

DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES

Office of Structural Materials

Quality Assurance and Source Inspection



Bay Area Branch
690 Walnut Ave. St. 150
Vallejo, CA 94592-1133
(707) 649-5453
(707) 649-5493

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-001938**Date Inspected:** 09-Apr-2008**Project Name:** SAS Superstructure**OSM Arrival Time:** 6300**Prime Contractor:** American Bridge/Fluor Enterprises, a JV**OSM Departure Time:** 2100**Contractor:** Zhenhua Port Machinery Company, Ltd (ZPMC), Changxing Island **Location:** Shanghai, China**CWI Name:** Sun Wei**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**Summary of Items Observed:**

Caltrans Quality Assurance (QA) Inspector Tim McClendon 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.

The Caltrans QA Inspector observed welding utilizing the dual process WPS-B-T-2342-U1 (U-rib)-3 welding procedure specification for closed rib welding of the Production Monitoring Test (PMT) #1 for Production Panel DP112-002 and DP324-001 on closed U-rib Partial Joint Penetration (PJP) welds in Bay #1. ZPMC welding personnel performed Gantry Machine, Gas Metal Arc Welding (GMAW) for the root pass and immediately performed Gantry Machine, Submerged Arc Welding (SAW) for the cover/final pass on PMT #1, using gantry machine #1. Upon completion of the SAW pass on U-rib PJP welds on PMT #1 Visual Testing (VT) was performed on weld #1 through #6 by ZPMC personnel and was rejected due to incomplete fusion. ZPMC welding personnel then performed Gantry Machine, Gas Metal Arc Welding (GMAW) for the root pass and immediately performed Gantry Machine, Submerged Arc Welding (SAW) for the cover/final pass on PMT #2, using gantry machine #1. Upon completion of the SAW pass on U-rib PJP welds on PMT #2 Visual Testing (VT) was performed on weld #1 through #6 by ZPMC personnel and was accepted then VT was performed by the Caltrans QA and was accepted. Ultrasonic Testing (UT) was then performed by ZPMC inspector and PMT #2 was determined to be acceptable. Macro etch samples were selected by the Caltrans QA inspector on PMT #2. The following welders were observed welding the corresponding weld joints for PMT #2, weld joint (wj) #1 was welded by Mr. Chen Jie, wj #2 was welded by Mr. Han Chang Hou, wj #3 was welded by Mr. Zhang Shoa Hui and wj #4 was welded Mr. Song Yin Shu, wj #5 was welded by Mr. Xu Guo Yin and wj #6 was welded by Mr. Xiang Jie.. Welding operator was Mr. Bi Ya Hui. The welding parameters were observed and recorded for each

WELDING INSPECTION REPORT

(Continued Page 2 of 4)

welder and the minimum and maximum welding variables of the PMT during GMAW are listed as follows, amperage 355 to 370 voltages 30.3 to 30.9 with a travel speed of 528 mm/min. The welding parameters were observed and recorded for each welder and the minimum and maximum welding variables of the PMT during SAW are listed as follows, amperage 680 to 685 voltages 24.9 to 25.4 with a travel speed of 518 mm/min.

After welding was completed on PMT #1, ZPMC personnel performed welding utilizing the GMAW process on Production Panel DP112-002, on U-rib #U35 for wj #1 and wj #2, #U15 for wj #3 and wj #4, #U38 for wj #5 and wj #6 and #U59 for wj #7 and wj #8. The following welders were observed welding production deck plate on closed U-ribs PJP welds, Mr. Chen Jie welded wj #1, Mr. Han Chang Hou welded wj #2, Mr. Zhang Shoa Hui welded wj #3 and #5, Mr. Song Yin Shu welded wj #4 and #6, Mr. Xu Guo Yin welded wj #7 and Mr. Xiang Jie welded wj #8. The welding variables of the GMAW pass on production panel closed U-ribs PJP welds were observed and recorded for each welder. The minimum and maximum weld parameters are as follows, amperage 351 to 369, and voltage 30.2 to 31.5 with a travel speed of 530mm/min.

