

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



Bay Area Branch  
 690 Walnut Ave. St. 150  
 Vallejo, CA 94592-1133  
 (707) 649-5453  
 (707) 649-5493

Contract #: 04-0120F4  
 Cty: SF/ALA Rte: 80 PM: 13.2/13.9  
 File #: 69.25B

## QUALITY ASSURANCE -- NON-CONFORMANCE REPORT

**Location:** Changxing Island, Shanghai, P.R. China

**Report No:** NCR-000527

**Prime Contractor:** American Bridge/Fluor Enterprises, a JV

**Date:** 05-Dec-2009

**Submitting Contractor:** Zhenhua Port Machinery Company, Ltd (ZPMC), Changxing Island

**NCR #:** ZPMC-0500

### Type of problem:

<b>Welding</b>	<b>Concrete</b>	<b>Other</b>	
<b>Welding</b>	<b>Curing</b>	<b>Procedural</b>	<b>Bridge No:</b> 34-0006
<b>Joint fit-up</b>	<b>Coating</b>	<b>Other</b>	<b>Component:</b> Segment 8AE
<b>Procedural</b>	<b>Procedural</b>	<b>Description:</b> Missed MT indications	

**Reference Description:** Longitudinal Indications discovered with MT after the contractor had tested and accepted the welds in Segment 8AE

### Description of Non-Conformance:

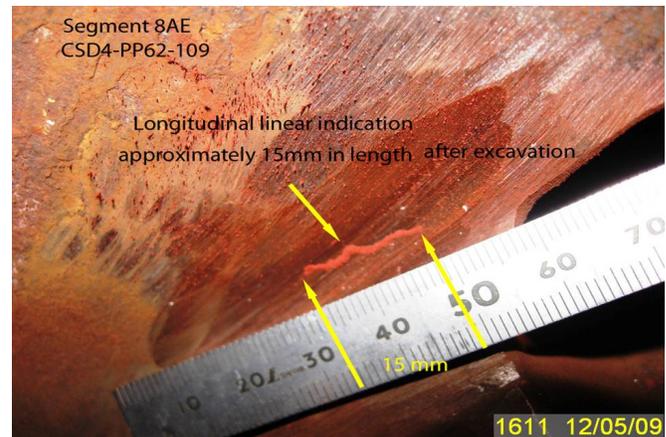
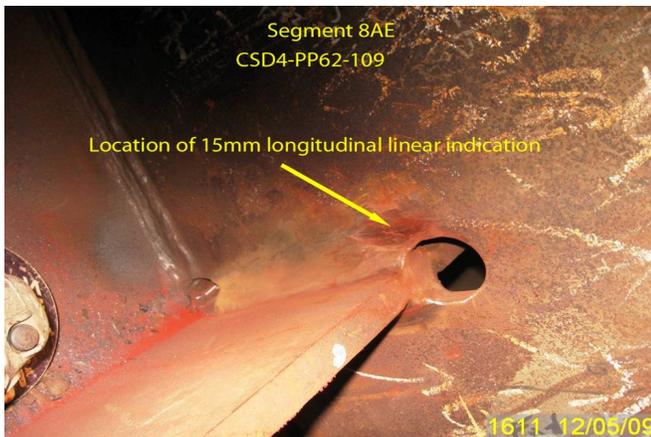
During Quality Assurance Magnetic Particle Testing (MT) review of welds located on Segment 8AE, this Quality Assurance Inspector (QA) discovered the following issues:

-Two (2) Longitudinal linear indications measuring approximately 8mm and 15mm in length. The welds are identified as:

1. SD24-PP62.5-049 @ Panel Point (PP)-062.5 (8 mm indication)
2. CSD4-PP62-109 @ Panel Point (PP)-062 (15 mm indication)

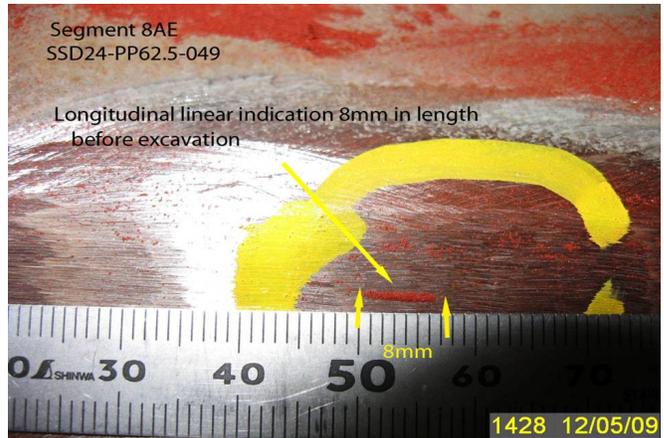
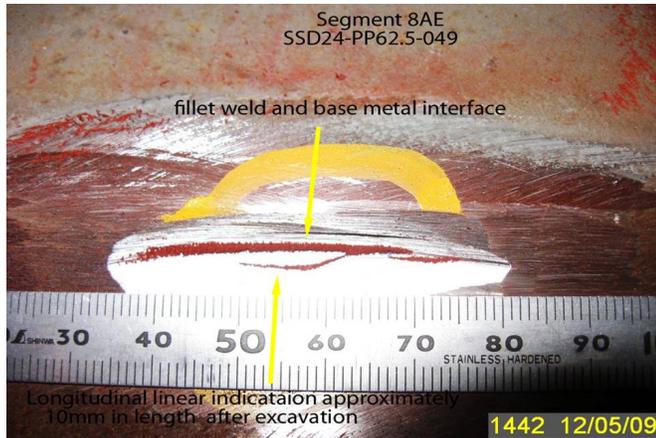
-The OBG Segment is located at outside yard.

-The Notice of Witness Inspection Number (NWIT) is 004796. The indication is located inside the area that has been previously tested and accepted by ZPMC Quality Control (QC) personnel.



# QUALITY ASSURANCE -- NON-CONFORMANCE REPORT

( Continued Page 2 of 2 )



## Applicable reference:

-Special Provisions Section 8.3 – “Quality Control (QC) shall be the responsibility of the Contractor. As a minimum, the Contractor shall perform inspection and testing of each weld joint prior to welding, during welding, and after welding as specified in this section and to ensure that materials and workmanship conform to the requirements of the contract documents.”

-AWS D1.5 (02) Section 6.26.2 – “Welds that are subject to MT in addition to visual inspection shall have no cracks.

**Who discovered the problem:** Chandra Sudalaimuthu

**Name of individual from Contractor notified:** Tang Youging

**Time and method of notification:** 0700 hours, Verbal

**Name of Caltrans Engineer notified:** Ching Chao and Bill Howe

**Time and method of notification:** 0800 hours, Verbal

**QC Inspector's Name:** Wang Xian Pin

**Was QC Inspector aware of the problem:** Yes No

**Contractor's proposal to correct the problem:**

N/A

## 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 Mazen Wahbeh, +(86) 134.7247.7571, who represents the Office of Structural Materials for your project.

