**DEPARTMENT OF TRANSPORTATION**
DIVISION OF ENGINEERING SERVICES
Office of Structural Materials
Quality Assurance and Source Inspection

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Contract #: 04-0120F4
Cty: SF/ALA Rte: 80 PM: 13.2/13.9
File #: 69.28

# WELDING INSPECTION REPORT

**Resident Engineer:** Pursell, Gary
**Address:** 333 Burma Road
**City:** Oakland, CA 94607

**Report No:** WIR-004510
**Date Inspected:** 03-Nov-2008

**Project Name:** SAS Superstructure
**Prime Contractor:** American Bridge/Fluor Enterprises, a JV
**Contractor:** Zhenhua Port Machinery Company, Ltd (ZPMC), Changxing Island

**OSM Arrival Time:** 1400
**OSM Departure Time:** 2300
**Location:** Shanghai China

**CWI Name:** Zhu Zhong Hai

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| **Inspected CWI report:** | ☑ Yes | ☐ No | ☐ N/A | **CWI Present:** | ☑ Yes | ☐ No | |
| **Electrode to specification:** | ☑ Yes | ☐ No | ☐ N/A | **Rod Oven in Use:** | ☑ Yes | ☐ No | ☐ N/A |
| **Qualified Welders:** | ☑ Yes | ☐ No | ☐ N/A | **Weld Procedures Followed:** | ☑ Yes | ☐ No | ☐ N/A |
| **Approved Drawings:** | ☑ Yes | ☐ No | ☐ N/A | **Verified Joint Fit-up:** | ☑ Yes | ☐ No | ☐ N/A |
| | | | | **Approved WPS:** | ☑ Yes | ☐ No | ☐ N/A |
| | | | | **Delayed / Cancelled:** | ☐ Yes | ☑ No | ☐ N/A |

**Bridge No:** 34-0006
**Component:** Tower

**Summary of Items Observed:**
89M mock up

Caltrans QA Inspector observed that ZPMC performed the welding of fit-lug to stiffener plate on 2 welds; these welds were identified as MUB-MA21-A/J-29 and MUB-MA21-A/J-60. Upon the arrival of this QA inspector it was observed that ZPMC was using welding procedure WPS-B-T-2133 for the FCAW process in the vertical position (3F). The fit lug sizes for these locations where 75 mm x 370mm x 30mm. ZPMC was using welding electrode E71T-1, 1.4mm electrode for this weld trial and locations as outlined in the WPS. The welding personnel ZPMC used for these locations were; MUB-MA21-A/J 29, #058174 and for MUB-MA21-A/J-60 was #062259. The welding parameters for MUB-MA21-A/J 29 were, pre-heat of 186ºc, 203 amps, 23.2 volts and a travel speed of 125mm/min for root pass and pre-heat of 192ºc, 212 amps, 24.3 volts and a travels speed of 120mm/min for intermediate and cover passes. For Weld number MUB-MA21-A/J-60 were, pre-heat of 188ºc, 212 amps, 23.8 volts and a travels speed of 123mm/min for root pass and pre-heat of 198ºc, 213 amps, 24.1 volts and a travels speed of 118 mm/min for intermediate and cover passes. ZPMC performed MT of the root passes by technician Xu Hai with acceptable results as stated by ZPMC. ABF personnel were present for the MT and also accepted these results for the hold point as outlined within the procedure. According to the ABF letter dated October 14, 2008 the weld trials were to be done by using “the same equipment, equipment set up, welders and QC/QA staff” it has been observed and documented that ZPMC has not used the same welders for these trials. The welders used are as follows; for date 10-28-08, FCAW welders 067079 and 066734, for date 10-30-08, SMAW welders 054467 and 048659 for date 11-1-08, SMAW welders 067993 and 068924 for today’s date of 11-3-08, FCAW welders #058174 and #062259. The starting time and temperatures for the controlled cool down started at 1500 hrs with a starting temperature of 220ºc the ambient temperature was approximately 25ºc. Below are the details of the

controlled cool down.

1500 hrs – 220ºc (Start of cool down)
1530 hrs – 202ºc
1600 hrs – 187ºc (33ºc drop in 1 hour)
1630 hrs – 170ºc
1700 hrs – 152ºc (35ºc drop in 1 hour)
1730 hrs – 133ºc
1800 hrs – 115ºc (37ºc drop in 1 hour)
1830 hrs – 103ºc
1900 hrs – 85ºc (18ºc drop in 1 hour)
1930 hrs – 66ºc
2000 hrs – 51ºc (15ºc drop in 1 hour)

The controlled cool down appears to be within the requirements of the submitted procedure by ABF.
This QA Inspector also noted that ZPMC was in process of removing the old fit-lugs and PJP welds from the opposite side of the 89M mock up in preparations of continuing the weld trial. The locations for these are MUB-MA21-G/J, the exact weld numbers are not available at this time due to renumbering of the single PJP weld areas for double fillet welds at the fit lugs.

