

**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-012732**Date Inspected:** 20-Mar-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 Contents in Report**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 E2 to E3.
- B). Welding of the Field Splice E1 to E2
- C). QC MPT/UT of the Field Splice E2 to E3

A) Field Splice E2/E3, WN: 2E-3E-B

The QAI observed the Complete Joint Penetration (CJP) groove welding of the edge plate field splice identified as Weld Number (WN): 2E-3E-B. The welding was performed by the AB/F welding personnel James Zhen ID-6001, utilizing the Flux Cored Arc Welding (FCAW-G) process, with the welding progression in the vertical up position (3G), as per the Welding Procedure Specification (WPS) ABF-WPS-D15-3042B-3 Rev. 0 and the AWS D1. 5-2002 Chapter 5/Section 5.12. The WPS was also used by the AB/F Quality Control (QC) Inspector Bonifacio Daquinag as a reference to perform QC verification of the Direct Current Electrode Positive (DCEP) welding parameters during the CJP groove welding of the edge plate field splice. Later in the shift the QAI observed the QC inspector verifying the welding parameters of each welder and were noted as follows: 226 amps, 22.9 volts and a travel speed measured at 143 mm/minute. The QC inspector also monitored the surface temperatures during the field welding and the following was observed and noted by the QAI: the minimum preheat temperature of 60 degrees Celsius and the maximum interpass temperature of 230 degrees Celsius.

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## WELDING INSPECTION REPORT

( Continued Page 2 of 4 )

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The QAI also observed the CJP groove welding of the side plate field splice identified as 2E-3E-C performed by AB/F welding personnel Mitch Sittinger ID-0315. During the welding, Mr. Sittinger utilized the FCAW-G as per the WPS identified as ABF-WPS-D15-3042A-1 Rev. 0, which was also used by the QC inspector as a reference to verify the DCEP welding parameters and were observed and noted by the QAI as follows: 244 amps, 24.5 volts and the travel speed measured at 290 mm/minute. The surface temperatures were verified by the QAI inspector and were noted as follows: the minimum preheat temperature of 60 degrees Celsius and the maximum interpass temperature of 230 degrees Celsius.

### B) Field Splice 1E-2E-F

The QA inspector observed the removal of the backing bar and the backgouging process on face "B" of the CJP groove weld identified as 1E-2E-F, Segment F1. The backgouging was performed by the welder Chun Fai Tsui ID-3426 utilizing a barrel grinder with a rotary file attachment.

Later in the shift the QAI inspector observed the continued backgouging of the bottom deck splice identified as 1E-2E-D, Segments D1 and D2. The backgouging was performed by AB/F personnel Salvador Sandoval utilizing the plasma arc cutting process.

### C) Field Splice 2E-3E-A/QC-UT

The QAI also observed the continued Ultrasonic Testing (UT) of the transverse CJP weld on deck plate field splice identified as WN: 3E-2E-A, Weld Segment A2. The testing was performed by the QC technicians Steve McConnell and Tom Pasqualone utilizing a USM 35 and a US-52L, manufactured by Krautkramer. The QAI observed the UT technicians perform the required longitudinal and shear wave scanning technique during the testing which was performed utilizing 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. The technicians performed the testing utilizing the longitudinal and transverse scanning techniques as per the UT Procedure identified as SE-UT-D1.5-CT-100 Rev.4.

### C) Field Splice 2E-3E-A/QC-MPT

The QAI also observed the Magnetic Particle Testing (MPT) of the transverse weld deck splice identified as 2E-3E-A, Weld Segment A4 performed by the QC technician Jesse Cayabyab. At the conclusion of the testing there were no rejectable indications noted by the QC technician. The testing equipment and procedure utilized by Mr. Cayabya to perform the testing appeared to be identified as a AC/DC Contour Probe/Model No. DA-400S, a product manufactured by Parker Research Corporation and the MPT procedure identified as SE-MT-CT-D1.5-100 Rev. 4. The above Non-Destructive Testing (NDT) was completed during this shift. See QA Observation and Verification Summary regarding QAI verification.

### QA Observation and Verification Summary

The QA inspector observed the QC activities and the FCAW-G process of the E2/E3 field splices utilizing the WPS's as noted above which appeared to be posted at the weld station. The welding parameters and surface

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# WELDING INSPECTION REPORT

( Continued Page 3 of 4 )

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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 1.4 mm diameter consumables identified as ESAB Dual Shield 70 Ultra Plus was utilized during the welding of the CJP groove welds and appeared to be in compliance with the AWS Specification A5.20 and the AWS Classification E71T-1M. The QC inspection, testing and welding performed on this shift was not completed, except as noted above, appeared to be in general compliance with the contract documents. The QAI randomly verified the QC inspection, testing and the welding parameters and surface temperatures utilizing various inspection equipment and gages, a Fluke 337 Clamp Meter and Tempilstik Temperature indicators.

The QAI also performed a random MPT verification test of the Complete Joint Penetration (CJP)groove weld identified as WN: 2E-3E-A, Weld Segment A4. A total area of approximately 10% was tested to verify the weld and testing performed by QC meet the requirements of the contract documents. The QAI performed the test in two (2) directions (longitudinal and transverse axis)during the performance of the QAI MPT verification. An Magnetic Particle Test report, TL6028, was generated on this date.

The QAI also performed a random ultrasonic verification test of the Complete Joint Penetration (CJP)groove weld identified as WN: 1E-2E-B, Weld Segment B1. 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 performed UT verification between the linear dimensions 0 mm and 300mm as noted on the steel deck. The examination was performed in the first and second leg and a ultrasonic test report, TL6027, was generated on this date.

The digital photographs below illustrates the work observed during this scheduled 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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# WELDING INSPECTION REPORT

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**Inspected By:** Reyes,Danny

Quality Assurance Inspector

**Reviewed By:** Levell,Bill

QA Reviewer