

ENCL. 8  
SHIPMENT BY  
BY AIR MAIL  
PL. DATED 12/29/2014

### PREHEAT AND INTERPASS TEMPERATURES

FOR ASTM A709 GRADE 36, 50, 50W STRUCTURAL STEEL  
IN ACCORDANCE WITH AASHTO/AWS D1.5-2010

THICKNESS OF THICKEST PART AT POINT OF WELDING	MINIMUM PREHEAT/INTERPASS AT POINT OF WELDING
to 3/4" inclusive	50°F
over 3/4" to 1-1/2"	70°F
over 1-1/2" to 2-1/2"	150°F
over 2-1/2"	225°F

MAXIMUM PREHEAT TEMPERATURE 450°F  
MAXIMUM INTERPASS TEMPERATURE 550°F

REVISED 7/26/14  
ORIGINAL ISSUE 1/1/92

#### WELDING PROCEDURE FOR AWS PREQUALIFIED JOINTS

### W2

MATERIAL SPECIFICATION: ASTM A709 GRADE 36, 50, 50W  
WELDING PROCESS: SHIELDED METAL ARC WELDING  
MANUAL OR MACHINE: MANUAL  
POSITION OF WELDING: ALL EXCEPT VERTICAL DOWN  
FILLER METAL SPECIFICATION: AWS A5.1 AND A5.5  
WELD METAL CLASSIFICATION: E7018-AR AND E8018-C3-H4  
WIRE/FILLER: SICALUB E7018-AR AND E8018-C3-H4  
ROOT TREATMENT: REMOVE LOOSE/THICK SCALE, RUST & CONTAMINANTS. GRIND TO SOUND METAL FOR GROOVE APPLICATION. REMOVE ALL SCALE FOR WEB TO FLANGE APPLICATION.

PASS NO.	WIRE DIA.	WIRE FEED SPEED (in/min)	WIRE FEED SPEED (mm/min)	VOLTS	TRAVEL SPEED (in/min)	TRAVEL SPEED (mm/min)	TYPICAL APPLICATIONS/DETAILS
1	1/8"	90-150	118-158	9-9"	9-9"	9-9"	E7018-AR TACK WELDS ONLY
ALL	5/32"	130-180	168-228	9-13"	9-13"	9-13"	E7018-AR TACK WELDS, GROOVE WELDS, FILLET WELDS AND REPAIR WELDS
ALL	3/16"	200-300	258-380	9-15"	9-15"	9-15"	E8018-C3-H4

CURRENT/POLARITY: DCEP OR AC  
PREHEAT AND INTERPASS TEMPERATURE: SEE PREHEAT CHART

REVISIONS: 8/11/14  
ORIGINAL ISSUE 1/18/92

#### WELDING PROCEDURE FOR AWS PREQUALIFIED JOINTS

### W6

MATERIAL SPECIFICATION: ASTM A709 GRADE 36, 50, 50W  
WELDING PROCESS: FLUX CORED ARC WELDING  
MANUAL OR MACHINE: SEMI-AUTOMATIC OR MACHINE  
POSITION OF WELDING: ALL  
FILLER METAL SPECIFICATION: AWS A5.20  
WELD METAL CLASSIFICATION: E71T-1  
WIRE/FILLER: HOBART FORMULA XL508  
WIRE DIAMETER: .035"  
SINGLE OR MULTIPLE ARC: SINGLE ARC  
CURRENT/POLARITY: DCEP  
ROOT TREATMENT: REMOVE LOOSE/THICK SCALE, RUST & CONTAMINANTS. FOR CJP/PJP APPLICATIONS GRIND TO SOUND METAL.  
PREHEAT/INTERPASS TEMPERATURE: SEE PREHEAT CHART  
ELECTRICAL STICK-OUT: 3/4"  
SHIELDING GAS: 100% CO2  
GAS FLOW: 40-50 CFH

PASS NO.	AMPS	WIRE FEED SPEED (in/min)	WIRE FEED SPEED (mm/min)	VOLTS	TRAVEL SPEED (in/min)	TRAVEL SPEED (mm/min)	TYPICAL APPLICATIONS/DETAILS
1	225-250	285-335"	25-27"	14.75-16.5"	3/16"	TACK WELDS	

