

**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:** Casey, William**Address:** 333 Burma Road**City:** Oakland, CA 94607**Report No:** WIR-027651**Date Inspected:** 24-May-2012**Project Name:** SAS Superstructure**OSM Arrival Time:** 700**Prime Contractor:** American Bridge/Fluor Enterprises, a JV**OSM Departure Time:** 1730**Contractor:** American Bridge/Fluor Enterprises, a JV**Location:** Job Site**CWI Name:** Andrew Keach**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 Base 13 meter diaphragm, ABF welder Xiao Jian Lou was observed continuing to perform 2G (horizontal position) Shielded Metal Arc Welding (SMAW) welding fill pass on 250mm X 250mm X 60mm thick corner stiffener plate shop marked 380 PJP T-joint W140-1. The welder was noted using SMAW with 4.0mm diameter E7018H4R electrode on the fill to cover pass implementing Caltrans approved welding procedure ABF-WPS-D15-1170. The corner stiffener has a 45 degree double bevel configured for a Partial Joint Penetration (PJP) per detail drawing FWT28 of FWDT-2 Field Welding Schedule drawing. The stiffener plate is being welded to the 45mm diaphragm plate on one side and to the tower skin plate on the other side. The welder was noted welding alternately from one side to the other to avoid distortion. Prior welding, the plates were preheated to more than 150°F using propylene gas torch. This QA Inspector observed QC Inspector Andrew Keach using a Fluke infra red temperature gauge to verify the preheat temperature of more than 150°F. This QA Inspector performed a verification of the welding parameters and observed working current of 165 amperes on the 4.0mm diameter electrode. At the end of the shift, the 3G (vertical position) PJP T-joint SMAW welding was completed at 'W' location of North external diaphragm plate.

At Tower Base shear plate above 9 meter between inner West and center external diaphragms, this QA Inspector randomly observed ABF personnel Jin Pei Wang perform 3F (vertical) position fillet welding on the 290mm long X 150mm wide 12mm thick ladder holding bracket. The welder was noted fillet welding the bracket plate to the 60

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mm thick Tower shaft 'E' skin plate E using Shielded Metal Arc Welding (SMAW) with 3.2mm diameter E7018H4R electrode and implementing Caltrans approved Welding Procedure Specification (WPS) ABF-WPS-D15-F1200A. This QA Inspector observed ABF personnel using propylene gas torch to preheat the plates to more than 150°F prior welding. This QA Inspector observed QC Inspector Andrew Keach using a Fluke infra red temperature gauge to verify the preheat temperature of more than 150°F and measured the welding parameters to 124 amperes. At the end of the shift, 10mm fillet welded on both sides of the four (4) holding brackets were completed.

At Tower Base 13 meter outer West external diaphragm, ABF welder Xiao Jian Wan was observed perform buttering on the one side of the PJP T-joint W111 due to excessive root gap as previously reported. The welder was noted buttering where the maximum measured root opening was measured 6.0mm. The welder was noted buttering at overhead position using Shielded Metal Arc Welding (SMAW) with 3.2mm diameter E7018H4R electrode implementing Caltrans approved Welding Procedure Specification (WPS) ABF-WPS-D15- F1200A. The diaphragm plate being buttered was noted preheated to more than 150°F using propylene gas torch. During the shift, buttering on the PJP T-joint W111 was completed. After the buttering completion, ABF QC Andrew was observed performing Visual Test (VT) and Magnetic Particle Testing (MT) and found no relevant indication during the test. This QA also performed MT verification on the same buttering and noted same result.

After the completion of MT, the same welder resumed welding the root pass of the PJP T-joint mentioned above. The welder was noted using the same process but implemented Caltrans approved Welding Procedure Specification (WPS) ABF-WPS-D15-1160. The same QC also monitored the welding parameters during root pass welding. ABF QC Andrew Keach performed the VT/MT after the completion of the root pass and found no relevant indication during the test. This QA performed the same MT verification and noted same result.

This QA noted two ABF welders performed the manual Flux Cored Arc Welding (FCAW-G) welding fill pass on PJP T-joint W111 after the completion of the MT. ABF welders Xiao Jian Wan and Jin Pei Wang were noted 2G (horizontal) position welding side by side using dual shield 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 diaphragm plate and shear plate being welded were noted preheated to more than 225°F using Miller Proheat 35 Induction Heating System. During welding, ABF Quality Control (QC) Andrew Keach was noted monitoring the welding parameters of the welders. Measured welding parameters during welding were 250 amperes, 23.4 volts and 330mm travel speed and 256 amperes, 24.0 volts and 330mm travel speed respectively for Xiao Jian Wan and Jin Pei Wang. At the end of the shift, fill pass welding was still continuing for both welders and should remain tomorrow.

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At Tower Base 13 meter South external diaphragm, ABF QC Andrew Keach was observed performing Magnetic Particle Testing (MT) on welded root pass of the diaphragm to shear plate PJP T-joint W111.



05-24-2012 1331 Hours Self Anchored Suspension Bridge

At Tower Base 13 meter South external diaphragm, ABF welders Xiao Jian Wan and Jin Pei Wang were observed performing side by side 2G (horizontal) position Flux Cored Arc Welding (FCAW-G) welding fill pass on PJP T-joint W111.



05-24-2012 1603 Hours Self Anchored Suspension Bridge

At Tower Base 13 meter, ABF welder Jin Pei Wang was observed performing 2F (vertical) position fillet welding 290mm long X 150mm wide X 12mm thick ladder holding bracket to Tower East Shaft skin



05-24-2012 1025 Hours Self Anchored Suspension Bridge



05-24-2012 1036 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.

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**Inspected By:** Lizardo, Joselito

Quality Assurance Inspector

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**Reviewed By:** Levell, Bill

QA Reviewer