

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-016046**Date Inspected:** 03-Aug-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 W1/W2
- B). Field Splice W2/W3
- C). Field Splice W4/W5
- D). Field Splice E1/E2
- E). Field Splice E3/E4

A). Field Splice W1/W2

The QAI observed the continued excavations of the unacceptable discontinuities discovered during the Ultrasonic Testing (UT) of bottom plate field splice identified as 1W-2W-D2. The excavations were performed by Ken Chappell and the welding was performed by Xiao Jian Wan ID-9677. The machining of the excavations was performed utilizing a high cycle grinder to remove the defects. 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 the 3.2mm 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, Mr. Pasqualone, as a reference to monitor and verify the Direct Current welding parameters which were noted as 142 amps. The welding was

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performed in the flat (1G) position with the work approximately in the horizontal plane and the weld metal deposited from the upper side. The minimum preheat temperature of 60 degrees Celsius and the maximum interpass temperature of 230 degrees Celsius was monitored and maintained by the QC inspector during the repair welding.

The QAI also observed the continued excavations of the unacceptable discontinuities on the bottom plate field splice identified as 1W-2W-D2. The excavations and repair welding were performed by James Zhen ID-6001. The machining of the excavations was performed utilizing a high cycle grinder to remove the defects. At the conclusion of the excavations the QAI observed the QC technician William Sherwood perform the Magnetic Particle Test (MPT) of the excavated areas, which were machined to a bright metal, 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 the 3.2mm 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, Mr. Sherwood, as a reference to monitor the welding and verify the Direct Current welding parameters which were noted as 142 amps. The welding was performed in the overhead (4G) position the work in a fixed position, approximately in a horizontal plane and the weld metal deposited from the under side. The minimum preheat temperature of 60 degrees Celsius and the maximum interpass temperature of 230 degrees Celsius was monitored by the QC inspector during the repair welding.

Later in the shift the QAI observed Steve McConnell perform Ultrasonic Testing (UT) of the R2 repairs on the edge plate field splice identified as WN: 1W-2W-F1. The testing was performed by the QC technician utilizing the UT Procedure identified as SE-UT-D1.5-CT-100 Rev.4. The QC technician performed the required shear wave testing for weld soundness which was performed utilizing a .75 x .75 rectangular transducer. The ultrasonic testing of the two (2) repairs were completed and were rejected by the QC technician and are now in the R3 cycle category. QC Field Supervisor, Mike Johnson, generated the appropriate documentation which was forwarded to document control personnel, William Norris, for review and will be forwarded to the Welding Quality Control Manager, James Bowers.

B). Field Splice W2/W3

The QAI also observed the continued excavations of the unacceptable discontinuities on the bottom plate field splice identified as 1W-2W-D2. The repair welding was performed by Fred Kaddu ID-2188. The machining of the excavations was performed by Ken Chappell utilizing a high cycle grinder to remove the defects. At the conclusion of the excavations the QAI observed the QC technician William Sherwood perform the Magnetic Particle Test (MPT) of the excavated areas, which were machined to a bright metal, 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 the 3.2mm 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, Mr. Sherwood, as a reference to monitor the welding and verify the Direct Current welding parameters which were noted as 135 amps. The welding was performed in the overhead (4G) position the work in a fixed position, approximately in a horizontal plane and the weld metal deposited from the under side. The minimum preheat temperature of 60 degrees Celsius and the maximum interpass temperature of 230 degrees Celsius was monitored by the QC inspector during the

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repair welding.

C). Field Splice W4/W5

The QAI also observed the Complete Joint Penetration (CJP) welding at the side plate connection identified as WN: 4W-5W-E2. The welding was performed by Song Tao Huang ID-3794 utilizing the Flux Cored Arc Welding (FCAW-G) as per the Welding Procedure Specification (WPS) identified as ABF-WPS-D15-3040A, Rev. 0 which was also used by the QC inspector, John Pagliero, to monitor the in process welding and verify the DCEP welding parameters. The welding parameters were verified and recorded by the QC inspector as 257 amps, 23.8 volts and a travel speed measured at 287 mm/minute. The minimum preheat temperature of 60 degrees Celsius and maximum interpass temperature of 230 degrees Celsius were also noted and recorded by the QC inspector and verified by the QAI. The CJP welding was performed in the vertical (3G) position with the worked positioned in an approximate fixed incline of 22 degrees and was performed from the "A" face of the weld joint.

D). Field Splice E1/E2

The QAI observed the removal of paint on the deck plate field splice identified as 1E-2E-A. The removal of the paint was required due the fact that the initial Ultrasonic Testing (UT) of the repairs was performed prior to the required twenty-four (24) hold time was not honored. The Magnetic Particle Testing was performed by Bonifacio Daquinag, Jr. and the UT testing was performed by Steve McConnell and no rejectable flaws were noted at the following areas; Segment A2, Y=4605mm to 4695mm, Segment A3, Y=180mm to 260mm, Y=324mm to 414mm, Y=5280mm to 5420mm, Segment A4, Y=4897mm to 4997mm.

E). Field Splice E3/E4

The QAI observed Jesse Cayabyab perform Ultrasonic Testing (UT) of the repairs on the bottom plate field splice identified as WN: 3E-4E-D1 and D2. The testing was performed by the QC technician utilizing the UT Procedure identified as SE-UT-D1.5-CT-100 Rev.4. The QC technician performed the required shear wave technique during the testing for weld soundness which was performed utilizing a .75 x .75 rectangular transducer. The ultrasonic testing of four (4) repairs was completed during this shift. The QAI also observed and verified the QC technician performing the calibration of the G.E./Krautkramer UT instrument, USM-35X, utilizing a metric IIW Calibration Block. See QA Observation and Verification Summary regarding QAI UT verification.

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 processes 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.

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The QAI performed a weld verification as per the Request for Information (RFI) document identified as ABF-RFI-00611R00 regarding the multi-pass fillet welds at the floor beam web to skin plate weld at the E3 Orthotropic Box Girder (OBG) suspender brackets located at various areas as noted in the RFI. The QAI performed this task to verify the fillet welds along girder Face "B", for 1100mm from the OBG corner on girder Face "A", and for 800mm from the OBG corner on girder Face "C". At the conclusion of the QAI verification no issues were noted on the OBG identified as E3, PP20 and PP22.

The QAI also performed an Ultrasonic Test (UT) on the repairs of the bottom field splice weld identified as WN: 3E-4E-D1 and D2. The repaired areas were tested 100% to verify that the welds and testing by QC meet the requirements of the contract documents. The examination was performed as per the contract documents and a ultrasonic test report, TL-6027 was generated on this date.

The digital photographs below illustrate the work observed during this scheduled shift.



Summary of Conversations:

There were general conversations with Quality Control Inspector Mike Johnson at the start of the shift regarding the location of American Bridge/Fluor welding personnel and inspection/ N.D.E. testing scheduled for this shift.

At approximately 1430, the QAI was requested by QC inspector, Jesse Cayabyab, to perform a UT inspection on four repairs on the bottom plate field splice identified as E3-E4-D1 and D2. The QAI contacted QC Supervisor, Leonard Cross, regarding this request and the QAI was verbally informed by Mr. Cross to proceed with QAI UT verification of the repairs.

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.

Inspected By: Reyes, Danny

Quality Assurance Inspector

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Reviewed By: Levell,Bill

QA Reviewer