

**DEPARTMENT OF TRANSPORTATION**

DIVISION OF ENGINEERING SERVICES

Office of Structural Materials

Quality Assurance and Source Inspection



Bay Area Branch  
690 Walnut Ave. St. 150  
Vallejo, CA 94592-1133  
(707) 649-5453  
(707) 649-5493

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-002726**Date Inspected:** 29-May-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:** Lvliqing and Zhang Bao Lei**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 these Bays mentioned below;

Bay # 2: 77 and 114M Tower Mock-ups, Plate Cutting, Rolling

This QA Inspector observed Tower Mock-up was idle and no Caltrans material on the table of cutting machine. On rolling machine, this QA observed 60mm thick plate without visible marking was seen complete. On horizontal milling machine, 65mm thick plates X 460mm width X 1015mm long marked P236(2pcs), P4(1pc) and P329(3pcs) were seen in the milling machine table#1 while 60mm thick plates X 400mm width X 1015mm long marked P235(8pcs) were seen at milling machine #2. These plates mentioned appear to be skin inside stiffeners.

Bay 3-OBG side/bottom/edge panel:

The QA Inspector randomly observed ZPMC welder Li Xuehua ID number 058174, utilizing the FCAW process with a 1.4mm diameter electrode, filler metal brand E71T-1, class Supercored 71H in the 3G (Vertical Groove) Position with ZPMC WPS WPS-B-T-2233-B-U2-F, to weld groove splice butt joint on W18 X 46 flange to make WT rib stiffener for side panel SP182-001-019, SP182-001-022 and SP182-001-006. The QA Inspector randomly observed ZPMC CWI Zhang Bao Lei monitoring weld parameters. This QA also observed two ZPMC welders Ru Heng Hua ID # 037779 and Yang Gencheng ID# 066418 tack welding/ fitting open rib stiffeners to side panel SP412-001-001~010 and SP426-001-001~010 respectively. These two welders were using WPS-B-P-2112-FCM with recorded parameters of 176Amps and 23Volts that deem acceptable to the WPS requirements.

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Other activities observed were two panels marked SP428-001-001~010 and SP090-001-001~010 being clamped at gantry number 1, grinding off paint coating on W18X46 prior to cut to WT rib stiffeners for SP006-787 and grinding/cleaning of tack welds on open rib stiffeners to various side panels.

### Bay 4 Tower Diaphragm

The QA Inspector randomly observed ZPMC welder Gu Caihong ID Number 053748, 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 and cover pass on butt splices of Tower Diaphragm Sub-Assemblies. The QA Inspector randomly observed ZPMC CWI Ye Yong Jun, monitoring weld parameters. The QA Inspector also randomly monitored weld parameters during welding of SSD1-SA333-A/B-1B(2B) and recorded them as follows: 615 amps, 31.0 volts with a travel speed of 475 mm per minute. Weld parameters appeared to comply with contract requirements. Another ZPMC welder Jiang Ting Teng ID# 046830 was observed utilizing same process, position, and WPS mentioned above on splice of tower diaphragm plate SSD1-SA261-1A2A/1B2B. The same ZPMC CWI was monitoring this welder's parameters.

The QA Inspector randomly observed ZPMC welder ID number 053609, utilizing the FCAW Process in the 3G (Vertical Groove) Position with ZPMC WPS WPS-B-T-2233-B-U3-F, to weld groove splice butt joint on Tower Diaphragm ring Sub-Assembly ESD1-SA287 weld number 6B. The QA Inspector randomly observed ZPMC CWI Lvliqing monitoring weld parameters. The weld parameters observed were 215Amps, 26.3Volts and 120 mm/min travel speed, which appeared to comply with contract requirements. In separate location, this QA also observed FCAW on plate splice butt welding of tower diaphragm NSD1-SA19-13 following WPS-B-T-2331-B-P3-F-1.

This QA randomly observed heat straightening of side panel SP413(A)-001 due to welding distortion. Oxy-acetylene was used and less than 650 degree C thermal heat input was implemented following procedure HSR1(B)-1054. Bending of heavy plates P1256(N)-1 4/21(D) and P667(S)-1 4/21(P) for diaphragm ring using oxy-acetylene with thermal heat input of less than 650 degree C and following procedure HSR1(T)-2051 and HSR1(T)-2048 respectively.

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

This QA Inspector observed welded floor beam sub-assemblies were seen stacked on top of each other that could give strong possibility of distorting their squareness. This QA called the attention of ABF Inspector Kevin Dye to correct the situation. This ABF Inspector responded by saying he will issue an NCR against ZPMC. See photo below.

The QA Inspector randomly observed ZPMC welder Xie Jin Xia ID Number 048038, utilizing the FCAW Process with a 1.4mm diameter electrode, filler metal brand E71T-1, class Supercored 71H in the 1G (Flat Groove) Position with ZPMC WPS WPS-B-T-2231-B-U2-F-1, to weld plate splice root joint on floor beam Sub-Assembly FB027-001-081/101. This QA also observed ZPMC welder Huang Xin Lan ID Number 044780, utilizing the Submerged Arc Welding (SAW) Process in the 1G (Flat Groove) Position with ZPMC WPS WPS-B-T-2221-B-L2c-S-1, to weld the fill and cover pass on butt splices of floor beam sub-assembly FB019-001-081/101. The QA Inspector randomly observed ZPMC QC Yang Ding monitoring weld parameters.

FCAW fillet welding (2F) was also observed on flange to web of floor beam sub-assemblies FB016-013-004 and

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FB016-013-010. Two ZPMC welders working on these were identified as Hong Shuili ID# 044815 and Chen Chuanzong ID# 044824. ZPMC CWI Hu Wei Qing was noted monitoring the parameters. Tack welding/fit-up was continuing on stiffener to web plate of floor beam FB016-012 using 4.0mm electrode TL-508. Cutting of access hole on 300mm X 300mm hallow steel diagonal brace using oxy-acetylene for floor beam sub-assembly was also observed.

### Bay 8: Tower Diaphragms

The QA Inspector randomly observed ZPMC welder ID number 058482, utilizing the FCAW Process in the 3G (Vertical Groove) Position with ZPMC WPS WPS-B-T-2233-B-U3-F, to weld groove splice butt joint on Tower Diaphragm ring Sub-Assembly SSD1-SA326 weld number 5B. The QA Inspector randomly observed ZPMC CWI Li Zhijiang monitoring weld parameters. The weld parameters observed were 215Amps, 25.5Volts, and 116mm/min travel speed. FCAW PJP on corner joint of longitudinal diaphragms LD009-002-012 and LD007-002-012 using WPS-B-T-2332-Tc-P4-F was observed. The QA Inspector randomly observed ZPMC QC Wang Xiang monitoring the weld parameters. Tack welding on run off tab using E9018 4.0mm diameter and implementing 1G procedure WPS-B-T-3311-TcP4 and 3G procedure WPS-B-T-3313-Tc-P4 on tower diaphragm WSD1-SA309-11A/12A this QA Inspector observed. Bevel cutting on various bent heavy plates for diaphragm ring continues.



### Summary of Conversations:

On Bay 7 wherein OBG floor beams are fabricated, it was noted that completed sub-assembly of floor beams are stacked on top of each other that could distort the squareness of the beams. This QA informed ABF Inspector Kevin Dye about this condition and said he will issue an NCR against ZPMC.

### 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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**Inspected By:** Lizardo, Joselito

Quality Assurance Inspector

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**Reviewed By:** Cochran,Jim

QA Reviewer