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**Inspected By:** Carreon,Albert

Lead Reviewer/Task Leader

---

**Reviewed By:** Wahbeh,Mazen

SMR



**DEPARTMENT OF TRANSPORTATION - District 4 Toll Bridge**

333 Burma Road  
Oakland CA 94607  
Tel: Fax:

**NON-CONFORMANCE REPORT TRANSMITTAL**

**To:** AMERICAN BRIDGE/FLUOR, A JV  
375 BURMA ROAD  
OAKLAND CA 95607

**Date:** 24-Dec-2009  
**Contract No:** 04-0120F4  
04-SF-80-13.2 / 13.9

**Dear:** Mr. Charles Kanapicki  
**Attention:** Mr. Thomas Nilsson Project/Fabrication Manager  
**Subject:** NCR No. ZPMC-0500

**Job Name:** SAS Superstructure  
**Document No:** 05.03.06-000488

**Reference Description:** Longitudinal Indications discovered with MT after the contractor had tested and accepted the welds in Segment 8AE

The attached Non-Conformance Report describes an occurrence where the contractor did not comply with a requirement of the contract document as indicated below:

- Material or Workmanship not in conformance with contract documents.
- Quality Control (QC) not performed in conformance with contract documents.
- Recurring QC issue that constitutes a systematic problem in quality control.
- Non-Conformance Resolved.

**Material Location:** OBG **Lift:** 08

**Remarks:**

During Quality Assurance Magnetic Particle Testing (MT) review of welds located on Segment 8AE, this Quality Assurance Inspector (QA) discovered the following issues:

-Two (2) Longitudinal linear indications measuring approximately 8mm and 15mm in length. The welds are identified as:

1. SD24-PP62.5-049 @ Panel Point (PP)-062.5 (8 mm indication)
2. CSD4-PP62-109 @ Panel Point (PP)-062 (15 mm indication)

-The OBG Segment is located at outside yard.

-The Notice of Witness Inspection Number (NWIT) is 004796. The indication is located inside the area that has been previously tested and accepted by ZPMC Quality Control (QC) personnel.

**Action Required and/or Action Taken:**

Submit a repair procedure to the engineer for approval. Missed MT indications by ZPMC QC are a chronic problem. Perform training with MT technicians and test for competency to ensure the quality of MT inspection can achieve consistently accurate results. A response for the resolution of this issue is expected within 7 days.

**Transmitted by:** Bill Howe

**Attachments:** ZPMC-0500

**cc:** Rick Morrow, Gary Pursell, Peter Siegenthaler, Stanley Ku, Brian Boal, Jason Tom, Contract Files, Ching Chao

**File:** 05.03.06

## NCR PROPOSED RESOLUTION

**To:** CALTRANS - SAS Superstructure  
333 Burma Road  
Oakland CA 94607

**Attention:** Pursell, Gary  
Resident Engineer

**Ref:** 05.03.06-000488

**Subject:** NCR No. ZPMC-0500

**Dated:** 11-Jan-2010

**Contract No.:** 04-0120F4  
04-SF-80-13.2 / 13.9

**Job Name:** SAS Superstructure

**Document No.:** ABF-NPR-000458 Rev: 00

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### Contractor's Proposed Resolution:

**Reference Resolution:** ZPMC has acknowledged the missed MT indication, has generated an internal NCR, performed repairs and re-inspected the welds. ZPMC requests closure of this NCR.

ZPMC has acknowledged the missed MT indication, has generated an internal NCR, performed repairs and re-inspected the welds. ABF QCM has performed updated training to MT operators as a means to prevent re-currence. See attached documentation. ZPMC requests closure of this NCR.

Note to CT, for documentation purposes, be reminded to revise your NCR to address the correct weld joint number as indicated in the ZPMC letter.

**Submitted by:** Lawton, Steve

**Attachment(s):** ABF-NPR-000458R00;

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### Caltrans' comments:

**Status:** CLO

**Date:** 11-Jan-2010

Documentation received is sufficient to close this NCR. Panel Point correction accepted.

**Submitted by:** Howe, Bill

**Date:** 11-Jan-2010

**Attachment(s):**



No. B-554

## LETTER OF RESPONSE

**TO: American Bridge/Flour**

**DATE: 2010-1-6**

**REGARDING: NCR-000527(ZPMC-0500)**

With this letter of response, ZPMC requests closure of CT NCR-000527(ZPMC-0500), what mentioned that QA observed missed MT indication.

ZPMC acknowledged this problem and has issued internal NCR. Attached is documentation of the repair of the missed indications and subsequent NDT. Training was conducted by ABF's QCM with ZPMC's MT inspectors. By the way, CT located a wrong weld ID. SD24-PP62.5-049 in CT's NCR <sup>what</sup> was confirmed to be SSD24-PP63.5-049.

Based on these actions and the attached documentation, ZPMC requests closure of this NCR.

**ATTACHMENT:**

NCR-B-354(ZPMC-0500)

NCR-000527(ZPMC-0500)

B-CWR967

B-CWR966

B787-MT-16539

B787-MT-16539R1

MT TRAINING RECORD (MT-22-DEC-09)

1/6/10



# Nonconformance Report

## 不符合项报告

Project Name: S.F.O.B.B 项目名称: 美国加州海湾大桥		NCR Number: NCR 编号: NCR-B-354(ZPMC-0500)
Item: Missed MT Indication 名称描述: MT 漏检	Item Number: 件号: 8AE	Drawing: 图号: 5SD24-PP62.5-049@Panel Point (PP)-062.5 CSD4-PP62-109@Panel Point (PP)-062
Location: outside yard 位置: OBG 外场	Date: 日期: 2009-12-31	

### Description of Nonconformance:

不符合项状态描述:

During QA Magnetic Particle Testing review of welds located on Segment 8AE, this QA inspector discovered the following issues:

-Two longitudinal linear indications measuring approximately 8mm and 15mm in length. The welds are identified as:

1. 5SD24-PP62.5-049@Panel Point (PP)-062.5 (8mm indication)

2. CSD4-PP62-109@Panel Point (PP)-062 (15mm indication)

AWS D1.5-2002 Section 6.2.6.2: Welds that are subject to MT in addition to visual inspection shall have no cracks.

