DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
Office of Structural Materials
Quality Assurance and Source Inspection

Bay Area Branch
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Contract #: 04-0120F4
Cty: SF/Ala Rte: 80 PM: 13.2/13.9
File #: 69.28

WELDING INSPECTION REPORT

Resident Engineer: Pursell, Gary
Address: 333 Burma Road
City: Oakland, CA 94607

Report No: WIR-015098
Date Inspected: 17-May-2010

Project Name: SAS Superstructure
Prime Contractor: American Bridge/Fluor Enterprises, a JV
Contractor: Zhenhua Port Machinery Company, Ltd (ZPMC), Changxing Island

OSM Arrival Time: 1900
OSM Departure Time: 700
Location: Shanghai, China

CWI Name:	See below	**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 and OBG Components

Summary of Items Observed:

On this date Caltrans OSM Quality Assurance Inspector (QA Inspector) George Goulet was present during the times noted above for observations relative to the work being performed.

Bay 10
This QA Inspector randomly observed the following work in progress in Bay 10:

FCAW welding of weld joints ED1-A27B/B-40, 38, 32, 30 located on PCMK east tower, shear plate assembly, connection plates to stiffeners. Welders were identified respectively as 057180, 053116, 054069, 052075. QC was identified as ZPMC CWI Li Lin (QC1). The welding variables recorded by QC1 appeared to comply with WPS-B-T-2332-TC-P4-F. Also present at this location and appearing to be monitoring the welding operations was ABF Representative Zhao Ying Sheng.

FCAW welding of weld joints WD1-A28A/B-26, 27, 30, 31 located on PCMK west tower, shear plate assembly, connection plates to stiffeners. Welder was identified as 040533. QC was identified as QC1. Assisting QC1 at this location and appearing to be monitoring the welding and recording data was ZPMC QC Yuan Hui Gang, who was not a CWI. The welding variables recorded by QC1's assistant appeared to comply with WPS-B-T-2332-TC-P4-F. Also present at this location and appearing to be monitoring the welding operations was ABF Representative Zhao Ying Sheng.

FCAW welding of base metal on plate ED1-A1 located on PCMK east tower. Welders were identified as 054069, 052075. QC was identified as QC1. Assisting QC1 at this location and appearing to be monitoring the welding

and recording data was ZPMC QC Yuan Hui Gang, who was not a CWI. The welding variables recorded by QC1's assistant appeared to comply with WPS-345-FCAW-2G(2F)-repair as listed on a ZPMC repair order written in Chinese characters only and no repair order number. Also present at this location and appearing to be monitoring the welding operations was ABF Representative Zhao Ying Sheng.

FCAW welding of weld joints ED1-A27B/B-34, 36 located inside PCMK east tower, base shear plate. Welder was not identified. QC was identified as QC1. The welding variables recorded by QC1 appeared to comply with WPS-B-T-2332-TC-P4-F.

Bay 11
This QA Inspector randomly observed no welding related work in progress in Bay 11.

Heavy Dock
ABF Representative Zhao Ying Sheng informed this inspector that no work was being performed on the Heavy Dock.

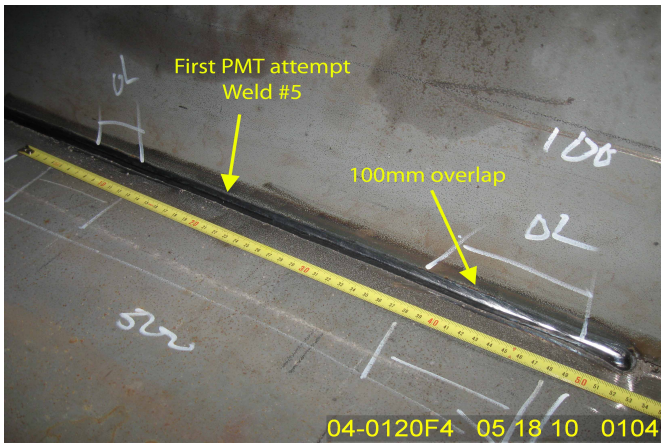
Bay 10 - MT
In response to ZPMC Notification Inspection #005759 for magnetic particle testing (MT) inspection of tower shear plate A26, this QA Inspector performed random visual testing (VT) and then MT of approximately 15% of the area previously tested and accepted by ZPMC Quality Control personnel. This QA Inspector generated an MT report for this date. The member was identified as ND1-A26B/B. The weld designations reviewed were: 37, 38. No relevant indications were observed.

