

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-002159**Date Inspected:** 17-Apr-2008**Project Name:** SAS Superstructure**OSM Arrival Time:** 630**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:** Fu Yu Hong**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, Alfredo Acuna was present for the fabrication scheduled for this project at the ZPMC facility in Shanghai, China for the San Francisco Oakland Bay Self Anchored Suspension Bridge.

Production Monitoring test (PMT) and Fabrication

The QA inspector performed random fit-up verifications to the PMT coupons and Deck Panels DP-324-002 at the junction of the U-ribs to deck plate. The QA inspector found that U-ribs fit-up appeared to be in compliance with the contract documents.

Welding of PMTs started at approximately 0845hours. The QA inspector observed welding operators Xu Guo Yin welder ID # 059443, Xiang Jie, ID # 059378, Jiang Ting Guang, ID # 062265, Tao Xin Dong ID # 059361, Zhang Shao Hui, 059403 and Xiang Huan Feng, 05916 performing welding operations on the root pass weld joints # 1 thru 6 respectively with the automatic Gantry Lincoln machine # 1 with the gas metal arc welding (GMAW) on the metal transferring with spray transfer mode following 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 DP-324-002 and DP-275-001 on closed U-rib Partial Joint Penetration (PJP) welds in Bay #1 and simultaneously with the submerged arc welding (SAW) process.

The QA inspector performed final visual inspection to the weld joint # 1 thru 6. The QA inspector found that the welds appeared to be in accordance with the contract documents. The QA inspector marked areas to cut for macroetch samples.

ABF representative Mr. Art Peterson and Peter Saw and ZPMC representatives Mr. Lay Tao present at the OBG fabrication shop.

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ZPMC certified welding inspector Sun Wei and Men Lin Nan performed visual weld inspection to the root passes. ZPMC found that welds were in accordance with the contract documents.

Before ZPMC started welding the PMTs at approximately 0812 hours the QA inspector performed fit-up verifications and visual weld inspection to the tack welds for the deck panel DP-324-002 welds 6 and 7. The QA inspector found two transverse cracks at the tack weld # 11 weld # 7. The QA inspector had a conversation with ZPMC QC representatives Lay Tao and Sun Wei. The QA inspector asked if ZPMC completed their visual examinations. Mr. Sun Wei relayed that ZPMC did not complete the visual examination. The QA inspector asked ZPMC when ZPMC was planning to perform their visual examination since ZPMC was getting prepare to start welding the PMTs.

The QA inspector had a conversation with ABF representatives Art Peterson and Peter Saw. The QA inspector brought to the attention of ABF representatives that the QA inspector found transverse crack on the deck panel DP-324-002 weld # 7. The QA inspector relayed that ZPMC appeared to overlook the indications since ZPMC was going to start the welding operations of the panel shortly.

ZPMC resolved to remove the indications by grinding. After grinding the indications, ZPMC performed magnetic particle testing (MT) and ZPMC and accepted the weld repair. The QA inspector asked the QC inspector by signs if ZPMC completed their verifications. ZPMC personnel relayed that the QA inspector could start his verifications.

The QA inspector performed MT to the repair area. The QA inspector observed that a transverse crack was still in the excavated area. The QA inspector showed the indication to ZPMC representative. ZPMC representative agreed. The QA inspector informed to ZPMC and ABF representative that the QA inspector was going to recommend the issued of an incident report because ZPMC overlooked a transverse crack(ZPMC performed MT over residues from the grinding operation that were masking the indication). ZPMC continued grinding in the base metal down to approximately 5 mm until the transverse cracks were completely removed.

The QA inspector performed MT verifications to the repair area. The QA inspector found that the weld repairs appeared to be in compliance with the contract documents.