加州检验员在对 8AE 进行 MT 复探时发现长约 8mm 和 15mm 的纵向缺陷。根据 AWS 要求, 除目检之外进行的 MT 检测的焊缝严禁有裂纹。

Work By: 施工方: <u>LLM of 01/06</u>	Prepared by: <u>Zhang Wei</u> 准备: 2009.12-31	Reviewed by QCE: 质量工程师批准: <u>Lu Benhua</u> 12/31/09
<input type="checkbox"/> Drawing Error 图纸错误	<input type="checkbox"/> Material Defect 材料缺陷	<input type="checkbox"/> Fabrication Error 制作错误
<input type="checkbox"/> Other 其他原因		

Disposition: 处理措施:	<input type="checkbox"/> Use as is 回用	<input type="checkbox"/> Repair 返修	<input type="checkbox"/> Reject 拒收
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### Recommendation:

建议:

确认返修.

Confirm and repair

Prepared by: <u>LLM of 01/06</u> 准备	Approved by QCA: _____ 质量经理批准
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### Reason for Nonconformance:

不符合原因:

纵向缺陷没有检测到.

Discover longitudinal defect.

Prevention of Re-occurrence:

预防措施:

加强技术监督, 加强复检.

Enhance technology supervision and re-inspection.

Approved by/批准:

L. L. H. 1/3/06

Technical Justification for Use-As-Is/Repair:

回用或返修的技术依据:

Attachment

附件

Non-attachment

无附件

Reviewed /批准: \_\_\_\_\_

Verification:

确认:

Acceptable

可接受

Unacceptable

不可接受

Verified by QCI/质检确认: \_\_\_\_\_

Reviewed by QCA/质检主任审核: \_\_\_\_\_

#R787-QCP-1300



DEPARTMENT OF TRANSPORTATION - District 4 Toll Bridge  
 333 Burma Road  
 Oakland CA 94607  
 Tel: Fax:

**NON-CONFORMANCE REPORT TRANSMITTAL**

To: AMERICAN BRIDGE/FLUOR, A JV  
 375 BURMA ROAD  
 OAKLAND CA 95607

Date: 24-Dec-2009

Contract No: 04-0120F4  
 04-SF-80-13.2 / 13.9

Dear: Mr. Charles Kanapicki  
 Attention: Mr. Thomas Nilsson Project/Fabrication Manager

Job Name: SAS Superstructure  
 Document No: 05.03.06-000488

Subject: NCR No. ZPMC-0500

Reference Description: Longitudinal Indications discovered with MT after the contractor had tested and accepted the welds in Segment 8AE

The attached Non-Conformance Report describes an occurrence where the contractor did not comply with a requirement of the contract document as indicated below:

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- Quality Control (QC) not performed in conformance with contract documents.
- Recurring QC issue that constitutes a systematic problem in quality control.
- Non-Conformance Resolved.

Material Location: OBG

Lift: 28

**Remarks:**

During Quality Assurance Magnetic Particle Testing (MT) review of welds located on Segment 8AE, this Quality Assurance Inspector (QA) discovered the following issues:

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1. SD24-PP62.5-049 @ Panel Point (PP)-062.5 (8 mm indication)
2. CSD4-PP62-109 @ Panel Point (PP)-062 (15 mm indication)

-The OBG Segment is located at outside yard.

-The Notice of Witness Inspection Number (NWIT) is 004798. The indication is located inside the area that has been previously tested and accepted by ZPMC Quality Control (QC) personnel.

**Action Required and/or Action Taken:**

Submit a repair procedure to the engineer for approval. Missed MT indications by ZPMC QC are a chronic problem. Perform training with MT technicians and test for competency to ensure the quality of MT inspection can achieve consistently accurate results. A response for the resolution of this issue is expected within 7 days.

Transmitted by: Bill Howe

Attachments: ZPMC-0500

cc: Rick Morrow, Gary Pursell, Peter Siegenthaler, Stanley Ku, Brian Boal, Jason Tom, Contract Files, Ching Chao  
 File: 05.03.06

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

Bay Area Branch  
690 Walnut Ave. St. 150  
Vallejo, CA 94592-1133  
(707) 649-5453  
(707) 649-5493

Contract #: 04-0120F4

Cty: SF/ALA Rte: 80 PM: 13.2/13.9

File #: 69.25B



**QUALITY ASSURANCE -- NON-CONFORMANCE REPORT**

**Location:** Changxing Island, Shanghai, P.R. China

**Report No:** NCR-000527

**Prime Contractor:** American Bridge/Fluor Enterprises, a JV

**Date:** 05-Dec-2009

**Submitting Contractor:** Zhenhua Port Machinery Company, Ltd (ZPMC), Changxing Island

**NCR #:** ZPMC-0500

**Type of problem:**

- Welding  Concrete  Other
- Welding  Curing  Procedural  Bridge No: 34-0006
- Joint fit-up  Coating  Other  Component: Segment 8AE
- Procedural  Procedural  Description: Missed MT indications

**Reference Description:** Longitudinal Indications discovered with MT after the contractor had tested and accepted the welds in Segment 8AE

**Description of Non-Conformance:**

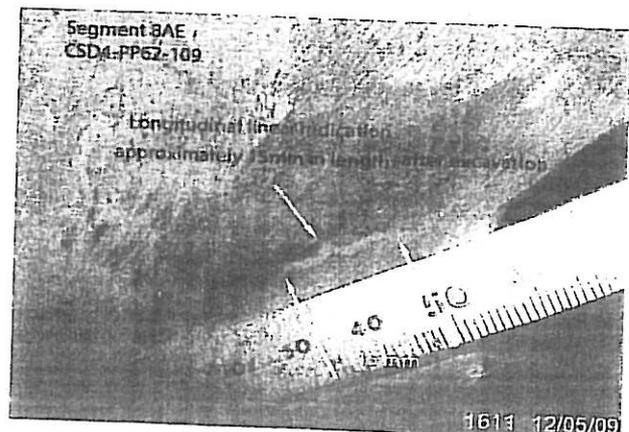
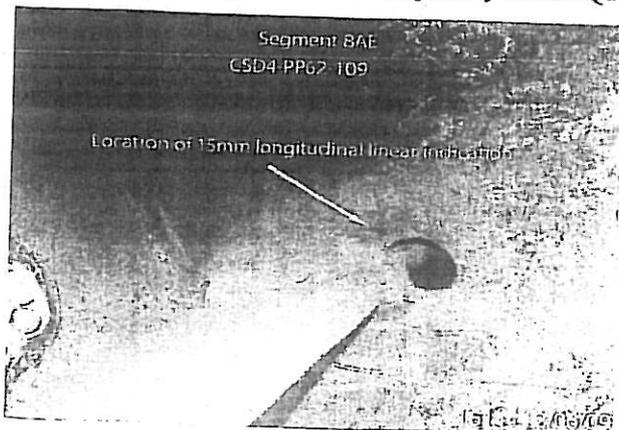
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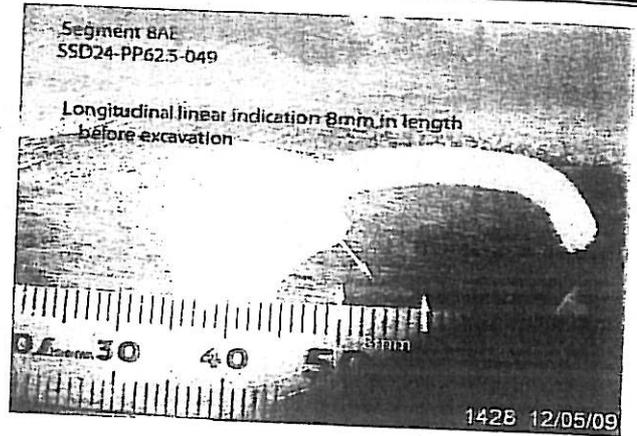
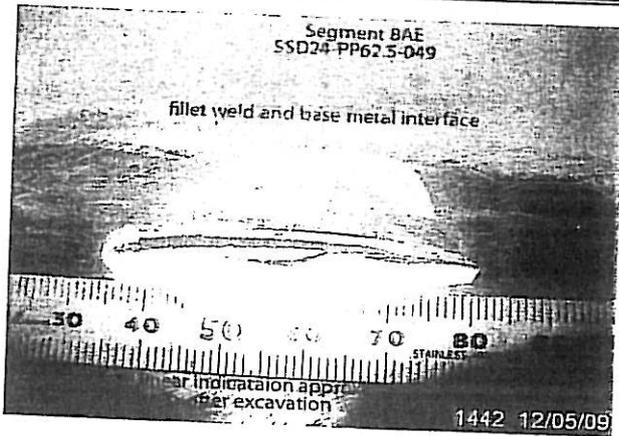
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# QUALITY ASSURANCE -- NON-CONFORMANCE REPORT

