

**DEPARTMENT OF TRANSPORTATION**

DIVISION OF ENGINEERING SERVICES

Office of Structural Materials

Quality Assurance and Source Inspection



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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-019448**Date Inspected:** 12-Jan-2011**Project Name:** SAS Superstructure**OSM Arrival Time:** 630**Prime Contractor:** American Bridge/Fluor Enterprises, a JV**OSM Departure Time:** 1500**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 W8/W9
- B). Deck Access Hole
- C). Field Splice E9/E10
- D). Pipe Supports

A). Field Splice W8/W9

The QAI observed the excavation of the unacceptable discontinuities on the deck plate field splice identified as WN: 8W-9W-A5, repair cycle # R1. The rejectable discontinuities were discovered during the Ultrasonic Testing (UT) performed by the QC technician, Patrick Swain. The discontinuities appeared to travel in the longitudinal direction of the weld axis. The excavations of the rejected areas was performed by the welder Wai Kitlai ID-2953 utilizing a high cycle grinder to remove the defects and a rotary file to bring the excavated area into compliance with the Weld Procedure Specification (WPS) ABF-WPS-D15-1001 Repair, Rev. 0. At the conclusion of the excavations the QAI observed the QC inspector, Mr. Swain, performed a Visual Inspection (VT) and a Magnetic Particle Test (MPT) of the excavated areas and no rejectable indications were noted. At the conclusion of the VT and MPT, the welder commenced the welding of the repair which was identified with the following Y coordinates; Segment A5, Y=2720. The welding was performed by Mr. Kitlai utilizing the Shielded Metal Arc Welding (SMAW) process as per the WPS which was also utilized by the QC inspector, Gary Erhsam, to monitor the

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welding and to verify the DC welding parameters. The QC inspector verified the DC welding parameters as 125 amps and the minimum preheat temperature of 40 degrees Celsius and the maximum interpass temperature of 230 degrees Celsius appeared to comply with the contract documents. The welding was performed in the flat (1G) position utilizing a 3.2 mm low hydrogen electrode. The welding of the repairs were not completed during the scheduled shift. The QAI also verified the dimensions of the excavations and were noted and recorded as follows; Segment A5, Y=2720 mm, L=150 mm, d=14 mm.

### B). Deck Access Hole

The QAI observed the excavation of the unacceptable discontinuities on the deck plate field splice identified as WN: 6W-PP46.5-W5, repair cycle # R1. The rejectable discontinuities were discovered during the Ultrasonic Testing (UT) performed by the QC technician, John Pagliero. The discontinuities appeared to travel in the longitudinal direction of the weld axis. The excavations of the rejected areas was performed by the welder Jorge Lopez ID-6149 utilizing a high cycle grinder to remove the defects and a rotary file to bring the excavated area into compliance with the Weld Procedure Specification (WPS) ABF-WPS-D15-1001 Repair, Rev. 0. At the conclusion of the excavations the QAI observed the QC inspector, Gary Erhsam, performed a Visual Inspection (VT) and a Magnetic Particle Test (MPT) of the excavated areas and no rejectable indications were noted. At the conclusion of the VT and MPT, the welder commenced the welding of the repair which was identified with the following Y coordinates; Y=0 mm and Y=4225 mm. The welding was performed by Mr. Lopez utilizing the Shielded Metal Arc Welding (SMAW) process as per the WPS which was also utilized by Mr. Erhsam, to monitor the welding and to verify the DC welding parameters. The QC inspector verified the DC welding parameters as 127 amps and the minimum preheat temperature of 40 degrees Celsius and the maximum interpass temperature of 230 degrees Celsius appeared to comply with the contract documents. The welding was performed in the overhead (4G) position utilizing a 3.2 mm low hydrogen electrode. The welding of the repairs were not completed during the scheduled shift. The QAI also verified the dimensions of the excavations and were noted and recorded as follows; Y=0 mm, L=75 mm, d=17 mm and Y=4225 mm, 90 mm and 18 mm.

### C). Field Splice E9/E10

The QAI observed the welder, Xiao Jian Wan ID-9677, perform the CJP groove welding on the longitudinal stiffener field splice identified as WN: 9E-10E-A-LS4. The welder utilized the SMAW process as per the Welding Procedure Specification (WPS) identified as ABF-WPS-D15-1012-3, Rev.0 which was also utilized by the QC inspector Fred Von Hoff 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 were 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 minimum preheat temperature of 100 degrees Celsius and the interpass temperature of 230 degrees Celsius appeared to comply with the contract documents. The welder utilized a slag hammer 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 QC inspector Mr. Von Hoff performed the fit-up inspection of the longitudinal stiffener and no planar

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alignment or root opening issues were noted. The alignment dimensions appeared to be 2mm and the root opening was measured at 6 mm. The QAI concurs with the QC inspector's assessment.

## D). Pipe Supports

At the request of Mr. Johnson, the QAI randomly verified the welding of the pipe supports at the OBG's identified as W1 through W5 and W7 located along the W5 grid line. The QAI verification was performed to verify that the welding and visual weld inspection performed by the QC inspector meet the requirements of the contract documents. At the conclusion of the QAI verification it appeared that the welds and the QC inspection complies with the contract documents. QAI Note: The installation of additional pipe supports are required and will be completed at a later date.

## 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 welding 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 some of the work observed during this scheduled shift.



## Summary of Conversations:

There were general conversations with Quality Control Inspector Bonifacio Daquinag, Jr. 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.

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## 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 Nina Choy 510-385-5910, 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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