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

Bay Area Branch
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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-024271
Date Inspected: 06-Jun-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: 1930
Location: Job Site

CWI Name: Pat Swain

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: SAS Tower

Summary of Items Observed:

Caltrans Office of Structural Material (OSM) Quality Assurance Inspector (QAI) Joselito Lizardo was present at the Self Anchored Suspension (SAS) job site as requested to perform observations on the welding of components for the San Francisco Oakland Bay Bridge (SFOBB) Project.

At Tower Shear Plate to Diaphragm Plate, elevation 9 meters;

At Tower Base Shear Plate (60mm) to Diaphragm Plate (45mm) weld joint #030, this QA Inspector randomly observed ABF personnel Hua Qiang Hwang perform production 1G welding on the Partial Joint Penetration (PJP) of T-joint between the 45mm thick skin plate and 45mm thick diaphragm plate. The welder was using the dual shielded Flux Cored Arc Welding (FCAW-G) with E71T-1M, 1/16” diameter wire electrode and implementing Caltrans approved Welding Procedure Specification (WPS) ABF-WPS-D15-3160-1. The joint fit up was checked and accepted by ABF QC and verified by this QA. This QA Inspector observed ABF personnel using Miller Proheat 35 Induction Heating System to preheat the plates being welded prior to and after welding. This QA Inspector observed QC Inspector Pat Swain using a Fluke infra red temperature gauge to verify the preheat temperature of more than 225°F. This QA Inspector performed a verification of the welding parameters and observed 290 amperes and 24.5 volts with a travel speed of 580 mm per minute with equivalent heat input of 0.735 Kj per mm. The welding appeared to comply with Welding Procedure Specification (WPS) ABF-WPS-D15-3160-1. During the shift, the welder has not completed the PJP weld and should continue tomorrow. At the end of the shift and partially welding the weld joint, ABF personnel were noted covering the weld with heater blanket in preparation for the three hours holding of preheat temperature of more than 225°F as required. ABF personnel were using Miller Proheat 35 Induction Heating System to hold the preheat that was

programmed to shut off after three hours.

At Tower Base South Shaft Skin Plate 'E' to Diaphragm Plate, elevation 9 meters;

At Tower Base South Shaft Skin Plate 'E' to 45mm thick diaphragm plate weld joint #053, this QA Inspector randomly observed ABF personnel Wai Kitlai continuing to perform production 1G welding on the Partial Joint Penetration (PJP) of T-joint between the 60mm thick skin plate 'E' and 45mm thick diaphragm plate. ABF personnel had previously removed the root pass welded (1160mm long) on the weld joint due to porosity that was noted. The welder was noted welding back the root pass with Shielded Metal Arc Welding (SMAW) with 1/8" diameter E7018H4R electrode. After the completion of the SMAW root pass, ABF QC Pat Swain was observed performing the Magnetic Particle Testing (MT) on the welded root pass. The MT was accepted by QC and the welder has switched to Flux Cored Arc Welding (FCAW) and welded the fill pass to cover pass. The welder was using the dual shielded Flux Cored Arc Welding (FCAW-G)) with E71T-1M, 1/16" diameter wire electrode and implementing Caltrans approved Welding Procedure Specification (WPS) ABF-WPS-D15-3160-1. This QA Inspector observed ABF personnel using Miller Proheat 35 Induction Heating System to preheat the plates being welded prior to and after welding. This QA Inspector observed QC Inspector Pat Swain using a Fluke infra red temperature gauge to verify the preheat temperature of more than 225°F. This QA Inspector performed a verification of the welding parameters and observed 265 amperes and 25.0 volts with a travel speed of 420 mm per minute with equivalent heat input of 0.95 Kj per mm. The welding appeared to comply with Welding Procedure Specification (WPS) ABF-WPS-D15-3160-1. The joint was previously welded but portion of it was not welded. During the shift, the welder has completed the PJP weld joint except where the drop in will be installed and welded in place after the Electro Slag Welding of the shear plate. After the completion of the weld joint, ABF personnel were noted covering the weld with heater blanket in preparation for the three hours holding of preheat temperature of more than 225°F as required. ABF personnel were using Miller Proheat 35 Induction Heating System to hold the preheat that was programmed to shut off after three hours.

At Tower Base South Shaft, location 'G' of weld number S-045, ABF welder Hua Qiang Hwang was observed 3G Shielded Metal Arc Welding (SMAW) welding cover repair on this Electro Slag Welding (ESW) welded T-joint. The welder was noted using 1/8" diameter E7018H4R electrode implementing Caltrans approved ABF-WPS-D15-1000 repair. The welder was noted preheating the excavated weld cover to more than 300 °F using propylene gas torch. Location of the repair being welded was noted at Y=2350mm to Y=2440mm. ABF QC Pat Swain was noted monitoring the parameters of the welder. At the end of the shift, repair welding of the weld cover mentioned above was completed.

At Tower Base Elevation 13Meters Shear Plate Electro Slag Welding (ESW);

This QA was present at the Tower Base to observe the Electro Slag Welding of the weld number W-044 located at 'D' position per ABF weld map. The weld joint to be welded is a 60-70mm transition butt joint located at the corner of tower West shaft skin plates 'A' and 'E' and to implement Caltrans approved welding procedure ABF-WPS-ESW-60-70TR.

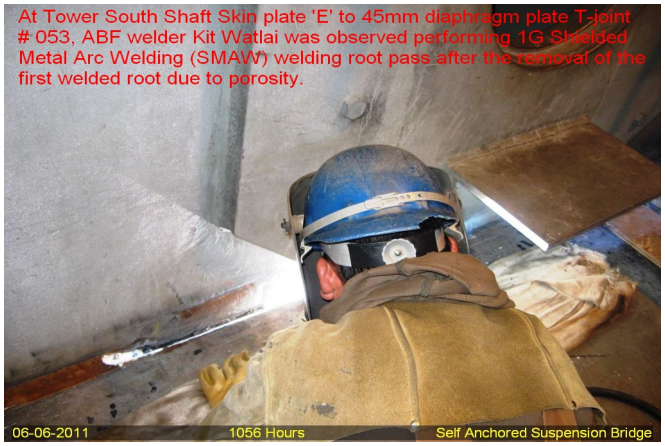
Upon QA's arrival, ABF personnel were noted preparing to weld the shear plate butt joint by checking all the necessary electrical and water hose weld shoe cooling connections are all in place prior to commence ESW. It was noted that three weld shoes were in position at each opposing side of the joint and so with the consumable guide

tube that was placed in between the joint gap which was separated by consumable ceramic insulators.

The fit up alignment was check by ABF QC Pat Swain and verified by fellow QA Danny Reyes. A result of the fit up verification was submitted to ABF for review.

Prior to the start of the ESW, a Check List for the implementation of the ESW was provided by ABF and that it was carried out by ABF Production personnel Mr. Dan Ieraci and ABF QC Pat Swain. Other ABF personnel that were noted assisting the preparation of the ESW include ABF QCM Jim Bowers, ABF Production Manager John Callaghan and Mr. Dan Danks of Oregon Institute of Technology.

Initial firing of the ESW has started at 1407 hours and it was successful and that the welding parameters have stabilized and continued without a hitch until the completion of the joint at 1904 hours. There was no breakdown of welding machines and water cooling system that contributed to the successful completion of the weld joint.



Summary of Conversations:

No significant conversation ocurred today.

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 SMR Nina Choy 510-385-5910, who represents the Office of Structural Materials

for your project.

Inspected By:	Lizardo,Joselito	Quality Assurance Inspector
Reviewed By:	Levell,Bill	QA Reviewer