

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:** Siegenthaler, Peter**Address:** 333 Burma Road**City:** Oakland, CA 94607**Report No:** WIR-024431**Date Inspected:** 16-Jun-2011**Project Name:** SAS Superstructure**OSM Arrival Time:** 700**Prime Contractor:** American Bridge/Fluor Enterprises, a JV**OSM Departure Time:** 1830**Contractor:** American Bridge/Fluor Enterprises, a JV**Location:** Job Site**CWI Name:** Pat Swain and Mike Johnson**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:** 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 #039, 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 shear 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. 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 420 mm per minute with equivalent heat input of 1.02 Kj per mm. The welding appeared to comply with Welding Procedure Specification (WPS) ABF-WPS-D15-3160-1. At the end of the shift, cover pass welding was completed and 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.

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At Tower Base Skin Plate 'B' (45mm) to Diaphragm Plate (45mm) weld joint #051, this QA Inspector randomly observed ABF personnel Hua Qiang Hwang continuing to 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. 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 296 amperes and 25.5 volts with a travel speed of 500 mm per minute with equivalent heat input of 0.9 KJ per mm. The welding appeared to comply with Welding Procedure Specification (WPS) ABF-WPS-D15-3160-1. At the end of the shift, cover pass welding was partially completed along the length of the joint and should continue tomorrow. 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 Electro Slag Welded (ESW) T-joint S-045 at location 'G', ABF welder Han Wen Yu was observed excavating two repairs that have been rejected by Ultrasonic Testing (UT). The location of the repair excavations were at Y=1050mm having excavation profile of 125mm long x 22mm wide x 13mm deep and at Y=4360mm having excavation profile of 115mm long x 18mm wide x 10mm deep. The first repair excavation was already Magnetic Particle Testing (MT) tested while the other repair excavation was still in progress.

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 E-044 located at 'B' position per ABF weld map. The weld joint to be welded is a 60-70mm transition shear plate to Tower East Shaft skin plate (70mm) 'A', butt joint located at the corner of tower East shaft skin plates 'A' and 'E'. ABF intends to implement Caltrans approved welding procedure ABF-WPS-ESW-60-70TR in performing the ESW.

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. Other ABF personnel that were noted assisting the preparation of the ESW include ABF QCM Jim Bowers, ABF Production Manager John Callaghan, Daniel Hester and Mr. Dan Danks of Oregon Institute of Technology.

The fit up alignment was jointly checked by ABF QC Jesse Cayabyab and this QA. The root gap was measured from bottom to top and the result noted was 18mm minimum and 21mm maximum and the offset was measured and exceeded the allowed offset. Results of the fit up inspection/verification were forwarded to ABF and Caltrans for review.

At 1250hours, ABF Operations Superintendent Dan Ieraci and ABF QC Mike Johnson performed the check list verification and noted it was all OK.

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At 1300hours, all ABF personnel involved in the ESW converged and performed a pre-operations meeting reminding each and everyone's role in performing their job. After the meeting, each personnel went to their own respective assignment and positioned themselves and got ready for the start.

Initial firing of the ESW has started at 1311 hours and it was successful and that the welding parameters have stabilized and continued without a hitch until the completion of the joint at around 1720 hours.



At Tower Base Electro Slag Welded (ESW) joint #N-045 at location 'E', ABF QC Steve Mc Connell was noted performing Ultrasonic Testing (UT) on welded T-joint.

06-16-2011 1102 Hours Self Anchored Suspension Bridge



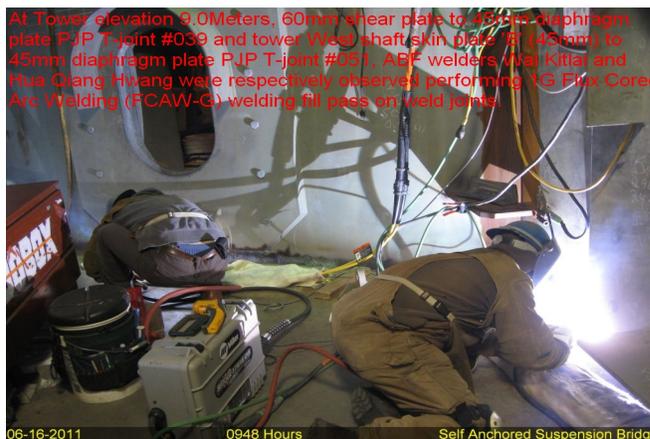
At Tower Base Electro Slag Welding (ESW) of 60mm transition butt joint #E-044 at location 'E', ABF personnel were observed moving the water cooled weld shoe to the next level during the welding operation.

06-16-2011 1701 Hours Self Anchored Suspension Bridge



At Tower Base Electro Slag Welded (ESW) weld joint #S-045 at location 'G', ABF personnel was noted excavating the weld repair at Y=1050mm.

06-16-2011 1330 Hours Self Anchored Suspension Bridge



At Tower elevation 9.0Meters, 60mm shear plate to 45mm diaphragm plate P-JP T-joint #039 and tower web shaft skin plate #1 (45mm) to 45mm diaphragm plate P-JP T-joint #051, ABF welders Wai Kitai and Hua Qiang Hwang were respectively observed performing 1G Flux Cored Arc Welding (FCAW-G) welding fill pass on weld joints.

06-16-2011 0948 Hours Self Anchored Suspension Bridge

Summary of Conversations:

No significant conversation occurred 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