REVISIONS: 6/30/14  
ORIGINAL ISSUE 5/3/86

QUALIFIED IN ACCORDANCE WITH 5.12.4  
WELDING PROCEDURE QUALIFICATION RECORD AWS-13-59 (EXPIRES 7/16/18)

#### WELDING PROCEDURE FOR AWS PREQUALIFIED JOINTS

### GMAW-P 2F TACKS

MATERIAL SPECIFICATION: ASTM A709 GRADE 36, 50, 50W  
WELDING PROCESS: GAS METAL ARC WELDING - PULSED SPRAY  
POWER SOURCE/MWFORM: MILLER ACCESS 458/ACCU-PULSE/LOCKED FILE  
SEMIAUTOMATIC OR MACHINE: SEMIAUTOMATIC OR MACHINE  
POSITION OF WELDING: 2F (HORIZONTAL)  
FILLER METAL SPECIFICATION: AWS A5.18  
CLASSIFICATION: ER70S-9  
MANUFACTURER/PRODUCT: LINCOLN SUPRARC L-55  
WIRE DIAMETER: .035"  
SINGLE OR MULTIPLE ARC: SINGLE ARC  
CURRENT/POLARITY: DCEP  
ROOT TREATMENT: REMOVE LOOSE/THICK SCALE, RUST & CONTAMINANTS. REMOVE ALL SCALE FOR WEB TO FLANGE.  
PREHEAT TEMPERATURE: SEE PREHEAT CHART  
ELECTRICAL STICK-OUT: 3/4"  
SHIELDING GAS: 92% AR / 8% CO2  
GAS FLOW: 32-48 CFH

PASS NO.	AMPS	WIRE FEED SPEED (in/min)	WIRE FEED SPEED (mm/min)	VOLTS	TRAVEL SPEED (in/min)	TRAVEL SPEED (mm/min)	TYPICAL JOINT DETAILS
1	223-268	295-300"	24.2-26"	19.25-22"	3/16"	TACK WELDS - 2F	

USED FOR SINGLE-PASS TACKS  
WEB TO FLANGE, CROSSFRAMES  
AND MISC. DETAILS

REVISIONS: 6/19/14  
ORIGINAL ISSUE 5/21/88

QUALIFIED IN ACCORDANCE WITH 5.12.4  
WELDING PROCEDURE QUALIFICATION RECORD AWS-14-89 (EXPIRES 4/28/19)

#### WELDING PROCEDURE FOR AWS PREQUALIFIED JOINTS

### GMAW-P 4F TACKS

MATERIAL SPECIFICATION: ASTM A709 GRADE 36, 50, 50W  
WELDING PROCESS: GAS METAL ARC WELDING - PULSED SPRAY  
POWER SOURCE/MWFORM: MILLER ACCESS 458/ACCU-PULSE/LOCKED FILE  
SEMIAUTOMATIC OR MACHINE: SEMIAUTOMATIC OR MACHINE  
POSITION OF WELDING: 4F (OVERHEAD)  
FILLER METAL SPECIFICATION: AWS A5.18  
CLASSIFICATION: ER70S-9  
MANUFACTURER/PRODUCT: LINCOLN SUPRARC L-55  
WIRE DIAMETER: .035"  
SINGLE OR MULTIPLE ARC: SINGLE ARC  
CURRENT/POLARITY: DCEP  
ROOT TREATMENT: REMOVE LOOSE/THICK SCALE, RUST & CONTAMINANTS. REMOVE ALL SCALE FOR WEB TO FLANGE.  
PREHEAT TEMPERATURE: SEE PREHEAT CHART  
ELECTRICAL STICK-OUT: 5/8"  
SHIELDING GAS: 92% AR / 8% CO2  
GAS FLOW: 36-43 CFH

PASS NO.	AMPS	WIRE FEED SPEED (in/min)	WIRE FEED SPEED (mm/min)	VOLTS	TRAVEL SPEED (in/min)	TRAVEL SPEED (mm/min)	TYPICAL JOINT DETAILS
1	188-208	200-225"	20.5-22.5"	17-20"	3/16"	TACK WELDS - 4F	

