

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-000037**Date Inspected:** 11-Nov-2006**Project Name:** SAS Superstructure**OSM Arrival Time:** 800**Prime Contractor:** American Bridge/Fluor Enterprises, a JV**OSM Departure Time:** 1730**Contractor:** Zhenhua Port Machinery Company, Ltd (ZPMC), Changxing Island **Location:** Shanghai, China**CWI Name:** Xie Ping**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:** N/A**Summary of Items Observed:**

Office of Structural Materials Quality Assurance Inspector (QA), David McClary observed quality control functions related to procedure qualification (PQR) testing at the ZPMC facility in Shanghai, Republic of China for the San Francisco Oakland Bay Self Anchored Suspension Bridge.

The QA Inspector observed Mechanical Testing of 1G SAW Maximum Heat Input PQR, HP-2006101, and 1G FCAW Maximum Heat Input PQR, HP-2006103. During the cutting of the Charpy-V notch, Ms. Xie Ping inadvertently notched the weld cap of the sample rather than the face. It was determined that there was a sufficient amount of the original welded plate left to make additional samples, and the plate was sent out and machined into new Charpy-V notch samples. See photos of additional plate.

The QA Inspector observed the mechanical testing including: all weld metal tensile (AWMT), reduced section tensile, side bend, macro-etch and Charpy-V notch tests. The Charpy-V notch tests were conducted at the -30 degrees Celsius Fracture Critical (FCM) requirements for welding Seismic Performance Critical Members (SPCM).

All of the mechanical testing for the 1G SAW Maximum Heat Input PQR, HP-2006101, appeared to comply with the contract documents. However, the electrode is not certified to ASTM A5.17 and is currently not approved for use on this contract. The contractor has proceeded with testing at their own risk, and still needs to submit an RFI requesting to use this electrode / flux combination.

The Charpy-V notch specimens for the 1G FCAW Maximum Heat Input PQR, HP-2006103, did not appear to comply with the contract requirements. The values for the five (5) samples were recorded by ZPMC's Ms. Xie

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Ping at 27, 42, 71, 24 and 32 Joules. The minimum requirement is 34 Joules, therefore, three (3) out of the five (5) samples failed to meet the minimum requirements for SPCM members. ZPMC's Testing Center Director Mr. Liu Liu informed Caltrans they would prepare an additional set of samples for re-test, but did not have much confidence in them passing since AWS D1.5 requires all of the retest samples, after dropping the high and low, to meet or exceed 34 Joules.

The QA Inspector went inside ZPMC's informational mock-up of the tower to look at locations which present ABF with concerns regarding accessibility. During these observations, QA observed what appears to be telltale signs of heat straightening on many of the components. Since this mock-up is only for ZPMC's information and not the actual mock-up required in the Special Provisions this may just be part of the learning process or could be indicative of ZPMC's intended fabrication practices. See Photos below for typical areas heat straightened on the skin plate stiffeners:



Summary of Conversations:

ZPMC Testing Center Director Mr. Liu Liu informed Caltrans they intend to perform a Procedure Qualification (PQR) test for non-standard joints against ceramic backing. Mr. Liu Liu gave Caltrans a copy of the proposed parameters. The parameters listed were not within those qualified by the Figure 5.1 Max-Min FCAW tests already performed. Mr. Liu Liu was informed of this issue and that ZPMC would have to perform testing to qualified the mechanical properties (Fig. 5.1) for the proposed non-standard joints or change the parameters to within those qualified. After speaking with his technology department, Mr. Liu Liu stated that they would need to run a new Figure 5.1 Plate (Min HI) to qualify the parameters for the root since those already qualified were inadequate for

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the proposed joint.

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:	McClary,David	Quality Assurance Inspector
Reviewed By:	Lowry,Patrick	QA Reviewer