After completion of the GMAW welding on Production Panel DP112-002, ZPMC personnel performed welding utilizing GMAW process on DP324-001, on U-rib #U167 for wj #1 and wj #2, #U169 for wj #3 and wj #4, #U165 for wj #5 and #6 and #U161 for wj #7 and #8. The following welders were observed welding production deck plate on closed U-ribs PJP welds, Mr. Chen Jie welded wj #1, Mr. Han Chang Hou welded wj #2, Mr. Zhang Shoa Hui welded wj #3 and #5, Mr. Song Yin Shu welded wj #4 and #6, Mr. Xu Guo Yin welded wj #7 and Mr. Xiang Jie welded wj #8. The welding variables of the GMAW pass on production panel closed U-ribs PJP welds were observed and recorded for each welder. The minimum and maximum weld parameters are as follows, amperage 362 to 377, and voltage 30.3 to 31.1 with a travel speed of 530mm/min. Weld #5 at Weld Head #3, encountered problems with the wire feed. Approximately, 840 mm of the joint was welded intermittently due to the wire feeder malfunctioning. The weld metal that had been deposited was ground out and Magnetic Particle (MT) inspection was performed on the areas by ZPMC personal and witnessed by the QA inspector. ZMPC proceeded to repair the GMAW of Weld #5 with the Gantry Machine. An incident report will be issued for the use of the Gantry welder for repair welding without an approved WPS.

After completion of the GMAW welding on Production Panel DP324-001, ZPMC personnel performed welding utilizing the SAW process on Production Panel DP112-002, on U-rib #U35 for wj #1 and wj #2, #U15 for wj #3 and wj #4, #U38 for wj #5 and wj #6 and #U59 for wj #7 and wj #8. The following welders were observed welding production deck plate on closed U-ribs PJP welds, Mr. Chen Jie welded wj #1, Mr. Han Chang Hou welded wj #2, Mr. Zhang Shoa Hui welded wj #3 and #5, Mr. Song Yin Shu welded wj #4 and #6, Mr. Xu Guo Yin welded wj #7 and Mr. Xiang Jie welded wj #8. The welding variables of the GMAW pass on production panel closed U-ribs PJP welds were observed and recorded for each welder. The minimum and maximum weld parameters are as follows, amperage 673 to 685, and voltage 24.2 to 25.4 with a travel speed of 512mm/min.

After completion of the SAW welding on Production Panel DP112-002, ZPMC personnel performed welding utilizing SAW process on DP324-001, on U-rib #U167 for wj #1 and wj #2, #U169 for wj #3 and wj #4, #U165 for wj #5 and #6 and #U161 for wj #7 and #8. The following welders were observed welding production deck plate on closed U-ribs PJP welds, Mr. Chen Jie welded wj #1, Mr. Han Chang Hou welded wj #2, Mr. Zhang Shoa Hui welded wj #3 and #5, Mr. Song Yin Shu welded wj #4 and #6, Mr. Xu Guo Yin welded wj #7 and Mr. Xiang Jie welded wj #8. The welding variables of the GMAW pass on production panel closed U-ribs PJP welds were observed and recorded for each welder. The minimum and maximum weld parameters are as follows, amperage

WELDING INSPECTION REPORT

(Continued Page 3 of 4)

670 to 687, and voltage 24.7 to 25.2 with a travel speed of 510mm/min.

The Caltrans QA Inspector observed welding utilizing the dual process WPS-B-T-2342-U1 (U-rib)-3 welding procedure specification for closed rib welding of the Production Monitoring Test (PMT) #1 for Production Panel DP409-001 and DP166-001 on closed U-rib Partial Joint Penetration (PJP) welds in Bay #1. ZPMC welding personnel performed Gantry Machine, Gas Metal Arc Welding (GMAW) for the root pass and immediately performed Gantry Machine, Submerged Arc Welding (SAW) for the cover/final pass on PMT #1, using gantry machine #2. Upon completion of the SAW pass on U-rib PJP welds on PMT #1 Visual Testing (VT) was performed on weld #1 through #6 by ZPMC personnel and was accepted then VT was performed by the Caltrans QA and was accepted. Ultrasonic Testing (UT) was then performed by ZPMC inspector and PMT #1 was determined to be acceptable. Macro etch samples were selected by the Caltrans QA inspector on PMT #1. The following welders were observed welding the corresponding weld joints for PMT #1, weld joint (wj) #1 was welded by Mr. Gao Xin Dong, wj #2 was welded by Mr. Jiang Ting Guang, wj #3 was welded by Mr. Xiang Huan Feng, wj #4 was welded Mr. Feng Chuan Hang, wj #5 was welded by Mr. Xu Guo Yin and wj #6 was welded by Mr. Xiang Jie. Welding operator was Mr. Li Xi De. The welding parameters were observed and recorded for each welder and the minimum and maximum welding variables of the PMT during GMAW are listed as follows, amperage 358 to 375 voltages 29.9 to 30.5 with a travel speed of 533 mm/min. The welding parameters were observed and recorded for each welder and the minimum and maximum welding variables of the PMT during SAW are listed as follows, amperage 676 to 683 voltages 24.6 to 25.1 with a travel speed of 510 mm/min.