USED FOR SINGLE-PASS TACKS  
WEB TO FLANGE, CROSSFRAMES  
AND MISC. DETAILS

REVISIONS: 6/19/14  
ORIGINAL ISSUE 5/9/88

#### WELDING PROCEDURE FOR AWS PREQUALIFIED JOINTS

### GMAW-P FILLETS

MATERIAL SPECIFICATION: ASTM A709 GRADE 36, 50, 50W  
WELDING PROCESS: PULSED GAS METAL ARC WELDING  
MANUAL OR MACHINE: SEMIAUTOMATIC OR MACHINE  
POSITION OF WELDING: 2F (HORIZONTAL)  
FILLER METAL SPECIFICATION: AWS A5.18  
WELD METAL CLASSIFICATION: E7018-9  
WIRE/FILLER: LINCOLN SUPRARC L-56 L-59  
WIRE DIAMETER: .035"  
SINGLE OR MULTIPLE ARC: SINGLE ARC  
CURRENT/POLARITY: DCEP  
ROOT TREATMENT: REMOVE LOOSE/THICK SCALE, RUST & CONTAMINANTS.  
PREHEAT TEMPERATURE: SEE PREHEAT CHART  
ELECTRICAL STICK-OUT: 3/4"  
SHIELDING GAS: 92% AR / 8% CO2  
GAS FLOW: 32-48 CFH

PASS NO.	WIRE DIA.	WIRE FEED SPEED (in/min)	WIRE FEED SPEED (mm/min)	AMPS	VOLTS	TRAVEL SPEED (in/min)	TRAVEL SPEED (mm/min)	TYPICAL JOINT DETAILS
1	.035"	275-325"	225-268"	25.2-26.5"	14-16.5"			

USED FOR SINGLE-PASS FILLETS UP TO 5/16"  
AND 3/16" TACKS

REVISIONS: 10/14/14  
ORIGINAL ISSUE 8/5/88

QUALIFIED IN ACCORDANCE WITH 5.12.4  
WELDING PROCEDURE QUALIFICATION RECORD AWS-11-86 (EXPIRES 10/29/18)

#### WELDING PROCEDURE FOR AWS PREQUALIFIED JOINTS

### W13X-2

MATERIAL SPECIFICATION: ASTM A709 GRADE 36, 50, 50W  
WELDING PROCESS: SUBMERGED ARC WELDING  
SEMIAUTOMATIC OR MACHINE: SEMIAUTOMATIC OR MACHINE  
POSITION OF WELDING: 2F (HORIZONTAL)  
FILLER METAL SPECIFICATION: AWS A5.23  
CLASSIFICATION: F702-ENIK-N1-H8  
MANUFACTURER/PRODUCT: LINCOLN LA-75/558  
WIRE DIAMETER: 3/32"  
SINGLE OR MULTIPLE ARC: SINGLE ARC  
CURRENT/POLARITY: DCEP/DCSP  
ROOT TREATMENT: REMOVE ALL SCALE, RUST & CONTAMINANTS. REMOVE ALL SCALE FOR WEB TO FLANGE AND LOOSE/THICK SCALE, RUST & CONTAMINANTS FOR OTHER APPLICATIONS.  
PREHEAT TEMPERATURE: SEE PREHEAT CHART  
ELECTRICAL STICK-OUT: 1-INCH

PASS NO.	AMPS	WIRE FEED SPEED (in/min)	WIRE FEED SPEED (mm/min)	VOLTS	TRAVEL SPEED (in/min)	TRAVEL SPEED (mm/min)	CURRENT/POLARITY	JOINT DETAIL
1	+530-550	+185-195"	+37.4-38"	17-22"	DCEN			
2	500-550	187-125"	38-38"	14-22"	DCEP			

REVISIONS: 6/19/14  
ORIGINAL ISSUE 1/26/99

QUALIFIED IN ACCORDANCE WITH 5.12.1 (EXP. 7/16/18)  
AWS 1-13-16, T-18-16, DCEP FOR AWS-13-58 (EXPIRES 4/28/19)

