

J. A. JONES CONSTRUCTION COMPANY
SITE INSPECTION AND TEST PROCEDURE
FOR

WELDING INSPECTION
QA VAULT

WATERFORD SES UNIT NO. 3
CONTRACT NO. W3-NY-4

EBASCO SERVICES
INCORPORATED

QUALITY
ASSURANCE
ENGINEERING

This Document is:

- ☒ Reviewed Without Comments
☐ Reviewed With Comments as
Noted; Incorporate Comments,
and Resubmit; Proceed With
Order.
☐ Rejected; Revise and Resubmit

NOTE:

Review of this document, with or
without comments, is for general
conformance with the applicable
specifications only and in no way
relieves the manufacturer or con-
tractor from full responsibility for
delivery of all materials, equip-
ment, services and documentation
in strict accordance with the Purchase Order.

By: *[Signature]*
Date: 3/14/80

REV.	DATE	ENGINEERING REVIEWED BY	DATE	CONSTRUCTION REVIEWED BY	DATE	QUALITY ASSURANCE APPROVED BY	DATE
0	4-5-76	<i>al Prince</i>	4/5/76	<i>Les Terry</i>	4/5/76	<i>William E. H</i>	4/5/76
1	4/27/76	<i>P. Gault</i>	4/27/76	<i>Les Terry</i>	4-27-76	<i>William E. H</i>	4/27/76
2	6/24/76	<i>al Prince</i>	6/24/76	<i>W. H. H</i>	6-24-76	<i>William E. H</i>	6/24/76
3	12/20/76	<i>C. D. D</i>	12/20/76	<i>D. E. H</i>	12-20-76	<i>Robert Pulliam</i>	12-20-76
4	2-20-80	<i>R. D. D</i>	2/20/80	<i>E. Woodery</i>	2-8-80	<i>[Signature]</i>	2-20-80

FREEDOM OF INFORMATION
ACT REQUEST

84-455

C/669

FOR INFORMATION ONLY

SITE INSPECTION AND TEST PROCEDURE:	PROCEDURE NO. W-SITP-14
TITLE: WELDING INSPECTION	REV. NO. 4 DATE: 2-20-80
PROJECT TITLE: WATERFORD SES UNIT NO. 3, CONTRACT NO. W3-NY-4	

1.0 PURPOSE

To delineate the inspection activities that J. A. Jones Quality Assurance/Quality Verification personnel will use to assure that welding performed by J. A. Jones personnel is in accordance with contract drawings and specifications, applicable welding procedures and AWS D1.1-72, "Structural Welding Code".

2.0 SCOPE

This procedure covers inspection of Seismic Class I structural welding for Waterford SES Unit No. 3, Phase I Concrete Construction. Weld repairs shall be inspected utilizing the same criteria as specified for original weld.

3.0 REFERENCES

3.1 J. A. Jones Work Procedure W-WP-3, "Qualification of Welders".

3.2 J. A. Jones Work Procedure W-WP-10, "Welding Material Control".

3.3 J. A. Jones Special Process Procedure W-SP-4, "Welding Procedure".

3.4 J. A. Jones Site Inspection and Test Procedure W-SITP-3, "Verification of Welder Qualification".

3.5 J. A. Jones Site Inspection and Test Procedure W-SITP-10, "Welding Material Control Verification".

3.6 American Welding Society AWS D1.1-72, "Structural Welding Code".

3.7 Ebasco Specification LOU-1564.723, "Structural Steel, with Addendum for Class I Structures and Components".

3.8 ANSI N45.2.5-1974, "Supplementary Quality Assurance Requirements for Installation, Inspection and Testing of Structural Concrete and Structural Steel During the Construction Phase of Nuclear Power Plants".

