

**DEPARTMENT OF TRANSPORTATION**

DIVISION OF ENGINEERING SERVICES

Office of Structural Materials

Quality Assurance and Source Inspection



Bay Area Branch  
690 Walnut Ave. St. 150  
Vallejo, CA 94592-1133  
(707) 649-5453  
(707) 649-5493

Contract #: 04-0120F4Cty: SF/ALA Rte: 80 PM: 13.2/13.9File #: 1.28**WELDING INSPECTION REPORT****Resident Engineer:** Siegenthaler, Peter**Address:** 333 Burma Road**City:** Oakland, CA 94607**Report No:** WIR-016645**Date Inspected:** 02-Sep-2010**Project Name:** SAS Superstructure**OSM Arrival Time:** 1000**Prime Contractor:** American Bridge/Fluor Enterprises, a JV**OSM Departure Time:** 1830**Contractor:** American Bridge/Fluor Enterprises, a JV**Location:** Job Site**CWI Name:** See Below**CWI Present:** Yes No**Inspected CWI report:** Yes No N/A**Rod Oven in Use:** Yes No N/A**Electrode to specification:** Yes No N/A**Weld Procedures Followed:** Yes No N/A**Qualified Welders:** Yes No N/A**Verified Joint Fit-up:** Yes No N/A**Approved Drawings:** Yes No N/A**Approved WPS:** Yes No N/A**Delayed / Cancelled:** Yes No N/A**Bridge No:** 34-0006**Component:** Orthotropic Box Girders**Summary of Items Observed:**

At the start of the shift the Quality Assurance Inspector (QAI) traveled to the project site and observed the following work performed by American Bridge/Fluor Enterprises (AB/F) personnel at the locations noted below:

- A). OBG E1 and E2, Field Welding of Erection Access Insert Plates
- B). Field Splice E3/E4, "A" Deck Stiffeners
- C). Field Splice E4/E5
- D). Field Splice E5/E6
- E). Field Splice W1/W2, "A" Deck Stiffeners

A). OBG E1, Field Welding Erection Access Insert Plates

The QAI observed the Shielded Metal Arc Welding (SMAW) of the erection access hole insert plate identified as Weld Number (WN): 1E-PP9.5-E3-W2, 1E-PP9.5-E4-W3 and 2E-PP12-E4-W4 on the "A" deck of the Orthotropic Box Girder (OBG) E1. The welder James Zhen ID-6001 performed the welding of the root to covers on the Complete Joint Penetration (CJP) groove weld utilizing the Welding Procedure Specification (WPS) ABF-WPS-D15-1050A, Rev. 1. The WPS was also utilized by the QC inspector William Sherwood as a reference to monitor the welding and verify the Direct Current Electrode Positive (DCEP) welding parameters which was recorded as 175 amps by the QC inspector. The 4.0mm Lincoln electrode was utilized with the welding performed in the flat (1G) position with the work placed in an approximately horizontal plane and the weld metal deposited from the upper side. The groove joint appeared to comply with the AWS joint designation identified as B-U4a. The minimum preheat temperature of 60 degrees Celsius and the maximum interpass

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temperature of 230 degrees Celsius were verified by the QC inspector.

## B). Field Splice E3/E4, "A" Deck Stiffeners

The QAI observed the welder, Hua Qiang Hwang ID-2930, perform the Complete Joint Penetration (CJP) groove welding on the longitudinal stiffener field splice identified as WN: 3E-4E-A-LS3. The welder utilized the SMAW process as per the Welding Procedure Specification (WPS) identified as ABF-WPS-D15-1012-3, Rev.0 and was also utilized by the QC inspector John Pagliero as a reference. The amperage was recorded as 120 amps and the minimum preheat of 100 degrees Celsius and the maximum interpass temperature of 230 degrees Celsius was verified.

The welding was performed in the vertical (3G) position with the work placed in an approximately vertical plane and the groove approximately vertical. The welder utilized a slag hammer, pneumatic air gun with an attached chisel and a wire wheel attached to a 4" high cycle grinder to remove slag after deposit each fill pass. The electrodes were stored in electrically heated, thermostatically controlled oven after removal from sealed containers.

