

A-23

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PROCEDURE TRACKING SHEET

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PROCEDURE NO. 4.3.3

OFFICE OF THE CLERK
DOCKETING & SERVICE
BRANCH

REVISION D
(8-29-84)

INTERIM:

CECO INTERIM APPROVAL - 9-7-84
* Effective

FINAL:

S & L/CECO FINAL APPROVAL - 10-4-84
* Effective

**IMPLEMENTATION DATE - 9-28-84

SUPERCEDED BY REVISION F APPROVED _____ (Interim/Final)
* Effective

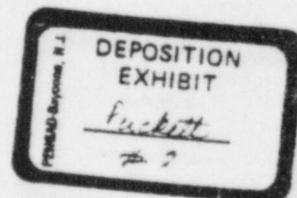
NUCLEAR REGULATORY COMMISSION Docket No. <u>50-456 + 457-02</u> Official Exh. No. <u>23</u> In the matter of <u>Com E. L. Loran co</u>	IDENTIFIED	RECEIVED	REJECTED	DATE	Witness
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>6-10-86</u>	
Staff	Applicant	Ingenieur	Cont'g Off'r	Contractor	Other
	<input checked="" type="checkbox"/>				
Reporter					



*Effective Date - The date Q.C. received approval.

**Implementation Date - The effective date plus fifteen working days.

FOR INFORMATION ONLY



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PDR ADOCK 05000456
G PDR



QUALITY CONTROL DIVISION
WELDING PROCEDURE REVIEW

CLIENT Commonwealth Edison Company STATION Braidwood UNIT 1&2
CONTRACTOR L. K. Comstock & Co. PROJECT NO. 4683-05

NUCLEAR, CLASS -- SAFETY SHOP IMPACT REQUIREMENTS
 NON-SAFETY FIELD

REVIEWED TO: ASME / / S&L SPEC. L-2790
ANSI / AWS D1.1 / OTHER

REVIEWED BY E. V. Andruszkiewicz DATE September 26, 1984

ITEM NO.	STATUS	GUIDELINE IDENT.	PROCEDURE NO.	REV.	DATE	WELDING PROCESS	P-NOS	THICKNESS RANGE QUALIFIED, INCHES
1.	2	--	4.3.3	D	8/29/84	SMAW	C.S.	Qualified & Prequalified
Comments: <p>A) On Attachment 'A' state "single", under "Single or multiple pass."</p> <p>B) It appears that Attachment 'K' is for the welding of a partial penetration groove weld. If this is so, then delete the Note referring to backgouging of the weld.</p> <p>C) On Attachment 'F' the volts can only be from 19 to 26 volts since the procedure was only qualified at 23 volts.</p> <p>D) On Attachment 'N' for the overhead position the volts shall be "21-29 volts", "2 - 29 volts" is unacceptable.</p> <p style="text-align: center;">FOR INFORMATION ONLY</p>								

1. Reviewed and accepted.
2. Revise as noted and resubmit, Contractor can proceed based on making revisions noted.
3. Revise as noted and resubmit. Hold fabrication.
4. Results do not meet specification requirements.

4.3.3
WELDING PROCEDURE
FOR
STRUCTURAL ATTACHMENTS
(7018)

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C - 01/17/84
C - 01/17/84
C - 01/17/84

FOR INFORMATION ONLY

ATTACHMENTS

A
B
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D - (5 pages)
E - (5 pages)
F - (5 pages)
G - (11 pages)
H - (5 pages)
I
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O - (5 pages)

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C - 01/17/84
C - 01/17/84
C - 01/17/84
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SARGENT & LUNDY
REVISE AS NOTED AND RESUBMIT.
2. CONTRACTOR CAN PROCEED BASED ON MAKING REVISIONS NOTED.
ACTION SHOWN DOES NOT RELIEVE CONTRACTOR FROM HIS OBLIGATIONS UNDER THE CONTRACT.

F. A. KOSIK 9-27-84
BY DATE
SPEC. L 2790 PROJ. H-13-15
NO. NO.

Table I - Conduit & Junction Box Hanger Weld Procedure Specification (WPS) Cross Reference Table (10 pages)

D - 08/29/84

Table II - Cable Pan & Hanger Weld Procedure Specification (WPS) Cross Reference Table (2 pages)

D - 08/29/84

APPROVALS:

L. K. COMSTOCK AND COMPANY, INC.

[Signature]
QUALITY CONTROL MANAGER

DATE 7-4-84

L. K. COMSTOCK AND COMPANY, INC.

[Signature]
PROJECT MANAGER

DATE 7-4-84

L. K. COMSTOCK AND COMPANY, INC.

[Signature]
PROJECT ENGINEER

DATE 9-4-84

L. K. COMSTOCK AND COMPANY, INC.

[Signature]
QA ENGINEER

DATE 9/4/84

VOID

00741

REV. D (08/29/84)
EFFECTIVE DATE: 09/07/84

4.3.3

WELDING PROCEDURE
FOR
STRUCTURAL ATTACHMENTS
(7018)

1.0 REFERENCE

- 1.1 S & L Standard Form 1701
- 1.2 AWS Structural Welding Code, AWS D1.1-75
- 1.3 AWS Filler Material Specifications, AWS A5.1 and AWS A5.4
- 1.4 S & L Form 1895
- 1.5 L. K. Comstock QA/QC Manual Section 1.0.1, Criteria 4.3

2.0 PURPOSE/SCOPE

- 2.1 This procedure is proposed to meet and assure the requirements of AWS D1.1-75, Structural Welding Code, and is applicable to the base metals specified in AWS D1.1-75, Section 8.2 and 10.2, or as specified by a Welding Procedure Test Record.
- 2.2 To include appropriate quantitative or qualitative acceptance criteria for determining that important activities have been accomplished.
- 2.3 The scope of this procedure applies to all structural steel welding performed by L. K. Comstock utilizing 7018 Weld Rod.

3.0 PROCEDURE

3.1 Base Metal

- 3.1.1. Steel will comply with the specifications of AWS D1.1-75, Paragraph 8.2 and 10.2, or as specified by a Welding Procedure Test Record.

3.2 Filler Metal

- 3.2.1 The filler metal employed will conform to the following requirements:

- 3.2.1.1 Electrodes will conform to American Welding Society Specifications AWS A5.1.
- 3.2.1.2 Electrodes will be stored and handled in accordance with L. K. Comstock "Storage and Control of Welding Materials" procedure (Sect. 4.3.10).

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3.0 PROCEDURE - continued

3.3 Position

3.3.1 The welding will be performed in all positions as defined by AWS Structural Welding Code D1.1-75. The welder shall be qualified to LKC Procedure 4.7.1.

- 3.3.1.1 Flat position
- 3.3.1.2 Horizontal position
- 3.3.1.3 Vertical position
- 3.3.1.4 Overhead position

3.4 Joint Design

3.4.1 Joint design will be as per AWS Structural Welding Code D1.1-75 for fillet welds and groove welds. Weld joint design other than those prequalified by the code will be qualified per the AWS code.

- 3.4.1.1 Joint designs will be qualified prior to utilization on site and test results will be recorded on a "Welding Procedure Qualification Test Record" (Ref. See Page 11).
- 3.4.1.2 Joint designs, tested and accepted, will then be recorded on a "Qualified Joint Welding Procedure" (WPS) and entered into the weld procedure.

3.4.2 The LKC Engineer shall obtain the appropriate Weld Procedure Specification(s) (WPS) from the Cross Reference Tables, (Table I of Table II) and list them on the Welding Installation Record (Attachment 'J').

- 3.4.2.1 The completed WIR will be signed and dated by the engineer and forwarded to the applicable foreman.

NOTE: Welding Installation Records will be given a sequential number and logged to assure timely completion.

3.5 Joint Preparation and Cleaning

3.5.1 Joints may be prepared by machining, oxygen gouging, air carbon arc gouging, chipping or grinding. Cut surfaces and edges shall be free of slag.

3.5.2 Prior to fitting, the surfaces of joint are to be cleaned free of rust, scale, paint or other foreign matter. The metal shall be cleaned back from the joint edge to insure that the welded joint will not become contaminated. The cleaning may be done by wire brushing, grinding, grit-blasting or other suitable means.

FOR INFORMATION ONLY

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3.0 * PROCEDURE - continued

3.5.3 The members to be welded will be brought into correct alignment and held in position by bolts, clamps, wedges, guy lines, struts, other suitable devices or by tack welds until welding has been completed. The parts to be joined by fillet welds shall be brought into as close contact as practicable. The gap between parts shall normally not exceed 3/16 in. Tack welds are normally to be incorporated into final welds. I

3.5.3.1 When the fillet weld leg length is increased due to the fit-up gap, up to 3/16", it shall be noted on the Welding Installation Record by the journeyman welder. Quality Control must be notified to inspect the fit-up if the joint that is to be welded will be completely hidden by the required weldment.

3.6 Joint Welding Details

3.6.1 Single and multiple pass of fillet welds and groove welds will be as specified below:

3.6.1.1 The minimum size of a root pass shall be sufficient to prevent cracking.

3.6.1.2 The maximum size of fillet welds which may be made in one pass will be:

- A. 3/8" in the flat position.
- B. 5/16" in the horizontal or overhead.
- C. 1/2" in the vertical position.

3.6.1.3 The maximum size of root passes for groove welds will be 1/4". The maximum thickness of layers subsequent to the root pass of fillet and groove welds will be:

- A. 1/8" in flat position.
- B. 3/16 in vertical, overhead, and horizontal positions.

3.6.1.4 The minimum effective throat for partial joint penetration groove welds shall be as in the following table:

BASE METAL THICKNESS OF THICKER PART JOINTED IN.	MINIMUM EFFECTIVE THROAT IN.
to 1/4 incl.	1/8
over 1/4 to 1/2 incl.	3/16
over 1/2 to 3/4 incl.	1/4
over 3/4 to 1-1/2 incl.	5/16
over 1-1/2 to 2-1/4 incl.	3/8
over 2-1/4 to 6 incl.	1/2
over 6	5/8

ATTENTION: QUALITY CONTROL
 FOR
 WELDING

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3.0 . PROCEDURE - continued

3.6.1.5 The minimum fillet weld size, except for fillet welds used to reinforce groove welds, shall be as shown in the following table:

BASE METAL THICKNESS OF THICKER PART JOINED (T)	MINIMUM SIZE OF FILLET SIZE
T less than or equal to 1/4	1/8" single pass
1/4 less than T less than or than or equal to 1/2	3/16 single pass welds only will be used.

BASE METAL THICKNESS OF THICKER PART JOINED (T)	MINIMUM SIZE OF FILLET WELD
---	--------------------------------

In.	In.
1/2 less than T less than or equal to 3/4	1/4*
3/4 less than T	5/16*

*Single Pass Welds Must Be Used.

3.6.1.6 Weld undercut is a groove melted into the base metal adjacent to the toe or root of a weld and left unfilled by weld metal. This groove shall not be considered as undercut if it is not greater than 3/16" in length and not greater than 1/16" in depth provided spacing between two adjacent grooves is at least 3 inches.

3.6.1.6.1 Weld undercut greater than 1/32" depth and greater than 3/16" length shall be repaired.

3.6.1.6.2 For weld quality of undercut for welds to the building support system and welds for component supports, AWS D1.1-75 shall be followed with the exception of weld undercut limitation of 0.01" depth when the weld direction is transverse to primary tensile stress in the part that is undercut. However, the maximum depth of weld undercut shall be limited to 1/32 inch.

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3.6.2 Plug and slot welds will be as specified below:

3.6.2.1 For welds to be made in the flat position, the arc is carried around the root of the joint and then carried along a spiral path to the center of the hole, fusing the depositing a layer of weld metal in the root and bottom of the joint. The arc is then carried to the periphery of the hole, and the procedure repeated, fusing and depositing successive layers to fill the hole to the depth required. The slag covering the weld metal should be kept molten, or nearly so, until the weld is finished. If the arc is broken, except briefly for changing electrodes, the slag must be allowed to cool and be completely removed before re-starting the weld.

3.6.2.2 For welds to be made in the vertical position, the arc is started at the root of the joint, at the lower side of the hole, and carried upward fusing into the face of the inner plate and the side of the hole. Stop at the top of the hole, clean off the slag and repeat on the opposite side. After cleaning the slag from the weld, other layers should be similarly deposited to fill the holes to the required depth.

3.6.2.3 For welds to be made in the overhead position the procedure is the same for flat position welding except that the slag should be allowed to cool and should be completely removed after depositing each successive layer until the hole is filled to the required length.

3.6.2.4 Slot welds may be made with a technique similar to that specified above for plug welds, except if the length of the slot exceeds three times the diameter, or if the slot extends to the edge of the part, the technique specified in 3.6.2.3 should be followed for welds made in the flat position.

3.6.3 The maximum diameter of electrodes shall be as follows:

3.6.3.1 5/16 in. (8.0 mm) for all welds made in the flat position, except root passes.

3.6.3.2 1/4 in. (6.4 mm) for horizontal fillet welds.

3.6.3.3 1/4 in. (6.4 mm) for root passes of fillet welds made in the flat position and groove welds made in the flat position with backing and with a root opening of 1/4 in. or more.

FOR THE COMPANY ONLY

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- 3.6.3.4 5/32 in. for welds made with low-hydrogen electrode in the vertical and overhead positions.
- 3.6.3.5 3/16 in. for root passes of groove welds and for all other welds not included above.

3.6.4 Electrodes will be of the class as shown below:

GROUP DESIGNATION	AWS ELECTRODE CLASSIFICATION
F4	E7018

3.7 Weld Detail and Technique

- 3.7.1 Cracked or otherwise defective tack welds are to be removed before deposition of first pass.
- 3.7.2 Weld passes are to be cleaned of all slag or other foreign matter before deposition of additional passes.
- 3.7.3 Slag and spatter are to be removed from finished welds prior to application of protective coating when applicable.
- 3.7.4 Welds shall be free from overlap, cracks, craters, undercut.* There shall be no porosity visible on the surface of the weld, except as noted in AWS-D1.1 Paragraph 8.15.1.8.

*REFERENCE: Paragraph 3.6.1.6

3.8 Preheat

- 3.8.1 Base metal that is below the specified minimum temperature will be preheated so the that the parts on which weld metal is deposited is at or above the minimum temperatures specified below. The minimum temperature will be effective for a radius equal to the thickness of the part of be welded; however, not less than 3 inches radius in all directions from the point of the weld.
- 3.8.2 Joints of more than one thickness of base metal will be preheated to the preheat temperature of the thicker base metal to be welded. Preheat shall be recorded on the Welding Installation Record, Attachment "J". LKC QC shall witness preheat other than ambient temperature of 50°F.
- 3.8.3 Preheating is not required for base metal up to and including 3/4 inch thickness, except when the base metal temperature is below 32°F. The base metal shall be heated to at least 70°F and shall be maintained at this minimum temperature during welding.

FOR RECORD ONLY

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3.8.3.1 Exceptions to the above as follows:

3.8.3.1.1 The minimum preheat and interpass temperature requirement is 50°F, 10°C (Ref. AWS D1.1-75, Table 4.2) for thickness of up to and including 3/4 inch.

3.8.3.1.1.1 When shielded metal arc welding with low hydrogen electrodes, submerged arc welding, gas metal arc welding, flux cored arc welding with ASTM A572 Grades 55, 60, 65 or ASTM A633 Grade E base metals.

3.8.3.1.1.2 When shielded metal arc welding with low hydrogen electrodes, submerged arc welding with carbon or alloy steel wire, neutral flux, gas metal arc welding with ASTM A514 over 2-1/2 in., ASTM A517 or ASTM A709 Grades 100 & 100W base metals.

3.8.3.1.1.3 When submerged arc welding with carbon steel wire or alloy flux with ASTM A514 2-1/2 in. and under or ASTM A709 2-1/2 in. and under Grades 100 & 100W base metals.

3.8.4 Preheating of metal in excess of 3/4 inch thickness will be performed as per the following requirement:

3.8.4.1 Shielded metal arc welding with low hydrogen electrodes (E7018).

3/4 thru 1-1/2	50°F
Over 1-1/2 thru 2-1/2	150°F
Over 2-1/2	225°F

3.8.4.2 The welder will use localized heating to obtain the preheat temperatures. QC will verify preheat by use of a temp. stick.

3.9 Weld Repairing and Corrections

3.9.1 Any weld requiring repair of undercut or for being undersize shall be welded in accordance with the general provisions of this specification.

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3.9.2 Welds requiring repair of unsoundness are to be excavated to clean sound metal, after which they are to be cleaned and repair welded in accordance with the foregoing provisions of this specification.

3.9.3 Cracks extending into the base metal shall require written approval of the CECO Site Electrical Field Engineer prior to repair.

3.10 Weld Inspection

3.10.1 Weld inspection shall be performed per Section 4.8.3.

3.11 Precautions for Welding

3.11.1 Protect adjacent materials from the effects of welding heat, to prevent damage to installation. Use asbestos blankets, etc., to protect cables, panels, equipment, and personnel from falling slag, metal and sparks.

3.11.2 Do not weld where fire hazard exists, such as gasoline or fuel storage areas, areas with heavy dust concentrations, or where large quantities of combustible material may be ignited. If welding may be done in an area, be sure sufficient loaded fire extinguishers are present within easy reach to prevent start of a large fire.

3.11.3 Be sure that the current path of welding is adequate to prevent other components from being overheated by external currents.

3.12 Safety

3.12.1 Wear proper apparel, including helmet, goggles, leathers, gloves, etc., to prevent burns to skin and hair.

3.12.2 Avoid looking at arc strikes and welding directly, in order to prevent damage to eyes by ultraviolet or intense light. Protect eyes of others where practicable, by draping or shielding area being welded.

3.12.3 Be sure ventilation is adequate - avoid breathing fumes produced by welding, as they may be hazardous to health.

3.12.4 Prevent fires from starting, but if fires starts, have the proper means available to extinguish it quickly.

3.12.5 Be sure welding or cutting operations will not cause collapse of structures bearing load.

3.12.6 Beware electrical shock hazards, such as wet area/exposed metal ground.

3.12.7 Use caution when handling high-pressure containers for oxygen, etc., to prevent them from becoming missiles.

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4.0 EQUIPMENT

4.1 Calibrated Weld Machines

5.0 FORMS/RECORDS

5.1 Welding Installation Record (WIR) (Attachment 'J')

5.2 Weld Inspection Checklist (Form 19) Ref. B.P. 4.8.3

5.3 Weekly In-Process Welding Inspection Checklist (Form 19A)
Ref. B.P. 4.8.36.0 SPECIAL INSTRUCTIONS

6.1 Upon completing weld, the welder must stamp his symbol adjacent to the weld.

6.2 Welds shall not be painted until Quality Control has inspected and accepted the welds.

6.3 Weld Installation Records are not required for welds performed in non-safety related/non-seismic areas such as turbine and outlying buildings.

6.4 For control room panel butt welds (Ref: Attachment L) the LKC welder must contact QC to perform a final visual inspection prior to the grinding of that weld.

6.5 If the field installation warrants the use of an "alternate" support detail, it will be so noted in the "Remarks" section of the Welding Installation Report by the foreman.

FOR INFORMATION ONLY

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PREQUALIFIED JOINT WELDING PROCEDURE
PROCEDURE SPECIFICATION

Material specification _____
 Welding process _____
 Manual or machine _____
 Position of welding _____
 Filler metal specification _____
 Filler metal classification _____
 Flux _____
 Weld metal grade _____
 Shielding gas _____ Flow _____
 Single or multiple pass _____
 Single or multiple arc _____
 Welding current _____
 Polarity _____
 Welding progression _____
 Root treatment _____
 Preheat and interpass temperature _____
 Postheat treatment _____

WELDING PROCEDURE

Pass no.	Electrode size	Welding Current		Travel speed	Joint Detail
		Amps	Volts		

This procedure may vary due to fabrication sequence, fit-up, pass size, etc. within the limitation of variables given in 4B, C, or D AWS D1.1, Structural Welding Code.

Manufacturer or Contractor _____

Authorized by _____

Date _____

FOR INFORMATION

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WELDING PROCEDURE QUALIFICATION TEST RECORD

PROCEDURE SPECIFICATION

Material specification
 Welding process
 Manual or machine
 Position of welding
 Filler metal specification
 Filler metal classification
 Weld metal grade
 Shielding gas Flow.....
 Single or multiple pass
 Single or multiple arc
 Welding current
 Welding progression
 Preheat temperature
 Postheat treatment
 Welder's name

GROOVE WELD TEST RESULTS

Reduced-section tension test
 Tensile strength, psi:
 1 _____
 2 _____

Guided-bend test
 Root Face
 1 _____ 1 _____
 2 _____ 2 _____

Radiographic-Ultrasonic Examination _____

Fillet test results
 Min Size Multiple Pass Max Size Single Pass
 Macroetch Macroetch
 1 _____ 3 _____ 1 _____ 3 _____
 2 _____ 2 _____

Laboratory Test No.

WELDING PROCEDURE

Pass no.	Elect. size	Welding Current		Speed of travel	Joint Detail
		Amps/Volts*	Volts		

We the undersigned, certify that the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of 5B of AWS D1.1, Structural Welding Code.

Manufacturer or Contractor

Authorized by

Date

Rev. C (01/17/84)

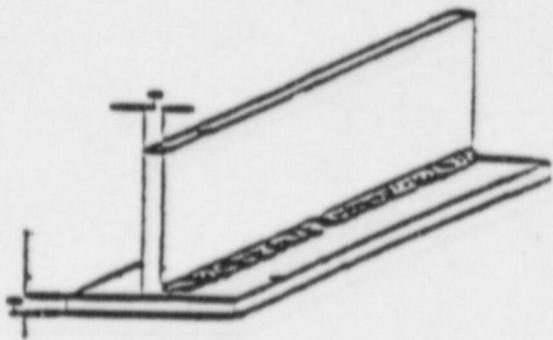
FOR INFORMATION ONLY

FILET WELD
PREQUALIFIED JOINT WELDING PROCEDURE
PROCEDURE SPECIFICATION

Material specification	ASTM A36, A500 Grade B, A501, A570 Grade D & E	
Welding process	SHAW	
Manual or machine	MANUAL	
Position of welding	Flat, Horizontal, Vertical, Overhead	
Filler metal specification	AWS A5.1	
Filler metal classification	E70 18	
Flux	N/A	
Weld metal grade	N/A	
Shielding gas	N/A	
Single or multiple pass	Single and Multiple	Flux N/A
Single or multiple run	Single	
Welding current	DC	
Polarity	Reverse	
Welding progression	Downward (Vertical)	
Root treatment	N/A	
Preheat and interpass temperature	As Applicable	
Post heat treatment	N/A	

I

WELDING PROCEDURE

Thickness	Welding Current		Travel speed	Joint Detail
	Amperes	Volts		
1/2"	70-100	22-28	N/A	
3/8"	85-150	22-28		
5/8"	120-190	22-28		

This procedure may vary due to fabrication conditions, fluxes, joint size, etc. within the limitation of variables given in AISC or AWS D1.1, Structural Welding Code.

