

**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-003012**Date Inspected:** 12-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, repair and nondestructive testing of Saddles.

**Fabrication Shop 4**

On this date the Caltrans Quality Assurance (QA) inspector, Joe Lanz arrived at JSW fabrication shop number 4 and observed the in process welding operation of the structural steel plates for the West Deviation Saddle Base W2E1, rib plate 1-5 to stem plate 1-2, weld designation E1Y-5V, on one side only, rib plate 1-6 to stem plate 1-2, weld designation E1Y-6V, on one side only. The root welding was performed on the side of the joint facing the center of the base in between tack welds that had been welded and inspected visually and by magnetic particle examination previously. The JSW welding personnel Yuchi Arai, identified as number 08-5157 and Kouzou Kabayashi, identified as 08-5023 performed the welding utilizing the Shielded Metal Arc Welding (SMAW) process per the welding procedure specification (WPS) SJ-3011-3. The welding was performed in the 1G (Flat) position. The filler metal utilized was identified as 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°Celsius and maximum interpass temperature of 260°Celsius were 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 by the QA

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inspector.

Immediately after the root pass was welded in the repair area, the root pass was inspected by magnetic particle examination by the Nikko Inspection Services QC/NDT technician Mr. Kazuya Kobayashi. The MT was performed in accordance with ASTM standard E709 and Nikko Inspection Services procedure SF-MT-01 using the yoke method with high temperature 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. No relevant indications were reported.

After the root pass was inspected, the JSW welding personnel The JSW welding personnel Yuchi Arai, identified as number 08-5157 and Kouzou Kabayashi, identified as 08-5023 welded three fill passes over the root pass utilizing the same welding procedure as noted above for the root pass. 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. 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 by the QA inspector.

During the above welding the QA inspector observed that the above welds were not being welded in accordance with Attachment 5 in the Submittal 711 - Distortion Control Plan submitted by Japan Steel Works and approved by Caltrans. Please see attached for details. This issue was brought to the attention of Quality Control (QC) inspector Mr. Kuan. Mr. Kuan responded that he was not sure if the Distortion Control Plan was being followed, but he would speak with JSW Deputy Manager Mr. Kazunori Sato.

Later in the shift the Caltrans Quality Assurance (QA) inspector, Joe Lanz observed the in process welding operation of the structural steel plates for the West Deviation Saddle Base W2E1, end plate 1-4 to stem plate 1-2, weld designation E1Y-4V. The root welding was performed in between tack welds that had been welded and inspected visually and by magnetic particle examination previously. The JSW welding personnel Yuchi Arai, identified as number 08-5157 and Kouzou Kabayashi, identified as 08-5023 performed the welding utilizing the Shielded Metal Arc Welding (SMAW) process per the welding procedure specification (WPS) SJ-3011-4. The welding was performed in the 2G (Horizontal) position. The filler metal utilized was identified as 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°Celsius and maximum interpass temperature of 260°Celsius were 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 by the QA inspector.

Immediately after the root pass was welded in the repair area, the root pass was inspected by magnetic particle examination by the Nikko Inspection Services QC/NDT technician Mr. Kazuya Kobayashi. The MT was

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performed in accordance with ASTM standard E709 and Nikko Inspection Services procedure SF-MT-01 using the yoke method with high temperature 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. No relevant indications were reported.

After the root pass was inspected, the JSW welding personnel The JSW welding personnel Yuchi Arai, identified as number 08-5157 and Kouzou Kabayashi, identified as 08-5023 welded three fill passes over the root pass utilizing the same welding procedure as noted above for the root pass. 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. 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 by the QA inspector.

