

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 #: 74.28**WELDING INSPECTION REPORT****Resident Engineer:** Pursell, Gary**Address:** 333 Burma Road**City:** Oakland, CA 94607**Report No:** WIR-007385**Date Inspected:** 17-Jun-2009**Project Name:** SAS Superstructure**OSM Arrival Time:** 730**Prime Contractor:** American Bridge/Fluor Enterprises, a JV**OSM Departure Time:** 1730**Contractor:** Goodwin Steel, UK**Location:** Stoke on Trent, UK**CWI Name:****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:** Cable Band**Summary of Items Observed:**

The following report is based on METS observations at Goodwin Foundry in Stoke on Trent, England.

Magnetic Particle Testing

QA inspector observed, Goodwin Steel Castings NDT Level II technician Mr. Alan Banks perform Magnetic Particle testing (MT) of Cable Band casting GG29430-1, B3-2-M (final inspection after repair and post weld heat treatment). The MT was performed in accordance with ASTM standard E709 and Goodwin Steel Castings Magnetic Particle Procedure for Cable Band Castings MT06-09-02 revision 1, using the prod method with leach magnet contacts. Wet fluorescent magnetic particles were utilized. The direct current magnetizing current appeared to be approximately 1,600 amps. No relevant indications were marked by Mr. Banks. The testing was completed on this date and the Quality Assurance Inspector did concur with Mr. Bank's inspection results.

QA inspector observed, Goodwin Steel Castings NDT Level II technician Mr. Alan Banks perform Magnetic Particle testing (MT) of Cable Band casting GG29425-1, B5-1-F (inspection of excavations). The MT was performed in accordance with ASTM standard E709 and Goodwin Steel Castings Magnetic Particle Procedure for Cable Band Castings MT06-09-02 revision 1, using the prod method with leach magnet contacts. Wet fluorescent magnetic particles were utilized. The direct current magnetizing current appeared to be approximately 1,600 amps.

No relevant indications were marked by Mr. Banks. The testing was completed on this date and the Quality Assurance Inspector did concur with Mr. Bank's inspection results.

Repair

QA inspector witnessed repair welding of casting GG29447-2, B14/CBB as submitted in ABF-SUB-000366 Rev. 33. The welder was observed welding in the flat position utilizing approved welding procedure WPS04-0120F4B.

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Parameters were observed to be within the limits of the WPS.

Mechanical Testing

The following tensile testing was performed by Goodwin Steel Castings Quality Control Technician, Mr. Rob Freeman. The testing was witnessed and completed today:

GG29447-1, After PWHT

Yield Strength 410 N/mm²

Ultimate Tensile Strength 583 N/mm²

Elongation 31 %

Reduction of area 50 %

GG29438-1, After PWHT

Yield Strength 427 N/mm²

Ultimate Tensile Strength 614 N/mm²

Elongation 26 %

Reduction of area 44 %

Fettle

Two Goodwin employees were observed removing riser material from the exterior surface of one Type 1 cable band casting GG29432-2. B8-1-M. The material was removed utilizing an Oxygen Fuel Gas Torch method. Work was not completed on this date and appears to meet the minimum requirements of the contract documents.

Dressing

Two Goodwin employees were observed removing excess material from the exterior surfaces of castings GG29425-1, B5-1-F and GG29447-1, B14-CBT. The exterior surfaces of the castings were dressed by grinding. Work was not completed on this date and appears to meet the minimum requirements of the contract documents.

Radiography

The QA inspector reviewed radiographic film of casting B10/F-1 GG29439-1 with Goodwin Steel Castings NDT Level II technician Mr. Ian Pointon. The film quality and weld quality were reviewed for compliance with Goodwin Steel Castings Radiographic Inspection Procedure RT06-09-020 revision 1. Unacceptable levels of defectes were observed at several locations.

Band D, view 3 to 4.

Indications were interpreted to be ASTM E446, Level 4 Gas.

Band F, views 2 to 3 and 3 to 4.

Indications were interpreted to be ASTM E446, Level 4 Gas.

Band G, view 8 to 9.

Indications were interpreted to be ASTM E280, Level 4 Shrinkage.

Band H, views 2 to 3 and 3 to 4.

Indications were interpreted to be ASTM E446, Level 4 Gas and Cracks.

Band J, view 3 to 4.

Indications were interpreted to be Crack.

Band K, view 5 to 6.

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Indications were interpreted to be ASTM E446, Level 4 Gas.

Band L, view 7 to 8.

Indications were interpreted to be ASTM E280, Level 4 Shrinkage.

The QA inspector concurred with Mr. Pointon's interpretation.

Mr. Pointon found the films for Band M view 1 to 2 and Band L view 5 to 6 to have unacceptable film densities and the film for Band C view 5 to 6 to be missing. Goodwin Steel Castings Quality Control Manager, Mr. Les Peake reported that these three radiographs would be reshot after repairs were completed.

The QA inspector witnessed radiography performed by Goodwin Steel Castings. Mr. Scott Bennett performed radiography on casting GG29435-1, B8-2-F, a type 2 cable band. The casting was radiographed using a single wall exposure. The radiographs were performed using a 3.2mm effective focal spot size, 8MEV linear accelerator.

The source to film distance was maintained at 2,500mm. Number 40 to 100 hole type and Set 1C or 1D wire type image quality indicators were placed source side on each different thickness radiographed. AGFA type D4, D5 and D7 film of various sizes were used for single and composite views to cover the range of thicknesses.

Radiography of this casting was not completed on this date. Radiography of the main body outside the suspender grooves was performed by Applied Inspections.

Summary of Conversations:

During this visit, METS met with Mr. Jason Cross of Goodwin Steel Castings. The following topic was discussed.

Mr. Cross stated he would review which cable bands have had the casting method revised after radiographic acceptance of the first casting and which areas of the following castings will be radiographed to verify the revised method. Mr. Cross stated that he would be submitting RFI's through American Bridge for approval of partial radiography of the revised castings.

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.

Inspected By:	Lanz,Joe	Quality Assurance Inspector
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Reviewed By:	Levell,Bill	QA Reviewer
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