

COMMON ARC WPS REVIEW AND ACCEPTANCE

I have reviewed the WPS listed below and have indicated those accepted for use during Common Arc simultaneous testing sessions. In accordance with Section IX, QG-106.3(b), I certify that the contractor noted below has (check as appropriate):

___ certified procedure qualification records (PQR) meeting the requirements of Section IX of the ASME Code that support the WPS checked below;

___ adopted an SWPS in accordance with Article V of Section IX of the ASME Code that covers the range of variables to be followed during the performance qualification using the WPS checked below.

- ___ CA-01 GTAW-SMAW Low Alloy
- ___ CA-02 SMAW Low Alloy BR
- ___ CA-03 GTAW-SMAW SS
- ___ CA-04 SMAW Low Alloy 6010
- ___ CA-05 FCAW Gas & BR
- ___ CA-06 FCAW BR Up
- ___ CA-07 FCAW BR Down
- ___ CA-08 FCAW Gas & BR
- ___ CA-09 FTA-SMA Inconel
- ___ CA-11 FCAW SS
- ___ CA-12 SMAW 7010

Participating Contractor (print) _____

Authorized Representative (print name) _____

Authorized Representative (sign) _____ Date: _____

WPS NO: CA - 01
 Issue Date: January 1, 2009

Revision No: 2
 Revision Date: September 25, 2009

Welding Processes: GTAW/SMAW
 Type: Manual

BASE METALS: P-No: <u>1</u> to P No: <u>1</u> Base Metal Thickness Range: <u>Groove: 1/16" - 3/4"</u> Diameter Range: <u>Groove: All</u>																																																			
Other: <u>Maximum deposited pass thickness shall not exceed 1/2". Filler metal must be added for all GTAW passes. This WPS intended for performance qualification only.</u>																																																			
JOINTS: Joint Design: <u>Vee - Groove</u> Backing (Type): <u>None</u> Material: <u>N/A</u> Root Spacing: <u>1/8" Maximum</u> Retainers: <u>N/A</u> Other: <u>None</u>																																																			
POSITIONS: Groove Position: <u>All</u> Weld Progression: <u>Vertical Up</u>																																																			
PREHEAT: Temperature Interpass Temp: <u>50°F Minimum</u> Preheat Maint: <u>600°F Maximum</u> <u>Throughout all welding</u>				TYPICAL SKETCH POSTWELD HEAT TREATMENT: (QW-407) Temp Range: <u>None</u> Time Range: <u>N/A</u> Other: <u>N/A</u>																																															
FILLER METALS: (QW-404) <table style="width:100%; border-collapse: collapse;"> <tr> <td>Process:</td> <td><u>GTAW</u></td> <td><u>SMAW</u></td> </tr> <tr> <td>SFA No:</td> <td><u>5.18</u></td> <td><u>5.1</u></td> </tr> <tr> <td>AWS No:</td> <td><u>ER70S-2</u></td> <td><u>E7018</u></td> </tr> <tr> <td>F-No:</td> <td><u>6</u></td> <td><u>4</u></td> </tr> <tr> <td>A-No:</td> <td><u>1</u></td> <td><u>1</u></td> </tr> <tr> <td>Maximum Deposited Thickness:</td> <td><u>1/8" - Groove -</u></td> <td><u>3/4"</u></td> </tr> <tr> <td>Electrode Flux:</td> <td><u>N/A</u></td> <td><u>N/A</u></td> </tr> <tr> <td>Consumable Insert:</td> <td><u>N/A</u></td> <td><u>N/A</u></td> </tr> <tr> <td>Other:</td> <td><u>None</u></td> <td><u>None</u></td> </tr> </table>				Process:	<u>GTAW</u>	<u>SMAW</u>	SFA No:	<u>5.18</u>	<u>5.1</u>	AWS No:	<u>ER70S-2</u>	<u>E7018</u>	F-No:	<u>6</u>	<u>4</u>	A-No:	<u>1</u>	<u>1</u>	Maximum Deposited Thickness:	<u>1/8" - Groove -</u>	<u>3/4"</u>	Electrode Flux:	<u>N/A</u>	<u>N/A</u>	Consumable Insert:	<u>N/A</u>	<u>N/A</u>	Other:	<u>None</u>	<u>None</u>	GAS: (QW-408) <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>Gas</th> <th>Composition</th> <th>Flow Rate</th> </tr> </thead> <tbody> <tr> <td>Shielding (GTAW):</td> <td><u>Argon</u></td> <td><u>100%</u></td> <td><u>15 - 20 cfm</u></td> </tr> <tr> <td>Backing:</td> <td><u>N/A</u></td> <td><u>N/A</u></td> <td><u>N/A</u></td> </tr> <tr> <td>Shielding (GMAW):</td> <td><u>N/A</u></td> <td><u>N/A</u></td> <td><u>N/A</u></td> </tr> </tbody> </table>					Gas	Composition	Flow Rate	Shielding (GTAW):	<u>Argon</u>	<u>100%</u>	<u>15 - 20 cfm</u>	Backing:	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	Shielding (GMAW):	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	
