

**DEPARTMENT OF TRANSPORTATION**

DIVISION OF ENGINEERING SERVICES

Office of Structural Materials

Quality Assurance and Source Inspection



Bay Area Branch  
690 Walnut Ave. St. 150  
Vallejo, CA 94592-1133  
(707) 649-5453  
(707) 649-5493

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-021512**Date Inspected:** 05-Mar-2011**Project Name:** SAS Superstructure**OSM Arrival Time:** 700**Prime Contractor:** American Bridge/Fluor Enterprises, a JV**OSM Departure Time:** 1530**Contractor:** American Bridge/Fluor Enterprises, a JV**Location:** Job Site**CWI Name:** See below**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 OBG**Summary of Items Observed:**

This Quality Assurance (QA) Inspector, Rick Bettencourt 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, Rick Bettencourt was on site between the times noted above.

The QAI observed ABF personnel welding cover plates into the Tower Grillage at Pier 7. The QAI noted that the 4 tower shaft sections have 10 plates that have all been installed and tack welded into the grillage. The QA Inspector performed dimensional measurements of the cover plates at 25mm thick and noted that all the materials to be welded are grade 485W. The QA Inspector noted that the Quality Control (QC) Inspector Mike Johnson and Fred Vonhoff are on site monitoring the welding and weld repairs. Upon the arrival of the QA Inspector it was observed the induction heating blankets were installed 360° around the external skin plates of the south tower shaft. The QA Inspector noted the induction heating was turned on and the material appeared to be between 350°-375°F. The QA Inspector utilized the QC Inspector Fred Vonhoff calibrated laser temperature indicating gun to achieve the temperatures identified above.

**East Shaft**

The QA Inspector randomly observed the ABF welder identified as Rick Clayborn performing shielded metal arc welding (SMAW) of the partial joint penetration (PJP) groove weld identified as TG-E-5E/1E. The QA Inspector randomly observed the ABF welder utilizing 5/32" E9018 low hydrogen electrodes with 165 Amps. The QA Inspector noted the ABF welder was performing the SMAW fill passes for the duration of the shift. The QA Inspector noted the ABF welder identified as Gil Peralta was performing SAW fill passes of the PJP groove weld

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identified as TG-E-p4b/ p3a. The QA Inspector observed Mr. Peralta was utilizing 1/8" E9018 low hydrogen electrodes with 130 Amps. This QA Inspector was informed by QC Inspector Fred Von Hoff the welding parameters were within the required heat input range in the Welding Procedure Specifications (WPS) ABF-WPS-D15-1162-4 for the PJP welds. This QA Inspector randomly observed the amperage's and voltages of ABF welding personnel Rick Clayborn (#2733) and Gilbert Peralta (#9453) were within the ranges in the WPS. This QA Inspector observed that both 1/8" and 5/32" diameter E9018H4R electrodes were being used and stored in separate heated storage containers. This QA Inspector also observed the 1-hour exposure limit for the electrodes appeared to be monitored and adhered to. The QA Inspector randomly observed and noted the above identified welders spent the remainder of the shift filling the above identified weld joints. The QA Inspector noted the weld joints identified above appeared to be approximately 80% complete at the end of the shift on this date. The QA Inspector did note the ABF WQCM Jim Bowers was on site to monitor the in process welding on this date.

### South Shaft

The QA Inspector randomly observed the ABF welder identified as Richard Garcia (#5892) excavating cracked weld material from the weld joint identified as TG-S-P1/P5. The QA Inspector noted the weld joints identified as P1/P5 and P1/P2 were previously determined to be cracked full length and required removed and repair. The QA Inspector noted the repair procedure was previously submitted and approved for excavation and welding. The QA Inspector randomly observed the repair was being performed in accordance with RWR 201103-001. The QA Inspector observed the ABF welder utilized carbon arc gouging and grinding to completely remove the weld material from the weld joint. Prior to removing all of the weld material, the QA Inspector observed the welder utilized a hydraulic jack to hold the cover plate in place and attempt to reduce the amount of distortion to plate due to the heat and lack of weld material on the P1/P5 weld joint. Once the hydraulic jack was in place and all of the weld material was removed, the QA Inspector observed the SE QC Inspector perform visual and magnetic particle testing of 100% of the P1/P5 weld joint. The QC Inspector informed the QA Inspector no relevant indications were located at the time of the testing. The QA Inspector performed random visual testing of the excavated weld joint and noted the weld joint appeared to be in compliance with contract requirements and ready for weld repair. The QA Inspector randomly observed the ABF welder preheat the area to approximately 250°F and begin the SMAW root pass joining the P5/P1 plates to the stiffener. The Inspector noted the weld was utilizing 1/8" E9018 low hydrogen electrodes with 131 Amps. The QA Inspector randomly observed the ABF welder deposit several passes for the multi pass root. After the root pass was completed the QA Inspector randomly observed the QC Inspector perform MT of the completed root pass. The QA Inspector noted no relevant indications were located at the time of the testing. The QA Inspector noted the ABF welder spent the remainder of the shift performing the SMAW fill passes.