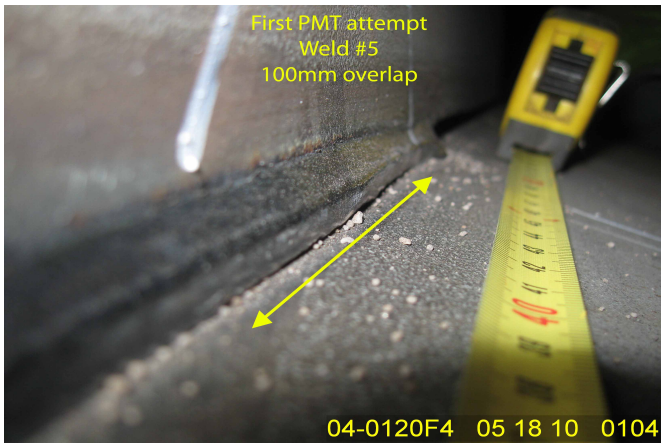
Bay 9 – PMT
This QA Inspector monitored OBG Production Monitoring Test (PMT) #3121 for deck panels DP3121-001 and DP3123-001 at Gantry #1. Prior to the start of the PMT, this QA Inspector observed the root openings to be within the 0.0 to 0.5mm tolerance. The magnetic particle test (MT) of the tack welds was noted on the test panel as having been performed by ZPMC MT Technician Wang Wei on 5/17/10. The visual inspection of tack welds and root gaps was performed by ABF Representative Cai Haizhou (ABF), ZPMC CWI Chen Shigang (PQC), and this QA Inspector. The tack welds and root gaps appeared to be within prescribed tolerances. This QA Inspector observed that the deck plate of the test panel was 20mm thick and the deck plate of the production panels were 20mm thick. The ambient temperature was approximately 20°C. Flame preheat was applied to the specimens to above 60°C immediately prior to start of the gas metal arc welding (GMAW) pass. The interpass temperature was checked between processes and observed to be above 60°C. The start time for welding of the 3–12mm x 20mm specimens was approximately 0017 hours on 5/18/10 and the finish time was approximately 0047 hours. This QA Inspector randomly verified and documented the welding amperage, voltage, and travel speed during the gas metal arc welding (GMAW) and submerged arc welding (SAW) processes, and performed a visual inspection welds 1 thru 6 at the completion of both the GMAW root pass and SAW cover pass. The welding variables recorded by PQC appeared to comply with WPS-B-T-2342-U1-(U-rib)-5. The welds were visually inspected by ABF, PQC and this QA Inspector. PQC and ABF informed this QA Inspector that weld #1 appeared to exhibit 30mm of incomplete fusion, weld #5 appeared to exhibit 155mm of overlap, and welds #6 appeared to exhibit incomplete fusion, not in conformance with contract documents and were not acceptable. See photos below showing one of two areas of overlap in weld #5. PQC rejected the test and this QA Inspector concurred.

This QA Inspector monitored the second attempt of OBG Production Monitoring Test (PMT) #3121 for deck panels DP3121-001 and DP3123-001 at Gantry #1. Prior to the start of the PMT, this QA Inspector observed the root openings to be within the 0.0 to 0.5mm tolerance. The magnetic particle test (MT) of the tack welds was noted on the test panel as having been performed by ZPMC MT Technician Gu Yunwu on 5/12/10. The visual inspection of tack welds and root gaps was performed by ABF, PQC, and this QA Inspector. The tack welds and root gaps appeared to be within prescribed tolerances. This QA Inspector observed that the deck plate of the test panel was 20mm thick and the deck plate of the production panels were 20mm thick. The ambient temperature was approximately 20°C. Flame preheat was applied to the specimens to above 60°C immediately prior to start of the gas metal arc welding (GMAW) pass. The interpass temperature was checked between processes and observed to be above 60°C. The start time for welding of the 3–12mm x 20mm specimens was approximately 0120 hours on 5/18/10 and the finish time was approximately 0142 hours. This QA Inspector randomly verified and documented the welding amperage, voltage, and travel speed during the gas metal arc welding (GMAW) and submerged arc welding (SAW) processes, and performed a visual inspection welds 1 thru 6 at the completion of both the GMAW root pass and SAW cover pass. The welding variables recorded by PQC appeared to comply with WPS-B-T-2342-U1-(U-rib)-5. The welds were visually inspected by ABF, PQC and this QA Inspector. PQC and ABF informed this QA Inspector that all 6 welds were acceptable and this QA Inspector concurred. This QA inspector randomly witnessed ZPMC ultrasonic testing (UT) technician, identified as Xu Wei, perform UT on each of the 500 mm test welds for depth of penetration and conformance. This QA Inspector selected fifteen designated locations for macroetch sampling per contract requirements. Each macroetch sample location was stamped by ZPMC personnel with the number 3121, a letter M, chosen randomly by this QA Inspector as a verification mark, and an individual progressive macroetch identifying number for each macroetch sample. After removal from each of the weld test specimens, polishing, and acid etching of the selected end, the macroetch samples were evaluated with a 7X optical magnifier and accepted by PQC, ABF, and this QA Inspector.

All fifteen sample macroetch samples appeared to meet requirements and were noted to appear acceptable. See Caltrans U-ribs PMT Inspection Sheet, ZPMC production monitoring test plate inspection report, and Caltrans Macro Etch Log - all dated 5/18/2010 for additional information.

Unless otherwise noted, all work observed on this date appeared to generally comply with applicable contract documents.





WELDING INSPECTION REPORT

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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 Eric Tsang, 150-0042-2372, who represents the Office of Structural Materials for your project.

Inspected By:	Goulet,George	Quality Assurance Inspector
Reviewed By:	Dawson,Paul	QA Reviewer