

**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-020897**Date Inspected:** 18-Feb-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 Items Observed**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). "A" Deck Stiffeners
- B. QC Inspection Request
- C). QAI MPT Verification
- D). Miscellaneous Task

A). "A" Deck Stiffeners

The QAI observed the continued Complete Joint Penetration (CJP) welding of the east and west longitudinal stiffener splices located at the deck access hole identified as WN: 3W-PP19.5-W2-LSE and LSW. The welding was performed by Xiao Jian Wan ID-9677, utilizing the SMAW process as per the Welding Procedure Specification (WPS) identified as ABF-WPS-D15-1012-3, Rev.0. The WPS was also utilized by the QC inspector Gary Erhsom as a reference to verify the amperage which was recorded as 122 amps and to monitor the welding. The welding was performed in the vertical (3G) position with the work placed in an approximate 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 the deposit of each fill pass. The electrodes were stored in electrically heated, thermostatically controlled oven after removal from the sealed containers. The exposure limits of the electrodes identified as E9018-H4R and the minimum

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storage oven temperature of 250 degrees Celsius appeared to be in compliance with the contract documents. At the time of the observation no issues were noted by the QAI. The CJP welding of the stiffener splices was completed during this shift.

The QAI also observed the Complete Joint Penetration (CJP) welding of the B-side longitudinal stiffener field splice identified as WN: 3W-4W-A-LS1. The welding was performed by Hua Qiang Hwang ID-2930 utilizing the Shielded Metal Arc Welding (SMAW) process as per the Welding Procedure Specification (WPS) identified as ABF-WPS-D15-1012-3, Rev.0. The WPS was also utilized by the QC inspector Mr. Erhsom as a reference to monitor the welding operation and verify the welding parameters. The amperage was observed by the QAI and recorded by the QC inspector as 124 amps. The welding was performed by the welder in the vertical (3G) position with the work placed in an approximate 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 of each fill pass. The electrodes were stored in electrically heated, thermostatically controlled oven after removal from the 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 issues were noted by the QAI.

### B). Field Splice E5/E6

The QAI observed the Ultrasonic Testing (UT) of the R4 repair on the bottom plate splice identified as WN: 5E-6E-D1. The testing was performed by the QC technician Jesse Cayabyab utilizing a G.E./Krautkramer USM 35X. The examination of the repair was conducted utilizing UT Procedure identified as SE-UT-D1.5-CT-100 Rev. 4 and the applicable contract documents. The QC technician performed the required longitudinal wave technique, utilizing a 25.4mm diameter transducer, to perform the examination for base metal soundness and the shear wave technique for the examination of weld soundness which was performed utilizing a 16mm x 19mm rectangular transducer. At the conclusion of the welding no rejectable indications were noted by the QC technician. NOTE: Due to limited access and the location of the repair and interference regarding the bottom plate Tee stiffeners, the scanning patterns "D" and "E" were utilized to achieve the volumetric coverage of the repaired area.

### C). Field Splice E6/E7

The QAI observed the excavation of the unacceptable discontinuity discovered during the Ultrasonic Testing (UT) performed by the QC Technician, Mike Johnson, of the "A" deck field splice identified as WN: 6E-7E-A1, R6. The excavation was performed by the welder Wai Kitlai ID-2953 utilizing a high cycle grinder to remove the defect. At the conclusion of the excavation the QC inspector, Mike Johnson, performed a visual inspection and a Magnetic Particle Test (MPT) of the excavated area. The QC inspector performed the MPT of the excavation, which was ground to a bright metal, utilizing the MPT procedure identified as SE-MT-D1.5-CT-100 Rev.4 and at the conclusion of the testing no rejectable indications were noted by the QC inspector. At this time Mr. Kitlai commenced the welding utilizing the WPS identified as ABF-WPS-D15-1003-Repair Rev. 0. The QAI verified the DCEP welding parameters as 160 amps, the minimum preheat of 40 degrees Celsius and the maximum interpass temperature of 230 degrees Celsius. Later in the shift the QAI observed at random intervals the QC inspector monitoring and verifying the welding parameters. The repair welding was completed during this shift.

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### C).QC Inspection Request

At the request of Quality Control Field Supervisor, Bonifacio Daquinag, the QAI randomly verified the QC visual inspection of the Complete Joint Penetration (CJP) welding of the following; the Lifting Lug Hole (LLH) identified as WN: 6W-PP40-E3, Weld Numbers 3 and 4 and WN: 6W-PP40-E4, Weld Numbers 1 through 4. The QAI verification was performed to verify that the welding and the visual weld inspection performed by the QC inspector meet the requirements of the contract documents. The QAI verification was performed on the overhead portion of the CJP's as requested by Mr. Daquinag. At the conclusion of the QAI verification it appeared that the welds and the QC inspection complies with the contract documents.

### D). Miscellaneous Task

The QAI also performed a review and update of the project progress utilizing QA field reports and NDT reports. The updated project information was documented into the various QA tracking logs.

### 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 inspectors 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:

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There were general conversations with Quality Control Field Supervisor, 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 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
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<b>Reviewed By:</b>	Levell, Bill	QA Reviewer
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