Process:	<u>GTAW</u>	<u>SMAW</u>																																																	
SFA No:	<u>5.18</u>	<u>5.1</u>																																																	
AWS No:	<u>ER70S-2</u>	<u>E7018</u>																																																	
F-No:	<u>6</u>	<u>4</u>																																																	
A-No:	<u>1</u>	<u>1</u>																																																	
Maximum Deposited Thickness:	<u>1/8" - Groove -</u>	<u>3/4"</u>																																																	
Electrode Flux:	<u>N/A</u>	<u>N/A</u>																																																	
Consumable Insert:	<u>N/A</u>	<u>N/A</u>																																																	
Other:	<u>None</u>	<u>None</u>																																																	
	Gas	Composition	Flow Rate																																																
Shielding (GTAW):	<u>Argon</u>	<u>100%</u>	<u>15 - 20 cfm</u>																																																
Backing:	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>																																																
Shielding (GMAW):	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>																																																
TECHNIQUE: (QW-410) Beads-Stringer or Weave: <u>Stringer or Weave</u> Cup or Nozzle Size: <u>5/16" - 3/8"</u> Oscillation: <u>N/A</u> Nozzle to Work Distance: <u>N/A</u>				ELECTRICAL CHARACTERISTICS: (QW-409) Tungsten Electrode: <u>3/32" or 1/8" diameter EWLa-1.5 (1.5% Lanthanated)</u> Metal Transfer Mode: <u>N/A</u> Wire Feed Speed: <u>N/A</u> Current Pulsing: <u>N/A</u>																																															
INITIAL/INTERPASS CLEANING: <u>As required to produce weld surfaces free of dirt, grease, or other contaminant prior to each weld pass.</u> BACK GOUGE: <u>None.</u>				Passes Per Side: <u>Single or Multiple</u> Peening: <u>Not Allowed</u> Electrode Stickout: <u>N/A</u> No. Electrodes: <u>Single</u>																																															
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Weld Layer</th> <th rowspan="2">Process</th> <th colspan="2">Filler Metal</th> <th rowspan="2">Polarity</th> <th colspan="2">Current</th> <th rowspan="2">Other</th> </tr> <tr> <th>Class</th> <th>Diameter</th> <th>Amps.</th> <th>Volts</th> </tr> </thead> <tbody> <tr> <td>Root</td> <td>GTAW</td> <td>ER70S-2</td> <td>3/32"</td> <td>DCSP</td> <td>70 - 140</td> <td>10 - 15</td> <td>N/A</td> </tr> <tr> <td>Root</td> <td>GTAW</td> <td>ER70S-2</td> <td>1/8"</td> <td>DCSP</td> <td>70 - 140</td> <td>10 - 15</td> <td>N/A</td> </tr> <tr> <td>Fill & Cap</td> <td>SMAW</td> <td>E7018</td> <td>3/32"</td> <td>DCRP</td> <td>70 - 110</td> <td>18 - 26</td> <td>N/A</td> </tr> <tr> <td>Fill & Cap</td> <td>SMAW</td> <td>E7018</td> <td>1/8"</td> <td>DCRP</td> <td>90 - 150</td> <td>18 - 26</td> <td>N/A</td> </tr> </tbody> </table>								Weld Layer	Process	Filler Metal		Polarity	Current		Other	Class	Diameter	Amps.	Volts	Root	GTAW	ER70S-2	3/32"	DCSP	70 - 140	10 - 15	N/A	Root	GTAW	ER70S-2	1/8"	DCSP	70 - 140	10 - 15	N/A	Fill & Cap	SMAW	E7018	3/32"	DCRP	70 - 110	18 - 26	N/A	Fill & Cap	SMAW	E7018	1/8"	DCRP	90 - 150	18 - 26	N/A
Weld Layer	Process	Filler Metal		Polarity	Current		Other																																												
		Class	Diameter		Amps.	Volts																																													
Root	GTAW	ER70S-2	3/32"	DCSP	70 - 140	10 - 15	N/A																																												
Root	GTAW	ER70S-2	1/8"	DCSP	70 - 140	10 - 15	N/A																																												
Fill & Cap	SMAW	E7018	3/32"	DCRP	70 - 110	18 - 26	N/A																																												
Fill & Cap	SMAW	E7018	1/8"	DCRP	90 - 150	18 - 26	N/A																																												

