

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-001999**Date Inspected:** 28-Mar-2008**Project Name:** SAS Superstructure**OSM Arrival Time:** 630**Prime Contractor:** American Bridge/Fluor Enterprises, a JV**OSM Departure Time:** 1730**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 7-OBG - Floor Beam Sub Assembly: (repair)**

QA Inspector Brannon randomly observed ZPMC qualified welder Mr. Wu Wan Yong ID #050242 repair groove welding floor beam flange plate to floor beam web plate for FB021-02-061 & 062. Ms. Wu 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. 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 60°C and welding parameters amps of 297, volts of 29.5, and a travel speed of 296 mm/min. Welding parameters observed by QA Inspector Brannon appear to be in general compliance with the approved WPS-B-T-2232-TC-U4B-F. ZPMC welding repair report number B-WR137.

Bay 7-OBG - Floor Beam Sub Assembly:

QA Inspector Brannon randomly observed ZPMC qualified welder Mr. Wu Wan Yong ID #050242 fillet welding floor beam stiffener to floor beam web for FB022-02-092. Mr. Wu was observed welding in the 2F (horizontal)

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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 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 Mr. Hu Wei Qing to be: preheat temperature of 20°C and welding parameters amps of 308, volts of 28.6, a travel speed of 440 mm/min and a gas flow of 20L/min. Welding parameters observed by QA Inspector Brannon appear to be in general compliance with the approved WPS-B-T-2132-3.

Bay 7-OBG - Floor Beam Sub Assembly:

QA Inspector Brannon randomly observed ZPMC qualified welder Mr. Wang Chen Fa ID #058102 and Mr. Wa Xian Jian ID#066445 fillet welding joining floor beam diaphragm flange to floor beam diaphragm plate for FB014-004-027, 028, 035, 036, 040 and 041. Mr. Wang and Mr. Wu was observed welding in the 2F (horizontal) position utilizing a shielded metal arc welding (SMAW) process with a 5.0mm diameter electrode, filler metal brand E7018, brand TL-508, manual. 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 Mr. Hu Wei Qing to be: preheat temperature of 60°C and welding parameters amps of 210/211 respectively. Welding parameters observed by QA Inspector Brannon appear to be in general compliance with the approved WPS-B-P-2112-FCM.

Bay 7-OBG - Floor Beam Sub Assembly:

QA Inspector Brannon randomly observed ZPMC qualified welder Mrs. Huang Xin Lan ID #044780 groove welding joining floor beam diaphragm plate to floor beam diaphragm plate for FB003-005-006. Mrs. Huang was observed welding in the 1G (flat) position utilizing a submerged arc welding (SAW) process with a 4.8mm diameter electrode, filler metal brand JW-3, class EM12K 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 60°C and welding parameters amps of 524, volts of 30.0, and a travel speed of 436 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's tack welding various floor beam stiffener plates to floor beam web plate using a shielded metal are welding (SMAW) process. QA Inspector Brannon observed tack welding for the following floor beams FB009-005, FB006-003 and FB021-02.

Bay 8 – 47.6 Meter Tower Diaphragm Sub Assembly:

QA Inspector Brannon randomly observed ZPMC qualified welder Mrs. Ma Ying ID #045270 groove welding fill pass's joining SA226 (E) to P407 (E) weld joint ESD1 SA226-10A. 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 ENIS machine. QA Inspector Brannon observed the ZPMC QC CWI Inspector Sha Zhi 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 Sha Zhi to be: preheat temperature of 180°C and welding parameters amps of 606, volts of 30.8, and a travel speed of 470

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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 – 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 SA265 (N) to P207 (N) weld joint NSD1-SA265 10A. Mrs. Xi was observed welding in the 1f (flat) position utilizing a submerged arc welding (SAW) process with a 4.8mm diameter electrode, filler metal brand LA-85, class ENIS machine. QA Inspector Brannon observed the ZPMC QC CWI Inspector Sha Zhi 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 Sha Zhi to be: preheat temperature of 180°C and welding parameters amps of 586, volts of 30.5, and a travel speed of 465 mm/min. Welding parameters observed by QA Inspector Brannon appear to be in general compliance with the approved WPS-B-T-3211-B-U3b-1.

Bay 8 – 38 Meter Diaphragm Sub Assembly:

The QA Inspector Brannon randomly observed ZPMC welding personnel utilizing the carbon air arc gouging process to back gouge weld in weld joint SSD1-SA293 1A/2A joining SA293 (S) to P559 (S) in preparation for the submerged arc welding (SAW) process.

Bay 8 – 13 Meter Diaphragm Sub Assembly:

QA Inspector Brannon randomly observed ZPMC personnel performing heat straightening diaphragm plate P773. ZPMC report #HSR1(T)-354-1st lift, P773. Cause for heat straightening mill induced distortion. Heat Straightening method by flame straightening with natural gas using a hand torch.

