

**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-016648**Date Inspected:** 08-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). Field Splice E4/E5, "A" Deck Stiffeners
- B). OBG E1, Erection Access Hole Insert Plate
- C). Field Splice E6/E7

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

The QAI observed the welder, Hua Qiang Hwang ID-2930, continue the Complete Joint Penetration (CJP) groove welding on the longitudinal stiffener field splice identified as WN: 4E-5E-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 130 amps and the minimum preheat of 100 degrees Celsius and the maximum interpass temperature of 230 degrees Celsius was verified.

The QAI also observed the welder, Darcel Jackson ID-9967, perform the Complete Joint Penetration (CJP) groove welding on the longitudinal stiffener field splice identified as WN: 4E-5E-A-LS4. 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 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.

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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.

## B). OBG E1, Erection Access Hole Insert Plate

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-W3 on the "A" deck of the Orthotropic Box Girder (OBG) E1. The welder Jin Pei Wang ID-7299 performed the overhead (OH) welding of the "B" side of the Complete Joint Penetration (CJP) groove weld utilizing the Welding Procedure Specification (WPS) ABF-WPS-D15-1110-B, Rev. 1. The WPS was also utilized by the QC inspector John Pagliero as a reference to monitor the welding and verify the Direct Current Electrode Positive (DCEP) welding parameters which was recorded as 124 amps by the QC inspector. The 3.2 mm Lincoln electrode was utilized with the welding performed in the overhead (4G) position with the work placed in an approximately horizontal plane and the weld metal deposited from the bottom 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 temperature of 230 degrees Celsius were verified by the QC inspector.

## C). Field Splice E6/E7

The QAI observed the Complete Joint Penetration (CJP) of the deck plate field splice identified as WN: 6E-7E-A. The welding was performed by James Zhen ID-6001 utilizing the Welding Procedure Specification (WPS) identified as ABF-WPS-D15-3040A-1 Rev. 0 which was also used by the QC inspector, William Sherwood, to monitor the in process welding and verify the welding parameters. The Flux Cored Arc Welding (FCAW-G) was performed in the flat position (1G) with the work placed so that the filler weld metal was deposited from the upper side of the weld joint. The welding parameters were verified and recorded by the QC inspector as 225 amps, 21.8 volts and a travel speed measured at . The minimum/maximum surface temperatures were also verified and recorded by the QC inspector. The CJP welding was performed at the "A1" deck segment beginning from the south side of the OBG (0) for a length of 500 mm.

The QAI also observed the continuous tack welding of the backing bar to the deck plate identified as WN: 6E-7E-A. The welding was performed by Song Tao Huang ID-3794 utilizing the Shielded Metal Arc Welding (SMAW) as per the Welding Procedure Specification (WPS) identified as ABF-WPS-D15-F1200A Rev. 1 which was also used by the QC inspector to monitor the in process welding and verify the welding parameters. The welding was performed in the horizontal position (2F) with the work placed so that the fillet weld metal appeared to be deposited on the upper side of the horizontal surface and against the vertical surface. The welding parameters were verified and recorded by the QC inspector as 130 amps. The minimum/maximum surface temperatures were also verified and recorded by the QC inspector.

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Later in the shift, the QAI observed the CJP welding of the bottom plate field splice identified as WN: 6E-7E-D2. The welding was performed by Xiao Jian Wan, ID-9677 utilizing the Welding Procedure Specification (WPS) identified as ABF-WPS-D15-3040A-1, Rev. 0 which was also used by the QC inspector to monitor the in process welding and verify the welding parameters. The FCAW-G welding was performed in the flat position (1G) with the work placed so that the filler weld metal was deposited from the upper side of the weld joint. The welding parameters were verified and recorded by the QC inspector as 232 amps, 23.5 volts and a travel speed measured at 292 mm/m. The minimum/maximum surface temperatures were also verified and recorded by the QC inspector. The welding length of approximately 500 mm measured from the north end of the "D" plate to "E" plate connection was performed on this scheduled shift.

### 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 and the FCAW-G processes 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

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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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<b>Inspected By:</b>	Reyes,Danny	Quality Assurance Inspector
<b>Reviewed By:</b>	Levell,Bill	QA Reviewer

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