

**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-016634**Date Inspected:** 30-Aug-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 W5/W6
- B). OBG W2, Longitudinal Shear Plate
- C). Field Splice E3/E4, "A" Deck Stiffeners

A). Field Splice W5/W6

The QAI observed the Shielded Metal Arc Welding (SMAW) of the Complete Joint Penetration (CJP) identified as Weld Number (WN) 5W-6W-E1. The welding was performed by the welding operator Song Tao Huang, ID-3794 utilizing the WPS ABF-D15-1042A-1 Rev. 0. The joint designation appeared to comply with AWS single-v-groove butt joint identified as B-U2a. The WPS was also used by the QC inspector Tom Pasqualone as a reference to monitor and verify the Direct Current Electrode Positive (DCEP) welding parameters which was noted and recorded as 131 amps. The welding was performed in vertical (3G) position at approximate incline of 22 degrees and the welding deposited from the upper side of the weld joint. The 3.2mm Atom Arc electrode, manufactured by ESAB, which appeared to comply with the AWS Classification E7018 H4R. The QAI inspector also verified the minimum preheat temperature of 20 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 DCEP welding parameters. The CJP welding of the "A" face was completed during this shift. The Y coordinates were from 4377mm to 5277mm equal to a length

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of 900mm.

The QAI observed the back gouging operation performed by the welders Bryce Howell and Mike Maday. The work was performed on the "B" face of the single-v-groove weld identified as Weld Number (WN): 5W-6W-C1 and C2. The back gouging was performed utilizing the plasma arc cutting method.

### B). OBG W2, Longitudinal Shear Plate

The QAI observed the excavation of the unacceptable discontinuities, discovered during the Ultrasonic Testing (UT) performed by the QC Technician, Tom Pasqualone, which are currently in the R2 repair cycle. The excavations were performed by Ken Chappell, utilizing a 4" high cycle grinder, and the repair welding was performed by welding personnel Fred Kaddu ID-2188. At the conclusion of the excavations the QC technician, Steve McConnell, performed a visual inspection and a Magnetic Particle Test (MPT) of the excavated areas. No rejectable indications were noted by the QC inspector and Mr. Kaddu commenced the repair welding utilizing the Shielded Metal Arc Welding (SMAW) process as per the Welding Procedure Specification (WPS) identified as ABF-WPS-D15-1000-Repair Rev. 2. The inspection of the repair welding was performed by Mr. Pasqualone utilizing the WPS as a reference. The QC inspector verified the DCEP welding parameters as 132 amps and the minimum preheat 20 degrees Celsius and the maximum interpass temperature of 230 degrees Celsius. The repair welding was completed during this shift.

### C). Field Splice E3/E4

The QC inspector John Pagliero performed the fit-up inspection of the longitudinal stiffener identified as WN: 3E-4E-A-LS5 and no vertical planar alignment or root opening issues were noted. The alignment dimensions appeared to be 2mm and the root opening was measured at 7mm. The QAI concurs with the QC inspector's assessment.

At the conclusion of the QC inspection, the welder, Xiao Jian Wan ID-9677, performed the CJP groove welding on the longitudinal stiffener field splice identified as WN: 3E-4E-A-LS5. 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 126 amps and the minimum preheat of 100 degrees Celsius and the maximum interpass temperature of 230 degrees Celsius was 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 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 of 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. At the time of the observation no issues were noted by the QAI.

The QAI also observed the QC inspector perform the fit-up inspection of the longitudinal stiffener field splices identified as WN: 3E-4E-A-LS1, LS2 and LS3. At the completion of the inspection the QC inspector, Mr. Pagliero, noted and informed the QAI of the dimensional issues regarding the alignment. There appears to be an average misalignment of 4.3mm with the greatest dimension of 7.5mm on the stiffener identified as 3E-4E-A-LS2 (See Summary of Conversations regarding this issue). The contractor has elected to proceed, at their own risk,

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with the welding and a verbal approval has been issued by the Department to correct the misalignment by welding a 2.5 to 1 transition on the opposite sides of the weld joint. The QAI has generated an Incident Report regarding this issue.

Later in the shift the QAI observed the welder, Hua Qiang Hwang ID-2930, performed the CJP groove welding on the longitudinal stiffener field splice identified as WN: 3E-4E-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 129 amps and the minimum preheat of 100 degrees Celsius and the maximum interpass temperature of 230 degrees Celsius was 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 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 the weld deposit of 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.

## 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.



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**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.

The QC inspector informed the QAI that he had notified Mike Johnson of the misalignment issue and Mr. Johnson in turn informed Welding Quality Control Manager (WQCM), James Bowers of the issue. Later in the shift the QC inspector informed the QAI that AB/F was in the process of generating a Request for Information (RFI) to correct the misalignment and would be submitted to the Department for review and approval

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

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