OBG Assembly Shop

Bay 2 – OBG Bottom Plate:

QA Inspector Brannon randomly observed ZPMC qualified welder Mr. Wang Min ID#048296 groove welding fill/cover pass's at Seg016A-003 joining BP010-01 to BP011-01. Mr. Wang was observed welding in the 1G (flat) position utilizing a submerged arc welding (SAW) process with a 4.8mm diameter electrode, filler metal brand JW-3, class EM12K machine. QA Inspector Brannon observed the ZPMC QC Inspector Mr. Chen Chin Ming 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 Chen Chin Ming to be: preheat temperature of 20°C and welding parameters amps of 630, volts of 33.6, and a travel speed of 526 mm/min. Welding parameters observed by QA Inspector Brannon appear to be in general compliance with the approved WPS-B-T-223(2)-1T.

Bay 2 – OBG Side Plate-repair:

QA Inspector Brannon randomly observed ZPMC qualified welder Mr. Dai Lu ID#048659 repair fillet welding at SP016-001 weld joints 029~042, SP028-001 weld joints 013~023 and SP021-001 weld joints 026~037. Mr. Dai was observed welding in the 2F (horizontal) position utilizing a shielded metal arc welding (SMAW) process with a 4.0mm diameter electrode, filler metal brand E7018-1, brand THJ-506Fe-1, manual. QA Inspector Brannon observed the ZPMC QC Inspector Mr. Chen Chin Ming verifying that the welding parameters and pre-heat were in accordance with the Welding Procedure Specification (WPS). QA Inspector observed preheat and welding

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parameters measured by the QC CWI Inspector Chen Chin Ming to be: preheat temperature of 40°C and welding parameters amps of 172. Welding parameters observed by QA Inspector Brannon appear to be in general compliance with the approved WPS-345-SMAW-2G(2F)-FCM-repair. Note: Repairs are a result of ZPMC CWI Chen Chin Ming performing visual inspection (VT).

Bay 2 – OBG Side Plate:

QA Inspector Brannon randomly observed ZPMC qualified welder Mr. Hong Yong Li ID #044801 groove welding root/fill pass's at Seg016A-005 joining SP022-01 to SP030-01. 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 CWI Inspector WPS-B-T-223(2)-1T 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 Mr. Chen Chin Ming to be: preheat temperature of 20°C and welding parameters amps of 282, volts of 28.7, a travel speed of 201 mm/min and a gas flow of 20L/min. Welding parameters observed by QA Inspector Brannon appear to be in general compliance with the approved WPS-B-T-223(2)-1T.

Bay 2 – OBG Bottom Plate:

QA Inspector Brannon observed that ZPMC had completed the root and fill pass's at Seg015A-004 joining BP008-01 to BP009-01. QA Inspector Brannon questioned the ZPMC CWI Inspector Mr. Chen Chin Ming on which welding procedures specification (WPS) had been used for the root and fill pass's for Seg015A-004 joining BP008-01 to BP009-01. Mr. Chen stated to QA Inspector Brannon that ZPMC had utilized a flux corded arc welding (FCAW) process with a 1.4mm diameter electrode, filler metal brand E71T-1, class Supercored 71H, semi automatic with WPS-B-T-223(2)-1T. QA Inspector Brannon Informed ABF David LaRue and ZPMC Mr. Chen of the present joint configuration resulting from ZPMC's repair attempt did not reflect any Caltrans approved welding procedure specifications. QA Inspector Brannon issued an Incident Report. See Caltrans Quality Assurance – Incident Report, TL-15 dated March 28, 2008 for additional information.

Bay 2 – OBG Side Plate:

QA Inspector Brannon observed that ZPMC had completed the root/fill passes at Seg015A-002 joining SP026-01 to SP018-01 and had started welding fill/cover passes with a submerged arc welding (SAW) process. QA Inspector Brannon questioned the ZPMC CWI Inspector Mr. Chen Chin Ming on which welding procedures specification (WPS) had been used for the root and fill pass's for Seg015A-002 joining SP026-01 to SP018-01. Mr. Chen stated to QA Inspector Brannon that ZPMC had utilized a flux corded arc welding (FCAW) process with a 1.4mm diameter electrode, filler metal brand E71T-1, class Supercored 71H, semi automatic with WPS-B-T-223(2)-1T. QA Inspector Brannon Informed ABF David LaRue and ZPMC Mr. Chen of the present joint configuration resulting from ZPMC's repair attempt did not reflect any Caltrans approved welding procedure specifications. QA Inspector Brannon issued an Incident Report. See Caltrans Quality Assurance – Incident Report, TL-15 dated March 28, 2008 for additional information.

Bay 2 - OBG Floor Beam Sub Assembly NDT (VT/MT):

QA Inspector Brannon performed visual inspection (VT) and magnetic particle testing (MT) on the fillet/groove welds for FB002-001 (Far side) and FB001-004 (near side) weld joints. See Caltrans Magnetic Particle Test Report, TL-6028 dated March 28, 2008 for additional information.

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



Summary of Conversations:

As stated within the 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: Cuellar, Robert

QA Reviewer