STRUCTAL BRIDGES, a division of Canam Steel Corp.

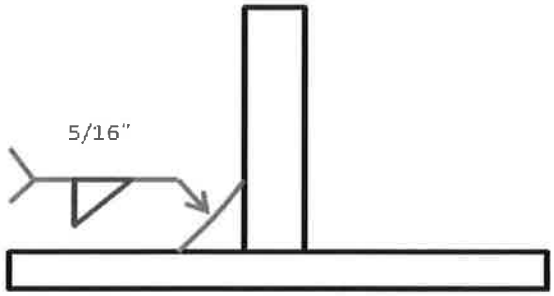
WELDING PROCEDURE SPECIFICATION

FCM AND NON FCM WELDS

WPS Number: FC-1001A	Issue date:03-07-2013
Project: Jamaica VT., ER-BRF-015-1(23)	STRUCTAL job #.: UPO 1195
Base metal: ASTM A709 GR 36,50,50W, HPS 50W.	
Welding process:Flux Cored Arc Welding	
Filler metal spec. AWS,A5.29 ESAB DualShield 810X-Ni1	
Flux / shielding gas:100% CO_2	
Current and polarity: DCEP	Electrical stickout: 3/4" +/- 1/4"
Welding position: 1F and 2F	
Preheat temp..:AWS D1.5 Table 4.3 / 12.3	WPS qualification:AWS D1.5 / section 5
Heat input: 35.34 - 49.00, Kilojoules	Supporting PQR#:FCAW-PQR-50W-50W-1G-WM23, REV.1

electrode size	welding amps	current volts	travel speed
1/16"	300 - 345	27 - 29	12.25 -13.75

Joint Detail :T joint



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Minimum preheat and interpass temperatures per AWS D1.5 Table 4.3 / 12.3

Maximum interpass temp. shall be 450°F

Thickness of thickest part at point of welding	FCM	Non FCM
up to 3/4"	125°F	50°F
3/4" to 1 1/2"	200°F	70°F
1 1/2" to 2 1/2"	300°F	150°F
over 2 1/2"	350°F	225°F

This procedure may vary due to fabrication sequence, fit up, pass size, etc. within the limits provided in the contract documents and the AWS D1.5, 2010 Bridge Welding Code.

STRUCTAL BRIDGES, a division of Canam Steel Corp.

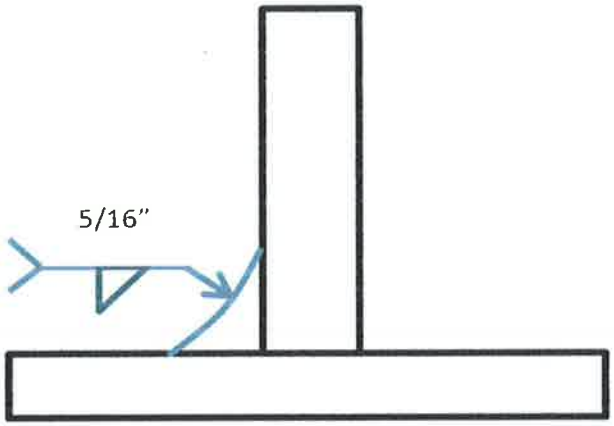
WELDING PROCEDURE SPECIFICATION

FCM AND NON FCM WELDS

WPS Number: FC-1002A	Issue date:03-07-2013
Project: Jamaica VT., ER-BRF-015-1(23)	STRUCTAL job #.:UPO 1195
Base metal: ASTM A709 GR 36,50,50W, HPS 50W.	
Welding process:Flux Cored Arc Welding	
Filler metal spec. AWS,A5.29 ESAB DualShield 810X-Ni1	
Flux / shielding gas:100% CO_2	
Current and polarity: DCEP	Electrical stickout: 3/4" +/- 1/4"
Welding position: 3F	
Preheat temp..:AWS D1.5 Table 4.3 / 12.3	WPS qualification:AWS D1.5 / section 5
Heat input: 36.8 - 48.21, Kilojoules	Supporting PQR#:FCAW-PQR-50W-50W-3G-WM23

electrode size	welding amps	current volts	travel speed
1/16"	200 - 225	23 - 25	7 - 7.5 I/M

Joint Detail :T joint



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Notes: For welding 5/16" Fillet welds.

