

**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-014699**Date Inspected:** 10-Jun-2010**Project Name:** SAS Superstructure**OSM Arrival Time:** 1100**Prime Contractor:** American Bridge/Fluor Enterprises, a JV**OSM Departure Time:** 1930**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). Field Splice W3/W4
- C). Field Splice W4/W5
- D). Field Splice E1/E2 and E2/E3

A). Field Splice W1/W2

The QAI observed Chun Fai Tsui ID-3426 perform the repair welding of the areas marked as UT rejects on the longitudinal stiffener Complete Joint Penetration (CJP) groove welds identified as WN: 1W-2W-D-S5 and S8. Also at the conclusion of the excavations the QC technician Tom Pasqualone 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 3.2mm electrode as per the Welding Procedure Specification (WPS) identified as ABF-WPS-1000 Repair Rev. 1. The WPS was also used by the QC inspector, Mr. Pasqualone as a reference to monitor and verify the Direct Current welding parameters and were noted as 126 amps. The welding was performed in the vertical position (3G) with the work positioned approximately in the vertical plane with the groove approximately vertical and the weld progression up.

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The QAI also observed James Zhen ID-6001 perform the repair welding of the areas marked as UT rejects on the longitudinal stiffener Complete Joint Penetration (CJP) groove welds identified as WN: 1W-2W-D-S11. The repair welding was performed utilizing the Shielded Metal Arc Welding (SMAW) process and 3.2mm electrode as per the Welding Procedure Specification (WPS) identified as ABF-WPS-1000 Repair Rev. 1. The WPS was also used by the QC inspector, Mr. Pasqualone as a reference to monitor and verify the Direct Current welding parameters and were noted as 125 amps. The welding was performed in the vertical position (3G) with the work positioned approximately in the vertical plane with the groove approximately vertical and the weld progression up. Also at the conclusion of the excavations the QC technician Tom Pasqualone 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.

## B). Field Splice W3/W4

The QAI observed the automatic Flux Cored Arc Welding (FCAW-G) on the "A" face of the weld joint identified as Weld Number (WN) 3W-4W-C, Segment C1. The welding was performed by welding personnel Song Tao Huang, ID-3794 utilizing the WPS ABF-D15-3042A-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 Bernie Docena as a reference to monitor and verify the Direct Current Electrode Positive (DCEP) welding parameters which was noted and recorded by the QAI as follows: 242 amps, 23.5 volts and a travel speed measured as 320mm/ minute. The welding was performed in vertical position (3G) at an approximate incline of 22 degrees. The QAI inspector also verified the minimum preheat temperature of 60 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.

## C). Field Splice W4/W5

The QAI observed the Submerged Arc Welding (SAW) process of the deck plate field splice identified as Weld Number (WN): 4W-5W-A, Segments 1A-3A. The welding was performed by the welding operator Mike Maday ID-3391 utilizing the Welding Procedure Specification (WPS) ABF-WPS-D15-4042B-1 Rev. 0. The WPS was also used by the AB/F Enterprises Quality Control (QC) Inspector Steve McConnell as a QC reference to verify the Direct Current Electrode Positive (DCEP) welding parameters during the Complete Joint Penetration (CJP) groove welding of the transverse field splice. The QAI observed the QC inspector verifying the welding parameters and were noted as follows: 573 amps, 33.0 volts and a travel speed measured at 389mm per minute. The surface temperatures and the calculation of the heat input were also verified by the QC inspector and were noted as follows: the minimum preheat temperature of 60 degrees Celsius, the maximum interpass temperature of 230 degrees Celsius and the heat input of 2.9 kj/mm.

The QAI also observed the Submerged Arc Welding (SAW) process of the deck plate field splice identified as Weld Number (WN): 4W-5W-A, Segments 3A-5A. The welding was performed by the welding operator Bryce Howell ID-5591 utilizing the Welding Procedure Specification (WPS) ABF-WPS-D15-4042B-1 Rev. 0. The WPS was also used by the AB/F Enterprises Quality Control (QC) Inspector Leonard Cross as a QC reference to verify the Direct Current Electrode Positive (DCEP) welding parameters during the Complete Joint Penetration (CJP) groove welding of the transverse field splice. The QAI observed the QC inspector verifying the welding

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parameters and were noted as follows: 581 amps, 33.0 volts and a travel speed measured at 386mm per minute. The surface temperatures and the calculation of the heat input were also verified by the QC inspector and were noted as follows: the minimum preheat temperature of 60 degrees Celsius, the maximum interpass temperature of 230 degrees Celsius and the heat input of 2.9 kJ/mm. The welding of the deck plate splice was completed during this shift.

### D). Field Splice E1/E2 and E2/E3

The QAI observed the excavation of the unacceptable discontinuities discovered during the Ultrasonic Testing (UT) performed by the QC Technician, Jesse Cayabyab. The weld joints were identified as WN: 1E-2E-D and 2E-3E-D. The excavations were performed by welding personnel Fred Kaddu ID-2188 utilizing a 4" high cycle grinder and a rotary file to remove the defects. At the conclusion of the excavations the QC inspector, William Sherwood performed a visual inspection and a Magnetic Particle Test of the areas. No reject able indications were noted by the QC inspector and Mr. Kaddu commence the welding of the excavations utilizing the WPS identified as ABF-WPS-D15-1000-Repair Rev. 2. The QAI verified the DCEP welding parameters as 142 amps and the minimum preheat 60 degrees Celsius and the maximum interpass temperature of 230 degrees Celsius. The welding The work was positioned in an approximately horizontal plane with the weld metal deposited from the upper side. Later in the shift the QAI observed at random intervals the QC inspector monitoring and verifying the welding parameters.

### 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's 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 FCAW-G, SAW and SMAW process appeared to comply with the AWS Specification and AWS Classification. The QC inspection, testing and welding performed on this shift was not completed, except as noted, 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 also performed a random ultrasonic verification test of the Complete Joint Penetration (CJP) groove weld identified as WN: 1E-2E-D and 2E-3E-D. 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 examination was performed in the first and second leg and a ultrasonic test report, TL6027, was generated on this date.

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 no pertinent conversations were discussed in regards to the project.

## 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