WPS NO: CA - 02
 Issue Date: January 1, 2009

Revision No: 1
 Revision Date: April 2, 2009

Welding Processes: SMAW
 Type: Manual

BASE METALS:																				
P-No: <u>1</u>		to		P No: <u>1</u>																
Base Metal Thickness Range:			Groove: <u>1/16" - 3/4"</u>		Diameter Range:		Groove: <u>All</u>													
Other: <u>Maximum deposited pass thickness not to exceed 1/2". This WPS intended for performance qualification only.</u>																				
JOINTS:				<p>37.5 °</p> <p>1/4" Max.</p>																
Joint Desgn: <u>Vee - Groove</u> Backing (Type): <u>Metal</u> Material: <u>P-No. 1</u> Root Spacing: <u>1/4"</u> Maximum Retainers: <u>N/A</u> Other: <u>None</u>																				
POSITIONS:				TYPICAL SKETCH																
Groove Position: <u>All</u> Weld Progression: <u>Vertical Up</u>				POSTWELD HEAT TREATMENT: (QW-407) Temp Range: <u>None</u> Time Range: <u>N/A</u> Other: <u>N/A</u>																
PREHEAT:				GAS: (QW-408)																
Temperature: <u>50°F</u> Minimum Interpass Temp: <u>600°F</u> Maximum Preheat Maint: <u>Throughout all welding</u>				<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Gas</th> <th>Composition</th> <th>Flow Rate</th> </tr> </thead> <tbody> <tr> <td>Shielding (GTAW):</td> <td><u>N/A</u></td> <td><u>N/A</u></td> </tr> <tr> <td>Backing</td> <td><u>N/A</u></td> <td><u>N/A</u></td> </tr> <tr> <td>Shielding (FCAW):</td> <td><u>N/A</u></td> <td><u>N/A</u></td> </tr> </tbody> </table>					Gas	Composition	Flow Rate	Shielding (GTAW):	<u>N/A</u>	<u>N/A</u>	Backing	<u>N/A</u>	<u>N/A</u>	Shielding (FCAW):	<u>N/A</u>	<u>N/A</u>
Gas	Composition	Flow Rate																		
Shielding (GTAW):	<u>N/A</u>	<u>N/A</u>																		
Backing	<u>N/A</u>	<u>N/A</u>																		
Shielding (FCAW):	<u>N/A</u>	<u>N/A</u>																		
FILLER METALS: (QW-404)				ELECTRICAL CHARACTERISTICS: (QW-409)																
Process: <u>SMAW</u> SFA No: <u>6.1</u> AWS No: <u>E7018</u> F-No: <u>4</u> A-No: <u>1</u> Max. Deposited Thickness: <u>3/4"</u> - Groove - Electrode Flux: <u>N/A</u> Other: <u>None</u>				Tungsten Electrode: <u>N/A</u> Metal Transfer Mode: <u>N/A</u> Wire Feed Speed: <u>N/A</u> Current Pulsing: <u>N/A</u>																
TECHNIQUE: (QW-410)				INITIAL/INTERPASS CLEANING:																
Beads-Stringer or Weave: <u>Stringer or Weave</u> Cup or Nozzle Size: <u>N/A</u> Oscillation: <u>N/A</u> Nozzle to Work Distance: <u>N/A</u>				As required to produce weld surfaces free of dirt, grease, or other contaminant prior to each weld pass.																
BACK GOUGE:				None																
Weld Layer	Process	Filler Metal		Current		Volts	Other													
		Class	Diameter	Polarity	Amps.															
Root, Fill & Cap	SMAW	E7018	3/32"	DCRP	70 - 110	18 - 26	N/A													
Root, Fill & Cap	SMAW	E7018	1/8"	DCRP	90 - 150	18 - 26	N/A													

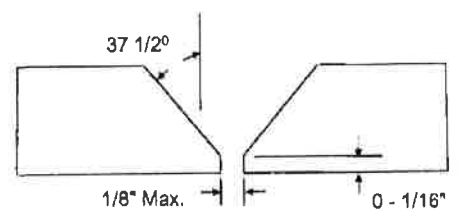
WPS NO: CA - 03
 Issue Date: January 1, 2009

Revision No: 2
 Revision Date: September 25, 2009

Welding Processes: GTAW/SMAW
 Type: Manual

BASE METALS:
 P-No: 8 to P No: 8
Base Metal Thickness Range: 1/16" - 3/4" **Diameter Range:** All
 Other: Maximum deposited pass thickness not to exceed 1/2". Filler metal must be added for all GTAW passes.
This WPS intended for performance qualification only.

JOINTS:
 Joint Design: Vee - Groove
 Backing (Type): None
 Material: N/A
 Root Spacing: 1/8" Maximum
 Retainers: None
 Other: None



POSITIONS:
 Groove Position: All
 Weld Progression: Vertical Up

TYPICAL SKETCH
POSTWELD HEAT TREATMENT: (QW-407)
 Temp Range: None
 Time Range: N/A
 Other: N/A

PREHEAT:
 Temperature: 50°F Minimum
 Interpass Temp: 350°F Maximum
 Preheat Maint: Throughout all welding

FILLER METALS: (QW-404)

Process:	GTAW	SMAW
SFA No:	<u>5.9</u>	<u>5.4</u>
AWS No:	<u>ER309/309L</u>	<u>E309/309L-16</u>
F-No:	<u>6</u>	<u>5</u>
A-No:	<u>8</u>	<u>8</u>
Maximum Deposited Thickness:	<u>1/8"</u> - Groove -	<u>3/4"</u>
Electrode Flux:	<u>N/A</u>	<u>N/A</u>
Consumable Insert:	<u>N/A</u>	<u>N/A</u>
Other:	<u>None</u>	<u>None</u>

GAS: (QW-408)

	Gas	Composition	Flow Rate
Shielding (GTAW):	<u>Argon</u>	<u>100%</u>	<u>10 - 20 cfm</u>
Backing	<u>Argon</u>	<u>100%</u>	<u>5 - 15 cfm</u>
Shielding (GMAW):	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>
Trailing:	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>

TECHNIQUE: (QW-410)
 Beads-Stringer or Weave: Stringer or Weave
 Cup or Nozzle Size: 5/16" to 3/8"
 Oscillation: N/A
 Nozzle to Work Distance: N/A

ELECTRICAL CHARACTERISTICS: (QW-409)
 Tungsten Electrode: 3/32" or 1/8" diameter EWLa-1.5 (1.5% Lanthanated)
 Metal Transfer Mode: N/A
 Wire Feed Speed: N/A
 Current Pulsing: N/A
 Passes Per Side: Single or Multiple
 Peening: Not Allowed
 Electrode Stickout: N/A
 No. Electrodes: Single

INITIAL/INTERPASS CLEANING: As required to produce weld surfaces free of dirt, grease, or other contaminant prior to each weld pass.
BACK GOUGE: None.

