Casco Bay Steel Structures

One Wallace Ave, South Portland ME 04106

AWS - Welding Procedure Specification (WPS)

WeldOffice WPS

WPS record number Date	664 5/06/2016	Revision	Qualified to Company name	AWS D1.5 Casco Bay Steel Structures
Supporting PQR(s) Reference docs.	613 FCM			

Scope	Groove
Joint	Joint details for this welding procedure specification in: JOINTS section of this WPS

BASE METALS

Type	Gr 50	P-no.	Grp-no. -
Welded to	Gr 50	P-no.	Grp-no. -
Backing:	None	P-no.	Grp-no. -
Retainers Notes			

THICKNESS RANGE QUALIFIED (in.)

	As-welded Min.	As-welded Max.	With PWHT Min.	With PWHT Max.
Complete pen.	-	-	-	-
Impact tested	-	-	-	-
Partial pen.	-	-	-	-
Fillet welds	-	-	-	-

DIAMETER RANGE QUALIFIED (in.)

As-welded Min.	As-welded Max.	With PWHT Min.	With PWHT Max.
-	-	-	-

FILLER METALS

	SFA	Classification	F-no.	A-no.	Chemical analysis or Trade name	THICKNESS RANGE QUALIFIED (in.) As-welded Min.	As-welded Max.	With PWHT Min.	With PWHT Max.
GMAW	5.36	E70C-6MH4	6		ESAB Core Weld C6	-	-	-	-
Sup. filler	-	-	-	-	-	- None -			

WELDING PROCEDURE

Welding process		GMAW
Type		Semi-automatic
Minimum preheat/interpass temperature	(°F)	SEE BACKPAGE
Maximum interpass temperature	(°F)	390 F
Filler metal size	(in.)	.052
Layer number		
Position		F,H
Weld progression		Not applicable
Current/polarity		DCEP (reverse polarity)
Amperes		296
Volts		29.1
Travel speed	(in./min)	13.1
Maximum heat input	(kJ/in.)	39.5
Wire feed speed	(in./min)	
Arc transfer mode		Spray
Shielding: Gas type		Argon/CO2, 90/10
Flow rate	(cfh)	35
Trailing: Gas type		
Flow rate	(cfh)	
Backing: Gas type		
Flow rate	(cfh)	
String or weave		Stringer or Weave
Orifice/gas cup size		
C.T.W.D	(in.)	5/8
Multi/Single pass per side		Single or Multiple passes
Multi/single electrode		Single electrode
Maximum pass thickness	(in.)	
Weld deposit chemistry		E70C-6MH4
Notes		

Approved for
Waitsfield Hopper
5/13/16 RSF

(c) Copyright 2016 C-spec Software. All rights reserved worldwide.

Casco Bay Steel Structures

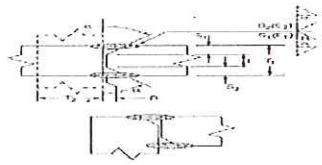
One Wallace Ave, South Portland ME 04106

AWS - Welding Procedure Specification (WPS)

WeldOffice WPS

WPS record number	664	Revision	Qualified to	AWS D1.5
Date	5/06/2016		Company name	Casco Bay Steel Structures

JOINTS: Typical joint(s). See actual production drawings and engineering specifications for details.



PARAMETERS

	A	V	TS
rqd	296	29.1	13.1
max	325.6	31.1	15.1
min	266.4	27.1	11.1

TC-P6-GF

Fillet weld may be placed on second side as required by plans

Type of groove	Single-U-groove PJP	Minimum groove angle	(deg)	15
		Minimum root opening	(in)	0
		Maximum root face	(in)	n/a

PREHEAT TABLE

Applicable standard	
AWS D1.5 Bridge Welding Code	For thickness 1/8 to 3/4(in.): 50(°F). Preheat to 70(°F) if the base metal temperature is below 32(°F). Over 3/4 thru 1-1/2(in.): 70(°F). Over 1-1/2 thru 2-1/2(in.): 150(°F). Over 2-1/2(in.): 225(°F). Refer to AWS D1.5 2010 Table 4.3 (pg 85)

TECHNIQUE

Peening	Not used
Surface preparation	Grind/Blast/chemical/wirebrush clean to be free of moisture, slag, millscale, oils, dust
Initial/interpass cleaning	Brushing and Grinding
Back gouging method	Grinding or Air Carbon Arc Gouging

NOTES

5/13/16
RSF

Signature 1		Signature 2	
Name Matthew Cote	Signature	Name	Signature
Date 5/9/16	Matthew J Cote CWI 08051341 QC1 EXP. 5/1/2017	Date	

Signature 3		Signature 4	
Name	Signature	Name	Signature
Date		Date	

(c) Copyright 2016 C-spec Software. All rights reserved worldwide.

