

**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-019811**Date Inspected:** 31-Jan-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 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 W1/W2
- B). DAH Access Hole/PP24.5
- C). Field Splice W2/W3
- D). Field Splice W9/W10
- E). QC Ultrasonic Inspection

## A). Field Splice W1/W2

The QAI observed the welder, Xiao Jian Wan ID-9677, perform the excavation and repair welding of the longitudinal stiffener field splice identified as 1W-2W-A-LS4. The rejectable discontinuity was discovered by the QC inspector, John Pagliero, during the UT examination of the Stiffener splice. 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 127 amps and the minimum preheat of 20 degrees Celsius and the maximum interpass temperature of 230 degrees Celsius was verified. Prior to the repair welding the QAI verified the dimensions of the excavation and were noted as Y=10 mm, L=100 mm, d=16 mm.

The welding was performed in the vertical (3G) position with the work placed in an approximately vertical plane

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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, pneumatic air gun with an attached chisel and a wire wheel attached to a 4" high cycle grinder to remove slag after deposit 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. The welder completed the repair welding during this shift. At the time of the observation no issues were noted by the QAI.

### B). Deck Access Hole/PP24.5

The QAI observed the welder Jin Pei Wang ID-7299 perform excavation and the repair welding of the areas marked as UT reject on the Complete Joint Penetration (CJP) groove weld identified as WN: 1W-PP24.5-W5-SW, R1 cycle repair . Also at the conclusion of the excavation the QC technician Gary Erhsom performed a Magnetic Particle Test (MPT) of the excavated area 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-1001 Repair Rev. 0. The WPS was also used by the QC inspector, Mr. Erhsom, as a reference to monitor and verify the Direct Current welding parameters which were noted as 135 amps. The welding was performed in the flat position (1G) with the work placed in an approximately horizontal plane and the weld metal deposited from the upper side. The dimensions of the excavation were noted and recorded as follows; ,Y=3580, L=230 mm, d=12 mm.

### C). Field Splice W2/W3

The QAI observed the welder, Hua Qiang Hwang ID-2930, performed fit-up and the CJP groove welding on the longitudinal stiffener field splice identified as WN: 2W-3W-A-LS-5. The fit-up and alignment appeared to comply with the contract specifications and the welder proceeded with the welding operation utilizing 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 123 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 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.

### D). Field Splice W9/W10

The QAI observed the Shielded Metal Arc Welding (SMAW) process of the edge plate field splice identified as

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Weld Number (WN): 6E-7E-B1. The welding was performed by Jorge Lopez ID-6149 utilizing the Welding Procedure Specification (WPS) ABF-WPS-D15-1110A-1, Rev. 1. 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 with the work placed in an approximately vertical plane with the groove approximately vertical.

### E). QC Ultrasonic Inspection

The QAI also observed the Ultrasonic Testing (UT) of the Complete Joint Penetration (CJP) groove weld on the deck access hole identified as WN: 8W-PP70.5-W5-SE. The testing was performed by the QC technician Pat Swain utilizing a G.E./Krautkramer USM 35X. The examination of the groove weld 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.

Later in the shift, the QAI observed the UT of the CJP groove welds on the longitudinal stiffeners and transverse stiffener located at the deck access hole located at PP10.5, grid line W5. The groove welds were identified as WN: 1W-PP10.5-W5-East, West and 1W-PP10.5-W5-TS. The UT was performed by John Pagliero utilizing a G.E./Krautkramer USM 35X and the UT Procedure identified as SE-UT-D1.5-CT-100 Rev.4 and the applicable 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 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 on page 4 of this report illustrate some of 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.

The QAI in conversation with Project Manager, John Callahan, regarding RFI # ABF-RFI-002224R01 Mr. Callahan informed the QAI that work would presume on the damaged structural tee members located at WN: 6E-7E-D, north of grid line 3 and south of grid line 4 when the documentation is revised.

## 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 Sang Le (916) 764-5650, 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