ATTACHMENT 'A'

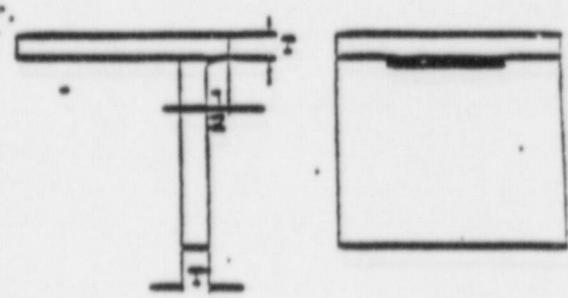
REVISED	APPROVED	DESIGNED	TITLE	ISS. DATE	REV. DATE	NO.
TS	EFD	TS	PROCEDURE	1-18-78	8/29/84	

FOR INFORMATION ONLY

TACK WELD
 PREQUALIFIED JOINT WELDING PROCEDURE
 PROCEDURE SPECIFICATION

Material specification	ASTM A-36, A500 Grade B, A501, A570 Grade D & E		
Welding process	SHAW		
Manual or machine	MANUAL		
Position of welding	Flat, Horizontal, Vertical, Overhead		
Filler metal specification	AWS A5.1		
Filler metal classification	E 7018		
Flux	N/A		
Shielding gas	N/A		
Shielding gas flow	N/A		
Single or multiple pass	Single		
Single or multiple arc	Single		
Welding current	DC		
Polarity	Reverse		
Welding progression	Upward, (Vertical)		
Post treatment	N/A		
Preheat and interpass temperature	As Required		
Postheat treatment	N/A		

WELDING PROCEDURE

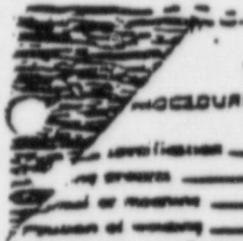
Electrode size	Welding Current		Travel speed	Joint Detail
	Amps	Volts		
1/8"	70-100	22-28	N/A	
1/8"	85-150	22-28		
3/16"	120-190	22-28		

This procedure may vary due to fabrication sequence, fit-up, joint size, etc. within the limitations of variation given in AWS D1.1, Structural Welding Code.

FOR INFORMATION ONLY

REVISED	APPROVED	REVISED	TITLE	ISS. DATE	REV. DATE	SCALE
001	170	TS	PROCEDURE	1-15-78	8/29/84	

ATTACHMENT "B"



WELDING PROCEDURE QUALIFICATION TEST RECORD

WELDING PROCEDURE SPECIFICATION

Qualification ASME A446 & A500
 Joint description SMW
 Position of groove VERTICAL
 Position of working FACE
 Filler metal specification AWS A5.1
 Filler metal classification 7018
 Weld metal grade N/A
 Shielding gas N/A Flow N/A
 Single or multiple pass SINGLE
 Single or multiple arc SINGLE
 Welding current DC
 Welding progression N/A
 Preheat temperature N/A
 Postheat treatment N/A
 Welder's name C. H. WISSEMAN - 1046

GROOVE WELD TEST RESULTS

Reduction-section (ASME 1951)
 Tensile strength, psi:
 1 N/A
 2 _____
 Guided-bend test
 Root Pass
 1 N/A 2 N/A
 2 _____
 Radiographic-Ultrasonic Examination _____
 Test Results
 Min Elong (ultimate) Pass
 Max Elong Elong Pass
 Measurement
 1 N/A 2 _____
 2 _____
 Flare Bevel Groove
 Max Elong Elong Pass
 Measurement
 1 3/16" 2 3/16"
 2 3/16"

Min 1/8" E. T. Partial
 Penetration Flare-Bevel Groove
 Per S & L Detail
 Drawing #0-1191L, Rev. 1.

Laboratory Test No. 4900
AWQ 19

WELDING PROCEDURE

Pass no.	Elect. size	Welding Current		Speed of travel	Joint Detail
		Amperes	Volts		
1	3/32	95 (81 - 110)	25 (21 - 28)	N/A	

3/32 electrode only to be used
 Single pass welds only to be used
 () Denotes \pm 15 Amp-Volt Range

FOR INFORMATION ONLY

The undersigned, hereby certifies that the conditions in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of §5 of AWS D1.1, Structural Welding Code.

This Procedure may vary
 due to fabrication sequence,
 setup, pass size, metal
 thickness, etc..

Manufacturer or Contractor F. C. Young, Inc.
 Authorized by R. W. Marshall
 Date 1-10-79

TITLE	ORIG. DATE	REV. DATE	REV. NO.	PAGE
MANUAL SHIELDED METAL ARC-WELDING FOR STRUCTURAL STEEL	1-8-78	8-29-84	D	

ATTACHMENT "C"

FLARE BEVEL GROOVE
JOINT WELDING PROCEDURE
SPECIFICATION

Material specification ASTM A36, A500, Grade B, A501
 Welding process SHAW
 Method of assembly MANUAL
 Position of welding 1G, 2G, 3G, 4G
 Filler metal specification AWS A5.1
 Filler metal classification E70 18 14
 Flux N/A
 Weld metal grade N/A
 Shielding gas N/A Flow N/A
 Single or multiple pass Multiple
 Single or multiple arc Single
 Welding current DC
 Polarity Reverse
 Welding progression Vertical Downward
 Root treatment N/A
 Preheat and interpass temperature AS APPLICABLE
 Post heat treatment N/A

WELDING PROCEDURE

Position	Elec-trode Size	Welding Current		Travel Speed	Joint Detail
		Amperes	Volts		
Flat	3/32"	77 - 109	19 - 28	5-10-84 N/A	
Vert.		76 - 104	19 - 28	5-10-84 N/A	
Horiz.	1/8"	97 - 133	19 - 28	N/A	
Ovhd.		133	27	N/A	
		5-10-84	5-10-84		

This procedure may vary due to inspection requirements. It is the responsibility of the contractor to verify the dimensions of materials given in AS, C, or D AWS D1.1, Structural Welding Code.

For PQR See Attachments
ATTACHMENTS D8.

D5, D6, D7,

MANUFACTURER OF CONTRACTOR: L. R. SPANGLER & COMPANY
 AUTHORIZED BY: [Signature]
 DATE: 8-13-84
 ATTACHMENT 'D'

REVISED	APPROVED	REVISED	TITLE	ISSUE DATE	REV. DATE	DATE
		TS	PROCEDURE	1-3-83	8-29-84	

FOR OFFICIAL USE ONLY

L. K. CONSTOCK

WELDING PROCEDURE QUALIFICATION TEST RECORD

PROCEDURE SPECIFICATION

Material specification ASTM A-36 to A500B
 Welding process SHAW
 Method of testing Manual
 Position of welding Overhead 4G
 Filter class classification ANSI A5.1
 Filter class designation E-7018
 Weld metal grade F-4
 Shielding gas N/A None N/A
 Slope of electrode axis Multiple
 Slope of electrode arc Single
 Welding current DC WP
 Welding speed N/A
 Process temperature 500°
 Postheat treatment N/A
 Worker's name Tim Donahue 403

GROOVE WELD TEST RESULTS

Reduced-section groove test
 Tensile strength, psi
 1 N/A
 2 N/A
 Charpy-impact test
 Feet
 1 N/A
 2 N/A
 Reinspection-Strain Rate Examination N/A
 Flare Bevel Groove
 Width test results
 Min. Size Maximum Pass
 Measurement
 1 Acc 2 Acc
 2 Acc
 Max. Size Single Pass
 Measurement
 1 1/16 2 1/16
 2 1/16

Laboratory Test No. RET. 7-26
MXG-82

WELDING PROCEDURE

Pass No.	Elect. Size	Welding Current		Speed of travel	Joint Detail
		Amperes	Volts		
1	3/32	90	23	N/A	
2	3/32	90	23	N/A	
3	3/32	90	23	N/A	
4	3/32	90	23	N/A	
5	1/8	115	23	N/A	
thru 13		(97.75-132.25) (19.55-26.45)			

To the undersigned, certify that the specimens in this record are correct and that the test results were prepared, tested and tested in accordance with the requirements of BS or AWS D1.1, Structural Welding Code.

RECEIVED

Manufacturer or Contractor L. K. Constock & Co
 Authorized by [Signature]
 Date 12-19-83

DEC 29 1983

L. K. CONSTOCK ENG. CO., INC.

ATTACHMENT 'D-5'

FOR OFFICIAL USE ONLY

PREPARED	APPROVED	REVISED	TITLE	ORIG. DATE	REVISION	PAGE
IFD			PROCEDURE	C 1/17/84		

L. E. CONSTOCK

WELDING PROCEDURE QUALIFICATION TEST RECORD

PROCEDURE SPECIFICATION

Material specification ASTM A-36 to A500B
 Welding process SMAW
 Method of electrode Manual
 Position of welding Vertical 3G
 Filter mask specification AWS A5.7
 Filter mask classification E-7018
 Weld metal group E-4
 Shielding gas N/A Flux N/A
 Slope of electrode axis Multiple
 Slope of electrode arc Single
 Welding current DC SP
 Welding progression UPWARD
 Preheat temperature 500y
 Postheat treatment N/A
 Welder's name Jim Davidson #92

GROOVE WELD TEST RESULTS

Reduced-section groove test
 Tensile strength, ksi
 1 N/A
 2 N/A
 Charpy-impact test
 Feet
 1 N/A Feet N/A
 2 N/A Feet N/A
 Radiographic-Fluorescent Examination N/A
 Flare Bevel Groove
 X-ray test results
 Min Elong Machine Test Max Elong Strip Test
 Magnification
 1 ACC 2 ACC 1 N/A 2 N/A
 2 ACC 2 N/A

Laboratory Test No. RST-7361
1120-81

WELDING PROCEDURE

Pass no.	Elect. size	Welding Current		Speed of travel	Joint Detail
		Amperes	Volts		
1	3/32	90	23	N/A	
2	3/32	90	23	N/A	
3	3/32	90	23	N/A	
4	3/32	90	23	N/A	
5	1/8	115	23	N/A	
CHRU L3		(97.75-132.25)	(19.55-26.45)		

() Denotes ± 15% amp. volt range
 EI required = 1/2"

We the undersigned, certify that the specimens in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of IS of AWS D1.1, Structural Welding Code.

RECEIVED

DEC 29 1983

CONSTOCK ENG. CO., INC.

Manufacturer or Contractor L. E. CONSTOCK & CO
 Authorized by [Signature]
 Date 12-19-83

ATTACHMENT 'D-6'

FOR INFORMATION ONLY

PREPARED	APPROVED	REVISED	TITLE	ORIG. DATE	REVISION	PAGE
IFD		PROCEDURE	C 1/17/84		

L. E. CONSTOCK

WELDING PROCEDURE QUALIFICATION TEST RECORD

PROCEDURE SPECIFICATION

Material specification ASTM A-36 to A500
 Welding process SHAW
 Manual or automatic Manual
 Position of welding Horizontal 2G
 Filler metal specification AWS A5.1
 Filler metal identification E-7018
 Weld metal grade F-4
 Shielding gas N/A Flow N/A
 Slope or number of ripples Multiple
 Slope or number of ripples are Single
 Shielding current DC SP
 Welding progression N/A
 Preheat temperature 500°
 Postheat treatment N/A
 Welder's name Jim Davidson #92

GROOVE WELD TEST RESULTS

Reinforced-concrete tension test
 Tensile strength, psi
 1 N/A
 2 N/A
 Groove-tensile test
 Root Face
 1 N/A 2 N/A
 1 N/A 2 N/A
 Reinforcement-Load/Strain Relationship N/A
 Flare Bevel Groove
 Flare test results
 Min Size Maximum Pass Max Size Groove Pass
 Measurement Measurement
 1 Acc 2 Acc 1 N/A 2 N/A
 2 Acc 2 N/A

Laboratory Test No. 257-7260
MAQ-80

WELDING PROCEDURE

Pass no.	Elect. size	Welding Current		Speed or travel	Joint Detail
		Amperes	Volts		
1	3/32	90	23	N/A	
2	3/32	90	23	N/A	
3	3/32	90	23	N/A	
4	3/32	90	23	N/A	
5	1/8	115	23	N/A	

thru 13
 (7.75-132.25) (19.55-26.45)
 (Denotes 15% amp. volt range)
 ET required = 1/2"

We do acknowledge, certify that the information in this record is correct and that the test welds were prepared, tested and tested in accordance with the requirements of SB of AWS D1.1, Structural Welding Code.

RECEIVED

DEC 25 1983

WALTRICK ENG. CO., INC.

Manufacturer or Contractor L. E. CONSTOCK & Co.
 Authorized by [Signature]
 Date 12-19-83

ATTACHMENT 'D-7'

PREPARED	APPROVED	REVISED	TITLE	ORIG. DATE	REVISION	PAGE
IFD			PROCEDURE	C 1/17/84		

RECEIVED
 DEC 25 1983
 WALTER TRICK ENGINEERING CO., INC.
 1111 1/2 S. 10th St.
 MILWAUKEE, WI 53233

L. K. COMSTOCK

WELDING PROCEDURE QUALIFICATION TEST RECORD

PROCEDURE SPECIFICATION

Material specification ASTM A-36 to A500B
 Welding process SHAW
 Manual or remote Manual
 Position of welding Plat 1G
 Filter mass classification AWS 15.1
 Filter mass classification S-7018
 Shielding gas P-1
 Shielding gas N/A Flux N/A
 Slope or multiple pass Multiple
 Slope or multiple arc Single
 Welding current DC SP
 Welding progression N/A
 Preheat temperature 500°
 Postheat treatment N/A
 Welder's name Jim Davidson #92

GROOVE WELD TEST RESULTS

Reduced-section tensile test
 Tensile strength, ksi
 1 N/A
 2 N/A
 Charpy-impact test
 Test Pass
 1 N/A N/A
 2 N/A N/A
 Backscatter-Reflectance Examination
 PLATE BEVEL GROOVE
 X-Ray test results
 Min Size Max Size Pass
 Max Size Slope Pass
 Max Size
 1 ACC ACC N/A N/A
 2 ACC N/A

Laboratory Test No. BST-7259
MWQ-79

WELDING PROCEDURE

Pass no.	Elect. size	Welding Current		Grain or wire	Joint Detail
		Amperes	Volts		
1	3/32	90	23	N/A	
2	3/32	90	23	N/A	
3	3/32	90	23	N/A	
4	3/32	90	23	N/A	
5	1/8	115	23	N/A	
Extra 13		(97.75-132.25) (19.55-26.45)			

(*) Denotes = 15% amp. volt range
 ET required = 1/2"

We the undersigned, certify that the statements in this record are correct and that the test welds were prepared, tested and tested in accordance with the requirements of SE of AWS D1.1, Structural Welding Code.

RECEIVED

DEC 29 1983

COMSTOCK ENG. CO., INC.

Manufacturer or Contractor L. K. Comstock & Co.

Authorized by [Signature]

Date 12-19-83

ATTACHMENT 'D-8'

PREPARED	APPROVED	REVISED	TITLE	ORIG. DATE	REVISION	PAGE
IFD			PROCEDURE	1/17/84		

ALL INFORMATION CONTAINED HEREIN IS UNCLASSIFIED
 DATE 08-01-2001 BY 60322 UCBAW/BJS

FLARE BEVEL GROOVE

JOINT WELDING PROCEDURE SPECIFICATION

Material specification	ASTM A36, A300 Grade B, A501, A570 Grade C		
Welding process	SHAW		
Method of assembly	MANUAL		
Position of welding	Flat, Horizontal, Vertical, (1G), (2G), (3G) Flare Bevel Groove		
Filler metal specification	AWS A5.1 E70 18		
Filler metal classification	E70 18		
Flux	N/A		
Shielding gas	N/A		
Shielding gas	Flux N/A		
Single or multiple pass	Multiple		
Single or multiple arc	Single		
Welding current	DC		
Polarity	Reverse		
Welding progression	Upward		
Root treatment	N/A		
Preheat and interpass temperature	AS APPLICABLE		
Post heat treatment	N/A		

WELDING PROCEDURE

Position	Electrode size	Welding Current		Travel speed	Joint Detail
		Amperes	Volts		
Flat	3/32"	77 - 109	19 - 26	N/A	
Vert.		225 - 240			
Horiz. Ovhd.	1/8"	97 - 132	19 - 26	N/A	

This procedure may vary due to fabrication techniques, fluxes, pipe size, etc. within the limitations of variables given in A.S. or D AWS D1.1, Structural Welding Code. For PQR See Attachment

MANUFACTURER OR CONTRACTOR: L. E. CONSTRUCTION & CO.
 AUTHORIZED BY: [Signature]
 DATE: 11/12/83
 ATTACHMENT: 1

E-9, E-10, E-11, E-12.

REVISED	APPROVED	REVISED	TITLE	DATE	REV. DATE
		TS	PROCEDURE	1-18-78	8-29-84

FOR OFFICIAL USE ONLY
 AUTHORITY: [Illegible]
 DATE: [Illegible]

L. E. CONSTOCK

WELDING PROCEDURE QUALIFICATION TEST RECORD

PROCEDURE SPECIFICATION

Material specification ASTM A36 to A500B
 Welding process SHAW
 Manual or remote Manual
 Position of welding Overhead 4G
 Filler metal specification AWS A5.1
 Filler metal identification E-7018
 Shielding gas F-4
 Electrode or electrode size N/A None
 Single or multiple pass Multiple
 Single or multiple arc Single
 Welding current DC RP
 Welding speed N/A
 Preheat temperature 500°
 Postheat treatment N/A
 Welder's name Jim Davidson #92

GROOVE WELD TEST RESULTS

Reheat-temperatures used
 Temperature, min
 1 N/A
 2 N/A
 Control-test case
 Root
 1 N/A Pass
 2 N/A Pass
 Root-face
 1 N/A Pass
 2 N/A Pass
 Root-radius-Uniformity Examination N/A
 Flare Bevel Groove
 Max Slope Max Slope Pass
 Max Slope
 1 Acc 2 Acc 1 N/A 2 N/A
 2 Acc 2 N/A

Laboratory Test No. 25T-7254
MLC-74

WELDING PROCEDURE

Pass no.	Elect. size	Welding Current		Range of speed	Joint Config.
		Amperes	Volts		
1	3/32	90	23	N/A	
2	3/32	90	23	N/A	
3	3/32	90	23	N/A	
		(77.5-103.5)	(19.55-26.45)		
4	1/8	115	23	N/A	
thru 8		(97.75-132.25)	(19.55-26.45)		

() Denotes ± 15% amp. volt range.
 EI required = 5/16"

We the undersigned, certify that the information in this record is correct and that the test welds were prepared, welded and tested in accordance with the requirements of 5B of AWS D1.1, Structural Welding Code.

Manufacturer or Contractor L. E. Constock & Co.
 Authorized by [Signature]
 Date 12-19-83

RECEIVED

DEC 29 1983

CONSTOCK ENG. CO., INC.

ATTACHMENT 'E-9'

PREPARED	APPROVED	REVISED	TITLE	ORIG. DATE	REVISION	PAGE
IFD	IFD		PROCEDURE	C 1/17/84		

FOR INFORMATION ONLY

L. E. GIMSTOCK

WELDING PROCEDURE QUALIFICATION TEST RECORD

PROCEDURE SPECIFICATION

Material specification ASTM A-36 to A500B
 Welding process SHAW
 Manual or automatic Manual
 Position of welding Vertical 3G
 Filler metal specification AWS A5.1
 Filler metal classification E-7018
 Shielding gas F-4
 Shielding gas N/A Flow N/A
 Slope or ripples Multiple
 Slope or ripples are Single
 Welding current DC SP
 Welding progression Downward
 Preheat temperature 500°
 Postheat treatment N/A
 Welder's name Jim Davidson #93

GROOVE WELD TEST RESULTS

Reduction-in-section tensile test
 Tensile strength, psi
 1 N/A
 2 N/A
 Guided-bend test
 Pass
 1 N/A Pass N/A
 2 N/A Pass N/A
 Radiographic-Ultrasonic Examination
Flare Bevel Groove
 Minimum Max Surface Pass Max Size Surface Pass
 Measurement Measurement
 1 Acc 2 Acc 1 1/A 2 1/A
 2 Acc 2 1/A

Laboratory Test No. 85T-7253
PLQ-73

WELDING PROCEDURE

Pass No.	Elect. Size	Welding Current		Speed or Rate	Joint Detail
		Amperes	Volts		
1	3/32	90	23	N/A	
2	1/8	115	23	N/A	
3	1/8	115	23	N/A	

() Denotes ± 15% amp. volt range)
 RT required = 5/16"

We the undersigned, certify that the information in this record is correct and that the test welds were prepared, tested and tested in accordance with the requirements of 3B of AWS D1.1, Structural Welding Code.

Manufacturer or Contractor L. E. Gimstock & Co.

Authorized by [Signature]

Date 12-19-83

RECEIVED

DEC 29 1983

GIMSTOCK ENG. CO., INC.

