

**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-017246**Date Inspected:** 06-Oct-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 E6/E7
- B). Field Splice E7/E8
- C). Ventilation Access Hole, Insert Plate
- D). Erection Access Hole, Insert Plate

A). Field Splice E6/E7

Later in the shift, the QAI observed the Flux Cored Arc Welding (FCAW-G) of the weld joint identified as Weld Number (WN) 6E-7E-C1 and C2. The welding was performed by the welder/operators Rory Hogan ID-3186 and Jeremy Dolman ID-5042 utilizing the WPS ABF-WPS-D15-3042B-1, Rev. 0. The WPS was also used by the QC inspector William Sherwood as a reference during the monitoring of the welding and verifying the welding parameters which were observed as follows: 246 amps, 23.7 volts and a travel speed measured as 188 mm. The QC inspector also verified the minimum preheat temperature of 100 degrees Celsius and the maximum interpass temperature of 230 degrees Celsius. The welding was performed in the overhead position (4G) with the work at an approximate incline of 22 degrees and the weld metal deposited from the underneath side.

B). Field Splice E7/E8

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The QAI observed the Complete Joint Penetration (CJP) welding of the edge plate field splice identified as Weld Number (WN): 6E-7E-B1. The welding was performed by the welder Hua Qiang Hwang ID-2930 utilizing the Shielded Metal Arc Welding (SMAW) process and the 3.2 mm electrode as per the Welding Procedure Specification (WPS) ABF-WPS-D15-1040B-1, Rev. 0. The WPS was also used by the Quality Control (QC) Inspector William Sherwood to verify the Direct Current Electrode Positive (DCEP) welding parameters and to monitor the Complete Joint Penetration (CJP) welding. The QAI observed the QC inspector verifying the welding parameters and were noted as 128 amps. The minimum preheat temperature of 20 degrees Celsius and the maximum interpass temperature of 230 degrees Celsius appeared to comply with contract documents. The welding was performed in the vertical (3G) position and the work placed in an approximately vertical plane with the groove approximately vertical. The contractor has elected to utilize a copper backing bar in lieu of the steel backing bar.

The QAI also observed the welder Xiao Jian Wan ID-9677 performing the CJP welding of the edge plate field splice identified as WN: 6E-7E-F1. The welding was performed utilizing the Shielded Metal Arc Welding (SMAW) process and the E7018 H4R 3.2 mm electrode. The welding was performed utilizing the WPS identified as ABF-WPS-D15-1040B-1, Rev. 0 which was also used by the QC inspector as a reference. The QAI observed the QC inspector, Mr. Sherwood, verify the welding parameters which were noted as 119 amps utilizing the 3.2 welding consumable. The minimum preheat temperature of 20 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 with the work placed in an approximately vertical plane with the groove approximately vertical. The contractor has elected to utilize a copper backing bar in lieu of the steel backing bar.

### C). Ventilation Access Hole, Insert Plate

The QAI observed the Complete Joint Penetration (CJP) welding of the ventilation access hole, insert plate, identified as WN: 2E-PP10.5-E2-L2E-SW. The welding was performed by, Wai Kitlai ID-2953, utilizing the Shielded Metal Arc Welding (SMAW) as per the Welding Procedure Specification (WPS) identified as ABF-WPS-D15-1010, Rev. 1. The WPS was also utilized by the QC inspector Patrick Swain as a reference to monitor the welding and verify the Direct Current Electrode Positive (DCEP) welding parameters which was recorded as 123 amps by the QC inspector. The 3.2 mm electrode was utilized with the welding performed in the flat (1G) position with the work in an approximately horizontal plane and the weld metal deposited from the upper side. The minimum preheat temperature of 20 degrees Celsius and the maximum interpass temperature of 230 degrees Celsius were verified by the QC inspector.

Prior to the welding, the QAI observed the QC inspector perform a visual inspection of the field fit-up on the ventilation access hole, insert plate to the deck plate. At the conclusion of the inspection no rejectable areas were noted by the QC inspector at this time and the QAI concurs with QC assessment.

### D). Erection Access Hole, Insert Plate

The QAI observed the excavations of rejectable flaws discovered by Ultrasonic Testing (UT) performed by QC technician, Steve McConnell. The excavation process was performed by the welder, Darcel Jackson ID-9967, utilizing a high cycle 4" grinder on the welds identified as WN: 1E-PP11-E4-W1, W2, W3 and W4. At the conclusion of the testing QAI observed the QC inspector Patrick Swain perform the Magnetic Particle Testing (MPT) of the excavated areas and no rejectable indications were noted by the QC inspector.

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## 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 welding 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. 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

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**Reviewed By:** Levell, Bill

QA Reviewer