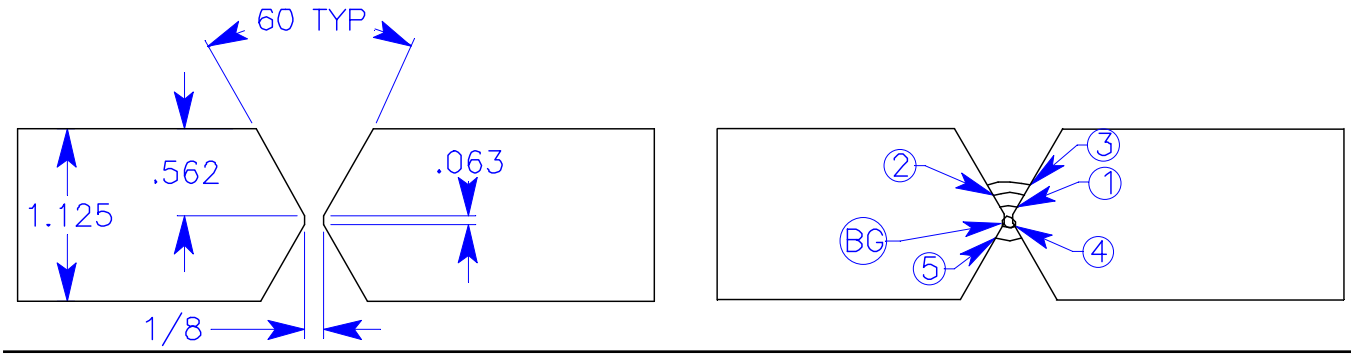
WELDING PROCEDURE SPECIFICATION

Welding Procedure Specification No. FERMI CS-3* Date 1/8/2008
Revision No. *1 (typo correction on WPS number) Date 1/14/08 Supporting PQR No.(s) CS-3
** 2 changed joint root gap *** 3 Changed soak time Date 6/12/08
Welding Processes 1) SMAW Type 1) Manual
2) Type 2)
(Manual, Auto, Semi)

JOINTS (QW-402)

Joint Design Double "V" Backing: Yes X No
Backing Material (Type) Root: Base Metal Remainder: Filler metal
Retainer: Yes No Type: Non-Metallic Metallic (non-fusing)

DETAILS **



BASE METALS (QW-403)

P No. 1 Group 1 To P No. 1 Group 1
Specification Type and Grade SA 105 to SA 105
To Specification Type and Grade
OR
Chemical Analysis and Mech. Properties
To Chemical Analysis and Mech. Properties

Thickness Range:	PROCESS 1		PROCESS 2	
Base Metal	Groove 3/16-2.25	Fillet unl	Groove	illet
Deposited Weld Metal	Groove 3/16-2.25	Fillet unl.	Groove	Fillet
Pipe Diameter Range	Groove 2 7/8 min	Fillet unl.	Groove	Fillet

FILLER METALS (QW-404)	PROCESS 1	PROCESS 2
Specification No. (SFA)	5.1	
AWS No. (Class)	E7018	
F-No.	4	
A-No.	1	
Size of Filler Metals	3/32, 1/8, 5/32, 3/16	
Deposited Weld Metal Thickness Range	Groove 3/16-2.25 Fillet 2.25 max	Groove Fillet
Electrode-Flux (Class)	N/A	
Flux Trade Name	N/A	
Consumable Insert	None	

EACH BASE METAL-FILLER METAL COMBINATION SHOULD BE RECORDED INDIVIDUALLY

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FERMI CS-3*

POSITIONS (QW-405)

Positions of Groove 1G

Welding Progression: Up n/a Down

Positions of Fillet N/A

POSTWELD HEAT TREATMENT (QW-407)

Temperature Range 1125-1175 F

Time Range 3 hr hold ***

Other: ASME Sect 8 P No. 1 Stress relief

PREHEAT (QW-408)

Preheat Temperature Minimum 32°F

Interpass Temperature Maximum Not Measured

Preheat Maintenance

Minimum Temperature for Welding 32°F

GAS (QW-408)

Percent Composition

	Gas(es)	Mixture	Flow Rate
Shielding	N/A		
Trailing	N/A		
Backing	N/A		

ELECTRICAL CHARACTERISTICS (QW-409)

Current AC or DC Direct Polarity Reverse Characteristics:

AMPS (Range) See Chart Volts (Range) See Chart

Tungsten Electrode Size and Type N/A

Mode of Metal Transfer for GMAW N/A

Electrode Wire Feed Speed Range N/A

TECHNIQUE (QW-410)

String or Weave Bead String or weave. Weave not to exceed 1/8 wide

Orifice or Gas Cup Size N/A

Initial Interpass Cleaning (Brushing, Grinding, etc.) Grind flame cut 1/16 minimum. Wire brush with steel brushes between passes. Grinding is allowed between passes.

Method of Back Gouging Arc Gouge and grind or grinding alone to clean metal

Oscillation N/A

Contact Tube to Work Distance N/A

Multiple or Single Pass (per side) Multipass

Multiple or Single Electrodes Single

Travel Speed (Range) As Required

Peening None

Other

Weld Layers	Processes	Filler Metal Class	Filler Metal Diameter	Current Type Polarity	Current Amp. Range	Volt Range	Travel Speed Range	Other (Power Source)
1-5	SMAW	E7018	3/32	DCRP	70-100	18-20		
Bal.	SMAW	E7018	1/8	DCRP	100-140	19-23		
		E7018	5/32	DCRP	120-200	20-24		