

**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-001937**Date Inspected:** 12-Apr-2008**Project Name:** SAS Superstructure**OSM Arrival Time:** 6300**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:** Li Yan Hua**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 DP136-001 and DP298-001 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. Xi De Hua, wj #5 was welded by 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 welder and the minimum and maximum welding variables of the PMT during GMAW are listed as follows, amperage 360 to 379 voltages 29.4 to 30.4 with a travel speed of 540 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 678 to 684 voltages 24.3 to 25.9 with a travel speed of 515 mm/min.

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After welding was completed on PMT #1, ZPMC personnel performed welding utilizing the GMAW process on Production Panel DP298-001, on U-rib #U180 for wj #1 and wj #2, #U174 for wj #3 and wj #4 and #U177 for wj #5 and wj #6. The following welders were observed welding production deck plate on closed U-ribs PJP welds, Mr. Gao Xin Dong welded wj #1, Mr. Jiang Ting Guang welded wj #2, Mr. Xiang Huan Feng welded wj #3 and #5, and Mr. Xi De Hua welded wj #4 and #6. 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 355 to 376, and voltage 30.1 to 31.2 with a travel speed of 530mm/min. ZPMC performed Visual Inspection of the GMAW welding prior to the SAW pass and found several areas of porosity on weld #6 at the tack locations. Grinding to remove all porosity removed approximately 7mm of weld metal. ZPMC's CWI Li Yan Hua planned to weld these areas with the gantry welding machine.

After completion of the GMAW welding on Production Panel DP298-001, ZPMC personnel performed welding utilizing GMAW process on DP136-001, on U-rib #U154 for wj #1 and wj #2, #U156for wj #3, wj #4, and #U170 for wj #5 and #6, #U171 for wj #7 and #8 and #U172 for wj #9 and #10. The following welders were observed welding production deck plate on closed U-ribs PJP welds, Mr. Gao Xin Dong welded wj #1, Mr. Jiang Ting Guang welded wj #2, Mr. Xiang Huan Feng welded wj #5, Mr. Xi De Hua welded wj #6, 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 356 to 378, and voltage 30.0 to 30.7 with a travel speed of 530mm/min. At the start of welding wj #3, wj #4, wj #7 and wj #8the entire weld length contained porosity and welding was halted on these welds. The porosity indications was also discovered in the base metal an attempt was being made to remove the damaged areas by grinding at the end of this inspectors shift. See photographs below for additional details.

The ambient temperature in bay # 1 was recorded at 15 degrees Celsius with the production panel temperature recorded at 16 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

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your project.

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<b>Inspected By:</b>	McClendon, Timothy	Quality Assurance Inspector
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<b>Reviewed By:</b>	Cuellar, Robert	QA Reviewer
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