ATTACHMENT 'E-10'

PREPARED	APPROVED	REVISED	TITLE	ORIG. DATE	REVISION	PAGE
IFD	IFD	PROCEDURE	C 1/17/84		

FOR INFORMATION ONLY

L. K. CONSTOCK

WELDING PROCEDURE QUALIFICATION TEST RECORD

PROCEDURE SPECIFICATION

Material specification ASTM A36 to A500B
 Welding process SHAW
 Manual or automatic Manual
 Position of welding Horizontal 2G
 Filler metal specification AWS A5.1
 Filler metal classification E-7018
 Shielding gas F-6
 Shielding gas N/A Flow N/A
 Slope or rootface angle Multiple
 Slope or rootface angle Single
 Welding current DC SP
 Welding progression N/A
 Preheat temperature 900°
 Postheat treatment N/A
 Welder's name Jim Davidson #92

GROOVE WELD TEST RESULTS

Reduced-section groove test
 Tensile strength, psi
 1 N/A
 2 N/A
 Guided-bend test
 Root
 1 N/A Pass
 2 N/A Pass
 1 N/A
 2 N/A
 Radiographic-Ultrasonic Examination
 Flare Bevel Groove
 Minimum Size Murdock Pass
 Maximum
 1 1pc 2 1pc
 2 1pc
 Maximum
 1 N/A 2 N/A
 2 N/A

Laboratory Test No. 257-7252
142-72

WELDING PROCEDURE

Pass no.	Elect. size	Welding Current		Speed of travel	Joint Detail	
		Amperes	Volts			
1	3/32	90	23	N/A		
2	3/32	90	23	N/A		
3	3/32	90	23	N/A		
4 thru 8	1/8	115	19.55-26.45	N/A		
			(19.55-26.45)			
		(97.75-132.25)				
() denotes ± 15% amp, volt range RT required = 5/16"						

We the undersigned, certify that the statements in this record are correct and that the test welds were prepared, tested and tested in accordance with the requirements of SS of AWS D1.1, Structural Welding Code.

RECEIVED

DEC 29 1983

Manufacturer or Contractor C. K. CONSTOCK & Co.
 Authorized by [Signature]
 Date 12-19-83

CONSTOCK ENG. CO., INC.

ATTACHMENT 'E-11'

PREPARED	APPROVED	REVISED	TITLE	ORIG. DATE	REVISION	PAGE
IFD	IFD	-	PROCEDURE	C 1/17/84		

XERO COPY ONLY

L. E. COMSTOCK

WELDING PROCEDURE QUALIFICATION TEST RECORD

PROCEDURE SPECIFICATION

Material specification ASTM A36 to A500 B
 Welding process SHAW
 Manual or machine Manual
 Process of welding FLAC 1G
 Filler metal specification AMS A5.1
 Filler metal classification E-7018
 Weld metal grade F4
 Shielding gas N/A Flux N/A
 Groove or restraint size Multiple
 Groove or restraint are Single
 Welding current DC RP
 Welding progression N/A
 Preheat temperature 500°F
 Postheat treatment N/A
 Welder's name Tim Davidson #02

GROOVE WELD TEST RESULTS

Reduced-section tension test
 Tensile strength, psi
 1 N/A
 2 N/A
 Guided-bend test
 Pass
 1 N/A 1 N/A
 2 N/A 2 N/A
 Radiographic-Ultrasonic Examination
 Flare Bevel Groove
 Min Size Murdock Pass Max Size Snipe Pass
 Macroetch
 1 Acc 2 Acc 1 N/A 2 N/A
 2 Acc 2 N/A

Laboratory Test No. 25T-7251
MLQ-71

WELDING PROCEDURE

Pass no.	Elect. size	Welding Current		Amount of Weld	Joint Detail
		Amperes	Volts		
1	3/32	90	23	N/A	
2	3/32	90	23	N/A	
3	3/32	90	23	N/A	
		(77.5-103.5) (19.55-26.45)			
4	1/8	115	23	N/A	
5	1/8	115	23	N/A	
6	1/8	115	23	N/A	
		(97.75-132.25)			

() denotes ± 15% amp, volt range
 ET required = 5.16"

We the undersigned, certify that the information in this record is correct and that the test welds were prepared, welded and tested in accordance with the requirements of SB of AWS D1.1, Structural Welding Code.

RECEIVED

DEC 29 1983

COMSTOCK ENG. CO., INC.

Manufacturer or Contractor L. E. Comstock & Co
 Authorized by Tim Davidson
 Date 12-19-83

ATTACHMENT 'E-12'

PREPARED	APPROVED	REVISED	TITLE	ORIG. DATE	REVISION	PAGE
IFD	IFD	PROCEDURE	1/17/84		

FOR INFORMATION ONLY

FLARE BEVEL GROOVE
JOINT WELDING PROCEDURE
SPECIFICATION

Material specification	ASTM A36, A500 Grade B, A501
Welding process	SHAW
Method of execution	MANUAL
Position of welding	(1G), (2G), (3G), (4G), Flare Bevel Groove
Filler metal specification	AMS A5.1
Filler metal classification	E7018
Flux	N/A
Weld metal grade	N/A
Shielding gas	N/A
Shielding gas	Flux N/A
Single or multiple pass	Multiple
Single or multiple run	Single
Welding current	DC
Polarity	Reverse
Welding progression	Vertical Downward
Post treatment	N/A
Post and interpass temperatures	AS APPLICABLE
Post heat treatment	N/A

WELDING PROCEDURE

Position	Elec-trode Size	Welding Current		Travel Speed	Joint Detail
		Amperes	Volts		
Horiz.	3/32"	77 - 105	19 - 28	N/A	
Vert.		104 - 140	19 - 28	N/A	
Flat	1/8"	97 - 135	19 - 28	N/A	
Ovhd.		133 - 170	19 - 28	N/A	

This procedure may vary due to fabrication techniques. It is, however, within the limitations of variations given in ASME B31.1, Sectional Welding Code.

For PQR see attachments

F-5, F-6, F-7, F-8

Manufacturer of Contractor: 6th Construction
 Authorized by: [Signature]
 Date: 12-13-83
 Attachment: '7'

REVISED	APPROVED	DESIGNED	TITLE	ISSUE DATE	REV. DATE	PAGE
II		TS	PROCEDURE	1-29-78	8-29-84	

FOR INFORMATION ONLY

L. E. CONSTOCK

WELDING PROCEDURE QUALIFICATION TEST RECORD

PROCEDURE SPECIFICATION

Material specification: ASTM A-36 to A500B
 Welding process: SHAW
 Manual or automatic: Manual
 Position of welding: Overhead 4-G
 Filler metal classification: AWS A5.1
 Filler metal classification: E-7018
 Wire metal grade: F-4
 Shielding gas: N/A Gas: N/A
 Single or multiple pass: Multiple
 Single or multiple arc: Single
 Welding current: DC RP
 Welding progression: N/A
 Preheat temperature: 50°F
 Postheat treatment: N/A
 Welder's name: Jim Davidson #92

GROOVE WELD TEST RESULTS

Random-section tensile test
 Tensile strength, psi
 1 N/A
 2 N/A

Guided-bend test
 Root Pass
 1 N/A
 2 N/A

Root Face
 1 N/A
 2 N/A

Reduction of Area
 1 N/A
 2 N/A

Flare Bevel Groove
 1 N/A
 2 N/A

Min Size Microseal Pass
 1 N/A
 2 N/A

Max Size Strip Pass
 1 N/A
 2 N/A

Laboratory Test No. BST-7258
MCO-78

WELDING PROCEDURE

Pass no.	Equiv. dia.	Welding Current		Speed of travel	Joint Detail
		Amps	Volts		
1	3/32	90	23	N/A	
2	3/32	90	23	N/A	
3	3/32	90	23	N/A	
4	3/32	(77.5-103.5)	(19.55-26.45)	N/A	
12	1/8	115	23	N/A	<p>() Denotes ± 15% amp. volt range If required = 3/8"</p>
		(97.75-132.25)	(19.55-26.45)	N/A	

We the undersigned, certify that the conditions in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of SS of AWS D1.1, Structural Welding Code.

RECEIVED

DEC 29 1983

CONSTOCK ENG. CO., INC.

Manufacturer or Contractor: L. E. CONSTOCK & CO
 Authorized by: [Signature]
 Date: 12-19-83

ATTACHMENT 'F-5'

PREPARED	APPROVED	REVISED	TITLE	ORIG. DATE	REVISION	PAGE
IFD			PROCEDURE	C 1/17/84		

FOR INFORMATION ONLY

L. K. CONSTOCK

WELDING PROCEDURE QUALIFICATION TEST RECORD

PROCEDURE SPECIFICATION

Material specification ASTM A-36 to A500
 Welding process SHAW
 Method of restraint Manual
 Position of welding Vertical J-G
 Filler metal specification AMS A5.1
 Filler metal classification E-7019
 Weld metal grade F-4
 Shielding gas N/A Flux N/A
 Slope or electrode run Multiple
 Slope or electrode arc Single
 Welding current DC RP
 Welding progression N/A
 Preheat temperature 500°
 Postheat treatment N/A
 Welder's name Jim Davidson #92

GROOVE WELD TEST RESULTS

Reduced-section tensile test
 Tensile strength, psi
 1 N/A
 2 N/A
 Guided-bend test
 Root
 1 N/A
 2 N/A
 Face
 1 N/A
 2 N/A
 Back-groove ultrasonic examination N/A
 Flare Bevel Groove
 Minimum results
 Min Size Maximize Pass
 Max Size Slope Pass
 Maximum
 1 Acc 2 Acc 1 N/A 2 N/A
 2 Acc 2 N/A

Laboratory Test No. BST-2257
MXB-77

WELDING PROCEDURE

Pass no.	Elec. size	Welding Current		Slope of weld	Joint Detail
		Amperes	Volts		
1	3/32 (stringer)	90 (77.5-103.5)	23 (19.55-26.45)	N/A	
2	1/8	115	23	N/A	
3	1/8 (cover)	115 (97.75-132.25)	23 (19.55-26.45)	N/A	

() Denotes $\pm 15\%$ amp. volt range
ET required = 3/8"

We the undersigned, certify that the specimens in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of ISO of AWS D1.1, Structural Welding Code.

RECEIVED

DEC 29 1983

CONSTOCK ENG. CO., INC.

Manufacturer or Contractor L. K. CONSTOCK & Co.
 Authorized by Jim Davidson
 Date 12-19-83

ATTACHMENT 'F-6'

PREPARED	APPROVED	REVISED	TITLE	ORIG. DATE	REVISION	PAGE
IFD			PROCEDURE	C 1/17/84		5

FOR INFORMATION ONLY

L. K. CONSTOCK

WELDING PROCEDURE QUALIFICATION TEST RECORD

PROCEDURE SPECIFICATION

Material specification ASTM A-36 to A500B
 Welding process SMAW
 Manual or automatic Manual
 Position of welding Horizontal 2-G
 Filler metal specification AWS A5.1
 Filler metal classification E-7018
 Weld metal grade F-4
 Shielding gas N/A Gas N/A
 Slope or multiple pass Multiple
 Slope or multiple arc Single
 Welding current DC RP
 Welding progression N/A
 Preheat temperature 300°
 Postheat treatment N/A
 Welder's name Jim Davidson #92

GROOVE WELD TEST RESULTS

Resistance rupture tension test
 Tensile strength, psi
 1 N/A
 2 N/A
 Guided bend test
 Root Pass
 1 N/A Pass N/A
 2 N/A Pass N/A
 Backswept Ultrasonic Examination
Flare Bevel Groove
 Minimum results
 Min Size Multiple Pass Max Size Single Pass
 Measurement Measurement
 1 Ac 2 Ac 1 N/A 2 N/A
 2 Ac 2 N/A

Laboratory Test No. BST-7256
1760-76

WELDING PROCEDURE

Pass no.	Elect. size	Welding Current		Speed of travel	Joint Detail
		Amperes	Volts		
1 thru 4	3/32	90 (77.5-103.5)	23 (19.55-26.45)	N/A	
5 thru 13	1/8	115 (97.75-132.25)	23 (19.55-26.45)	N/A	

() Denotes ± 15% amp. volt range
 ET required = 3/8"

We the undersigned, certify that the specimens in this record are correct and that the test results were properly obtained and stated in accordance with the requirements of S9 of ANSI Q1.1, Structural Welding Code.

RECEIVED

DEC 29 1983

CONSTOCK ENG. CO., INC.

Manufacturer or Contractor L. K. CONSTOCK & Co.
 Authorized by Jim Davidson
 Date 12-19-83

ATTACHMENT 'F-7'

PREPARED	APPROVED	REVISED	TITLE	ORIG. DATE	REVISION	PAGE
IFD			PROCEDURE	C 1/17/84		

L. K. CONSTOCK

WELDING PROCEDURE QUALIFICATION TEST RECORD

PROCEDURE SPECIFICATION

Material specification ASTM A-36 to A50QB
 Welding process SHAW
 Method or methods Manual
 Position of welding FLAT IG
 Filter mask classification AWS A5.1
 Filter mask classification E-7018
 Shielding gas F-5
 Shielding gas N/A Flux N/A
 Slope or multiple pass Multiple
 Slope or multiple pass Single
 Welding current DC RP
 Welding progression N/A
 Preheat temperature 500°
 Postheat treatment N/A
 Tester's name JIM BRIDSON #92

GROOVE WELD TEST RESULTS

Post-weld heat treatment
 Tensile strength, psi
 1 N/A
 2 N/A
 Guided bend test
 Root
 1 N/A Pass
 2 N/A Pass
 Flare Bevel Groove
 N/A
 Min Size Multiple Pass
 Max Size Single Pass
 1 Acc 2 Acc 1 N/A 2 N/A
 2 Acc 2 N/A

Laboratory Test No. BST-7255
700-75

WELDING PROCEDURE

Pass no.	Elect. size	Welding Current		Speed of travel	Joint Detail
		Amperes	Volts		
1 thru 4	3/32	90 (77.5-103.5)	23 (19.55-26.45)	N/A	
5 thru 9	1/8	115 (97.75-132.25)	23 (19.55-26.45)	N/A	

() Denotes $\pm 15\%$ amp. volt range
 ET required = 3/8"

We the undersigned, certify that the conditions in this record are correct and that the test welds were prepared, tested and tested in accordance with the requirements of 5B of AWS D1.1, Structural Welding Code.

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DEC 89 1983

CONSTOCK ENG. CO., INC.

Manufacturer or Contractor L. K. CONSTOCK & CO.

Authorized by [Signature]

Date 12-19-83

ATTACHMENT 'F-8'

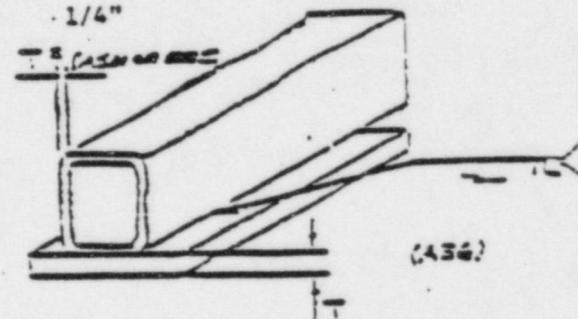
PREPARED	APPROVED	REVISED	TITLE	ORIG. DATE	REVISION	PAGE
IFD			PROCEDURE	C 1/17/84		

FOR THE RECORD ONLY

FLARE BEVEL GROOVE
 JOINT WELDING PROCEDURE
 SPECIFICATION

Associated identification	ASTM A36, A500, Grade B, A501
Welding process	SMW
Manual or machine	MANUAL
Position of weld	(1G), (2G), (3G), (4G), Flare Bevel Groove
Filler metal identification	AWS A5.1
Filler metal classification	E70 18 FA
Flux	N/A
Weld metal grade	N/A
Shielding gas	N/A
Shielding gas	Flow N/A
Single or multiple pass	Multiple
Single or multiple arc	Single
Welding current	DC
Polarity	Reverse
Welding progression	Vertical Upward
Root treatment	N/A
Preheat and interpass temperature	AS APPLICABLE
Post heat treatment	N/A

WELDING PROCEDURE

Position	Electrode size	Welding Current		Tensile strength	Joint Detail
		Amperes	Volts		
Vert.	3/32"	76-112	21-28		
	1/8"	98-150	19-28		
Horiz.	3/32"	76-110	21-28		
	1/8"	106-150	21-28		
Flat	3/32"	81-110	21-28		
	1/8"	106-161	21-28		
Overhead	3/32"	85-115	20-28		
	1/8"	121-163	23-30		

This procedure may vary due to fabrication resources. It is the responsibility of the fabricator to ensure that the procedure is followed within the limitations of variables given in AWS D1.1, Structural Welding Code.

For PQR's see attachments
 G-1, G-2, G-3, G-4, G-5, G-6, G-7,
 G-8, G-9, G-10.

Manufacturer or Contractor: L. K. Brantner & Co.
 Authorized by: [Signature]
 Date: 12-17-84

REVISED	APPROVED	REVISED	TITLE	ORIG. DATE	REV. DATE	DATE
		IFD	PROCEDURE	1-10-78	C 1/17/84	

ATTN: ONLY

Material Spec. ASTM A26, A500 GR. B
 Processed Specimen Designation: SPAN
 Material Condition: NATURAL
 Material Size: 1/8" x 1/8" x 1/8"
 Material Heat Treatment: AMS A5.1
 Material Lot Number: 7018
 Material Grade: NA
 Material Thickness: NA
 Material Width: NA
 Material Length: NA
 Material Weight: NA
 Material Test Method: RP
 Material Test Location: FLAT
 Material Test Orientation: NA
 Material Test Direction: NA
 Material Test Operator: JIM MILLER

Material Condition: NA
 Material Thickness: NA
 Material Width: NA
 Material Length: NA
 Material Weight: NA
 Material Test Method: RP
 Material Test Location: FLAT
 Material Test Orientation: NA
 Material Test Direction: NA
 Material Test Operator: JIM MILLER

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MAY 12 1981

MAY 14 1981

Laboratory Test No. 7760-33
 EST-5830

BRADWOOD OFFICE STOCK END

Size	Area	Volts	Speed of Travel	Joint Detail
1 1/8"	130	25	NA	
2 1/8"	130 (110.5-149.5)	25 (21.29-28.75)	NA	

() Denotes ± 15 amp volt range

ET Required = 1/4"

In the individual, verify that the materials in this report are correct for
 the test with very frequent, valid and correct in accordance with the
 rules of the test, and the test results.

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MAY 05 1981

Authorized by [Signature]
 Date May 5, 1981

BRADWOOD OFFICE
 PITTSBURGH TESTING LABORATORY

ATTACHMENT 'G-1'

PREPARED	APPROVED	REVISED	TITLE	DATE	REV. DATE	PAGE
RAB	PP		PROCEDURE	5/18/81	3 (09/28/83)	

BRADWOOD OFFICE STOCK END

AWS 375, 4501, 5008
 MANUAL
 7018
 AWS AS.1
 NA
 NA
 MULTIPLE
 SINGLE
 NA
 NA
 NA
 NA
 NA
 NA
 JIM MILLER

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MAY 1 4 1981

LK. CHESTOCK ENG. CO.

MAY 10 40
BST-5837

ITEM	SIZE	LENGTH	WIDTH	THICKNESS	NOTES
1	1/8"	125	25	NA	
2	1/8"	125	25	NA	(105.25-143.75) (21.25-28.75)
3	3/16"	90	25	NA	(21.25-28.75)

(1) Dimensions ± 15 and volt range

ET Required 3/4

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MAY 1 2 1981

BRAIDWOOD OFFICE
PITTSBURGH TESTING LABORATORY

L. K. Chestock
 May 6, 1981

ATTACHMENT 'C-2'

REVISIONS	APPROVED	REVISED	TITLE	DATE	BY
RAG	PP		PROCEDURE	5/18/81	(09/28/83)

000

MATERIAL SPEC. ASTM A36 A500 GR. 3
 FINISH SPAN
 POSITION OF WELD RAYIAL
 WELDING PROC. AWS A5.1
 WELDING CLASS. 7018
 WELD METAL SPEC. NA
 POSITION OF WELD NA FLOW NA
 TYPE OF WELD JOINT MULTIPLE
 TYPE OF WELD JOINT SINGLE
 WELDING POSITION DC RP
 WELDING POSITION UPWARD
 WELDING POSITION NA
 WELDING POSITION NA
 MILLER

Reduced-section tension test
 Tensile strength, psi:

1 NA
 2 NA

Ordnance bend test

Root Face
 1 NA NA
 2 NA NA

Penetration-transverse face groove
 NA

Make test results
 Use the principle part for the single part
 1 NA NA
 2 NA NA

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 MAY 12 1981 MAY 14 1981

Laboratory Doc No. MWD-4
 BST-5232

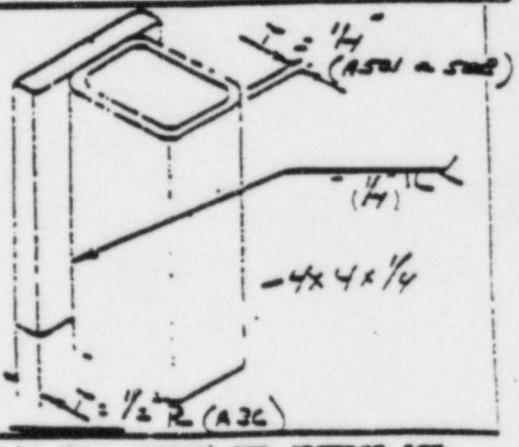
BRAIDWOOD OFFICE

PITTSBURGH TESTING LABORATORY I.K. CONSTRUCTION PROCEDURE

TEST NO.	SIZE	WELDING PROC.	WELDING CLASS.	WELDING POSITION	WELDING CLASS.	WELDING POSITION
1	1/8"	115	25	NA		
2	3/32"	90	25	NA		
		(76.5-103.5)	(97.75-132.25)			

() Denotes ± 15 amp volt range

ET Required = 1/4"



The welder shall verify that the specimens in this report are correct and
 that the test results are correct, welded and tested in accordance with the relevant
 Structural Welding Code.

