

**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-006113**Date Inspected:** 03-Apr-2009**Project Name:** SAS Superstructure**OSM Arrival Time:** 645**Prime Contractor:** American Bridge/Fluor Enterprises, a JV**OSM Departure Time:** 1900**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:** Tower Fabrication**Summary of Items Observed:**

CWI Inspectors: Mr. Zhu Zhong Hai and Mr. Huang Wei

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. The QA Inspector observed the following:

**Procedure Qualification**

Yesterday, April 2, 2009, American Bridge/Fluor representative Mr. Jeff Evans informed the QA Inspector that ZPMC is going to perform two procedure qualification test plate welds. ZPMC completed a 1G procedure qualification test plate weld and completed the root pass of a 3G procedure qualification test plate weld on April 2, 2009. Today, April 3, 2009, ZPMC completed welding of the 3G procedure qualification test plate weld.

**3G (Vertical) Procedure Qualification Test HP2009221**

The QA Inspector observed ZPMC welder Mr. Jin Rong, stencil 066471 first preheated the test coupon to a minimum of 20 degrees Celsius then he started to use welding procedure specification PWPS-B-T-2233T-1 to complete the 3G Weld Procedure Qualification Test (PQR) plate identified by ZPMC as HP2009221. This PQR provides the parameters for welding a groove weld in the 3G (vertical) position using the semi automated flux cored welding process. The welding procedure specification stipulates use of 1.4 mm diameter Supercored 71H, E71T-1, AWS 5.20 welding material and the use of ceramic backing material. The supplied certified material test

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report for the base material indicates the plate that was tacked together for welded is 30 mm thick ASTM A709-50T-2 steel. ZPMC conducted the procedure qualification test in the ZPMC welding lab. The QA Inspector observed ZPMC CWI Mr. Huang Wei monitoring this welding and measuring the welding current, voltage, travel speed and base material interpass temperature for each of the weld passes. The QA Inspector observed ZPMC welder Mr. Jin Rong, stencil 066471 manually completed a total of eleven weld passes. The QA Inspector performed random measurement of the welding current, voltage and travel speed and ZPMC appears to be recording these welding attributes accurately. ZPMC recorded an average welding current of approximately 210.5 amps, 24.8 volts, welding travel speed of 102.9 mm per minute and a heat input of 3.0 kJ per mm during the welding. The QA Inspector observed Mr. Jin Rong occasionally used a grinder to grind areas of the weld several times during this procedure qualification test. During the groove welding ZPMC CWI Mr. Huang Wei recorded a welding current of between 220 and 230 amps, 27.5 to 28 volts, a travel speed between 115 and 129 mm per minute and a heat input of 3.00 to 3.21 kJ/mm. QC Inspectors used a laser temperature measuring device to monitor the base material temperature prior to and during the welding of the plate. Following completion of the welding of the Mr Wei informed the QA Inspector that the weld is visually acceptable. The QA Inspector performed random visual inspections and confirmed the weld appears to comply with project specifications and AWS D1.5 welding procedure specification section 5.0. ZPMC assigned PQR number HP2009221 to this weld test and the QA Inspector assigned lot number B254-004-009 to the welding of the groove procedure qualification test plate. See the photographs below for additional information.

OBG Bay 19

The QA Inspector observed ZPMC welder Mr. Sun Zhaowen, stencil 062745 is using welding procedure WPS-B-T-2232-TC-T4C-F to make flux cored groove welds in the 2G (horizontal) position on Cross Beam CB3 Side plate SP227-001 to Deck plate DP532-001. The QA Inspector measured a welding current of approximately 290 amps and 32.0 volts. QA Inspector observed the base material had been preheated with a torch prior to welding. Items observed by the QA Inspector appear to comply with project specifications.

The QA Inspector observed ZPMC welder Mr. Zhang Baodao, stencil 062738 is using welding procedure WPS-B-T-2232-TC-T4C-F to make flux cored groove welds in the 2G (horizontal) position on Cross Beam CB3 Side plate SP227-001 to Deck plate DP532-001. The QA Inspector measured a welding current of approximately 290 amps and 32.0 volts. QA Inspector observed the base material had been preheated with a torch prior to welding. Items observed by the QA Inspector appear to comply with project specifications.

