

**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-014861**Date Inspected:** 27-May-2010**Project Name:** SAS Superstructure**OSM Arrival Time:** 1900**Prime Contractor:** American Bridge/Fluor Enterprises, a JV**OSM Departure Time:** 700**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**Summary of Items Observed:**

CWI Inspectors: Mr. Guo Yan Fei, Mr. Xu Tao, Mr. Geng Wei

On this date CALTRANS OSM Quality Assurance (QA) Inspector, Mr. Paul Dawson, arrived on site at the Zhenhua Port Machinery Company (ZPMC) facility at Changxing Island, in Shanghai, China, for the purpose of monitoring welding and fabrication of the San Francisco / Oakland Bay Bridge (SFOBB) components. This QA Inspector observed the following:

**OBG Bay 13**

This QA Inspector observed ZPMC welder Ms. Wang Min, stencil 044771 is using submerged arc welding procedure specification WPS-B-T-2221-U3C-S-2 to make OBG segment 13AE bottom plate groove butt weld BP3103-001-005. This QA Inspector observed Ms. Wang Min appears to be certified to make this weld and measured a welding current of approximately 600 amps and 31.0 volts. ZPMC has used electric heating elements to maintain the temperature of the steel plates that are being welded. Items observed on this date appeared to generally comply with applicable contract documents.

**OBG Bay 14**

This QA Inspector observed ZPMC welder Mr. Li Jun, stencil 051348 is using shielded metal arc welding process to make 4G (overhead position) weld SEG3004A-004 on the underside of OBG segment 12AW edge plate to side plate. This QA Inspector observed a welding current of approximately 150 amps and Mr. Li Jun appears to be

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certified to make this weld and that the base material had been preheated with electric heating elements. Items observed on this date appeared to generally comply with applicable contract documents.

This QA Inspector observed ZPMC welder Mr. Wang Changmin, stencil 047864 is using shielded metal arc welding process to make 4G (overhead position) weld SEG3004A-020 on the underside of OBG segment 12AW edge plate to side plate. This QA Inspector observed QC CWI Mr. Xu Tao has recorded a welding current of 150 amps, Mr. Wang Changmin appears to be certified to make this weld and that the base material is being preheated with electric heating elements. Items observed on this date appeared to generally comply with applicable contract documents.

OBG Segment 11BW in the yard behind bay 13

This QA Inspector observed ZPMC welder Mr. Kua Wenshan, stencil 054013 is using shielded metal welding process to make weld SEG067A-005 on the crossbeam side of OBG segment 11BW. ZPMC QC Inspector Mr. Way Wei Ming informed this QA Inspector that that he had previously measured a welding current of 150 amps. Mr. Kua Wenshan appears to be certified to make this weld. Items observed by this QA Inspector appear to comply with project specifications.

This QA Inspector observed ZPMC welder Mr. Hu Yacheng, stencil 049339 is using shielded metal welding process to make weld SEG067A-005 on the crossbeam side of OBG segment 11BW. ZPMC QC Inspector Mr. Way Wei Ming informed this QA Inspector that that he had previously measured a welding current of 150 amps. Mr. Hu Yacheng appears to be certified to make this weld. Items observed by this QA Inspector appear to comply with project specifications.

OBG Segment Assembly

This QA Inspector observed ZPMC welder Ms. Cheng Haixia, stencil 045209 is using flux cored welding procedure WPS-B-T-2231(2)T-2 to make weld OBW9-004. This weld joins the deck plates between OBG segments 9AW and 9BW. This QA Inspector observed welding current of approximately 240 amps and 28 volts. Ms. Cheng Haixia appears to be certified to make these welds. Items observed on this date appeared to generally comply with applicable contract documents.

This QA Inspector observed ZPMC welder Mr. Bi Laishu, stencil 045280 is using flux cored welding procedure WPS-B-T-2231(2)T-2 to make weld OBW9-003. This weld joins the deck plates between OBG segments 9AW and 9BW. This QA Inspector observed welding current of approximately 320 amps and 32.0 volts. WPS lists the welding current range of 224 amps to 244 amps and a welding voltage range of 27.9 volts to 30.0 volts. This QA Inspector informed CWI Mr. Gu Rong Jian and QC Inspector Mr. Wang Li Yang that Mr. Bi Laishu appears to have excessive welding current and voltage. Mr. Gu Rong Jian and Mr. Wang Li Yang both said they do not know why the amps and volts are too high but that they will adjust them to an acceptable level and they will monitor the welding machine volts and amperages more closely. Mr. Bi Laishu appears to be certified to make these welds. Items observed on this date do not fully appear to comply with applicable contract documents.

This QA Inspector observed ZPMC welder Mr. Yu Hui Ye, stencil 045280 is using flux cored welding procedure WPS-B-T-2231(2)T-2 to make weld OBW9-002. This weld joins the deck plates between OBG segments 9AW

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and 9BW. This QA Inspector observed welding current of approximately 320 amps and 31.0 volts. WPS lists the welding current range of 224 amps to 244 amps and a welding voltage range of 27.9 volts to 30.0 volts. This QA Inspector informed CWI Mr. Gu Rong Jian and QC Inspector Mr. Wang Li Yang that Mr. Yu Hui Ye appears to have excessive welding current and voltage. Mr. Gu Rong Jian and Mr. Wang Li Yang both said they do not know why the amps and volts are too high but that they will adjust them to an acceptable level and they will monitor the welding machine volts and amperages more closely. Mr. Yu Hui Ye appears to be certified to make these welds. Items observed on this date do not fully appear to comply with applicable contract documents.