The exposure limits of the electrodes identified as E9018-H4R and the minimum storage oven temperature of 250 degrees Celsius appeared to be in compliance with the contract documents. The welder completed the correcting of the root opening and the QAI observed the QC inspector perform a dimensional survey of the root opening and the included angle prior to the CJP welding. At the time of the observation no issues were noted by the QAI.

## C). Field Splice E4/E5, "A" Deck Stiffeners

The QAI observed the welder, Xiao Jian Wan ID-9677, perform the CJP groove welding on the longitudinal stiffener at the field splices identified as WN: 4E-5E-A-LS4 and LS6. The welder utilized the SMAW process as per the Welding Procedure Specification (WPS) identified as ABF-WPS-D15-1012-3, Rev.0 and was also utilized by the QC inspector John Pagliero as a reference. The amperage was recorded as 123 amps and the minimum preheat of 100 degrees Celsius and the maximum interpass temperature of 230 degrees Celsius was verified.

Later in the shift, the QAI observed the welder, Mr. Wan correcting the excessive root opening of the weld joint utilizing the SMAW process as per the Welding Procedure Specification (WPS) identified as ABF-WPS-D15-1012-3, Rev.0. This work was completed on the longitudinal stiffener field splice identified as WN: 4E-5E-A-LS5 and the inspection was performed by the QC inspector utilizing the WPS as a reference. The QC inspector verified the DC welding parameters and were observed and recorded by the QAI as 121 amps.

The welding was performed in the vertical (3G) position with the work placed in an approximately vertical plane and the groove approximately vertical. The welder utilized a slag hammer, pneumatic air gun with an attached chisel and a wire wheel attached to a 4" high cycle grinder to remove slag after deposit each fill pass. The electrodes were stored in electrically heated, thermostatically controlled oven after removal from sealed containers.

The exposure limits of the electrodes identified as E9018-H4R and the minimum storage oven temperature of 250 degrees Celsius appeared to be in compliance with the contract documents. The welder completed the correcting of the root opening and the QAI observed the QC inspector perform a dimensional survey of the root opening and the included angle prior to the CJP welding. At the time of the observation no issues were noted by the QAI.

## D). Field Splice E4/E5

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The QAI observed Darcel Jackson ID-9967 perform the repair welding of the areas previously marked during QC ultrasonic testing on the side plate field splice identified as WN: 4E-5E-C. The repair welding was performed utilizing the Shielded Metal Arc Welding (SMAW) process and the 3.2mm electrode as per the Welding Procedure Specification (WPS) identified as ABF-WPS-1000 Repair Rev. 2. The WPS was also used by the QC inspector, William Sherwood, as a reference to monitor and verify the Direct Current welding parameters and were noted as 125 amps. The welding was performed in the vertical (3G) position with the work positioned approximately on an incline of 22 degrees and the weld progression up.

### D). Field Splice E5/E6

The QAI observed continued the Ultrasonic Testing (UT) on the side plate field splice identified as WN: 5E-6E-D1 and D2. The testing was performed by the QC technician Steve McConnell utilizing a G.E. /Krautkramer USM 35X and the UT Procedure identified as SE-UT-D1.5-CT-100 Rev.4. The QC technician performed the required longitudinal testing for base metal soundness and shear wave testing for weld soundness which was performed utilizing a 16mm x 19mm rectangular transducer. The testing was not completed during this shift.

### E). Field Splice W1/W2, "A" Deck Stiffeners

The QAI observed the welder, Wai Kitlai ID-, perform the CJP groove welding on the longitudinal stiffener field splice identified as WN: 2E-3E-A-LS1. The welder utilized the SMAW process as per the Welding Procedure Specification (WPS) identified as ABF-WPS-D15-1012-3, Rev.0 and was also utilized by the QC inspector John Pagliero as a reference. The amperage was recorded as 121 amps and the minimum preheat of 20 degrees Celsius and the maximum interpass temperature of 230 degrees Celsius was verified.

