

**DEPARTMENT OF TRANSPORTATION**

DIVISION OF ENGINEERING SERVICES

Office of Structural Materials

Quality Assurance and Source Inspection



Bay Area Branch  
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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-002908**Date Inspected:** 13-Jun-2008**Project Name:** SAS Superstructure**OSM Arrival Time:** 630**Prime Contractor:** American Bridge/Fluor Enterprises, a JV**OSM Departure Time:** 1530**Contractor:** Zhenhua Port Machinery Company, Ltd (ZPMC), Changxing Island **Location:** Shanghai, China

<b>CWI Name:</b>	Wu Ming Cai and Ye Yong Jun	<b>CWI Present:</b>	Yes	No
<b>Inspected CWI report:</b>	Yes No N/A	<b>Rod Oven in Use:</b>	Yes	No N/A
<b>Electrode to specification:</b>	Yes No N/A	<b>Weld Procedures Followed:</b>	Yes	No N/A
<b>Qualified Welders:</b>	Yes No N/A	<b>Verified Joint Fit-up:</b>	Yes	No N/A
<b>Approved Drawings:</b>	Yes No N/A	<b>Approved WPS:</b>	Yes	No N/A
		<b>Delayed / Cancelled:</b>	Yes	No N/A
<b>Bridge No:</b>	34-0006	<b>Component:</b>	OBG and SAS Tower Fabrication	

**Summary of Items Observed:**

On this date, Caltrans Office of Structural Material (OSM) Quality Assurance (QA) Inspector Joselito Lizardo was present as requested to perform observations on the fabrication of Orthotropic Box Girder (OBG) and SAS Tower at Zhenhua Port Machinery Company (ZPMC) facility at Changxing Island, in Shanghai, China.

The QA Inspector has randomly observed the following activities on these Bays mentioned below;

**Bay 2: 114M Tower Mock-ups, Plate Cutting, Rolling**

This QA Inspector observed machining/beveling of 2-40mm thick plates marked P541 and P553 were seen in progress; drilling of 18-24mm diameter bolt holes on 24mm thick X 340mm wide X 1105mm long for various connection plates on going and so with 16-24mm diameter bolt holes on each side of welded spacer beam flange for floor beam sub-assembly; rolling of 70mm thick X 410mm wide marked P1328 seen complete which appears to be longitudinal skin plate stiffener. Tower mock up for elevation 114Meters has 3 ZPMC personnel and 3 ABF personnel doing survey on the tower mock up.

**Bay 3: OBG side/bottom/edge panel:**

The QA Inspector randomly observed ZPMC welder Wu Zhibin ID Number 049804, utilizing the Submerged Arc Welding (SAW) Process in the 1G (Flat Groove) Position with ZPMC WPS WPS-B-T-3221-B-U3c-S-1, to weld the fill pass on plate splice butt joint of open rib stiffener for deck panel DP011-001-010. The QA Inspector randomly observed ZPMC CWI Wu Ming Cai monitoring weld parameters. The QA Inspector also randomly monitored weld parameters and recorded them as follows: 589 amps, 31.0 volts with a travel speed of 420 millimeters (mm) per minute. The weld parameters appeared to comply with contract requirements.

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FCAW (3G) CJP welding on flange splice butt joint of W21x57 for side panel SP174-001-001, SP172-001-003/004 and SP175-001-005/006 this QA Inspector observed. Two ZPMC welders Xin Meng ID #053742 and Li Zhaoqian ID #048810 were noted utilizing WPS-B-T-2233-B-U2-F to complete this task. ZPMC QC and CWI were seen monitoring these two welder's welding parameters. Grinding of cut edges and taking off paint coating on WT (W21x57) rib stiffener for various side panels and back gouging after welding one side of W21 x 57 for side panel SP172-001-007 and SP175-001-007 continues.

This QA Inspector observed manual FCAW minor repair on fillet welds of 6-WT rib stiffener to side panel SP180-001-007~018 at gantry #1 and tack welding/fit-up of 3-open rib stiffener on deck panel DP024-001-001~004 and DP022-001-001~006 using THJ506Fe-1 SMAW electrode.

### Bay 4: Tower Diaphragm

This QA Inspector observed ZPMC UT personnel Ma Jilong and Xu Ronggang perform Final UT on two tower diaphragm plate splice butt joint NSD1-SA333 A/B-1B, 2B and SSD1-SA261-1B, 2B. On separate location, another ZPMC MT personnel Wang Wei perform 10% Magnetic Particle Testing on fillet weld between 5-open rib stiffener to side panel SP086-001-001~010 and 6-WT rib stiffener to side panel SP302-001-068~079. It was noted that rust and scale have been removed by ZPMC workers on weld areas prior MT testing. Electromagnetic Yoke was used with alternating current (AC) as power source. The detection media used was dry red ferromagnetic particles and applied with powder blower while the magnetizing force is on. While the ZPMC NDT Wang was MT testing the welds, this QA randomly perform VT on fillet welds with 10%MT and cover pass mentioned and appears conforming to the project requirements. This QA also observed ZPMC's conduct of MT on these welds deemed acceptable.

