

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-002969**Date Inspected:** 19-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**CWI Name:** Hu Wei Qing and Shazhi**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 1 -40mm thick plates marked P669 seen complete while 1-40mm thick plate marked P643 being set-up at the machining table. Drilling of 18-24mm diameter bolt holes on 24mm thick X 340mm wide X 1105mm long for various connection plates of floor beam sub-assembly on going and cutting of 30mm thick plate marked P346, P344, P347, P348 and P1550 was seen in progress. Rolling machine and tower mock up 114M were both noted idle.

Bay 3: OBG side/bottom/edge panel:

The QA Inspector randomly observed ZPMC welder operators Sun Ti Yu ID Number 054459 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 Open-Ribs stiffener to Deck Plate DP022-001 at weld joints 003/004.

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: 305 amps, 30.1 volts amps. Travel speed was randomly observed at 400 millimeters (mm) per minute. Tack welding/fit-up of 6-WT rib stiffener to side

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panel SP175-001-012~021 by two ZPMC welders Dai Lu ID # 048659 and Du Henghua ID #037779 this QA also observed.

This QA observed drilling of 21-27mm diameter bolt holes on one end of open rib stiffener for various panels and preheating with corner thermal blanket on open rib stiffener to deck panel DP022-001 weld numbers 001/002 and 005/006 prior welding noted.

Bay 4: Tower Diaphragm

This QA observed ZPMC MT personnel Wang Wei perform 10% Magnetic Particle Testing on fillet weld between WT rib stiffener to side panel SP195-001-068~079, SP194-001-001~012 and SP190-001-079~092. 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 were dry yellow ferromagnetic particles and applied with powder blower while the magnetizing force is on and magnetizing force is applied in perpendicular direction (180 degree apart). While the ZPMC NDT Mr. Wang was MT testing the welds, this QA randomly perform VT and 10%MT on fillet welds mentioned and appears conforming to the project requirements. This QA also observed ZPMC's conduct of MT on these welds deemed acceptable.

This QA randomly observed heat straightening of side panel SP181(A)-001 weld numbers 008~021 due to welding distortion. Oxy-acetylene was used and less than 650 degree C thermal heat input was implemented following procedure HSR1(B)-1128. Bending of heavy plates P1246(S)- 4/8(1), P1246(W)-4.7(H) and P1082(E)-4/8(L) for diaphragm flanges using oxy-acetylene with thermal heat input of less than 650 degree C and following procedure HSR(T)-131, HSR(T)-80 and HSR(T)-124 respectively.

This QA also observed FCAW(2F) tack welding/fit-up of fillet weld on tower diaphragm plate to diaphragm flange ESD1-SA287-1 using 1.4 diameter wire brand K-71TSR by ZPMC welder Li Shu Qiang ID #053609. In this fit-up, the root gap was measured less than 5.0mm and preheat of greater than 180 degree C but less than 230 degree C and weld surface area was free from paint coating material. ZPMC CWI Zhao Chen Sun was monitoring welding parameters and constantly measuring the gap to make sure, it does not exceed the WPS-B-T-4132 requirement. See photo below.

Bay 7: OBG - Floor Beam Sub Assembly

This QA Inspector observed three ZPMC UT personnel perform UT on floor beam plate splice butt joints FB027-001-078~081, FB027-001-101, 108, FB030-001-078~081, FB030-001-101, 108, FB029-001-078~081, FB029-001-101, 108, FB032-001-078~081 and FB032-001-101, 108.

The QA Inspector randomly observed ZPMC welder Duan Xiu Zhi ID Number 050502, utilizing the SAW Process in the 1G (Flat Groove) Position with ZPMC WPS WPS-B-T-2221-B-L2c-S-1, to weld the fill pass on plate butt splice of floor beam FB019-001-122. The QA Inspector randomly observed ZPMC CWI Hu Wei Qing, monitoring weld parameters. The QA Inspector also randomly monitored weld parameters and recorded them as follows: 522 amps, 30.6 volts with a travel speed of 427 mm per minute. Weld parameters appeared to comply with contract requirements.

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

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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 FB012-010-043. 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 stiffener to web plate on floor beam sub-assembly FB012-010-weld joints 011 and 012. ZPMC welder working on these were identified as Wang Hong Lei ID# 066687 and Zhuo Jibo ID #066687. ZPMC CWI Hu Wei Qing was noted monitoring the parameters. Tack welding/fit-up was continuing on flange to web plate of floor beam FB011-002 using electrode TL-508. During tack welding/fit-up of this sub-assembly, paint coating was removed, close and tight gap noted and preheating was used.

This QA randomly observed heat straightening of floor beam FB020-001 weld numbers 078, 079, 080, 081, 101 and 108 due to welding distortion. Oxy-acetylene was used and less than 650 degree C thermal heat input was implemented following procedure HSR1(B)-1188.

Bay 8: Tower Diaphragm

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 root and fill pass on plate butt splice of Tower Diaphragm WSD1-SA301A/B-11A /12A. The QA Inspector randomly observed ZPMC CWI Lvliqing, monitoring weld parameters. The QA Inspector also randomly monitored weld parameters and recorded them as follows: 626 amps, 30.5 volts with a travel speed of 475 mm per minute. Weld parameters appeared to comply with contract requirements.

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-SA326-9B. The QA Inspector randomly observed ZPMC CWI Lvliqing monitoring weld parameters.



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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 for your project.

Inspected By: Lizardo, Joselito

Quality Assurance Inspector

Reviewed By: Cuellar, Robert

QA Reviewer