DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
Office of Structural Materials
Quality Assurance and Source Inspection

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Contract #: 04-0120F4
Cty: SF/ALA Rte: 80 PM: 13.2/13.9
File #: 1.28

WELDING INSPECTION REPORT

Resident Engineer: Siegenthaler, Peter
Address: 333 Burma Road
City: Oakland, CA 94607

Report No: WIR-017448
Date Inspected: 14-Oct-2010

Project Name: SAS Superstructure
Prime Contractor: American Bridge/Fluor Enterprises, a JV
Contractor: American Bridge/Fluor Enterprises, a JV

OSM Arrival Time: 1000
OSM Departure Time: 1830
Location: Job Site

CWI Name: See Below

Inspected CWI report:	☐ Yes	☑ No	☐ N/A	**CWI Present:**	☑ Yes	☐ No	
Electrode to specification:	☑ Yes	☐ No	☐ N/A	**Rod Oven in Use:**	☑ Yes	☐ No	☐ N/A
Qualified Welders:	☑ Yes	☐ No	☐ N/A	**Weld Procedures Followed:**	☑ Yes	☐ No	☐ N/A
Approved Drawings:	☑ Yes	☐ No	☐ N/A	**Verified Joint Fit-up:**	☑ 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 E6/E7
B). Field Splice W7/W8
C). Ventilation Access Hole
D). Erection Access Hole
E). Longitudinal Stiffeners

A). Field Splice E6/E7

The QAI observed the continued removal of the backing bar performed by the welders Rory Hogan and Jeremy Dolman. At the conclusion of removing the backing bar the backing gouging process commenced. This work was performed on the "B" face of the weld joint identified as WN: 6E-7E-D1 and D2. The removal of the backing bar was performed utilizing the plasma arc cutting method.

B). Field Splice W7/W8

The QAI observed the excavations of the unacceptable discontinuities on the deck plate field splice identified as WN: 7E-8E-A1, repair cycle # 1, Flaw #1 and Flaw #2. The rejectable discontinuities were discovered during the Ultrasonic Testing (UT) performed by the QC technician, Tom Pasqualone and appeared to travel in the

longitudinal direction of the weld axis. The excavation was performed by welding personnel Fred Kaddu ID-2188 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 excavation the QC inspector, Mr. Pasqualone, performed a visual inspection and a Magnetic Particle Test (MPT)of the areas and no rejectable indications were noted. At this time the welder commenced the repair welding 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 135 amps and the minimum preheat temperature 40 degrees Celsius and the maximum interpass temperature of 230 degrees Celsius which appeared to comply with the contract documents. The 3.2 mm electrode was utilized with the welding performed in the flat (1G) position with the work in an approximately horizontal plane and the weld metal deposited from the upper side. Prior to the welding the QAI verified the dimensions of the excavations and were noted and recorded as follows; Flaw # 1, Y=52 mm, L=122 mm and d=21.5 mm; Flaw #2, Y=280 mm, L=130 mm and d=21 mm. The welding and the QC inspection was completed during this shift.

Later in the shift, the QAI verified the dimensions and the Y coordinates of the excavations which noted and recorded as follows; Flaw #3, Y=595 mm, L=100 mm and d=21 mm; Flaw #4, Y=750 mm, L=110 mm and d=21 mm.
The QAI also observed the excavations of the unacceptable discontinuities on the deck plate field splice identified as WN: 7E-8E-A2, repair cycle # 1, Flaw #5, Flaw #6 and Flaw #7. The rejectable discontinuities were discovered during the Ultrasonic Testing (UT) performed by the QC technician, Tom Pasqualone and appeared to travel in the longitudinal direction of the weld axis. The excavation was performed by welding personnel Fred Kaddu ID-2188 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 excavation the QC inspector, Mr. Pasqualone, performed a visual inspection and a Magnetic Particle Test (MPT)of the areas and no rejectable indications were noted. At this time the welder, Mr. Kaddu commenced the repair welding 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 40 degrees Celsius and the maximum interpass temperature of 230 degrees Celsius which appeared to comply with the contract documents. The 3.2 mm electrode was utilized with the welding performed in the flat (1G) position with the work in an approximately horizontal plane and the weld metal deposited from the upper side. Prior to the welding the QAI verified the dimensions of the excavations and were noted and recorded as follows; Flaw # 5, Y=3880 mm, L=120 mm and d=12.5 mm; Flaw # 6, Y=4775 mm, L=100 mm and d=14 mm; Flaw # 7, Y=4960 mm, L=160 mm and d=12 mm. The welding and the QC inspection was completed during this shift.

The 3.2 mm electrode was utilized with the welding performed, during the repair welding, in the flat (1G) position with the work placed in an approximately horizontal plane and the weld metal deposited from the upper side.

