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-025343
Date Inspected: 22-Jul-2011

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

OSM Arrival Time: 700
OSM Departure Time: 1530
Location: Job Site

CWI Name: Steve McConnell

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: OBG Sections

Summary of Items Observed:

This Quality Assurance (QA) Inspector, Craig Hager was on site at the job site between the times noted above. This QA Inspector was on site to randomly observe Quality Control (QC) personnel perform Non-Destructive Testing (NDT) and monitor American Bridge/Fluor (ABF) welding operations. This Quality Assurance (QA) Inspector, Craig Hager observed the following.

Tower Shear Plates – Electro Slag Welding (ESW) – weld number W-041:

This QA Inspector was informed by ABF welding personnel Rory Hogan (#3186) the Electro Slag Welding (ESW) of the shear plate was anticipated to begin between 1000 to 1100 hours this date.

Prior to the start of ESW this date this QA Inspector observed the following; the bottom slump plate and top run off tabs were welded into position, the consumable guide was centered in the weld joint and held into position with ceramic insulators approximately 150 mm apart (one on each side of the guide). See photo below of bottom section of weld joint. This QA Inspector was informed by QC Inspector Steve McConnell that he had performed the QC check off list with ABF welding personnel Danny Ieraci (#3232) and that all item appeared to comply with the contract requirements. This QA Inspector had been previously informed by QA Inspector Jojo Lizardo that he had performed the verification of the weld joint fit up including the root opening and offset.

1016 hours – This QA Inspector observed the start of the ESW at weld joint number W-041, on the Northeast side of the North Tower. The joint configuration is a skewed Tee joint for use with Welding Procedure Specification (WPS) ABF-WPS-ESW-120T.

1019 hours – The ESW had progressed beyond the bottom slump with all parameters and the sound of the weld appearing normal.

1115 hours – The ESW parameters and sound of the welding appear to be normal. The inlet and outlet temperatures of the cooling water are approximately between 60°F and 70°F with a flow rate of 3.8 Gallons Per Minute (GPM).

1215 hours – The ESW parameters and sound of the welding appear to be normal. The ABF personnel both inside and outside have been "jumping" the welding "shoes" without incident.

1228 hours - This QA Inspector observed there appeared to be an issue attaching the top shoe just jumped to this location, but that it appeared it was attached properly prior to the weld pool reaching the bottom of the shoe. Welding has progressed to approximately 600 mm below the 9 meter diaphragm elevation.

1315 hours – The ESW parameters and sound of the welding appear to be normal.

1415 hours - The ESW parameters and sound of the welding appear to be normal. This QA Inspector has observed QC Inspector Steve McConnell at various location, inside, outside and at the ESW control deck at the 13 meter elevation at various times thru out the ESW this date.

1425 hours – This QA Inspector was located at the 3 meter elevation outside the towers and observed what appeared to be several clouds of steam rising into the air above the ESW joint. This QA Inspector proceeded to the inside location at the 9 meter elevation. This QA Inspector observed various ABF personnel rushing to and from the ESW location. This QA Inspector went around the ESW location to the South in order to prevent impeding any movement of ABF personnel. This QA Inspector arrived inside the North Tower and observed through the access man way that water was spraying profusely from several of the cooling lines and that the water lines were not attached to the welding shoes. This QA Inspector observed water was running down the East side of the North Tower adjacent to the weld joint and that water was reaching the hot weld joint due to the amount of steam and hissing sounds. This QA Inspector observed multiple ABF welding personnel on the access ladders working to control the situation. This QA Inspector observed that welding had not been stopped and that it appeared the weld pool was approximately 1200 mm for the top of the shear plate at this time. This QA Inspector observed that was approximately 1-2 inches (25 -50 mm) of water running across the 9 meter elevation diaphragm plates.

1446 hours – This QA Inspector observed the ESW weld had been completed. Prior to the completion of the welding this QA Inspector observed one more of the welding shoes had been jumped to complete the welding. Shortly after the completion of welding the water supply was shut off and this QA Inspector observed what appeared to be two disconnected cooling lines.

1450 hours – This QA Inspector performed a random visual inspection of the top 2 meters of the ESW weld from the 9 meter diaphragm plate elevation. This QA Inspector did not observe and gross weld defects at this time.

1500 hours- This QA Inspector used an electronic temperature gauge and recorded the following temperatures: at

the top of the shear plate - 430°F, midway between the top of the shear plate and the diaphragm plates at the 9 meter elevation 217°F, at the 9 meter elevation diaphragm plates 130°F.

1505 hours - This QA Inspector used an electronic temperature gauge and recorded the following temperatures: at the top of the shear plate - 380°F, midway between the top of the shear plate and the diaphragm plates at the 9 meter elevation 185°F, at the 9 meter elevation diaphragm plates 120°F.

This QA Inspector had observed Caltrans Engineer Doug Wright was also present and verbally informed him of the temperature readings noted above. Caltrans Engineer Doug Wright informed this QA Inspector he had contacted Caltrans Engineer Mark Woods regarding the loss of cooling water and the water quenching of the weld as noted above and had been informed that ABF may want to proceed with the Post Weld Heat Treatment (PWHT) of this weld as soon as possible.

This QA Inspector notified Lead QA Inspector Bill Levell and Jojo Lizardo of the issues noted above. This QA Inspector had a conversation with Caltrans Engineer Doug Wright regarding a request to obtain a copy of the welding parameters data from ABF to observed items such as the water temperature, water pressure and flow rate.

This QA Inspector had taken several photos during the quenching of the weld in an effort to capture a cloud of steam, but unfortunately none of the photos produced the intended results. See photo below of a typical ESW shoe to note where and how the cooling lines are attached. The cooling lines are attached by sliding the hose over a fitting by hand a mechanical fastener, such as a clamp is not used.

Summary of Conversations:

This QA Inspector had general conversations with American Bridge/Fluor (ABF) and Caltrans personnel during this shift. Except as described above and noted below there were no notable conversations.

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 Nina Choy (510) 385-5910, who represents the Office of Structural Materials for your project.

WELDING INSPECTION REPORT

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Inspected By:	Hager,Craig	Quality Assurance Inspector
Reviewed By:	Levell,Bill	QA Reviewer