

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

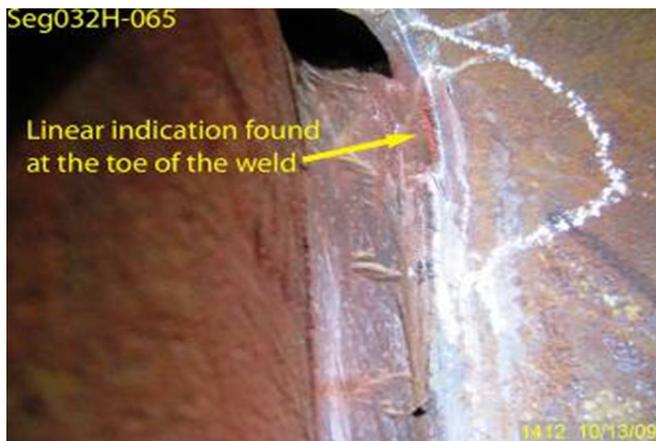
Contract #: 04-0120F4Cty: SF/ALA Rte: 80 PM: 13.2/13.9File #: 69.25B**QUALITY ASSURANCE -- NON-CONFORMANCE REPORT****Location:** Changxing Island, Shanghai, P.R. China**Report No:** NCR-000477**Prime Contractor:** American Bridge/Fluor Enterprises, a JV**Date:** 14-Oct-2009**Submitting Contractor:** Zhenhua Port Machinery Company, Ltd (ZPMC), Changxing Island**NCR #:** ZPMC-0450**Type of problem:****Welding****Concrete****Other****Welding****Curing****Procedural****Bridge No:** 34-0006**Joint fit-up****Coating****Other****Component:** OBG Segment 6CE Deck Plate Stiffener Weld Joint**Procedural****Procedural****Description:** Missed MT indication by QC and Repair without CWR**Reference Description:** Missed MT Indications by QC on Segment 6CE and weld repair without CWR**Description of Non-Conformance:**

During a random verification of Magnetic Particle (MT) Testing of the OBG Segment 6CE welds, Caltrans Quality Assurance (QA) inspector discovered a total three (3) linear indications approximately 12mm to 20mm in length located at welds SEG32H-065, 123 and 023. These welds have been previously tested and accepted by ZPMC Quality Control MT technicians. Also, ZPMC personnel completed these weld repairs without prior Engineer approval or utilizing an approved critical weld repair procedure (CWR).



QUALITY ASSURANCE -- NON-CONFORMANCE REPORT

(Continued Page 2 of 3)



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 6.26.1.1; “Welds shall have no Cracks”.

AWS D1.5 (02) Section 6.26.2; “Welds that are subject to MT in addition to visual inspection shall have no Cracks”

QUALITY ASSURANCE -- NON-CONFORMANCE REPORT

(Continued Page 3 of 3)

Special Provisions Section 8.3; In addition to the provisions in AWS D1.5, Section 3.7.4 and Section 12.17, Third-time repairs of welds or base metals, regardless of NDT method, and all repairs of cracks require prior approval of the engineer.

AWS D1.5 (02) Section 12.17.4 Approval; All critical repairs to base metal and welds shall be approved by the Engineer prior to beginning the repair and shall be documented giving details of the type of discontinuity and extent of repair.

Who discovered the problem: Hiranch Patel

Name of individual from Contractor notified: Man Kit Lee

Time and method of notification: 1600 hours, Verbal

Name of Caltrans Engineer notified: Ching Chao

Time and method of notification: 1730 hours, Email

QC Inspector's Name: Zhang Wei

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.

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: 17-Nov-2009

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

Dear: Mr. Charles Kanapicki

Job Name: SAS Superstructure

Attention: Mr. Thomas Nilsson Project/Fabrication Manager

Document No: 05.03.06-000440

Subject: NCR No. ZPMC-0450

Reference Description: Missed MT Indications by QC on Segment 6CE and weld repair without CWR

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:** 06

Remarks:

During a random verification of Magnetic Particle (MT) Testing of the OBG Segment 6CE welds, Caltrans Quality Assurance (QA) inspector discovered a total three (3) linear indications approximately 12mm to 20mm in length located at welds SEG32H-065, 123 and 023. These welds have been previously tested and accepted by ZPMC Quality Control MT technicians. Also, ZPMC personnel completed these weld repairs without prior Engineer approval or utilizing an approved critical weld repair procedure (CWR).

