

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 #: 70.28**WELDING INSPECTION REPORT****Resident Engineer:** Pursell, Gary**Address:** 333 Burma Road**City:** Oakland, CA 94607**Report No:** WIR-002801**Date Inspected:** 03-Jun-2008**Project Name:** SAS Superstructure**OSM Arrival Time:** 800**Prime Contractor:** American Bridge/Fluor Enterprises, a JV**OSM Departure Time:** 1830**Contractor:** Japan Steel Works**Location:** Muroran, Japan**CWI Name:** Chung-Fu Kuan**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:** Tower, Jacking and Deviation Saddles**Summary of Items Observed:**

The following report is based on METS observations at Japan Steel Works (JSW) in Muroran Japan. Current work: Casting, machining and nondestructive testing of Saddles.

Fabrication Shop 4

The QA inspector periodically observed The Nikko Inspection Services QC/NDT technician Mr. Kazuya Kobayashi perform magnetic particle (MT) testing of West Deviation Saddle base W2E1 multi-layer tack welds after several tacks were found to be cracked during visual inspection. The MT was performed in accordance with ASTM standard E709, Nikko Inspection Services procedure SF-MT-01 using the yoke method with dry visible powder. The yoke dead lift was verified with a 4.65kg test plate. The magnetic field was verified with a field indicating gauge (pie gauge). All calibrations appear to meet the minimum requirements of ASTM E709. The testing was evaluated in accordance with the contract special provisions. 17 relevant indications were marked by Mr. Kobayashi. 16 of the indications were found to be between various rib plates and the stem plate. These indications were cracks the full length of the tack welds at the toe of the weld. 1 indication was found in the stem to base plate tack weld at rib 7. This indication was not the full length of the weld and was located at the toe of the weld. The testing was not completed on this date and the work appears to meet the minimum requirements of the contract specifications.

The QA inspector performed magnetic particle testing (MT) verification of West Deviation Saddle base W2E1, at tack weld locations after MT was performed by Nikko Inspection Services QC/NDT technician Mr. Kazuya Kobayashi as noted above. The welds and weld locations were examined using magnetic particle testing of

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approximately 10% of the locations examined by Nikko Inspection Services QC/NDT technicians. The QA inspector performed the magnetic particle testing in accordance with ASTM E709 and JSW procedure SF-MT-01 using a magnetic particle AC yoke. Several relevant indications were verified. The QA inspector did concur with the QC/NDT inspector's assessment. Please see the Magnetic Particle Testing Report (TL-6028) that was generated on this date for details of welds that were tested in accordance with the contract requirements.

- 1) Rib 1-16 to base plate 1-3, weld E1Y-16L, 6 multi-pass tack welds, no relevant indications.
- 2) Rib 1-16 to stem plate 1-2, weld E1Y-16V, 4, multi-pass tack welds, the 2 tack welds nearest the base plate were found to be cracked.
- 3) Rib 1-14 to base plate 1-3, weld E1Y-14L, 6 multi-pass tack welds, no relevant indications.
- 4) Rib 1-14 to stem plate 1-2, weld E1Y-14V, 4, multi-pass tack welds, the 2 tack welds nearest the base plate were found to be cracked.
- 5) Rib 1-8 to base plate 1-3, weld E1Y-8L, 6 multi-pass tack welds, no relevant indications.
- 6) Rib 1-8 to stem plate 1-2, weld E1Y-8V, 4, multi-pass tack welds, the 2 tack welds nearest the base plate were found to be cracked.
- 7) Rib 1-6 to base plate 1-3, weld E1Y-6L, 6 multi-pass tack welds, no relevant indications.
- 8) Rib 1-6 to stem plate 1-2, weld E1Y-6V, 4, multi-pass tack welds, no relevant indications.
- 9) Stem 1-2 to base plate 1-3, weld E1S-2L, 10, multi-pass tack welds on even numbered rib side, no relevant indications.