(Continued Page 2 of 2)



## Applicable reference:

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**Who discovered the problem:** Chandra Sudalaimuthu

**Name of individual from Contractor notified:** Tang Youging

**Time and method of notification:** 0700 hours, Verbal

**Name of Caltrans Engineer notified:** Ching Chao and Bill Howe

**Time and method of notification:** 0800 hours, Verbal

**QC Inspector's Name:** Wang Xian Pin

**Was QC Inspector aware of the problem:**  Yes  No

**Contractor's proposal to correct the problem:**

N/A

## Comments:

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**Inspected By:** Carreon, Albert

**Reviewed By:** Wahbeh, Mazen

**Lead Reviewer/Task Leader**

SMR



关键焊缝返修报告  
Critical Welding Repair Report (CWR)

版本  
Rev. No.:

0

项目名称 Project Name:	美国海湾大桥 SFOBB	部件图号 Drawing No.:	SSD24	报告编号 Report No.:	B-CWR967
合同号 Contract No.:	04-0120F4	部件名称 Item Name:	8AE FLOOR BEAM SPLICE	NDT 报告编号 NDT Report No.:	B787-MT-16539
项目编号 Project No.:	ZP06-787				

焊缝缺陷描述:

Description of Welding Discontinuity:

在对SSD24-PP63.5-049检测时, 发现1处横向裂纹. L=3mm

Welder ID No. (焊工编号): 051356

Position:(位置): 2F

One transverse crack was found by use of MT on SSD24-PP63.5-049.

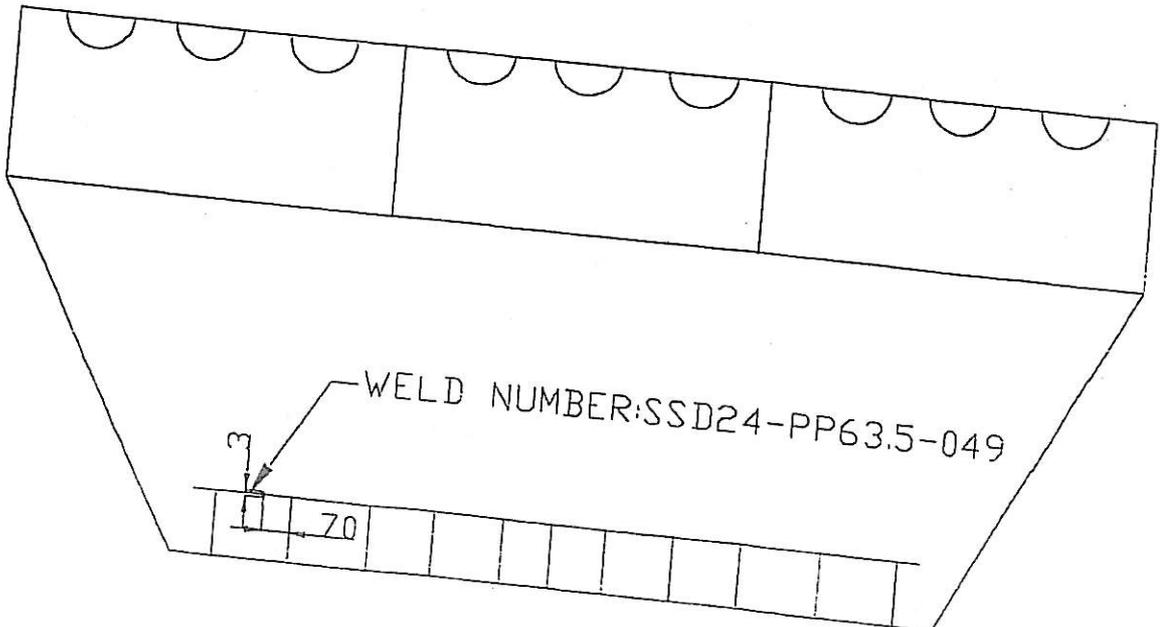
This document is APPROVED  
State of California  
DEPARTMENT OF TRANSPORTATION  
Pursuant to Section 5-1.02 of the  
Standard Specifications  
Initial SJE Date: 12/1/09

检验员 (Inspector): Sun Gongchang

日期 (Date): 2009-12-07

焊缝返修位置示意图:

Draft of Welding Discontinuity:



产生原因:

Cause:

1. 火焰加热时, 水汽没有完全的去掉或者这个区域预热不够;
1. Moisture wasn't completely removed during drying operation (preheating) or the area wasn't preheated sufficiently.