3.9 Ebasco Services Incorporated Procedure No. ASP-IV-26, Current Revision.

4.0 RESPONSIBILITIES

4.1 Ebasco Services Incorporated is responsible for receiving, storage and issue of all weld filler material.

SITE INSPECTION AND TEST PROCEDURE:	PROCEDURE NO. W-SITP-14
TITLE: WELDING INSPECTION	REV. NO. 4 DATE: 2-20-80
PROJECT TITLE: WATERFORD SES UNIT NO. 3 CONTRACT NO. W3-NY-4	

4.2 J. A. Jones and Subcontractor engineering and construction personnel are responsible for the requisition, post-requisition control, proper use of welding filler material, qualification of welders and the use of only qualified welders for any welding.

4.3 J. A. Jones Quality Verification personnel are responsible for verifying compliance with this procedure and with References 3.1 through 3.8.

5.0 INSPECTION

R-3 J. A. Jones Quality Verification personnel are responsible for performing 100% inspection on fit-ups prior to welding.

5.1 Prior to welding:

5.1.1 Verify that proposed welding procedure is approved.

5.1.2 Verify that proposed welder is qualified.

5.1.3 Check proper configuration of joint to be welded. This inspection shall include, as a minimum, the following items where applicable:

5.1.3.1 Included Angle

5.1.3.2 Root Opening on Joint Fit-Up

5.1.3.3 Root Face

5.1.3.4 Joint Alignment

5.1.4 Check that weld area is cleaned and free of oxides, mill scale, cutting slag, paints, oils, greases and other foreign contaminants.

5.1.5 Check that required material certifications are available and correct.

R-2

SITE INSPECTION AND TEST PROCEDURE:	PROCEDURE NO. W-S,TP-14
TITLE: WELDING INSPECTION	REV. NO. 4 DATE: 2-20-80
PROJECT TITLE: WATERFORD SES UNIT NO. 3 Contract No. W3-NY-4	

R-4

5.2 During in-weld process, inspectors will be responsible for monitoring 20% or more of field welds. Inspectors will:

- 5.2.1 Check that correct joint configuration and cleanliness is maintained.
- 5.2.2 Check that correct size and type electrode is used.
- 5.2.3 Check that correct welding current, voltage and polarity is maintained.
- 5.2.4 Check that correct preheat and interpass temperatures are maintained.
- 5.2.5 Check that slag is removed from each pass and that pass is wire-brushed prior to deposition of additional passes.
- 5.2.6 Check correct root treatment is performed when required.
- 5.2.7 Check essential variables of welding process.

R-2

5.3 Post-weld visual inspection:

5.3.1 Welds shall be visually inspected upon completion.

5.3.2 A weld shall be deemed acceptable by visual inspection if the following criteria are met.

5.3.2.1 The weld has no cracks.

5.3.2.2 There exist no undercut.

5.3.2.3 All Craters are filled to the full cross section of the welds.

5.3.2.4 Weld profiles are in accordance with the following figure.

R-3

SITE INSPECTION AND TEST PROCEDURE:

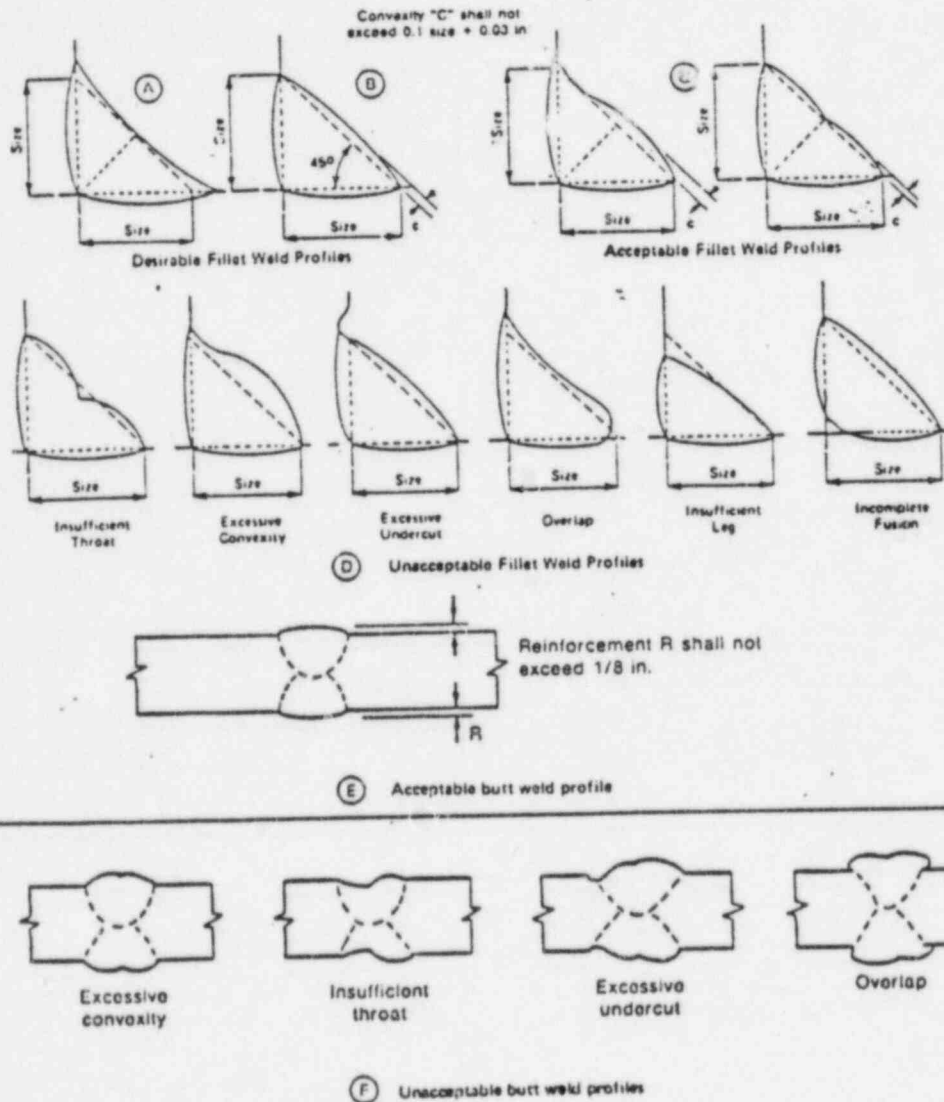
PROCEDURE NO.
W-SITP-14

TITLE: WELDING INSPECTION

REV. NO. 4

DATE: 2-20-80

PROJECT TITLE: WATERFORD SES UNIT NO. 3 CONTRACT NO. W3-NY-4



5.3.2.5

The sum of diameters of piping porosity does not exceed $3/8 \text{ in}$ in any linear inch of weld and shall not exceed $3/4 \text{ in}$ in any 12 in length of weld. The maximum diameter of an individual pore shall not exceed $3/32 \text{ in}$.

SITE INSPECTION AND TEST PROCEDURE:	PROCEDURE NO. W-SITP-14
TITLE: WELDING INSPECTION	REV. NO. 4 DATE: 2-20-80
PROJECT TITLE: WATERFORD SES UNIT NO. 3 CONTRACT NO. W3-NY-4	

5.3.2.6 Fillet welds in any single continuous weld shall be permitted to under run the nominal fillet size required by 1/16" without correction provided that the undersize weld does not exceed 10% of the length of the weld.

5.3.2.7 Undercut shall be no more than 0.01" deep when the direction is transverse to primary tensile stress in the part that is undercut, nor more than 1/32" for all other situations.

5.4 Stud Welding

5.4.1 Prior to welding

5.4.1.1 Check that studs are free from rust, rust pits, scale, oil or other deleterious matter that would adversely affect the welding operation.