Weld Layer	Process	Filler Metal		Polarity	Current		Volts	Other
		Class	Diameter		Amps.			
Root or Root	GTAW	ER309/309L	3/32"	DCSP	80 - 110	10 - 14	N/A	
Fill & Cap and / or Fill & Cap	GTAW	ER309/309L	1/8"	DCSP	100 - 130	10 - 14	N/A	
	SMAW	E309/309L-16	3/32"	DCRP	40 - 70	18 - 26	N/A	
	SMAW	E309/309L-16	1/8"	DCRP	60 - 100	18 - 26	N/A	

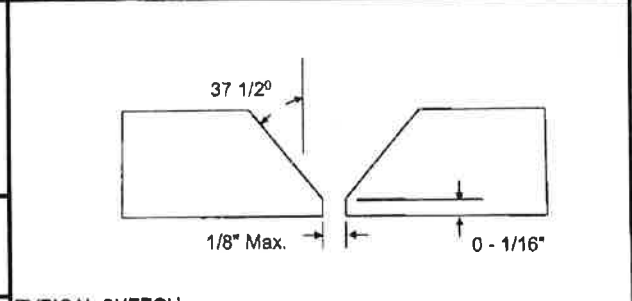
WPS NO: CA - 04
 Issue Date: January 1, 2009

Revision No: 1
 Revision Date: April 2, 2009

Welding Processes: SMAW
 Type: Manual

BASE METALS:
 P-No: 1 to P No: 1
 Base Metal Thickness Range: 1/16" - 3/4" Diameter Range: All
 Other: Maximum deposited pass thickness not to exceed 1/2". This WPS intended for performance qualification only.

JOINTS:
 Joint Design: Vee - Groove
 Backing (Type): None
 Material: N/A
 Root Spacing: 1/8" Maximum
 Retainers: N/A
 Other: None



POSITIONS:
 Groove Position: All
 Weld Progression: Vertical Up

PREHEAT: Temperature
 Interpass Temp: 50°F Minimum
 Preheat Maint: 600°F Maximum
Throughout all welding

POSTWELD HEAT TREATMENT:
 Temp Range: None
 Time Range: N/A
 Other: N/A

FILLER METALS:

Process:	SMAW	SMAW
SFA No:	5.1	5.1
AWS No:	E6010	E7018
F-No:	3	4
A-No:	1	1
Maximum Deposited Thickness:	1/8" - Groove -	3/4"
Electrode Flux:	N/A	N/A
Consumable Insert:	N/A	N/A
Other:	None	None

GAS:

	Gas	Composition	Flow Rate
Shielding (GTAW):	N/A	N/A	N/A
Backing	N/A	N/A	N/A
Shielding (FCAW):	N/A	N/A	N/A

TECHNIQUE:
 Beads-Stringer or Weave: Stringer or Weave
 Cup or Nozzle Size: N/A
 Oscillation: N/A
 Nozzle to Work Distance: N/A

ELECTRICAL CHARACTERISTICS:
 Tungsten Electrode: N/A
 Metal Transfer Mode: N/A
 Wire Feed Speed: N/A
 Current Pulsing: N/A
 Passes Per Side: Single or Multiple
 Peening: Not Allowed
 Electrode Stickout: N/A
 No. Electrodes: Single

INITIAL/INTERPASS CLEANING: As required to produce weld surfaces free of dirt, grease, or other contaminant prior to each weld pass.
BACK GOUGE: None.

Weld Layer	Process	Filler Metal		Polarity	Current		Volts	Other
		Class	Diameter		Amps.			
Root or Root	SMAW	E6010	3/32"	DCRP	40 - 70	18 - 26	N/A	
Fill & Cap and / or Fill & Cap	SMAW	E6010	1/8"	DCRP	75 - 130	18 - 26	N/A	
	SMAW	E7018	3/32"	DCRP	70 - 110	18 - 26	N/A	
	SMAW	E7018	1/8"	DCRP	90 - 150	18 - 26	N/A	

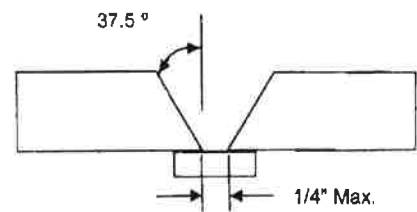
WPS NO: CA - 05
 Issue Date: January 1, 2009

Revision No: 1
 Revision Date: April 2, 2009

Welding Processes: FCAW
 Type: Semi-Automatic

BASE METALS:
 P-No: 1 to P No: 1
Base Metal Thickness Range: 1/16" - 3/4" **Diameter Range:** All
 Other: Maximum deposited pass thickness not to exceed 1/2". This WPS intended for performance qualification only.