RECEIVED
 MAY 05 1981

Manufacturer or Contractor J. Smith & Co.
 Witnessed by [Signature]
 Date May 5 1981

BRAIDWOOD OFFICE
 PITTSBURGH TESTING LABORATORY

ATTACHMENT 'G-3'

AT&T INFORMATION COPY

TEST SPECIFICATION:

TEST METHOD:

ASTM A29, A901 or E203
 MANUFACTURER SHAW
 SPECIFICATION MANUAL
 PART NUMBER 7018
 SPECIFICATION ALX A5 1
 TEST TYPE NA
 TEST TYPE NA
 TEST TYPE MULTIPLE
 TEST TYPE SINGLE
 TEST TYPE RC RP
 TEST TYPE NA
 TEST TYPE NA
 TEST TYPE NA
 TEST TYPE JIM MILLER

TEST METHOD: TEST METHOD

1: NA
 2: NA

TEST METHOD: TEST METHOD

TEST METHOD: TEST METHOD

TEST METHOD: TEST METHOD

Groove
 TEST METHOD: TEST METHOD
 TEST METHOD: TEST METHOD

RECEIVED

MAY 14 1981

BRADWOOD OFFICE: 1140-30
 BST-5827

LI CONSTRUCTIVE ENG CO INC

TEST	STANDARD	TEST RESULT	TEST METHOD
1	1/8" 125 25 NA		
2	1/8" 125 25 NA 106.25-143.75 (21.25-28.75)		

() Denotes ± 15 amp volt range
 E.T. By *[Signature]* = 1/4

Handwritten diagram of a bolt with dimensions: 10x6 1/4, 1/4" (301.2500), 1/2" (A36)

RECEIVED

MAY 12 1981

DATE: May 6, 1981

BRADWOOD OFFICE
 PITTSBURGH TESTING LABORATORY

ATTACHMENT 'G-4'

TEST	STANDARD	TEST RESULT	TEST METHOD
RAB	RP		

PROCEDURE: 5/18/81 (09/28/83)

Handwritten notes and markings on the left margin.

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MAY 12 1981

MAY 14 1981

CONSTRUCTION UNIT NO. MMO-35
857-5532

BRAIDWOOD OFFICE
BIRCHMOUNT TESTING LABORATORY

LX CONSTRUCTION ENGINEERING, INC.

NO.	SIZE	TENSILE		YIELD	ELONG.	BEND	JOINTS
		TEST	RESULT				
1	1/8"	130	28	NA			
2	1/8"	130	28	NA			
3	1/8"	130	28	NA			

() Denotes ± 10 amp-volt range

ET Required $\frac{1}{4}$ "

(Faint technical notes regarding quality control and testing procedures)

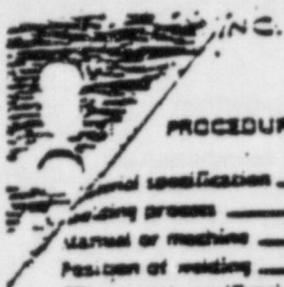
RECEIVED

MAY 05 1981

APPROVED BY: [Signature]
DATE: May 1981

BRAIDWOOD OFFICE		ATTACHMENT 'G-5'	
REV.	DESCRIPTION	DATE	BY
RAB	PP	5/18/81	

INFORMATION ONLY



WELDING PROCEDURE QUALIFICATION TEST RECORD

PROCEDURE SPECIFICATION

Material specification Grade 3 & A501
 Welding process SMALL
 Manual or machine MANUAL
 Position of welding OVERHEAD
 Fil or metal specification AWS 1.9.1
 Fil or metal classification 7018
 Weld metal grade N/A
 Shielding gas N/A Flow N/A
 Single or multiple pass MULTIPLE
 Single or multiple arc SINGLE
 Welding current DCRP
 Welding progression N/A
 Preheat temperature N/A
 Postheat treatment N/A
 Welder's name G. I. Windsor 1198

GROOVE WELD TEST RESULTS

Reduced-section tension test
 Tensile strength, psi:
 1 N/A
 2 _____
 Guided-bend test
 Root Pass
 1 N/A 2 N/A
 2 _____
 Radiographic-Ultrasonic Examination N/A
 * Fillet test results
 Min Size Multiple Pass 3/16" Max Size Single Pass 3/16"
 Measurement 2 3/16" Measurement 2
 2 3/16" 2 _____

* Joint is a Partial Penetration Groove Weld

Laboratory Test No. BST-2966
MW-4

WELDING PROCEDURE

Elem. size	Welding Current		Speed of travel	Joint Detail
	Amps	Volts		
3/32	100 (85-115)	24 (20-28)	N/A	
1/8	142 (121-163)	26 (23-30)	N/A	
<p>T = 1/4" thru 1 1/2" * Minimum ET Reference Para 3.6.1.4 of this Procedure Procedure Qualification Test Tube T = 1/4" Flare T = 1/2" ET required = 3/16"</p>				

83
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The undersigned, certify that the statements in this record are correct and that the test welds were prepared, examined and tested in accordance with the requirements of SE of AWS D1.1, Structural Welding Code.

This procedure may vary due to fabrication, sequence, fit-up, pass size, metal thickness, etc.
 Denotes 15 Amp-Volt Range

Manufacturer or Contractor E. C. Ernst
 Authorized by R. W. [Signature]
 Date 6/7/78

TITLE	ORIG. DATE	REV. DATE	REV. NO.	PAGE
MANUAL SHIELDED METAL ARC-WELDING FOR STRUCTURAL STEEL	1-18-78	5-18-81	B (09/28/83)	

Attachment 'G-7'

WELDING PROCEDURE QUALIFICATION TEST RECORD

PROCEDURE SPECIFICATION

Procedure Specification ASTM A36, A500 Grade
 Material specification A 501
 Welding process SMW
 Method or machine MANUAL
 Position of welding VERTICAL UP
 Filler metal specification AWS A5.1
 Filler metal classification 7018
 Shield metal grade N/A
 Shielding gas N/A Flow N/A
 Single or multiple pass MULTIPLE
 Single or multiple arc SINGLE
 Welding current DCRP
 Welding progression UPWARD
 Preheat temperature N/A
 Postheat treatment N/A
 Welder's name G. L. WINSOR 1198

GROOVE WELD TEST RESULTS

Root-to-root tension test
 Tensile strength, psi
 1 N/A
 2 _____
 Guided-bend test
 Root Face
 1 N/A 1 N/A
 2 _____ 2 _____
 Radiographic-Ultrasonic Examination N/A
 * Filler test results
 Min Size Multiple Pass Max Size Single Pass
 Maximum Maximum
 1 9/32" 1 7/32" 1 N/A 1 _____
 2 5/16" 2 _____ 2 _____

* Joint is a Partial Penetration Groove Weld

Laboratory Test No. B51-2967
ITW-5

WELDING PROCEDURE

Shan. size	Welding Current		Speed of travel	Joint Detail
	Amps	Volts		
3/32	97 (82-112)	25 (21-29)	N/A	
1/8	130 (110-150)	23 (19-26)	N/A	
T = 1/4" thru 1 1/2" * Minimum EI Reference Para. 3.5.1.5 of this procedure Procedure Qualification Test: Tube T = 1/4" Plate T = 1/2" EI required = 3/16"				

We the undersigned, certify that the specimens in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of SB of AWS D1.1, Structural Welding Code.

This procedure may vary due to fabrication, sequence, fit up, pass size, metal thickness, etc.

Manufacturer or Contractor E. C. GANST
 Authorized by R. W. McNeill
 Date 6/7/78

○ Denotes ± 15 Amp-Volt Range

TITLE	ORIG. DATE	REV. DATE	REV. NO.	PAGE
MANUAL SHIELDED METAL ARC-WELDING FOR STRUCTURAL STEEL	1-18-78	5-18-81	3 (09/28/83)	

ATTACHMENT 'G-8'

FOR INFORMATION ONLY

WELDING PROCEDURE QUALIFICATION TEST RECORD

PROCEDURE SPECIFICATION
 ASME A58, A500 Grade
 B & A501
 Welding process SMW
 Position or machine MANUAL
 Position of welding HORIZONTAL
 Filler metal specification AWS A5 1
 Filler metal classification E7018
 Shield metal grade N/A
 Shielding gas N/A Flow N/A
 Single or multiple pass MULTIPLE
 Single or multiple arc SINGLE
 Welding current DC RP
 Welding progression N/A
 Preheat temperature N/A
 Postheat treatment N/A
 Welder's name G. L. WINSOR 1198

GROOVE WELD TEST RESULTS
 Reduced-section tension test
 Tensile strength, psi
 1 N/A
 2 _____
 Guided-bend test
 Root Face
 1 N/A 1 N/A
 2 _____ 2 _____
 Radiographic-Ultrasonic Examination N/A
 *Flint test results
 Min Size Multiple Pass Max Size Single Pass
 Macroetch
 1 3/16" 2 3/8" 1 N/A 2 _____
 2 3/16" 2 _____

* Joint is a Partial Penetration Groove Weld.

Laboratory Test No. RST 2964
MWC-2

WELDING PROCEDURE

Spec. size	Welding Current		Size of weld	Joint Detail
	Amps.	Volts		
3/32	95 (81-110)	25 (21-29)	N/A	
1/8	130 (110-150)	25 (21-29)	N/A	
T = 1/4" thru 1 1/2" * Minimum ET Reference Para 3.8.1.4 of this procedure Procedure Qualification Test Tube T = 1/4" Plate T = 1/2" ET required = 3/16"				

We do not warrant, certify that the conditions in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of SB of AWS C1.1, Structural Welding Code.

This procedure may vary due to fabrication, sequence, fit-up, pass size, metal thickness, etc.

⊕ Denotes ± 15 Amp-Volt Range

Manufacturer or Contractor F.C. ERNST
 Authorized by R.W. Manoff
 Date 6/9/78

TITLE	ORIG. DATE	REV. DATE	REV. NO.	PAGE
MANUAL SHIELDED METAL ARC-WELDING FOR STRUCTURAL STEEL	1-18-78	5-13-81	8 (02/28/83)	

ATTACHMENT "G-9"

FOR INFORMATION ONLY

INC. (1)
WELDING PROCEDURE QUALIFICATION TEST RECORD
GROOVE WELD TEST RESULTS

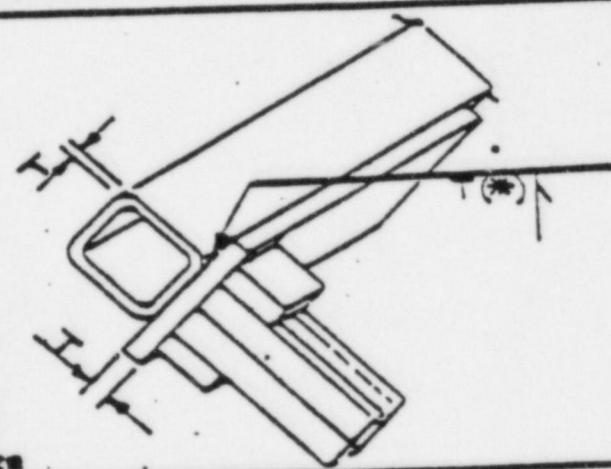
PROCEDURE SPECIFICATION
 ASTM A36, A500 Grade
 Filler specification B & A501
 Welding process SHAW
 Manual or machine MANUAL
 Position of welding FLAT
 Filler metal specification AWS A5.1
 Filler metal classification 7018
 Weld metal grade N/A
 Shielding gas N/A Flow N/A
 Single or multiple pass MULTIPLE
 Single or multiple arc SINGLE
 Welding current DCRP
 Welding progression N/A
 Preheat temperature N/A
 Postheat treatment N/A
 Welder's name G. L. WINSOR 1198

Reduced-section carbon test
 Tensile strength, psi
 1 N/A
 2 _____
 Guided-bend test
 Root Face
 1 N/A 1 N/A
 2 _____ 2 _____
 Radiographic-Ultrasonic Examination N/A
 *Pilot test results
 Min Size Multiple Pass Measurement
 1 7/32" 2 9/32"
 Max Size Single Pass Measurement
 1 N/A 2 _____

* Joint is a Partial Penetration Groove Weld.

Laboratory Test No. BST-2965
ATW-3

WELDING PROCEDURE

Elect. size	Welding Current		Speed of travel	Joint Detail
	Amps	Volts		
3/32	95 (81-110)	25 (21-26)	N/A	
1/8	140 (119-161)	25 (21-29)	N/A	
T = 1/4" thru 1 1/2" * Minimum RT Reference Para 3.8.1.4 of this procedure Procedure Qualification Test Tube T = 1/4" Flare T = 1/2" RT required 3/16" O Denotes + 15 Amp-Volt Range				

We the undersigned, certify that the conditions in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of SE of AWS D1.1, Structural Welding Code.

This procedure may vary due to fabrication, sequence, fit-up, pass size, metal thickness, etc.

Manufacturer or Contractor E. C. ERNST
 Authorized by R. W. M. M. L.
 Date 6/7/78

TITLE	ORIG. DATE	REV. DATE	REV. NO.	PAGE
MANUAL SHIELDED METAL ARC-WELDING FOR STRUCTURAL STEEL	1-18-78	5-18-81	3 (09/28/83)	

ATTACHMENT 'G-10'

**FILLET WELD
JOINT WELDING PROCEDURE
SPECIFICATION**

Material specification ASTM A446, & A300 Grade B or A36
 Welding process SMW
 Method or machine MANUAL
 Position of welding FLAT, HORIZONTAL, VERTICAL, OVERHEAD (1F)(2F)(3F)(4F)
 Filler metal specification AWS A5.1
 Filler metal classification E7018
 Flux N/A
 Weld metal grade V/A
 Shielding gas N/A Flow N/A
 Single or multiple pass Multiple
 Single or multiple arc SINGLE
 Welding current DC
 Polarity Reverse
 Welding direction Vertical upward
 Root treatment N/A
 Preheat and interpass temperature AS APPLICABLE
 Post heat treatment N/A

FOR INFORMATION ONLY

3/8" Minimum Size Fillet Weld **WELDING PROCEDURE**

Thickness inches	Welding Current		Tensile strength	Joint Detail
	Amperes	Volts		
3/32	82 (70-94)	25 (21-29)	N/A	
1/8	125 (106-144)	25 (21-29)	N/A	
3/16	148 (126-170)	25 (21-29)	N/A	

() Denotes ± 15% Amp-Volt Range

The conditions may vary due to fabrication conditions, fluxes, position, etc. within the limitations of variation given in AWS A5.1, Structural Welding Code.

For PQR See Attachments H-1, H-2, H-3
 H-4

Manufacturer or Contractor [Signature]
 Authorized by: [Signature]
 Date: 12-17-87
 ATTACHMENT 'H'

REVISED	APPROVED	REVISED	TITLE	ORIG. DATE	REV. DATE	NO.
1		TS	PROCEDURE	1-18-78	8-29-84	

WELDING PROCEDURE QUALIFICATION TEST RECORD

GROOVE WELD TEST RESULTS

PROCEDURE SPECIFICATION

Identification ASME 1665 & 1600
 Welding process SMAG
 Method of welding MANUAL
 Position of welding FOR POSITION
 Filler metal identification AWS A5.1
 Filler metal classification 7018
 Weld metal grade N/A
 Shielding gas N/A Flux N/A
 Sample or electrode size AS REQUIRED
 Sample or electrode size SINGLE
 Welding current DC SP
 Welding preparation N/A
 Preheat temperature N/A
 Postheat treatment N/A
 Welder's name G. E. WHELAN - 1040

Reduced-section tension test
 Tensile strength, psi N/A
 1. _____
 2. _____
 Guided-load test
 Root N/A Face N/A
 1. _____ 1. _____
 2. _____ 2. _____
 Radiographic-Ultrasonic Examination N/A
 Fillet test results
 Min Size Multiple Pass Max Size Single Pass
 Location
 1. 5/16 2. 1/16 1. N/A 2. _____
 2. _____ 2. _____

$3/32 \leq \text{Filler Size} \leq 1/16$

Laboratory Test No. 2579577

WELDING PROCEDURE

Electrode size	Welding Current		Source of Power	Joint Detail
	Amperes	Volts		
3/32	82 (70-94)	25 (21-29)	N/A	
1/8	125 (106-144)	25 (21-29)	N/A	
5/32	148 (126-170)	25 (21-29)	N/A	

() Denotes ± 15 Amp-Volt Range

We the undersigned, certify that the information in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of SB of AWS Q1.1, Structural Welding Code.

Manufacturer or Contractor E. C. TRIST
 Authorized by [Signature]
 Date 8/4/75

REV. NO.	REV. DATE	ORIG. DATE	PAGE
8	09/28/83	1-15-73	1

ATTACHMENT 'B-1'

WELDING PROCEDURE QUALIFICATION TEST RECORD

PROCEDURE SPECIFICATION

Joint classification: ASME A446 & A500
 Electrode process: SMAP
 Method of machine: MANUAL
 Position of welding: 7.5° GAL
 Filler metal identification: AMS A5.1
 Filler metal classification: 7013
 Weld metal grade: N/A
 Shielding gas: N/A Flow: N/A
 Single or multiple pass: AS REQUIRED
 Single or multiple arc: SINGLE
 Welding current: DCSP
 Welding progression: UP
 Preheat temperature: N/A
 Postheat treatment: N/A
 Welder's name: C. E. WHEATON - 1046

GROOVE WELD TEST RESULTS

Reduced-section tension test
 Tensile strength, psi:
 1: N/A
 2: _____

Guided-bend test
 Root: _____ Face: _____
 1: N/A 1: N/A
 2: _____ 2: _____

Radiographic-Ultrasonic Examination: N/A

Fillet test results
 Min Size Multiple Pass: _____ Max Size Single Pass: _____
 Measurement: _____ Measurement: _____
 1: 5/8 2: 9/16 1: N/A 2: _____
 2: 5/16 2: _____

Laboratory Test No. 35T4080

$\frac{7}{8} \leq \text{Fillet Size} \leq \frac{7}{8}$

WELDING PROCEDURE

Electrode size	Welding Current		Sense of wave	Joint Detail
	Amperes	Volts		
1/32	82 (70-94)	25 (21-29)	N/A	
1/8	125 (106-144)	25 (21-29)	N/A	
5/32	148 (126-170)	25 (21-29)	N/A	

() Denotes ± 15 Amp-Volt Range

The undersigned, certify that the statements in this record are correct and that the test welds were prepared, tested and tested in accordance with the requirements of SB of AWS D1.1, Structural Welding Code.

Manufacturer or Contractor: E. C. FINEST

Authorized by: R. W. Mansfield

Date: 4/14/78

REV.	ORIG. DATE	REV. DATE	REV. NO.	PAGE
	1-8-78	09/28/83	3	

ATTACHMENT 'R-2'

ORIGINAL COPY
 3030
 100



WELDING PROCEDURE QUALIFICATION TEST RECORD

PROCEDURE SPECIFICATION

Specification A500 A646 & A500
 Process STAW
 Position VERTICAL
 Position of welding Face
 Filler metal specification AWS A5.1
 Filler metal classification 7018
 Shielding gas N/A Flow N/A
 Single or multiple pass AS REQUIRED
 Single or multiple arc SINGLE
 Welding current DCEN
 Welding progression N/A
 Preheat temperature N/A
 Postheat treatment N/A
 Welder's name C. E. WEAVER - 1040

GROOVE WELD TEST RESULTS

Reduced-section tension test
 Tensile strength, psi
 1 N/A
 2 _____
 Guided-bend test
 Root Face
 1 7/16 1 7/16
 2 _____ 2 _____
 Radiographic-Ultrasonic Examination 7/16
 Fillet test results
 Min Size Multiple Pass Max Size Single Pass
 Measurement Measurement
 1 7/16 2 7/16 1 N/A 2 _____
 2 7/16 2 _____ 2 _____

$5/8" \leq \text{Fillet Size} \leq 5/8"$

Laboratory Test No. BST 4070

WELDING PROCEDURE

Elect. size	Welding Current		Sound of weld	Joint Detail
	Amps	Volts		
3/32	82 (70-94)	25 (21-29)	N/A	
1/8	125 (106-144)	25 (21-29)	N/A	
5/32	148 (120-170)	25 (21-29)	N/A	

○ Denotes ± 15 Amp-Volt Range

We the undersigned, certify that the specimens in this record are correct and that the test welds were prepared, tested and tested in accordance with the requirements of SB of AWS D1.1, Structural Welding Code.