Casco Bay Steel Structures, Inc.

WELDING PROCEDURE SPECIFICATION

Material specification ASTM Gr. 50 + G-50W
Welding process Gas Metal ARC Welding (GMAW)
Manual or machine Semi Auto
Position of welding Flat + Horizontal
Filler metal specification AWS-A5.28 ESAB
Filler metal classification E80C-Ni1
Flux N/A
Shielding gas 90% AR / 10% CO^2 Flow rate 35CFH +8/-4, Elec. Stickout 5/8
Single or multiple pass Single + multiple
Single or multiple arc Single
Welding current DC
Polarity DCEP
Welding progression See Detail
Root treatment Blast Clean - Wire Brush - Area Tobe Free of slag - Rust - Moisture
Preheat and interpass temperature See Table and as Required
Postheat temperature As Required
Heat Input Min 24.4 KJ/in Max 38.3 KJ/in P.Q.R. 418-FCM = 34.8 KJ/IN
* 35.0 KJ/in Min for single pass

Minimum Preheat and Interpass Temperature, °C [°F]

Welding Process (Base Metal)	Thickness of Thickest Part at Point of Welding, mm [in]: To 20 mm [3/4 in] Incl.	Over 20 mm [3/4 in] to 40 mm [1-1/2 in] Incl.	Over 40 mm [1-1/2 in] to 65 mm [2-1/2 in] Incl	Over 65 mm [2-1/2 in]
SAW; GMAW; FCAW; SMAW (M270M [M270] [A 709M (A 709)] 345 [50].	10 [50]	20 [70]	65 [150]	110 [225]
FCM Gr50	150°F	200°F	225°F	325°F
FCM Gr50W	150°F	250°F	325°F	350°F

Preheats to the NYSSCM

	Gr 50	Gr 50W
to 3/4	50F	100F
over 3/4 to 1-1/2	70F	200F
over 1-1/2 to 2-1/2	150F	300F
over 2-1/2	225	350F

Max Interpass 440°F

WELDING PROCEDURE

Sec. 5.12.4.2

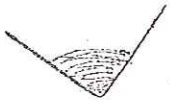
AWS D1.5 Joint detail Fillet

Pass no.	Electrode size	Welding current: Amperes	Volts	Travel speed
AS REQ	.052	307	29.2	15.5
		338.7 to 276.3	31 to 27	17.5 to 13.5
* 1 Pass	.052	338.7 to 281.3	31 to 28.0	17.5 to 13.5

2F

To 3/8

To 5/8



To 1/2

1F

This procedure may vary due to fabrication sequence, fit-up, pass size, etc., within the limitation of variables given in applicable A.W.S. codes or contract specifications

Procedure no. FCM 610

Revision no.

Contractor Casco Bay Steel

Authorized By Paul C. Goodale

Date 8-1-2013

Approved for Wait-field Joint 5/13/16 RSF

Casco Bay Steel Structures

One Wallace Ave, South Portland ME 04106

AWS - Welding Procedure Specification (WPS)

WeldOffice WPS

WPS record number Date	653 10/5/2015	Revision	Qualified to Company name	AWS D1.5 Casco Bay Steel Structures
Supporting PQR(s) Reference docs.	613 FCM			

Scope	Groove
Joint	Joint details for this welding procedure specification in: JOINTS section of this WPS

BASE METALS

Type	Gr 50	P-no.	Grp-no. -
Welded to	Gr 50	P-no.	Grp-no. -
Backing	as rqd	P-no.	Grp-no. -
Retainers Notes			

THICKNESS RANGE QUALIFIED (in)

	As-welded Min.	As-welded Max.	With PWHT Min.	With PWHT Max.
Complete pen.	-	-	-	-
Impact tested	-	-	-	-
Partial pen.	-	-	-	-
Fillet welds	-	-	-	-