5.4.1.2 Check that the stud base is free of paint, galvanizing and cadmium plating.

5.4.1.3 Check that areas on members to which studs are to be welded are free of scale, rust or other injurious material.

5.4.1.4 No welding is to be done when base metal temperature is below zero F or when the surface is wet or exposed to falling rain or snow.

5.4.1.5 When the temperature of the base metal is below 32F, one stud in each 100 studs shall be tested in accordance with below, in addition to the first two tested.

5.4.1.6 If studs are to be fillet welded in place, verify that the following requirements are met:

- a) only low-hydrogen electrodes, 5/32 or 3/16 inch in diameter may be used.
- b) stud base must be prepared so that the outside circumference of the stud fits tightly against the base metal.

SITE INSPECTION AND TEST PROCEDURE:	PROCEDURE NO. W-SITP-14
TITLE: WELDING INSPECTION	REV. NO. 4 DATE: 2-20-80
PROJECT TITLE: WATERFORD SES UNIT NO. 3 CONTRACT NO. W3-NY-4	
<p>c) all rust and mill scale shall be removed from the base metal and the end of the stud shall be cleaned.</p> <p>d) base metal shall be preheated in accordance with the requirements of the applicable welding procedure.</p> <p>5.4.2 After welding (Shear Connectors)</p> <p>5.4.2.1 Fillet welding, where performed, shall be a minimum of 5/16 inch in size.</p> <p>5.4.2.2 All visual inspection requirements shall apply to at a minimum 20% of studs welded with the exception of post-weld inspection which requires 100% inspection.</p> <p>5.4.2.3 The first two studs welded by each welder for each day's welding shall be allowed to cool and bent to an angle of 30 degrees from its original axis by striking the stud with a hammer. If failure occurs in the weld zone of either stud, the procedure shall be corrected and the process repeated until two consecutive studs have been tested and found to be satisfactory before any production welding is allowed.</p> <p>5.4.2.4 If failure occurs in the stud shank, an investigation shall be made to ascertain and correct the cause before more studs are welded.</p> <p>5.4.2.5 The foregoing testing shall be performed after any change in the welding procedure.</p> <p>5.4.2.6 Studs on which a full 360 deg weld fillet is not obtained may be repaired by adding a 5/16 inch minimum fillet weld in place of the missing weld fillet, using the shielded metal arc process with low hydrogen electrodes, 5/32 or 3/16 inch in diameter. The repair weld shall extend 3/8 inch minimum beyond each end of defect being repaired.</p>	

SITE INSPECTION AND TEST PROCEDURE:	PROCEDURE NO. W-SITP-14
TITLE: WELDING INSPECTION	REV. NO. 4 DATE: 2-20-80
PROJECT TITLE: WATERFORD SES UNIT NO. 3 CONTRACT NO. W3-NY-4	

5.4.2.7 If the reduction in the length of studs as they are welded becomes less than normal, i.e., the length of stud is more than 1/16 inch greater than specified, welding shall be stopped immediately and not resumed until the cause has been corrected.

5.4.2.8 If visual inspection reveals any stud shear connector that does not show a full 360 degree weld fillet, any stud that has been repaired by welding, or any stud in which the reduction in length due to welding is less than normal, such stud shall be struck with a hammer and bent to an angle of 15 deg from its original axis. For studs showing less than 360 degree weld fillet, the direction of bending shall be opposite to the missing weld fillet. Studs that crack either in the weld, the base metal, or the shank under inspection shall be replaced.

5.4.2.9 Verify location of studs in accordance with drawings. Studs may vary a maximum of 1 inch from the location shown, provided that adjacent studs are not closer than 2-1/2 inch center to center and are at least one stud diameter plus 1/8 inch from the edge of a member.

