

**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-018438**Date Inspected:** 03-Dec-2010**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). Deck Access Hole-Insert Plate
- B). Field Splice W7/W8
- C). Field Splice W6/W7
- D). Pipe Supports

A). Deck Access Hole-Insert Plate

The QAI observed the field fit-up and tack welding Shielded Metal Arc Welding (SMAW) of the Deck Access Hole-Insert Plate (DAH-IP) identified as Weld Number (WN): 4W-PP24.5-W5-South located on the "A" deck of the Orthotropic Box Girder (OBG) W4. The welder Ken Chappell ID-3833 performed the tack welding utilizing the Welding Procedure Specification (WPS) ABF-WPS-D15-1010, Rev. 0. The WPS was also utilized by the QC inspector Steve McConnell as a reference to monitor the welding and verify the welding parameters which was recorded as 126 amps by the QC inspector. The 3.2 mm low hydrogen electrode, E7018 H4R, 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 20 degrees Celsius and the maximum interpass temperature of 230 degrees Celsius were verified by the QC inspector. The work performed appeared to comply with the contract documents and no issues regarding the dimensions of the root opening or planar alignment at the

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time of the QC inspection.

### B). Field Splice W7/W8

The QAI also observed the Flux Cored Arc Welding (FCAW-G) of the weld joint identified as Weld Number (WN) W7-W8-C1. The Complete Joint Penetration (CJP) welding was performed by welding personnel Song Tao Huang, ID-3794 utilizing the WPS ABF-D15-3042B-1, Rev. 0. The WPS was also used by the QC inspector William Sherwood as a reference to monitor the welding and to verify the DC welding parameters which were noted and recorded by the QC as follows; 255 amps, 23.2 volts and a travel speed measured at 275 mm/m. The welding was performed in vertical position (3G) at approximate incline of 22 degrees with the weld progression up. The QC inspector also verified the minimum preheat temperature of 100 degrees Celsius and the maximum interpass temperature of 230 degrees Celsius. Later during the shift the QAI observed, at random intervals, the QC inspector monitoring the in process welding, the surface temperatures and verifying the welding parameters. The CJP welding was not completed during this shift.

### C). Field Splice W6/W7

The QAI observed the excavation of the unacceptable discontinuities on the side plate field splice identified as WN: 6W-7W-C1, repair cycle # R1. The rejectable discontinuities were discovered during the Ultrasonic Testing (UT) performed by the QC technician, Jesse Cayabyab. The discontinuities appeared to travel in the longitudinal direction of the weld axis. The excavations of the rejected areas was performed by the welder Fred Kaddu ID-2188 utilizing a high cycle grinder to remove the defects and a rotary file to bring the excavated areas 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 perform a visual inspection 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 repairs which was identified with the following Y coordinates; Y=735 mm and 1310 mm.

Later in the shift, the QAI observed the excavation of the unacceptable discontinuity on the side plate field splice identified as WN: 6W-7W-C2, repair cycle # R1. The excavation of the rejected area was performed by the welder Fred Kaddu ID-2188 utilizing a high cycle grinder to remove the defects and a rotary file to bring the excavated areas 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 perform a visual inspection 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 repairs which was identified with the following Y coordinates; Y=4930 mm.

The welding was performed by Mr. Kaddu utilizing the Shielded Metal Arc Welding (SMAW) process as per the WPS which was also utilized by the QC inspector 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 vertical (3G) position utilizing an E7018 3.2 mm low hydrogen electrodes. The welding of the repairs was not completed during the scheduled shift. The QAI verified the dimensions of the three (3) excavations and were noted and recorded as follows; Y=735 mm, L=100 mm, d=10

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mm, Y=1310 mm, L=110 mm, d=12 mm and Y=4930 mm, L=110 mm, d=10 mm.

## D). Pipe Supports

The QAI observed the continued fillet welding of the pipe supports located along the pier column at W2-E1, which was performed by David Garcia ID-8789 utilizing a 3.2 mm electrode as per the Welding Procedure Specification (WPS) identified as Fillet Murex. The fillet welding was performed in vertical (3F) position utilizing a 3.2 mm electrode. The QC inspection was performed by Mike Johnson utilizing the WPS to monitor the welding and to verify the amperage.

## 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 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.

## 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 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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