



WELDING PROCEDURE SPECIFICATION

WPS - 3500-D1.8-1 **REV. NO.:** 0 **DATE:** 6/18/2008 ****APPLICABILITY****
WELDING PROCESS: FCAW **and FCAW** **ASME:** **AWS: X** **OTHER:** AISC 341-05 Demand Criti
SUPPORTING PQR: 3500-D1.8-1- 2G 3500-D1.8-1- 3G 3500-D1.8-1- 4G

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: Groove & Fillet Welds	Class:	Full & Partial Penetration
See GWS 1-06 and WFP's for joint details	Preparation:	Thermal/Mechanical
Root Opening: 3/16 - 3/8	Backing:	With
Backgrnd root: When required	Backing Mat.:	Metal or as specified
Bkgrd Method: Grind or Arc gouge	GTAW Flux: N/A	Backing Retainer: N/A

FILLER METALS		Class:	E71T-8-H16	and	E71T-8-H16
A No: 1	SFA Class: 5.20 an 5.20	F No: 6 an 6	Size: 1/16	1/16	1/16 1/16
Insert: N/A	Insert Desc.: N/A	Weld Metal Thickness Ranges:			
Flux: Type: N/A	Size: N/A	AWS Root Pass:	.0125	thru	.0250
Filler Metal Note: Welder shall use Lincoln 1/16" Intershield NR-233 wire	AWS Balance:	0.125	thru	99.00	
	ASME Root Pass:		thru		
	ASME Balance:		thru		

BASE MATERIAL	P/S No. 1	Gr No.	to: P/S No. 1	Gr No.
Spec. AWS Group I	Grade:	to: Spec. AWS Group I or II		Grade:
Qualified Pipe Dia. Range: ≥ AWS:	24	ASME:		
Qualified Thickness Range: AWS:	0.125	thru 99.000	ASME:	thru

QUALIFIED POSITIONS:	AWS: All	ASME:	Vert. Prog.:	Vert. Up
Preheat Min. Temp.:	50 °F	GAS: Shielding:	N/A	or N/A
Interpass Max. Temp.:	550 °F	Gas Composition:	/ / %	/ / %
Preheat Maintenance:	50 °F	Gas Flow Rate cfh:	to	to
PWHT: Time @ °F Temp. N/A		Backing Gas/Comp:	N/A	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:** 6/18/2008

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WELDING CHARACTERISTICS:

Current: DCEN and DCEN **Tungsten Type:** N/A **Transfer Mode:** Globular
Ranges: Amps 185 to 310 **Tungsten Dia.:** N/A **Pulsing Cycle:** N/A to N/A
 Volts 17 to 23 **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: Semi-Automic **Cleaning Method:** Wire brush, grinder, chipping Hammer
Single Pass or Multi Pass: Multi **Stringer or Weave bead (S/W):** S or W **Oscillation:** 3x
GMAW Gun Angle °: 0 to 20 **Forehand or Backhand for GMAW (F/B):** Forehand
No Pass >1/2": True **GMAW/FCAW Tube to work distance:** .750 - 1.125
Maximum K/J Heat Input: **Travel speed:** Varies **Gas Cup Size:** N/A

PROCEDURE QUALIFIED FOR:

Charpy "V" Notch: Yes **Nil-Ductil Transition Temperature:** No **Dynamic Tear:** No

Comments: This WPS is specifically qualified for Demand Critical welds required by AISC 341-05 & AWS D1.8 Siesmic Welding including qualified for Charpy-V-Notch in weld metal to 24 ftlbs@ -20°F. HAZ +1mm qualified to 38 ftlbs@+50 F°. HAZ +5mm is qualified to 32 ftlbs@ +50 F°.

Weld Layer	Manual Process	Filler Metals	Size	Amp Range	Volt Range	Travel/ipm	Nozzle Angle	Other
1	FCAW	E71T-8-H16	1/16	185 to 225	17 to 19	4 to 6	0 to 20	
2	FCAW	E71T-8-H16	1/16	205 to 235	18 to 20	5 to 7		
3	FCAW	E71T-8-H16	1/16	210 to 255	19 to 20	5 to 7		
4	FCAW	E71T-8-H16	1/16	225 to 275	19 to 21	7 to 9		
5								
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.