Manufacturer or Contractor E. C. IRNS-
 Authorized by R. W. Maxwell
 Date 5/4/78

REV. NO.	ORIG. DATE	REV. DATE	REV. NO.	PAGE
1	1-3-78	09/28/83	3	

ATTACHMENT 'E-3'

FOR
 BOSTON
 ONLY

WELDING PROCEDURE QUALIFICATION TEST RECORD

GROOVE WELD TEST RESULTS

PROCEDURE SPECIFICATION

Qualification ASME A5.1 A5.2 & A5.3
 Welding process Shielded Metal Arc
 Position of welding OVERHEAD
 Filler metal specification A5.1 A5.1
 Filler metal classification 7023
 Weld metal grade N/A
 Shielding gas N/A Flow N/A
 Single or multiple pass AS REQUIRED
 Single or multiple arc SINGLE
 Welding current DC SP
 Welding progression N/A
 Preheat temperature N/A
 Postheat treatment N/A
 Welder's name C. WHEATON - 1068

Required Section Tension Test

Tensile strength, psi:

1 N/A
2 _____

Guided-Bend Test

Root Face
 1 N/A 1 N/A
 2 _____ 2 _____

Radiographic-Ultrasonic Examination

N/A

Files Test Results

Max Size Multiple Pass Max Size Single Pass
 Measurement Measurement
 1 1/2 2 1/2 1 N/A 2 _____
 2 7/16 2 _____

Laboratory Test No. AST 4078

$7/8 \leq \text{Filler Size} \leq 1/16$

WELDING PROCEDURE

Electrode	Welding Current		Speed of Travel	Joint Detail
	Amps	Volts		
3/32	82 (70-94)	25 (21-29)	N/A	
1/8	125 (106-144)	25 (21-29)	N/A	
5/32	148 (126-170)	25 (21-29)	N/A	

() Denotes ± 15 Amp-Volt Range

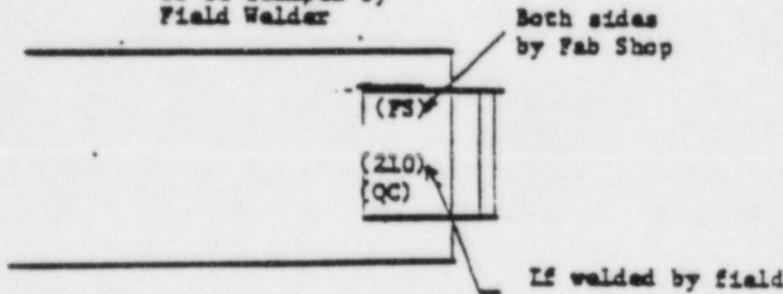
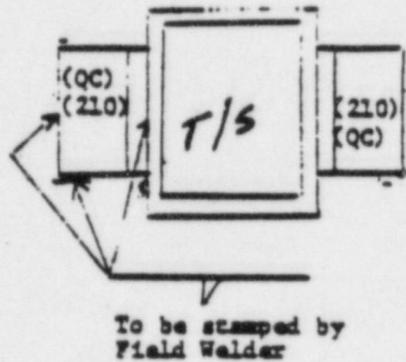
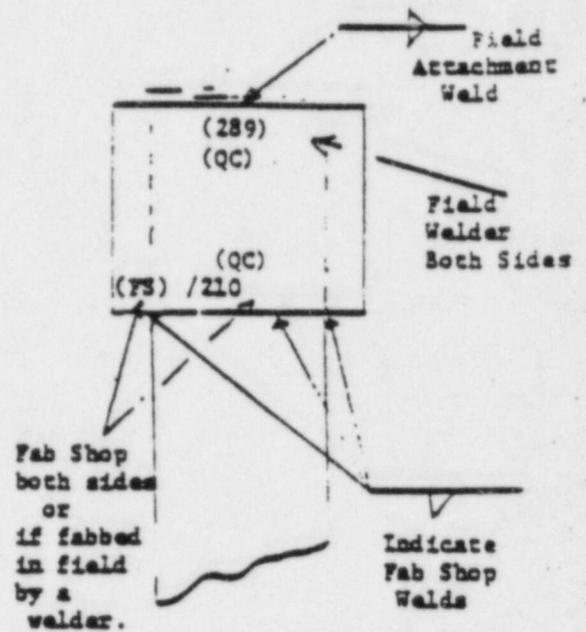
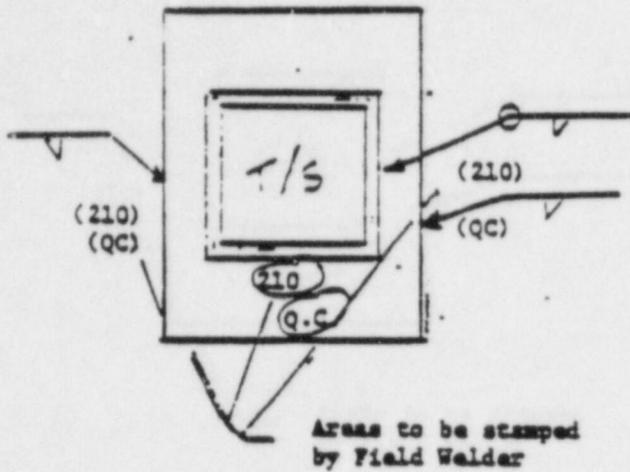
We the undersigned, certify that the statements in this record are correct and that the test welds were prepared, examined and tested in accordance with the requirements of S8 of AWS D1.1, Structural Welding Code.

Manufacturer or Contractor V. C. WINE
 Authorized by R. W. Marshall
 Date 5/4/78

FILE	ORIG. DATE	REV. DATE	REV. NO.	PAGE
MANUAL SHIELDED METAL ARC WELDING FOR	1-8-78	09/28/83	8	

ATTACHMENT 'B-4'

PHOTO COPY ONLY



FOR INFORMATION ONLY

TYPICAL EXAMPLES OF STAMPING

L. K. CONSTOCK WELDED CONNECTIONS

ATTACHMENT 'I'
REV. B
(09/28/83)

ONLY

WELDING INSTALLATION REPORT

WIR NO. _____ OF
SHEET _____

LKC ENGINEERING

LKC CONSTRUCTION

CONDUIT HANGER NUMBER _____ Dwg. _____ REV. _____
 PAN HANGER NUMBER _____ Dwg. _____ REV. _____
 EQUIPMENT NUMBER _____ Dwg. _____ REV. _____
 CABLE PAN MODES _____ Dwg. _____ REV. _____
 JCT. BOX NO. _____ Dwg. _____ REV. _____
 FCR's ECM's Etc. _____

Fit up inspection required prior to welding

Yes [] No [] (If yes, notify LKC QC prior to welding)
 Preheat required: YES [] NO [] Temp. _____

Fit-Up/Preheat _____ Date _____
 QC Inspector _____

REMARKS: _____

CONN.	DETAIL	DWG	MPS	WELD	PROG./REV.	ROD	TYPE	SIZE

REMARKS: _____

LKC ENGINEER _____ DATE _____

ENGINEER _____ DATE _____

REV. C (01/17/84)

ENGINEERING REVIEW

At the completion of installation return form to LKC Quality Control via LKC Eng.

Information contained herein conforms to latest design requirements and tolerances:

Welder _____ I.D.# _____
 (Signature)

Foreman _____ Date: _____
 (Signature)

SINGLE BEVEL GROOVE WELD
 PREQUALIFIED JOINT WELDING PROCEDURE
 PROCEDURE SPECIFICATION

Material specification	A36
Welding process	SMW
Method or means	Manual
Position of welding	Horizontal flat
Filler metal specification	AWS E5.1
Filler metal classification	7018
Flux	N/A
Weld metal grade	N/A
Shielding gas	N/A
Shielding gas	Flow N/A
Single or multiple pass	Multiple
Single or multiple arc	Single
Welding current	DC
Polarity	Reverse
Welding progression	N/A
Post treatment	N/A
Preheat and interpass temperature	N/A
Postheat treatment	N/A

WELDING PROCEDURE

Pipe size	Electrode size	Welding Current		Travel speed	Joint Detail
		Amperes	Volts		
3/32"	70 (59.5-80.5)	24 (20.4-27.6)	N/A		<p>EFFECTIVE THROAT = T</p> <p>See Note A T = 1/2" MAX.</p>
<p>() Denotes ± 15% Amp., Volt parameter</p>					

This procedure may vary due to fabrication issues. It is to be used within the limitations of variables given in AWS C or D AWS D1.1, Structural Welding Code.

NOTE A

Gouge root to sound metal on second side before starting to weld second side.

Manufacturer or Contractor L. K. Comstock Co.

Authorized by [Signature]

Date 1/17/84

ATTACHMENT 'K'

PREPARED LGS	APPROVED IFD	REVISED	TITLE PROCEDURE	ORIG. DATE C 01/17/84	REV. DATE	PAGE
-----------------	-----------------	---------	--------------------	-----------------------------	-----------	------

FOR INFORMATION ONLY

PREQUALIFIED JOINT WELDING PROCEDURE
PROCEDURE SPECIFICATION

Material specification A-36
 Welding process SHAW
 Method of machine Manual
 Position of working Flat, horizontal, vertical, overhead
 Filler metal specification AWS E70.1
 Filler metal classification E 7018
 Flux N/A
 Weld metal grade N/A
 Shielding gas N/A Flow N/A
 Slope or number of rills Multiple
 Slope or number of arcs Single
 Welding current DC
 Polarity Reverse
 Welding progression Inward (vertical)
 Root treatment N/A
 Preheat and interpass temperature N/A
 Postheat treatment N/A

WELDING PROCEDURE

Part No.	Thickness	Welding Current		Travel Speed	Joint Detail
		Amps	Volts		
	3/32"	70 (59.5-80.5)	24 (20.4-27.0)	N/A	
O Denotes ± 15% Amp., Volt parameter					

This procedure may vary due to fabrication practices. Refer, also, to the limitations of variables given in A5. C. or D AWS C1.1, Structural Welding Code.

Note A

Gouge root to sound metal on second side before starting to weld second side.

Manufacturer or Contractor L. K. Comstock Co.

Authorized by [Signature]

Date 1.17.1964

ATTACHMENT 'L'

PREPARED	APPROVED	REVISED	TITLE	ORIG. DATE	REV. DATE	PAGE
BEB	IFD		PROCEDURE	C 01/17/84		

FOR INFORMATION ONLY

60° GROOVE
PREQUALIFIED JOINT WELDING PROCEDURE
PROCEDURE SPECIFICATION

Material specification ASTM A36 to A36
 Welding process SMAW
 Method or machine Manual
 Position of welding 1G-2G-3G-4G
 Filler metal specification AWS A5.1
 Filler metal classification E-4 GROUP
 Flux N/A 5-10-84
 Weld metal grade E7018
 Shielding gas N/A Flow N/A
 Single or multiple pass Multiple
 Single or multiple arc Single
 Welding current DC
 Polarity RP
 Welding progression Vertical Upward
 Root treatment N/A
 Preheat and interpass temperature As Applicable
 Postheat treatment N/A

WELDING PROCEDURE

Pass no.	Thickness	Welding Current		Travel speed	Joint Detail
		Amperes	Volts		
Flat Horiz.	3/32"	82 - 112	21 - 29	N/A	<p>ET = 1/8" Minimum</p>
Ovhd. Vert.	3/32"	74 - 101	19 - 26	N/A	

This procedure may vary due to fabrication sequences, fit-up, plate size, etc. within the limitation of variables given in 4B, C, or D AWS D1.1, Structural Welding Code.

For PQR See Attachments M1, M2, M3, M4.

Manufacturer or Contractor L. K. Comstock Co., Inc.

Authorized by [Signature]

Date 4-9-84

ATTACHMENT M

FOR INFORMATION ONLY

PREPARED	APPROVED	REVISED	TITLE	ORIG. DATE	REV. DATE	PAGE
IFD	IFD		PROCEDURE	C 01/17/84		

L. E. COMSTOCK

WELDING PROCEDURE QUALIFICATION TEST RECORD

PROCEDURE SPECIFICATION

Material specification ASTM A36 to A36
 Welding process SMAW
 Manual or automatic Manual
 Position of welding 4G Overhead
 Filler metal specification AWS A5.1
 Filler metal classification E-7018
 Weld metal grade E-7018
 Shielding gas N/A Flux N/A
 Slope or multiple test Multiple
 Slope or multiple are Single
 Welding current DC RP
 Welding progression N/A
 Preheat temperature N/A
 Postheat treatment N/A
 Welder's name Jim Davidson #92

GROOVE WELD TEST RESULTS

Relevant section of AWS spec
 Tensile strength, ksi
 1 N/A
 2 N/A
 Charpy test
 Reel Pass
 1 N/A 1 N/A
 2 N/A 2 N/A
 Radiographic-Ultrasonic Examination
 Groove test results
 Min Size Multiple Pass Max Size Single Pass
 Measurement 2 1/4" Measurement
 1 1/32" 2 1/16" 1 _____ 2 _____
 2 _____

Laboratory Test No. AST-7725

FOR INFORMATION ONLY

WELDING PROCEDURE

Pass No.	Spec. No.	Welding Current		Slope of Groove	Joint Detail
		Amperes	Volts		
Multiple	3/32"	88 (74-101)	23 (19-26)	N/A	<p>14"x4"x12" 2"x4"x12" 60° ET = 1/8" Minimum</p>
()	de-notes	+15% amp.	Volt Range		

We the undersigned, certify that the statements in this record are correct and that the test welds were prepared, tested and tested in accordance with the requirements of S8 of AWS Q1.1, Structural Welding Code.

Manufacturer or Contractor [Signature]
 Authorized by [Signature]
 Date 2-1-84

RECEIVED

MAR 29 1984

COMSTOCK ENG. CO., INC.

ATTACHMENT M1

PREPARED	APPROVED	REVISED	TITLE	ORIG. DATE	REVISION	PAGE
IFD	IFD		PROCEDURE	01/17/84		

L. K. COMSTOCK

WELDING PROCEDURE QUALIFICATION TEST RECORD

PROCEDURE SPECIFICATION

Material specification ASTM A36 to A36
 Welding process SPAW
 Method of restraint Manual
 Position of welding 3G Vertical
 Filler metal specification AWS A5.1
 Filler metal classification E-7018
 Shielding gas N/A Gas N/A
 Slope or multiple size Multiple
 Slope or multiple size Single
 Welding current DC RP
 Welding progression uphill
 Preheat temperature N/A
 Postheat treatment N/A
 Welder's name Jim Davidson #92

GROOVE WELD TEST RESULTS

Repeatability - witness test
 Tensile strength, psi
 1 N/A
 2 N/A
 Guided-bend test
 Root Pass
 1 N/A 1 N/A
 2 N/A 2 N/A
 Radiographic-Ultrasonic Examination
 Groove
 Min Size Multiple Pass Max Size Single Pass
 Magnification
 1 1/32" 2 1/32" 1 1 2 1
 2 1/32" 2 1/32" 2 1 2 1

Laboratory Test No. AST-7724

FOR INFORMATION ONLY

WELDING PROCEDURE

Pass No.	Size	Welding Current		Slope of Weld	Joint Detail
		Amperage	Voltage		
Multiple	3/32"	88 (74-101)	23 (19-26)	N/A	
()	de-notes	+15 Amp.	Volt Range		ET = 1/8" Minimum

We the undersigned, certify that the conditions in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of S8 of AWS D1.1, Structural Welding Code.

Manufacturer or Contractor Jim Davidson #92
 Authorized by Jim Davidson
 Date 3-1-84

RECEIVED

MAR 29 1984

COMSTOCK ENGR. CO. INC.

ATTACHMENT M2

PREPARED	APPROVED	REVISED	TITLE	ORIG. DATE	REVISION	PAGE
IFD	IFD		PROCEDURE	C 01/17/84		

L. K. COMSTOCK

WELDING PROCEDURE QUALIFICATION TEST RECORD

PROCEDURE SPECIFICATION

Material specification ASTM A36 to A36
 Welding process SHAW
 Manual or machine Manual
 Position of welding 2G Horizontal
 Filler metal specification AWS A5.1
 Filler metal classification E-7018
 Weld metal grade E-7018
 Shielding gas N/A Flow N/A
 Single or multiple pass Multiple
 Single or multiple arc Single
 Welding current DC RP
 Welding progression N/A
 Preheat temperature N/A
 Postheat treatment N/A
 Welder's name Jim Davidson #92

GROOVE WELD TEST RESULTS

Retained-section tension test
 Tensile strength, psi
 1 N/A
 2 N/A
 Guided-bend test
 Root
 1 N/A
 2 N/A
 Face
 1 N/A
 2 N/A
 Radiographic-Ultrasonic Examination _____
 Groove test results
 Min Gap Multiple Pass 9/32"
 Max Gap Single Pass _____
 Min Groove _____
 Max Groove _____
 1 5/16"
 2 1/4"

Laboratory Test No. 85T-7723

WELDING PROCEDURE

Pass no.	Elect. size	Welding Current		Speed or range	Joint Detail
		Amperes	Volts		
Multiple	3/32"	97 (82-112)	25 (21-29)	N/A	<p>ET = 1/8" Minimum</p>
()	de notes	+15 Amp	Volt	Range	

FOR OFFICIAL USE ONLY

COMSTOCK ENG. CO., INC.

MAR 29 1984

RECEIVED

The undersigned, certify that the information in this record is correct and that the test welds were prepared and tested in accordance with the requirements of SB of AWS D1.1, Structural Welding Code.

Manufacturer or Contractor L.K. COMSTOCK & CO.
 Authorized by [Signature]
 Date 1-22-84

ATTACHMENT - M3

PREPARED	APPROVED	REVISED	TITLE	ORIG. DATE	REVISION	PAGE
IFD	IFD		PROCEDURE	C 01/17/84		

L. K. CONSTOCK

WELDING PROCEDURE QUALIFICATION TEST RECORD

PROCEDURE SPECIFICATION

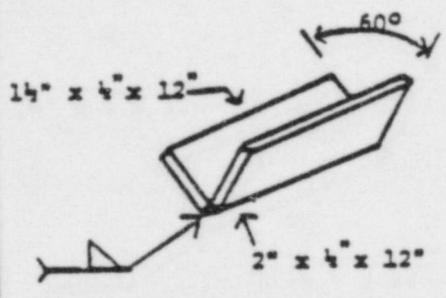
Material specification A-36 to A-36
 Welding process SMW
 Manual or machine MANUAL
 Position of welding 1G FLAT
 Filler metal specification AWS A5.1
 Filler metal classification E-4 GROUP
 Weld metal grade E-7018
 Shielding gas N/A Flow N/A
 Single or multiple pass Multiple
 Single or multiple arc Single
 Welding current DC RP
 Welding progression N/A
 Preheat temperature N/A
 Postheat treatment N/A
 Welder's name Jim Davidson #92

GROOVE WELD TEST RESULTS

Reduced-section tension test
 Tensile strength, psi
 1 N/A
 2 N/A
 Guided-bend test
 Root
 1 N/A Pass N/A
 2 N/A Pass N/A
 Radiographic-Ultrasonic Examination
 Groove weld results
 Min Size Macro Pass
 Macro 1 9/32" 2 9/32"
 Max Size Single Pass
 Macro 1 2
 2 9/16" 2

Laboratory Test No. RST-7727

WELDING PROCEDURE

Test No.	Elect. Prod.	Welding Current		Speed of travel	Joint Detail
		Amperage	Volts		
Multiple	3/32"	97 (82-112)	25 (21-29)	N/A	 <p>14" x 1/4" x 12" 2" x 1/4" x 12" 60° ET = 1/8" Minimum</p>
()	de-notes	+ 15 Amp	Volts	Range	

I, the undersigned, certify that the statements in this record are correct and that the test welds were prepared, tested and tested in accordance with the requirements of SB of AWS D1.1, Structural Welding Code.

Manufacturer or Contractor L. K. CONSTOCK & CO.
 Authorized by [Signature]
 Date 2-22-84

ATTACHMENT M4

CONSTOCK LINE CO., INC.

MAR 29 1984

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PREPARED	APPROVED	REVISED	TITLE	ORIG. DATE	REVISION	PAGE
IFD	IFD		PROCEDURE	C 01/17/84		

**30° GROOVE
PREQUALIFIED JOINT WELDING PROCEDURE
PROCEDURE SPECIFICATION**

Material specification	ASTM A36 to A36
Welding process	SMAW
Manual or machine	Manual
Position of welding	1G-2G-3G-4G
Filler metal specification	AWS A5.1
Filler metal classification	F-4 Group
Flux	N/A
Weld metal grade	E-7018
Shielding gas	N/A
Shielding gas flow	N/A
Single or multiple pass	Multiple
Single or multiple arc	Single
Welding current	DC
Polarity	RP
Welding progression	Vertical Upward
Root treatment	N/A
Preheat and interpass temperature	As Applicable
Postheat treatment	N/A

WELDING PROCEDURE

Pass no.	Electrode size	Welding Current		Travel speed	Joint Detail
		Amperes	Volts		
Flat	3/32"	85 - 115	20 - 28	N/A	<p style="text-align: center;">ET = 1/8" Minimum</p>
Horz. Vert.	3/32"	70 - 95	19 - 26	N/A	
Ovhd.	3/32"	74 - 100	21 - 29	N/A	

This procedure may vary due to fabrication sequences, fit-up, joint size, etc. within the limitation of variables given in 4B, C, or D AWS D1.1, Structural Welding Code.

For PQR See Attachments N1, N2, N3, N4.

Manufacturer or Contractor L. K. Comstock Co., Inc.

Authorized by [Signature]

Date 1-9-81

ATTACHMENT N

ONLY
 FOR THE
 BRAIDWOOD

PREPARED	APPROVED	REVISED	TITLE	ORIG. DATE	REV. DATE	PAGE
IFD	IFD		PROCEDURE	01/17/84		

L. E. CONSTOCK

WELDING PROCEDURE QUALIFICATION TEST RECORD

PROCEDURE SPECIFICATION

Material specification ASTM A36 to A36
 Welding process SMAW
 Manual or automatic Manual
 Position of welding AC Overhead
 Filler metal specification A-5.1
 Filler metal classification F-4 Group
 Wire metal grade E-7018
 Shielding gas N/A Flow N/A
 Single or multiple pass Multiple
 Single or multiple arc Single
 Welding current DC SP
 Welding progression N/A
 Preheat temperature N/A
 Postheat treatment N/A
 Welder's name Jim Davidson #02

GROOVE WELD TEST RESULTS

Root-face width test
 Tensile strength, psi
 1 N/A
 2 N/A
 Guided-bend test
 Root
 1 N/A 2 N/A
 2 N/A 2 N/A
 Radiographic-Ultrasonic Examination N/A
 Groove
 Fillet weld results
 Min Size Multiple Pass
 Measurement 3/8" 1/32"
 1 3/8" 2 1/32"
 2 3/8" 2 1/32"
 Max Size Single Pass
 Measurement

Laboratory Test No. BST-7721

WELDING PROCEDURE

Pass	Elect. size	Welding Current		Speed of travel	Joint Detail
		Amperes	Volts		
Multiple	3/32"	87 (74-100)	25 (21-29)	N/A	<p>ET = 1/8" Minimum</p>
() Denotes \pm 15% Amp-Volt Range					

FOR INFORMATION ONLY

RECEIVED

MAR 29 1984

CONSTOCK ENG. CO., INC.

Manufacturer or Contractor C.A. Constock & Co
 Authorized by [Signature]
 Date 2-22-84

ATTACHMENT N1

PREPARED	APPROVED	REVISED	TITLE	ORIG. DATE	REVISION	PAGE
IFD	IFD	PROCEDURE	01/17/84		

L. K. CONSTOCK

WELDING PROCEDURE QUALIFICATION TEST RECORD

PROCEDURE SPECIFICATION

Material specification ASTM A36 to A36
 Welding process SMAW
 Manual or machine Manual
 Position of welding 3G Vertical
 Filler metal specification A5.1
 Filler metal classification E 7018
 Weld metal grade E-7018
 Shielding gas N/A Flow N/A
 Single or multiple pass Multiple
 Single or multiple arc Single
 Welding current DC RP
 Welding progression Upward
 Preheat temperature N/A
 Postheat treatment N/A
 Welder's name Jim Davidson #92

GROOVE WELD TEST RESULTS

Rebound-indentation hardness test
 Tensile strength, psi
 1 N/A
 2 N/A
 Guided-bend test
 Root Pass
 1 N/A
 2 N/A
 Radiographic-Ultrasonic Examination N/A
 Groove
 Root Reinforcement
 Min Size Macroscopic Pass
 Macroscopic
 1 2 5/16" 3/32"
 2 1/4" 3/32"
 Max Size Single Pass
 Macroscopic
 1 2 5/16" 3/32"
 2 1/4" 3/32"
 3-6-84

Laboratory Test No. AST-7720

WELDING PROCEDURE

Pass No.	Elect. Prod.	Welding Current		Series of tests	Joint Detail
		Amperes	Volts		
Multiple	3/32"	83 (70-95)	23 (19-26)	N/A	
()		LSZ Denotes ± Amp-Volt Range			
		ET = 1/8" Minimum			

We, undersigned, certify that the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of SB of AWS D1.1, Structural Welding Code.