### OBG BAY 9

This QA Inspector monitored welding of closed rib Production Monitoring Test (PMT) representing OBG segment 13AE deck plates DP3080-001 and DP3074-001 which were welded using one single base plate starting at around 0010 hours using gantry #1. This QA Inspector observed six ZPMC welders using welding procedure specification WPS-B-T-2342-U1(Urib)-5 using the gas metal arc welding process for the root pass and submerged arc welding process for the cover pass of partial penetration groove welds on six PMT closed rib welds at the same time. Approximately ten seconds after the GMAW welding started ZPMC stopped all welding due to a failure of GMAW welding machine #6 to feed out the welding wire properly. Welding machines #1 through #5 had welded for a distance of approximately 50 mm length on each of the production test plates. These first 50 mm lengths of these welds were not selected as part of the 500 mm weld sample that was later identified by ZPMC QC as representing the sample to be tested. PMC resolved the GMAW wire feed problem and welding commenced at approximately 0015 hours. ZPMC has multiple welding manipulators attached to a movable gantry that runs on a track along the length of the stiffener plates. This QA Inspector observed a welding travel speed of approximately 537 mm per minute for the root passes and 515 mm per minute for the cover passes. As the welding commences, each of the welders is responsible for one of the welding heads. Welder Mr. Hu Yongchang, stencil 203805 completed the root pass of weld #1 with a welding current of approximately 340 amps and 31.2 volts and the cover pass welding current of approximately 680 amps and 25.0 volts. Welder Mr. Xiang Jie, stencil 059378, completed the root pass of weld #2 with a welding current of approximately 340 amps and 30.5 volts and the cover pass welding current of approximately 690 amps and 25.3 volts. Welder Mr. Yang Yongzeng, stencil 059418 completed the root pass of weld #3 with a welding current of approximately 359 amps and 31.6 volts and the cover pass welding current of approximately 685 amps and 24.7 volts. Welder Mr. Song Yinshu, stencil 059421 completed the root pass of weld #4 with a welding current of approximately 348 amps and 30.6 volts and the cover pass welding current of approximately 690 amps and 25.2 volts. Welder Mr. Xiang Huan Feng, stencil 59416 completed the root pass of weld #5 with a welding current of approximately 350 amps and 30.7 volts and the cover pass welding current of approximately 685 amps and 25.0 volts. Welder Ms. Jiang Shuangchen, stencil 201788 completed the root pass of weld #6 with a welding current of approximately 360 amps and 30.6 volts and the cover pass welding current of approximately 685 amps and 25.5 volts. This QA Inspector performed random visual inspection of the weld joint fitups, root passes and cover passes and items observed appear to comply with project specifications. Following completion of the welding, ZPMC QC CWI Inspector Mr. Guo Yan Fei marked a 500 mm length on each of the welds as being the areas that are to be representative of this PMT test. This QA Inspector observed ZPMC NDE Inspector Mr. Xu Wei performing ultrasonic inspections of each of the six welds in the areas where Mr. Guo Yan Fei had marked for PMT testing. Following ZPMC's UT acceptance the QA Inspector marked a total of 15 locations where macroetch samples are to be obtained. ZPMC then cut and prepared macroetch samples. ZPMC QC CWI Inspector Mr. Guo Yan Fei and ABF representative Mr. Wang Wan Jueng visually inspected these macroetch samples and documented their acceptance on the ZPMC Production

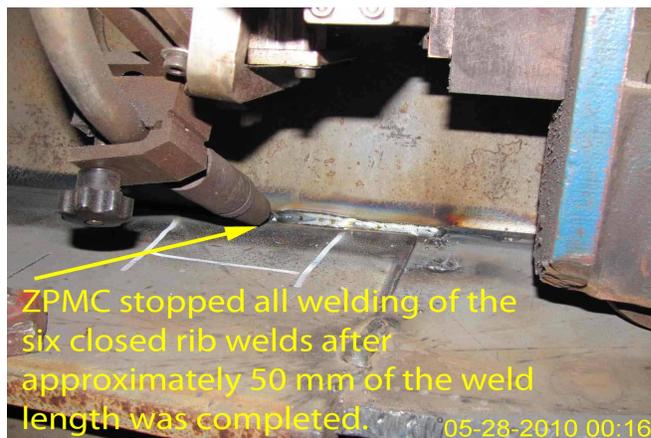
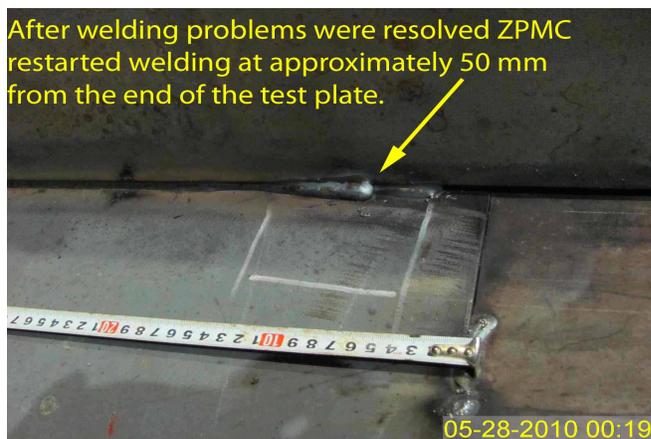
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Monitoring Test Plate Inspection Report sheet dated May 28, 2010. This QA Inspector visually inspected each of these macroetch samples and items observed by the QA Inspector appear to comply with project specifications and the QA Inspector documented this inspection on the "Production Monitoring Test Plate Inspection Report".



## Summary of Conversations:

See Above.

## 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 Eric Tsang phone: 150-0042-2372 , who represents the Office of Structural Materials for your project.

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**Inspected By:** Dawson,Paul

Quality Assurance Inspector

**Reviewed By:** Carreon,Albert

QA Reviewer