

**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-018249**Date Inspected:** 18-Nov-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). Field Splice E6/E7
- B). Ventilation Access Hole, Longitudinal Stiffeners
- C). Ventilation Access Hole, Insert Plate
- D). Pipe Supports

A). Field Splice E6/E7

The QAI observed the repair welding of the bottom plate field splice identified as WN: 6E-7E-D1, R1 located at the Y coordinate 0 mm and a length for approximately 1250 mm. The welding was performed by Fred Kaddu ID-2188 utilizing the Shielded Metal Arc Welding (SMAW) process as per the Welding Procedure Specification identified as ABF-WPS-D15-1001 Repair, Rev. 0 which was also utilized by the QC inspector, William Sherwood, to monitor the welding and to verify the DC welding parameters. The QC inspector verified the DC welding parameters as 170 amps and the minimum preheat temperature 40 degrees Celsius and the maximum interpass temperature of 230 degrees Celsius which appeared to comply with the contract documents. The welding was performed in the flat (1G) position utilizing a 4.0 mm electrode. The welding and the QC inspection was not completed during this shift.

The QAI inspector also observed the repair welding of the edge plate field splice identified as WN: 6E-7E-B1, R2

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located at the Y coordinate 950 mm. The welding was performed by Jorge Lopez ID-6149 utilizing the Shielded Metal Arc Welding (SMAW) process as per the Welding Procedure Specification identified as ABF-WPS-D15-1001 Repair, Rev. 0 which was also utilized by the QC inspector, William Sherwood, to monitor the welding and to verify the DC welding parameters. The QC inspector verified the DC welding parameters as 120 amps and the minimum preheat temperature 40 degrees Celsius and the maximum interpass temperature of 230 degrees Celsius which appeared to comply with the contract documents. The welding was performed in the vertical (3G) position utilizing a 3.2 mm electrode. The welding and the QC inspection was not completed during this shift.

The QAI observed the welder, Hua Qiang Hwang ID-2930, performed the CJP groove welding on the "B" face of the longitudinal stiffener field splice identified as WN: 6E-7E-A-LS2. 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 121 amps and the minimum preheat of 100 degrees Celsius and the maximum interpass temperature of 230 degrees Celsius was verified. The preheat temperature was maintained utilizing the heat induction process. The CJP welding was completed during this shift.

### B). Ventilation Access Holes, Longitudinal Stiffener

The QAI observed the welder Xiao Jian Wan ID-9677 perform the welding on the Complete Joint Penetration (CJP) groove joint identified as 3E-PP23.5-E5-West on the "A" deck of the Orthotropic Box Girder (OBG) E4. The welding was performed utilizing the Shielded Metal Arc Welding (SMAW) process as per the WPS identified as ABF-WPS-D15-1012, Rev. 0 which was also used by the QC inspector John Pagliero as a reference to monitor and to verify the welding parameters which were observed and verified by the QAI as 132 amps. The welding was performed in the vertical (3G) position with the work placed in an approximate vertical plane with the groove approximately vertical with the weld progression up utilizing the 3.2 mm electrode. The groove joint appeared to comply with the AWS joint designation identified as B-U2a and the minimum preheat temperature of 100 degrees Celsius and the maximum interpass temperature of 230 degrees Celsius were verified by the QC inspector.

The welding of the longitudinal stiffener field splice 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. The CJP welding was completed during this shift.

Later in the shift, the QAI observed the on the Complete Joint Penetration (CJP) groove joint identified as 3E-PP23.5-E5-TS. The welding was performed by Xiao Jian Wan ID-9677 utilizing the Shielded Metal Arc Welding (SMAW) process as per the WPS identified as ABF-WPS-D15-1010, Rev. 1 which was also used by the QC inspector John Pagliero as a reference to monitor and to verify the welding parameters which were observed and verified by the QAI as 128 amps. The welding was performed in the vertical (3G) position with the work placed in an approximate vertical plane with the groove approximately vertical with the weld progression up utilizing the 3.2 mm, E7018H4R electrode. The groove joint appeared to comply with the AWS joint designation

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identified as B-U2a and the minimum preheat temperature of 20 degrees Celsius and the maximum interpass temperature of 230 degrees Celsius were verified by the QC inspector. The welding was completed during this shift.

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

The QAI observed the excavation of the unacceptable discontinuity on the access hole insert plate identified as WN: 2E-PP17.5-E2, repair cycle # R1. The excavation was performed by the welder Wai Kitlai utilizing a high cycle grinder to remove the defects and a rotary file to bring the excavated area 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, Steve McConnell, performed 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 repair which was identified with the following Y coordinate 370 mm. The welding was performed by Mr. Kitlai ID-2953 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 110 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 overhead (4G) position utilizing a low hydrogen electrode identified as E7018 H4R. The welding and QC inspection of the repair was completed during this scheduled shift. The QAI also verified the dimensions of the excavation and were noted and recorded as follows; Y=370 mm, L=75 mm and d=4 mm.

### D). Pipe Supports

The QAI observed F.W. Spencer personnel performing the layout locations on the column embeds for the pipe supports. There was no welding performed during this 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 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 on page 4 of this report 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. 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.

In regards to the QAI verification, the QAI and QC inspector, Mike Johnson, agreed that QC would notify the QAI in a timely manner, either verbal or cell phone, to schedule weld inspection of the pipe supports. The QAI reminded Mr. Johnson that in the case the QAI had prior commitments or was involved with other inspections, that QC was to proceed with the scheduled work as not to burden the contractor's work schedule.

## 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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