THIS WELD IS REJECTED FOR STRUCTURAL MEMBERS PER SECTION 506.10(c). THIS WELD CAN BE USED FOR DRIP BAR CONNECTIONS ONLY.

Minimum preheat and interpass temperatures per AWS D1.5 Table 4.3 / 12.3

Maximum interpass temp. shall be 450˚F

Thickness of thickest part at point of welding	FCM	Non FCM
up to 3/4"	125˚F	50˚F
3/4" to 1 1/2"	200˚F	70˚F
1 1/2" to 2 1/2"	300˚F	150˚F
over 2 1/2"	350˚F	225˚F

This procedure may vary due to fabrication sequence, fit up, pass size, etc. within the limits provided in the contract documents and the AWS D1.5, 2010 Bridge Welding Code.

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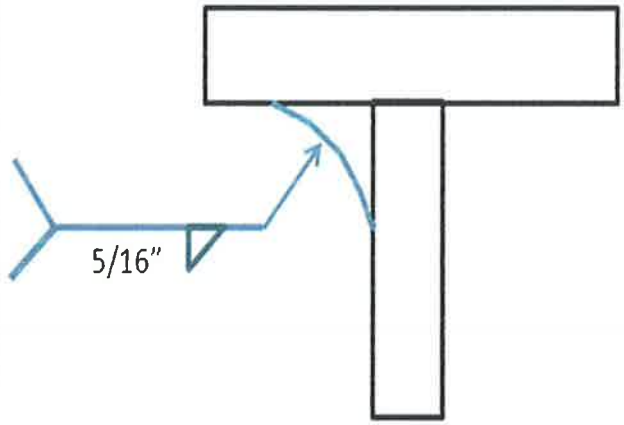
WELDING PROCEDURE SPECIFICATION

FCM AND NON FCM WELDS

WPS Number: FC-1003A	Issue date:03-07-2013
Project: Jamaica VT., ER-BRF-015-1(23)	STRUCTAL job #.: UPO 1195
Base metal: ASTM A709 GR 36,50,50W, HPS 50W.	
Welding process:Flux Cored Arc Welding	
Filler metal spec. AWS,A5.29 ESAB DualShield 810X-Ni1	
Flux / shielding gas:100% CO_2	
Current and polarity: DCEP	Electrical stickout: 3/4" +/- 1/4"
Welding position: 4F	
Preheat temp..:AWS D1.5 Table 4.3 / 12.3	WPS qualification:AWS D1.5 / section 5
Heat input: 28.86-48.02, Kilojoules	Supporting PQR#:FCAW-PQR-50W-50W-4G-WM23.

electrode size	welding amps	current volts	travel speed
1/16"	240.5 - 260	24.5 - 27	10.5-12.25 I/M

Joint Detail :T joint



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Notes: For welding 5/16" Fillet welds.

THIS WELD IS REJECTED FOR STRUCTURAL MEMBERS PER SECTION 506.10(c). THIS WELD CAN BE USED FOR DRIP BAR CONNECTIONS ONLY.

Minimum preheat and interpass temperatures per AWS D1.5 Table 4.3 / 12.3

Maximum interpass temp. shall be 450°F

Thickness of thickest part at point of welding	FCM	Non FCM
up to 3/4"	125°F	50°F
3/4" to 1 1/2"	200°F	70°F
1 1/2" to 2 1/2"	300°F	150°F
over 2 1/2"	350°F	225°F

This procedure may vary due to fabrication sequence, fit up, pass size, etc. within the limits provided in the contract documents and the AWS D1.5, 2010 Bridge Welding Code.