Action Required and/or Action Taken:

Submit a repair procedure to the engineer for approval. Provide training and certification verification to the engineer. Use the correct CWR.

Transmitted by: Bill Howe

Attachments: ZPMC-0450

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: 05.03.06-000440

Subject: NCR No. ZPMC-0450

Dated: 11-Jan-2010

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

Job Name: SAS Superstructure

Document No.: ABF-NPR-000474 **Rev:** 00

Contractor's Proposed Resolution:

Reference Resolution: ZPMC NDT personnel acknowledge the missed MT indication. These indications have subsequently been repaired and re-inspected.

ZPMC NDT personnel acknowledge the missed MT indication. These indications have subsequently been repaired and re-inspected. This NCR also describes these indications were repaired without a CWR. As these indications are located where the weld joins the base metal and at the end of the weld in a difficult to access area where it is difficult to "tie the weld into the base metal and properly clean, these indication were not interpreted as a "Crack" nor are they indicated as a "Crack" in the body of the NCR. ZPMC will forward the WRR, MT report and training records at a later date to close this NCR.

Submitted by: Lawton, Steve

Attachment(s): ABF-NPR-000474R00

Caltrans' comments:

Status: REJ

Date: 11-Jan-2010

The response letter contradicts the NCR and does not address the requested information in the NCT. Therefore it is rejected.

Submitted by: Howe, Bill

Attachment(s):

Date: 11-Jan-2010

NCR PROPOSED RESOLUTION

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

Attention: Pursell, Gary
Resident Engineer

Ref: 05.03.06-000440

Subject: NCR No. ZPMC-0450

Dated: 17-Mar-2010

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

Job Name: SAS Superstructure

Document No.: ABF-NPR-000474 Rev: 01

Contractor's Proposed Resolution:

Reference Resolution: ZPMC has repaired the missed indications, and is providing both the repair reports and NDT after repair to show the welds are acceptable.

ZPMC has repaired the missed indications, and is providing both the repair reports and NDT after repair to show the welds are acceptable. Since the increase of missed indications, ZPMC has conducted training to improve inspector technique and there has been a corresponding decrease in missed indication NCRs. Based on this ZPMC requests closure of this NCR.

Submitted by: Ishibashi, Joshua

Attachment(s): ABF-NPR-000474R01;

Caltrans' comments:

Status: CLO

Date: 24-Mar-2010

This proposed resolution is acceptable. The documentation received is sufficient and the Department concurs that Non-Conformance ZPMC-0450 is closed.

Submitted by: Eagen, Sean

Attachment(s):

Date: 24-Mar-2010



No. B-691

LETTER OF RESPONSE

TO: American Bridge/Flour

DATE: 2010-3-17

REGARDING: NCR-000477(ZPMC-0450)

ZPMC is providing the CWRs and NDT records show the repairs for missed MT indications are acceptable. After NDT verification this issue has been removed from punchlist by CT's representative. Based on this, ZPMC is requesting this NCR to be closed.

ATTACHMENT:

NCR-000477(ZPMC-0450)

B-CWR1329

B787-MT-20555 R1

B-CWR1328

B787-MT-20554 R1

B-CWR1330

B787-MT-20556 R1

A handwritten signature in black ink, appearing to be 'Jing W'.

3/17/10



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: 17-Nov-2009

Contract No: 04-0120F4
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Dear: Mr. Charles Kanapicki

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

File: 05.03.06

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Office of Structural Materials
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Bay Area Branch
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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-000477

Prime Contractor: American Bridge/Fluor Enterprises, a JV

Date: 14-Oct-2009

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

NCR #: ZPMC-0450

Type of problem:

Welding Concrete Other

Welding Curing Procedural **Bridge No:** 34-0006

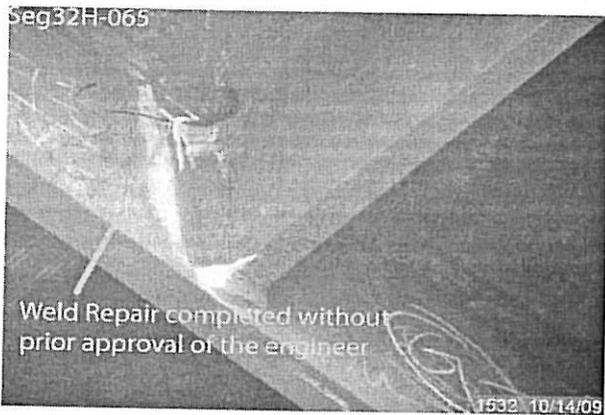
Joint fit-up Coating Other **Component:** OBG Segment 6CE Deck Plate Stiffener Weld Joint