#### WELDING PROCEDURE FOR AWS PREQUALIFIED JOINTS

### W13X-2 GB

MATERIAL SPECIFICATION: ASTM A709 GRADE 36, 50, 50W  
WELDING PROCESS: SUBMERGED ARC WELDING  
SEMIAUTOMATIC OR MACHINE: SEMIAUTOMATIC OR MACHINE  
POSITION OF WELDING: 2F (HORIZONTAL)  
FILLER METAL SPECIFICATION: AWS A5.23  
CLASSIFICATION: F702-ENIK-N1-H8  
MANUFACTURER/PRODUCT: LINCOLN LA-75/558  
WIRE DIAMETER: 5/32"  
SINGLE OR MULTIPLE ARC: SINGLE ARC  
CURRENT/POLARITY: DCEP/DCSP  
ROOT TREATMENT: REMOVE ALL SCALE, RUST & CONTAMINANTS.  
PREHEAT TEMPERATURE: SEE PREHEAT CHART  
ELECTRICAL STICK-OUT: 1-1/4"

PASS NO.	AMPS	WIRE FEED SPEED (in/min)	WIRE FEED SPEED (mm/min)	VOLTS	TRAVEL SPEED (in/min)	TRAVEL SPEED (mm/min)	CURRENT/POLARITY	JOINT DETAIL
1	684-768	34.4-37"	24-27"	DCEN				
2	530-600	32-34"	22-25"	DCEP				

REVISIONS: 6/19/14  
ORIGINAL ISSUE 2/23/10

QUALIFIED IN ACCORDANCE WITH 5.12.1 (EXP. 7/26/18)  
AWS 1-13-15, T-13-16, DCEP FOR AWS-13-54 (EXPIRES 4/28/19)

QUALIFIED IN ACCORDANCE WITH 5.12.1  
AWS 1-14-23, FOR AWS-13-67 (EXPIRES 8/28/18)

#### WELDING PROCEDURE FOR AWS PREQUALIFIED JOINTS

### W44X-2

MATERIAL SPECIFICATION: ASTM A709 GRADE 36, 50, 50W  
WELDING PROCESS: SUBMERGED ARC WELDING  
SEMIAUTOMATIC OR MACHINE: SEMIAUTOMATIC OR MACHINE  
POSITION OF WELDING: 2F (HORIZONTAL)  
FILLER METAL SPECIFICATION: AWS A5.23  
CLASSIFICATION: F702-ENIK-N1-H8  
MANUFACTURER/PRODUCT: LINCOLN LA-75/558  
WIRE DIAMETER: 3/32"  
SINGLE OR MULTIPLE ARC: SINGLE ARC  
CURRENT/POLARITY: DCEP/DCSP  
ROOT TREATMENT: REMOVE LOOSE/THICK SCALE, RUST & CONTAMINANTS.  
PREHEAT TEMPERATURE: SEE PREHEAT CHART  
ELECTRICAL STICK-OUT: 1-INCH

PASS NO.	AMPS	WIRE FEED SPEED (in/min)	WIRE FEED SPEED (mm/min)	VOLTS	TRAVEL SPEED (in/min)	TRAVEL SPEED (mm/min)	CURRENT/POLARITY	JOINT DETAIL
1	412-457	134-152"	31.8-34.2"	13-18"	DCEN			
2	400-550	80-125"	29-36.6"	14-22"	DCEP			

REVISIONS: 7/2/14  
ORIGINAL ISSUE 1/26/99

QUALIFIED IN ACCORDANCE WITH 5.12.1 (EXP. 7/12/18)  
AWS 1-18-05, T-18-04, DCEP FOR AWS-13-50, DCEP FOR AWS-13-56 (EXPIRES 10/29/18)

Vermont Agency of Transportation  
**RECEIVED**  
CK'D BY J. CLARK OK'D BY D. PETERSON  
December 10, 2014  
RESUBMIT NO Approved  
BY C. CARLSON DATE 12/17/2014

WELDING PROCEDURE QUESTIONS MAY BE REFERRED TO:  
PAUL MUFFULETTO, HIGH STEEL STRUCTURES LLC  
PMUFFULETTO@HIGH.NET  
PHONE: (717)390-4253

NO.	REVISION	BY	CHK'D	DATE

HOLES	BOLTS	COATING	CODES/1	SCALE	N.T.S.

STATE	CONTRACTOR	PROJ. NO.	PROJ. MGR.	DATE
VT	CCS CONSTRUCTORS LLC	0235 (11)	KEN GLIDDEN	12/29/14

DRAWING MANAGER	PROJECT NUMBER	DATE	DRAWN BY	DATE
DAVE PAINTER (IH)	S-1140166A-1	12/29/14	WPI	

High Steel Structures  
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