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WELDING PROCEDURE SPECIFICATION

FCM AND NON FCM WELDS

WPS Number: SM-100	Issue date:03-07-2013
Project: Jamaica VT., ER-BRF-015-1(23)	STRUCTAL job #.:UPO 1195
Base metal: ASTM A709 GR50W, HPS 50W	
Welding process: Sielded Metal Arc Welding	
Filler metal spec. and Trade Name.:AWS A5.5 Excalibur 8018-C3 MR	
Flux / shielding gas: N/A	
Current and polarity:DCEP	Electrical stickout:N/A
Welding position: 1F- 1G and 2F	
Preheat temp..:AWS D1.5 Table 4.3 / 12.3	WPS qualification:AWS D1.5 - 5.11
Heat input: 38-130 Kilojoules	Supporting PQR#: Pre Approved

electrode size	welding amps	welding volts	travel speed
1/8"	125-150	23-26	3 - 4.5
5/32"	140-190	23-26	3 - 4.5
3/16"	180-250	23-26	3 - 4.5

Joint Detail : 1F-1G and 2F

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Notes: 8018 Stick electrodes to be used for weld repairs and tacking
weld repair and tack welding

Minimum preheat and interpass temperatures per AWS D1.5 Table 4.3 / 12.3

Maximum interpass temp. shall be 450°F

Thickness of thickest part at point of welding	FCM	Non FCM
up to 3/4"	125°F	50°F
3/4" to 1 1/2"	200°F	70°F
1 1/2" to 2 1/2"	225°F	150°F
over 2 1/2"	325°F	225°F

This procedure may vary due to fabrication sequence, fit up, pass size, etc. within the limits provided in the contract documents and the AWS D1.5, 2010 Bridge Welding Code.

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WELDING PROCEDURE SPECIFICATION

FCM AND NON FCM WELDS

WPS Number: SM-200	Issue date:03-07-2013
Project: Jamaica VT., ER-BRF-015-1(23)	STRUCTAL job #.: UPO 1195
Base metal: ASTM A709 GR50W, HPS 50W	
Welding process: Sielded Metal Arc Welding	
Filler metal spec. and Trade Name.:AWS A5.5 Excalibur 8018-C3 MR	
Flux / shielding gas: N/A	
Current and polarity:DCEP	Electrical stickout:N/A
Welding position: 2G	
Preheat temp..:AWS D1.5 Table 4.3 / 12.3	WPS qualification:AWS D1.5 - 5.11
Heat input: 38-130 Kilojoules	Supporting PQR#: Pre Approved

electrode size	welding amps	welding volts	travel speed
1/8"	125-150	23-26	3 - 4.5 I/M
5/32"	140-190	23-26	3 - 4.5 I/M
3/16"	180-250	23-26	3 - 4.5 I/M

Joint Detail : 2G

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Notes: 8018 Stick electrodes to be used for ~~weld repairs and~~ tacking ~~weld repair and~~ tack welding

Minimum preheat and interpass temperatures per AWS D1.5 Table 4.3 / 12.3

Maximum interpass temp. shall be 450˚F

Thickness of thickest part at point of welding	FCM	Non FCM
up to 3/4"	125˚F	50˚F
3/4" to 1 1/2"	200˚F	70˚F
1 1/2" to 2 1/2"	225˚F	150˚F
over 2 1/2"	325˚F	225˚F

This procedure may vary due to fabrication sequence, fit up, pass size, etc. within the limits provided in the contract documents and the AWS D1.5, 2010 Bridge Welding Code.

