STATE OF CALIFORNIA—BUSINESS, TRANSPORTATION AND HOUSING AGENCY Arnold Schwarzenegger, Governor

DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
MATERIALS ENGINEERING AND TESTING SERVICES
Office of Structural Materials
Quality Assurance and Source Inspection
Bay Area Branch
690 Walnut Ave., St. 150
Vallejo, CA 94592-1133
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Contract #: **04-0120E4**
Cty **SF** Rte **80** PM **13.4,13.8**
File # **13 .25 B**

QUALITY ASSURANCE - NONCONFORMANCE REPORT

Location: Vancouver, WA **Date**: 6/20/2006

Prime Contractor: Kiewit, FCI & Manson Joint Venture **NCR #099**

Submitting Contractor: Oregon Iron Works

Type of problem:

Welding	☒	**Concrete**	☐	**Other**	☐	
Welding:	☒	**Curing:**	☐	**Procedural:**	☐	**Bridge No.** 34-0006
Joint fit-up:	☐	**Coating:**	☐	**Other:**	☐	**Component:** E2
Procedural:	☐	**Procedural:**	☐			

Description of Non-Conformance: OIW Quality Control Inspector William Bartlett allowed OIW welder Shannon Doolittle (welder identification D-18) to perform submerged arc welding on a top flange weld joint that contained an excessive root opening. The root opening was measured to be approximately 5 to 6 millimeters. Oregon Iron Works Welding Procedure Specification 4226 calls out for a maximum root opening of 1.5 mm (as fit) (maximum by Code 3mm). The welding was performed on Pod Section NA2, Interior Transverse Girder G121-1 to Pile Sleeve 301-2 (WJ# C1). The weld joint root opening was not corrected before commencing Submerged Arc Welding.

Applicable reference: AWS D1.5 –2002 Section 3.3, Contract 04-0120E4 Special provisions section 8.3, Oregon Iron Works Welding Procedure Specification 4226.

Who discovered the problem: QA Inspector Joe Adame

Name of individual from Contractor notified: QC Inspector Russ Lynch

Time and method of notification: 6/20/2006 1300, phone call.

Name of Caltrans Engineer notified: Mark Vilcheck, Structure Representative

Time and method of notification: June 22, 2006 via email notification

QC Inspector's Name: QC Inspector Russ Lynch

Was the QC Inspector aware of problem: No

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Contractor's proposal to correct the problem: No corrective proposal has been submitted at this time.

Comments: This report is for the purpose of determining general 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 Ryan Smith, (858) 232-6799, who represents the Office of Structural Materials for your project.

Inspected By: Joe Adame Quality Assurance Inspector

Reviewed By: Dave McClary Lead QA Reviewer

Hardcopy Routing Instructions:
1. Resident Engineer *2. Inspecting Branch Contract File* *3. Responsible Branch Contract File (with supporting documentation)*

State of California
DEPARTMENT OF TRANSPORTATION

Business, Transportation and Housing Agency

M e m o r a n d u m

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To: MARK VILCHECK
Structure Representative
333 Burma Road
Oakland, CA 94607

Date: September 7, 2006

File: 04-0120E4
E2/T1 Foundations

From: RYAN T. SMITH
Structural Materials Representative
Quality Assurance and Source Inspection Branch
Office of Structural Materials

KFM SUBMITTALS FOR OREGON IRON WORK'S (OIW) RESPONSES TO NCRs

The Materials Engineering and Testing Service (METS) has reviewed the following submittals requesting to close Nonconformance Reports (NCRs) regarding the fabrication of the E2 and T1 Steel Piling in Napa, CA. Please find the following comments regarding NCRs:

Submittal Number	Date Submitted	Description	Approved / Rejected	Notes
206-01	08/24/06	OIW Response to NCR 018	Approved	1
851-00	08/29/06	OIW Response to NCR 091	Approved	2
872-00	09/06/06	OIW Response to NCR 113	Approved	3
873-00	09/06/06	OIW Response to NCR 34 & 51	Approved	4
870-00	08/30/06	OIW Response to NCR 081	Approved	5
875-00	09/06/06	OIW Response to NCR 098	Approved	6
871-00	09/06/06	OIW Response to NCR 022	Approved	7
874-00	09/06/06	OIW Response to NCR 099	Approved	8
869-00	09/05/06	OIW Response to NCR 104	Approved	9
885-00	09/07/06	OIW Response to NCR 118	Approved	10

884-00	09/07/06	OIW Response to NCR 116	Approved	11
883-00	09/07/06	OIW Response to NCR 097	Approved	12
882-00	09/07/06	OIW Response to NCR 100	Approved	13
881-00	09/07/06	OIW Response to NCR 106	Approved	14
880-00	09/06/06	OIW Response to NCR 105	Approved	15
879-00	09/06/06	OIW Response to NCR 055	Approved	16