Procedural Procedural **Description:** Missed MT indication by QC and Repair without CWR

Reference Description: Missed MT Indications by QC on Segment 6CE and weld repair without CWR

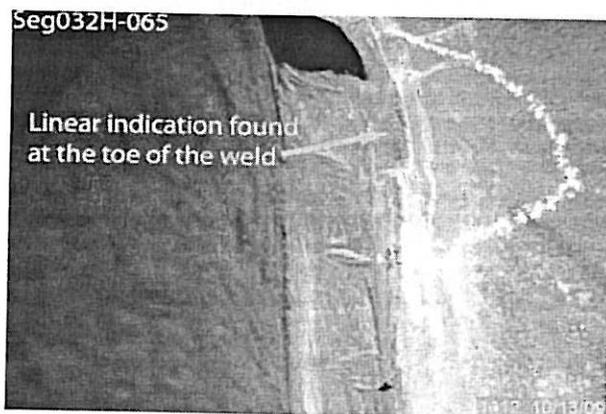
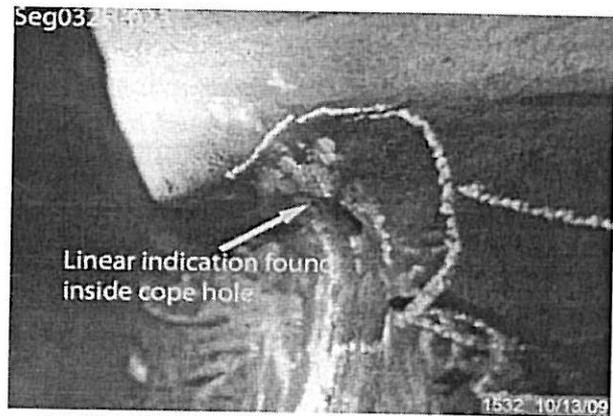
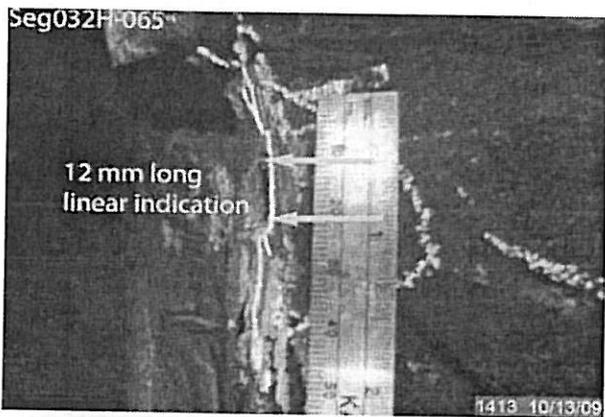
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QUALITY ASSURANCE -- NON-CONFORMANCE REPORT

(Continued Page 2 of 3)



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QUALITY ASSURANCE -- NON-CONFORMANCE REPORT

(Continued Page 3 of 3)

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Time and method of notification: 1600 hours, Verbal

Name of Caltrans Engineer notified: Ching Chao

Time and method of notification: 1730 hours, Email

QC Inspector's Name: Zhang Wei

Was QC Inspector aware of the problem: Yes No

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Comments:

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Inspected By: Carreon,Albert

Lead Reviewer/Task Leader

Reviewed By: Wahbeh,Mazen

SMR

ZPMC-450



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.:	SEG032H	报告编号 Report No.:	B-CWR1329
合同号 Contract No.:	04-0120F4	部件名称 Item Name:	6CE CORNER ASSE MBLY	NDT 报告编号 NDT Report No.:	B787-MT-20555
项目编号 Project No.:	ZP06-787				

焊缝缺陷描述:

Description of Welding Discontinuity:
在对SEG032H-065检测时, 发现1处纵向裂纹。1、L=12mm.

Welder ID No. (焊工编号): 066258 Position:(位置): 3F

One longitudinal crack was found by use of MT on SEG032H-065.

