

**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-018407**Date Inspected:** 23-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 W7/W8
- B). Field Splice W8/W9
- C). Field Splice E7/E8
- D). Field Splice E8/E9
- E). Pipe Supports

A). Field Splice W7/W8

The QAI observed the Flux Cored Arc Welding (FCAW-G) of the weld joint identified as Weld Number (WN) W7-W8-E2. The Complete Joint Penetration (CJP) welding was performed by welding personnel Song Tao Huang, ID-3794 utilizing the WPS ABF-D15-3040B, Rev. 0. The WPS was also used by the QC inspector Steve McConnell as a reference to monitor the welding and to verify the DC welding parameters which were noted and recorded by the QC as follows; 254 amps, 23.3 volts and a travel speed measured at 267 mm/m. The welding was performed in vertical position (3G) at approximate incline of 22 degrees with the weld progression up. The QC 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 welding parameters. The

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CJP welding was not completed during this shift.

## B). Field Splice W8/W9

The QAI observed the continuous tack/seal welding of the backing bar to the deck plate "A" identified as WN: W8-W9-A5. The welding was performed Xiao Jian Wan ID-9677 by utilizing the Shielded Metal Arc Welding (SMAW) process as per the Welding Procedure Specification (WPS) identified as ABF-WPS-D15-F1200A Rev. 0. The WPS was also used by the QC inspector, Bonifacio Daquinag, Jr., to monitor the in process welding and verify the welding parameters. The welding parameters were verified and recorded by Mr. Daquinag as 165 amps. The minimum temperature of 60 degrees Celsius and the maximum interpass temperature of 230 degrees Celsius was also verified and recorded by the QC inspector. The welding performed in the horizontal position (2F) with the work placed so that the weld metal appeared to be deposited on the upper side of the horizontal surface and against the vertical surface. The welding of the deck plate to the backing bar was completed during this shift.

## C). Field Splice E7/E8

The QAI observed the continued Flux Cored Arc Welding (FCAW-G) of the weld joint identified as Weld Number (WN) 7E-8E-E1 and E2. The Complete Joint Penetration (CJP) was performed by the welder /operators Rory Hogan ID-3186 and Jeremy Dolman ID-5042 utilizing the WPS ABF-WPS-D15-3110-4. The WPS was also used by the QC inspector Mike Johnson as a reference when monitoring the welding and verifying the welding parameters which were observed as follows: 245 amps, 23.6 volts and a travel speed measured as 184 mm. The QC inspector also verified the minimum preheat temperature of 60 degrees Celsius and the maximum interpass temperature of 230 degrees Celsius. The welding was performed in the overhead (4G) position with the work at approximate incline of 22 degrees with the weld progression upward. The CJP welding of the "B" face of the joint was not completed during this scheduled shift.

## D). Field Splice E8/E9

The QAI observed the excavation of the unacceptable discontinuities on the deck plate field splice identified as WN: 8E-9E-A1, repair cycle # R1. The rejectable discontinuities were discovered during the Ultrasonic Testing (UT) performed by the QC technician, Tom Pasqualone, which appeared to travel in the longitudinal direction of the weld axis. The excavations of the rejected areas was performed by AB/F personnel Mick Chan 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; Segment A1, Y=2785 mm and Y=2983 mm. The welding was performed by Wai 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 132 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 flat (1G) position utilizing a 3.2 mm low hydrogen electrode. The welding of the repairs was not completed during the scheduled shift. The QAI also verified the dimensions of the excavations and were noted and recorded as follows;

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Segment A2, Y=2785 mm, L=115 mm, d=13 mm and Segment A2, Y=2985 mm, L=115 mm, d=12.

Later in the shift at the request of the QC Field Supervisor, Bonifacio Daquinag, the QAI verified the assembly fit-up of the edge plate field splice identified as WN: 8E-9E-B1. Prior to the inspection Mr. Daquinag informed the QAI of a planar misalignment of the field splice. The misalignment of 4 mm appeared to be located at the Y coordinate noted at 830 mm with an approximate length measured at 140 mm. At the conclusion of the inspection the QAI concurs with the QC assessment. The QC department will generate the appropriate documentation and submit for review regarding the planar misalignment of the field splice. The QAI will follow up regarding this issue at a later date.

### E). Pipe Supports

The QAI observed the fillet welding of the pipe supports located along the pier column at W2-W1, which was performed by David Garcia ID-8789 utilizing a 3.2 mm electrode as per the Welding Procedure Specification (WPS) identified as Fillet Murex. The fillet welding was performed in vertical (3F) position utilizing a 3.2 mm electrode. The QC inspection was performed by Mike Johnson utilizing the WPS to monitor the welding and to verify the amperage. The welding and inspection of the pipe supports was not completed during this shift.

### Quality Control Inspection Request

At the request of Quality Control Field Supervisor, Bonifacio Daquinag, the QAI randomly verified the visual appearance of the CJP field splice weld identified as WN: 3E-PP19.5-E5-LS-East and West including the south transverse stiffener and the erection access hole insert plates identified as WN: 3E-PP20-E4-W1 and W2 to verify that the welding and visual inspection performed by QC meet the requirements of the contract documents. At the conclusion of the QAI verification it appeared that the weld and the QC inspection is in compliance.

### 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.

## 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