

**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


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


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**Location:** Changxing Island, Shanghai, P.R. China**Report No:** NCR-000622**Prime Contractor:** American Bridge/Fluor Enterprises, a JV**Date:** 11-Jan-2010**Submitting Contractor:** Zhenhua Port Machinery Company, Ltd (ZPMC), Changxing Island**NCR #:** ZPMC-0595**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 5AE Deck to Side Panel
<b>Procedural</b>	<b>Procedural</b>	<b>Description:</b>	

**Reference Description:** Weld repair of transverse cracks without the Engineer's approval on Segment 5AE Deck to Side Panel

**Description of Non-Conformance:**

During the Quality Assurance in-process observations of the fabrication of lift 5 East, the QA inspector discovered the following issues:

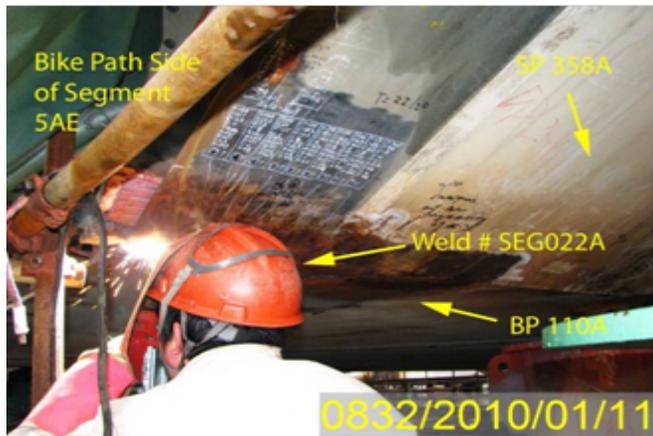
- Weld repair of transverse cracks without the Engineer's approval.
  - No approved welding procedure specification (WPS) was onsite during the welding repair process.
  - The weld is identified as "Hold Back" weld #SEG022A-007
  - The weld is a Complete Joint Penetration (CJP) weld.
  - The weld is joining bottom panel identified as BP110A to the side panel identified as SP558A
  - Location is nearest to panel point 032 on the bike path side of segment (@ E3 line).
  - Repair is being performed due to eleven (11) transverse indications being discovered in a 325mm area by the contractor using the Ultrasonic Testing (UT) method.
  - Y location of repair is noted to be between 20mm~345mm near the 5AE+4BE field splice.
  - Lift 5 East is located in the OGB Trial Assembly Area.
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# QUALITY ASSURANCE -- NON-CONFORMANCE REPORT

( Continued Page 2 of 2 )

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### Applicable reference:

Special Provisions Section 8-3; The Engineer shall be notified in writing when welding problems, deficiencies, base metal repairs, or any other type of repairs not submitted in the WQCP are discovered and also of the proposed repair procedures to correct them.

AWS D1.5-2002 Section 6.3.1; The inspector shall make certain that all WPS's are qualified in conformance with Section 5 of this code The inspector shall make certain that each welding operation is covered by a written WPS and that such WPS's are available to the welders and inspectors for reference.

AWS D1.5-2002 Section 3.7.4; Prior approval of the Engineer shall be obtained for repairs to base metal, repairs of major or delayed cracks.

ZPMC WQCP section 9 - 9.2.1.2 "Prior approval of the Engineer shall be obtained for repairs to base metal other than what was identified in section 9.2.1.1 of this manual and the repair of all other cracks."

**Who discovered the problem:** Joe Alaniz

**Name of individual from Contractor notified:** Shen Kushan

**Time and method of notification:** 0850 hours, 01/11/10, Verbal

**Name of Caltrans Engineer notified:** Bill Howe

**Time and method of notification:** 1330 hours, 01/11/10, Verbal

**QC Inspector's Name:** Wang Li Yang

**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:** Tsang, Eric

SMR

**Reviewed By:** Wahbeh, Mazen

SMR



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

333 Burma Road  
Oakland CA 94607  
Tel: Fax:

**NON-CONFORMANCE REPORT TRANSMITTAL**

<b>To:</b>	AMERICAN BRIDGE/FLUOR, A JV 375 BURMA ROAD OAKLAND CA 95607	<b>Date:</b>	11-Jan-2010
<b>Dear:</b>	Mr. Charles Kanapicki	<b>Contract No:</b>	04-0120F4 04-SF-80-13.2 / 13.9
<b>Attention:</b>	Mr. Thomas Nilsson Project/Fabrication Manager	<b>Job Name:</b>	SAS Superstructure
<b>Subject:</b>	NCR No. ZPMC-0595	<b>Document No:</b>	05.03.06-000585

