

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-002932**Date Inspected:** 06-Jun-2008**Project Name:** SAS Superstructure**OSM Arrival Time:** 800**Prime Contractor:** American Bridge/Fluor Enterprises, a JV**OSM Departure Time:** 1630**Contractor:** Japan Steel Works**Location:** Muroan, Japan

CWI Name:	Chung-Fu Kuan		
Inspected CWI report:	Yes	No	N/A
Electrode to specification:	Yes	No	N/A
Qualified Welders:	Yes	No	N/A
Approved Drawings:	Yes	No	N/A

CWI Present:	Yes	No	
Rod Oven in Use:	Yes	No	N/A
Weld Procedures Followed:	Yes	No	N/A
Verified Joint Fit-up:	Yes	No	N/A
Approved WPS:	Yes	No	N/A
Delayed / Cancelled:	Yes	No	N/A

Component: Tower, Jacking and Deviation Saddles

Bridge No: 34-0006**Summary of Items Observed:**

The following report is based on METS observations at Japan Steel Works (JSW) in Muroan Japan. Current work: Casting, machining 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 assembly fit-up operation of the structural steel plates for the West Deviation Saddle Base W2E2. The JSW fitter personnel Kiyotaka Koanagi continued assembly by aligning the rib plate, piece mark 2-15 with the stem plate, piece mark 2-2, joint designations E2Y-15V. 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. During tacking of the upper tack weld between the rib plate 2-15 to the stem, the QA inspector observed the preheat temperature measured on the opposite face of the stem plate, 100mm from the weld to be less than the required 160° Celsius per the WPS SJ-3011-3. This issue was brought to the attention of the QC inspector, Mr. Kuan who measured the actual temperature and found it to be 125° Celsius. AWS D1.5-2002 paragraph 4.2.7 states "When the base metal is below the temperature listed for the welding process being used and the thickness of material being welded, it shall be preheated (except as otherwise provided) in such a manner that the steel on which weld metal is being deposited is at or above the specified minimum temperature for a distance equal to the thickness of the part being welded, but not less than 75 mm [3 in.] in all directions from the point of welding." Mr. Kuan informed the JSW welding engineer Mr. Kou Aoki who was present at the time of the discrepancy was observed. Mr. Aoki informed The JSW lead welding Engineer Mr. Atushi Norita, who immediately came to the work area to access the

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discrepancy. Mr. Norita informed the QA inspector that the preheat was adequate and if there were any tack welds that were welded with inadequate preheat, they would be completely removed at a later date.

After the rib plate 2-15 was tack welded in place, Mr. Koanagi set end plates, piece marks 2-4 and 2-17 on the base plate, piece mark 2-3, joint designations E2Y-4L and E2Y-17L and aligning with the stem plate, piece mark 2-2, joint designations E2Y-17V and E2Y-4V. The tack welding of the end plates, joint designation E2Y-4L, E2Y-17L, E2Y-4V and E2Y-17V, was performed utilizing the Shielded Metal Arc Welding (SMAW) process per the welding procedure specification (WPS) SJ-3011-3 and SJ-3011-4. 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 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 except for the inadequate preheat noted above, the work 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 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 started the in process repair welding of Rib 5L, repair 2-12, location E-1 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 5L, number 2-12 length is 870 mm, width is 300 mm and maximum depth is 6 mm with an area of 2,610 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.

Item	Weld Identification	Applicable WPS	CWI Name	Amperage	Voltage	TravelSpeed	Preheat Temp	Remarks
1	W2E2, E2Y-15V	SJ-3011-3	C. Kuan	150 AC	22.5 AC	70 mm/min.	120° C	Y Ohta, preheat below required 160° C
2	W2E2, E2Y-16L	SJ-3011-2	C. Kuan	250 AC	24.0 AC	150 mm/min.	160° C	Y Ohta
3	W2E1/7L	SJ-3026-2	N/A	215 AC	23.0 AC	190mm/min	180° C	H. Sato

Summary of Conversations:

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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 and as noted 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) 967-6363, who represents the Office of Structural Materials for your project.

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