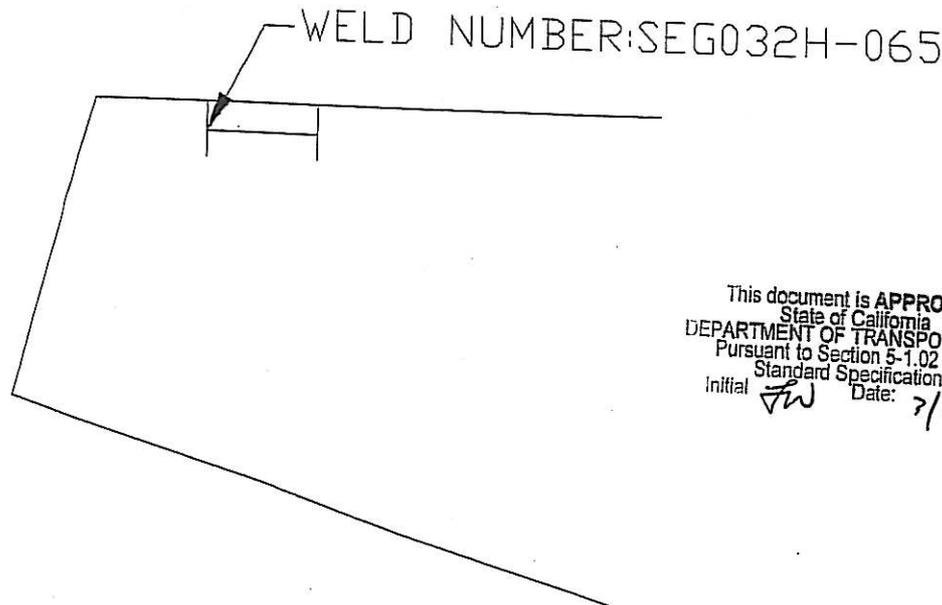
Please see the detail data from MT report!

检验员 (Inspector): Sun Gongchang

日期 (Date): 2010-03-13

焊缝返修位置示意图:

Draft of Welding Discontinuity:



This document is APPROVED
State of California
DEPARTMENT OF TRANSPORTATION
Pursuant to Section 5-1.02 of the
Standard Specifications
Initial JW Date: 3/17/10

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):

Ma Runguan

日期 (Date):

10.03.13

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 *[Signature]* Date: 3/17/16

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:

Xu Donghai

审核:

Approved By:

[Signature]

日期:

Date:

10.03.13



关键焊缝返修报告

版本
Rev. No.:

Critical Welding Repair Report (CWR)

0

项目名称 Project Name:	美国海湾大桥 SFOBB	部件图号 Drawing No.:	SEG032H	报告编号 Report No.:	B-CWR1329
合同号 Contract No.:	04-0120F4	部件名称 Item Name:	6CE CORNER ASSE MBLY	NDT 报告编号 NDT Report No.:	B787-MT-20555
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.

车间负责人 (Foreman):

Ma Ruiquan

日期 (Date):

10.03.13

参照的WPS编号 Repair WPS No.:	WPS-345-SMAW-3G(3F)-FCM -Repair	工艺员 Technologist:	Xu Dongkai 10.03.13
返修(碳刨)前预热温度 Preheat Temperature Before Gouging:	NA	返修的缺陷 Description of Discontinuity:	CR
焊前处理检查 Inspection Before Welding:	Am	焊前预热温度 Preheat Temperature Before Welding:	170°C
最大碳刨深度 Max. Depth of Gouge:	NA	碳刨总长 Total Length of Gouge:	NA
焊工 Welder:	058087	焊接类型 Welding Type:	SMAW
焊接电流 Current:	153	焊接电压 Voltage:	22.5
		焊接位置 Position:	3G
		焊接速度 Speed:	103

返修后检查

Inspection After Repair:

外观检查 VT Result:	Am	检验员 Inspector:	Li Yanhua	日期 Date:	10.03.17
NDT复检 NDT Result:	Am/acc	探伤员 NDT Person:	Sun Guangsheng	日期 Date:	10.03.17

见证:

Witness/Review:

备注:

Remark:

#R787-QCP-900

This document is APPROVED
State of California
DEPARTMENT OF TRANSPORTATION
Pursuant to Section 5-1.02 of the
Standard Specifications
Initial: [Signature] Date: 3/17/10