**Reference Description:** Weld repair of transverse cracks without the Engineer’s approval on Segment 5AE Deck to Side Panel

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:** 05

**Remarks:**

During the Quality Assurance in-process observations of the fabrication of lift 5 East, the QA inspector discovered the following issues:

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- Lift 5 East is located in the OGB Trial Assembly Area.

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

Propose a resolution for the identified non-conformance with revised procedures to prevent future occurrences. Notify the engineer and have WPS's onsite prior to the start of the repair.

A response for the resolution of this issue is expected within 7 days.

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# NCT

( Continued Page 2 of 2 )

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**Transmitted by:** Bill Howe      Sr. Transportation Engineer

**Attachments:**    ZPMC-0595

**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:** 05.03.06-000585

**Subject:** NCR No. ZPMC-0595

**Dated:** 18-Mar-2010

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

**Job Name:** SAS Superstructure

**Document No.:** ABF-NPR-000628 Rev: 00

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**Contractor's Proposed Resolution:**

**Reference Resolution:** ZPMC has repaired the UT indications noted in the NCR and is providing the CWR that was used as well as the NDT performed after to show that the weld is acceptable.

ZPMC has repaired the UT indications noted in the NCR and is providing the CWR that was used as well as the NDT performed after to show that the weld is acceptable. ZPMC QA has conducted training with ZPMC production crews to remind them of the requirement to have the required documents on site during welding to prevent these non conformances from occurring. Based on this ZPMC requests closure of this NCR.

**Submitted by:** Ishibashi, Joshua

**Attachment(s):** ABF-NPR-000628R00;

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**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-0595 is closed.

**Submitted by:** Eagen, Sean

**Date:** 24-Mar-2010

**Attachment(s):**



No. B-693

## LETTER OF RESPONSE

**TO: American Bridge/Flour**

**DATE: 2010-3-18**

**REGARDING: NCR-000622(ZPMC-0595)**

ZPMC is providing the CWR and NDT records show the repairs for UT 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-000622(ZPMC-0595)

B-CWR1048

UT-5E-016 R3

A handwritten signature in black ink, appearing to be 'J. W.' or similar, written in a cursive style.

3/18/10



**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:** 11-Jan-2010

**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-0595

**Job Name:** SAS Superstructure  
**Document No:** 05.03.06-000585

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**NCT**

*( Continued Page 2 of 2 )*

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**File:** 05.03.06

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Vallejo, CA 94592-1133

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Contract #: 04-0120F4

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

File #: 69.25B

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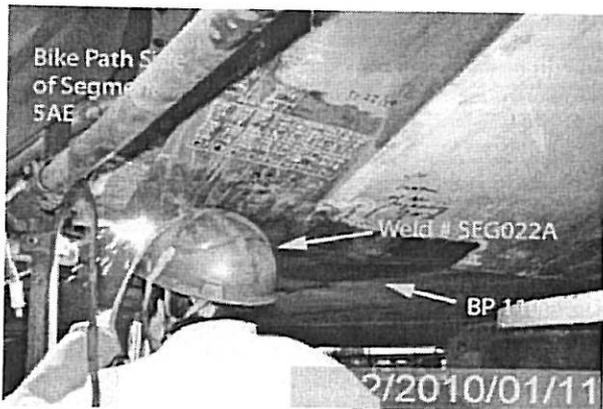
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## QUALITY ASSURANCE -- NON-CONFORMANCE REPORT

(Continued Page 2 of 2)



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### Comments:

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**Inspected By:** Tsang, Eric

SMR

**Reviewed By:** Wahbeh, Mazen

SMR



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

版本  
Rev. No.:

2

项目名称 Project Name:	美国海湾大桥 SFOBB	部件图号 Drawing No.:	Lift 5E	报告编号 Report No.:	B-CWR1048
合同号 Contract No.:	04-0120F4	部件名称 Item Name:	5AE corner split weld	NDT 报告编号 NDT Report No.:	NA
项目编号 Project No.:	ZP06-787				

Description:

描述:

These defects are located in repair areas from CWR1048.  
这些缺陷在B-CWR1048的位置。

WJ No. 焊缝编号: SEG002A-007

Location位置: 1G/4G

Welding process焊接方法: SMAW

*Li Liming* 2010.1.19

检验员 (Inspector) : Li Liming 日期 (Date) : 2010-1-19

焊缝返修位置示意图:

Draft of Welding Discontinuity:

SEE ATTACHMENTS  
见附件

This document is APPROVED  
State of California  
DEPARTMENT OF TRANSPORTATION  
Pursuant to Section 6-102 of the  
Standard Specifications  
Initial *SL* Date: 1/20/10

Cause:

原因:

1. The excavation was not in the correct location, relative to the "x" value.  
之前没有碳刨到正确的位置, 主要是 "x" 方向有误。
2. Inter pass cleaning may not have been adequate for all SMAW passes, very small defects as indicated in the UT report db readings.  
对于SMAW焊道间的清理可能不到位, 通过UT报告来看, 其中有许多很小的缺陷。

车间负责人 (Foreman): *MaRniguan*

日期 (Date): *2010.1.19*

This document is APPROVED  
State of California  
DEPARTMENT OF TRANSPORTATION  
Pursuant to Section 6-101 of the  
Standard Specifications  
Initial *fw* Date: *1/20/10*

Disposition:

处理方法:

1. Successful repairs are achievable only when careful application of all of the following process steps are carried out in sequence without variation.

只有当采用了如下所有的方法并按照顺序正确执行后,才可以成功得进行返修。

- a. Careful excavation of all defects and preparation of the repair site are paramount to a successful repair, and the grinding should be continuous unless a long portion of weld is removed  
对超标和不超标的缺陷进行仔细得挖掘和焊接前对返修区域很好的处理是对成功得返修极为关键的。
- b. Provide positive controls and MT tests to ensure the complete removal of the defects.  
提供正确得控制和MT检测,以确保缺陷完全被清除干净。
- c. Clean the repair site to remove foreign matter and debris before the start of any work.  
在进行任何工作前,对返修区域清理干净。
- d. Apply preheat of at least 160°C to the repair and insure that the preheat covers a sufficient area of the repair.  
对返修区域进行预热,并确保在足够的区域内达到足够的预热温度。
- e. Weld the repair in accordance to an approved welding procedure.  
根据批准的WPS进行返修。
- f. Apply postheat blankets and heaters to maintain the proper postweld heat (at least one hour at 160°C) for the required time.  
对返修后进行足够时间的后热处理,并使用电加热板进行。至少保证160°C一小时。
- g. Allow parts to cool to ambient temperature and wait the required time (48 hours minimum) before performing nondestructive evaluation of the repair site.  
等构件冷却到室温并等待48小时后才能对返修区域进行NDT检测。