The welder, Yao Xin Liang ID-, performed the CJP groove welding on the longitudinal stiffener field splice identified as WN: 3E-4E-A-LS5. The welder utilized the SMAW process as per the Welding Procedure Specification (WPS) identified as ABF-WPS-D15-1012-3, Rev.0 and was also utilized by the QC inspector John Pagliero as a reference. The amperage was recorded as 126 amps and the minimum preheat of 100 degrees Celsius and the maximum interpass temperature of 230 degrees Celsius was verified.

The welders utilized the Shielded Metal Arc Welding (SMAW) process as per the Welding Procedure Specification (WPS) identified as ABF-WPS-D15-1012-3, Rev.0 and was also utilized by the QC inspector Tom Pasqualone as a reference to monitor the welding and verify the welding parameters. The amperages were recorded as 121 amps and 126 amps accordingly and the minimum preheat of 100 degrees Celsius and the maximum interpass temperature of 230 degrees Celsius were also verified.

The welding was performed in the vertical (3G) position with the work placed in an approximately vertical plane and the groove approximately vertical. The welders utilized slag hammers, pneumatic air gun with an attached chisel and a wire wheels attached to a 4" high cycle grinders to remove slag after deposit of each fill pass. The electrodes were stored in electrically heated, thermostatically controlled oven after removal from sealed containers. The exposure limits of the electrodes identified as E9018-H4R and the minimum storage oven temperature of 250 degrees Celsius appeared to be in compliance with the contract documents. At the time of the observation no

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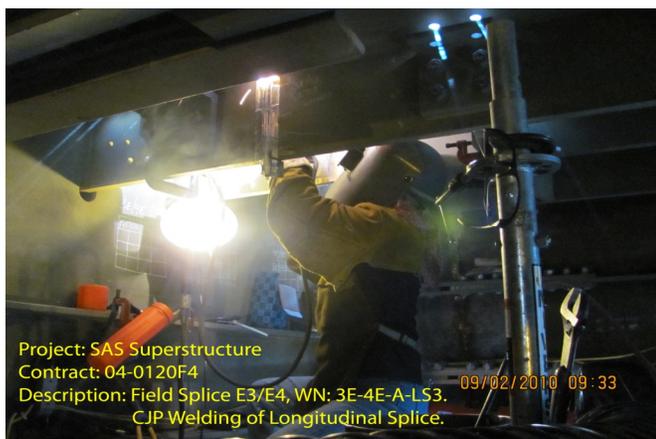
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issues were noted by the QAI.

## QA Observation and Verification Summary

The QA inspector observed the QC activities and the welding of the field splices utilizing the WPS as noted above, which appeared to be posted at the weld station. The welding parameters and surface temperatures were verified by the QC inspector and utilizing a Fluke 337 clamp meter for the electrical welding parameters and a Fluke 63 IR Thermometer for verifying the preheat and interpass temperatures. The ESAB consumables utilized for the SMAW process appeared to comply with the AWS Specification and AWS Classification. The QC inspection, testing and welding performed on this shift appeared to be in general compliance with the contract documents. At random intervals, the QAI verified the QC inspection, testing, welding parameters and the surface temperatures utilizing various inspection equipment and gages which included a Fluke 337 Clamp Meter and Tempilstik Temperature indicators.

The digital photographs below illustrate the work observed during this scheduled shift.



## Summary of Conversations:

There were general conversations with Quality Control Inspector Bonifacio Daquinag, Jr. and Mike Johnson at the start of the shift regarding the location of American Bridge/Fluor welding, inspection and N.D.E. testing personnel scheduled for this shift.

## Comments

This report is for the purpose of determining conformance with the contract documents and is not for the purpose of making repair or fit for purpose recommendations. Should you require recommendations concerning repairs or remedial efforts please contact Mohammad Fatemi (916) 813-3677, who represents the Office of Structural Materials for your project.

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**Inspected By:** Reyes, Danny

Quality Assurance Inspector

**Reviewed By:** Levell, Bill

QA Reviewer