

**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-003036**Date Inspected:** 21-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 sub-assembly Bays mentioned below;

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

This QA Inspector observed machining/beveling of 5 -30mm thick plates marked FB15A, FB22B, FB8C, FB78A, and FB21B were seen in progress. These plates are intended for floor beam splices. Drilling of 16-24mm diameter bolt holes on 300mm X 300mm hollow steel diagonal brace and welded spacer beam (W5.5 x 25.5 long) for floor beam sub-assembly still continues. Rolling of 1-60mm thick plate marked P229 for longitudinal skin plate stiffener on going. There was no Caltrans job at the cutting table and tower mock up 114M was noted idle.

Bay 3: OBG side/bottom/edge panel:

This QA observed cutting of W21 X 57 to make WT's for various bottom panel BP195-001 and BP194-001 in progress and drilling of 4-24mm diameter bolt holes (~every 3 feet) on 35mm thick plate open rib stiffener for various deck panels on going.

Tack welding/fit-up of 3-open rib stiffener to deck panel DP010-001-001~006 and 2-open rib stiffener to edge panel EP056-001-003~006 using THJ506Fe was noted. Three open rib stiffener DP046-001 weld number 001/002 and 005/006 being preheated with corner ceramic thermal blanket at gantry table prior welding and 3-open rib

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stiffener to deck panel DP045-001-001~006 being clamped and getting ready for preheat prior welding this QA observed.

### Bay 4: Tower Diaphragm

The QA Inspector randomly observed ZPMC welder operator Li Xue Hua ID Number 058174 utilizing the Flux Cored Arc Welding (FCAW) Process in the 2F (Horizontal Fillet) Position with a 1.4mm diameter electrode, filler metal brand K-71TSR, semi automatic in a gantry mounted welding apparatus and ZPMC Weld Procedure Specification (WPS) WPS-B-T-4132, to weld fillet root on tower diaphragm plate to diaphragm flange ESD1-SA287-2. The QA Inspector randomly observed ZPMC CWI Ye Yong Jun monitoring weld parameters and preheat of >180 degree C but < 230degree C. Prior welding, this QA noted gap of less than 5.0mm and weld surface free from paint coating.

This QA Inspector randomly observed two ZPMC welder ID number 053609 and ID #054460 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 ESD1-SA268 weld joint 6B and 4B respectively. The QA Inspector randomly observed ZPMC CWI Zhao Chen Sun monitoring weld parameters. The QA Inspector also randomly monitored weld parameters and recorded them as follows: 216 amps, 27.0 volts with a travel speed of 120 millimeters (mm) per minute for welder ID#053609 and 220 amps, 26.8 volts with a travel speed of 120 millimeters (mm) per minute for welder ID#054460. The weld parameters appeared to comply with contract requirements.

Bending of heavy plates P1082(N)- 4.14(D) and P1246(W)- 4.8(J) for diaphragm flanges using oxy-acetylene with thermal heat input of less than 650 degree C and following procedure HSR(T)-66 and HSR(T)-81 respectively.

This QA observed no activity on three flanges (being fit to its respective tower diaphragm plate) that have issues concerning unacceptable gap and tight fit as previously reported. However, fillet welding of one flange to diaphragm plate started on ESD1-SA287-2 as mentioned above.

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

QA Inspector J. Lizardo randomly observed ZPMC qualified welder Zhang Qingquan ID #044774 groove welding fill pass on (flange to web plate) tee joint. Mr. Zhang was observed welding in the 2G (horizontal) 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 FB012-005-043. 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 flange to web plate on floor beam sub-assembly FB010-001-010 and FB010-001-002. ZPMC welders working on these were identified as Liu Long Xian ID# 044786 and Zhuo Jibo ID #055564. ZPMC CWI Hu Wei Qing was noted monitoring the parameters. SMAW fillet(2F/3F) welding was also noted on 8.0mm plate end cap to 300mm x 300mm diagonal brace for various floor beams FB006-027, FB006-026 and FB006-025 using 4.0mm diameter, TL-508 electrode.

Heat straightening was also observed on longitudinal shear plate LD019-001 weld joints 011 / 012 due to welding

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distortion. Oxy-acetylene gas was used and less than 650 degree C thermal heat input was implemented following procedure HST1(B)-1245. All other welding related activities observed in this bay include back gouging of floor beam splice butt joints FB032-001, FB029-001 and FB027-001 and beveling to 45 degree with oxy-acetylene gas 3-sides of web plate for longitudinal shear plate LD001-011, LD002-011 and LD002-012.

## Bay 8: Tower Diaphragm

The QA Inspector randomly observed ZPMC welder ID number 045240 utilizing the FCAW Process in the 3G (Vertical Groove) Position 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-SA270-6A. The QA Inspector randomly observed ZPMC CWI Lvliqing monitoring weld parameters.

Tack welding/fit-up was noted on flange to web plate of longitudinal shear plate LD003-012 and LD001-007 using 4.0mm diameter TL-508 electrode. ZPMC welder Fu Yanjie ID #066268 was identified performing the task. During tack welding/fit-up of these sub-assemblies, paint coating was removed, close and tight gap noted and preheating was used.



## Summary of Conversations:

No significant conversation occurred today.

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

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

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