5.4.3 After Welding (Applications Other Than Shear Connectors)

5.4.3.1 Fillet welding, where performed, shall be a minimum of 5/16 inch in size.

5.4.3.2 All visual inspection requirements shall also apply to stud welding.

SITE INSPECTION AND TEST PROCEDURE:

PROCEDURE NO.
W-SITP-14

TITLE: WELDING INSPECTION

REV. NO. 4
DATE: 2-20-80

PROJECT TITLE: WATERFORD SES UNIT NO. 3 Contract No. W3-NY-4

- 5.4.3.3 Before starting the welding operations, or at the request of the Engineer, two stud connectors shall be welded to separate material in the same general position (flat, vertical, overhead, sloping) and of similar thickness and material as the member. After being allowed to cool, each stud shall be tested by striking the stud with a hammer and bending it to an angle of 30 degrees from its original axis. If failure occurs in the weld zone of either stud, the procedure shall be corrected and two successive studs successfully welded and tested before any studs are welded to the member.
- 5.4.3.4 The foregoing testing shall be performed after any change in the welding procedure.
- 5.4.3.5 If failure occurs in the stud shank, an investigation shall be made to ascertain and correct the cause before more studs are welded.
- 5.4.3.6 Studs on which a full 360 deg weld fillet is not obtained may, be repaired by adding a 5/16 inch minimum fillet weld in place of the missing weld fillet, using the shielded metal arc process with low hydrogen electrodes, 5/32 or 3/16 inch in diameter, in accordance with the requirements of W-SP-4. The repair weld shall extend 3/8 inch minimum beyond each end of defect being repaired.
- 5.4.3.7 If the reduction in the length of studs as they are welded becomes less than normal, i.e., the length of stud is more than 1/16 inch greater than specified, welding shall be stopped immediately and not resumed until the cause has been corrected.

SITE INSPECTION AND TEST PROCEDURE:	PROCEDURE NO. W-SITP-14
TITLE: WELDING INSPECTION	REV. NO. 4 DATE: 2-20-80
PROJECT TITLE: WATERFORD SES UNIT NO. 3 CONTRACT NO. W3-NY-4	

5.4.3.8 The areas of all components subjected to tensile stresses where a defective stud has been removed shall be made smooth and flush. Where, in such areas, base metal has been pulled out in the course of stud removal, a shielded metal-arc welding process with low-hydrogen electrodes in accordance with the requirements of W-SP-4, shall be used to fill the pockets and the weld surface ground flush. In compression areas of members where stud failures are confined to shanks of studs or fusion zones of studs, a new stud may be welded adjacent to the defective area in lieu of repair and replacement on existing weld area. If metal is pulled from the base metal of such areas, the repair provisions shall be the same as for tensile areas except that, when the depth of defect is not more than the lesser of 1/8 inch or 7% of the base metal thickness, the defect may be faired by grinding in lieu of filling the defective area with weld metal. Where a replacement stud is to be placed in the defective area, the above repair shall be made prior to welding the replacement stud. Replacement shear connector studs shall be tested by bending to an angle of 15 deg from their original axes. The areas of components exposed to view in completed structures shall be made smooth and flush where a stud has been removed.

5.4.3.9 If visual inspection reveals any stud shear connector that does not show a full 360 degree weld fillet, any stud that has been repaired by welding, or any stud in which the reduction in length due to welding is less than normal, such stud shall be struck with a hammer and bent to an angle of 15 deg from its original axis. For studs showing less than 360 degree weld fillet, the direction of bending shall be opposite to the missing weld fillet. Studs that crack either in the weld, the base metal, or the shank under inspection or subsequent straightening shall be replaced.

SITE INSPECTION AND TEST PROCEDURE:	PROCEDURE NO. W-SITP-14
TITLE: WELDING INSPECTION	REV. NO. 4 DATE: 2-20-80
PROJECT TITLE: WATERFORD SES UNIT NO. 3 CONTRACT NO. W3-NY-4	

5.4.3.10 For studs other than shear connectors, at least one stud in every 100 shall be struck with a hammer and bent to an angle of 15 degrees from its original axis. If the stud fails, the procedure shall be checked in accordance with 5.4.3.3 and two more of the existing studs shall be bent. If either of these two studs fails, all of the studs represented by the tests shall be bend-tested or rejected.