Notes:

1. METS NCR 018 was issued on October 24, 2005 to document the Contractor allowing the heat straightening of ring segment A43-6 without prior approval by the Engineer. In order to continue with the removal of the distortion in the ring segments, the Contractor forwarded KFM Submittal 206-00, dated November 2, 2005, outlining the procedure and conditions for "pre-approved" heat straightening. In accordance with State Letter 05.003.01.000631, dated December 8, 2005, the Department agreed to allow the heat straightening with provided that three conditions were included in the Contractor's procedure. Although KFM and OIW agreed to these conditions verbally in December 2005, they were not incorporated into OIW's Welding Quality Control Plan until Submittal 206-01, dated August 28, 2006. METS takes no exception to the revisions contained in Submittal 206-01; however, it should be noted that the attached Ultrasonic Examination Reports show the examination results of the pile sleeves after heat straightening and are not necessary for approval of Submittal 206-01 or the closure of NCR 018. METS considers this issue resolved as a heat straightening request would not have been necessary to remove the distortion from A43-6 per the approved changes to Submittal 206-01.
2. In accordance with the OIW letter dated August 25, 2006, the welders have received additional training regarding the use of proper preheat before welding the steel piling. Additionally, OIW has installed Cooperheat thermal pads to aide in achieving and maintaining the heat during welding operations. As of the date of this memorandum, METS understands that the Contractor has addressed the issue and has implemented measures to control

the heat before, during, and after welding. METS considers this NCR to be resolved at this time.

3. Per the comments in OIW's response letter to State Letter 05.003.01-001764, dated September 6, 2006, METS understands that the Contractor's use of an unapproved WPS was an isolated oversight by the Quality Control Department and should not be an issue in the future. Additionally, it should be noted that the WPS in question was approved by METS in KFM Submittal 864-00 on September 7, 2006. METS considers this NCR to be resolved at this time.

4. Per the comments in OIW's response letter to State Letter's 05.003.01-00828 and 05.003.01-001069, the OIW staff was counseled regarding the importance of receiving approval prior to proceeding with Heat Straightening. METS concurs that no further instances of this issue occurred after the above documented instances. Additionally, HSR 026 and HSR 041 have documented the heat straightening performed. At this time HSR 026 has been closed; however, HSR 041 is still pending. METS considers this NCR to be resolved provided that the Contractor will clear the repair through the closing documents for HSR 026 and HSR 041.

5. In OIW's response letter to State Letter 05.003.01-001174, dated August 30, 2006, OIW repaired a crack in the weld connecting Pile Sleeve 301-1 to Girder G121-2 as a result in miscommunication between the Quality Control and Production departments regarding the status of approval by the Engineer. METS understands that OIW has counseled their staff about the importance of receiving approval prior to proceeding with Critical Weld Repairs. METS considers this NCR to be resolved provided that the Contractor will clear the CWR through the closing documents for CWR 020.

6. As stated in OIW's response letter to State Letter 05.003.01-001450, dated September 6, 2006, the joint connecting G181-3 and G171-1 was originally a Partial Joint Penetration (PJP) weld and was approved to be a changed to a Complete Joint Penetration (CJP) weld per KFM RFI 258. METS understands that the welder was unaware of this change and welded the joint as a PJP weld. OIW has since verified that all welders understand the detail change in order to prevent future occurrences. The PJP weld has been removed and rewelded as a CJP in accordance with the approved repair procedure in OIW CWR 028. METS considers this issue to be resolved at this time.

7. In OIW's response letter to State Letter 05.003.01-000591, dated September 6, 2006, METS understands that OIW performed the CWR as a result of

miscommunication with their night shift personnel. OIW has counseled their staff regarding the importance of receiving approval prior to proceeding with Critical Weld Repairs. METS considers this NCR to be resolved provided that the Contractor will clear the CWR through the closing documents for CWR 006.

8. NCR 099 was issued to document the Contractor welding the joints on G181-3 and 171-1 with excessive root gaps. As stated in OIW's response letter to State Letter 05.003.01-001451, dated September 6, 2006, OIW ensured the root pass in question was removed during the backgouging of the CJP weld. Additionally, the Contractor's Quality Control Inspectors examined the area by Magnetic Particle Testing (MT) before depositing the subsequent fill passes. The attached MT reports verify the suspect area to be clear. The Contractor also agreed that future buttering of welds would be performed with Flux Cored Arc Welding (FCAW) in lieu of Submerged Arc Welding (SAW) in order to obtain the correct joint geometry prior to welding root pass.