JOINTS:
 Joint Design: Vee - Groove
 Backing (Type): Metal
 Material: P-No. 1
 Root Spacing: 1/4" Maximum
 Retainers: N/A
 Other: None



POSITIONS:
 Groove Position: All
 Weld Progression: Vertical Up

PREHEAT: **Temperature**
50°F Minimum
 Interpass Temp: 600°F Maximum
 Preheat Maint: Throughout all welding

TYPICAL SKETCH
POSTWELD HEAT TREATMENT: (QW-407)
 Temp Range: None
 Time Range: N/A
 Other: N/A

FILLER METALS: (QW-404)
 Process: FCAW
 SFA No: 5.20
 AWS No: E71T-1M
 F-No: 6
 A-No: 1
 Max. Deposited Thickness: 3/4" - Groove -
 Other: None

GAS: (QW-408)

Gas	Composition	Flow Rate
Shielding (GTAW):	N/A	N/A
Backing	N/A	N/A
Shielding (FCAW):	Argon/CO ₂	75%/25% 25 - 30 cfm

ELECTRICAL CHARACTERISTICS: (QW-409)
 Tungsten Electrode: N/A
 Metal Transfer Mode: Spray
 Wire Feed Speed: 300 - 750 ipm
 Current Pulsing: N/A

TECHNIQUE: (QW-410)
 Beads-Stringer or Weave: Stringer or Weave
 Cup or Nozzle Size: 5/8"
 Oscillation: N/A
 Nozzle to Work Distance: 1/2"

Passes Per Side: Single or Multiple
 Peening: Not Allowed
 Electrode Stickout: 3/4"
 No. Electrodes: Single

INITIAL/INTERPASS CLEANING: As required to produce weld surfaces free of dirt, grease, or other contaminant prior to each weld pass.
BACK GOUGE: None.

Weld Layer	Process	Filler Metal		Polarity	Current		Volts	Other
		Class	Diameter		Amps.			
Root, Fill & Cap or Root, Fill & Cap or Root, Fill & Cap	FCAW	E71T-1M	0.035"	DCRP	130 - 180	22 - 28	N/A	
	FCAW	E71T-1M	0.045"	DCRP	130 - 180	22 - 28	N/A	
	FCAW	E71T-1M	0.062"	DCRP	130 - 180	22 - 28	N/A	

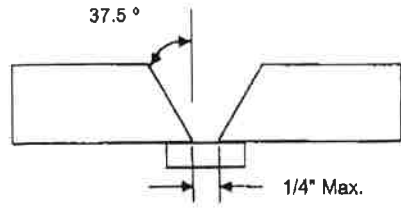
WPS NO: CA - 06
 Issue Date: January 1, 2009

Revision No: 0
 Revision Date: January 1, 2009

Welding Processes: FCAW
 Type: Semi Automatic

BASE METALS:
 P-No: 1 to P No: 1
 Base Metal Thickness Range: Groove: 1/16" - 3/4" Diameter Range: Groove: All
 Other: Self Shielded FCAW - Maximum deposited pass thickness not to exceed 1/2". This WPS intended for performance qualification only.

JOINTS:
 Joint Design: Vee - Groove
 Backing (Type): Metal
 Material: P-No 1
 Root Spacing: 1/4" Maximum
 Retainers: None
 Other: None



POSITIONS:
 Groove Position: All
 Weld Progression: Vertical Up

PREHEAT:
 Temperature: 50°F Minimum
 Interpass Temp: 600°F Maximum
 Preheat Maint: Throughout all welding

TYPICAL SKETCH
POSTWELD HEAT TREATMENT:
 Temp Range: None
 Time Range: N/A
 Other: N/A

FILLER METALS:
 Process: FCAW
 SFA No: 5.20
 AWS No: E71T-11
 F-No: 6
 A-No: 1
 Maximum Deposited Thickness: 3/4" - Groove -
 Other: None

GAS:

	Gas	Composition	Flow Rate
Shielding (GTAW):	N/A	N/A	N/A
Backing	N/A	N/A	N/A
Shielding (GMAW):	N/A	N/A	N/A

ELECTRICAL CHARACTERISTICS:
 Tungsten Electrode: N/A
 Metal Transfer Mode: Spray
 Wire Feed Speed: 150 - 275 ipm
 Current Pulsing: N/A

TECHNIQUE:
 Beads-Stringer or Weave: Stringer or Weave
 Cup or Nozzle Size: 5/8"
 Oscillation: N/A
 Nozzle to Work Distance: 3/4" - 1"

Passes Per Side: Single or Multiple
 Peening: Not Allowed
 Electrode Stickout: 1/2"
 No. Electrodes: Single

INITIAL/INTERPASS CLEANING: As required to produce weld surfaces free of dirt, grease, or other contaminant prior to each weld pass.
BACK GOUGE: None.

Weld Layer	Process	Filler Metal		Current		Volts	Other
		Class	Diameter	Polarity	Amps.		
Root, Fill & Cap or Root, Fill & Cap or Root, Fill & Cap	FCAW	E71T-11	0.035"	DC-SP	160 - 220	20 - 26	N/A
	FCAW	E71T-11	0.045"	DC-SP	160 - 220	20 - 26	N/A
	FCAW	E71T-11	0.062"	DC-SP	160 - 220	20 - 26	N/A

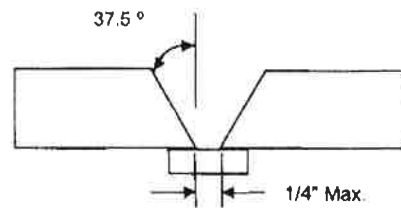
WPS NO: CA - 07
 Issue Date: January 1, 2009

Revision No: 0
 Revision Date: January 1, 2009

Welding Processes: FCAW
 Type: Semi Automatic

BASE METALS:
 P-No: 1 to P No: 1
 Base Metal Thickness Range: Groove: 1/16" - 3/4" Diameter Range: Groove: All
 Other: Self Shielded FCAW - Maximum deposited pass thickness not to exceed 1/2". This WPS intended for performance qualification only.

