

**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-001838**Date Inspected:** 22-Mar-2008**Project Name:** SAS Superstructure**OSM Arrival Time:** 600**Prime Contractor:** American Bridge/Fluor Enterprises, a JV**OSM Departure Time:** 2230**Contractor:** Zhenhua Port Machinery Company, Ltd (ZPMC), Changxing Island **Location:** Shanghai China**CWI Name:** Zhao Chen Sun**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:** Tower/OBG**Summary of Items Observed:**

This Quality Assurance (QA) inspector arrived at ZPMC to perform observations of Self Anchored Suspension (SAS) Bridge for the SFOBB western span. Below is an account of the day's observation during the fabrication process at ZPMC. It includes the tower mock-ups, Orthotropic Bridge Girders (OBG) which includes side plates and bottom plates at different stages of fabrication from fit-up to welding and inspections.

**New tower shop**

This QA inspector performed periodic observations in the New Tower shop and observed ZPMC personnel performing grinding on 4 vertical welds at the lug plates to diaphragm and stiffener plates with the following weld numbers MUB-MA21 A/J-21.22.25 and 26 these weldments were completed on the previous work day for the welding process. This QA inspector was informed by ZPMC Quality Control (QC) personnel Yang Bai Qiang that the weldments had a 24 and 48 hr hold before Magnetic Particle (MT) could be performed. The weld numbers and times are as follows; for the 48 hr hold weldments MUB-MA21 A/J 22 was completed at 1457 hrs Weld MUB-MA21 A/J 26 was completed at 1618 hrs. For the 24 hr hold weldments MUB-MA21 A/J-25 was completed at 1457 hrs weld MUB-MA21 A/J-21 was completed at 1808 hrs. Also noted in the new tower shop was heat treating being performed by ZPMC personnel on skin plates this QA inspector noted 31 plates total for tables 1 and 2 in the shop. ZPMC was using procedure HSR (T)-243 with a 650°C maximum temperature. 9 ZPMC QC personnel were noted as being present in the new tower shop. During this QA inspectors continued observation it was noted that ZPMC was using the hydraulic press to flatten and straighten a diaphragm plate using the press with a concave base. This QA inspector spoke with Li Xiu Yang pertaining to this operation and it not being approved for the diaphragm plates. It was relayed that this diaphragm plate was for practice in trying to establish a criteria for submittal. This QA inspector in turn replied that if ZPMC was using it for practice that it should be clearly marked with that information to not create confusion between production pieces and practice pieces. Also it was relayed

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that there should be some documentation that showed Caltrans that it was taken off the production list for the project.

### Bay 2

This QA inspector observed ZPMC using the burn table near the rear of the fabrication bay flame cutting multiple skin plates throughout the shift. At the time of this QA inspectors observation skin plate SA178-1 skin B was being cut.

### Bay 3

This QA inspector observed ZPMC in bay 3 working side and bottom plates in multiple stages of fabrication that included the following the areas; WT stiffeners were in the process of being fit-up to the deck plate, WT stiffeners were being welded together with a Complete Joint Penetration (CJP) groove weld. ZPMC personnel were using abrasive wheels to remove primer coating to the areas where the WT stiffeners will be welded. ZPMC personnel informed this QA inspector that CWR number B-CWR048 was starting and needed Caltrans METS witnessing. This QA inspector observed the base metal repairs associated with the CWR the excavated areas were a total of 26 locations with a maximum depth of 5.5mm and a combined length of 2080mm. ZPMC welder Li Zhaoqian performing the Flux Cored Arc Welding (FCAW) process in the flat (1G) position. This QA inspector verified the welding parameters as follows; 266 amps, 29.2 volts and travel speed of 361 mm/min. the required preheat temperature was 65°C. The Welding Procedure Specification applied for this CWR was WPS-345-FCAW-1G (1F)-Repair-1 and the above parameters and preheat was within this WPS. ZPMC Quality Control/Certified Welding Inspector (QC/CWI) Xu Xianping was present during the repair process and was monitoring welding parameters and progression. Once the repairs had been completed it was relayed to this QA inspector that the required MT would be performed at a later date possibly tomorrow. The above work appeared to be within the general requirements of the contract documents.

### Bay 4 Diaphragm plate splice

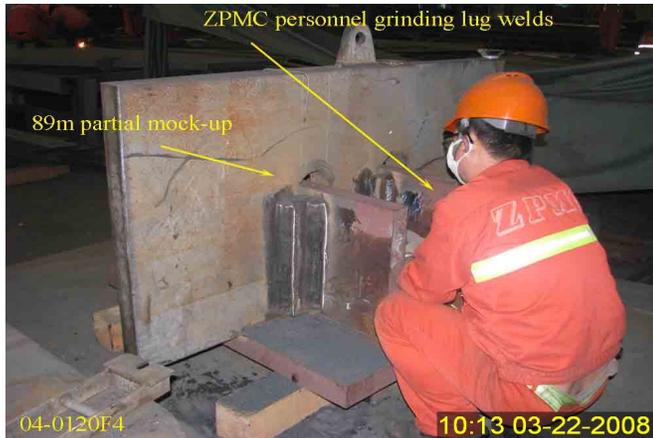
This QA inspector continued his observation at ZPMC in bay 4 for diaphragm plate splices. It was observed that diaphragm number ESD1-SA287 was being spliced together using a double V groove for the Complete Joint Penetration (CJP) weldment with Submerged Arc Welding (SAW) in the flat position. This QA inspector witnessed ZPMC's QC and CWI personnel monitoring the required preheat temperatures as required by WPS-B-T-3221-B-U3c-S-1 which has a high end of 230°C and a low end of 180°C. ZPMC welding personnel Gu Caihong was observed as operating the SAW system during the welding process and the welding parameters were verified by this QA inspector as 580 amps, 30 volts, and a travel speed of 488 mm/min. This is within the tolerances of the above stated WPS. This QA inspector observed ZPMC's CWI monitor the welding parameters and welding progression during this process. When ZPMC had approximately 21 passes completed they then turned the diaphragm plate over again to reduce the welding distortion. The joints being welded were 3A, 3B, 4A and 4B. ZPMC's QC/CWI that was present during this operation was Zhao Chen Sun along with an additional 6 QC personnel working in bay 4 monitoring the heat striating process of multiple diaphragm plate according to procedure HSR(T)-243. ZPMC personnel was observed grinding the lug weldments on the partial 89m mock up. No other welding or work was being performed for this component (see digital photo below). The above noted work appeared to be within general requirements of the contract document

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## Summary of Conversations:

As noted in contents of report.

## 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 Mazen Wahbeh, (818) 292-0659, who represents the Office of Structural Materials for your project.

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<b>Inspected By:</b>	Riley, Ken	Quality Assurance Inspector
<b>Reviewed By:</b>	Hager, Craig	QA Reviewer

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