In addition the QA Inspector randomly observed the ABF welder identified as Jason Collins performing SMAW fill/cover passes at weld joint identified as TG-S-P4/P6. The QA Inspector randomly observed the ABF welder completing a weld that was started on the previous day shift. The QA Inspector noted the ABF welder was utilizing 5/32" E9018 electrodes with 172 Amps in the 4G position. The QA Inspector noted the weld was completed at the end of the shift and the QC Inspector Fred Vonhoff performed VT and marked up several areas to have additional weld material deposited.

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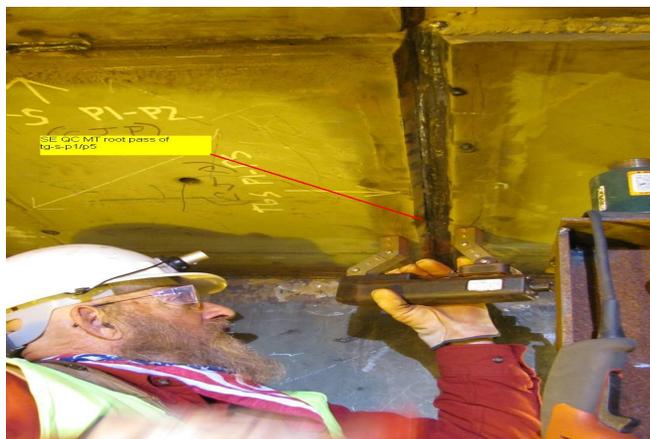
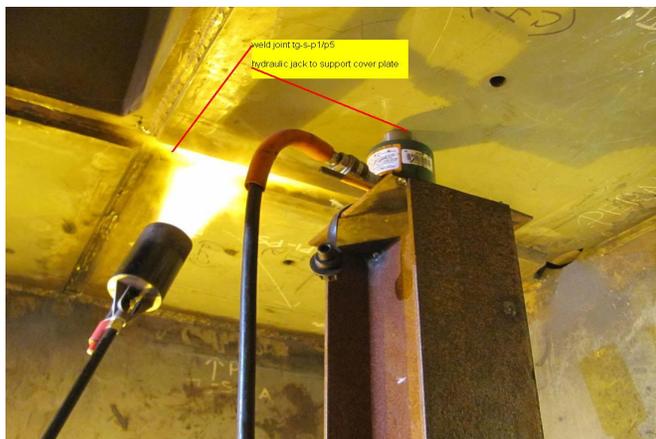
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## Summary of Conversations:

The SE QC Inspector Fred Vonhoff informed the QA Inspector the tack welds that were previously welded during the fit up of the cover plates are being removed. The QC Inspector went on to inform the QA Inspector once the ABF welder welds up to a tack weld, the tack weld is removed completely by grinding. Once the tack weld is removed magnetic particle testing is performed to ensure the temporary tack weld is completely removed.

The SE QC Inspector Vonhoff informed the QA Inspector even though VT is being performed after the welding is complete, the official VT will not be performed until all of the welds are completed in the particular shaft.

The ABF WQCM Jim Bowers informed the QA Inspector that AWS table 12.4 for the given electrode and heat input values, actually allows the minimum required preheats of the approved WPS to be 25°F less than that stated. Mr. Bowers pointed out as long as the Heat Input value for the given electrode with H4 designation is above 2.0 the lower temperatures do apply.

## 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.

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**Inspected By:** Bettencourt,Rick

Quality Assurance Inspector

**Reviewed By:** Levell,Bill

QA Reviewer