Manufacturer or Contractor L.K. Constock & Co

Authorized by Jim Davidson

Date 5-22-84

ATTACHMENT N2

FOR RECORD ONLY

CONSTOCK ENGINE CO, INC

MAR 29 1984

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IFD	IFD		PROCEDURE	01/17/84		

L. K. CONSTOCK

WELDING PROCEDURE QUALIFICATION TEST RECORD

PROCEDURE SPECIFICATION

Material specification ASTM A36 to A36
 Welding process SHAW
 Method or methods Manual
 Position of welding 2G Horizontal
 Filler metal specification A-5.1
 Filler metal classification E-7018
 Weld metal grade E-7018
 Shielding gas N/A Flow N/A
 Slope or multiple pass Multiple
 Slope or multiple are Single
 Welding current DC RP
 Welding progression N/A
 Preheat temperature N/A
 Postheat treatment N/A
 Welder's name Jim Davidson #92

GROOVE WELD TEST RESULTS

Reduced-section tensile test
 Tensile strength, psi
 1 N/A
 2 N/A
 Guided-bend test
 Pass
 1 N/A
 2 N/A
 Radiographic-Ultrasonic Examination N/A
 Groove
 Min Size Multiple Pass 5/16"
 Max Size Single Pass 5/16"
 Max Size Groove Pass 5/16"
 Max Size Groove Pass 5/16"

Laboratory Test No. 85T-7719

WELDING PROCEDURE

Pass	Elect. Size	Welding Current		Speed of Weld	Joint Detail
		Amps	Volts		
Multiple	3/32"	83 (70-95)	23 (19-26)	N/A	<p>2" x 1/4" x 12" 30° 1 1/4" x 1/4" x 12"</p>
() Denotes ± 15% Amp-Volt Range ET = 1/8" Minimum					

We the undersigned, certify that the statements in this record are correct and that the test welds were prepared in accordance with the requirements of SB of AWS D1.1, Structural Welding Code.

Manufacturer or Contractor L.K. Constock Inc

Authorized by [Signature]

Date 3-22-84

ATTACHMENT N3

FOR INFORMATION ONLY

CONSTOCK LINC CO, INC

MAR 29 1984

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IFD	IFD	-	PROCEDURE	C 01/17/84		

L. E. COMSTOCK

WELDING PROCEDURE QUALIFICATION TEST RECORD

PROCEDURE SPECIFICATION

Material specification ASTM A36 to A36
 Welding process SMAW
 Manual or machine Manual
 Position of welding 1G Flat
 Fillet metal classification A-5.1
 Root metal classification E-6 Group
 Weld metal grade E-7018
 Shielding gas N/A Flow N/A
 Slope or rousture join Multiple
 Slope or rousture arc Single
 Welding current DC RP
 Welding progression N/A
 Preheat temperature N/A
 Postheat treatment N/A
 Welder's name Jim Davidson #92

GROOVE WELD TEST RESULTS

Reduced-section tensile test
 Tensile strength, psi:
 1 N/A
 2 N/A
 Guided-bend test
 Root Pass
 1 N/A 1 N/A
 2 N/A 2 N/A
 Radiographic-Ultrasonic Examination N/A
 Groove
 Fillet test results
 Min Size Multiple Pass Max Size Single Pass
 Magnification 3/32 Macroscan
 1 1/4" 2 1/32"
 2 1/4" 2 1/32"

Laboratory Test No. BST-7718

WELDING PROCEDURE

Pass no.	Slopes	Welding Current		Slope of throat	Joint Detail
		Amps	Volts		
Multiple	3/32"	100 (85-115)	24 (20-28)	N/A	
() Denotes ± Amp-Volt Range 15% ET = 1/8" Minimum					

FOR INFORMATION ONLY

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MAR 29 1984

COMSTOCK LINE CO, INC

I hereby certify that the statements in this record are correct and that the test welds were prepared in accordance with the requirements of SB of AWS Q1.1, Structural Welding Code.

Manufacturer or Contractor L. E. Comstock & Co
 Authorized by [Signature]
 Date 1-23-84

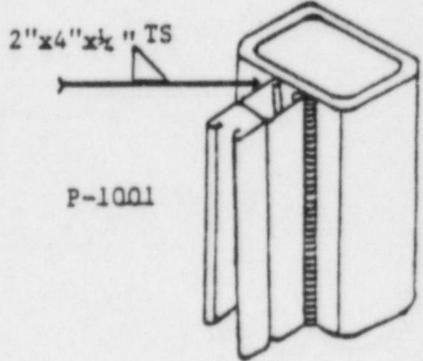
ATTACHMENT N4

PREPARED	APPROVED	REVISED	TITLE	ORIG. DATE	REVISION	PAGE
IFD	IFD		PROCEDURE	C 01/17/84		

QUALIFIED JOINT WELDING PROCEDURE
PROCEDURE SPECIFICATION

Material identification ASTM A446 - A500B
 Welding process SMAW
 Method or machine Manual
 Position of welding 1F - 2F - 3F - 4F - 5F 7/5-8
 Filler metal specification AWS A5.1
 Filler metal classification E4 - Group
 Flux N/A
 Weld metal grade E-7018
 Shielding gas N/A Flux N/A
 Shape or number of passes Single
 Shape or number of arcs Single
 Welding current DC
 Polarity RP
 Welding progression Vertical Upward
 Root treatment N/A
 Preheat and interpass temperature As applicable
 Postheat treatment N/A

WELDING PROCEDURE

Pipe size	Thickness wall	Welding Current		Travel speed	Joint Detail
		Amperes	Volts		
Horz. Flat	1/8"	100 - 135	19 - 26	N/A	 <p>2"x4"x$\frac{1}{2}$" TS P-1001</p>
Ovhd.	1/8"	96 - 130	20 - 26	N/A	
Vert.	1/8"	88 - 118	18 - 24	N/A	

This procedure may vary due to fabrication conditions. Refer to AWS D1.1, Structural Welding Code.

For PQR's See Attachment 01, 02,
03, 04

Manufactured or Constructed by Anderson
 Authorized by L.K. Construction & Co
 Date 7-2-84

Attachment 0

FOR INFORMATION ONLY

PREPARED	APPROVED	REVISED	TITLE	ORIG. DATE	REV. DATE	PAGE
EAP	RAB	IFD	PROCEDURE	1/17/84	8/29/84	10 of 11

WELDING PROCEDURE QUALIFICATION TEST RECORD

PROCEDURE SPECIFICATION

Material specification ASTM A-446 to A500B
 Welding process SMW
 Method of procedure Manual
 Position of welding 2F Vertical - 4P 7/8 P+
 Filler metal classification A5.1
 Filler metal classification F- Group
 Electrode classification E-7018
 Shielding gas N/A Flow N/A
 Slope of rootface Single
 Slope of rootface Single
 Welding current DC RP
 Welding progression Upward
 Preheat temperature N/A
 Postheat treatment N/A
 Welder's name Jim Davidson #92

GROOVE WELD TEST RESULTS

Tensile strength, ksi:
 1 N/A
 2 N/A
 Charpy impact test:
 Root: 1 N/A 2 N/A
 Face: 1 N/A 2 N/A
 Radiographic-Ultrasonic Examination:
 Fillet test results:
 Min Slope Measurement: 1 N/A 2 N/A
 Max Slope Measurement: 1 Acc 2 Acc
 Max Groove: 1 Acc 2 Acc

Laboratory Test No. BST-8430

WELDING PROCEDURE

Pass	Elect. size	Welding Current		Slope of root	Joint Detail
		Amperage	Voltage		
Sing.	1/8"	103 (88 - 118)	21 (18 - 24)	N/A	2"x4"x1/2" TS P-1001

() Denotes + 15% Amp-Volt Range

Fillet = 1/8" Max.

We the undersigned, certify that the specifications in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of SS of AWS D1.1, Structural Welding Code.

Manufacturer or Contractor G.H. COMSTOCK & Co
 Authorized by A. Howard
 Date 7-2-84

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JUL 9 1984

COMSTOCK CO., INC.

Attachment 01

PREPARED	APPROVED	REVISED	TITLE	ORIG. DATE	REVISION	PAGE
IFD	IFD	IFD	PROCEDURE	1/17/84	8/29/84	

FOR REVIEW ONLY
 7/10/84

COMSTOCK

WELDING PROCEDURE QUALIFICATION TEST RECORD

PROCEDURE SPECIFICATION

Material Specification ASTM A-446 to A500B
 Welding process SMW
 Method or methods Manual
 Position of welding 4F Overhead
 Filler metal specification A5.1
 Filler metal classification E4 GROUP
 Weld metal grade E-7018
 Shielding gas N/A Gas N/A
 Shape of electrode Single
 Shape of electrode arc Single
 Welding current DC RP
 Welding progression N/A
 Preheat temperature N/A
 Postheat treatment N/A
 Welder's name Jim Davidson #92

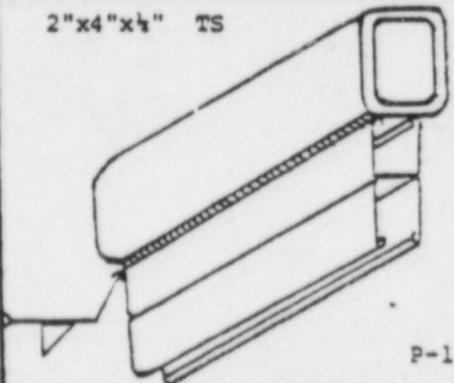
GROOVE WELD TEST RESULTS

Results-section length test
 Tensile strength, psi:
 1 N/A
 2 N/A
 Charpy test
 Acft
 1 N/A 1 N/A
 2 N/A 2 N/A
 Radiographic-Ultrasonic Examination N/A
 Fillet test results
 Min Size Max Size Pass
 Measurement Measurement
 1 N/A = N/A 1 Acc = Acc
 2 N/A = N/A 2 Acc = Acc

Labortory Test No. BST-8431

FOR INFORMATION ONLY

WELDING PROCEDURE

Pip. No.	Elec. Size	Welding Current		Shape of Weld	Joint Config.
		Amps	Volts		
Sing.	1/8"	113 (96-130)	23 (20-26)		2"x4"x1/2" TS
() Denotes $\pm 15\%$ Amp-Volt Range Fillet = 1/8" Max.					
					

We the undersigned, certify that the specifications in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of SB of AWS D1.1, Structural Welding Code.

Manufacturer or Contractor L.K. Comstock Co
 Authorized By J.D. Davidson
 Date 7-2-84

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JUL 09 1984

COMSTOCK CO., INC.

Attachment 02

PREPARED	APPROVED	REVISED	TITLE	ORIG. DATE	REVISION	PAGE
IFD	IFD	IFD	PROCEDURE	1/17/84	D 8/29/84	

WELDING PROCEDURE QUALIFICATION TEST RECORD

PROCEDURE SPECIFICATION

Material identification ASTM A-446 to A500B
 Welding process SMAW
 Method of machine Manual
 Position of welding 2F Horizontal JWP 7/8"
 Filler metal classification A5.1
 Filler metal classification E4 Group
 Weld metal grade E-7018
 Shielding gas N/A Flow N/A
 Groove or root face Single
 Groove or root face Single
 Welding current DC RP
 Welding progression N/A
 Preheat temperature N/A
 Postheat treatment N/A
 Welder's name Jim Davidson #92

GROOVE WELD TEST RESULTS

Radiograph-Visual Inspection
 Tensile strength, ksi:
 1 N/A
 2 N/A
 Charpy-Impact test
 Root Face
 1 N/A 1 N/E
 2 N/A 2 N/E
 Radiographic-Ultrasonic Examination
 Fillet test results
 Min. Size Microbe Pass Max. Size Single Pass
 Measurement Measurement
 1 N/A 2 N/A 1 Acc 2 Acc
 2 N/A 2 Acc

Laboratory Test No. 35T-8429

WELDING PROCEDURE

Pass	Elect. Size	Welding Current		Speed of Travel	Joint Class
		Amps	Volts		
Sing.	1/8"	118 (100-135)	23 (19-26)	N/A	
() Denotes $\pm 15\%$ Amp-Volt Range Fillet = 1/8" Max.					

We the undersigned, certify that the information in this record is correct and that the test welds were prepared, welded and tested in accordance with the requirements of SB of AWS D1.1, Structural Welding Code.

Manufacturer or Contractor G.K. Constock & Co
 Authorized by [Signature]
 Date 7-2-84

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JUL 9 1984
COMSTOCK CO., INC.

ATTACHMENT 03

PREPARED	APPROVED	REVISED	TITLE	ORIG. DATE	REVISION	PAGE
IFD	IFD	IFD	PROCEDURE	1/17/84	8/29/84	

APPROVED BY: [Signature]
 DATE: [Date]

WELDING PROCEDURE QUALIFICATION TEST RECORD

PROCEDURE SPECIFICATION

Welding Specification ASTM A-446 to A500B
 Welding Process SMAW
 Manual or Machine MANUAL
 Position of Welding 1P Flat SP 7.3-24
 Filler metal classification A5.1
 Filler metal classification E4 Group
 Weld metal grade E-7018
 Shielding gas N/A Flow N/A
 Groove or multiple pass Single
 Groove or multiple pass Single
 Welding current DC RP
 Welding progression N/A
 Preheat temperature N/A
 Postheat treatment N/A
 Welder's name Jim Davidson

GROOVE WELD TEST RESULTS

Reference to Break Test
 1 N/A
 2 N/A
 Groove Weld Test
 Root
 1 N/A 1 N/A
 2 N/A 2 N/A
 Radiographic-Ultrasonic Examination
 Fillet Test Results
 Min Size Murders Pass
 Max Size Groove Pass
 Measurement
 1 N/A 2 N/A 1 Pass 2 Pass
 2 N/A 2 Pass

Laboratory Test No. 85T-8428

FOR OFFICIAL USE ONLY

WELDING PROCEDURE

Pass	Size	Welding Current		Speed of Travel	Joint Detail
		Amperage	Volts		
Sing.	1/8"	118 (100-135)	23 (19-26)	N/A	2"x4"x1/2" TS P-1001
() Denotes $\pm 15\%$ Amp-Volt Range Fillet = 1/8" Max.					

Use the undersigned, certify that the conditions in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of SS of AWS D1.1, Structural Welding Code.

RECEIVED

JUL 09 1984

COMSTOCK CO., INC.

Manufacturer or Contractor G.K. Carrcock & Co
 Authorized by [Signature]
 Date 7-2-84

Attachment 04

PREPARED	APPROVED	REVISED	TITLE	ORIG. DATE	REVISION	PAGE
IFD	IFD	IFD	PROCEDURE	1/17/84	8/29/84	

REFERENCE TABLE NO. 1

CONDUIT & JUNCTION BOX HANGER
 WELD PROCEDURE SPECIFICATION (WPS)
 CROSS REFERENCE TABLE
 PROCEDURE 4.3.3

<u>S&L CONNECTION DETAIL NO.</u>	<u>DWG. NO.</u>	<u>WPS ATTACHMENT</u>	<u>WELD ROD</u>
A	O-3393M	B	E7018
A	O-3393P	A, B, O	E7018
A	O-3393T	B	E7018
A	O-3393V	A, B	E7018
A1 & A2	O-3393N	B	E7018
AA	O-3393K	A, B (On Beams)	E7018
AA	O-3393K	D (For 1/2" T.S.)	E7018
AA	O-3393K	E (For 5/16" T.S.)	E7018
AA	O-3393K	F (For 3/8" T.S.)	E7018
AA	O-3393K	G (For 1/4" T.S.)	E7018
AB	O-3393D	A, B	E7018
AP	O-3393D	A, B, O	E7018
AP, AP1, AP2 (Alt.)	O-3393D	A, B	E7018
AP1	O-3393S	A, B, O	E7018
AP2	O-3393S	A, B, For Plates	E7018
AP2	O-3393S	A, B, O	E7018
AT	O-3393D	A, B	E7018
B	O-3393E	B, O	E7018
B	O-3393M	B	E7018
B	O-3393N	B	E7018

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FOR INFORMATION ONLY

REFERENCE TABLE NO. 1

CONDUIT & JUNCTION BOX HANGER
 WELD PROCEDURE SPECIFICATION (WPS)
 CROSS REFERENCE TABLE
 PROCEDURE 4.3.3

<u>S&L CONNECTION DETAIL NO.</u>	<u>DWG. NO.</u>	<u>WPS ATTACHMENT</u>	<u>WELD ROD</u>
B	0-3393T	B	E7018
B	0-3393V	A, B	E7018
BB1	0-3393S	A, B, for LS	E7018
BB1	0-3393S	B, O	E7018
C	0-3393M	B	E7018
C	0-3393N	B	E7018
C	0-3393P	A, B, O, K	E7018
C	0-3393T	A, B	E7018
C1	0-3393E	A, B, O	E7018
C2	0-3393E	A, B, O	E7018
CCB (vertical)	0-3393W	A, B, (For PL)	E7018
CCB (vertical)	0-3393W	D (For 1/2" T.S.)	E7018
CCB (vertical)	0-3393W	E (For 5/16" T.S.)	E7018
CCB (vertical)	0-3393W	F (For 3/8" T.S.)	E7018
CCB (vertical)	0-3393W	G (For 1/4" T.S.)	E7018
CCB/Horiz. Conduit Run	0-3393W	A, B, (For PL)	E7018
CCB/Horiz. Conduit Run	0-3393W	D (For 1/2" T.S.)	E7018
CCB/Horiz. Conduit Run	0-3393W	E (For 5/16" T.S.)	E7018
CCB/Horiz. Conduit Run	0-3393W	F (For 3/8" T.S.)	E7018
CCB/Horiz. Conduit Run	0-3393W	G (For 1/4" T.S.)	E7018
CFP	0-3393R	A, B	E7018
CL	0-3393K	A, B	E7018

FOR INFORMATION ONLY

REFERENCE TABLE NO. 1

CONDUIT & JUNCTION BOX HANGER
 WELD PROCEDURE SPECIFICATION (WPS)
 CROSS REFERENCE TABLE
 PROCEDURE 4.3.3

<u>S&L CONNECTION DETAIL NO.</u>	<u>DWG. NO.</u>	<u>WPS ATTACHMENT</u>	<u>WELD ROD</u>
CP	0-3393B	B	E7018
CS	0-3393F	A, B	E7018
CSL1	0-3393K	A, B	E7018
CSL2	0-3393K	A, B	E7018
D	0-3393M	B	E7018
D	0-3393T	B	E7018
E	0-3393M	B, O	E7018
E & E1	0-3393T	B	E7018
E, F, G, J, K, (Alt.)	0-3393N	A, B	E7018
EB	0-3393D	A, B	E7018
EC2	0-3393K	B, D	E7018
EC3	0-3393R	B, G	E7018
EP	0-3393D	A, B, O	E7018
EP	0-3393L	A, B, O	E7018
ET	0-3393D	A, B	E7018
F	0-3393M	B	E7018
F	0-3393T	B, D, O	E7018
FPW	0-3393U	A, B	E7018
G	0-3393E	B, D (For 1/2" T.S.)	E7018
G	0-3393E	B, E (For 5/16" T.S.)	E7018
G	0-3393E	B, F (For 3/8" T.S.)	E7018
G	0-3393E	B, G (For 1/4" T.S.)	E7018

FOR INFORMATION ONLY

REFERENCE TABLE NO. 1

CONDUIT & JUNCTION BOX HANGER
 WELD PROCEDURE SPECIFICATION (WPS)
 CROSS REFERENCE TABLE
 PROCEDURE 4.3.3

<u>S&L CONNECTION DETAIL NO.</u>	<u>DWG. NO.</u>	<u>WPS ATTACHMENT</u>	<u>WELD ROD</u>
G	0-3393M	B, O	E7018
G	0-3393P	A, B	E7018
G	0-3393T	B, O	E7018
G (Alt. A)	0-3393P	A, B	E7018
G (Alt. B)	0-3393P	A, B	E7018
G (Alt. C)	0-3393P	A, B	E7018
H	0-3393M	B, O	E7018
H1	0-3393T	B, O	E7018
J	0-3393F	A, B, O	E7018
J	0-3393F	D (For 1/2" T.S.)	E7018
J	0-3393F	E (For 5/16" T.S.)	E7018
J	0-3393F	F (For 3/8" T.S.)	E7018
J	0-3393F	G (For 1/4" T.S.)	E7018
J	0-3393M	B, O	E7018
JA	0-3393J	B, O	E7018
JB	0-3393J	B, O	E7018
JB EP	0-3393W	B, O	E7018
JB EP (Alt.)	0-3393W	A, B, O	E7018
JBW	0-3393W	B, O	E7018
JC	0-3393J	A, B, O	E7018
JCB	0-3393W	B, O	E7018

FOR CONSTRUCTION ONLY

REFERENCE TABLE NO. 1

CONDUIT & JUNCTION BOX HANGER
 WELD PROCEDURE SPECIFICATION (WPS)
 CROSS REFERENCE TABLE
 PROCEDURE 4.3.3

<u>S&L CONNECTION DETAIL NO.</u>	<u>DWG. NO.</u>	<u>WPS ATTACHMENT</u>	<u>WELD ROD</u>
JCC	0-3393W	B, O	E7018
JEA	0-3393J	A, B	E7018
JS	0-3393J	B, O	E7018
LA1	0-3393F	A, B	E7018
LA2	0-3393F	A, B	E7018
LE1	0-3393F	A, B	E7018
LE2	0-3393F	A, B	E7018
LS1	0-3393F	A, B	E7018
LS2	0-3393F	A, B	E7018
LS3	0-3393F	A, B	E7018
LS4	0-3393F	A, B	E7018
LS5	0-3393F	A, B	E7018
LS6	0-3393F	A, B	E7018
LTS1	0-3393F	A, B	E7018
LTS1	0-3393F	D (For 1/2" T.S.)	E7018
LTS1	0-3393F	E (For 5/16" T.S.)	E7018
LTS1	0-3393F	F (For 3/8" T.S.)	E7018
LTS1	0-3393F	G (For 1/4" T.S.)	E7018
LTS2	0-3393F	A, B	E7018
LTS2	0-3393F	D (For 1/2" T.S.)	E7018
LTS2	0-3393F	E (For 5/16" T.S.)	E7018
LTS2	0-3393F	F (For 3/8" T.S.)	E7018

