

**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-001918**Date Inspected:** 08-Apr-2008**Project Name:** SAS Superstructure**OSM Arrival Time:** 1200**Prime Contractor:** American Bridge/Fluor Enterprises, a JV**OSM Departure Time:** 2300**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:** Deck panels**Summary of Items Observed:**

On this day CALTRANS OSM Quality Assurance Inspector (QA) Steve Hall was present during the times noted above for observations relative to the fabrication of the SAS Superstructure being performed by Zhenhua Port Machinery Company (ZPMC) at Changxing Island, in Shanghai, China. QA observed and/or found the following:

OBG bay 1 (Gantry 1)

QA observed ZPMC qualified welding personnel perform the SAW welds joining the closed U-Ribs to deck panels DP-085-001\* and DP-274-001. QA observed 4 ZPMC QC inspectors in the vicinity of the welding operations including ZPMC CWI identified as Mr. Sun Wei. There were also 3 American Bridge/Fluor (ABF) inspectors in the area as well. QA and QC monitored the welding process continuously until its completion. QA completed a production panel welding report for the above mentioned deck panels. The reports are on file in the Caltrans QA office. The welder identifications and welding parameters as measured with the calibrated gages on the machines appeared to be in conformance with the posted WPS's and were as follows:

SAW DP-085-001

Volts: 24.9 – 25.4 Amps: 676 – 682 Travel speed: 513 – 515 mmpm

SAW DP-274-001

Volts: 24.7 – 25.1 Amps: 670 – 687 Travel speed: 515 mmpm

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Welder ID#'s

Weld joint 1: 059468

Weld joint 2: 059464

Weld joint 3 & 5: 059403

Weld joint 4 & 6: 059421

\* Shortly after QA arrival, ABF and ZPMC QC inspectors brought it to the attention of QA that SAW welding head #2 on gantry 1 had malfunctioned almost immediately after commencement of the SAW process on weld W2, deck panel DP-085-001. Apparently the welding flux ceased flowing from the flux hopper thus creating an area of "cluster porosity" measuring 100mm in length and penetrating approximately 9mm into the weld groove area and 6mm into the deck plate base metal. (see attached photos)

ZPMC's initial approach to this issue was to remove all of the defective area and Magnetic particle Test (MT) the area and repair utilizing the gantry and the GMAW process without an approved repair procedure. QA informed ZPMC QC CWI identified as Sun Wei and ABF representative identified as Denny McDonald that if ZPMC proceeded with the repair as indicated a Caltrans incident report would be submitted due to the fact that no weld repair procedure has been approved for the repair of these Partial Joint Penetration (PJP) welds on the deck panels. Soon afterwards, QA observed ZPMC QC leader and ZPMC production supervisor having a long discussion, apparently concerning what ZPMC's approach would be to this issue. Since the area of porosity started only 140mm from the start of the joint and extended an additional 100mm, ZPMC elected to skip over the defective area and restart the SAW weld about 25mm forward of the defective area in order to complete this panel.

ZPMC QC CWI identified as Sun Wei informed QA that ZPMC has reconsidered and intends to submit a repair procedure for approval prior to repairing this area. ZPMC did grind and MT the area in question. No incident report has been issued at this time due to the fact that ZPMC did not attempt to repair this area by welding without an approved repair procedure.

Gantry 2

QA observed ZPMC qualified welding personnel perform the SAW welds joining the closed U-Ribs to deck panels DP-382-001 and DP-436-001. QA observed 4 ZPMC QC inspectors in the vicinity of the welding operations including ZPMC CWI identified as Mr. Sun Wei. There were also 3 American Bridge/Fluor (ABF) inspectors in the area as well. QA and QC monitored the welding process continuously until its completion. QA completed a production panel welding report for the above mentioned deck panels. The reports are on file in the Caltrans QA office. The welder identifications and welding parameters as measured with the calibrated gages on the machines appeared to be in conformance with the posted WPS's and were as follows:

SAW DP-382-001

Volts: 24.2 – 25.2 Amps: 666 – 686 Travel speed: 515 mmpm

SAW DP-436-001

Volts: 24 – 25.4 Amps: 673 – 690 Travel speed: 510 - 512 mmpm

Welder ID#'s

Weld joint 1 & 3: 059443

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Weld joint 2 & 4: 059378

Weld joint 5 & 7: 059361

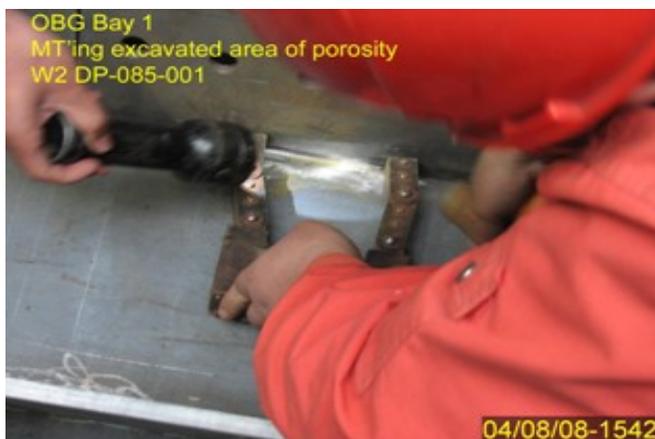
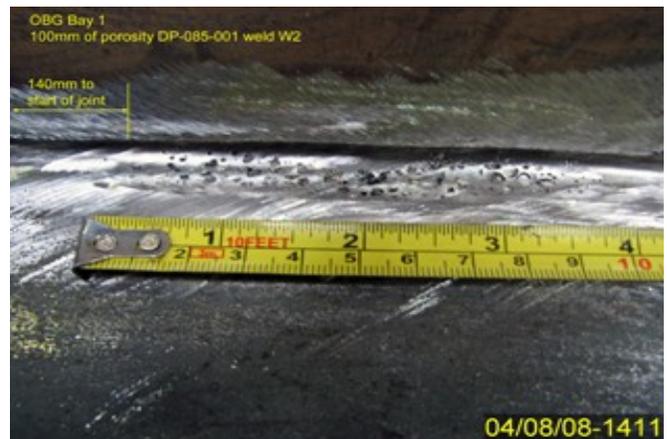
Weld joint 6 & 8: 062265

Weld joint 9: 059416

Weld joint 10: 059371

NOTE: GMAW welding had been completed on both gantries prior to QA arrival this afternoon.

QA performed a random visual weld inspection verification on some of the completed welds on deck panel DP-139-001. All welds that were inspected appeared to exhibit some degree of lack of fusion, overlap, oversize and/or under fill. All of the (PJP) welds joining U-Rib to deck plate that were inspected on this panel do not comply with the visual acceptance criteria specified in AWS D1.5 2002 and the contract documents and are rejected. QA completed a Caltrans QA visual weld inspection report to include welds W1, W2, W3, W4, W5 and W10 for the OBG deck panel mentioned above.



## Summary of Conversations:

As noted 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 Patrick Lowery (858)-344-2712, who represents the Office of Structural Materials

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for your project.

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