

**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 #: 78.28**WELDING INSPECTION REPORT****Resident Engineer:** Casey, William**Address:** 333 Burma Road**City:** Oakland, CA 94607**Report No:** WIR-030048**Date Inspected:** 17-Sep-2013**Project Name:** SAS Superstructure**OSM Arrival Time:** 600**Prime Contractor:** American Bridge/Fluor Enterprises, a JV**OSM Departure Time:** 1430**Contractor:** Steward Machine Co.**Location:** Birmingham, AL**CWI Name:** Fred Hudson & Darrell Nix**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:** E2 Shear Key Anchorages**Summary of Items Observed:**

Quality Assurance Inspector (QAI) Fritz Belford was present on the date and times noted above in order to observe the fabrication and Quality Control (QC) functions performed by Steward Machine Company for the E2 Shear Key Anchorages for the SFOBB project. Material Test Reports (MTRs) for all materials used have been reviewed and approved by others at the XKT shop in Vallejo California prior to shipping to Steward Machine Company. The following items were observed:

**STEWARD MACHINE - PLANT 1:**

The QA performed a walkthrough at the shop to verify plates on site and to observe Steward Machine personnel at work machining and welding. Work performed at the Steward Machine shop as noted below:

**Welders Ben Rhodes (#481) & John Ray (#469):**

The welders were observed welding fillet welds of the T3 and S3 round bars to the R3, K3, J3 & M4 plates utilizing Welding Procedure Specification (WPS) P2-W101-B for Flux Core Arc Welding-Gas Shielded (FCAW-G) in the 1G position. The welding parameters were observed adjusted and monitored by Certified Welding Inspector (CWI) Fred Hudson (Cert. #0106501) who was onsite with the WPS as required by contract documents. The welding parameters were measured to be 27.5volts/260amps using 1/16" Class E70T-1 filler and 100% CO2 at 40cfm.

Welder John Ray (#469) was also observed tack welding the S3B assembly utilizing Welding Procedure Specification (WPS) P2-W126-B for Flux Core Arc Welding-Gas Shielded (FCAW-G) in the 2G position. The welding parameters were observed adjusted and monitored by Certified Welding Inspector (CWI) Fred Hudson

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## WELDING INSPECTION REPORT

( Continued Page 2 of 4 )

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(Cert. #01061501) who was onsite with the WPS as required by contract documents. The welding parameters were measured to be 30volts/300amps using 1/16" Class E70T-1 filler and 100% CO2 at 40cfm. Welding 2G was out of position qualified and will be removed before the root pass is welded. Certified Welding Inspector (CWI) Darrell Nix was onsite to monitor welding operation.

### S3B Assembly:

The painters were observed sand blasting the Class B Faying surfaces of the assembly plates to SP10 prior to assembly. The plates sand blast profiles were verified by NACE level II Inspector Chris Shifflett using ASTM 4417 Method C with X-Coarse Tape with an indication range of 1.5 to 4.5 Mils. The profile verified by tape ranged from 1.7 to 2.9 mils well within the acceptable limits as per contract documents. After profile verification the plates were moved to the weld shop where they were immediately assembled for welding. Assembly S3B as noted above includes plates S3B-f4, S3B-g4, S3B-d4, S3B-c4, S3B-h4, S3B-b4 & S3B-a4.

### Plate Milling:

CNC Machine #230 milling S4B assembly (Milling North side)

CNC Machine #231 milling S10C assembly (Milling assembly ends)

CNC Machine #245 milling plate S3C-h3. (Milling outside radius)

The following plates were noted staged throughout the shop in various stages of processing.

### Bay 4 & 5- Plates:

S4B Assembly (Plates f4, g4, d4, c4, h4, b4 & a4). (7 plts)

S3B Assembly (Plates f4, g4, d4, c4, h4, b4 & a4). (7 plts)

S3C-a3. Formed, stressed relieved and partially machined.

S3C-b3. Formed, stressed relieved and partially machined.

S3C-c3. Formed, stressed relieved and partially machined.

S3C-d3. Formed, stressed relieved and partially machined.

S3C-e3. Milling complete.

S3C-f3. Formed, stressed relieved and partially machined.

S3C-g3. Formed, stressed relieved and partially machined.

S4C-a4. Formed, stressed relieved and partially machined.

S4C-b4. Formed, stressed relieved and partially machined.

S4C-c4. Formed, stressed relieved and partially machined.

S4C-d4. Formed, stressed relieved and partially machined.

S4C-e4. Milling complete.

S4C-f4. Formed, stressed relieved and partially machined.

S4C-g4. Formed, stressed relieved and partially machined.

S4C-h4. Formed, stressed relieved and partially machined.

S4B-e4. Milling complete.

### STEWARD MACHINE - PLANT 2:

The QA performed a walkthrough at the shop to verify plates on site and to observe Steward Machine personnel at work machining and welding. Work performed at the Steward Machine shop as noted below:

Welder David Hyche (#37) was observed performing the stud welding on the plate S3B-e3 using stud welding

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# WELDING INSPECTION REPORT

( Continued Page 3 of 4 )

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procedure specification WPS P2-Stud. Prior to welding the stud the operator performed test stud welds on scrap plates to test the welding parameters. The test studs welded were bent over 15 degrees and none showed any signs of failure with complete 360 degrees flashing noted throughout. The welder then proceeded to weld the stud on to the S3B-e3 plate as required. The stud weld was visually acceptable with flashing noted 360 degrees around the base of the stud. Welding was performed using 1500amps on 3/4" diameter stud at .89 seconds with 1/8" plunge as per WPS.

## COMPONENT RELEASES.

None.

## NON-DESTRUCTIVE TESTING (NDT).

The QA performed NDT on the following.

Plate S3C-c3 Visual Testing (VT) and Magnetic Particle Testing (MPT):

- Machined Trough Area MPT Acceptable. See TL-6028 for detailed information.

The Non Destructive Testing (NDT) listed above were observed performed and accepted by the QC Inspectors prior to the QA Inspector performing the tests. The QC Inspectors performed 100% NDT with the QA Inspector performing over 10% NDT.

The completed and accepted work observed at this location appeared to be in compliance with the contract specifications.



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# WELDING INSPECTION REPORT

( Continued Page 4 of 4 )

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**Summary of Conversations:**

The QC Inspector relayed to the QA Inspector that the S4C assembly will be prepared early tomorrow morning for assembly by blasting the faying surfaces before assembly.

**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 Gary Thomas (916) 764 - 6027, who represents the Office of Structural Materials for your project.

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<b>Inspected By:</b>	Belford,Fritz	Quality Assurance Inspector
<b>Reviewed By:</b>	Foerder, Mike	QA Reviewer

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