JOINTS:
 Joint Design: Vee - Groove
 Backing (Type): Metal
 Material: P-No 1
 Root Spacing: 1/4" Maximum
 Retainers: None
 Other: None



POSITIONS:
 Groove Position: All
 Weld Progression: Vertical Down

PREHEAT:
 Temperature: 50°F Minimum
 Interpass Temp: 600°F Maximum
 Preheat Maint: Throughout all welding

TYPICAL SKETCH
POSTWELD HEAT TREATMENT:
 Temp Range: None
 Time Range: N/A
 Other: N/A

FILLER METALS:
 Process: FCAW
 SFA No: 5.20
 AWS No: E71T-11
 F-No: 6
 A-No: 1
 Maximum Deposited Thickness: 3/4" - Groove -
 Other: None

GAS:

	Gas	Composition	Flow Rate
Shielding (GTAW):	N/A	N/A	N/A
Backing	N/A	N/A	N/A
Shielding (GMAW):	N/A	N/A	N/A

ELECTRICAL CHARACTERISTICS:
 Tungsten Electrode: N/A
 Metal Transfer Mode: Spray
 Wire Feed Speed: 150 - 275 ipm
 Current Pulsing: N/A

TECHNIQUE:
 Beads-Stringer or Weave: Stringer or Weave
 Cup or Nozzle Size: 5/8"
 Oscillation: N/A
 Nozzle to Work Distance: 3/4" - 1"

Passes Per Side: Single or Multiple
 Peening: Not Allowed
 Electrode Stickout: 1/2"
 No. Electrodes: Single

INITIAL/INTERPASS CLEANING: As required to produce weld surfaces free of dirt, grease, or other contaminant prior to each weld pass.
 BACK GOUGE: None.

Weld Layer	Process	Filler Metal		Current		Volts	Other
		Class	Diameter	Polarity	Amps.		
Root, Fill & Cap or Root, Fill & Cap	FCAW	E71T-11	0.035"	DC-SP	160 - 220	20 - 26	N/A
Root, Fill & Cap or Root, Fill & Cap	FCAW	E71T-11	0.045"	DC-SP	160 - 220	20 - 26	N/A
Root, Fill & Cap	FCAW	E71T-11	0.062"	DC-SP	160 - 220	20 - 26	N/A

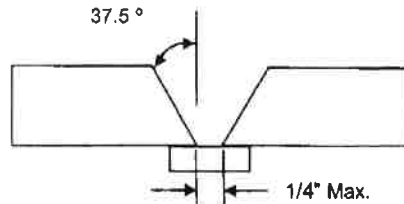
WPS NO: CA - 08
 Issue Date: June 10, 2015

Revision No: 0
 Revision Date: June 10, 2015

Welding Processes: FCAW
 Type: Semi-Automatic

BASE METALS:
 P-No: 1 to P No: 1
Base Metal Thickness Range: Groove: 1/16" - 3/4" **Diameter Range:** Groove: All
 Other: Maximum deposited pass thickness not to exceed 1/2". This WPS intended for performance qualification only.

JOINTS:
 Joint Design: Vee - Groove
 Backing (Type): Metal
 Material: P-No. 1
 Root Spacing: 1/4" Maximum
 Retainers: N/A
 Other: None



POSITIONS:
 Groove Position: All
 Weld Progression: Vertical Up

PREHEAT: **Temperature**
50°F Minimum
 Interpass Temp: 600°F Maximum
 Preheat Maint: Throughout all welding

TYPICAL SKETCH
POSTWELD HEAT TREATMENT: (QW-407)
 Temp Range: None
 Time Range: N/A
 Other: N/A

FILLER METALS: (QW-404)
 Process: FCAW
 SFA No: 5.20
 AWS No: E71T-12M
 F-No: 6
 A-No: 1
 Max. Deposited Thickness: 3/4" - Groove -
 Other: None

GAS: (QW-408)

	Gas	Composition	Flow Rate
Shielding (GTAW):	N/A	N/A	N/A
Backing:	N/A	N/A	N/A
Shielding (FCAW):	Argon/CO ₂	75%/25%	25 - 30 cfm

ELECTRICAL CHARACTERISTICS: (QW-409)
 Tungsten Electrode: N/A
 Metal Transfer Mode: Spray
 Wire Feed Speed: 300 - 750 ipm
 Current Pulsing: N/A

TECHNIQUE: (QW-410)
 Beads-Stringer or Weave: Stringer or Weave
 Cup or Nozzle Size: 5/8"
 Oscillation: N/A
 Nozzle to Work Distance: 1/2"

Passes Per Side: Single or Multiple
 Peening: Not Allowed
 Electrode Stickout: 3/4"
 No. Electrodes: Single

INITIAL/INTERPASS CLEANING: As required to produce weld surfaces free of dirt, grease, or other contaminant prior to each weld pass.
BACK GOUGE: None.