DIAMETER RANGE QUALIFIED (in)

As-welded Min.	As-welded Max.	With PWHT Min.	With PWHT Max.
-	-	-	-

FILLER METALS

	SFA	Classification	F-no.	A-no.	Chemical analysis or Trade name	THICKNESS RANGE QUALIFIED (in) As-welded Min.	As-welded Max.	With PWHT Min.	With PWHT Max.
GMAW	5.36	E70C-6MH4	6		ESAB Core Weld C6	-	-	-	-
Sup. filler	-	-	-	-	-	- None -			

WELDING PROCEDURE

Welding process		GMAW
Type		Automatic / Semi-Automatic
Minimum preheat/interpass temperature	(°F)	SEE BACKPAGE
Maximum interpass temperature	(°F)	390 F
Filler metal size	(in.)	.052
Layer number		
Position		F,H
Weld progression		Not applicable
Current/polarity		DCEP (reverse polarity)
Amperes		296
Volts		29.1
Travel speed	(in./min)	13.1
Maximum heat input	(kJ/in.)	39.5
Wire feed speed	(in./min)	
Arc transfer mode		Spray
Shielding: Gas type		Argon/CO2, 90/10
Flow rate	(cfh)	35
Trailing: Gas type		
Flow rate	(cfh)	
Backing: Gas type		
Flow rate	(cfh)	
String or weave		Stringer or Weave
Orifice/gas cup size		
C.T.W.D	(in.)	5/8
Multi/Single pass per side		Single or Multiple passes
Multi/single electrode		Single electrode
Maximum pass thickness	(in.)	
Weld deposit chemistry		E70C-6MH4
Notes		

Approved for Waitsfield Joint
5/13/16
RJF

(c) Copyright 2015 C-spec Software. All rights reserved worldwide.

Casco Bay Steel Structures

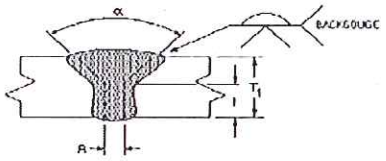
One Wallace Ave, South Portland ME 04106

AWS - Welding Procedure Specification (WPS)

WeldOffice WPS

WPS record number	653	Revision	Qualified to	AWS D1.5
Date	10/5/2015		Company name	Casco Bay Steel Structures

JOINTS: Typical joint(s). See actual production drawings and engineering specifications for details.



PARAMETERS

	A	V	TS
rqd	296	29.1	13.1
max	325.6	31.1	15.1
min	266.4	27.1	11.1

B-U2-GF

Type of groove	Single-V-groove	Minimum groove angle	(deg)	40
		Minimum root opening	(in)	0
		Maximum root face	(in)	3/16

PREHEAT TABLE

Applicable standard	
AWS D1.5 Bridge Welding Code	For thickness 1/8 to 3/4(in.): 50(°F). Preheat to 70(°F) if the base metal temperature is below 32(°F). Over 3/4 thru 1-1/2(in.): 70(°F). Over 1-1/2 thru 2-1/2(in.): 150(°F). Over 2-1/2(in.): 225(°F). Refer to AWS D1.5 2010 Table 4.3 (pg 85)

TECHNIQUE

Peening	Not used
Surface preparation	Grind/Blast/chemical/wirebrush clean to be free of moisture, slag, millscale, oils, dust
Initial/interpass cleaning	Brushing and Grinding
Back gouging method	Grinding or Air Carbon Arc Gouging

NOTES

5/13/16
RSF

Signature 1		Signature 2	
Name	Signature	Name	Signature
Matthew J Cote			
Date		Date	
10/5/15			

Matthew J Cote
CWI 08051341
QC1 EXP 5/1/2017

Signature 3		Signature 4	
Name	Signature	Name	Signature
Date		Date	

(c) Copyright 2015 C-spec Software. All rights reserved worldwide.

Casco Bay Steel Structures

One Wallace Avenue, South Portland ME 04106

AWS - Welding Procedure Specification (WPS)

WeldOffice WPS

WPS record number Date	661 6/23/2015	Revision	Qualified to Company name	
Supporting PQR(s) Reference docs.	613 FCM			

Scope	Groove
Joint	Joint details for this welding procedure specification in: JOINTS section of this WPS

BASE METALS

Type	Gr 50	P-no.	Grp-no. -
Welded to	Gr 50	P-no.	Grp-no. -
Backing:	as rqd	P-no.	Grp-no. -
Retainers Notes			

THICKNESS RANGE QUALIFIED (in.)

