

DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES

Office of Structural Materials

Quality Assurance and Source Inspection



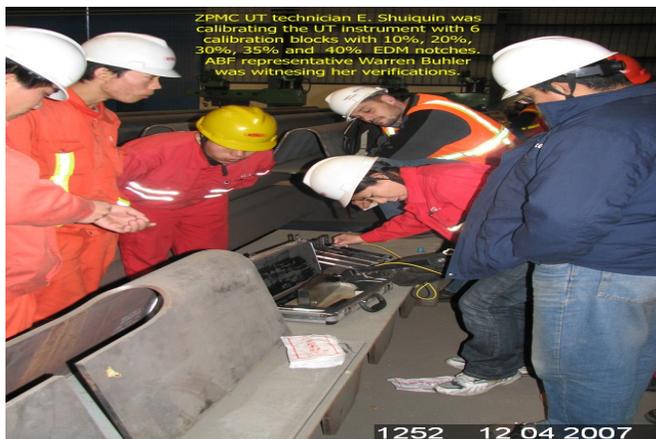
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Contract #: 04-0120F4Cty: SF/ALA Rte: 80 PM: 13.2/13.9File #: 69.28**WELDING INSPECTION REPORT****Resident Engineer:** Pursell, Gary**Address:** 333 Burma Road**City:** Oakland, CA 94607**Report No:** WIR-000999**Date Inspected:** 04-Dec-2007**Project Name:** SAS Superstructure**OSM Arrival Time:** 630**Prime Contractor:** American Bridge/Fluor Enterprises, a JV**OSM Departure Time:** 1730**Contractor:** Zhenhua Port Machinery Company, Ltd (ZPMC), Changxing Island **Location:** Shanghai, China**CWI Name:** Fu Yu Hong**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:** OBG Second Weld Trial**Summary of Items Observed:**

CALTRANS Quality Assurance (QA) Inspector, Alfredo Acuna was present witnessing and performing 100% ultrasonic verifications on the partial penetration joint (PJP) for the second weld trial scheduled for this project at the ZPMC facility in Shanghai, China for the San Francisco Oakland Bay Self Anchored Suspension Bridge on Bay # 1. Caltrans Senior Level III Mr. John Kinsey, Structures Material Representative, Mr. Pat Lowry, ABF representative Mr. Warren Buehler were witnessing the test. ABF representative Mr. Art Peterson, and ZPMC representative Ms. E Shuiquin were at location performing the test. The photographs below show Ms. E Shuiquin and Art Peterson performing the test. The QA inspector had a conversation with Mr. Warren Buehler who was coordinating the test. Mr. Warren Buehler relayed that 100 % of the weld # 10 was going to be tested and that the minimum recordable LOP was going to be 2.5 mm (considering that the material thickness measured was 12.5 mm) from the spread sheet given by ZPMC. The QA inspector recommended that ZPMC performs the verification first, follows by ABF representative and the QA inspector would go behind them. Mr. Warren Buehler agreed.

WELDING INSPECTION REPORT

(Continued Page 2 of 4)



Item Description	WBS	Dwg No.	Status
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1 UT verifications on the PJP for the U-Ribs Second Weld Trial