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WELDING PROCEDURE SPECIFICATION

FCM AND NON FCM WELDS

WPS Number: SM-300	Issue date:03-07-2013
Project: Jamaica VT., ER-BRF-015-1(23)	STRUCTAL job #.: UPO 1195
Base metal: ASTM A709 GR50W, HPS 50W	
Welding process: Sielded Metal Arc Welding	
Filler metal spec. and Trade Name.:AWS A5.5 Excalibur 8018-C3 MR	
Flux / shielding gas: N/A	
Current and polarity:DCEP	Electrical stickout:N/A
Welding position: 3F and 3G	
Preheat temp..:AWS D1.5 Table 4.3 / 12.3	WPS qualification:AWS D1.5 - 5.11
Heat input: 29.04 - 137.7 Kilojoules	Supporting PQR#: Pre Approved

electrode size	welding amps	welding volts	travel speed
1/8"	110 - 130	21 - 22	3 - 4 I/M
5/32"	130 - 140	21 - 22	2.75 - 3.5

Joint Detail : 3F and 3G

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Notes: 8018 Stick electrodes to be used for ~~weld repairs and~~ tacking ~~weld repair and~~ tack welding

Minimum preheat and interpass temperatures per AWS D1.5 Table 4.3 / 12.3

Maximum interpass temp. shall be 450˚F

Thickness of thickest part at point of welding	FCM	Non FCM
up to 3/4"	125˚F	50˚F
3/4" to 1 1/2"	200˚F	70˚F
1 1/2" to 2 1/2"	225˚F	150˚F
over 2 1/2"	325˚F	225˚F

This procedure may vary due to fabrication sequence, fit up, pass size, etc. within the limits provided in the contract documents and the AWS D1.5, 2010 Bridge Welding Code.

STRUCTAL BRIDGES, a division of Canam Steel Corp.

WELDING PROCEDURE SPECIFICATION

FCM AND NON FCM WELDS

WPS Number: SM-400	Issue date:03-07-2013
Project: Jamaica VT., ER-BRF-015-1(23)	STRUCTAL job #.: UPO 1195
Base metal: ASTM A709 GR50W, HPS 50W	
Welding process: Sielded Metal Arc Welding	
Filler metal spec. and Trade Name.:AWS A5.5 Excalibur 8018-C3 MR	
Flux / shielding gas: N/A	
Current and polarity:DCEP	Electrical stickout:N/A
Welding position: 4F and 4G	
Preheat temp..:AWS D1.5 Table 4.3 / 12.3	WPS qualification:AWS D1.5 - 5.11
Heat input: 29.04 - 137.7 Kilojoules	Supporting PQR#: Pre Approved

electrode size	welding amps	welding volts	travel speed
1/8"	125 - 150	23 - 26	3 - 4.5 I/M
5/32"	140 - 190	23 - 26	3 - 4.5 I/M

Joint Detail : 4Fand 4G

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Notes: 8018 Stick electrodes to be used for weld repairs and tacking weld repair and tack welding

Minimum preheat and interpass temperatures per AWS D1.5 Table 4.3 / 12.3

Maximum interpass temp. shall be 450˚F

Thickness of thickest part at point of welding	FCM	Non FCM
up to 3/4"	125˚F	50˚F
3/4" to 1 1/2"	200˚F	70˚F
1 1/2" to 2 1/2"	225˚F	150˚F
over 2 1/2"	325˚F	225˚F

This procedure may vary due to fabrication sequence, fit up, pass size, etc. within the limits provided in the contract documents and the AWS D1.5, 2010 Bridge Welding Code.

STRUCTAL BRIDGES, a division of Canam Steel Corp.