9. In accordance with the OIW letter dated August 30, 2006, the welders have received training regarding the use of proper preheat before welding the steel piling. Additionally, OIW has installed Cooperheat thermal pads to aide in achieving and maintaining the heat during welding operations. As of the date of this memorandum, METS understands that the Contractor has addressed the issue and has implemented measures to control the heat before, during, and after welding. METS considers this NCR to be resolved at this time.

10. NCR 118 was issued to document the Contractor proceeding with second time repairs on the weld connecting the support beam to Pile Sleeve 306-1. METS understands that this issue occurred as a result of the Contractor's decision to proceed in order to meet deadlines in their schedule. METS personnel have discussed this issue with the KFM and OIW Quality Control Managers and have reminded them of their contractual requirement to receive Engineer approval before proceeding with CWRs. METS does not expect this to be an issue with OIW in the future. Additionally, OIW has included the NDT reports of the repairs made to the above referenced weld and the results appear to be acceptable. METS considers this NCR to be resolved at this time.

11. NCR 116 was issued to document the Contractor proceeding with a CWR without approval by the Engineer. In accordance with OIW's response letter to NCR 116, dated September 7, 2006, METS understands that OIW proceeded with the G181-3/G121-3 connection as a result of a misunderstanding that it had been approved

with multiple other repairs that had been submitted the same day. METS believes this to be an isolated instance and does not expect it to be a reoccurring issue as the Contractor typically obtains approval before proceeding with CWRs. METS considers this NCR to be resolved at this time.

12. Due to difficulties when the Contractor was installing the inter-tie girders between the two half pods in the South Pod Assembly, the Contractor chose to grind the edge of several joints in order to provide additional space during fit-up operations. As a result, this created excessive root gaps (7-12mm) in the PJP welds on the bottom flanges of multiple inter-tie girders. NCR 097 was issued when OIW proceeded with welding the joint connecting G181-4 and G121-2 without building the weld to achieve the correct joint geometry. The Department approved the change from a Partial Joint Penetration (PJP) weld to a Complete Joint Penetration (CJP) weld per the response to KFM RFI 258. METS understands that this weld was subsequently backgouged and welded in accordance with the approved procedure that was included with the Contractor's response to the NCR. Additionally, the Contractor has included the NDT reports verifying the examination of the modified CJP weld. METS understands this is no longer an issue and considers the NCR to be resolved at this time.

13. NCR 100 was issued to document the Contractor's use of temporary attachments on the shear key angles which have not been approved in the shop drawings. As stated in OIW's response to State Letter 05.003.01-001452, the Contractor has issued METS an advanced copy of the revised drawings on September 7, 2006. METS takes no issue with the use of the attachments and has verified their removal from the structure. METS considers this issue to be resolved provided that the revised drawings are submitted by the Contractor and approved by the Department.

14. NCR 106 was issued to document the Contractor allowing the welding of G181-3 to G121-3 without maintaining the required preheat. The insufficient preheat was apparent as the top flange of G121-3 was remained wet during the welding operations. In discussions with the Contractor regarding this issue, OIW stated that the proper preheat temperature was maintained on the bottom side of the G121-3 flange during the entire time the joint was welded. Additionally, OIW has provided the NDT reports for this joint and they appear to be acceptable. METS considers this NCR to be resolved at this time.

15. NCR 105 was issued on July 10, 2006 to document the Contractor welding outside the parameters of the WPS for the connection of G191-1 to Pile Sleeve 301-1. The

WPS requires a flux filled channel as backing for the weld joint; however, the channel did not contain any flux. As stated in OIW's response letter to State Letter 05.003.01-001517, dated September 7, 2006, the Contractor performed a deeper backgouge to ensure the root and butter passes were removed before depositing subsequent fill passes. METS agreed to this proposal and has verified the repair. METS considers this NCR to be resolved at this time.

16. NCR 055 was issued on February 27, 2006 to document the Contractor welding over a crack in the weld connecting G101-2 to Pile Sleeve 302-1. As stated in OIW's response to State Letter 05.003.01-001070, the issue occurred as a result of a welder excavating an in-process repair that extended close to the root of the weld. Instead of backgouging the area and having to reweld the root pass, the welder chose to deposit additional weld passes and repair the area from the other side. OIW subsequently informed all welders not to weld over cracks under any circumstances. METS understands this issue was an isolated instance and is no longer an issue. METS considers this NCR to be resolved provided that the Contractor will clear the repair through closing documents for CWR 016.

If you have any questions, or would like to discuss the issues, please call me at (858) 232-6799.

cc: Rafael Bolon
Tom Shimada
David McClary