

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-002590**Date Inspected:** 24-Apr-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:** See below**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/Tower**Summary of Items Observed:**

Caltrans Quality Assurance (QA) Inspector Sherri Brannon arrived on site at the Zhenhua Port Machinery Company (ZPMC) facility at Changxing Island, in Shanghai, China to periodically monitor welding and Quality Control (QC) functions. While on site the QA Inspector observed and/or discovered the following.

OBG/Tower Sub-Assembly**Bay 2****77 & 144 Meter Mock-up:**

QA Inspector Brannon observed tower mock-up to be idle during this shift. QA Inspector Brannon also, randomly observed ZPMC personnel CNC torch cutting with 75% natural gas and 25% oxygen for interior splice plate for various tower elevations.

Bay 3-OBG side/edge panels (Gantry 2):

QA Inspector Brannon randomly observed ZPMC qualified welders Mr. Liz Hao Qian ID#048810, Mr. Xin Meng ID#053742 and Mr. Sun Ti Yu ID#054459 fillet welding joining T-stiffeners to side panel plate for EP002-001 weld joints 004~007, EP001-001 weld joints 004~007 and SP567-001 weld joints 001~012. Mr. Liz, Mr. Xin and Mr. Sun was observed welding in the 2F (horizontal) position utilizing flux cored arc welding (FCAW) process with a 1.4mm diameter electrode, filler metal brand Supercored 71H, class E71T-1. Welding parameters observed by QA Inspector Brannon appear to be in general compliance with the approved WPS-B-T-2132-3.

Bay 3-OBG side panel:

QA Inspector Brannon randomly observed ZPMC welder Mr. Jiang Jingteng ID #046830 welding fill/cover pass's

WELDING INSPECTION REPORT

(Continued Page 2 of 5)

joining SP121-001, pl 517A to pl 517B. Mr. Jiang was observed welding in the 1G (flat) position utilizing a submerged arc welding (SAW) process with a 4.0mm diameter electrode, filler metal brand EM12K, class JW3, machine. QA Inspector Brannon observed the ZPMC QC CWI Inspector Mr. Wu Ming Kai verifying that the welding parameters and pre-heat were in accordance with the Welding Procedure Specification (WPS). QA Inspector observed preheat and welding parameters measured by the QC CWI Inspector Wu Ming Kai to be: preheat temperature of 60°C and welding parameters amps of 510, volts of 29.2, and a travel speed of 432. Welding parameters observed by QA Inspector Brannon appear to be in general compliance with the approved WPS-B-T-2221-B-L2c-S-1.

Bay 3-OBG side/bottom/edge panels:

QA Inspector Brannon randomly observed ZPMC qualified welders, tack welding various T stiffeners plate utilizing a shielded metal arc welding (SMAW) process with a 4.0mm diameter electrode, filler metal brand E7018, class TL508. Welding parameters observed by QA Inspector Brannon appear to be in general compliance with the approved WPS-B-P-2112-FCM.

Bay 3-OBG W shape beams (splice)

QA Inspector Brannon randomly observed ZPMC qualified welder Mr. Li Shu Qiang ID#053609 splice welding W shape beams. Mr. Li was observed welding in the 3G (vertical) 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. QA Inspector Brannon observed the ZPMC QC Inspector Mr. Wu Ming Kai and Mr. Baolei Zhang verifying that the welding parameters and pre-heat were in accordance with the Welding Procedure Specification (WPS). QA Inspector Brannon observed preheat and welding parameters measured by the QC CWI Inspector Mr. Wu Ming Kai and Mr. Baolei Zhang to be: a minimum preheat temperature of 10°C and welding parameters amps of 204, volts of 26.1, a travel speed of 118 mm/min and a gas flow of 19L. Welding parameters observed by QA Inspector Brannon appear to be in general compliance with the approved WPS-B-T-2233-BU2-F.

Bay 4 – Heat straightening side panel:

QA Inspector Brannon randomly observed ZPMC personnel performing heat straightening on various side/bottom/edge panels and tower diaphragm plates. Side/bottom/edge panels cause for heat straightening welding distortion and tower diaphragm pates cause for heat straightening mill induced. Heat Straightening is performed by flame straightening using oxygen acetylene or natural gas using a hand torch.

Bay 4 Tower 33/43 Meter Elevation:

QA Inspector Brannon randomly observed ZPMC welder Mrs. Gu Cai Hong ID #053748 welding fill/cover pass's joining SA318 (E) to P830 (E) weld joint # ESD1 SA318 -3A & 4A and SA27 (N) to P546 (N) weld joint # NSD1 SA27 -1A & 1B. Mrs. Gu was observed welding in the 1G (flat) position utilizing a submerged arc welding (SAW) process with a 4.0mm diameter electrode, filler metal brand LA-85, class ENi5, machine. QA Inspector Brannon observed the ZPMC QC CWI Inspector Mr. Zhao Chen Sun and Mr. Ye Yongjun verifying that the welding parameters and pre-heat were in accordance with the Welding Procedure Specification (WPS). QA Inspector observed preheat and welding parameters measured by the QC CWI Inspector Zhao Chen Sun and Mr. Ye Yongjun to be: preheat temperature of 180°C and welding parameters amps of 626/630, volts of 30.3/30.8, and a travel speed of 486/490 respectively. Welding parameters observed by QA Inspector Brannon appear to be in general compliance with the approved WPS-B-T-3221-B-U3c-S-1.