车间负责人 (Foreman):

Li Zhigang

日期 (Date):

09.12.07

处理意见

Disposition:

1. 这次返修时, QC和Leader CWI到现场对打磨, 焊接进行指导和监控工作以保证返修按照处理意见进行;
2. 整个返修的过程, QC和Leader CWI应该有批准CWR的复印件;
3. 去除热影响区域上在各个方向上不小于25mm范围内的油漆;
4. 将杂物以及MT检测遗留的残留物清理干净, 然后采用打磨的方法去除裂纹, 打磨前预热至65° C. 对于单个裂纹返修, 打磨返修范围为沿缺陷焊缝每一端加50mm;
5. 如果打磨时母材损伤, 则在返修前将损伤区域打磨干净; 如果打磨时或打磨后根部间隙大于5mm, 则在继续返修前另需递交文件给工程师予以审核批准, 并按照被批准的方法将角焊缝改成CJP焊缝;
6. 焊接前按照新的焊接返修工艺准备焊接接头形式;
7. 返修前, VT和MT检测确认返修区域没有裂纹及其他缺陷存在, 同时靠近裂纹的母材也要做MT, 保证没有裂纹延伸到母材. 如果在母材上发现裂纹, 则另外需CWR, 且只有当这份另出的CWR批准后才能继续返修;
8. 将杂物以及MT检测遗留的残留物清理干净. 按照WPS进行预热和焊接, 预热温度为160° C-230° C;
9. 焊接后WPS要求进行后热, 后热温度为230° C-315° C, 后热时间至少1个小时;
10. 后热后将焊缝逐渐冷却到周围环境温度, 并控制冷却速率不超过50° C每小时;
11. 后热后将修补区域打磨与母材或相邻焊缝平齐;
12. 在焊缝冷却至环境温度至少经过48小时以后进行NDT检查;
13. 返修后根据图纸进行MT检测, 并按照合同10-1.59 "钢结构" 中的 "检测和试验" 要求进行附加MT检测. 对于CJP焊缝, NDT为VT, MT和UT.

This document is APPROVED  
 State of California  
 DEPARTMENT OF TRANSPORTATION  
 Pursuant to Section 5-1.02 of the  
 Standard Specifications  
 Initial SJC Date: 12/19/09

1. QC and a Lead CWI shall be present, direct and supervise all grinding and welding operations during this repair to ensure the repair is per the disposition requirements

2. QC and a Lead CWI shall have an approved copy of the CWR in hand prior to the repair.

3. Remove paint ≥ 25mm in all direction of HAZ prior to MT.

4. Clean the excavation area of all loose debris including MT powder. Preheat to 65° C before removing cracks by grinding, repair area shall extend a minimum of 50mm beyond each end of single crack repairs.

5. If base metal is damaged by grinding, the damaged area shall be ground clean prior to performing weld repair. If gap > 5mm is found during or after grinding, comply with the notification on changing fillet weld to CJP which is submitted for Engineer's review and approval form.

6. Prepare excavation in accordance with the New Repair Procedure prior to welding.

7. Before this repair, Verify with VT and MT repair areas are defects free, and also MT shall be performed on the base metal laying abroad cracks to ensure that no cracks were propagated to the base metal. Separate CWR approval is needed if cracks are found in the base metal, and only after this new CWR's approval can continue the repair.

8. Clean excavation area of all loose debris including MT powder after excavation. Preheat and weld according to repair WPS, the preheat shall between 160° C-230° C.

9. Perform post weld heating according to repair WPS, the postheat shall between 230° C-315° C and for one hour minimum.

10. Allow the weld to cool to ambient temperature gradually. Control cooling rate after PWHT to no more than 50° C per hour.

11. Grind the repaired area flush with base metal or the adjacent weld after post weld heating.

12. Wait 48 hours at least after the repair area has cooled to ambient temperature before performing NDT.

13. Perform MT inspection to all repair area according to Contract Drawings along with all additional NDT required by the applicable notes Special Provision Section 10-1.59 'Steel Structure', subsection 'inspection testing'. NDT include VT, MT and UT if it is a CJP weld.

工艺:

Technical Engineer: He Xianlin

审核:

Approved By:

[Signature]

日期:

Date:

09.12.07



# 关键焊缝返修报告

## Critical Welding Repair Report (CWR)

版本  
Rev. No.:

0

项目名称 Project Name:	美国海湾大桥 SFOBB	部件图号 Drawing No.:	SSD24	报告编号 Report No.:	B-CWR967
合同号 Contract No.:	04-0120F4	部件名称 Item Name:	BAE FLOOR BEAM SPLICE	NDT 报告编号 NDT Report No.:	B787-MT-16539
项目编号 Project No.:	ZP06-787				

纠正措施:

Corrective Action to Prevent Re-occurrence:

1. 返修前, QC确认有效的预热, 以将水汽全部去除。

1. QC shall verify sufficient preheat has been applied, to remove moisture, prior to welding.

This document is APPROVED  
State of California  
DEPARTMENT OF TRANSPORTATION  
Pursuant to Section 5-1.02 of the  
Standard Specifications  
Initial SJE Date: 2/1/09

车间负责人 (Foreman):

Lizhigang

日期 (Date):

09.12.07

参照的WPS编号 Repair WPS No.:	WPS-345-SMAW-2G(2F)-Repair	工艺员 Technologist:	Hexiaoli 09.12.07
返修(碳刨)前预热温度 Preheat Temperature Before Gouging:	MA	返修的缺陷 Description of Discontinuity:	Crack
焊前处理检查 Inspection Before Welding:	Acc	焊前预热温度 Preheat Temperature Before Welding:	137℃
最大碳刨深度 Max. Depth of Gouge:	MA	碳刨总长 Total Length of Gouge:	MA
焊工 Welder:	054013	焊接类型 Welding Type:	SMAW
焊接电流 Current:	147	焊接电压 Voltage:	23.6
		焊接位置 Position:	2G
		焊接速度 Speed:	103

返修后检查  
Inspection After Repair:

外观检查 VT Result:	Acc	检验员 Inspector:	01120701 Li Yanhua	日期 Date:	2009.12.9.
NDT复检 NDT Result:	Acc	探伤员 NDT Person:	Gwngyong chun	日期 Date:	09.12.14

见证:  
Witness/Review:备注:  
Remark:

#R787-QCP-900



# 关键焊缝返修报告

## Critical Welding Repair Report (CWR)

版本  
Rev. No.:

0

项目名称 Project Name:	美国海湾大桥 SFOBB	部件图号 Drawing No.:	CSD4	报告编号 Report No.:	B-CWR966
合同号 Contract No.:	04-0120F4	部件名称 Item Name:	BAE FLOOR BEAM SPLICE	NDT 报告编号 NDT Report No.:	B787-MT-16539
项目编号 Project No.:	ZP06-787				

### 焊缝缺陷描述:

### Description of Welding Discontinuity:

在对CSD4-PP62-108检测时, 发现1处纵向裂纹. L=10mm

Welder ID No. (焊工编号): 066163

Position:(位置): 3F

One longitudinal crack was found by use of MT on CSD4-PP62-108.