REPORT OF MAGNETIC PARTICLE EXAMINATION

磁粉检测报告

REPORT NO. 报告编号 B787-MT-20555R1 DATE日期 2010.03.17 PAGE OF页码 1/1 Revision No: 0

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

DRAWING NO. SEG032H CALTRANS CONTRACT NO.:
 图号: 6CE CORNER ASSEMBLY 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 ST , 2010
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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
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MAGNETIZING METHOD 磁化方法	Continuous magnetic yoke 磁轭式连续法	CURRENT 电流	AC
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PARTICLE TYPE 磁粉类型	Dry magnet powder 干磁粉	YOKE SPACING 磁轭间距	70~150mm
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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-345T2-X 25/30mm
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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			
SEG032H-065	1R1			ACC.		100%MT

AFTER B-CWR1329

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EXAMINED BY 主探 Sungongchang <i>Sungongchang</i> 10.3.17	REVIEWED BY 审核 <i>Sunmei</i> 10.3.17
LEVEL - II SIGN 签名 / DATE日期 质量经理 / QCM	LEVEL-II SIGN / DATE日期 用户CUSTOMER
签字 SIGN / 日期 DATE	签字 SIGN / 日期 DATE

ZPMC-450



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 SFOBE	部件图号 Drawing No.:	SEG032H	报告编号 Report No.:	B-CWR132E
合同号 Contract No.:	04-0120F4	部件名称 Item Name:	6CE CORNER ASSE MBLY	NDT 报告编号 NDT Report No.:	B787-MT-20554
项目编号 Project No.:	ZP06-787				

焊缝缺陷描述:

Description of Welding Discontinuity:

在对SEG032H-023检测时, 发现1处纵向裂纹。1、L=20mm

Welder ID No. (焊工编号): 066258 Position:(位置): 3F

One longitudinal crack was found by use of MT on SEG032H-023.

Please see the detail data from MT report!

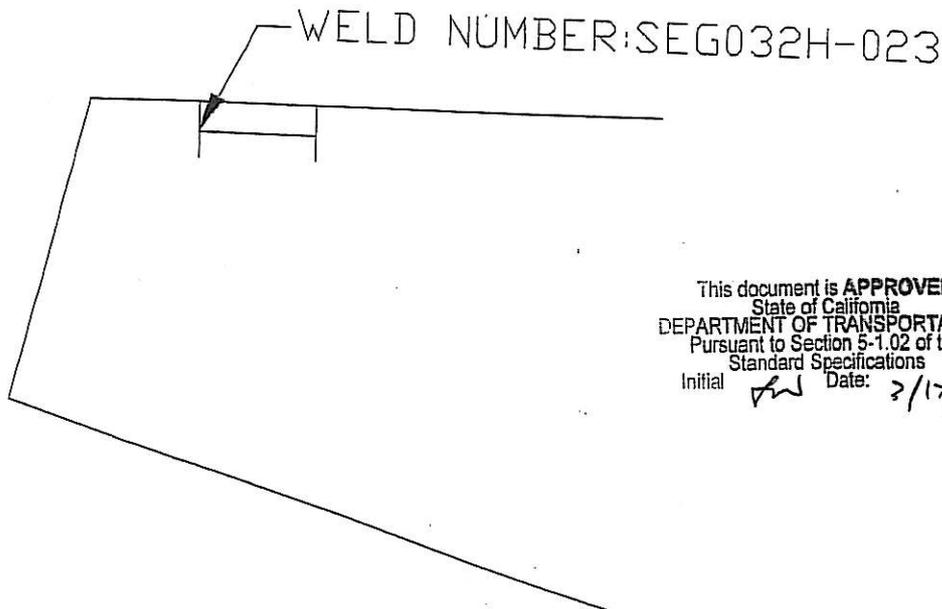
Sun Gongchang

检验员 (Inspector): Sun Gongchang

日期 (Date): 2010-03-13

焊缝返修位置示意图:

Draft of Welding Discontinuity:



This document is **APPROVED**
 State of California
 DEPARTMENT OF TRANSPORTATION
 Pursuant to Section 5-1.02 of the
 Standard Specifications
 Initial *SW* Date: 3/17/10

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.