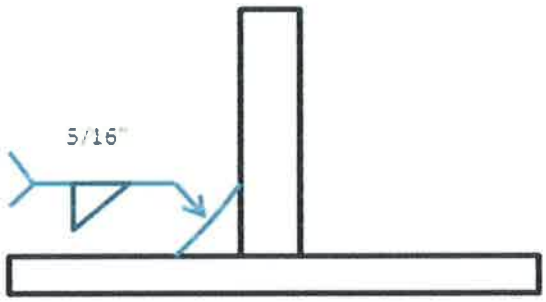
WELDING PROCEDURE SPECIFICATION

FCM AND NON FCM WELDS

WPS Number: S-1001-A	Issue date: 03-07-2013
Project: Jamaica VT, ER-BRF-015-1 (23)	STRUCTAL job #.:UPO 1195
Base metal: ASTM A709 GR 36,50,50W, HPS 50W.	
Welding process: Submerged Arc Welding	
Filler metal spec. AWS,A5.23 Lincolnweld LA-75	
Flux / shielding gas:Lincolnweld 960	
Current and polarity: DCEP	Electrical stickout: 3/4" +/- 1/4"
Welding position: 1F and 2F	
Preheat temp..:AWS D1.5 Table 4.3 / 12.3	WPS qualification:AWS D1.5 / section 5
Heat input: 47.25 - 74.15 Kilojoules	Supporting PQR#: WTTI P1-2674G

electrode size	welding amps	current volts	travel speed
3/32"	405 - 466	27.9 - 30.5	11.5 - 13.8

Joint Detail : T joint



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Notes: For welding 5/16" fillet welds.

Minimum preheat and interpass temperatures per AWS D1.5 Table 4.3 / 12.3

Maximum interpass temp. shall be 450˚F

Thickness of thickest part at point of welding	FCM	Non FCM
up to 3/4"	125˚F	50˚F
3/4" to 1 1/2"	200˚F	70˚F
1 1/2" to 2 1/2"	300˚F	150˚F
over 2 1/2"	350˚F	225˚F

This procedure may vary due to fabrication sequence, fit up, pass size, etc. within the limits provided in the contract documents and the AWS D1.5, 2010 Bridge Welding Code.

STRUCTAL BRIDGES, a division of Canam Steel Corp.

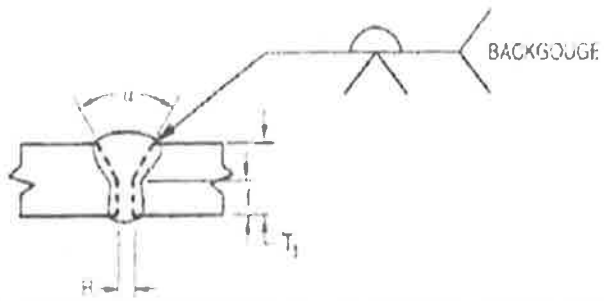
WELDING PROCEDURE SPECIFICATION

FCM AND NON FCM WELDS

WPS Number: S-1005	Issue date:03- 07-2013
Project: Jamaica VT, ER-BRF-015-1 (23)	STRUCTAL job #.:UPO 1195
Base metal: ASTM A709 GR 36,50,50W, HPS 50W.	
Welding process: Submerged Arc Welding	
Filler metal spec. AWS,A5.23 Lincolnweld LA-75	
Flux / shielding gas:Lincolnweld 960	
Current and polarity: DCEP	Electrical stickout: 3/4" +/- 1/4"
Welding position: 1G	
Preheat temp..:AWS D1.5 Table 4.3 / 12.3	WPS qualification:AWS D1.5 / section 5
Heat input: 47.25 - 74.15 Kilojoules	Supporting PQR#: WTTI P1-2674G

electrode size	welding amps	current volts	travel speed
3/32"	405 - 466	27.9 - 30.5	11.5 - 13.8

Joint Detail :B-L2c-S



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Notes: For welding Single Groove welds on Flanges.

1" to 1"	T1 = 1"	f = 1/4" minimum, + 1/4" - 0"	R = 0"	a = 60°
1 1/4" to 1 1/4"	T1 = 1 1/4"	f = 3/8" minimum, + 1/4" - 0"	R = 0"	a = 60°
2" to 2"	T1 = 2"	f = 1/2" minimum, + 1/4" - 0"	R = 0"	a = 60°

Grind flat after welding

Minimum preheat and interpass temperatures per AWS D1.5 Table 4.3 / 12.3

Maximum interpass temp. shall be 450°F

Thickness of thickest part at point of welding	FCM	Non FCM
up to 3/4"	125°F	50°F
3/4" to 1 1/2"	200°F	70°F
1 1/2" to 2 1/2"	300°F	150°F
over 2 1/2"	350°F	225°F

This procedure may vary due to fabrication sequence, fit up, pass size, etc. within the limits provided in the contract documents and the AWS D1.5, 2010 Bridge Welding Code.

