

**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-003475**Date Inspected:** 04-Aug-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**CWI Name:** Zhashi and 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:** 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 sub-assembly Bays mentioned below;

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

This QA Inspector observed machining/beveling of 2-40mm thick plates marked P9741 and P832 and 4-60mm thick plates marked P243, P263, P244 and P564 all intended for tower double diaphragm web plates in progress. Cutting of 2-40mm thick plates marked P658 and P520 for tower double diaphragm web plates also in progress. Rolling machine and tower mock-up 114M both noted idle.

Bay 3: OBG side/bottom/edge panel

The QA Inspector randomly observed ZPMC welder operators Wei Dashuai ID Number 051246 and Xin Meng ID Number 053742, utilizing the FCAW Process in the 2F (Horizontal Fillet) Position with gantry(#1) mounted welding apparatus and ZPMC WPS WPS-B-T-2132-3, to weld 6-open-Ribs on bottom plate BP311-001 weld joints 025 and 029 respectively. 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: 302 amps, 30.6 volts; 312 amps, 30.5 volts. Travel speed for all welds was randomly observed at 475 mm per minute. The weld parameters appeared to comply with contract requirements.

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## WELDING INSPECTION REPORT

( Continued Page 2 of 4 )

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The QA Inspector randomly observed ZPMC welder Wu Zhibin ID Number 049804, utilizing the Submerged Arc Welding (SAW) Process in the 1G Position (Flat Groove) with ZPMC WPS WPS-B-T-3221-B-U3c-S-1, to weld the cover pass on plate splice butt joint of open rib stiffener for deck panel DP623-001 weld joints 020 and 021. 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: 590 amps, 30.6 volts with a travel speed of 485 mm per minute. The weld parameters appeared to comply with contract requirements.

Tack welding/fit-up of 6-open rib stiffener to various side panels SP405-001, SP402-001 and SP400-001 using 4.0mm, TL-508 electrode was also noted.

This QA observed mapping by ABF/QA linear indications found by ZPMC/MT on (skewed) open rib/connection plate SP403-001 weld joints 001, 008, 032 and 035 in preparation for a Critical Weld Repair request. See photo below.

### Bay 4: Tower Diaphragm

This QA Inspector randomly observed ZPMC welder Li Shuofu ID #066674, Li Shu Qiang ID #053605 and Han Kun ID #066751 utilizing the FCAW Process in the 3G (Vertical Groove) Position with a 1.4mm diameter electrode, filler metal brand E71T-1, class Supercored 71H, semi automatic with ZPMC WPS WPS-B-T-2233-B-U3-F, to weld fill passes on groove (bent heavy plate) splice butt joint on Tower Diaphragm Flange Sub-Assembly ESD1-SA313-4A, WSD1-SA287-11B and SSD1-SA291-8A respectively. The QA Inspector randomly observed ZPMC CWI Zhao Chen Sun monitoring preheat and weld parameters.

This QA observed tack welding/fit-up of fillet weld connection of tower diaphragm plate to diaphragm flange SSD1-SA333 A/B-8 using 1.4mm diameter, K-71TSR wire electrode. Maximum gap noted around the weld perimeter was 6.5mm. ZPMC welder Dai Lu ID #048659 was also noted tack welding on 40mm thick web plate to tower double diaphragm ESD1-SA234 B/B-3 using Excalibur E9018M H4R.

This QA observed ZPMC/NDE perform MT on tack welds of 40mm/60mm thick web plate to tower double diaphragm ESD1-SA234 B/B PJP connection.

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

The QA Inspector randomly observed ZPMC welder Hong Shuili ID Number 044815, utilizing the FCAW Process with a 1.4mm diameter electrode, filler metal brand E71T-1, class Supercored 71H in the 3G (Horizontal Groove) Position with ZPMC WPS WPS-B-T-2233-Tc-U4b-F, to weld fill pass on skewed connection plate (of 300mm x 300mm diagonal brace) to floor beam bottom flange Sub-Assembly SSD11A-PP045-006/005. The QA Inspector randomly observed ZPMC CWI Hu Wei Qing monitoring weld parameters. FCAW(3G) CJP welding fill pass on flange splice butt joint floor beam FB019-001-021 using same procedure mentioned above by ZPMC welder Chen Chuanzong ID #044824 was also observed.

FCAW(2F) fillet welding on stiffener to web plate of longitudinal shear plate LD001-011-003 using 1.4mm diameter, filler metal brand E71T-1, class Supercored 71H by ZPMC welder Wang Hong Lei ID #066687 this QA observed. Surface porosity was also noted on fillet weld of stiffener to web plate of LD002-010-003. See photo below.

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# WELDING INSPECTION REPORT

( Continued Page 3 of 4 )

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Heat straightening was observed on longitudinal shear plate LD004-020 weld joints 001~012 due to welding distortion. Oxy-acetylene gas was used with thermal heat input of less than 650 degree C following procedure HSR1(B)- 1592.

## Bay 8: Tower Diaphragm

This QA Inspector randomly observed ZPMC welder Jiang Yong Sheng ID number 045240 and Chen Chao Nian ID #048688 utilizing the FCAW Process in the 3G (Vertical Groove) Position with a 1.4mm diameter electrode, filler metal brand E71T-1, class Supercored 71H, semi automatic with ZPMC WPS WPS-B-T-2233-B-U3-F, to weld fill pass on groove (bent heavy plate) splice butt joint on Tower Diaphragm Flange Sub-Assembly NSD1-SA248 weld joint 9B and SSD1-SA248 weld joint 10A respectively. The QA Inspector randomly observed ZPMC CWI Zhashi monitoring weld parameters.

This QA observed two ZPMC welders Yang Tianbang, ID #066439, Li Xing ID #066675 and Liu Xiaolin ID #067079 utilizing the FCAW Process in the 2F (Horizontal) Position with a 1.4mm diameter electrode, filler metal brand K-71TSR, semi automatic with ZPMC WPS WPS-B-T-4132 to weld fillet fill pass on fillet weld connection between tower diaphragm plates to diaphragm flange SSD1-SA277 A/B-6. The QA Inspector randomly observed ZPMC CWI Zhashi monitoring weld parameters.

Heat straightening was observed on tower diaphragm flange WSD1-SA290 weld joints 3A/B, 6A/B, 5A/B, 10A/B, 8A/B and 9A/B due to welding distortion. Natural gas was used with thermal heat input of less than 650 degree C and with the aid of 50-Ton hydraulic Ram following procedure HSR1(T)-3007.



## 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 Joshua Ishibashi, (858) 232-7081, who represents the Office of Structural Materials for your project.

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# WELDING INSPECTION REPORT

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**Inspected By:** Lizardo, Joselito

Quality Assurance Inspector

**Reviewed By:** Cuellar, Robert

QA Reviewer