5.5 Other nondestructive inspection:

R-4

5.5.1 Any radiography, magnetic particle, ultrasonic or liquid penetrant examination to be performed on J. A. Jones welding shall be performed by duly qualified and certified inspectors or outside agencies in accordance with SNT-TC-1A, AWS D1.1-72 latest revision, and the requirements of ASP-IV-26* latest revision.

5.5.2 Such nondestructive testing shall be done in conformance with all applicable codes and standards and will be subject to surveillance by J. A. Jones Quality Verification Personnel.

6.0 DOCUMENTATION

All welding inspection by J. A. Jones Quality Verification Personnel will be documented on the Welding Inspection Report.

7.0 ATTACHMENTS

7.1 Welding Inspection Report.

R-4

7.2 Process Control Sheet For Welding.

R-4

* ASP-IV-26 will become effective as of the approval of this procedure.

INSTRUCTIONS FOR COMPLETING WELDING INSPECTION REPORT

1. Print name of Welder, Welder's identification number, Inspector's name, date of weld/inspection, and indicate checking of Welder's certification.
2. Complete identification of weldment, e.g. embedded plate identification number; (Item (1))
3. Indicate position of item with sufficient accuracy so that it may be located at a later date, (Item (2))
4. Enter weld procedure designation; (e.g. SP-4), (Item (3)).
5. Check yes or no (Item (4))
6. Check yes or no (Item (5))
7. Item (6) is to be used for comments, if any. Any welds which including reasons for non acceptance, are indicated as unacceptable should be fully described in this section, proper construction supervision notified and the deficiency properly documented on a Discrepancy Report in accordance with POP-N-713 or a Nonconformance Report in accordance with POP-N-703, which ever is applicable.
8. Inspector signs and dates form in space provided.

J. A. JONES CONSTRUCTION COMPANY

WELDING INSPECTION REPORT

Welder's Name _____ Inspector _____

Welder's ID NO. _____ Date: _____

Welder Certification Checked _____

(1) Item or Component Welded _____

(2) Final Location of Item _____

(3) Weld Procedure Designation _____

(4) Weld Procedure Approved Yes _____ No _____ Complies With _____

(5) Welding Accomplished in accordance with Procedure and Requirements of this
Procedure Yes _____ No _____

(6) Comments _____

Inspector's Signature _____ Date _____

WATERFORD UNIT NO. 3

PROCESS CONTROL SHEET
FOR WELDING

LOG NUMBER:

MATERIAL SPECIFICATION: ASTM A-36 and ASTM-441 and similiar carbon
steel not to exceed 0.30% carbon contentWELDING PROCESS: Manual Shielded Metal Arc (SMAW)FILLER METAL SPECIFICATION: AWS A-5.1.CURRENT: D.C.R.P.FILLER METAL CLASSIFICATION: E 7018

LOT OR HEAT NUMBER: _____

ELECTRODE DIAMETER: _____

FIT-UP INSPECTION

ACCEPT

REJECT

N/A

1. JOINT FIT MEETS W-SP-4
2. JOINT DETAIL MEETS AWS D1.1-72#
3. JOINTS MEET AWS D1.1-72

IN PROCESS INSPECTION

1. PREHEAT TEMPERATURE
2. ROOT TREATMENT
3. ROOT PASS
4. INTERMEDIATE NDE
5. MULTIPLE PASS WELDS
6. INTERPASS TEMPERATURE
7. POSTHEATING

FINAL WELD INSPECTION

1. VISUAL INSPECTION per W-SITP-14
2. NDE
3. JOB COMPLETE

COMMENTS: _____

Q.C. INSPECTOR

DATE