DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
Office of Structural Materials
Quality Assurance and Source Inspection

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Contract #: 04-0120F4
Cty: SF/ALA Rte: 80 PM: 13.2/13.9
File #: 69.28

WELDING INSPECTION REPORT

Resident Engineer: Pursell, Gary
Address: 333 Burma Road
City: Oakland, CA 94607

Report No: WIR-002640
Date Inspected: 08-May-2008

Project Name: SAS Superstructure
Prime Contractor: American Bridge/Fluor Enterprises, a JV
Contractor: Zhenhua Port Machinery Company, Ltd (ZPMC), Changxing Island

OSM Arrival Time: 630
OSM Departure Time: 1530
Location: Shanghai, China

CWI Name: See below

CWI Present: ☑ Yes ☐ No

	Yes	No	N/A
Inspected CWI report:	☐	☑	☐
Electrode to specification:	☑	☐	☐
Qualified Welders:	☑	☐	☐
Approved Drawings:	☑	☐	☐

	Yes	No	N/A
Rod Oven in Use:	☑	☐	☐
Weld Procedures Followed:	☑	☐	☐
Verified Joint Fit-up:	☐	☑	☐
Approved WPS:	☑	☐	☐
Delayed / Cancelled:	☐	☑	☐

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 Shu Qian ID#053609 splice welding various W shape beams BP115-001-001. 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 27°C and welding parameters amps of 201, volts of 25.6, 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.

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/bottom 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 SP307-001 weld joints 037~050 & 009~022 and SP121-001 weld joints 032~043 & 008~018. 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 – Heat straightening:
QA Inspector Brannon randomly observed ZPMC personnel performing heat straightening on various side/bottom panels. Side and bottom panels cause for heat straightening. Heat straightening is performed by flame straightening using oxygen acetylene using a hand torch.

Bay 3 – bottom panel cracked tacks:
QA Inspector Brannon was informed by ZPMC CWI Wu Ming Kai of tack welds on BP060-001-017 that had cracked. Mr. Wu stated that the three areas will treated as repairs due to the depth of excavation.

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 flange 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 SA234 (W) to P1297 (W) weld joint # WSD1 SA234 -10B. 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 Brannon 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 628, volts of 29.0, and a travel speed of 490 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 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 -3A/4A. 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 625, volts of 30.0, and a travel speed of 500 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 panels:
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 SP529-001 welds joints 001~014 (accept), SP067-001 welds joints 001~012 (accept), SP525-001 welds joints 064~0067 (accept) and SP095-001 welds joints 001~013. QA Inspector Brannon observed accept and rejected marked on the side/ bottom panels.

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. Lin Xie ID#066236 fillet welding various floor beam diaphragm flange to web for FB003-028-047 & 048. Mr. Lin was observed welding in the 2F (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 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 20°C and welding parameters amps of 296, volts of 30.7, a travel speed of 435 mm/min and a gas flow of 21L. 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 Mrs. Xie Jin Xia ID#048038 welding various root passes floor beam web splice connections for FB016-013-021 & FB016-006-021. Mrs. Xie 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 20°C and welding parameters amps of 295, volts of 29.0, a travel speed of 521 mm/min and a gas flow of 21L. 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 – 47.6 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 SA169 (S) to P659 (S) weld joint SSD1 SA169-1A. 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 Li Qing verifying that the welding parameters and pre-heat were in accordance with the Welding Procedure Specification (WPS). QA Inspector Zhi Sha observed preheat and welding parameters measured by the QC CWI Inspector Lv Li Qing to be: preheat temperature of 180°C and welding parameters amps of 596, volts of 30.4, and a travel speed of 472 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 Ming ID #045270 groove welding fill pass's joining SA110 (W) to P773 (W) weld joint WSD1 SA110-101b. 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 EM12K, class JW3 machine. QA Inspector Brannon observed the ZPMC QC CWI Inspector Lv Li 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 Lv Li Qing to be: preheat temperature of 60°C and welding parameters amps of 637, volts of 32.7, and a travel speed of 489 mm/min. Welding parameters observed by QA Inspector Brannon appear to be in general compliance with the approved WPS-B-T-2221-B-U3c-S.

Bay 8 – 13 Meter Tower Diaphragm Sub Assembly:
QA Inspector Brannon randomly observed ZPMC qualified welder Mr. Tian Zhao Qian ID #045246 tack welding joining SA110 (E) to P773 (E) weld joint ESD1 SA110-10A. Mr. Tian was observed welding in the 1G (flat) position utilizing a shielded metal arc welding (SMAW) process with a 4.0mm diameter electrode, filler metal brand E9018, class Excalibur 9018M H4R manual. QA Inspector Brannon observed the ZPMC QC CWI Inspector Lv Li 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 Lv Li Qing to be: preheat temperature of 180°C and welding parameters amps of 164. 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 – Heat straightening:
QA Inspector Brannon randomly observed ZPMC personnel performing heat straightening on various tower diaphragm flange plates and tower stiffener plates. Cause for heat straightening mill induced distortion. Heat Straightening is performed by flame straightening using natural gas with a hand torch.

Bay 8 – Tower Diaphragm Flange Sub Assembly
QA Inspector Brannon randomly observed ZPMC personnel assembling tower diaphragm flange for SA 219and welding run off tabs.

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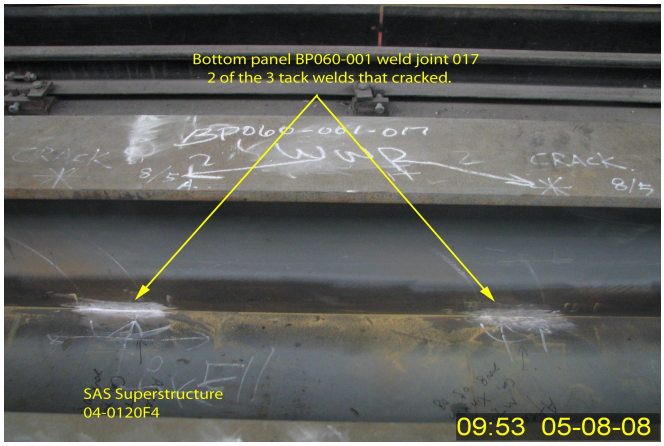
The following digital photograph below illustrates observation of the activities being performed.



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