Weld Layer	Process	Filler Metal		Polarity	Current		Other
		Class	Diameter		Amps.	Volts	
Root, Fill & Cap or Root, Fill & Cap or Root, Fill & Cap	FCAW	E71T-12M	0.035"	DCRP	130 - 180	22 - 28	N/A
	FCAW	E71T-12M	0.045"	DCRP	130 - 180	22 - 28	N/A
	FCAW	E71T-12M	0.062"	DCRP	130 - 180	22 - 28	N/A

WPS NO: CA - 09
 Issue Date: September 22, 2015

Revision No: 0
 Revision Date: September 22, 2015

Welding Processes: GTAW/SMAW
 Type: Manual

BASE METALS:								
P-No: <u>43</u>		to		P No: <u>43</u>				
Base Metal Thickness Range:		Groove: <u>1/16" - 3/4"</u>		Diameter Range:		Groove: <u>All</u>		
Other: <u>Maximum deposited pass thickness not to exceed 1/2". Filler metal must be added for all GTAW passes. This WPS intended for performance qualification only.</u>								
JOINTS:								
GTAW		SMAW						
Joint Design:	<u>Vee - Groove</u>	<u>Vee-Groove</u>						
Backing (Type):	<u>Gas</u>	<u>Metal</u>						
Material:	<u>Argon</u>	<u>P-No. 43</u>						
Root Spacing:	<u>5/32" Maximum</u>	<u>1/4"</u>						
Retainers:	<u>None</u>	<u>None</u>						
Other:	<u>None</u>	<u>None</u>						
POSITIONS:				TYPICAL SKETCH				
Groove Position:		<u>All</u>		POSTWELD HEAT TREATMENT: (QW-407)				
Weld Progression:		<u>Vertical Up</u>		Temp Range: <u>None</u>				
Preheat Maint:		<u>Throughout all welding</u>		Time Range: <u>N/A</u>				
Interpass Temp:		<u>350°F Maximum</u>		Other: <u>N/A</u>				
FILLER METALS: (QW-404)				GAS: (QW-408)				
Process:		<u>GTAW</u>		<u>SMAW</u>				
SFA No:		<u>5.14</u>		<u>5.11</u>				
AWS No:		<u>ERNiCr-3</u>		<u>ENiCrFe-3</u>				
F-No:		<u>43</u>		<u>43</u>				
A-No:		<u>N/A</u>		<u>N/A</u>				
Maximum Deposited Thickness:		<u>1/8" - Groove -</u>		<u>3/4"</u>				
Electrode Flux:		<u>N/A</u>		<u>N/A</u>				
Consumable Insert:		<u>N/A</u>		<u>N/A</u>				
Other:		<u>None</u>		<u>None</u>				
TECHNIQUE: (QW-410)				ELECTRICAL CHARACTERISTICS: (QW-409)				
Beads-Stringer or Weave:		<u>Stringer or Weave</u>		Tungsten Electrode: <u>3/32" or 1/8" diameter EWLa-1.5 (1.5% Lanthanated)</u>				
Cup or Nozzle Size:		<u>5/16" to 3/8"</u>		Metal Transfer Mode: <u>N/A</u>				
Oscillation:		<u>N/A</u>		Wire Feed Speed: <u>N/A</u>				
Nozzle to Work Distance:		<u>N/A</u>		Current Pulsing: <u>N/A</u>				
Passes Per Side:		<u>Single or Multiple</u>		Peening: <u>Not Allowed</u>				
Electrode Stickout:		<u>N/A</u>		No. Electrodes: <u>Single</u>				
Initial/Interpass Cleaning:		<u>As required to produce weld surfaces free of dirt, grease, or other contaminant prior to each weld pass.</u>						
BACK GOUGE:		<u>None.</u>						
Weld Layer	Process	Filler Metal		Polarity	Current		Volts	Other
		Class	Diameter		Amps.			
Root or Root	GTAW	ERNiCr-3	3/32"	DCSP	95-200	10 - 13	N/A	
Fill & Cap and / or Fill & Cap	GTAW	ERNiCr-3	1/8"	DCSP	95-200	10 - 13	N/A	
	SMAW	ENiCrFe-3	3/32"	DCRP	40-65	24-28	N/A	
	SMAW	ENiCrFe-3	1/8"	DCRP	65-95	26-30	N/A	

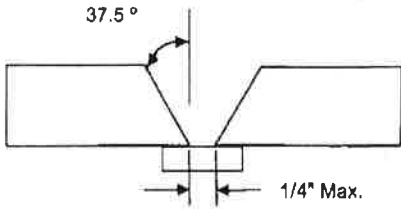
WPS NO: CA - 11
 Issue Date: January 1, 2009

Revision No: 2
 Revision Date: January 22, 2020

Welding Processes: FCAW
 Type: Semi Automatic

BASE METALS:
 P-No: 1 to P No: 1
 Base Metal Thickness Range: Groove: 1/16" - 1/2" Diameter Range: Groove: All
 Maximum deposited pass thickness not to exceed 1/2". This WPS intended for performance qualification only.