On this date the Caltrans Quality Assurance (QA) inspector, Joe Lanz arrived at JSW fabrication shop number 4 and observed the in process assembly fit-up operation of the structural steel plates for the West Deviation Saddle base W2E2. The JSW fitter personnel Kiyotaka Koanagi continued assembly of the West Deviation Saddle base W2E2 by aligning the rib plates, piece marks 2-13 and 2-14 on the base plate, joint designations E2Y-13L and E2Y-14L and aligning with the stem plate, joint designations E2Y-13V and E2Y-14V. The JSW welding personnel Yoshihiro Ohta, identified as number 08-2017 performed the in process tack welding utilizing the Shielded Metal Arc Welding (SMAW) process per the welding procedure specification (WPS) SJ-3011-2, SJ-3011-3. The welding was performed in the 2G (Horizontal) and 3G (Vertical) positions. The filler metal utilized was identified as 4.0mm and 4.8mm diameter, Class E9018-M-H4R, Brand name Hoballoy 9018-M. The welding parameters and heat control were monitored by Intertek Testing Services Quality Control (QC) inspector Mr. Chung-Fu Kuan at periodic intervals. The minimum preheat temperature of 160 degrees Celsius and maximum interpass temperature of 260 degrees Celsius was verified to meet the WPS requirements by Mr. Kuan and the QA inspector utilizing Tempilstik temperature indicators. This data was entered into the QC inspector's daily log, identifying the location on a weld map. The SMAW welding average amperage and voltage by clamp type meter and travel speed were verified to be within the welding procedure specification parameter range of 245 amps to 270 amps, 22 volts to 25 volts and travel speed of 132 to 168 mm per minute for the 4.8mm electrode and 145 amps to 165 amps, 21 volts to 24 volts and travel speed of 72 to 97 mm per minute for the 4.0mm electrode by the QA inspector. The work was not completed on this date and appears to meet the minimum requirements of the welding procedure specification and contract documents.

Foundry

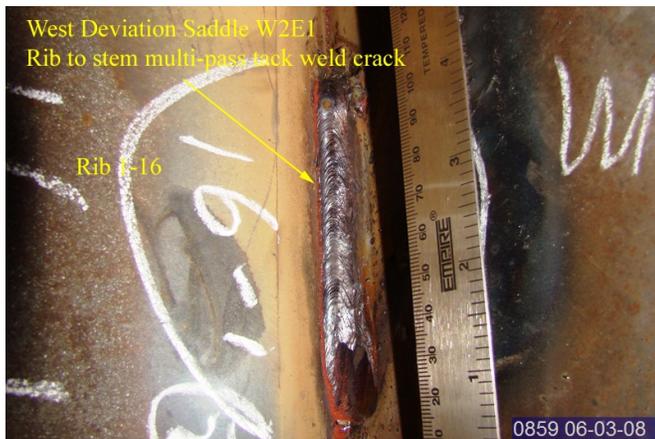
On this date the QA representative Joe Lanz traveled to JSW foundry to monitor the in process casting repair welding on West Deviation Saddle casting W2E1. The welding was performed to build up the thickness of the

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ribs in areas that were found to not meet the minimum thickness of the contract special provisions. The repair locations and repair details for this casting were submitted as number 000643, revision 02. The JSW welding personnel Mr. H. Sato, identified as number 69-2697 continued the in process repair welding of Rib 7L, repair 2-6, location C-3 utilizing the Shielded Metal Arc Welding (SMAW) process per the welding procedure specification (WPS) SJ 3026-2. The welding was performed in the 2G (Horizontal) position. The filler metal utilized was identified as 4.8 mm diameter, Class E10016-G, Brand name LB-106. The minimum preheat temperature of 150 degrees Celsius and maximum interpass temperature of 260 degrees Celsius was verified to meet the WPS requirements by the QA inspector utilizing Tempilstik temperature indicators. The SMAW welding average amperage and voltage by clamp type meter and travel speed were verified to be within the welding procedure specification parameter range of 180 amps to 240 amps, 22 volts to 26 volts and travel speed of 115 to 280 mm per minute by the QA inspector. The repair on rib 7L, number 2-6 length is 550 mm, width is 70 mm and maximum depth is 2 mm with an area of 56 square centimeters. The work was not completed on this date and appears to meet the minimum requirements of the welding procedure specification and contract documents.

The following digital photographs illustrate observations of the activities being performed.



Item	Weld Identification	Applicable WPS	CWI Name	Amperage	Voltage	TravelSpeed	Preheat Temp	Remarks
1	W2E2, E2Y-11L	SJ-3011-2	C. Kuan	250 AC	24.0 AC	150 mm/min.	160 C	Y. Ohta
2	W2E2, E2Y-14V	SJ-3011-3	C. Kuan	150 AC	22.5 AC	70 mm/min.	160 C	Y. Ohta

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3 W2E1, 7L SJ-3026-2 N/A, ASME 210 AC 23 AC 200 mm/min. 180 C H. Sato

Summary of Conversations:

There were general conversations with Japan Steel Works, Ltd. representative Mr. Kunio Nagaya and Intertek Testing Services Certified Welding Inspectors Mr. Chung-Fu Kuan relative to the location of the welding and inspection personnel in the fabrication shop number 4.

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 Venkatesh Iyer, (858) 967-6363, who represents the Office of Structural Materials for your project.

Inspected By:	Lanz, Joe	Quality Assurance Inspector
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Reviewed By:	Brasel, Ron	QA Reviewer
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