处理意见

车间负责人 (Foreman):

Ma Puiguan

日期 (Date):

10.03.15

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。

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 DEPARTMENT OF TRANSPORTATION
 Pursuant to Section 5-1.02 of the
 Standard Specifications
 Initial: [Signature] Date: 3/17/10

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: Xu Yongkai

审核:

Approved By: [Signature]

日期:

Date: 10.03.13



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 SFOBE	部件图号 Drawing No.:	SEG032H	报告编号 Report No.:	B-CWR1328
合同号 Contract No.:	04-0120F4	部件名称 Item Name:	6CE CORNER ASSE MBLY	NDT 报告编号 NDT Report No.:	B787-MT-20554
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.

车间负责人 (Foreman): Ma Ruiqun

日期 (Date): 10.03.13

参照的WPS编号 Repair WPS No.:	WPS-345-SMAW-3G(3F)-FCM -Repair		工艺员 Technologist:	Xu Donghai 10.03.13	
返修(碳刨)前预热温度 Preheat Temperature Before Gouging:	NA		返修的缺陷 Description of Discontinuity:	C-R.	
焊前处理检查 Inspection Before Welding:	An		焊前预热温度 Preheat Temperature Before Welding:	171°C	
最大碳刨深度 Max. Depth of Gouge:	NA		碳刨总长 Total Length of Gouge:	NA	
焊工 Welder:	058087	焊接类型 Welding Type:	SMAW	焊接位置 Position:	3G
焊接电流 Current:	155	焊接电压 Voltage:	4.7	焊接速度 Speed:	103
返修后检查 Inspection After Repair:					
外观检查 VT Result:	An	检验员 Inspector:	Li Yunchun	日期 Date:	10.03.17
NDT复检 NDT Result:	合格	探伤员 NDT Person:	Sunbenyong cheng	日期 Date:	10-03-17
见证: Witness/Review:					
备注: Remark:					

#R787-QCP-900

This document is APPROVED
State of California
DEPARTMENT OF TRANSPORTATION
Pursuant to Section 5-1.02 of the
Standard Specifications
initial Date: 3/17/10



REPORT OF MAGNETIC PARTICLE EXAMINATION

磁粉检测报告

REPORT NO. 报告编号 B787-MT-20554R1 DATE日期 2010.03.17 PAGE OF页码 1/1 Revision No: 0

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

DRAWING NO. SEG032H CALTRANS CONTRACT NO.:
 图号: 6CE CORNER ASSEMBLY 加州工程编号 04-0120F4

REFERENCING CODE ACCEPTANCE STANDARD PROCEDURE NO. CALIBRATION DUE DATE
 参考规范编码 接受标准 程序编号 仪器校正有效期
 AWS D1.5-2002 AWS D1.5-2002 ZPQC-MT-01 Dec. 28ST, 2010

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

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

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

MATERIAL TO BE √ WELDING 焊接件 Material & thickness A709M-345T2-X
 EXAMINED □ CASTING 铸件 母材, 厚度 25/30mm
 检测材料 □ FORGING 锻造

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

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			
SEG032H-023	1R1			ACC.		100%MT

AFTER B-CWR1328

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EXAMINED BY 主探 Sungongchang REVIEWED BY 审核 Swei
 LEVEL - II SIGN 签名 / DATE日期 10.03.17 LEVEL-II SIGN / DATE日期 10.03.17
 质量经理 / QCM _____ 用户CUSTOMER _____
 签字 SIGN / 日期 DATE _____ 签字 SIGN / 日期 DATE _____

ZPMC-450

		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.:	SEG032H	报告编号 Report No.:	B-CWR1330
合同号 Contract No.:	04-0120F4	部件名称 Item Name:	6CE CORNER ASSE MBLV	NDT 报告编号 NDT Report No.:	B787-MT-20556
项目编号 Project No.:	ZP06-787				

焊缝缺陷描述:

Description of Welding Discontinuity:

在对SEG032H-123检测时, 发现1处纵向裂纹。1、L=15mm.

Welder ID No. (焊工编号): 066258 Position:(位置): 3F

One longitudinal crack was found by use of MT on SEG032H-123.