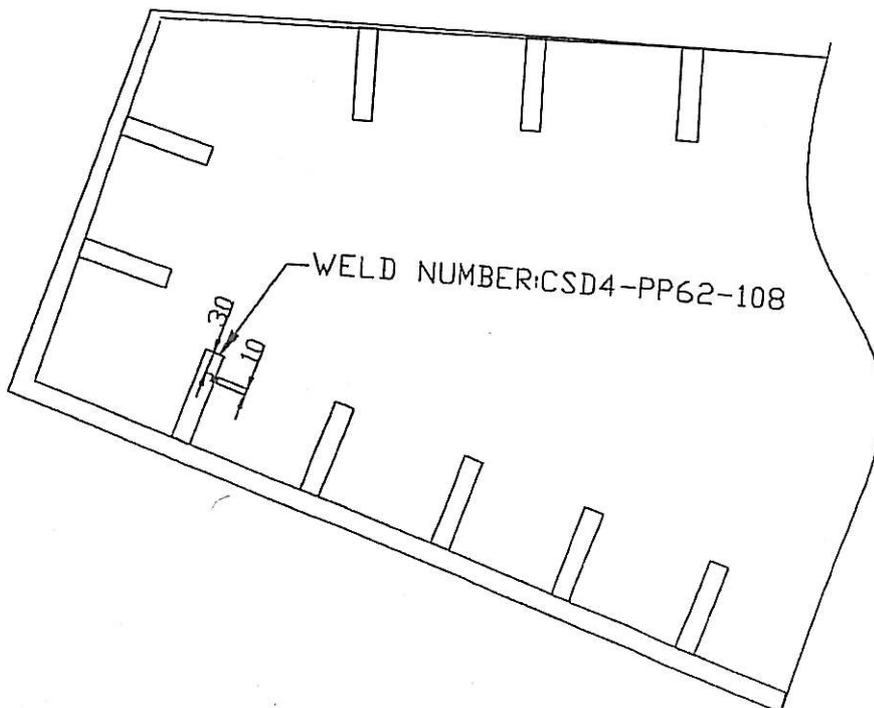
This document is APPROVED  
State of California  
DEPARTMENT OF TRANSPORTATION  
Pursuant to Section 5-1.02 of the  
Standard Specifications  
Initial SJE Date: 12/9/09

检验员 (Inspector): Sun Gongchang

日期 (Date): 2009-12-07

### 焊缝返修位置示意图:

### Draft of Welding Discontinuity:



产生原因:

Cause:

1. 火焰加热时, 水汽没有完全的去掉或者这个区域预热不够;
1. Moisture wasn't completely removed during drying operation (preheating) or the area wa sn't preheated sufficiently.

处理意见

车间负责人 (Foreman):

*Lizhigong*

日期 (Date):

19.12.07

Disposition:

1. 这次返修时, QC和Leader CWI到现场对打磨, 焊接进行指导和监控工作以保证返修按照处理意见进行;
2. 整个返修的过程, QC和Leader CWI应该有批准CWR的复印件;
3. 去除热影响区域上在各个方向上不小于25mm范围内的油漆;
4. 将杂物以及MT检测遗留的残留物清理干净。然后采用打磨的方法去除裂纹, 打磨前预热至65° C。对于单个裂纹返修, 打磨返修范围为沿缺陷焊缝每一端加50mm;
5. 如果打磨时母材损伤, 则在返修前将损伤区域打磨干净; 如果打磨时或打磨后根部间隙大于5mm, 则在继续返修前另需递交文件给工程师予以审核批准, 并按照被批准的方法将角焊缝改成CJP焊缝;
6. 焊接前按照新的焊接返修工艺准备焊缝接头形式;
7. 返修前, VT和MT检测确认返修区域没有裂纹及其他缺陷存在, 同时靠近裂纹的母材也要做MT, 保证没有裂纹延伸到母材。如果在母材上发现裂纹, 则另外需CWR, 且只有当这份另出的CWR批准后才能继续返修;
8. 将杂物以及MT检测遗留的残留物清理干净。按照WPS进行预热和焊接, 预热温度为160° C-230° C;
9. 焊接后WPS要求进行后热, 后热温度为230° C-315° C, 后热时间至少1个小时;
10. 后热后将焊缝逐渐冷却到周围环境温度, 并控制冷却速率不超过50° C每小时;
11. 后热后将修补区域打磨与母材或相邻焊缝平齐;
12. 在焊缝冷却至环境温度至少经过48小时以后进行NDT检查;
13. 返修后根据图纸进行MT检测, 并按照合同10-1.59 "钢结构" 中的 "检测和试验" 要求进行附加MT检测。对于CJP焊缝, NDT为VT, MT和UT。

This document is APPROVED  
 State of California  
 DEPARTMENT OF TRANSPORTATION  
 Pursuant to Section 5-1.02 of the  
 Standard Specifications  
 Initial *SJE* Date: *12/19/07*

1. QC and a Lead CWI shall be present, direct and supervise all grinding and welding operations during this repair to ensure the repair is per the disposition requirements
2. QC and a Lead CWI shall have an approved copy of the CWR in hand prior to the repair.
3. Remove paint  $\geq 25\text{mm}$  in all direction of HAZ prior to MT.
4. Clean the excavation area of all loose debris including MT powder. Preheat to 65° C before removing cracks by grinding, repair area shall extend a minimum of 50mm beyond each end of single crack repairs.
5. If base metal is damaged by grinding, the damaged area shall be ground clean prior to performing weld repair. If gap  $> 5\text{mm}$  is found during or after grinding, comply with the notification on changing fillet weld to CJP which is submitted for Engineer's review and approval form.
6. Prepare excavation in accordance with the New Repair Procedure prior to welding.
7. Before this repair, Verify with VT and MT repair areas are defects free, and also MT shall be performed on the base metal laying abroad cracks to ensure that no cracks were propagated to the base metal. Separate CWR approval is needed if cracks are found in the base metal, and only after this new CWR's approval can continue the repair.
8. Clean excavation area of all loose debris including MT powder after excavation. Preheat and weld according to repair WPS, the preheat shall between 160° C-230° C
9. Perform post weld heating according to repair WPS, the postheat shall between 230° C-315° C and for one hour minimum.
10. Allow the weld to cool to ambient temperature gradually. Control cooling rate after PWHT to no more than 50° C per hour.
11. Grind the repaired area flush with base metal or the adjacent weld after post weld heating.
12. Wait 48 hours at least after the repair area has cooled to ambient temperature before performing NDT.
13. Perform MT inspection to all repair area according to Contract Drawings along with all additional NDT required by the applicable notes Special Provision Section 10-1.59 'Steel Structure', subsection 'inspection testing'. NDT include VT, MT and UT if it is a CJP weld.