WELDING INSPECTION REPORT

(Continued Page 3 of 5)

Bay 7-OBG - Floor Beam Sub Assembly:

QA Inspector Brannon randomly observed ZPMC personnel performing heat straightening on floor beam flange plates for FB002-001-079, 122,125,126 & 127. Cause for heat straightening excessive repair work to the material as a result of inadequate welding techniques, defect – Mechanical assisted heat straightening additional pressure shall not be applied during heat application record document areas of applied force. Heat Straightening is performed by flame straightening and hydraulic jacks using oxygen acetylene with hand torch. See ZPMC heat straightening report HSR(B)-182 for additional information.

Bay 7-OBG - Floor Beam Sub Assembly:

QA Inspector Brannon randomly observed ZPMC qualified welder Mr. Zhang Qing Quan ID#044774 repair welding at the weld joint FB017-02-127. Mr. Zhang was observed welding in the 1G (flat) 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. QA Inspector Brannon observed the ZPMC QC Inspector Mr. Hu Wei Qing verifying that the welding parameters and pre-heat were in accordance with the Welding Procedure Specification (WPS). QA Inspector Brannon observed preheat and welding parameters measured by the QC CWI Inspector Mr. Hu Wei Qing to be: a minimum preheat temperature of 90°C and welding parameters amps of 293, volts of 30.0, and a gas flow of 20L. Welding parameters observed by QA Inspector Brannon appear to be in general compliance with the approved WPS-345-FCAW-1G(1F)-FCM-Repair. See also, ZPMC welding repair report #B-WR269 and ZPMC UT report #787-UT-439R1 for more information.

Bay 7-OBG floor beam panels:

QA Inspector Brannon randomly observed ZPMC qualified welders, tack welding various floor beam web splice connections utilizing a shielded metal arc welding (SMAW) process with a 4.0mm diameter electrode, filler metal brand E7018, class TL508. Welding parameters observed by QA Inspector Brannon appear to be in general compliance with the approved WPS-B-P-2112.

Bay 7-OBG - Floor Beam Sub Assembly:

QA Inspector Brannon randomly observed ZPMC qualified welder Zhang Qing Quan ID#044774 welding root pass at the floor beam FB015-006-023. Mr. Zhang was observed welding in the 1G (flat) 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. QA Inspector Brannon observed the ZPMC QC Inspector Mr. Hu Wei Qing verifying that the welding parameters and pre-heat were in accordance with the Welding Procedure Specification (WPS). QA Inspector Brannon observed preheat and welding parameters measured by the QC CWI Inspector Mr. Hu Wei Qing to be: a minimum preheat temperature of 40°C and welding parameters amps of 285, volts of 29.7, a travel speed of 507 mm/min and a gas flow of 20L. Welding parameters observed by QA Inspector Brannon appear to be in general compliance with the approved WPS-B-T-2231-B-U2-F-1.

Bay 8 – 38 Meter Tower Diaphragm Sub Assembly:

QA Inspector Brannon randomly observed ZPMC qualified welder Mrs. Xi Pei Pei ID #048431 groove welding fill pass's joining SA371 (E) to P965 (E) weld joint ESD1 SA371-6B. Mrs. Xi was observed welding in the 1G (flat) position utilizing a submerged arc welding (SAW) process with a 4.8mm diameter electrode, filler metal brand LA-85, class ENi5 machine. QA Inspector Brannon observed the ZPMC QC CWI Inspector Lv Jiangang verifying that the welding parameters and pre-heat were in accordance with the Welding Procedure Specification (WPS). QA Inspector observed preheat and welding parameters measured by the QC CWI Inspector Lv Jiangang

WELDING INSPECTION REPORT

(Continued Page 4 of 5)

to be: preheat temperature of 180°C and welding parameters amps of 608, volts of 30.6, and a travel speed of 475 mm/min. Welding parameters observed by QA Inspector Brannon appear to be in general compliance with the approved WPS-B-T-3221-B-U3c-S-1.

Bay 8 – 13 Meter Tower Diaphragm Sub Assembly:

QA Inspector Brannon randomly observed ZPMC qualified welder Mrs. Ma Ying ID #045270 groove welding joining SA126A (S) to P257 (S) weld joint SSD1 SA126A-1B. Mrs. Ma was observed welding in the 1G (flat) position utilizing a submerged arc welding (SAW) process with a 4.8mm diameter electrode, filler metal brand LA-85, class ENi5, machine. QA Inspector Brannon observed the ZPMC QC CWI Inspector Lv Jiangang verifying that the welding parameters and pre-heat were in accordance with the Welding Procedure Specification (WPS). QA Inspector observed preheat and welding parameters measured by the QC CWI Inspector Lv Jiangang to be: preheat temperature of 180°C and welding parameters amps of 607, volts of 29.6, and a travel speed of 487. Welding parameters observed by QA Inspector Brannon appear to be in general compliance with the approved WPS-B-T-3221-B-U3c-S-1

Bay 8 – Heat straightening:

QA Inspector Brannon randomly observed ZPMC personnel performing heat straightening on various tower diaphragm flange plates. Tower diaphragm plates cause for heat straightening mill induced distortion. Heat Straightening is performed by flame straightening using natural gas with a hand torch.

The following digital photograph below illustrates observation of the activities being performed.



Summary of Conversations:

No relevant conversations to report.

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: Brannon, Sherri

Quality Assurance Inspector

WELDING INSPECTION REPORT

(Continued Page 5 of 5)

Reviewed By: Cuellar,Robert

QA Reviewer