

**DEPARTMENT OF TRANSPORTATION**

DIVISION OF ENGINEERING SERVICES

Office of Structural Materials

Quality Assurance and Source Inspection



Bay Area Branch  
690 Walnut Ave. St. 150  
Vallejo, CA 94592-1133  
(707) 649-5453  
(707) 649-5493

Contract #: 04-0120F4Cty: SF/ALA Rte: 80 PM: 13.2/13.9File #: 1.28**WELDING INSPECTION REPORT****Resident Engineer:** Pursell, Gary**Address:** 333 Burma Road**City:** Oakland, CA 94607**Report No:** WIR-016110**Date Inspected:** 06-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 E1/E2
- B). Field Splice W1/W2
- C). Field Splice W3/W4

A). Field Splice E1/E2

The QAI observed the in process Complete Joint Penetration (CJP) groove welding of the field splice identified as 1E-2E-A-S4 performed by Xiao Jian Wan, ID-9677, utilizing the Welding Procedure Specification (WPS) identified as ABF-WPS-D15-1012-3, Rev.0. The WPS was also used by the Quality Control (QC) Inspector John Pagliero to monitor the in process welding and verify the Direct Current Electrode Positive (DCEP) welding parameters which verified and recorded as 125 amps by the QAI. The welding on the "B" face of the weld joint was completed during this shift.

Later in the shift the QAI observed the welder Mr. Wan perform the planar alignment of the weld joint identified as 1E-2E-A-S5. The field fit-up was not completed during this shift and no welding was performed on this field splice.

The minimum preheat of 100 degrees Celsius and the maximum interpass temperature of 230 degrees Celsius

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appeared to comply with the contract documents during the CJP welding. The contractor elected to utilize propane fuel to apply heat to the base metal in lieu of using resistance heating bands for the entire length of the weld. The welding was performed in the vertical (3G) position with the work placed in an approximately vertical plane and the groove approximately vertical.

The QAI also observed the welder James Zhen correcting the excessive root opening (12mm), by welding, utilizing the Shielded Metal Arc Welding (SMAW) as per the WPS identified as ABF-WPS-D15-1012-3, Rev.0. The in process weld inspection was performed by Mr. Pagliero utilizing the WPS to perform the weld inspection. The QC inspector verified the welding parameters and were observed and recorded by the QAI as 127 amps. The minimum preheat of 100 degrees Celsius and the interpass temperature of 230 degrees Celsius appeared to comply with the contract documents. The electrodes were stored in electrically heated, thermostatically controlled ovens 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.

### B). Field Splice W1/W2

The QAI observed Tom Pasqualone perform Ultrasonic Testing (UT) of the repairs on the bottom plate field splice identified as WN: 3W-4W-D2. The testing was performed by the QC technician utilizing the UT Procedure identified as SE-UT-D1.5-CT-100 Rev.4. The QC technician performed the required shear wave technique during the testing for weld soundness which was performed utilizing a .75 x .75 rectangular transducer. The ultrasonic testing of the repairs was completed during this shift and ten repairs were rejected and are now in the R2 cycle repair category.

### C). Field Splice W3/W4

The QAI observed the continued excavation of the unacceptable discontinuities discovered during the Ultrasonic Testing (UT) of bottom plate field splice identified as 3W-4W-D2. The excavations were performed by welding personnel Fred Kaddu ID-2188 utilizing a high cycle grinder to excavate and remove the defects. At the conclusion of the excavations the QC technician William Sherwood performed a Magnetic Particle Test (MPT) of the excavated areas and no rejectable indications were noted. The application and evaluation of the MPT appeared to comply with the MPT procedure identified as SE-MT-CT-D1.5-101 Rev. 4. The repair welding was performed utilizing the Shielded Metal Arc Welding (SMAW) process and the 3.2mm electrode as per the Welding Procedure Specification (WPS) identified as ABF-WPS-1000 Repair Rev. 2. The WPS was also used by the QC inspector, Mr. Sherwood, as a reference to monitor and verify the Direct Current welding parameters which were noted as 134 amps. The welding was performed in the flat (1G) position with the work approximately in the horizontal plane and the weld metal deposited from the upper side. The minimum preheat temperature of 60 degrees Celsius and the maximum interpass temperature of 230 degrees Celsius was monitored and maintained by the QC inspector during the repair welding. The repair welding was completed at the end of the scheduled shift.

### 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

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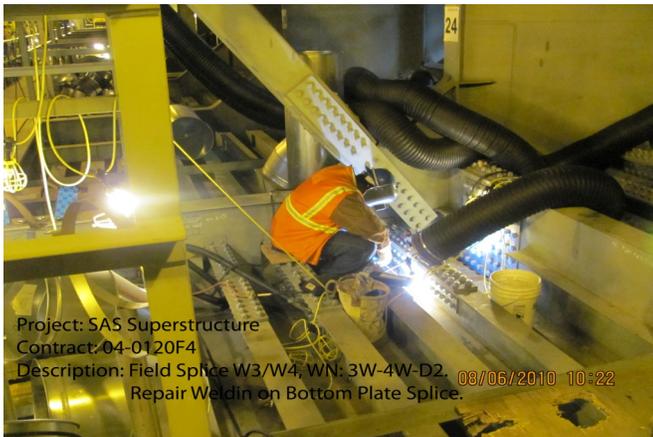
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by the QC inspector and utilizing a Fluke 337 clamp meter for the electrical welding parameters and a Fluke 63 IR Thermometer for verifying the preheat and interpass temperatures. The ESAB consumables utilized for the SMAW process appeared to comply 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 QAI continued the review and verification of the multi-pass fillet welds of the floor beam web to skin plate at the Orthotropic Box Girder (OBG) suspender brackets located at various areas as noted on the Request for Information (RFI) document identified as ABF-RFI-00611R00. The QAI performed a visual observation to verify that the fillet welds along girder Face "B", for 1100mm from the OBG corner on girder Face "A", and for 800mm from the OBG corner on girder Face "C" comply with the RFI. At the conclusion of the QAI verification no issues were noted on the OBG Lift E5, PP30, PP32, PP34 and PP36. No issues were observed.

The digital photographs below illustrate the work observed during this scheduled shift.



## Summary of Conversations:

There were general conversations with Quality Control Inspector Mike Johnson at the start of the shift regarding the location of American Bridge/Fluor welding personnel and inspection/ N.D.E. testing 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

**Reviewed By:** Levell, Bill

QA Reviewer