

**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:** Siegenthaler, Peter**Address:** 333 Burma Road**City:** Oakland, CA 94607**Report No:** WIR-026177**Date Inspected:** 02-Aug-2011**Project Name:** SAS Superstructure**OSM Arrival Time:** 1900**Prime Contractor:** American Bridge/Fluor Enterprises, a JV**OSM Departure Time:** 700**Contractor:** Zhenhua Port Machinery Company, Ltd (ZPMC), Changxing Island **Location:** Shanghai, China

<b>CWI Name:</b>	N/A	<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>	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.

Vessel Zhenghua #19

This QA Inspector randomly observed the following on the Vessel Zhenghua #19:

ZPMC workers were observed performing what appeared to be final tightening of ASTM A325M bolt sets using a pneumatic impact wrench at OBG Segment 14E, FL3 area, angle plate to edge plate and to above and below horizontal plate approximately 1M below deck plate, north (crossbeam) side, panel points 125~126. The bolt sets and adjacent steel being bolted showed no turn-of-nut initial tightening markings during or after final tightening. ZPMC workers were tightening the bolt assemblies with the pneumatic impact wrench to what appeared to be a final tightening force before any of the bolts were tightened to a snug tight condition. The impact wrench was held on each bolt while impacting for a period of 8 to 10 seconds. This QA Inspector observed a clear white paint mark on the socket of the pneumatic impact wrench and it appeared that the ZPMC workers were using the mark as a guide to achieve the 180°~210° rotation of the nut necessary for turn-of-nut method of tightening. This QA Inspector contacted ZPMC QA Zhang Wei (ZQA) who informed this QA Inspector that he would have a ZPMC QC representative come to the location to verify this QA Inspector's observed issues. ZPMC Bolting Foreman Ruo (Ruo) arrived at the location within 10 minutes and observed the tightening operation being performed incorrectly. Ruo talked to the ZPMC workers, who then began performing what appeared to be initial tightening by using the Pneumatic impact wrench for a period of only 2 to 3 seconds on all bolt sets before then performing what appeared to be final tightening by using the Pneumatic impact wrench for a period of 8 to 10 seconds on all

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bolt sets.

ZPMC workers were observed performing what appeared to be final tightening of ASTM A325M bolt sets using a pneumatic impact wrench at OBG Segment 13BW, location #17~20, side plate stiffener angled splice plates, 3rd and 4th from edge beam, south (crossbeam) side, between panel points 121~121.5; and at OBG Segment 13CW, location #9~12, bottom plate stiffeners, 1st and 2nd from edge beam, south (crossbeam) side, bottom plate stiffener splice plates, panel points 123~123.5. The bolt sets and adjacent steel being bolted showed no turn-of-nut initial tightening markings during or after final tightening. ZPMC workers were tightening the bolt assemblies with the pneumatic impact wrench to what appeared to be a final tightening force before any of the bolts were tightened to a snug tight condition. The impact wrench was held on each bolt while impacting for a period of 8 to 10 seconds. This QA Inspector contacted ZPMC QA Zhang Wei (ZQA) who informed this QA Inspector that he would have a ZPMC QC representative come to the location to verify this QA Inspector's observed issues. Ruo arrived at the location within 10 minutes and observed the tightening operation being performed incorrectly. Ruo talked to the ZPMC workers who then left the area, leaving all related tools, including an approximately 3kg hammer which this QA Inspector had observed ZPMC workers using to drive the bolts through the bolt holes. The approximately 26mm holes had been observed by this QA Inspector on 8/1/11 being re-drilled 7mm to 12mm from originally drilled holes making figure eight shaped elongated holes approximately 33mm to 38mm long. This QA Inspector contacted ZQA who had also been informed about the re-drilling of the bolt holes on 8/1/11. This QA Inspector informed ZQA that an Incident Report would be generated concerning the re-drilling of the bolt holes and the improper tightening of the bolt sets. See the daily report of 8/1/11 and the Caltrans Incident report of 8/2/11 for further details and photos.

This QA Inspector also randomly observed the following on the Vessel Zhenghua #19 in response to a verbal request from ZPMC QA Zhang Wei, Bolting Inspection Notification Sheet Number 00734:

Item 1 - OBG Segment 13CE, side plate, south (bikepath) side, panel points 124~124.5:

ZPMC workers began performing final ASTM A325M bolt tightening verification of bolt sets noted below at the direction of ZPMC QC Zhang Lin (QC1) using a ZPMC calibrated wrench with unreadable identification number. No less than 10% of the ASTM A325 bolt sets at each connection were to be torque tested. However, every bolt tested at the first connection needed to be rotated in excess of 180°. Ruo informed this QA Inspector that the items 1 through 4 of the inspection request was cancelled.

QC1 provided this QA Inspector with the following information regarding the bolt sets installed at this location. This QA Inspector observed ZPMC's Bolt Test Log for SFOBB (RoCap list), listing the RoCap Set numbers, bolt set size, and the NM test result for torque tightening purposes. The information presented by QC1 and listed below for item 1 appeared to this QA Inspector to match the RoCap list as follows:

Bolt Set No. DHGM270035 – M27x95 – test result 647NM

The torque of the above noted bolt sets was verified by torque testing with the above noted calibrated wrench with the wrench setting displayed as 650NM at the direction of QC1.

This QA Inspector and the ZPMC bolting crew proceed to the four locations of item 5 for testing.

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Item 5 – The inspection part was incorrectly listed on Bolting Inspection Notification Sheet Number 00734 incorrectly as LD. The actual inspection part was as follows. OBG Segments 13AE/13BE and 13BE/13CE, edge beams, south (bikepath) side and north (crossbeam) side, panel points 120~120.5 and panel points 122~122.5: ZPMC workers performed final ASTM A325M bolt tightening verification of bolt sets noted below at the direction of ZPMC QC Zhang Lin (QC1) using a ZPMC calibrated wrench with unreadable identification number. No less than 10% of the ASTM A325 bolt sets at each connection were torque tested. QC1 provided this QA Inspector with the following information regarding the bolt sets installed at this location. This QA Inspector observed ZPMC's Bolt Test Log for SFOBB (RoCap list), listing the RoCap Set numbers, bolt set size, and the NM test result for torque tightening purposes. The information presented by QC1 and listed below appeared to this QA Inspector to match the RoCap list as follows:

Bolt Set No. DHGM240021 – M24x95 – test result 540NM

The torque of the above noted bolt sets was verified by torque testing with the above noted calibrated wrench with the wrench setting displayed as 540NM at the direction of QC1. Based on the information above this concurred with QC1 for the issuance of green tag numbers.

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

### 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.

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<b>Inspected By:</b>	Goulet, George	Quality Assurance Inspector
<b>Reviewed By:</b>	Riley, Ken	QA Reviewer

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