

**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 #: 69.28**WELDING INSPECTION REPORT****Resident Engineer:** Pursell, Gary**Address:** 333 Burma Road**City:** Oakland, CA 94607**Report No:** WIR-010534**Date Inspected:** 26-Nov-2009**Project Name:** SAS Superstructure**OSM Arrival Time:** 1900**Prime Contractor:** American Bridge/Fluor Enterprises, a JV**OSM Departure Time:** 700**Contractor:** Zhenhua Port Machinery Company, Ltd (ZPMC), Changxing Island **Location:** Shanghai, China**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:** OBG and Tower**Summary of Items Observed:**

CWI Inspector: Mr. Du Zhiquan

On this date CALTRANS OSM Quality Assurance (QA) Inspector, Mr. Paul Dawson, arrived on site at the Zhenhua Port Machinery Company (ZPMC) facility at Changxing Island, in Shanghai, China, for the purpose of monitoring welding and fabrication of the San Francisco / Oakland Bay Bridge (SFOBB) components. This QA Inspector observed the following:

## Tower Bay 10

This QA Inspector observed ZPMC welder Ms. Wang Yudi, stencil 040268 is using shielded metal arc welding procedure WPS-B-T-4113-1 to make tower shear link 3F (vertical) fillet weld ED1-STSA3-2-89M-2-31. When ZPMC QC Inspector Mr. Yuan Hui Gang observed this QA Inspector walking toward the location where this welding was being performed, Mr. Yuan Hui Gang stopped Ms. Wang Yudi from welding as he used a temperature indicating crayon to measure the base material temperature adjacent to where the welding was taking place. Mr. Yuan Hui Gang then had a worker start to install an electrical heating element over the weld surface. Prior to the heating element being installed, this QA Inspector observed the base material adjacent to the weld that had been measured by Mr. Yuan Hui Gang has several lines of unmelted temperature indicating crayon which indicates the base material has a temperature less than the temperature indicating crayon. Mr. Yuan Hui Gang informed this QA Inspector that he had used a 180° Celsius temperature indicating crayon and the minimum required temperature is 160° Celsius. Mr. Yuan Hui Gang informed this QA Inspector that he does not have a 160° temperature indicating crayon. A ZPMC worker then installed an electrical heater over the weld location.

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This QA Inspector requested Mr. Yuan Hui Gang to ask ZPMC CWI Mr. Du Zhiqun to come to the location of the welding and when Mr. Du Zhiqun arrived he had the heating element removed and he used a 160° Celsius temperature indicating crayon to determine the base material is below the minimum allowed by the WPS. Mr. Du Zhiqun said he will have the last layer of weld material removed with a grinder and that ZPMC will perform magnetic particle inspections of this weld prior to any additional welding. Items observed on this date do not appear to fully comply with applicable contract documents.

This QA Inspector observed Ms. Wu Zhi Zhong, stencil 057180 is using flux cored welding procedure WPS-345-FCAW-2G(2F)-Repair to add weld material to extend the length of north tower first lifting bottom plate bearing stiffeners as detailed on critical weld repair TCWR0472-R0. This QA Inspector observed a welding current of approximately 340 amps and 29.8 volts. This QA Inspector observed ZPMC QC Inspector Mr. Yuan Hui Gang is monitoring the maximum interpass temperature and additional stiffener welds are not being made until the base metal adjacent to the weld is allowed to cool to a temperature of less than 260 degrees Celsius. Items observed by this QA Inspector appear to be progressing in compliance with project specifications.

This QA Inspector observed ZPMC welder Mr. Xu Xiuping, stencil 057244 is using flux cored welding procedure WPS-B-T-2133 to make north tower lift 4 weld NSTL4-3C/L-24. This QA Inspector observed a welding current of approximately 230 amps and 26 volts and the base material is being warmed with electrical heating elements. Items observed on this date appeared to generally comply with applicable contract documents.

This QA Inspector observed ZPMC welder Ms. Dong Yumei stencil 054069 is using flux cored welding procedure WPS-B-T-2133 to make north tower lift 4 weld NSTL4-3C/L-2274. This QA Inspector observed ZPMC CWI Mr. Du Zhiqun has recorded a welding current of 204 amps and 25.7 volts. Items observed on this date appeared to generally comply with applicable contract documents.

## OBG Assembly Yard

This Inspector performed random conventional Ultrasonic inspections (UT) after ABF UT personnel had performed similar UT inspections for detection of planar transverse indications utilizing scanning pattern A, B, C and D (AWS D1.5 Fig 6.7) of the following:

NDE request 11252009-2 item 1: OBG weld repair OBE1A-008, segment 1AW to 1BW bottom plate repairs at 16 locations. ABF has identified rejectable transverse indications at several locations and this QA Inspector observed class A longitudinal oriented UT rejects at locations 570 mm, 5750mm, 5760 mm and a class "D" indication at 5960 mm. See Caltrans Ultrasonic Transverse Indication Evaluation sheet dated November 26, 2009 for further information.

## Summary of Conversations:

See Above.

## 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 Eric Tsang phone: 150-0042-2372 , who represents the Office of Structural Materials for your project.

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| <b>Inspected By:</b> | Dawson,Paul | Quality Assurance Inspector |
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| <b>Reviewed By:</b> | Carreon,Albert | QA Reviewer |
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