After welding was completed on PMT #1, ZPMC personnel performed welding utilizing the GMAW process on Production Panel DP166-001, on U-rib #U65 for wj #1 and wj #2, #U22 for wj #3 and wj #4, #U4 for wj #5 and wj #6, #U25 for wj #7 and wj #8 and #U60 for wj #9 and wj #10. The following welders were observed welding production deck plate on closed U-ribs PJP welds, Mr. . Gao Xin Dong, welded wj #1 and wj #3, Mr. Jiang Ting Guang welded wj #2 and wj #4, Mr. Xiang Huan Feng welded wj #5 and #7, Mr. Feng Chuan Hang welded wj #6 and #8, Mr. Xu Guo Yin welded wj #9 and Mr. Xiang Jie welded wj #10. The welding variables of the GMAW pass on production panel closed U-ribs PJP welds were observed and recorded for each welder. The minimum and maximum weld parameters are as follows, amperage 362 to 373, and voltage 29.9 to 30.7 with a travel speed of 530mm/min.

After completion of the GMAW welding on Production Panel DP166-001, ZPMC personnel performed welding utilizing GMAW process on DP409-001, on U-rib #U63 for wj #1 and wj #2, #U36 for wj #3 and wj #4, #U64 for wj #5 and wj #6, #U17 for wj #7 and wj #8 and #U66 for wj #9 and wj #10. The following welders were observed welding production deck plate on closed U-ribs PJP welds, Mr. Gao Xin Dong, welded wj #1 and wj #3, Mr. Jiang Ting Guang welded wj #2 and wj #4, Mr. Xiang Huan Feng welded wj #5 and #7, Mr. Feng Chuan Hang welded wj #6 and #8, Mr. Xu Guo Yin welded wj #9 and Mr. Xiang Jie welded wj #10. The welding variables of the GMAW pass on production panel closed U-ribs PJP welds were observed and recorded for each welder. The minimum and maximum weld parameters are as follows, amperage 353 to 377, and voltage 29.6 to 30.4 with a travel speed of 535mm/min.

After completion of the GMAW welding on Production Panel DP409-001, ZPMC personnel performed welding utilizing the SAW process on Production Panel DP166-001, on U-rib #U65 for wj #1 and wj #2, #U22 for wj #3 and wj #4, #U4 for wj #5 and wj #6, #U25 for wj #7 and wj #8 and #U60 for wj #9 and wj #10. The following welders were observed welding production deck plate on closed U-ribs PJP welds, Mr. . Gao Xin Dong, welded wj

WELDING INSPECTION REPORT

(Continued Page 4 of 4)

#1 and wj #3, Mr. Jiang Ting Guang welded wj #2 and wj #4, Mr. Xiang Huan Feng welded wj #5 and #7, Mr. Feng Chuan Hang welded wj #6 and #8, Mr. Xu Guo Yin welded wj #9 and Mr. Xiang Jie welded wj #10. The welding variables of the SAW pass on production panel closed U-ribs PJP welds were observed and recorded for each welder. The minimum and maximum weld parameters are as follows, amperage 664 to 686, and voltage 24.5 to 25.4 with a travel speed of 510mm/min.

After completion of the SAW welding on Production Panel DP166-001, ZPMC personnel performed welding utilizing SAW process on DP409-001, on U-rib #U63 for wj #1 and wj #2, #U36 for wj #3 and wj #4, #U64 for wj #5 and wj #6, #U17 for wj #7 and wj #8 and #U66 for wj #9 and wj #10. The following welders were observed welding production deck plate on closed U-ribs PJP welds, Mr. Gao Xin Dong, welded wj #1 and wj #3, Mr. Jiang Ting Guang welded wj #2 and wj #4, Mr. Xiang Huan Feng welded wj #5 and #7, Mr. Feng Chuan Hang welded wj #6 and #8, Mr. Xu Guo Yin welded wj #9 and Mr. Xiang Jie welded wj #10. The welding variables of the GMAW pass on production panel closed U-ribs PJP welds were observed and recorded for each welder. The minimum and maximum weld parameters are as follows, amperage 676 to 862, and voltage 24.6 to 35.6 with a travel speed of 510mm/min. Weld #5 at Weld Head #3 lost flux and the weld was not completed. The approximate length of the linear weld that was incomplete was 1460mm. The area was ground and MT inspection was performed by ZPMC QC. The weld was not repaired due to base metal damage. However, weld 6 was completed without simultaneously welding Weld 5. QA Caltrans Inspector will issue an incident report on this issue.

The ambient temperature in bay # 1 was recorded at 15 degrees Celsius with the production panel temperature recorded at 15 degrees Celsius prior to welding.

Summary of Conversations:

No relevant conversations spoken on this date.

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 Pat Lowry, (858) 344-2712, who represents the Office of Structural Materials for your project.

Inspected By:	McClendon, Timothy	Quality Assurance Inspector
Reviewed By:	Cuellar, Robert	QA Reviewer
