

**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:** Pursell, Gary**Address:** 333 Burma Road**City:** Oakland, CA 94607**Report No:** WIR-012629**Date Inspected:** 11-Mar-2010**Project Name:** SAS Superstructure**OSM Arrival Time:** 1300**Prime Contractor:** American Bridge/Fluor Enterprises, a JV**OSM Departure Time:** 2130**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 E1/E2 and E2/E3 field splices:

- A). Welding of the Field Splice E1 to E2.
- B). Excavation and Welding of Repair-Field Splice E1 to E2
- C). UT and MT the Field Splice E1 to E2.
- D). Welding of Field Splice E2 to E3

The QAI observed the Flux Cored Arc Welding (FCAW-G) process of the side plate field splice identified as Weld Number (WN): 1E-2E-C, Weld Segment C2. The vertical up (3G) welding was performed by the welding operators Rory Hogan ID-3186 and Jeremy Dolman ID-5042 utilizing the Welding Procedure Specification (WPS) ABF-WPS-D15-3042A-1 Rev. 0. The WPS was also used by the AB/F Quality Control (QC) Inspector Bernard Docena to perform QC verification of the Direct Current Electrode Positive (DCEP) welding parameters during the Complete Joint Penetration (CJP) groove welding of the side plate field splice. The QAI also observed the QC inspector verifying the welding parameters and were noted as follows: 250 amps, 24.3 volts and a travel speed measured at 260 mm per minute with the calculated Heat Input (HI) noted as 1.4 kJ/mm. The QC inspector also monitored the minimum preheat temperature of 60 degrees Celsius and the maximum interpass temperature of 230 degrees Celsius during the field welding.

Later in the shift, the QA inspector observed the welder, Mitch Sittinger, commence the excavation of the UT

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reject of the deck plate field splice identified as 1E-2E-A, Segment A3. The excavation was performed utilizing a barrel type tool with an attached rotary file. The defect was removed and the area of excavation was Magnetic Particle Tested (MPT) by the QC technician, Jesse Cayabyab. No linear indications were noted by the QC inspector. The welder, Mr. Sittinger, commence the repair welding utilizing the Shielded Metal Arc Welding (SMAW) as per the WPS identified as ABF-WPS-D15-1000-Repair Rev. 2 which was also used by the QC inspector to verify the welding parameters, minimum preheat and interpass temperature for compliance with the contract documents. Mr. Cayabyab performed the verification of the welding parameters and were observed and noted by the QAI as 123 amps. The repair welding was completed during this shift.

The QAI also observed the Ultrasonic Testing (UT) performed by the technicians Tom Pasqualone and Jesse Cayabyab of the transverse deck plate field splice identified as WN: 1E-2E-A, Weld Segment A5. The UT technicians performed the required longitudinal and shear wave scanning techniques during the testing which was performed utilizing a USM 35 and a US-52L, a product manufactured by Krautkramer, a 1" diameter used to perform base metal soundness and a .75 x .75 rectangular transducers used to perform the angle beam technique for weld soundness. At the conclusion of the testing there were no rejectable discontinuities noted by the QC technicians and the testing was performed utilizing the longitudinal and transverse axis as per the UT Procedure identified as SE-UT-D1.5-CT-100 Rev.4. The UT was completed during this shift at approximately 1600 hours. See QA Observation and Verification Summary regarding QAI UT verification.

The QAI also observed the Submerged Arc Welding (SAW) process during the CJP groove welding of the E2/E3 bottom plate field splice identified as 1E-2E-D, Weld Segments D1 and D2. The welding was performed the welding operator Jordan Hazeleaar ID-2135 utilizing the WPS identified as ABF-WPS-D15-4042B-1 Rev. 0. The WPS was also used by the QC inspector Bonifacio Daquinag, Jr. during the QC verification of the DCEP welding parameters which were observed and noted by the QAI: 560 amps, 31 volts and the travel speed was measured as 420mm. The surface temperatures were maintained during the CJP welding and were noted by the QAI as 60 degrees Celsius minimum preheat temperature and the maximum interpass temperature of 230 degrees Celsius. Later in the shift the welding of the bottom plate splice was resumed utilizing the semi-automatic FCAW-G process at the designated areas identified as weld segments D1 and D2. The welding was performed by James Zhen ID-6001 and Songtao Huang ID-3794 utilizing the WPS identified as ABF-WPS-D15-3040B-1 Rev.0. The QC inspector, Mr. Daquinag, monitored and performed the in process weld inspection verification of the average welding parameters and were observed and noted by the QAI as follows: 237amps, 23.4 volts and the travel speed measured at 392mm/minute. The surface temperatures were maintained and monitored by the QC inspector.

### QA Observation and Verification Summary

The QA inspector observed the SMAW, FCAW-G and the SAW welding of the E1/E2 and E2/E3 field splice utilizing the WPS's as noted above which appeared to be posted at the weld station. The welding parameters and preheat temperatures were verified and noted 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 consumables utilized during the scheduled shift appeared to comply with the contract documents. The welding, QC inspection and UT performed on this shift was not completed except as noted above and appeared to be in general compliance with the contract documents. The QAI randomly verified the QC inspection, the welding parameters and surface temperatures utilizing various inspection equipment and gages, a Fluke 337 Clamp Meter and Tempilstik Temperature indicators.

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The QAI also performed a random ultrasonic verification test of the Complete Joint Penetration (CJP) groove weld identified as WN: 1E-2E-A, Weld Segment A5. A total area of approximately 10% was ultrasonically tested to verify the weld and testing by QC meet the requirements of the contract documents. The QAI utilized the first and second leg during the UT verification. An ultrasonic test report, TL6027, was generated for this date.

The QAI also performed random verification Magnetic Particle Testing (MPT) of the CJP groove weld identified as WN: 1E-2E-A, Weld Segment A5. A total area of approximately 10% of the 100% tested by QC was verified. The testing was conducted to verify that the welds and testing by QC comply with the contract documents. The MPT utilized the DC and AC modes with an approximate prod spacing of 6 inches. A MPT report, TL-6028 was generated on this date.

See digital photographs, below, illustrate the work observed during this shift.



### Summary of Conversations:

There were no pertinent conversations discussed in regards to the project except as noted above.

### 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

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**Reviewed By:** Levell, Bill

QA Reviewer