

**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-005243**Date Inspected:** 16-Jan-2009**Project Name:** SAS Superstructure**Prime Contractor:** American Bridge/Fluor Enterprises, a JV**Contractor:** Japan Steel Works**OSM Arrival Time:** 830**OSM Departure Time:** 1530**Location:** Muroran, Japan**CWI Name:** Chung 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:**

Steel Structure Welding Shop:

Witness Fillet Weld Procedure Qualification Record (PQR) qualification test (SW-14-1 and SW14-2): Caltrans Quality Assurance Inspector (QAI) representative witnessed an AWS D1.5 standard fillet weld PQR qualification welding test. The number of PQR qualification welding test is SJ-2942-WP-20 and two test plates #SW-14-1 (flat 1G) and #SW-14-2 (Horizontal 2G). The PQR qualification test utilizing Flux Cored Arc Welding (FCAW) welding processes were conducted by welder Mr. Kouzou Kobayashi (08-5023) performed in the flat position (1G) and horizontal position (2G). The material used for the PQR qualification test specimens was reported by JSW Welding Engineer Mr. Takaaki Maruya as ASTM A709M-HPS-485 having a thickness measurement of 25mm. The weld joint design used T-joint. One side welded with maximum size signal pass fillet weld and second side welded with minimum size multiple pass fillet weld. The two side fillet weld combines in a single test weldment. The filler metal and shield gas used in the test for FCAW is Hoballoy wire TM-95K2, 1.6 diameter made by Hobart Brothers with 100% CO<sub>2</sub>. The FCAW welding and parameters have been monitored and recorded by CWI inspector Mr. Chung Kuan and JSW Welding Engineer Mr. Takaaki Maruya. Based on Caltrans QA observation, the two fillet weld qualification tests appeared to be in general compliance with requirements of AWS D1.5 2002 Section 5 and Caltrans contract documents.

T1-1 Tower Saddle Casting and Steel Structure joint section: Caltrans QAI representative observed three Japan Steel Works (JSW) welders perform Flux Cored Arc Welding (FCAW) process on rib plate welds 7Y-6U-1, 7Y-5U-1 and 7Y-5U-2 of T1-1 tower. These three welds are connecting to casting and steel structure. The filler metal used for FCAW is Hoballoy wire TM-55, 1.6 diameter made by Hobart Brothers, USA. The parameters used for FCAW welding of assemblies were conducted in accordance with Caltrans approved WPS #SJ-3011-6.

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The FCAW welding process and parameters have been monitored and recorded by CWI inspector Mr. Chung Kuan. Based on Caltrans QA observation, the FCAW welding operation appeared to be in general compliance with requirements of AWS D1.5 2002 and Caltrans contract documents.

W2E3 West Deviation Saddle Steel Structure: Caltrans QAI representative, CWI Mr. Chung Kuan and NIS NDT level II technician performed VT and dry MT test on longitudinal and transverse cracks which caused from metal shrinkage and located on horizontal task welds during fit up process. The horizontal task welds tie in rib plates and stem plate to base plate. A total 12 cracks on tack welds have been found on welds E3Y-17L-1, E3Y-17L-2, E3Y-4L-1, E3Y-4L-2 and E3Y-16L-2 after MT test. All the cracks have been removed by grinding. The crack remove areas have re-examined by dry MT test. After MT test completion, Caltrans QAI observed three JSW welders perform SMAW root pass welding. The SMAW root pass welding surface also has been MT test after welding. The proper filler metal used for SMAW is Hoballoy 9018-M with 4.2mm diameter electrode made by Hobart Brothers, USA. The entire steel structure remains pre heat temperature 110C degree during the cracks removing and root pass welding. The root pass welding process and parameters have been monitored and recorded by CWI inspector Mr. Chung Kuan. All of root pass welds also accepted by MT test after welding and Caltrans QAI used same method verified the root pass welds. Based on Caltrans observation, no discrepancies were noted.

## Casting Shop:

West Deviation Saddle casting W2W2 and W2W1: Caltrans QAI observed two NIS NDT level II technicians perform straight beam UT test on rib side of W2W2 and W2W3 West Deviation Saddles. The thickness of saddle segment is casting from 150mm to 500mm and both saddle test surface have been Magnetic Particle Test (MT) prior UT test. First, a 500mm range reflection has calibrated on Krautkramer Branson USM 3 and the search unit is a 24mm x 2 MHz single transducer as a source of compression waves, and penetrated into segment W2W2 and W2W3 for scanning. The distance and sensitivity of straight beam is calibrated with the 3.0mm and 6.4mm diameter FBH reference blocks and an additional test reference block made by same casting metrical. The liquid glycerin is be used to couple the search unit to the test surface. The straight beam tests have not been completed today and will continue tomorrow. Base on Caltrans observation, no discrepancies were noted.

## Summary of Conversations:

Caltrans QAI informed to CWI Mr. Chung Kuan that JSW recently increase a couple major welding and crack repair on tower and deviation saddles spread around #4 welding shop zone. It seems one CWI can't cover all welding zone. Caltrans QAI suggest Mr. Chung Kuan ask his company for one more inspector. He will ask company on next Monday.

## 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 Nina Choy (510)385-5910, 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>	Lanz,Joe	QA Reviewer

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