C). Ventilation Access Hole

The QAI observed the welding and the weld profile grinding of the ventilation access hole, insert plate, identified as WN: 2E-PP17.5-E2-SE. The welding was performed by, Wai Kitlai ID-2953, utilizing the Shielded Metal Arc Welding (SMAW) as per the Welding Procedure Specification (WPS) identified as ABF-WPS-D15-1010, Rev. 1. The WPS was also utilized by the QC inspector Patrick Swain as a reference to monitor the welding and verify the

Direct Current Electrode Positive (DCEP) welding parameters which was recorded as 195 amps by the QC inspector. The 4.0 mm electrode was utilized with the welding performed in the flat (1G) position with the work in an approximately horizontal plane and the weld metal deposited from the upper side. The minimum preheat temperature of 40 degrees Celsius and the maximum interpass temperature of 230 degrees Celsius were verified by the QC inspector. The welding was completed during this shift.

D). Erection Access Hole

The QAI observed the repair welding on the weld joint identified as Weld Number (WN): 1E-PP11-E3-W3 on the "A" deck of the Orthotropic Box Girder (OBG) E1. The Shielded Metal Arc Welding (SMAW) process was utilized by the welder Darcel Jackson ID-9967 as per the Welding Procedure Specification (WPS) ABF-WPS-D15-1001Repair, Rev. The WPS was also utilized by the QC inspector Patrick Swain as a reference to monitor the welding and verify the Direct Current Electrode Positive (DCEP) welding parameters which was recorded as 200 amps by the QC inspector. The 4.0 mm Lincoln electrode was utilized with the welding performed in the flat (1G) position with the work placed in an approximately horizontal plane and the weld metal deposited from the upper side. The minimum preheat temperature of 20 degrees Celsius and the maximum interpass temperature of 230 degrees Celsius were verified by the QC inspector.

E). "A" Deck Longitudinal Stiffeners

The QAI observed the welder, Xiao Jian Wan ID-9677, perform the CJP groove welding on the longitudinal stiffener field splice identified as WN: 2E-PP13.5-E2-LS-West, located at the ventilation access hole. The welder utilized the SMAW process as per the Welding Procedure Specification (WPS) identified as ABF-WPS-D15-1012-3, Rev.0 and was also utilized by the QC inspector John Pagliero as a reference to monitor welding and verify the DC welding parameters. The amperage was recorded as 125 amps and the minimum preheat of 100 degrees Celsius and the maximum interpass temperature of 230 degrees Celsius was observed and verified.

The welding was performed in the vertical (3G) position with the work placed in an approximately vertical plane and the groove approximately vertical. The welder utilized a slag hammer, pneumatic air gun with an attached chisel and a wire wheel attached to a 4" high cycle grinder to remove slag after deposit of each fill pass. The electrodes were stored in electrically heated, thermostatically controlled oven after removal from sealed containers. The exposure limits of the electrodes identified as E9018-H4R and the minimum storage oven temperature of 250 degrees Celsius appeared to be in compliance with the contract documents. At the time of the observation no issues were noted by the QAI.

Later in the shift the QAI observed the welder, Hua Qiang Hwang ID-2930, performed the CJP groove welding on the longitudinal stiffener field splice identified as WN: 1E-PP10.5-E2-LS-West. The welder utilized the SMAW process as per the Welding Procedure Specification (WPS) identified as ABF-WPS-D15-1012-3, Rev.0 and was also utilized by the QC inspector Patrick Swain as a reference to monitor the welding and verify the DC welding parameters. The amperage was recorded as 127 amps and the minimum preheat of 100 degrees Celsius and the maximum interpass temperature of 230 degrees Celsius was verified.

The welding was performed in the vertical (3G) position with the work placed in an approximately vertical plane

and the groove approximately vertical. The welder utilized a slag hammer, pneumatic air gun with an attached chisel and a wire wheel attached to a 4" high cycle grinder to remove slag after deposit of each fill pass. The electrodes were stored in electrically heated, thermostatically controlled oven after removal from sealed containers. The exposure limits of the electrodes identified as E9018-H4R and the minimum storage oven temperature of 250 degrees Celsius appeared to be in compliance with the contract documents. At the time of the observation no issues were noted by the QAI.

The QAI also observed that the preheat temperatures were achieved and maintained utilizing electric resistance heating bands for the entire length of the weld. The heaters were be controlled by attached thermocouples. For additional information regarding the preheat temperatures, See Summary of Conversations paragraph 2.

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 below illustrate the work observed during this scheduled shift.

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.

At approximately 1500, Dan Ieraci ABF, Welding Supervisor, contacted and informed the QAI that the heat induction system would remain on and the preheat would be continuous throughout the welding operation.

WELDING INSPECTION REPORT

(Continued Page 5 of 5)

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
Reviewed By:	Levell,Bill	QA Reviewer