JOINTS:
 Joint Design: Vee - Groove
 Backing (Type): Metal
 Material: P-No 1
 Root Spacing: 1/4" Maximum
 Retainers: None
 Other: None



POSITIONS:
 Groove Position: All
 Weld Progression: Vertical Up

PREHEAT:
 Temperature: 50°F Minimum
 Interpass Temp: 600°F Maximum
 Preheat Maint: Throughout all welding

POSTWELD HEAT TREATMENT:
 Temp Range: None
 Time Range: N/A
 Other: N/A

FILLER METALS:
 Process: FCAW
 SFA No: 5.22
 AWS No: E309T1-4
 F-No: 6
 A-No: 8
 Maximum Deposited Thickness: 0.500 - Groove -
 Other: None

GAS:

	Gas	Composition	Flow Rate
Shielding (GTAW):	N/A	N/A	N/A
Backing	N/A	N/A	N/A
Shielding (FCAW):	Argon/CO ₂	75%/25%	25 - 30 cfm

ELECTRICAL CHARACTERISTICS:
 Tungsten Electrode: N/A
 Metal Transfer Mode: Spray
 Wire Feed Speed: 150 - 275 ipm
 Current Pulsing: N/A

TECHNIQUE:
 Beads-Stringer or Weave: Stringer or Weave
 Cup or Nozzle Size: 5/8"
 Oscillation: N/A
 Nozzle to Work Distance: 3/4" - 1"

Passes Per Side: Single or Multiple
 Peening: Not Allowed
 Electrode Stickout: 1/2"
 No. Electrodes: Single

INITIAL/INTERPASS CLEANING: As required to produce weld surfaces free of dirt, grease, or other contaminant prior to each weld pass.
 BACK GOUGE: None.

Weld Layer	Process	Filler Metal		Polarity	Current		Volts	Other
		Class	Diameter		Amps.			
Root, Fill & Cap or Root, Fill & Cap or Root, Fill & Cap	FCAW	E309T1-4	0.035"	DC-RP	160 - 220	20 - 26	N/A	
	FCAW	E309T1-4	0.045"	DC-RP	160 - 220	20 - 26	N/A	
	FCAW	E309T1-4	0.062"	DC-RP	160 - 220	20 - 26	N/A	

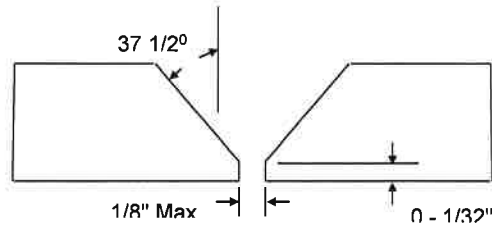
WPS NO: CA - 12
 Issue Date: July 24, 2020

Revision No: 0
 Revision Date: _____

Welding Processes: SMAW
 Type: Manual

BASE METALS:
 P-No: 1 to P No: 1
Base Metal Thickness Range: 3/16" - 1.250" **Diameter Range:** All
 Other: Maximum deposited pass thickness not to exceed 1/2".
This WPS intended for performance qualification only.

JOINTS:
 Joint Design: Vee - Groove
 Backing (Type): None
 Material: N/A
 Root Spacing: 1/16" Maximum
 Retainers: None
 Other: None



POSITIONS:
 Groove Position: All
 Weld Progression: Vertical Up

TYPICAL SKETCH
POSTWELD HEAT TREATMENT: (QW-407)
 Temp Range: None
 Time Range: N/A
 Other: N/A

PREHEAT:
Temperature
 50°F Minimum
 Interpass Temp: 350°F Maximum
 Preheat Maint: Throughout all welding

FILLER METALS: (QW-404)

Process:	<u>SMAW</u>	<u>SMAW</u>
SFA No:	<u>5.5</u>	<u>5.5</u>
AWS No:	<u>ER7010</u>	<u>E7018</u>
F-No:	<u>3</u>	<u>4</u>
A-No:	<u>2</u>	<u>2</u>
Maximum Deposited Thickness:	<u>0.250</u> - Groove -	<u>1.000</u>
Electrode Flux:	<u>N/A</u>	<u>N/A</u>
Consumable Insert:	<u>N/A</u>	<u>N/A</u>
Other:	<u>None</u>	<u>None</u>

GAS: (QW-408)

	<u>Gas</u>	<u>Composition</u>	<u>Flow Rate</u>
Shielding :	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>
Backing	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>
Shielding (GMAW):	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>
Trailing:	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>

ELECTRICAL CHARACTERISTICS: (QW-409)
 Tungsten Electrode: 3/32" or 1/8" diameter EWLa-1.5
(1.5% Lanthanated)
 Metal Transfer Mode: N/A
 Wire Feed Speed: N/A
 Current Pulsing: N/A

TECHNIQUE: (QW-410)
 Beads-Stringer or Weave: Stringer or Weave
 Cup or Nozzle Size: 5/16" to 3/8"
 Oscillation: N/A
 Nozzle to Work Distance: N/A

Passes Per Side: Single or Multiple
 Peening: Not Allowed
 Electrode Stickout: N/A
 No. Electrodes: Single

INITIAL/INTERPASS CLEANING: As required to produce weld surfaces free of dirt, grease, or other contaminant prior to each weld pass.
BACK GOUGE: None.

Weld Layer	Process	Filler Metal		Current		Volts	Other
		Class	Diameter	Polarity	Amps.		
Root or Root	SMAW	E7010-A1	3/32"	DCRP	70 - 120	19-25	N/A
Fill & Cap and / or Fill & Cap	SMAW	E7010-A1	1/8"	DCRP	100 - 150	20-28	N/A
Fill & Cap	SMAW	E7018-A1	3/32"	DCRP	70 - 120	19-25	N/A
Fill & Cap	SMAW	E7018-A1	1/8"	DCRP	100 - 150	20-28	N/A