REFERENCE TABLE NO. 1

CONDUIT & JUNCTION BOX HANGER
 WELD PROCEDURE SPECIFICATION (WPS)
 CROSS REFERENCE TABLE
 PROCEDURE 4.3.3

<u>SE CONNECTION DETAIL NO.</u>	<u>DWG. NO.</u>	<u>WPS ATTACHMENT</u>	<u>WELD ROD</u>
LH2	0-3393F	G (For 1/4" T.S.)	E7018
M	0-3393T	A, B	E7018
MC	0-3393K	D (For 1/2" T.S.)	E7018
MF	0-3393K	E (For 5/16" T.S.)	E7018
MG	0-3393K	F (For 3/8" T.S.)	E7018
MH	0-3393K	G (For 1/4" T.S.)	E7018
S1	0-3393H	A, B	E7018
S2	0-3393H	A, B	E7018
S3	0-3393H	A, B	E7018
S3	0-3393H	A, B	E7018
S3	0-3393H	A, B	E7018
S4	0-3393H	A, B	E7018
S5	0-3393H	A, B	E7018
S6	0-3393H	A, B	E7018
S6	0-3393H	D (For 1/2" T.S.)	E7018
S6	0-3393H	E (For 5/16" T.S.)	E7018
S6	0-3393H	F (For 3/8" T.S.)	E7018
S6	0-3393H	G (For 1/4" T.S.)	E7018
SE (Alt.)	0-3393H	A, B	E7018
SE1A	0-3393C	A, B, O	E7018
SE1B	0-3393C	A, B, O	E7018
SE1C	0-3393C	A, B, O	E7018

FOR INFORMATION ONLY

REFERENCE TABLE NO. 1

CONDUIT & JUNCTION BOX HANGER
 WELD PROCEDURE SPECIFICATION (WPS)
 CROSS REFERENCE TABLE
 PROCEDURE 4.3.3

<u>S&L CONNECTION DETAIL NO.</u>	<u>DWG. NO.</u>	<u>WPS ATTACHMENT</u>	<u>WELD ROD</u>
SS2A	0-3393C	A, B, O	E7018
SS2B	0-3393C	A, B, O	E7018
SS2C	0-3393C	A, B, O	E7018
SS3A	0-3393C	A, B, O	E7018
SS3B	0-3393C	A, B, O	E7018
SS3C	0-3393C	A, B, O	E7018
SS4A	0-3393S	A, B, O	E7018
SS4B	0-3393S	A, B, O	E7018
SS5B	0-3393S	A, B, O	E7018
ST	0-3393C	A, B	E7018
TS1	0-3393R	D (For 1/2" T.S.)	E7018
TS1	0-3393R	E (For 5/16" T.S.)	E7018
TS1	0-3393R	F (For 3/8" T.S.)	E7018
TS1	0-3393R	G (For 1/4" T.S.)	E7018
TS2	0-3393R	D (For 1/2" T.S.)	E7018
TS2	0-3393R	E (For 5/16" T.S.)	E7018
TS2	0-3393R	F (For 3/8" T.S.)	E7018
TS2	0-3393R	G (For 1/4" T.S.)	E7018
TS3	0-3393R	A, B	E7018
TS3	0-3393R	D (For 1/2" T.S.)	E7018
TS3	0-3393R	E (For 5/16" T.S.)	E7018
TS3	0-3393R	F (For 3/8" T.S.)	E7018

FOR INFORMATION ONLY

REFERENCE TABLE NO. 1

CONDUIT & JUNCTION BOX HANGER
 WELD PROCEDURE SPECIFICATION (WPS)
 CROSS REFERENCE TABLE
 PROCEDURE 4.3.3

<u>S&L CONNECTION DETAIL NO.</u>	<u>DWG. NO.</u>	<u>WPS ATTACHMENT</u>	<u>WELD ROD</u>
TS3	0-3393R	G (For 1/4" T.S.)	E7018
TS4	0-3393R	D (For 1/2" T.S.)	E7018
TS4	0-3393R	E (For 5/16" T.S.)	E7018
TS4	0-3393R	F (For 3/8" T.S.)	E7018
TS4	0-3393R	G (For 1/4" T.S.)	E7018
TS5	0-3393R	A, B	E7018
TS7	0-3393R	C	E7018
TSA	0-3393V	A, B, (For PL)	E7018
TSA	0-3393V	G	E7018
TSA (unistrut only)	09-3393V	B, O	E7018
TSEP	0-3393U	A, B, (For PL)	E7018
TSEP	0-3393U	D (For 1/2" T.S.)	E7018
TSEP	0-3393U	E (For 5/16" T.S.)	E7018
TSEP	0-3393U	F (For 3/8" T.S.)	E7018
TSEP	0-3393U	G (For 1/4" T.S.)	E7018
TSEP (Alt.)	0-3393U	A, B, (For PL)	E7018
TSEP (Alt.)	0-3393U	D (For 1/2" T.S.)	E7018
TSEP (Alt.)	0-3393U	E (For 5/16" T.S.)	E7018
TSEP (Alt.)	0-3393U	F (For 3/8" T.S.)	E7018
TSEP (Alt.)	0-3393U	G (For 1/4" T.S.)	E7018
US1	0-3393V	B, O	E7018
US2	0-3393V	B, O	E7018

FOR INFORMATION ONLY

REFERENCE TABLE NO. 1

CONDUIT & JUNCTION BOX HANGER
 WELD PROCEDURE SPECIFICATION (WPS)
 CROSS REFERENCE TABLE
 PROCEDURE 4.3.3

<u>S&L CONNECTION DETAIL NO.</u>	<u>DWG. NO.</u>	<u>WPS ATTACHMENT</u>	<u>WELD ROD</u>
US3	0-3393V	B, O	E7018
US4	0-3393V	B, O	E7018
UT1	0-3393H	A, B	E7018
UT2	0-3393H	D (For 1/2" T.S.)	E7018
UT2	0-3393H	E (For 5/16" T.S.)	E7018
UT2	0-3393H	F (For 3/8" T.S.)	E7018
UT2	0-3393H	G (For 1/4" T.S.)	E7018
UT3	0-3393H	D (For 1/2" T.S.)	E7018
UT3	0-3393H	E (For 5/16" T.S.)	E7018
UT3	0-3393H	F (For 3/8" T.S.)	E7018
UT3	0-3393H	G (For 1/4" T.S.)	E7018
UT4	0-3393H	A, B	E7018
UTA	0-3393V	B, G (For T.S.)	E7018
UTA	0-3393V	B, O (For Unistrut)	E7018
UWA	0-3393V	B, O (For Unistrut)	E7018
UWA	0-3393V	A, B, (For PL)	E7018
Unistrut Splice Det.	0-3393K	B, O	E7018
WA	0-3393A	A, B, G	E7018
WA (Alt.)	0-3393V	A, B, G	E7018
WCP1	0-3393A	A, B	E7018
WCP2	0-3393A	A, B	E7018
WCP3	0-3393K	A, B	E7018

FOR INFORMATION ONLY

REFERENCE TABLE NO. 1

CONDUIT & JUNCTION BOX HANGER
WELD PROCEDURE SPECIFICATION (WPS)
CROSS REFERENCE TABLE
PROCEDURE 4.3.3

<u>S&L CONNECTION DETAIL NO.</u>	<u>DWG. NO.</u>	<u>WPS ATTACHMENT</u>	<u>WELD ROD</u>
WCP4	0-3393K	A, B	E7018
WCP5	0-3393A	A, B	E7018
WD	0-3393K	B, O	E7018
WP1	0-3393B	B, O	E7018
WP2	0-3393B	B, O	E7018
WVC	0-3393N	A, B, O	E7018

FOR INFORMATION ONLY

TABLE II
 CABLE PAN & HANGER
 WELD PROCEDURE SPECIFICATION (WPS)
 CROSS REFERENCE TABLE
 PROCEDURE 4.3.3

<u>S&L CONNECTION DETAIL NO.</u>	<u>DWG. NO.</u>	<u>WPS ATTACHMENT</u>	<u>WELD ROD</u>
Alt. weld det. for all long brace con.	0-3268	A, B	E7018
Typ. Conn. of Aux. Stl. to strut. or Aux. Steel	0-3268	A, B	E7018
Typ. Conn. of Aux. Stl. to emb. plate	0-3263	A, B	E7018

FOR INFORMATION ONLY

TABLE II
 CABLE PAN & HANGER
 WELD PROCEDURE SPECIFICATION (WPS)
 CROSS REFERENCE TABLE
 PROCEDURE 4.3.3

<u>S&L CONNECTION DETAIL NO.</u>	<u>DWG. NO.</u>	<u>WPS ATTACHMENT</u>	<u>WELD ROD</u>
0002	0-3250	A, B, O	E7018
0003	0-3250	B, O	E7018
0008	0-3250	A, B, O	E7018
0009A	0-3251	D (For 1/2" T.S.)	E7018
0009A	0-3251	E (For 5/16" T.S.)	E7018
0009A	0-3251	F (For 3/8" T.S.)	E7018
0009A	0-3251	G (For 1/4" T.S.)	E7018
0009C	0-3252	B, O	E7018
0009D	0-3252	B, O	E7018
0009D	0-3252	D (For 1/2" T.S.)	E7018
0009D	0-3252	E (For 5/16" T.S.)	E7018
0009D	0-3252	F (For 3/8" T.S.)	E7018
0009D	0-3252	G (For 1/4" T.S.)	E7018
0016	0-3255	A, B	E7018
0031HV	0-3278	A, B, O	E7018
0034HV	0-3249	A, B	E7018
0034HV	0-3295	A, B	E7018
0035HV	0-3249	A, B	E7018
0036HV	0-3254	A, B	E7018
0037HV	0-3254	B, O	E7018
0038HV	0-3254	A, B	E7018
0039HV	0-3254	B, O	E7018

FOR INFORMATION ONLY

TABLE II
 CABLE PAN & HANGER
 WELD PROCEDURE SPECIFICATION (WPS)
 CROSS REFERENCE TABLE
 PROCEDURE 4.3.3

<u>S&L CONNECTION DETAIL NO.</u>	<u>DWG. NO.</u>	<u>WPS ATTACHMENT</u>	<u>WELD ROD</u>
0097	0-3249	A, B	E7018
0097A	0-3249	A, B	E7018
0121	0-3258	A, B, O	E7018
0544H	0-3299	A, B	E7018
0599HV	0-3243D	A, B, O	E7018
0600HV	0-3243D	A, B, O	E7018
0601HV	0-3243D	A, B	E7018
0605HV	0-3243D	A, B, O	E7018
0608HV	0-3243D	A, B	E7018
0662HV	0-3243F	A, B, O	E7018
0665HV	0-3243F	A, B	E7018
0665HV	0-3243F	D (For 1/2" T.S.)	E7018
0665HV	0-3243F	E (For 5/16" T.S.)	E7018
0665HV	0-3243F	F (For 3/8" T.S.)	E7018
0665HV	0-3243F	G (For 1/4" T.S.)	E7018
0666HV	0-3243F	A, B, O	E7018
0891	0-3248	A, B	E7018
0891A	0-3248	A, B	E7018
1006	0-3250	B, O	E7018
1007	0-3237	A, B, O	E7018
1008	0-3237	A, B	E7018
A	0-3284	A, B	E7018

FOR INFORMATION ONLY

TABLE II
 CABLE PAN & HANGER
 WELD PROCEDURE SPECIFICATION (WPS)
 CROSS REFERENCE TABLE
 PROCEDURE 4.3.3

<u>S&L CONNECTION DETAIL NO.</u>	<u>DWG. NO.</u>	<u>WPS ATTACHMENT</u>	<u>WELD ROD</u>
Alt. Stiff, DET.	0-3263	A, B	E7018
D-18 (Alt.)	0-3268	A, B (For Plate & T.S.)	E7018
DV-001	0-3263	A, B, O	E7018
DV-002	0-3263	A, B, O	E7018
DV-002	0-3263	D (For 1/2" T.S.)	E7018
DV-002	0-3263	E (For 5/16" T.S.)	E7018
DV-002	0-3263	F (For 3/8" T.S.)	E7018
DV-002	0-3263	G (For 1/4" T.S.)	E7018
DV-003	0-3263	A, B	E7018
DV-004	0-3263	A, B, H	E7018
DV-005	0-3264	A, B, H	E7018
DV-005	0-3264	D (For 1/2" T.S.)	E7018
DV-005	0-3264	E (For 5/16" T.S.)	E7018
DV-005	0-3264	F (For 3/8" T.S.)	E7018
DV-005	0-3264	G (For 1/4" T.S.)	E7018
DV-006	0-3264	A, B	E7018
DV-006 (Alt.)	0-3264	A, B	E7018
DV-007	0-3264	A, B (For Plates)	E7018
DV-007	0-3264	O (For Unistrut)	E7018
DV-008	0-3264	B, O	E7018
DV-008 (Alt.)	0-3264	B, O	E7018
DV-008 Optional	0-3265	B, O	E7018

END

TABLE II
CABLE PAN & HANGER
WELD PROCEDURE SPECIFICATION (WPS)
CROSS REFERENCE TABLE
PROCEDURE 4.3.3

<u>S&L CONNECTION DETAIL NO.</u>	<u>DWG. NO.</u>	<u>WPS ATTACHMENT</u>	<u>WELD ROD</u>
DV-008A	0-3264	A, B, O	E7018
DV-008A (Alt.)	0-3264	B, O	E7018
DV-008B	0-3265	B, O	E7018
DV-008C	0-3265	A, B, O	E7018
DV-009	0-3264	A, B, O (For Unistrut)	E7018
DV-009	0-3264	D (For 1/2" T.S.)	E7018
DV-009	0-3264	E (For 5/16" T.S.)	E7018
DV-009	0-3264	F (For 3/8" T.S.)	E7018
DV-009	0-3264	G (For 1/4" T.S.)	E7018
DV-014	0-3265	A, B	E7018
DV-015	0-3265	A, B (For Plates)	E7018
DV-015	0-3265	O (For Unistrut)	E7018
DV-016	0-3265	A, B	E7018
DV-017	0-3265	A, B	E7018
DV-018	0-3265	A, B	E7018
DV-019	0-3265	A, B	E7018
DV-020	0-3265	A, B	E7018
DV-021	0-3265	A, B	E7018
DV-022	0-3265	A, B, O (For Plate to Unist.)	E7018
DV-022	0-3265	A, B (For Plate to T.S.)	E7018
DV-023	0-3265	A, B	E7018
DV-024	0-3265	A, B (For Plate & Diag.)	E7018

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TABLE II
 CABLE PAN & HANGER
 WELD PROCEDURE SPECIFICATION (WPS)
 CROSS REFERENCE TABLE
 PROCEDURE 4.3.3

<u>S&L CONNECTION DETAIL NO.</u>	<u>DWG. NO.</u>	<u>WPS ATTACHMENT</u>	<u>WELD ROD</u>
DV-024	0-3265	B, O (For Unistrut & T.S.)	E7018
DV-024A	0-3265	A, B (For Plate & Diag.)	E7018
DV-024A	0-3265	B, O (For Unistrut & T.S.)	E7018
DV-024B	0-3265	A, B	E7018
DV-027	0-3266	A, B	E7018
DV-028	0-3266	A, B	E7018
DV-029	0-3266	A, B	E7018
DV-029A	0-3266	A, B	E7018
DV-030	0-3266	A, B	E7018
DV-030	0-3266	D (For 1/2" T.S.)	E7018
DV-030	0-3266	E (For 5/16" T.S.)	E7018
DV-030	0-3266	F (For 3/8" T.S.)	E7018
DV-030	0-3266	G (For 1/4" T.S.)	E7018
DV-031	0-3266	A, B, O	E7018
DV-032	0-3266	A, B, O	E7018
DV-033	0-3267	A, B	E7018
DV-034	0-3267	A, B	E7018
DV-035	0-3267	A, B	E7018
DV-036	0-3267	A, B	E7018
DV-037	0-3267	A, B (For Beam & Plate)	E7018
DV-037	0-3267	B, O (For Unistrut & PL)	E7018
DV-038	0-3267	A, B	E7018

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TABLE II
 CABLE PAN & HANGER
 WELD PROCEDURE SPECIFICATION (WPS)
 CROSS REFERENCE TABLE
 PROCEDURE 4.3.3

<u>S&L CONNECTION DETAIL NO.</u>	<u>DWG. NO.</u>	<u>WPS ATTACHMENT</u>	<u>WELD ROD</u>
DV-039	0-3267	A, B, O (For Unistrut)	E7018
DV-039	0-3267	G (For T.S.)	E7018
DV-040	0-3268	B, O (For P1004A)	E7018
DV-041	0-3268	A, B (For Plate & Channel)	E7018
DV-042	0-3268	A, B	E7018
DV-043	0-3268	A, B	E7018
DV-043	0-3268	D (For 1/2" T.S.)	E7018
DV-043	0-3268	E (For 5/16" T.S.)	E7018
DV-043	0-3268	F (For 3/8" T.S.)	E7018
DV-043	0-3268	G (For 1/4" T.S.)	E7018
DV-044	0-3268	A, B	E7018
DV-045	0-3269	A, B, O	E7018
DV-045	0-3269	D (For 1/2" T.S.)	E7018
DV-045	0-3269	E (For 5/16" T.S.)	E7018
DV-045	0-3269	F (For 3/8" T.S.)	E7018
DV-045	0-3269	G (For 1/4" T.S.)	E7018
DV-045 (Alt.)	0-3269	A, B, O	E7018
DV-046	0-3269	A, B	E7018
DV-047	0-3269	A, B, O	E7018
DV-048	0-3269	A, B	E7018
DV-049	0-3269	A, B	E7018
DV-050	0-3270	A, B (For Plates)	E7018

FOR USE ONLY

TABLE II
 CABLE PAN & HANGER
 WELD PROCEDURE SPECIFICATION (WPS)
 CROSS REFERENCE TABLE
 PROCEDURE 4.3.3

<u>S&L CONNECTION DETAIL NO.</u>	<u>DWG. NO.</u>	<u>WPS ATTACHMENT</u>	<u>WELD ROD</u>
DV-050	0-3270	B, O (For Unistrut)	E7018
DV-051	0-3270	A, B (For PLS)	E7018
DV-051	0-3270	B, O (For Unistrut)	E7018
DV-052	0-3270	A, B	E7018
DV-053	0-3270	A, B	E7018
DV-054	0-3270	A, B	E7018
DV-055	0-3270	A, B	E7018
DV-056	0-3270	B, O	E7018
DV-057	0-3269	A, B	E7018
DV-057	0-3269	B, O (For Unistrut)	E7018
DV-058	0-3269	A, B (For PLS)	E7018
DV-058	0-3269	B, O (For Unistrut)	E7018
DV-058 (Alt.)	0-3269	A, B (For PL)	E7018
DV-058 (Alt.)	0-3269	B, O (For Unistrut)	E7018
DV-058B	0-3269	A, B, O	E7018
DV-058B	0-3269	D (For 1/2" T.S.)	E7018
DV-058B	0-3269	E (For 5/16" T.S.)	E7018
DV-058B	0-3269	F (For 3/8" T.S.)	E7018
DV-058B	0-3269	G (For 1/4" T.S.)	E7018
DV-059	0-3271	A, B	E7018
DV-060	0-3271	A, B	E7018
DV-061	0-3249	A, B	E7018

FOR INFORMATION ONLY

TABLE II
 CABLE PAN & HANGER
 WELD PROCEDURE SPECIFICATION (WPS)
 CROSS REFERENCE TABLE
 PROCEDURE 4.3.3

<u>S&L CONNECTION DETAIL NO.</u>	<u>DWG. NO.</u>	<u>WPS ATTACHMENT</u>	<u>WELD ROD</u>
DV-061	0-3271	A, B	E7018
DV-062	0-3249	A, B	E7018
DV-062	0-3271	G (For 1/4" T.S.)	E7018
DV-063	0-3249	A, B	E7018
DV-063	0-3271	A, B (For Plates)	E7018
DV-064	0-3249	A, B	E7018
DV-064	0-3271	A, B	E7018
DV-065	0-3249	A, B	E7018
DV-065	0-3271	A, B	E7018
DV-066	0-3249	A, B	E7018
DV-066	0-3271	A, B	E7018
DV-067	0-3249	A, B	E7018
DV-068	0-3272	A, B	E7018
DV-068	0-3249	D (For 1/2" T.S.)	E7018
DV-068	0-3249	E (For 5/16" T.S.)	E7018
DV-068	0-3249	F (For 3/8" T.S.)	E7018
DV-068	0-3249	G (For 1/4" T.S.)	E7018
DV-069	0-3272	A, B	E7018
DV-070	0-3249	A, B	E7018
DV-070	0-3272	A, B	E7018
DV-071	0-3249	A, B	E7018
DV-071	0-3272	A, B	E7018

FOR INFORMATION ONLY

TABLE II
 CABLE PAN & HANGER
 WELD PROCEDURE SPECIFICATION (WPS)
 CROSS REFERENCE TABLE
 PROCEDURE 4.3.3

<u>S&L CONNECTION DETAIL NO.</u>	<u>DWG. NO.</u>	<u>WPS ATTACHMENT</u>	<u>WELD ROD</u>
DV-072	0-3249	A, B	E7018
DV-072	0-3272	A, B	E7018
DV-073	0-3249	A, B	E7018
DV-073	0-3272	A, B	E7018
DV-074	0-3249	A, B	E7018
DV-074	0-3272	A, B	E7018
DV-075	0-3249	A, B	E7018
DV-075	0-3272	A, B	E7018
DV-075 (Alt.)	0-3272	A, B	E7018
DV-076	0-3249	A, B	E7018
DV-076	0-3279	A, B	E7018
DV-078	0-3254	A, B	E7018
DV-078	0-3279	A, B	E7018
DV-079	0-3254	A, B	E7018
DV-079	0-3279	A, B	E7018
DV-080	0-3254	A, B	E7018
DV-080	0-3279	A, B	E7018
DV-081	0-3254	A, B	E7018
DV-081	0-3279	A, B	E7018
DV-082	0-3249	A, B	E7018
DV-082	0-3279	A, B	E7018
DV-083	0-3254	A, B	E7018