	As-welded Min.	As-welded Max.	With PWHT Min.	With PWHT Max.
Complete pen.	-	-	-	-
Impact tested	-	-	-	-
Partial pen.	-	-	-	-
Fillet welds	-	-	-	-

DIAMETER RANGE QUALIFIED (in.)

As-welded Min.	As-welded Max.	With PWHT Min.	With PWHT Max.
-	-	-	-

FILLER METALS

	SFA	Classification	F-no.	A-no.	Chemical analysis or Trade name	THICKNESS RANGE QUALIFIED (in.) As-welded Min.	As-welded Max.	With PWHT Min.	With PWHT Max.
GMAW	5.36	E70C-6MH4	6		ESAB Core Weld C6	-	-	-	-
Sup. filler	-	-	-	-	-	- None -			

WELDING PROCEDURE

Welding process		GMAW
Type		Semi-automatic
Minimum preheat/interpass temperature	(°F)	SEE BACKPAGE
Maximum interpass temperature	(°F)	390 F
Filler metal size	(in.)	.052
Layer number		
Position		F,H
Weld progression		Not applicable
Current/polarity		DCEP (reverse polarity)
Amperes		296
Volts		29.1
Travel speed	(in./min)	13.1
Maximum heat input	(kJ/in.)	39.5
Wire feed speed	(in./min)	
Arc transfer mode		Spray
Shielding: Gas type		Argon/CO2, 90/10
Flow rate	(cfh)	35
Trailing: Gas type		
Flow rate	(cfh)	
Backing Gas type		
Flow rate	(cfh)	
String or weave		Stringer or Weave
Orifice/gas cup size		
C.T.W.D	(in.)	5/8
Multi/Single pass per side		Single or Multiple passes
Multi/single electrode		Single electrode
Maximum pass thickness	(in.)	
Weld deposit chemistry		E70C-6MH4
Notes		

Approved for Waitsfield Joint
5/13/16
RSF

(c) Copyright 2015 C-spec Software. All rights reserved worldwide.

Casco Bay Steel Structures

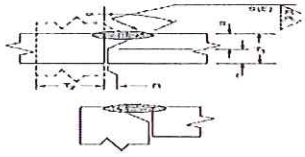
One Wallace Avenue, South Portland ME 04106

AWS - Welding Procedure Specification (WPS)

WeldOffice WPS

WPS record number	661	Revision	Qualified to	
Date	6/23/2015		Company name	

JOINTS: Typical joint(s). See actual production drawings and engineering specifications for details.



PARAMETERS

	A	V	TS
rqd	296	29.1	13.1
max	325.6	31.1	15.1
min	266.4	27.1	11.1

TC-P4-GF

Type of groove	Single-bevel-groove PJP	Minimum groove angle	(deg)	40
		Minimum root opening	(in)	0
		Maximum root face	(in)	AS NOTED

PREHEAT TABLE

Applicable standard	
AWS D1.5 Bridge Welding Code	For thickness 1/8 to 3/4(in.): 50(°F). Preheat to 70(°F) if the base metal temperature is below 32(°F). Over 3/4 thru 1-1/2(in.): 70(°F). Over 1-1/2 thru 2-1/2(in.): 150(°F). Over 2-1/2(in.): 225(°F). Refer to AWS D1.5 2010 Table 4.3 (pg 85)

TECHNIQUE

Peening	Not used
Surface preparation	Grind/Blast/chemical/wirebrush clean to be free of moisture, slag, millscale, oils, dust
Initial/interpass cleaning	Brushing and Grinding
Back gouging method	Not applicable

NOTES

5/13/16 RJS

Signature 1		Signature 2	
Name: Matthew Cote	Signature: Matthew Cote	Name	Signature
Date: 6/23/15	AWS Matthew J Cote CWI 08051341 QC1 EXP. 5/1/2017	Date	

Signature 3		Signature 4	
Name	Signature	Name	Signature
Date		Date	

(c) Copyright 2015 C-spec Software. All rights reserved worldwide