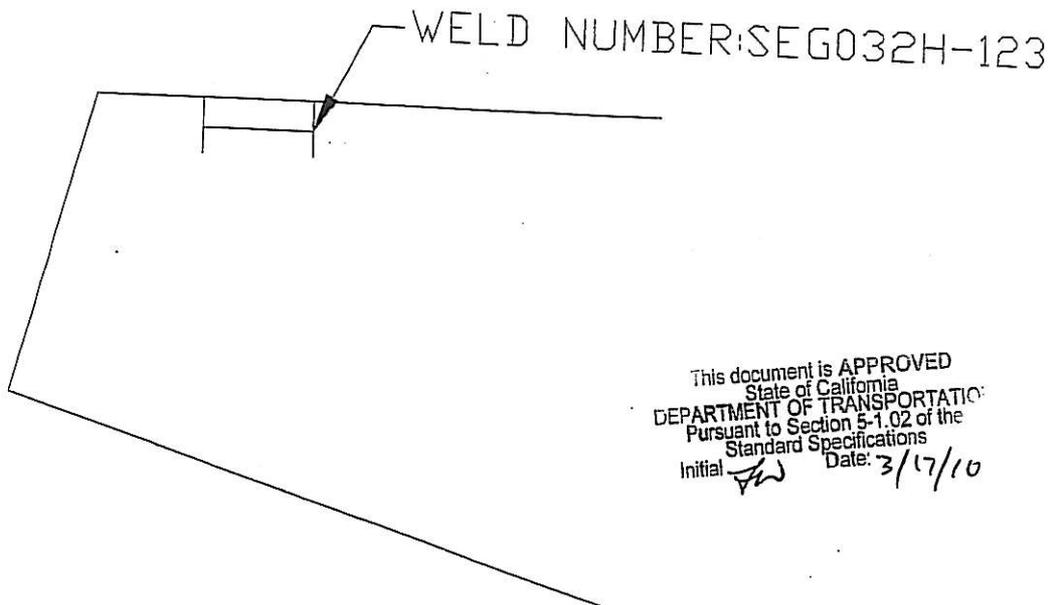
Please see the detail data from MT report!

检验员 (Inspector): Sun Gangchang

日期 (Date): 2010-03-13

焊缝返修位置示意图:

Draft of Welding Discontinuity:



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 Pursuant to Section 5-1.02 of the
 Standard Specifications
 Initial: SW Date: 3/17/10

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):

Ma Ruijun

日期 (Date):

10.03.13

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。

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 State of California
 DEPARTMENT OF TRANSPORTATION
 Pursuant to Section 5-1.02 of the
 Standard Specifications

Date: 3/17/10

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:

Xu Donghui

审核:

Approved By:

Liu Junhua

日期:

Date:

10.03.13



Visual Weld Inspection Report
焊缝目视检查报告

Caltrans Contract No. 州合同编号	04-0120F4	Girder/ 梁:	OBG Plate Panel Splice	周数	124#
Project No.: 名称	San Francisco Oakland Bay Bridge 海湾大桥	Tower/ 塔:		日期	2010.3.17
Project No.: 编号:	美国	Representative: 质检代表:			
	ZP06-787	CWI: 检验员:	Li Yanhua 07/20/09		

Weld No. 缝编号	Welder I.D.# 工识别号	Location 位置	Welding consumables 焊接材料	Undercut t 咬边	Porosity 气孔	Over lap 焊瘤	Crater 弧坑	Arc strike电 弧擦伤	Spatters 飞溅	Crack 裂纹	Accept	Repair	or
											接受或 拒收	返修	Reject 拒收
SEG032H-123	058087	3G	TL508 (H4) (Φ4.0)	✓	✓	✓	✓	✓	✓	✓	ACC	NA	NA

After root weld
 After CWR or WRR No.: B-CWR1330
 After cover pass
 After HSR No.:
 Others

#R787-QCP-603

"✓" is no defects. "X" is defects. "NA" is not applicable.



关键焊缝返修报告

版本
Rev. No.:

Critical Welding Repair Report (CWR)

0

项目名称 Project Name:	美国海湾大桥 SFOBB	部件图号 Drawing No.:	SEG032H	报告编号 Report No.:	B-CWR1330
合同号 Contract No.:	04-0120F4	部件名称 Item Name:	6CE CORNER ASSE MBLY	NDT 报告编号 NDT Report No.:	B787-MT-20556
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.

