

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-002613**Date Inspected:** 06-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:** 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 W shape beams (splice)

QA Inspector Brannon randomly observed ZPMC qualified welder Mr. Li Meng Qian ID#054460 splice welding W shape beams BP061-001-003. 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 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 to be: a minimum preheat temperature of 20°C and welding parameters amps of 201, volts of 25.4, a travel speed of 113 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-2233-B-U2-F.

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Bay 3-OBG bottom panels (splice)

QA Inspector Brannon randomly observed ZPMC qualified welder Mr. Wu Zhi Bin ID #048904 splice welding joining BP034-001-049, pl 705A to pl 705B. Mr. Wu was observed welding in the 1G (flat) position utilizing a submerged arc welding (SAW) process with a 4.8mm diameter electrode, filler metal brand EM12K, class JW3, machine. QA Inspector Brannon observed the ZPMC QC CWI Inspector Hu Wei Qing 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 Hu Wei Qing to be: preheat temperature of 78°C and welding parameters amps of 512, volts of 31.5, and a travel speed of 419. 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 non-FCM and filler metal brand E7018, class THJ506Fe-1 for FCM material . Welding parameters observed by QA Inspector Brannon appear to be in general compliance with the approved WPS-B-P-2112 and WPS-B-P-2112-FCM respectively.

Bay 3-OBG side panel (Gantry 1):

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 SP121-001 weld joints 008~019 & 032 to 043 and SP094-001 weld joints 009~022 & 037 to 050. 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 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 flange plates 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 43 Meter Elevation:

QA Inspector Brannon randomly observed ZPMC welder Mr. Jiang Jing Teng ID #046830 groove welding fill/cover pass's joining SA268 (W) to P590 (W) weld joint # WSD1 SA268 -16A. Mr. Jiang 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 Mr. Zhao Chen Sun 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 to be: preheat temperature of 180°C and welding parameters amps of 630, volts of 30.0, and a travel speed of 493 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 4-OBG side/bottom panels:

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ZPMC NDT (MT):

QA Inspector Brannon observed ZPMC magnetic particle (MT) technician Mr. Bo Ting Rui, Mr. Wang Wei and Mr. Cai Xin Xin performing (MT) at SP416-001 welds joints 011~020 (accept), SP522-001 welds joints 015~028 (accept), SP562-001 welds joints 011~020 (accept), SP602-001 welds joints 001~012, SP748-001 welds joints 001~012 (accept), SP510-001 welds joints 011~020 (accept), SP420-001 welds joints 011~020 (accept), BP057-001 welds joints 007~018 (accept), BP164-001 welds joints 007~018 (accept) and BP029-001 welds joints 0107~018 (accept). QA Inspector Brannon observed accept and rejected marked on the side/ bottom panels.

Bay 4 Tower 33 Meter Elevation:

QA Inspector Brannon randomly observed ZPMC welder Mrs. Gu Cai Hong ID #053748 groove welding fill/cover pass's joining SA318 (E) to P830 (E) weld joint # ESD1 SA318 – 3B/4B. Mrs. Gu 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 Mr. Zhao Chen Sun 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 to be: preheat temperature of 180°C and welding parameters amps of 583, volts of 30.3, and a travel speed of 493 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 4 – Heat straightening:

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

Bay 7-OBG - Floor Beam Sub Assembly:

QA Inspector Brannon randomly observed ZPMC personnel performing heat straightening on various floor beam plates. Cause for heat straightening welding distortion. Heat straightening is performed by flame straightening using oxygen acetylene with hand torch.

Bay 7-OBG floor beam panels:

QA Inspector Brannon randomly observed ZPMC qualified welders, tack welding various floor beam web splice connections and floor beam top and bottom diaphragm flange to web utilizing a shielded metal arc welding (SMAW) process with a 4.0mm diameter electrode, filler metal brand E7018, class TL508 or brand E7018, class ThJ506Fe1. Welding parameters observed by QA Inspector Brannon appear to be in general compliance with the approved WPS-B-P-2112 or WPS-B-P-2112-FCM.

Bay 7-OBG - Floor Beam Sub Assembly:

QA Inspector Brannon randomly observed ZPMC qualified welder Mr. Huang Xin Lan ID #044815 groove welding joining floor beam web splice at FB009-003-021. Mr. Sun was observed welding in the 1G (flat) position utilizing a submerged arc welding (SAW) process with a 4.8mm diameter electrode, filler metal brand EM12K, class JW3, machine. QA Inspector Brannon observed the ZPMC QC CWI Inspector Wen Pang Huang 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 Wen Pang Huang to

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be: preheat temperature of 40°C and welding parameters amps of 520, volts of 31.0, and a travel speed of 440 mm/min. 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 7-OBG - Floor Beam Sub Assembly:

QA Inspector Brannon randomly observed ZPMC qualified welder Mr. Hong Shuili ID#054460 splice welding root pass for FB002-005-023A. Mr. Hong 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. Wen Pang Huang 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. Wen Pang Huang to be: a minimum preheat temperature of 47°C and welding parameters amps of 287, volts of 30.0, a travel speed of 507 mm/min and a gas flow of 23L. 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 7-OBG - Floor Beam Sub Assembly:

QA Inspector Brannon randomly observed ZPMC qualified welder's Mr. Zhang Qing Quan ID#0044774 and Mr. Chen Chuan Zong ID#044824 groove welding floor beam diaphragm flange splice for FB005-012-043 & 044. Mr. Zhang and Mr. Chen 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. Wen Pang Huang 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. Wen Pang Huang to be: a minimum preheat temperature of 84°C/63°C and welding parameters amps of 279/289, volts of 29.6/30.0, a travel speed of 521/525 mm/min and a gas flow of 23L. 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 – 18 Meter Tower Diaphragm Sub Assembly:

QA Inspector Brannon randomly observed ZPMC qualified welder Mrs. Ma Ying ID #045270 groove welding joining SA311 (S) to P52 (S) weld joint SSD1 SA311-1B/2B. 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 Zhi Sha 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 Zhi Sha to be: preheat temperature of 180°C and welding parameters amps of 609, volts of 30.3, and a travel speed of 479 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 – Heat straightening:

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

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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

Reviewed By: Carreon, Albert

QA Reviewer