

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-004245**Date Inspected:** 20-Oct-2008**Project Name:** SAS Superstructure**OSM Arrival Time:** 1330**Prime Contractor:** American Bridge/Fluor Enterprises, a JV**OSM Departure Time:** 2230**Contractor:** Zhenhua Port Machinery Company, Ltd (ZPMC), Changxing Island **Location:** Shanghai, China**CWI Name:** Mr. 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:** OBG Fabrication**Summary of Items Observed:**

Caltrans 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. The QA Inspector observed the following:

OBG Bay 1

The Caltrans QA Inspector arrived in OBG bay 1 at around 1500 hrs for observations of ZPMC using tack welding procedure number WPS-B-T-2342-U5 to tack weld closed ribs onto deck panel DP179-001. During the observations it was noted that ZPMC had "hand rolled" the 1.4mm diameter GMAW welding electrode ER70S-6, onto rolls which were used during this welding. ZPMC welders Mr. Shi Yunli #050409 and Mr. Xiao Dianbin stencil 59440 completing this welding. ZPMC CWI Mr. Sun Wei arrived at this location at approximately 45 min after the start of this process, and ZPMC QC Inspector Mr. Cheng Shigang was monitoring this welding. ABF personnel were also present for the tack welding.

The QA Inspector observed Mr. Cheng Shigang adjusting welder Mr. Shi Yunli's welding machine to approximately 330 amps and 28 volts while welding on a scrap piece of plate. The WPS lists an operating range between 330 amps to 350 amps and between 25 volts to 28 volts. The welding machine adjustments made by Mr. Shigang appear to be within this WPS range. The QA Inspector observed the shielding gas flow meter tube is inclined at an angle of approximately 15 degrees from being vertical and the a shielding gas flow tube indicates a flow of approximately 22 cubic liters per minute. The WPS states the shielding gas flow should be between 20

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and 25 liters per minute and the flow that was observed by the QA Inspector appears to be within this range. The QA Inspector observed Mr. Yunli has a welding travel speed of approximately 400 mm per minute. The WPS lists a welding travel speed range of 495.6 to 605.8 mm per minute and Mr. Yunli appears to be below this minimum welding travel speed. Note: accurate measurement of welding speed is difficult due to the short distance that is being welded and based on the measurements observed the weld heat input is approximately 140 KJ/mm. This heat input appears to be slightly above the maximum of 1.31 KJ/mm as listed in the WPS.

ZPMC welder Mr. Shi Yunli initially started completing tack welds on the west end of deck plate DP179-001 weld #1 tacks 11, 12, 13 and 14. Mr. Yunli then welded similar tack welds on weld 2 through 10. Mr. Yunli then completed tack welds progressing toward the west end of DP179-001.

At around 1820 hours ZPMC welder Mr. Xiao Dianbin stencil 59440 commenced tack welding of closed ribs on the east end of deck plate DP179-001. The QA Inspector observed Mr. Dianbin to have a welding current of approximately 340 amps, 27.4 volts and a shielding gas flow of approximately 22 cubic liters per minute. The QA Inspector monitored these welding parameters throughout most of the shift and they appeared to be stable and did not appear to vary outside of the WPS limits. The QA Inspector observed Mr. Dianbin has a welding travel speed of approximately 400 mm per minute. The WPS lists a welding travel speed range of 495.6 to 605.8 mm per minute and Mr. Dianbin appears to be welding below this minimum welding travel speed. Note: accurate measurement of welding speed is difficult due to the short distance that is being welded and based on the measurements observed the weld heat input is approximately 140 KJ/mm. This heat input appears to be slightly above the maximum of 1.31 KJ/mm as listed in the WPS.

Both ZPMC welders typically take between twelve and fifteen seconds to complete the 80 mm long tack welds and when the end of the weld is reached the welders stop movement of the welding head and press the welding 'gun' trigger which decreases the welding current to around 180 amps and 18 volts. The welders appear to hold the welding head still for approximately 3 seconds then the trigger is clicked again, which ends the welding cycle. This welding technique leaves a small "lump" of weld material at the end of the fillet tack welds.



Summary of Conversations:

See above.

Comments

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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 Ady Velasco 13816942685, who represents the Office of Structural Materials for your project.

Inspected By:	Dawson,Paul	Quality Assurance Inspector
Reviewed By:	Carreon,Albert	QA Reviewer
