

**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-017024**Date Inspected:** 28-Sep-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 E6/E7
- B). Field Splice W6/W7
- C). Erection Access Hole, Insert Plate
- D). Ventilation Access Hole, Insert Plate

A). Field Splice E6/E7

The QAI observed the excavations and the repair welding of the areas marked as UT rejects on the Complete Joint Penetration (CJP) groove weld identified as WN: 6E-7E-A1. The excavations and welding of the repairs was performed by the welder Fred Kaddu ID-2188 utilizing the Shielded Metal Arc Welding (SMAW) process and 4.0 mm 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, William Sherwood, as a reference to monitor and verify the Direct Current welding parameters. The welder utilized a 3.2mm electrode for the application of the first weld layer and a 4.0mm for the fill and cover passes. The welding parameters were verified by the QC inspector and observed by the QAI as 125 amps for the 3.2mm electrode and 177 amps for the 4.0mm electrode. The welding was performed in the flat (1G) position with the work positioned in an approximate horizontal plane and the weld metal deposited from the upper side. 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 of the repairs

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was completed during this shift.

Also at the conclusion of the excavations the QC inspector, Mr. Sherwood, performed the 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 QAI observed the automatic Flux Cored Arc Welding (FCAW-G) of the weld joint identified as Weld Number (WN) 6E-7E-C1. The welding was performed by welding personnel Song Tao Huang, ID-3794 utilizing the WPS ABF-D15-3042B-1 Rev. 0. The joint designation appeared to comply with AWS single-v-groove butt joint identified as B-U2a-G. The WPS was also used by the QC inspector John Pagliero as a reference to monitor and verify the Direct Current Electrode Positive (DCEP) welding parameters which was verified by the QC inspector and observed by the QAI as follows: 243 amps, 24.6 volts and a travel speed measured as 275 mm per minute. The welding was performed in the vertical (3G) position at approximate incline of 22 degrees. The QC inspector also verified the minimum preheat temperature of 100 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.

### B). Field Splice W6/W7

The QAI observed the Ultrasonic Testing (UT) of the Complete Joint Penetration (CJP) groove weld on the deck plate field splice identified as WN: 6W-7W-A5. The testing was performed by the QC technician Tom Pasqualone utilizing a G.E./Krautkramer USM 35X. The examination of the CJP 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.

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

The QAI observed the excavations and repair welding of the unacceptable discontinuities discovered during the Ultrasonic Testing (UT) performed by QC/UT technicians. The repair welding was performed on the erection access hole insert plate identified as Weld Number (WN): E1-PP9.3-W1 on the "A" deck of the Orthotropic Box Girder (OBG) E1. The welder, Jin Pei Wang ID-7299, performed the welding utilizing the Shielded Metal Arc Welding (SMAW) as per the Welding Procedure Specification (WPS) identified as ABF-WPS-D15-1000 Repair, Rev. 2. The WPS was also utilized by the QC inspectors Steve McConnell as a reference to monitor the welding and verify the Direct Current Electrode Positive (DCEP) welding parameters which was recorded as 139 amps by the QC inspector. The 3.2 mm Lincoln electrode was utilized with the welding performed in the flat (1G) position with the work placed in an approximately horizontal plane and the weld metal deposited from the upper side. The groove joint appeared to comply with the AWS joint designation identified as B-U4a. The minimum preheat temperature of 20 degrees Celsius and the maximum interpass temperature of 230 degrees Celsius were verified by the QC inspector.

The QAI observed the excavations and repair welding of the unacceptable discontinuities discovered during the

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Ultrasonic Testing (UT) performed by QC/UT technicians. The repair welding was performed on the erection access hole insert plate identified as Weld Number (WN): E1-PP8.5-E4-W1, W2 and W4 on the "A" deck of the Orthotropic Box Girder (OBG) E1. The welder, Darcel Jackson ID-9967, performed the welding utilizing the Shielded Metal Arc Welding (SMAW) as per the Welding Procedure Specification (WPS) identified as ABF-WPS-D15-1000 Repair, Rev. 2. The WPS was also utilized by the QC inspectors Steve McConnell as a reference to monitor the welding and verify the Direct Current Electrode Positive (DCEP) welding parameters which was recorded as 209 amps by the QC inspector. The 4.0 mm Lincoln electrode was utilized with the welding performed in the flat (1G) position with the work placed in an approximately horizontal plane and the weld metal deposited from the upper side. The groove joint appeared to comply with the AWS joint designation identified as B-U4a. The minimum preheat temperature of 20 degrees Celsius and the maximum interpass temperature of 230 degrees Celsius were verified by the QC inspector.

The QC inspector, Tom Pasqualone, performed the 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.

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

The QAI also observed the Ultrasonic Testing (UT) of the Complete Joint Penetration (CJP) groove welds on the Ventilation Access Hole, Insert plate identified as WN: 1E-PP10.5-E2-L1E-S. The testing was performed by the QC technician John Pagliero utilizing a G.E./Krautkramer USM 35X. The examination of the CJP 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.

### 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 FCAW-G 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.

## 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

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