

**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-002287**Date Inspected:** 21-Jan-2008**Project Name:** SAS Superstructure**OSM Arrival Time:** 830**Prime Contractor:** American Bridge/Fluor Enterprises, a JV**OSM Departure Time:** 1930**Contractor:** Japan Steel Works**Location:** Muroran, Japan

<b>CWI Name:</b>	Chung Kuan/ Makhmud Ashadi	<b>CWI Present:</b>	Yes	No	
<b>Inspected CWI report:</b>	Yes No N/A	<b>Rod Oven in Use:</b>	Yes	No	N/A
<b>Electrode to specification:</b>	Yes No N/A	<b>Weld Procedures Followed:</b>	Yes	No	N/A
<b>Qualified Welders:</b>	Yes No N/A	<b>Verified Joint Fit-up:</b>	Yes	No	N/A
<b>Approved Drawings:</b>	Yes No N/A	<b>Approved WPS:</b>	Yes	No	N/A
		<b>Delayed / Cancelled:</b>	Yes	No	N/A
<b>Bridge No:</b>	34-0006	<b>Component:</b>	PQR test plate		

**Summary of Items Observed:**

Witness various mechanical tests for PQR #SJ-2941-WP1 (1G)

Caltrans Quality Assurance Inspector (QAI) representative, Mr. Wai Pau, traveled to Nikko Inspection Service (NIS) test lab, to witness various mechanical tests for ASME IX standard Shielded Metal Arc Welding (SMAW) process PQR qualification test. The PQR is numbered SJ-2941-WP1 (1G). The mechanical test includes 2 set (2 each) joint section tension test, 2 set (2 each) side bend test, and 2 set (3 each) V-notch impact test with 0 degree C and -20 degree C.

First, the NIS technician Mr. Naoya Takahashi performed section tensile tests. The tensile test equipment used is Universal tensile/compression machine with digital load indicator, serial number 72271, made by Shimadzu Corp. Japan. The machine calibrated due day is May-7-2009. Four tensile test specimens were individually installed into tensile/compression machine. Each test specimen ruptured under tensile load and determined the maximum ultimate tensile strength and type of failure. Caltrans QAI verified that accuracy of tensile strength readings that was indicated on digital indicator at the time of rupture. In addition QAI check the ruptured area and elongation of test specimens.

Second, the side bend test is performed by NIS technician Mr. Toshihiro Takayama, the side bend test equipment has been set up on the same machine; four side bend test specimens had been individual installed on the top of die member for each side bend test. The plunger aimed at center of weldments of the test specimens and forced into the die member until the test specimen became U-shaped. The weld and Heat Affect Zone (HAZ) was located in the approximate center and completely within the bent portion of the test specimen after U-shaped bending. Caltrans QAI verified the U-shaped specimen surface condition for any revealed defects on the face such as excessive undercut or lack of sidewall fusion after the test.

Next, the charpy V-notch impact test is performed by NIS foramen Mr. Hideo Domon., conventionally three

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specimens (1 set) is tested at one temperature and the results averaged. Three V-notch impact test standard specimens (2mm deep, with 45° angle and 0.25mm radius along the base) installed into a 0 degree C temperature container and other three standard specimens installed into a -20 degree C temperature container for held ten minutes prior charpy V-notch impact test. The impact test equipment used is JTT charpy testing machine with computerize load indicator, serial number 1173, made by Shimadzu Corp, Japan. To carry out the test the standard specimens are supported at its two ends on an anvil and struck on the opposite face to the notch by a pendulum arm. The specimen is fractured and the pendulum swings through, the height of the swing being a measure of the amount of energy absorbed in fracturing the specimen. All the broken specimens have been measured with later expansion for ductility. Caltrans QAI verified that accuracy of energy reading which indicated on the load indicator during each fractured time was properly recorded on QC data report.

The entire various mechanical tests operation were monitored and accepted by the NIS foramen Mr. Hideo Domon. Based on Caltrans QA observation, the various mechanical tests appeared to be in general compliance with requirement of Caltrans Special Provision and ASME IX 2006. A Caltrans Lot# B88-036-08 was assigned on the results of these various mechanical tests for tracking propose.

### Demonstration PQR qualification welding test (3G):

Caltrans Quality Assurance Inspector (QAI) representative Mr. Wai Pau travels to Japan Steel Works (JSW) Muroran plant to observe a demonstration of AWS D1.5 standard PQR welding test #SJ-2942-WP-2. This PQR has been failed twice prior with the RT test resulted in a numerous of porosity. The demonstration PQR tests utilizing the Shielded Metal Arc Welding (SMAW) process were conducted by welder Mr. Kouzou Kobayashi performed in the uphill vertical position (3G) with short-arc-strike length welding method and set the electrode at 10 degree angle above horizontal line when the welder strike the arc and lift the electrode up. The electrode E9018-M has been dried at least one hour at temperatures 315 degree C prior welding. JSW experiential this welding method to prevent porosities during welding. The material used for the PQR qualification test specimens was reported by JSW Welding Engineer Mr. Takaaki Maruya as ASTM A148 Gr.620-415 (casting) and ASTM A709-HPS-485WT (plate) both having a wall thickness measurement of 30mm. A total 21 inter passes have been completed the test. The PQR test plate has been scheduled tomorrow for radiographic testing (RT). Based on Caltrans QA observation, no discrepancies were noted.

### Summary of Conversations:

As Note within the report 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 Venkatesh Iyer (858)697-6363, who represents the Office of Structural Materials for your project.

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

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