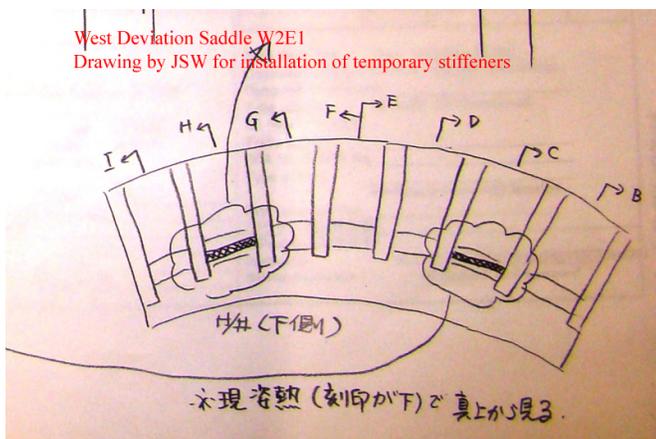
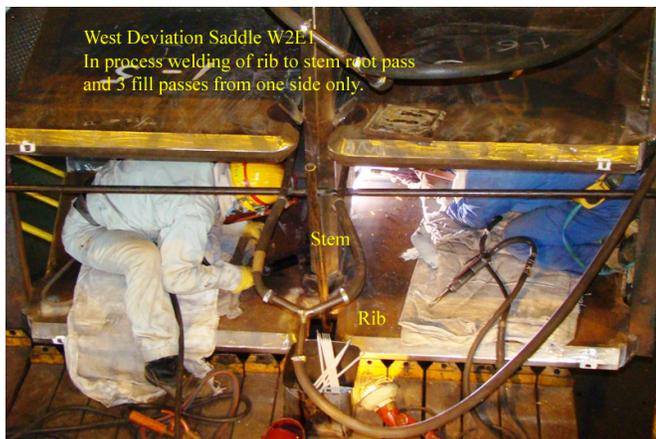
### Foundry

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. No repair welding was being performed on this date, two temporary stiffeners were being installed and welded between ribs. The stiffeners were welded on top of the weld metal deposited to build up the thickness of the ribs in areas that were found to not meet the minimum thickness of the contract special provisions. The stiffeners were located between rib 2L to 3L and rib 6L to 7L on the side opposite the identifying stamp mark. The JSW welding personnel Mr. Yoshio Kabutomori, identified as number 06-8000 and Kozuya Komai, identified as number 06-8002 performed the welding utilizing the Shielded Metal Arc Welding (SMAW) process per the welding procedure specification (WPS) SJ 3026-2. The welding was performed in the 3G (Vertical) position. The filler metal utilized was identified as 4.0 mm diameter, Class E10016-G, Brand name LB-106. The minimum preheat temperature of 150° Celsius and maximum interpass temperature of 260° 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 120 amps to 145 amps, 23 volts to 26 volts and travel speed of 76 to 100 mm per minute 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.

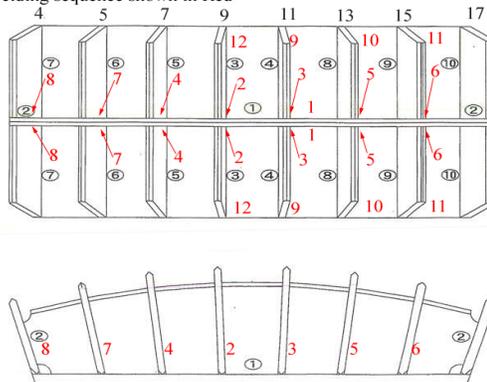
The following digital photographs illustrate observations of the activities being performed.

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West Deviation Saddle W2E1 Planned welding sequence shown in black, actual welding sequence shown in Red



Item	Weld Identification	Applicable WPS	CWI Name	Amperage	Voltage	TravelSpeed	Preheat Temp	Remarks
1	W2E1, 2L to 3L	SJ-3026-2	N/A	130 AC	23 AC	75 mm/min.	180°	C Yoshio
2	W2E1, 6L to 7L	SJ-3026-2	N/A	140 AC	23 AC	80 mm/min.	180° C	K Komai

## Summary of Conversations:

There were general conversations with Japan Steel Works, Ltd. representative and Mr. Kazunori Sato 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 and as noted above.

On this date the QA inspector attended an informal meeting at Japan Steel Works Muroran facility. The QA inspector met with JSW personnel Mr. Kazunori Sato, Deputy Manager. Submittal 711 - Distortion Control Plan submitted by Japan Steel Works and approved by Caltrans was discussed. The QA inspector reported that the welding sequence as shown in attachment 5 was not being followed. Mr. Sato stated that later today, he was meeting with the project welding engineer to discuss this issue and if necessary a revised distortion control plan would be submitted to Caltrans.

## 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.

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<b>Inspected By:</b>	Lanz,Joe	Quality Assurance Inspector
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<b>Reviewed By:</b>	Brasel,Ron	QA Reviewer
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