The QA Inspector observed ZPMC welder Mr. Liu Changqing, stencil 062738 is using welding procedure WPS-B-T-2132-3 to make flux cored fillet welds on Cross Beam CB3 Side plate SP216-001 to Floor Beam FB209-001. The QA Inspector measured a welding current of approximately 330 amps and 32.0 volts. QA Inspector observed the base material had been preheated with a torch prior to welding. Items observed by the QA Inspector appear to comply with project specifications.

The QA Inspector observed ZPMC welder Ms. Yu Binge, stencil 062737 is using welding procedure WPS-B-2232-TC-U4b-F to make flux cored fillet welds on Bottom Plate BP026-006 stiffeners to the bottom plate. The QA Inspector measured a welding current of approximately 320 amps and 32 volts. The QA Inspector observed the base material had been preheated with a torch where the welds were to be made. The QA Inspector observed ZPMC QC personnel monitoring this welding. Items observed by the QA Inspector appear to comply

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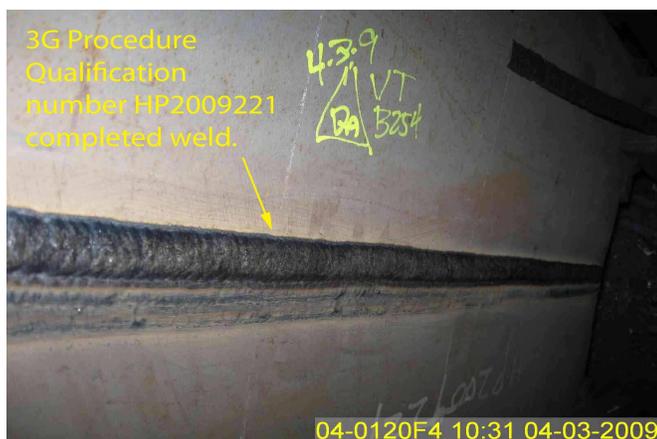
with project specifications.

The QA Inspector observed ZPMC welder Mr. Han Zejiao, stencil 062808 is using welding procedure WPS-B-2232-TC-U4b-F to make flux cored fillet welds on Bottom Plate BP026-006 stiffeners to the bottom plate. The QA Inspector measured a welding current of approximately 320 amps and 32 volts. The QA Inspector observed the base material had been preheated with a torch where the welds were to be made. The QA Inspector observed ZPMC QC personnel monitoring this welding. Items observed by the QA Inspector appear to comply with project specifications.

The QA Inspector observed ZPMC welder Mr. Hou Benli, stencil 062752 is using welding procedure WPS-B-2232-TC-U4b-F to make flux cored fillet welds on Bottom Plate BP026-006 stiffeners to the bottom plate. The QA Inspector measured a welding current of approximately 315 amps and 31 volts. The QA Inspector observed the base material had been preheated with a torch where the welds were to be made. The QA Inspector observed ZPMC QC personnel monitoring this welding. Items observed by the QA Inspector appear to comply with project specifications.

## Blast Shop

ZPMC issued an "Inspection Notification Sheet" #2516 requesting QA to green tag Orthotropic Box Girder Light Bracket LB1 and LB2 which are located in the blasting shop. The QA Inspector performed random visual inspections of some of the welds on these two Light Brackets and observed that several of the interior stiffener plates have welds with overlap and underfill conditions, and one stiffener has a 6 mm deep gouge in the edge of the plate. The QA Inspector was not able to locate any marking on either of these two Light Brackets that indicate a ZPMC Quality Control Certified Welding Inspector has visually accepted the welds either of these two Light Brackets. The QA Inspector informed ZPMC QC representative Mr. Fu Yuhong that several of the welds are visually rejectable and Mr. Fu Yuhong said he is attempting to find out if these welds have been visually inspected by a ZPMC CWI Inspector. See the photograph below for additional information.



## Summary of Conversations:

See above.

## Comments

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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 Serge Sinevod phone: 134-8257-0045 , who represents the Office of Structural Materials for your project.

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<b>Inspected By:</b>	Dawson,Paul	Quality Assurance Inspector
<b>Reviewed By:</b>	Clifford,William	QA Reviewer

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