STRUCTAL BRIDGES, a division of Canam Steel Corp.

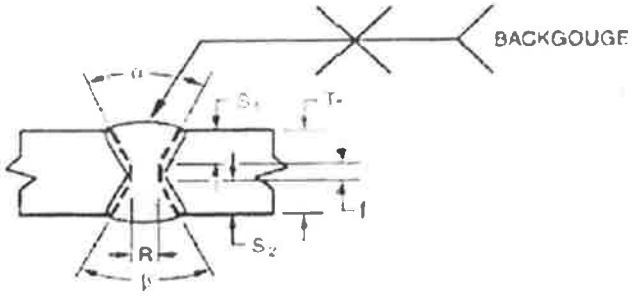
WELDING PROCEDURE SPECIFICATION

FCM AND NON FCM WELDS

WPS Number: S-1005-A	Issue date:03-07-2013
Project: Jamaica VT, ER-BRF-015-1(23)	STRUCTAL job #.:UPO 1195
Base metal: ASTM A709 GR 36,50,50W, HPS 50W.	
Welding process: Submerged Arc Welding	
Filler metal spec. AWS,A5.23 Lincolnweld LA-75	
Flux / shielding gas:Lincolnweld 960	
Current and polarity: DCEP	Electrical stickout: 3/4" +/- 1/4"
Welding position: 1G	
Preheat temp..:AWS D1.5 Table 4.3 / 12.3	WPS qualification:AWS D1.5 / section 5
Heat input: 47.25 - 74.15 Kilojoules	Supporting PQR#: WTTI P1-2674G

electrode size	welding amps	current volts	travel speed
3/32"	405 - 466	27.9 - 30.5	11.5 - 13.8

Joint Detail :B-U3c-S



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Notes: For welding Double Groove welds on Flanges,

2 1/4" to 2 1/4"	T_1 = 2 1/4"	S_1 = 1"
	R = 0"	S_2 = 1"
	a = 60°	f = 1/4"
Grind flat after welding	b = 60°	

Minimum preheat and interpass temperatures per AWS D1.5 Table 4.3 / 12.3

Maximum interpass temp. shall be 450°F

Thickness of thickest part at point of welding	FCM	Non FCM
up to 3/4"	125°F	50°F
3/4" to 1 1/2"	200°F	70°F
1 1/2" to 2 1/2"	300°F	150°F
over 2 1/2"	350°F	225°F

This procedure may vary due to fabrication sequence, fit up, pass size, etc. within the limits provided in the contract documents and the AWS D1.5, 2010 Bridge Welding Code.

STRUCTAL BRIDGES, a division of Canam Steel Corp.