工艺:

Technical Engineer: *Hexianlin*

审核:

Approved By: *Lizhigong*

日期:

Date: *19.12.07*

#R787-QCP-900



# 关键焊缝返修报告

## Critical Welding Repair Report (CWR)

版本  
Rev. No.:

0

项目名称  
Project Name:美国海湾大桥  
SFOBB部件图号  
Drawing No.:

SSD4

报告编号  
Report No.:

B-CWR966

合同号  
Contract No.:

04-0120F4

项目编号  
Project No.:

ZP06-787

部件名称  
Item Name:8AE FLOOR BEAM  
SPLICENDT 报告编号  
NDT Report No.:

B787-MT-16539

纠正措施:

Corrective Action to Prevent Re-occurrence:

1. 返修前, QC确认有效的预热, 以将水汽全部去除.

1. QC shall verify sufficient preheat has been applied, to remove moisture, prior to welding.

This document is APPROVED  
State of California  
DEPARTMENT OF TRANSPORTATION  
Pursuant to Section 5-1.02 of the  
Standard Specifications  
SJE Date: 12/19/09

车间负责人 (Foreman):

Li Zhigang

日期 (Date):

09.12.07

参照的WPS编号  
Repair WPS No.:WPS-345-SMAW-3G(3F)-FCM  
-Repair工艺员  
Technologist:He Xiaolin  
09.12.07返修(碳刨)前预热温度  
Preheat Temperature  
Before Gouging:

NA

返修的缺陷  
Description  
of  
Discontinuity:

Crack

焊前处理检查  
Inspection  
Before Welding:

Acc

焊前预热温度  
Preheat  
Temperature  
Before  
Welding:

136

最大碳刨深度  
Max. Depth of Gouge:

MA

碳刨总长  
Total Length  
of Gouge:

NA

焊工  
Welder:

054.13

焊接类型  
Welding Type:

SMAW

焊接位置  
Position:

3G

焊接电流  
Current:

136

焊接电压  
Voltage:

23.7

焊接速度  
Speed:

105

返修后检查

Inspection After Repair:

外观检查  
VT Result:

Acc

检验员  
Inspector:07/20/01  
Li Yanhua日期  
Date:

2009.12.09

NDT复检  
NDT Result:

Acc

探伤员  
NDT Person:

Sunjiong chun

日期  
Date:

09.12.14

见证:

Witness/Review:

备注:

Remark:

#R787-QCP-900



# REPORT OF MAGNETIC PARTICLE EXAMINATION

## 磁粉检测报告

REPORT NO. 报告编号 B787-MT-16539		DATE日期 2009.12.07	PAGE OF页码 1/1	Revision No: 0
PROJECT NO. 工程编号: ZP06-787		CONTRACTOR: 用户: CALTRANS		
DRAWING NO. 图号: SEG14B/SEG14E/SSD4/SSD24 8AE PLATE PANEL SPLICE		CALTRANS CONTRACT NO.: 加州工程编号 04-0120F4		
REFERENCING CODE 参考规范编码 AWS D1.5-2002	ACCEPTANCE STANDARD 接受标准 AWS D1.5-2002	PROCEDURE NO. 程序编号 ZPQC-MT-01	CALIBRATION DUE DATE 仪器校正有效期 Dec. 28 <sup>ST</sup> , 2009	
EQUIPMENT 设备 MT YOKE	MANUFACTURER 制造商 PARKER	MODEL NO. 样式编号 B310S	SERIAL NO. 连续编号 5395 5617 5620	
MAGNETIZING METHOD 磁化方法	Continuous magnetic yoke 磁轭式连续法	CURRENT 电流	AC	
PARTICLE TYPE 磁粉类型	Dry magnet powder 干磁粉	YOKE SPACING 磁轭间距	70~150mm	
MATERIAL TO BE EXAMINED 检测材料	<input checked="" type="checkbox"/> WELDING 焊接件 <input type="checkbox"/> CASTING 铸件 <input type="checkbox"/> FORGING 锻造	Material & thickness 母材, 厚度	A709M-345F2/T2-X 30/65/25/14/18/20/8mm	
WELDING PROCESS 焊接方法	FCAW	TYPE OF JOINT 焊缝类型	T-JOINT	

WELD I.D. 焊缝编号	DISCONTINUITY不连续性			ACCEPT 接受	REJECT 拒收	REMARKS 备注
	INDICATION 指示	TYPE 类型	LENGTH IN mm 长度			
SEG14B-051	1	longitudinal crack	100		REJ.	Y=0
SEG14B-054	1	longitudinal crack	50		REJ.	Y=50
SEG14B-052	1	longitudinal crack	100		REJ.	Y=0
SEG14E-152	1	longitudinal crack	25		REJ.	Y=0
CSD4-PP62-108	1	longitudinal crack	10		REJ.	Y=30
SSD24-PP63.5-049	1	transverse crack	3		REJ.	Y=70

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EXAMINED BY 主探 Sun Gongchang <i>Sun Gongchang</i> 09.12.07	REVIEWED BY 审核 <i>SUN Weir</i> 09.12.07
LEVEL - II SIGN 签名 / DATE 日期	LEVEL-II SIGN / DATE 日期
质量经理 / QCM	用户 CUSTOMER
签字 SIGN / 日期 DATE	签字 SIGN / 日期 DATE



# REPORT OF MAGNETIC PARTICLE EXAMINATION

## 磁粉检测报告

REPORT NO. 报告编号 B787-MT-16539R1      DATE日期 2009.12.14      PAGE OF页码 1/1      Revision No: 0

PROJECT NO. 工程编号: ZP06-787      CONTRACTOR: 用户: CALTRANS

DRAWING NO. 图号: SEG14B/SEG14E/SSD4/SSD24      CALTRANS CONTRACT NO.: 04-0120F4  
 8AE PLATE PANEL SPLICE      加州工程编号

REFERENCING CODE 参考规范编码: AWS D1.5-2002      ACCEPTANCE STANDARD 接受标准: AWS D1.5-2002      PROCEDURE NO. 程序编号: ZPQC-MT-01      CALIBRATION DUE DATE 仪器校正有效期: Dec. 28<sup>ST</sup>, 2009

EQUIPMENT 设备: MT YOKE      MANUFACTURER 制造商: PARKER      MODEL NO. 样式编号: B310S      SERIAL NO. 连续编号: 5395 5617 5620

MAGNETIZING METHOD 磁化方法: Continuous magnetic yoke 磁轭式连续法      CURRENT 电流: AC

PARTICLE TYPE 磁粉类型: Dry magnet powder 干磁粉      YOKE SPACING 磁轭间距: 70~150mm

MATERIAL TO BE EXAMINED 检测材料:  WELDING 焊接件      Material & thickness 母材, 厚度: A709M-345F2/T2-X  
 CASTING 铸件      30/65/25/14/18/20/8mm  
 FORGING 锻造

WELDING PROCESS 焊接方法: SMAW      TYPE OF JOINT 焊缝类型: T-JOINT

WELD I.D. 焊缝编号	DISCONTINUITY 不连续性			ACCEPT 接受	REJECT 拒收	REMARKS 备注
	INDICATION 指示	TYPE 类型	LENGTH IN mm 长度			
SEG14B-051	1R1			ACC.		
SEG14B-054	1R1			ACC.		
SEG14B-052	1R1			ACC.		
SEG14E-152	1R1			ACC.		
CSD4-PP62-108	1R1			ACC.		
SSD24-PP63.5-049	1R1			ACC.		