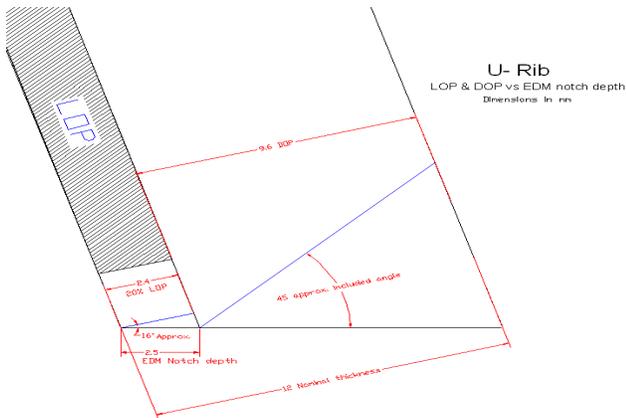
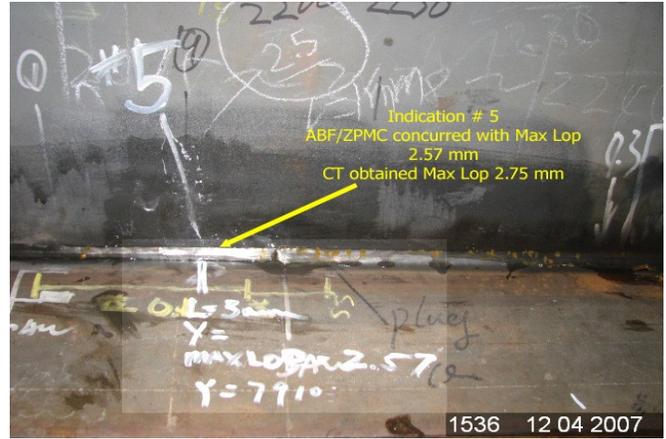
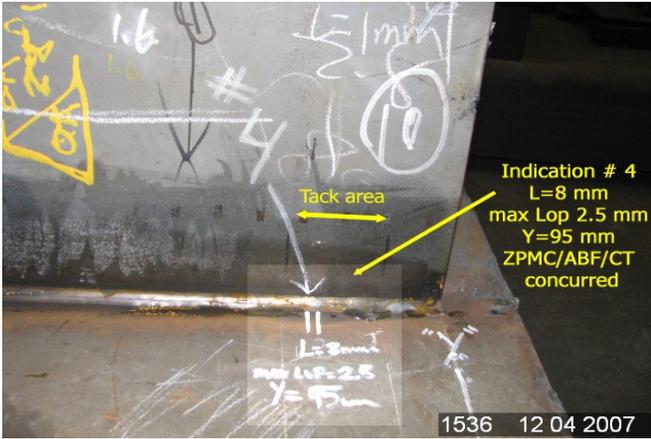
The QA performed 100% ultrasonic testing (UT) evaluation on the partial penetration joint (PJP) at the 12 mm U-rib # U-05 weld joint # 10 second weld trial.

The QA inspector calibrated with 6 calibration blocks made from the close ribs welded sections with a 39% 34%, 29%, 24%, 19% and 9% lack of penetration(LOP). According with EDM manufacturer's report, the notches of the references blocks were Electrical Discharge Machined (EDM) to have a lack of penetration of approximately 9% of the nominal thickness(1.15 mm LOP) and 1.2 mm deep of the notch, 19%(2.3 mm)LOP and 2.4 mm deep of the notch , 24% (2.9 mm)LOP with 3.0 mm deep of the notch, 29%(3.5 mm)LOP and 3.6 mm deep of the notch, 33 %(4.0 mm)LOP and 4.2 mm deep of the notch and 38%(4.6 mm)LOP with 4.8 mm deep of the notch. The photograph below shows the manufacturer's report with the actual size of the EDM notches; and sketch with the EDM notches versus the projected LOP 20 %(80 % depth of penetration (DOP)) per the special provisions. Note: After calibrating, the QA inspector obtained similar values from full screen high (FSH) from those measured by ABF and ZPMC within +/- 1 % on the 6 calibration blocks. ABF had a tabulated corrected LOP spread sheet(+ 1 mm experimental value obtained by measuring 30 test samples after breaking the samples)with values taken from 0 to 100 % FSH as shown on the photograph below. ZPMC, ABF and the QA inspector performed UT PJP verifications to the weld # 10 for the ZPMC OBG second weld Trial after ZPMC and ABF. ZPMC, ABF and the QA Inspector agreed in 5 indications found. However the QA Inspector obtained at indication # 3 a maximum of 55% FSH (3.62 mm LOP) in lieu of a maximum of 48% FSH(3.325 mm LOP) measured by ABF; and indication # 5 was found a maximum of 32% FSH (2.75 mm LOP) in lieu of a maximum of 28% (2.575 mm LOP). The digital photographs below show the locations of the indications and the ultrasonic scopes from ABF (operated by Art Peterson and Warren Buehler) and the QA inspector with different reading when evaluating the indication # 3.

Note: The amplitude ratio obtained between ABF and the QA inspector on discontinuities # 3 and 5 determined by decibel and amplitude ratio by the formula $NdB=20 \text{ Log}_{10}(A1/A2)$. For Discontinuity # 3. The QA inspector had $A2=55 \%$ FSH and ABF obtained $A1=48 \%$ FSH maximum that result with a approximately 1.2dB deviation and for discontinuity # 5 the QA inspector measured 32% FSH and ABF/ZPMC that result with approximately deviation of 1.15 dB.

WELDING INSPECTION REPORT

(Continued Page 4 of 4)



Summary of Conversations:

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 Mazen Wahbeh, (818) 292-0659, who represents the Office of Structural Materials for your project.

Inspected By: Acuna, Alfredo

Quality Assurance Inspector

Reviewed By: Cuellar, Robert

QA Reviewer