车间负责人 (Foreman): *McReignan*日期 (Date): *10.03.13*

参照的WPS编号 Repair WPS No.:	WPS-345-SMAW-3G(3F)-FCM -Repair	工艺员 Technologist:	<i>Xu Donghai</i> <i>10.03.13</i>
返修(碳刨)前预热温度 Preheat Temperature Before Gouging:	<i>NA</i>	返修的缺陷 Description of Discontinuity:	<i>CR</i>
焊前处理检查 Inspection Before Welding:	<i>Am</i>	焊前预热温度 Preheat Temperature Before Welding:	<i>184°C</i>
最大碳刨深度 Max. Depth of Gouge:	<i>NA</i>	碳刨总长 Total Length of Gouge:	<i>NA</i>
焊工 Welder:	<i>058057</i>	焊接类型 Welding Type:	<i>SMAW</i>
焊接电流 Current:	<i>156</i>	焊接位置 Position:	<i>3G</i>
		焊接速度 Speed:	<i>106</i>

返修后检查
Inspection After Repair:

外观检查 VT Result:	<i>Am</i>	检验员 Inspector:	<i>Li Tomhua</i>	日期 Date:	<i>10.03.17</i>
NDT复检 NDT Result:	<i>Am</i>	探伤员 NDT Person:	<i>Sunbongsheng</i>	日期 Date:	<i>10.03.17</i>

见证:
Witness/Review:备注:
Remark:

#R787-QCP-900

This document is APPROVED
State of California
DEPARTMENT OF TRANSPORTATION
Pursuant to Section 5-1.02 of the
Standard Specifications
Date: *3/17/10*



REPORT OF MAGNETIC PARTICLE EXAMINATION

磁粉检测报告

REPORT NO. 报告编号 B787-MT-20556R1 DATE日期 2010.03.17 PAGE OF页码 1/1 Revision No: 0

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

DRAWING NO. SEG032H CALTRANS CONTRACT NO.:
 图号: 6CE CORNER ASSEMBLY 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 ST , 2010
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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
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MAGNETIZING METHOD 磁化方法	Continuous magnetic yoke 磁轭式连续法	CURRENT 电流	AC
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PARTICLE TYPE 磁粉类型	Dry magnet powder 干磁粉	YOKE SPACING 磁轭间距	70~150mm
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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-345T2-X 25/30mm
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WELDING PROCESS 焊接方法	SMAW	TYPE OF JOINT 焊缝类型	T- JOINT
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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			
SEG032H-123	1R1			ACC.		1000%MT

AFTER B-CWR1330

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EXAMINED BY 主探 Sungongchang <i>Su Gongchang</i> 10/3/10	REVIEWED BY 审核 <i>Suei</i> 10/3/10
LEVEL - II SIGN 签名 / DATE 日期 质量经理 / QCM	LEVEL-II SIGN / DATE 日期 用户 CUSTOMER
签字 SIGN / 日期 DATE	签字 SIGN / 日期 DATE

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-000565**Prime Contractor:** American Bridge/Fluor Enterprises, a JV**Date:** 23-Mar-2010**Submitting Contractor:** Zhenhua Port Machinery Company, Ltd (ZPMC), Changxing Island **NCR #:** ZPMC-0450**Type of problem:**

Welding	Concrete	Other	
Welding	Curing	Procedural	Bridge No: 34-0006
Joint fit-up	Coating	Other	Component:
Procedural	Procedural	Description:	

Date the Non-Conformance Report was written: 14-Oct-2009**Description of Non-Conformance:**

During a random verification of Magnetic Particle (MT) Testing of the OBG Segment 6CE welds, Caltrans Quality Assurance (QA) inspector discovered a total three (3) linear indications approximately 12mm to 20mm in length located at welds SEG32H-065, 123 and 023. These welds have been previously tested and accepted by ZPMC Quality Control MT technicians. Also, ZPMC personnel completed these weld repairs without prior Engineer approval or utilizing an approved critical weld repair procedure (CWR).

Contractor's proposal to correct the problem:

Repair said indications and perform NDT required to verify weld quality.

Corrective action taken:

Contractor submitted approved CWRs used to perform indications along with subsequent NDT records verifying welds are now in conformance with Contract specifications.

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 152. 1675.3703, who represents the Office of Structural Materials for your project.

Inspected By: Simonis, Jim

Quality Assurance Inspector

Reviewed By: Wahbeh, Mazen

QA Reviewer