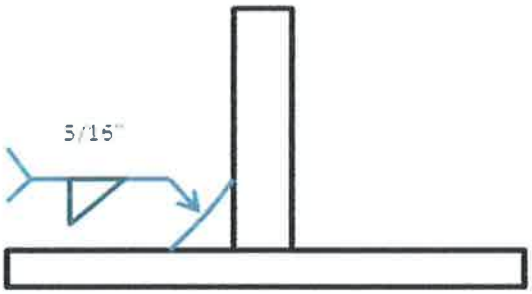
WELDING PROCEDURE SPECIFICATION

FCM AND NON FCM WELDS

WPS Number: S-1009	Issue date:03-07-2013
Project: Jamaica VT., ER-BRF-015-1(23)	STRUCTAL job #.:UPO 1195
Base metal: ASTM A709 GR 36,50,50W, HPS 50W.	
Welding process: Submerged Arc Welding	
Filler metal spec. AWS, A5.17 ESAB SpoolArc 81	
Flux / shielding gas: ESAB 10.71	
Current and polarity: DCEN	Electrical stickout:11/2" +/- 1/4"
Welding position: 1 and 2F	
Preheat temp..:AWS D1.5 Table 4.3 / 12.3	WPS qualification:AWS D1.5 / section 5
Heat input: 43.87 - 65.83 Kilojoules	Supporting PQR#: SAW, PQR ORTHO 1G DCEN Rev 0.

electrode size	welding amps	current volts	travel speed
1/8"	585 - 680	32.5 - 35.5	22 - 26

Joint Detail : T joint



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Notes: For welding 5/16" fillet welds.

Minimum preheat and interpass temperatures per AWS D1.5 Table 4.3 / 12.3

Maximum interpass temp. shall be 450˚F

Thickness of thickest part at point of welding	FCM	Non FCM
up to 3/4"	125˚F	50˚F
3/4" to 1 1/2"	200˚F	70˚F
1 1/2" to 2 1/2"	300˚F	150˚F
over 2 1/2"	350˚F	225˚F

This procedure may vary due to fabrication sequence, fit up, pass size, etc. within the limits provided in the contract documents and the AWS D1.5, 2010 Bridge Welding Code.

STRUCTAL BRIDGES, a division of Canam Steel Corp.

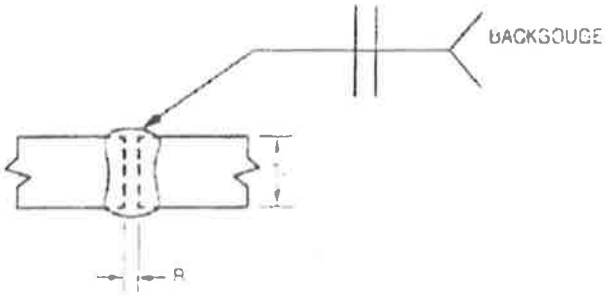
WELDING PROCEDURE SPECIFICATION

FCM AND NON FCM WELDS

WPS Number: S-1011	Issue date:03-07-2013
Project: Jamaica VT.,ER-BRF-015-1 (23)	STRUCTAL job #.: UPO 1195
Base metal: ASTM A709 GR 36,50,50W, HPS 50W.	
Welding process: Submerged Arc Welding	
Filler metal spec. and Trade Name:AWS,A5.23 Lincolnweld, LA-75	
Flux / shielding gas: Lincolnweld 960	
Current and polarity: DCEP	Electrical stickout:1" +/- 1/4"
Welding position: 1G	
Preheat temp...:AWS D1.5 Table 4.3 / 12.3	WPS qualification:AWS D1.5 / section 5
Heat input: 47.25 - 74.15 Kilojoules	Supporting PQR#:WTTI P1-2674G

electrode size	welding amps	current volts	travel speed
3/32"	405-466	28 - 30.5	11.5 - 13.5

Joint Detail : B-L1a-S



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RESUBMIT Approved

BY KMH DATE 03/25/13

Notes: For welding 1/2" Webs.

Square-Groove Butt Joint.

Grind Flat After Welding T_1 =1/2"

R = +1/16"- 0"

Minimum preheat and interpass temperatures per AWS D1.5 Table 4.3 / 12.3

Maximum interpass temp. shall be 450˚F

Thickness of thickest part at point of welding	FCM	Non FCM
up to 3/4"	125˚F	50˚F
3/4" to 1 1/2"	200˚F	70˚F
1 1/2" to 2 1/2"	300˚F	150˚F
over 2 1/2"	350˚F	225˚F

This procedure may vary due to fabrication sequence, fit up, pass size, etc. within the limits provided in the contract documents and the AWS D1.5, 2010 Bridge Welding Code.