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

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Contract #: 04-0120F4
Cty: SF/ALA Rte: 80 PM: 13.2/13.9
File #: 73.28

# WELDING INSPECTION REPORT

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

**Report No:** WIR-010430
**Date Inspected:** 04-Nov-2009

**Project Name:** SAS Superstructure
**Prime Contractor:** American Bridge/Fluor Enterprises, a JV
**Contractor:** HoChang, Korea

**OSM Arrival Time:** 800
**OSM Departure Time:** 1800
**Location:** Unyang, Korea

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| **CWI Name:** | Sang Ho Kwak | | **CWI Present:** | ☑ Yes | ☐ No |
| **Inspected CWI report:** | ☐ Yes | ☑ No | **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:** Pier E2 Bearing and Shear key

**Summary of Items Observed:**

The following report is based on METS observations at HoChang Machinery Industries (HMI).
On this date the Caltrans Quality Assurance (QA) inspector, Dong J. Shin arrived at HoChang Machinery Industries (HMI) located at Unyang and Onsan Korea and Korea Precision Co. located at Dooseo Korea. The Purpose of this trip was to observe quality control during fabrication and process of following items.

Forging

1. Bearing Bottom Housing (B1-07/F07302-010): Completed blasting and painting.
2. Bearing Bottom Housing (B2-07/F07302-020): Completed blasting and painting.
3. Bearing Bottom Housing (B3-07/F07302-030): Completed blasting and painting.
4. Bearing Bottom Housing (B4-07/F07302-040): Completed blasting and painting.
5. Spherical Ring (S1-07/F07302-050): Continue final machining.
6. Spherical Ring (S2-07/F07302-060): Continue final machining.
7. Spherical Ring (S3-07/F07302-070): Continue final machining.
8. Spherical Ring (S4-07/F07302-080): Continue final machining.
9. Solid Shaft (B1-02/F07302-090): Continue final machining.
10. Solid Shaft (B2-02/F07302-100): Continue final machining.
11. Solid Shaft (B3-02/F07302-110): Continue final machining.
12. Solid Shaft (B4-02/F07302-120): Continue final machining.

• F number is DooSan Production Number.
• B number is drawing Number.

Casting

On this date the Caltrans Quality Assurance (QA) inspector, Dong J. Shin arrived at HoChang Machinery Industries (HMI) located at Unyang, Korea and DooSan Heavy Industries(DHI) located at Changwon, Korea. The Purpose of this trip was to observe quality control during fabrication and process of following items. Samjeon NDT technician Mr. D. Y. Whang and Mr. G. T. Kim performed final MT on housing after final machining and minor defect removal area of Bearing Top Housing and Shear Key housing. QA inspector checked the following items prior to testing: Calibration Date, AC lifting power, and Pie gauge sensitivity. MPT used Yoke probe with wet visible method.

Samjeon NDT technician Mr. GT, Kim performed UT on minor repair area of Bearing Top Housing and Shear Key Housing. QA inspector checked following items prior to testing: UT Calibration date, calibration date and DAC curve, transducer size and frequency. Transducers Used: Straight Beam: 24mm dia. 2MHz, Dual Straight beam: 6 x 10mm 4MHz and miniature angle: 8 x 9mm 4 MHz 45º.

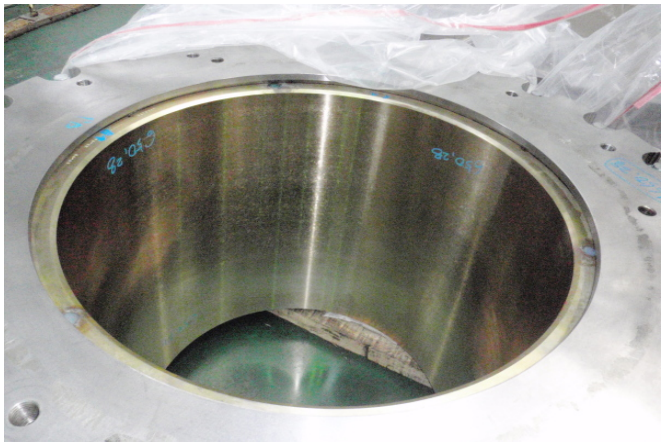
On this date, HMI Qualified welder Mr. O. J. Park performed minor repair welding on Bearing Top Housing and Shear Key Housing. QA inspector and HMI QC Inspector verified welding parameters prior to start welding. Welding process utilized was Gas Tungsten Arc Welding (GTAW) with ER70S-6 with diameter 2.4mm rod manufactured by Hyundai Steel, Brand name ST-50.6 with 100% Argon gas. QA inspector verified welding parameter range was 15-17 volts, 200-245 amps, travel speed 74-89mm/min, Gas flow 12-15little/min., preheat temperature over 150ºC and interpass temperature of less than 250º C. After completing repair welding, HMIC increased preheat up to 300ºC for PWHT and covered by Heat blanket for slow cool down. All of welding parameters comply with approved welding procedure specifications No A-T-Z1Z1-147.

KPC personnel started the remachining on E-2 Bearing bushings due to an out of tolerance overall dimension. Lubrite supervisor Mr. Dave, McWright has verified the dimensions with KPC QC Inspectors prior to machining.

1. Bearing Top Housing (B1-06, C07039-010): Minor repair welding.
2. Bearing Top Housing (B2-06, C07039-020): Minor repair welding.
3. Bearing Top Housing (B3-06, C07039-030): Minor repair welding.
4. Bearing Top Housing (B4-06, C07039-040): Minor repair welding.
5. Bearing Hold Down Assembly (B1-01-1, C07039-050): Completed final MT.
6. Bearing Hold Down Assembly (B1-01-2, C07039-060): Completed final MT.
7. Bearing Hold Down Assembly (B2-01-1, C07039-070): Completed final MT.
8. Bearing Hold Down Assembly (B2-01-2, C07039-080): Completed final MT.
9. Bearing Hold Down Assembly (B3-01-1, C07039-170): Completed final MT.
10. Bearing Hold Down Assembly (B3-01-2, C07039-180): Completed final MT.
11. Bearing Hold Down Assembly (B4-01-1, C07039-190): Completed final MT.
12. Bearing Hold Down Assembly (B4-01-2, C07039-200): Completed final MT.
13. Shear Key Stub (S1-01, C07039-090): Completed final machining.
14. Shear Key Stub (S2-01, C07039-100): Completed final machining.
15. Shear Key Stub (S3-01, C07039-110): Completed final machining.
16. Shear Key Stub (S4-01, C07039-120): Completed final machining.

17. Shear key Housing (S1-03, C07039-130): Continue final machining.
18. Shear key Housing (S2-03, C07039-140): Continue final machining.
19. Shear key Housing (S3-03, C07039-150): Continue final machining.
20. Shear key Housing (S4-03, C07039-160): Continue final machining.

* S and B number is drawing number.
* C number is DHI ID number.



**Summary of Conversations:**

*Discuss with Mr. S. H. Kwak regarding general project schedule.

**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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| **Inspected By:** | Shin,DJ | Quality Assurance Inspector |
| **Reviewed By:** | Edmondson,Fred | QA Reviewer |