AFTER B-CWR967 966 964 965

BLANK

EXAMINED BY 主探: Sun Gongchang      SIGN 签名: Sun Gongchang      DATE 日期: 09.12.14  
 LEVEL - II      质量经理 / QCM

REVIEWED BY 审核: Si Wei      SIGN 日期: 09.12.14  
 LEVEL-II      用户 CUSTOMER

签字 SIGN / 日期 DATE

签字 SIGN / 日期 DATE



教育培训纪录

培训编号: MT-22-Dec-09

培训内容:	MT Techniques
培训对象:	项目质检
授课人员:	Steve Lawton
培训类型:	内部培训
培训时间:	22-Dec-09 5:00 pm
计划培训地点:	ZPMC QC office

人员签到:

姓名	部门	姓名	部门
苏力书 Sunlei	钢桥	狄坤起 Di Kunlun	钢桥
孙工 Sun Gongchang	钢桥	蔡新鑫 Cai Xinxin	钢桥
徐海 Xu Hai	钢桥	傅志强 Fu Zhiqiang	钢桥
卜源源 Bian Yuanyuan	钢桥	顾云明 Gu Yunming	钢桥
许兵 Xu Bing	钢桥	金建廷 Jin Jianzhong	钢桥 MT
李振华 Li Zhenhua	钢桥	常书 Chang Shu	钢桥
李岫阳 Li Xiuyang	QA	袁俊 Yuan Jun	钢桥
王威 Wang Wei	钢桥	刘章敏 Liu Zhangmin	
施林 Shi Lin	钢桥 MT	徐华祥 Xu Huaixiang	钢桥
丁阿成 Ding A Cheng	钢桥 MT	周东运 Zhou Dongyun	钢桥
贺佳佳 He Jiajia	钢桥	赵成功 Zhao Chenggong	钢桥
黄谱 Huang Pu	钢桥	孙工 Sun Gongchang	钢桥
李黎明 Li Liming	钢桥	徐辉 Xu Hui	钢桥
李昌涛 Li Changtao		刘洪斌 Liu Hongbin	

# 会议纪要

Training memo

## 关于MT检测的NCR问题

1. 首先工作中的安全问题要注意

- ① 工作中应戴好防护眼镜、手套、尽量戴护膝。
- ② 注意用电安全，防止漏电。
- ③ 工作中的激光强度很重要，要保证光线充足。
- ④ 250 $\mu$ m以上使用黄磁粉。

2. ~~检测~~ 检测过程中注意事项。

- ① 机器提升力的清零。
- ② 机器在校正要经常校。
- ③ 机器在~~检测~~接头处位置容易磨损，磨损大了会影响机器的提升力。
- ④ 指示器。
- ⑤ 照相要保证。
- ⑥ 与焊缝位置非常重要。~~检测~~

身体。

- ⑦ 磁粉的使用量很重要，要适量。

- ⑧ 检测的方向。

~~检测~~

⑨ 被检测区域要保持干燥、干净。

3. 关于NCR的分析。

从10月份到12月份共17份NCR。

有9份NCR关于焊缝端部位置的。

ZPMC抽检位置应做好明显标记，以便CT抽检。

**DEPARTMENT OF TRANSPORTATION**

DIVISION OF ENGINEERING SERVICES

Office of Structural Materials

Quality Assurance and Source Inspection



Bay Area Branch  
690 Walnut Ave. St. 150  
Vallejo, CA 94592-1133  
(707) 649-5453  
(707) 649-5493

Contract #: 04-0120F4Cty: SF/ALA Rte: 80 PM: 13.2/13.9File #: xx.25A**QUALITY ASSURANCE -- NON-CONFORMANCE RESOLUTION****Location:** Changxing Island, Shanghai, P.R. China**Report No:** NCS-000452**Prime Contractor:** American Bridge/Fluor Enterprises, a JV**Date:** 20-Jan-2010**Submitting Contractor:** Zhenhua Port Machinery Company, Ltd (ZPMC), Changxing Island **NCR #:** ZPMC-0500**Type of problem:**

<b>Welding</b>	<b>Concrete</b>	<b>Other</b>	
<b>Welding</b>	<b>Curing</b>	<b>Procedural</b>	<b>Bridge No:</b> 34-0006
<b>Joint fit-up</b>	<b>Coating</b>	<b>Other</b>	<b>Component:</b>
<b>Procedural</b>	<b>Procedural</b>	<b>Descriptor:</b>	

**Date the Non-Conformance Report was written:** 05-Dec-2009**Description of Non-Conformance:**

During Quality Assurance Magnetic Particle Testing (MT) review of welds located on Segment 8AE, this Quality Assurance Inspector (QA) discovered the following issues:

-Two (2) Longitudinal linear indications measuring approximately 8mm and 15mm in length. The welds are identified as:

1. SD24-PP62.5-049 @ Panel Point (PP)-062.5 (8 mm indication)
2. CSD4-PP62-109 @ Panel Point (PP)-062 (15 mm indication)

-The OBG Segment is located at outside yard.

-The Notice of Witness Inspection Number (NWIT) is 004796. The indication is located inside the area that has been previously tested and accepted by ZPMC Quality Control (QC) personnel.

**Contractor's proposal to correct the problem:**

Repair indications, perform required NDT, and provide training to NDT Technicians.

**Corrective action taken:**

Contractor submitted CWR verifying the repairs were made along with NDT records verifying the weld is in conformance with Contract specifications. The NDT Technicians received training from the QCM in regards to the missed indications.

**Did corrective action require Engineer's approval?** Yes No

**If so, name of Engineer providing approval:**

**Date:**

**Is Engineer's approval attached?** Yes No

**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 Jim Simonis, who represents the Office of Structural Materials for your project.

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# QUALITY ASSURANCE -- NON-CONFORMANCE RESOLUTION

( Continued Page 2 of 2 )

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**Inspected By:** Simonis,Jim

Quality Assurance Inspector

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**Reviewed By:** Wahbeh,Mazen

QA Reviewer