The QA Inspector randomly observed ZPMC welder ID Number 046830, utilizing the SAW Process in the 1G (Flat Groove) Position with ZPMC WPS WPS-B-T-3221-B-U3c-S-1, to weld the fill pass on plate butt splices of Tower Diaphragm WSD1-SA287-3B/4B. The QA Inspector randomly observed ZPMC Zhao Chen Sun, monitoring weld parameters. The QA Inspector also randomly monitored weld parameters and recorded them as follows: 624 amps, 31.0 volts with a travel speed of 505 mm per minute. Weld parameters appeared to comply with contract requirements.

The QA Inspector randomly observed three ZPMC welders ID number 054460, 053609 and 053605 utilizing the FCAW Process in the 3G (Vertical Groove) Position with ZPMC WPS WPS-B-T-2233-B-U3-F, to weld groove (bent heavy plate) splice butt joint on Tower Diaphragm Flange Sub-Assembly SSD1-SA335-17A, SSD1-SA235-3A and ESD1-SA234 A/B -4B respectively. The QA Inspector randomly observed ZPMC CWI Zhao Chen Sun monitoring weld parameters.

### Bay 7: OBG - Floor Beam Sub Assembly:

This QA Inspector observed ZPMC UT personnel E. Shui Qing perform UT on two floor beam repair tee joints FB016-013-043 and FB015-011-043 and one new floor beam weld joint FB015-007-043. The two weld repairs were noted by ZPMC to still have defect on the weld joints whereas the new one was accepted.

QA Inspector J. Lizardo randomly observed ZPMC qualified welder Zhong Qing Quan ID #044774 groove welding fill pass on (flange to web plate) tee joint. Mr. Zhong was observed welding in the 2G (horizontal)

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position utilizing a flux corded arc welding (FCAW) process with a 1.4mm diameter electrode, filler metal brand E71T-1, class Supercored 71H, semi automatic at floor beam FB012-001-045. QA Inspector Lizardo observed the ZPMC QC CWI Inspector Huang Wen Pang verifying that the welding parameters and pre-heat were in accordance with the Welding Procedure Specification (WPS).

FCAW fillet welding (2F) was observed on stiffener to web plate on various floor beam sub-assemblies FB016-008-022 and FB016-008-021. ZPMC welders working on these were identified as Zhuo Jibo ID# 065564 and Lia Kai Ge ID #044830. ZPMC CWI Hu Wei Qing was noted monitoring the parameters. Tack welding/fit-up was continuing on stiffener to web plate of floor beam FB015-006-011/012 and FB015-006-015/016 using electrode TL-508. During tack welding/fit-up of these sub-assemblies, paint coating was removed, close and tight gap noted and preheating was used. FCAW 1G PJP welding was also continuing on critical weld repair B-CWR090 on longitudinal shear plate LD010-001-012 utilizing WPS-B-T-2231-Tc-U4b-F-1 by two ZPMC welders Chen Chuanzong and Wong Hong Lei. On floor beam FB011-008-002, random surface porosity was still noted on fillet weld between web plate and flange. See photo below.

This QA randomly observed heat straightening of floor beam FB028-001 weld numbers 078, 079, 080, 081, 101 and 108 due to welding distortion. Oxy-acetylene was used and less than 600 degree C thermal heat input was implemented following procedure HSR1(B)-1116.

## Bay 8: Tower Diaphragms

The QA Inspector randomly observed ZPMC welder Xu Pei Pei ID Number 050323, utilizing the SAW Process in the 1G (Flat Groove) Position with ZPMC WPS WPS-B-T-3221-B-U3c-S-1, to weld the fill pass on plate butt splice of Tower Diaphragm ESD1-SA316A/B-6B/12B. The QA Inspector randomly observed ZPMC CWI Lvliqing, monitoring weld parameters. This QA also observed grinding on groove bevel face after back gouging on Tower Diaphragm plate splice butt joints WSD1-SA301 A/B-11B/12B and ESD1-SA301 A/B-11B/12B.



## Summary of Conversations:

No significant conversation occurred today.

## 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

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for your project.

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<b>Inspected By:</b>	Lizardo, Joselito	Quality Assurance Inspector
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<b>Reviewed By:</b>	Cochran, Jim	QA Reviewer
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