The QA inspector asked ABF and ZPMC what ZPMC was going to do with the 5 mm depth excavation (after removal of the transverse crack). ZPMC and ABF discussed and relayed to the QA inspector that ZPMC would perform a base metal repair but ZPMC would record and issue a critical weld repair (CWR) for approval of the Engineer after repairing. ZPMC added that ZPMC did not want to stop production on this panel. The QA inspector asked what would be the corrective actions and if ZPMC would test more tack welds. Later, Mr. Art Peterson informed that ZPMC agreed to perform MT to 12 additional tacks around of those two tacks welds that were cracked (other linear indication found by Caltrans representative Larry Viars on third shift). ZPMC informed to the QA inspector that ZPMC found 3 additional longitudinal cracks after completing the MT verifications. ZPMC removed by grinding the linear indications.

The QA inspector had a conversation with ZPMC representatives. ZPMC showed the WPS that ZPMC planned to use. ZPMC representatives commented that ZPMC had submitted to Caltrans for approval the WPS for base metal repair for the U-ribs welding and Caltrans had not approved it.

The QA inspector observed that ZPMC welder Liu Chuang Hong welder identification # 059371 performed base metal repairs at four locations: tack welds # 11 and 12 (4.5 mm and 1.5 mm of depth excavations) weld joint # 7 and tack welds 11 and 13 (1.5 mm and 2 mm of depth excavation) with the flux cored arc welding (FCAW) process following the welding procedure specification (WPS) WPS-345-FCAW-2G (2F)-Repair-1 for the base metal repair. Note: ZPMC did not have approved base metal repair procedure on the U-ribs.

Mr. Art Peterson informed that ZPMC would start welding the partial penetration welds with their own risk and that ABF could not stop them. In addition, he said that a CWR covering the weld base metal repairs will be

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submitted to the Engineer on a later date.

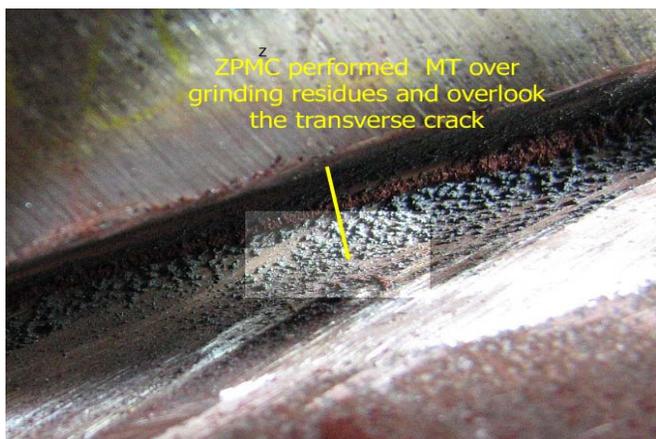
The QA inspector issued an incident report to ABF because ABF allowed: ZPMC overlooked transverse cracks by the visual (performed by ZPMC representative Sun Wei and Meng Lin Nan) and MT (performed by ZPMC representative Bo Ting Rui) methods and performing base metal repairs without prior approval of the Engineer.

ZPMC started welding operations approximately 1240 hours on the deck panel DP-275-001. The QA inspector performed fit-up verifications to the deck panel DP-275-001 weld joints 2 to 5. The QA inspector observed the following discrepancies:

1. Oil on the weld joint # 2, 4 and 5 before and after welding.
2. Tears on the bevel faces
3. Large accumulation of dust at the weld joint.

The QA inspector attended to correct the above listed discrepancies before welding but the time the QA inspector informed ABF and ZPMC representatives Peter Saw, Lay Tao and Sun Wei. The QA inspector asked who performed the fit-up verifications. ZPMC representative relayed that ZPMC representative Meng Lin Nan. The QA inspector issued an incident report addressing ZPMC welding over oil. The QA was informed by Caltrans representative Ady Velasco that welding over Tears on the bevel have been already reported since the start of welding on the deck panel and it should not be included on the incident report.

The photographs below show the non compliance conditions.



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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 Mazen Wahbeh, (818) 292-0659, who represents the Office of Structural Materials for your project.

Inspected By: Acuna,Alfredo

Quality Assurance Inspector

Reviewed By: Cuellar,Robert

QA Reviewer