FOR ONLY

TABLE II
 CABLE PAN & HANGER
 WELD PROCEDURE SPECIFICATION (WPS)
 CROSS REFERENCE TABLE
 PROCEDURE 4.3.3

<u>S&L CONNECTION DETAIL NO.</u>	<u>DWG. NO.</u>	<u>WPS ATTACHMENT</u>	<u>WELD ROD</u>
DV-083	0-3279	B, O	E7018
DV-084	0-3280	A, B	E7018
DV-084 (Alt.)	0-3280	A, B	E7018
DV-085	0-3254	A, B	E7018
DV-085	0-3280	A, B	E7018
DV-086	0-3249	A, B	E7018
DV-086	0-3254	A, B	E7018
DV-086	0-3280	A, B	E7018
DV-086A	0-3243G	A, B, O	E7018
DV-087	0-3254	A, B	E7018
DV-087	0-3280	A, B	E7018
DV-087A	0-3280	A, B	E7018
DV-088	0-3281	D (For 1/2" T.S.)	E7018
DV-088	0-3281	E (For 5/16" T.S.)	E7018
DV-088	0-3281	F (For 3/8" T.S.)	E7018
DV-088	0-3281	G (For 1/4" T.S.)	E7018
DV-088H	0-3243G	D (For 1/2" T.S.)	E7018
DV-088H	0-3243G	E (For 5/16" T.S.)	E7018
DV-088H	0-3243G	F (For 3/8" T.S.)	E7018
DV '88H	0-3243G	G (For 1/4" T.S.)	E7018
DV-089	0-3281	D (For 1/2" T.S.)	E7018
DV-089	0-3281	E (For 5/16" T.S.)	E7018

FOR INFORMATION ONLY

TABLE II
 CABLE PAN & HANGER
 WELD PROCEDURE SPECIFICATION (WPS)
 CROSS REFERENCE TABLE
 PROCEDURE 4.3.3

<u>S&L CONNECTION DETAIL NO.</u>	<u>DWG. NO.</u>	<u>WPS ATTACHMENT</u>	<u>WELD ROD</u>
DV-089	0-3281	F (For 3/8" T.S.)	E7018
DV-089	0-3281	G (For 1/4" T.S.)	E7018
DV-089R	0-3243G	D (For 1/2" T.S.)	E7018
DV-089R	0-3243G	E (For 5/16" T.S.)	E7018
DV-089R	0-3243G	F (For 3/8" T.S.)	E7018
DV-089R	0-3243G	G (For 1/4" T.S.)	E7018
DV-089S	0-3243G	D (For 1/2" T.S.)	E7018
DV-089S	0-3243G	E (For 5/16" T.S.)	E7018
DV-089S	0-3243G	F (For 3/8" T.S.)	E7018
DV-089S	0-3243G	G (For 1/4" T.S.)	E7018
DV-089T	0-3243G	D (For 1/2" T.S.)	E7018
DV-089T	0-3243G	E (For 5/16" T.S.)	E7018
DV-089T	0-3243G	F (For 3/8" T.S.)	E7018
DV-089T	0-3243G	G (For 1/4" T.S.)	E7018
DV-090	0-3281	A, B	E7018
DV-090R	0-3243G	A, B	E7018
DV-091	0-3281	A, B (For Angles)	E7018
DV-091	0-3281	D (For 1/2" T.S.)	E7018
DV-091	0-3281	E (For 5/16" T.S.)	E7018
DV-091	0-3281	F (For 3/8" T.S.)	E7018
DV-091	0-3281	G (For 1/4" T.S.)	E7018
DV-092	0-3254	A, B	E7018

FOR INFORMATION ONLY

TABLE II
 CABLE PAN & HANGER
 WELD PROCEDURE SPECIFICATION (WPS)
 CROSS REFERENCE TABLE
 PROCEDURE 4.3.3

<u>S&L CONNECTION DETAIL NO.</u>	<u>DWG. NO.</u>	<u>WPS ATTACHMENT</u>	<u>WELD ROD</u>
DV-092	0-3281	A, B	E7018
DV-093	0-3254	A, B	E7018
DV-093	0-3281	A, B	E7018
DV-094	0-3254	A, B	E7018
DV-094	0-3281	A, B (For Beam & Plate)	E7018
DV-094	0-3281	B, O (For Unistrut)	E7018
DV-095	0-3249	A, B	E7018
DV-095 (Alt.)	0-3249	A, B	E7018
DV-095 (Alt.)	0-3249	A, B	E7018
DV-096	0-3249	A, B	E7018
DV-096	0-3282	A, B (For Plates)	E7018
DV-097	0-3282	A, B	E7018
DV-098	0-3282	A, B (For Plates)	E7018
DV-098	0-3282	B, O (For Unistrut)	E7018
DV-098	0-3282	D (For 1/2" T.S.)	E7018
DV-098	0-3282	E (For 5/16" T.S.)	E7018
DV-098	0-3282	F (For 3/8" T.S.)	E7018
DV-098	0-3282	G (For 1/4" T.S.)	E7018
DV-099	0-3282	A, B	E7018
DV-100	0-3282	A, B	E7018
DV-101	0-3282	A, B	E7018
DV-102	0-3282	A, B	E7018

FOR INFORMATION ONLY

TABLE II
 CABLE PAN & HANGER
 WELD PROCEDURE SPECIFICATION (WPS)
 CROSS REFERENCE TABLE
 PROCEDURE 4.3.3

<u>S&L CONNECTION DETAIL NO.</u>	<u>DWG. NO.</u>	<u>WPS ATTACHMENT</u>	<u>WELD ROD</u>
DV-103	0-3282	A, B	E7018
DV-105	0-3283	A, B	E7018
DV-106	0-3283	A, B	E7018
DV-107	0-3283	A, B	E7018
DV-108	0-3283	A, B	E7018
DV-109	0-3283	A, B	E7018
DV-110	0-3283	A, B	E7018
DV-111	0-3283	A, B	E7018
DV-112	0-3283	D (For 1/2" T.S.)	E7018
DV-112	0-3283	E (For 5/16" T.S.)	E7018
DV-112	0-3283	F (For 3/8" T.S.)	E7018
DV-112	0-3283	G (For 1/4" T.S.)	E7018
DV-113	0-3283	A, B	E7018
DV-118	0-3284	A, B	E7018
DV-119	0-3284	A, B	E7018
DV-120	0-3284	A, B (For Plates)	E7018
DV-120	0-3284	D (For 1/2" T.S.)	E7018
DV-120	0-3284	E (For 5/16" T.S.)	E7018
DV-120	0-3284	F (For 3/8" T.S.)	E7018
DV-120	0-3284	G (For 1/4" T.S.)	E7018
DV-122	0-3284	A, B	E7018
DV-122	0-3284	D (For 1/2" T.S.)	E7018

FOR INFORMATION ONLY

TABLE II
 CABLE PAN & HANGER
 WELD PROCEDURE SPECIFICATION (WPS)
 CROSS REFERENCE TABLE
 PROCEDURE 4.3.3

<u>S&L CONNECTION DETAIL NO.</u>	<u>DWG. NO.</u>	<u>WPS ATTACHMENT</u>	<u>WELD ROD</u>
DV-122	0-3284	E (For 5/16" T.S.)	E7018
DV-122	0-3284	F (For 3/8" T.S.)	E7018
DV-122	0-3284	G (For 1/4" T.S.)	E7018
DV-124	0-3289	A, B	E7018
DV-125	0-3289	A, B (For Plate)	E7018
DV-125	0-3289	D (For 1/2" T.S.)	E7018
DV-125	0-3289	E (For 5/16" T.S.)	E7018
DV-125	0-3289	F (For 3/8" T.S.)	E7018
DV-125	0-3289	G (For 1/4" T.S.)	E7018
DV-126	0-3289	D (For 1/2" T.S.)	E7018
DV-126	0-3289	E (For 5/16" T.S.)	E7018
DV-126	0-3289	F (For 3/8" T.S.)	E7018
DV-126	0-3289	G (For 1/4" T.S.)	E7018
DV-127	0-3289	A, B, O, G (For Unistrut)	E7018
DV-128	0-3289	A, B	E7018
DV-129	0-3289	A, B	E7018
DV-130	0-3289	A, B	E7018
DV-131	0-3289	A, B	E7018
DV-133	0-3290	A, B	E7018
DV-134	0-3290	D (For 1/2" T.S.)	E7018
DV-134	0-3290	E (For 5/16" T.S.)	E7018
DV-134	0-3290	F (For 3/8" T.S.)	E7018

FOR INFORMATION ONLY

TABLE II
 CABLE PAN & HANGER
 WELD PROCEDURE SPECIFICATION (WPS)
 CROSS REFERENCE TABLE
 PROCEDURE 4.3.3

<u>S&L CONNECTION DETAIL NO.</u>	<u>DWG. NO.</u>	<u>WPS ATTACHMENT</u>	<u>WELD ROD</u>
DV-134	0-3290	G (For 1/4" T.S.)	E7018
DV-135	0-3290	A, B	E7018
DV-136	0-3290	A, B	E7018
DV-137	0-3290	A, B	E7018
DV-138	0-3290	A, B, O	E7018
DV-139	0-3290	A, B	E7018
DV-140	0-3290	A, B	E7018
DV-141	0-3290	A, B	E7018
DV-142	0-3291	A, B	E7018
DV-143	0-3291	A, B	E7018
DV-144	0-3291	A, B	E7018
DV-145	0-3291	A, B	E7018
DV-146	0-3291	A, B	E7018
DV-147	0-3291	A, B	E7018
DV-150	0-3291	A, B	E7018
DV-151	0-3291	A, B (For Plate)	E7018
DV-152	0-3291	A, B	E7018
DV-155	0-3292	A, B	E7018
DV-156	0-3292	A, B (For Angle)	E7018
DV-156	0-3292	D (For 1/2" T.S.)	E7018
DV-156	0-3292	E (For 5/16" T.S.)	E7018
DV-156	0-3292	F (For 3/8" T.S.)	E7018

FOR INFORMATION ONLY

TABLE II
 CABLE PAN & HANGER
 WELD PROCEDURE SPECIFICATION (WPS)
 CROSS REFERENCE TABLE
 PROCEDURE 4.3.3

<u>S&L CONNECTION DETAIL NO.</u>	<u>DWG. NO.</u>	<u>WPS ATTACHMENT</u>	<u>WELD ROD</u>
DV-156	0-3292	G (For 1/4" T.S.)	E7018
DV-156 (Alt.)	0-3292	A, B (For Plate)	E7018
DV-156 (Alt.)	0-3292	D (For 1/2" T.S.)	E7018
DV-156 (Alt.)	0-3292	E (For 5/16" T.S.)	E7018
DV-156 (Alt.)	0-3292	F (For 3/8" T.S.)	E7018
DV-156 (Alt.)	0-3292	G (For 1/4" T.S.)	E7018
DV-157	0-3292	A, B (For Angle)	E7018
DV-157	0-3292	D (For 1/2" T.S.)	E7018
DV-157	0-3292	E (For 5/16" T.S.)	E7018
DV-157	0-3292	F (For 3/8" T.S.)	E7018
DV-157	0-3292	G (For 1/4" T.S.)	E7018
DV-158	0-3292	A, B	E7018
DV-160	0-3292	A, B	E7018
DV-161	0-3292	A, B	E7018
DV-161A	0-3292	A, B	E7018
DV-161B	0-3292	A, B	E7018
DV-162	0-3292	A, B, C	E7018
DV-162 (Alt.)	0-3292	A, B (For Plates)	E7018
DV-162 (Alt.)	0-3292	D (For 1/2" For T.S.)	E7018
DV-162 (Alt.)	0-3292	E (For 5/16" T.S.)	E7018
DV-162 (Alt.)	0-3292	F (For 3/8" T.S.)	E7018
DV-162 (Alt.)	0-3292	G (For 1/4" T.S.)	E7018

FOR INFORMATION ONLY

TABLE II
 CABLE PAN & HANGER
 WELD PROCEDURE SPECIFICATION (WPS)
 CROSS REFERENCE TABLE
 PROCEDURE 4.3.3

<u>S&L CONNECTION DETAIL NO.</u>	<u>DWG. NO.</u>	<u>WPS ATTACHMENT</u>	<u>WELD ROD</u>
DV-163	0-3292	A, B	E7018
DV-164	0-3292	A, B	E7018
DV-165	0-3292	A, B	E7018
DV-166	0-3292	A, B	E7018
DV-167	0-3292	A, B	E7018
DV-168	0-3292	A, B	E7018
DV-169	0-3293	A, B	E7018
DV-169	0-3293	D (For 1/2" T.S.)	E7018
DV-169	0-3293	E (For 5/16" T.S.)	E7018
DV-169	0-3293	F (For 3/8" T.S.)	E7018
DV-169	0-3293	G (For 1/4" T.S.)	E7018
DV-170	0-3293	A, B	E7018
DV-171	0-3293	A, B	E7018
DV-172	0-3293	A, B	E7018
DV-173	0-3293	A, B	E7018
DV-174	0-3293	A, B	E7018
DV-175	0-3293	A, B	E7018
DV-175	0-3293	D (For 1/2" T.S.)	E7018
DV-175	0-3293	E (For 5/16" T.S.)	E7018
DV-175	0-3293	F (For 3/8" T.S.)	E7018
DV-175	0-3293	G (For 1/4" T.S.)	E7018
DV-176	0-3293	A, B	E7018

FOR INFORMATION ONLY

TABLE II
 CABLE PAN & HANGER
 WELD PROCEDURE SPECIFICATION (WPS)
 CROSS REFERENCE TABLE
 PROCEDURE 4.3.3

<u>S&L CONNECTION DETAIL NO.</u>	<u>DWG. NO.</u>	<u>WPS ATTACHMENT</u>	<u>WELD ROD</u>
DV-177	0-3293	A, B	E7018
DV-178	0-3293	D (For 1/2" T.S.)	E7018
DV-178	0-3293	E (For 5/16" T.S.)	E7018
DV-178	0-3293	F (For 3/8" T.S.)	E7018
DV-178	0-3293	G (For 1/4" T.S.)	E7018
DV-179	0-3293	A, B	E7018
DV-180	0-3271	A, B	E7018
DV-182	0-3291	A, B (For Plate)	E7018
DV-182	0-3291	D (For 1/2" T.S.)	E7018
DV-182	0-3291	E (For 5/16" T.S.)	E7018
DV-182	0-3291	F (For 3/8" T.S.)	E7018
DV-182	0-3291	G (For 1/4" T.S.)	E7018
DV-182A	0-3291	A, B (For Plate)	E7018
DV-182A	0-3291	D (For 1/2" T.S.)	E7018
DV-182A	0-3291	E (For 5/16" T.S.)	E7018
DV-182A	0-3291	F (For 3/8" T.S.)	E7018
DV-182A	0-3291	G (For 1/4" T.S.)	E7018
DV-185	0-3294	A, B	E7018
DV-186	0-3294	A, B	E7018
DV-187	0-3294	A, B	E7018
DV-188	0-3294	A, B	E7018
DV-189	0-3294	A, B	E7018

FOR INFORMATION ONLY

TABLE II
 CABLE PAN & HANGER
 WELD PROCEDURE SPECIFICATION (WPS)
 CROSS REFERENCE TABLE
 PROCEDURE 4.3.3

<u>S&L CONNECTION DETAIL NO.</u>	<u>DWG. NO.</u>	<u>WPS ATTACHMENT</u>	<u>WELD ROD</u>
DV-190	0-3294	A, B	E7018
DV-191	0-3294	A, B, C	E7018
DV-191	0-3294	D (For 1/2" T.S.)	E7018
DV-191	0-3294	E (For 5/16" T.S.)	E7018
DV-191	0-3294	F (For 3/8" T.S.)	E7018
DV-191	0-3294	G (For 1/4" T.S.)	E7018
DV-192	0-3294	A, B	E7018
DV-192	0-3294	D (For 1/2" T.S.)	E7018
DV-192	0-3294	E (For 5/16" T.S.)	E7018
DV-192	0-3294	F (For 3/8" T.S.)	E7018
DV-192	0-3294	G (For 1/4" T.S.)	E7018
DV-193	0-3294	A, B (For Beam)	E7018
DV-193	0-3294	D (For 1/2" T.S.)	E7018
DV-193	0-3294	E (For 5/16" T.S.)	E7018
DV-193	0-3294	F (For 3/8" T.S.)	E7018
DV-193	0-3294	G (For 1/4" T.S.)	E7018
DV-194	0-3243D	A, B	E7018
DV-202	0-3279	A, B	E7018
DV-204	0-3243G	A, B	E7018
DV-205	0-3243G	A, B	E7018
DV-206	0-3243G	A, B	E7018
DV-207	0-3243G	A, B	E7018

FOR INFORMATION ONLY

TABLE II
 CABLE PAN & HANGER
 WELD PROCEDURE SPECIFICATION (WPS)
 CROSS REFERENCE TABLE
 PROCEDURE 4.3.3

<u>S&L CONNECTION DETAIL NO.</u>	<u>DWG. NO.</u>	<u>WPS ATTACHMENT</u>	<u>WELD ROD</u>
DV-208	0-3243G	A, B, O	E7018
Fig. 10	0-3274	A, B	E7018
Fig. 11	0-3274	A, B	E7018
Fig. 12	0-3274	A, B	E7018
Fig. 15	0-3275	A, B	E7018
Fig. 16	0-3275	A, B	E7018
Fig. 17	0-3275	A, B	E7018
Fig. 18	0-3275	B, O (For Unistrut)	E7018
Fig. 18	0-3275	D (For 1/2" T.S.)	E7018
Fig. 18	0-3275	E (For 5/16" T.S.)	E7018
Fig. 18	0-3275	F (For 3/8" T.S.)	E7018
Fig. 18	0-3275	G (For 1/4" T.S.)	E7018
Fig. 19	0-3275	B, O	E7018
Fig. 19 (Alt.)	0-3275	A, B	E7018
Fig. 22	0-3273	B	E7018
Fig. 8	0-3274	A, B	E7018
Fig. 9	0-3274	A, B	E7018

FOR INFORMATION ONLY

Speed Letter

From J. F. Jones

To J. C. Jones

1070

PCD

Subject Receipt of document to user 3/22/68 - 433

- No 24 10 FOLD

MESSAGE

PCD and C-10 SA (C. Jones) have received document to
and it is a response to information user 3/22/68 - 433

Date 3/22/68 Signed J. F. Jones

REPLY

- No 6 FOLD

- No 10 FOLD

Date

Signed

Wilson Jones
GRAYLINE FORM 44-902 3-PART
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FOR INFORMATION ONLY

Speed Letter.

To F. ROLAN
LKC

From J. GIESEKEL
PCD

Subject PROCEDURE INTERIM APPROVAL -

MESSAGE

(8129184)

PCD/OA HAVE REVIEWED PROCEDURE 4.3.3 REV. D AND FIND IT
ACCEPTABLE FOR INTERIM ACCEPTANCE. THIS PROCEDURE HAS BEEN SUBMITTED
TO SPE/SFL FOR FINAL REVIEW.

cc: T.E. DUNKA.

Date 9/7/84 Signed J. GIESEKEL

REPLY

JULIE

PLEASE DISTRIBUTE
INTERIM APPROVED COPIES
TO MANUAL HOLDERS



Date 9-7-84

Signed J. GIESEKEL

Wilson Jones
GRAYLINE FORM 44-802 3-PART
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584

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SARGENT & LUNDY
ENGINEERS
55 EAST MONROE STREET
CHICAGO, ILLINOIS 60603
(312) 269-2000
TWX 910-221-2807

OCT - 3 1984

September 27, 1984
Project No. 4683-05

Commonwealth Edison Company
Braidwood - Units 1&2

Electrical Installation Work
S&L Specification L-2790

DL 143
Jwh

Mr. T. E. Quaka
Braidwood QA Superintendent
Commonwealth Edison Company
Braidwood Station

Dear Mr. Quaka:

Enclosed is a copy of the following procedure from L. K. Comstock & Company. Please revise as noted and resubmit, contractor may proceed based on making revisions noted.

Procedure: 4.3.3 Rev. D 8-29-84

Please respond with a disposition/resolution of these comments by October 26, 1984.

Yours very truly,

FRANK A. KOSIK / ANITA M. REDDING

F. A. Kosik
Senior Quality Control Coordinator

PAK:AMR:mn
In duplicate
Enclosure

Copies:

D. Elias	(1/1)
<u>D. L. Shamblin</u>	<u>(1/1)</u>
C. W. Fruehe	(1/0)
D. L. Leone/W. C. Cleff	(1/0)
B. G. Treece/T. B. Thorsell	(1/1)



ATND HOLDING COMPANY

Speed Letter.

To: Jim DeWard

From: J. GIESEKER

LKC AC

PCD

Subject: PROCEDURE APPROVAL (STATUS 2)

MESSAGE

THE FOLLOWING PROCEDURE HAS BEEN REVIEWED BY SEL AND IS APPROVED FOR USE CONTINGENT ON INCORPORATION OF THE COMMENTS AS INDICATED. PLEASE REVISE THE PROCEDURE AND RESUBMIT FOR STATUS 1 APPROVAL.
4.3.3 REV. D

CC TEQUANA

Date 10/4/84

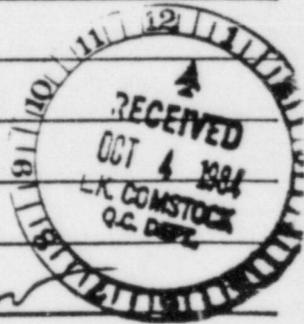
Signed James. Misura

REPLY

OK JKL 10-4-84

SUC

PLEASE DISTRIBUTE FINAL COPIES TO ANNUAL HOLDERS WITH SEL COMMENTS DATED (9-26-84)



Date 10-4-84

Signed James

Wilson Jones Company
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