-	E9018	1/8	118 to 140	18 to 24	5 to 7		
4	SMAW-	E9018		to	to	to		
5	SMAW-	E9018						
6								

REM. * Weld layers are representative only - actual number of passes and layer sequence may vary due to variations in joint design, thickness and fitup.

Use of LANL Welding Procedures and Welder Qualifications for non-LANL work shall be at the sole risk and responsibility of the Subcontractor, and the Subcontractor shall indemnify and save LANL and the Government harmless from any and all claims, demands, actions or causes of action, and for any expense or loss by reason of Subcontractor's and their employees possession and use of LANL procedures and qualifications.