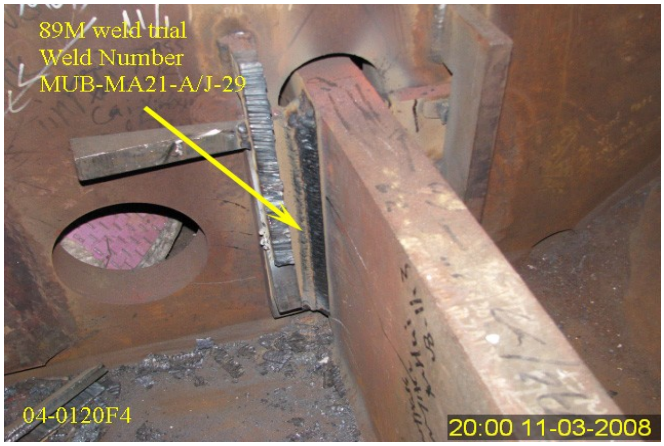
Heavy duty Shop Bay 1

This QA Inspector observed ZPMC in tower bay 1 for lift one of the south tower assembly in side performing fabrication from the confined space log in/out board at the entrance of the tower section. There were 21 ZPMC personnel logged in along with 1 ABF personnel. Continued observation within this bay by Caltrans QA observed ZPMC UT technicians performing testing on SSD1-Skin A, lift 2 for stiffener plates to skin plates for the CJP weldments. The testing was in process during the observation but it was noted that multiple locations on the 4 stiffeners had rejectable indications as noted by ZPMC. Submerged Arc Welding (SAW) was being performed for skin plate NSD1-SA22 B/E for welds 1, 3A, 4, 6A and 7A, and weld NSD1-SA22 C/E-1 under WPS-B-T-2221-B-U3c-S-2. The ZPMC CWI observed at this location was Liu Yang along with assistant QC personnel assisting him in the monitoring of welding parameters and in process welding.

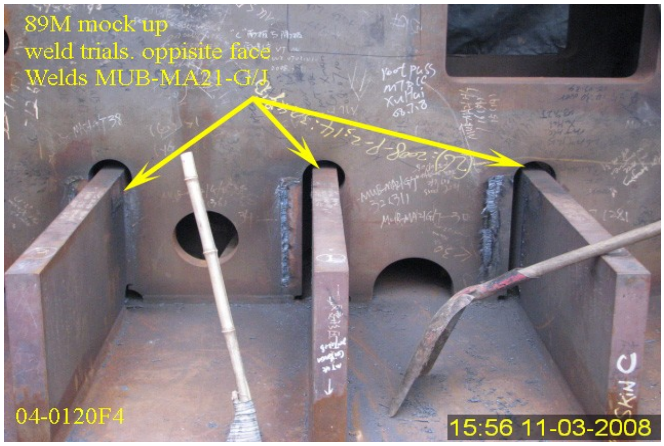
Heavy duty Shop Bay 2

This QA Inspector observed ZPMC in tower bay 2 for lift one of the East tower assembly in side performing fabrication from the confined space log in/out board at the entrance of the tower section. There were 10 ZPMC personnel logged in along with 1 ABF personnel. Continued observation within this bay by Caltrans QA observed ZPMC performing grinding and FCAW welding at gantry-2 for tower skin plate to stiffener plates component numberESD1- Skin A, lift 2. This QA Inspector also noted that ESD1- Skin E, lift 2 was being fit up with stiffener to skin plate components, tack welds were being placed within the weld grooves for the fit-up process. ZPMC was in multiple stages of fabrication throughout this location for skin plates and stiffener plates that included but not limited to, CJP splice welds, back gouging of CJP weldments, fit-up of CJP weld splices and attaching temporary

run off weld tabs for the CJP welds. The ZPMC CWI observed at this location was Guo Yan Fei and An Qing Xiang along with assistant QC personnel assisting him in the monitoring of welding parameters and in process welding.









**Summary of Conversations:**

As noted 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 Josh Ishibashi, 1-376-471-0411, who represents the Office of Structural Materials for your project.

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|---|---|---|
| **Inspected By:** | Riley,Ken | Quality Assurance Inspector |
| **Reviewed By:** | Carreon,Albert | QA Reviewer |