2. Excavation of the defect.

缺陷的挖掘清除

- b. Any contaminants present in the area to be repaired, such as rust, paint, UT gel etc, shall be removed before any gouging or grinding to remove the weld defect is done.  
任何返修区域内的杂物,比如锈迹,油漆,UT的浆糊等,都应在对焊缝缺陷进行碳刨和打磨前清理干净。
- c. Using air-arc gouging or grinding to remove the weld defect including the material above and to either side of the defect to the prescribed limits. Removal shall be witnessed by the CWI and MT verify that the defect was located and totally removed.  
使用碳刨或者打磨的方法对焊缝的缺陷清除,包括缺陷上面和左右的材料。碳刨过程需有CWI见证,确保缺陷的位置和缺陷完全被清除。之后MT确认。
- d. Preheat to 65° C before performing any gouging to remove weld metal defects.  
在开始对焊缝缺陷进行碳刨,对焊缝预热到 65° C.
- e. Excavation shall be as long as necessary to remove any defects that are extend 50mm by each side.  
碳刨应去除缺陷并左右延伸各50mm的区域。
- f. All excavations shall be ground to bright metal and 100% MT verify that no indication prior to doing any welding.  
在进行焊接前对碳刨区域打磨出金属光泽。100%MT确认无缺陷。
- g. Excavation of material shall be limited to no more than 4 mm per pass and the depth of excavation shall not exceed 2/3T ±2mm.  
每层碳刨深度不能大于4mm。碳刨的总深度不能大于2/3的板厚±2mm。
- h. When a crack is still present and excavations have reached the 2/3T +2mm maximum, and repair work shall proceed in accordance with one of the following procedures:  
如果,当碳刨深度已经达到了2/3的板厚±2mm,但MT显示缺陷仍存在,则返修工作需要按照下述的两条要求进行。

This document is APPROVED  
State of California  
DEPARTMENT OF TRANSPORTATION  
Pursuant to Section 17000 of the  
Standard Specifications  
Date 1/20/10

Disposition:

处理方法:

1. repair both sides of excavation

两面进行碳刨和返修

a. preheat repair area to 65°C prior to performing any gouging.

碳刨前预热至65度。

b. specify limit that the excavation to no more than 4mm per pass

每一道碳刨量深度不能大于4mm。

c. prepare excavation such that all metal is ground clean to a smooth, shiny metal finish and starts and stops are tapered to a 1:1 slope.

碳刨后将坡口打磨平滑, 且挖出的凹槽部分两个端头要有 1:1 的斜式过渡。

d. preheat to 160°C in accordance with table 1 and maintain this temperature throughout the entire repair procedure, including backgouging and welding of opposite side.

按照表一的要求预热到 160 度, 并且该温度要求持续整个焊接过程, 包括反面清根和反面的焊接。

e. weld first side of repair in accordance with the approved WPS.

按照批准的 WPS 进行第一个面的焊接。

f. excavate from the opposite side until sound weld metal is reached.

从反面进行碳刨和打磨直至露出金属光泽。

g. perform 100% MT of excavation to ensure crack has been removed entirely.

对碳刨出的坡口位置进行 100% 的 MT 检测, 确保裂纹清除干净。

h. prepare excavation such that all metal is ground clean to a smooth, shiny metal finish and starts and stops are tapered to a 1:1 slope.

对碳刨出的坡口要进行打磨平滑, 确保连个端头有 1:1 的斜式过渡。

i. weld opposite side of repair in accordance with the approved WPS.

按照 WPS 的要求进行反面的焊接。

j. after weld has been completed, apply post weld heat treatment (PWHT) in accordance with the temperature requirements of table 1 for a minimum of one hour.

焊接完成后, 按照表 1 的要求对焊缝进行后热处理, 处理时间至少 1 小时。

k. once repair has undergone the required PWHT, allow weld to cool gradually by automatic control of the heat machine. And the cooling speed has a maximum of 50°C per hour.

后热结束后, 需要对焊缝进行保温, 进行缓冷处理, 最大冷去速度为 50°C/h。

2. repairing in two stages 第2种返修方案

a. initial excavation 初步碳刨

i preheat repair area to 65°C prior to performing any gouging .

碳刨前加热到 65 度。

ii excavation of material shall be limited to no more than 4mm per pass.

碳刨的过程要注意每层刨除掉的焊缝厚度不能大于 4mm。

iii prepare excavation such that all metal is ground clean to a smooth, shiny metal finish and starts and stops are tapered to a 1:1 slope.

对碳刨出的坡口要进行打磨平滑, 确保连个端头有 1:1 的斜式过渡。

iv preheat to 160°C in accordance with table 1 and maintain this temperature throughout the entire repair procedure.

按照表一的要求预热到 160 度, 并且该温度要求持续整个焊接过程。

v weld first side of repair in accordance with the approved WPS.

按照批准的 WPS 进行第一个面的焊接。

vi after weld has been completed, apply PWHT in accordance with the temperature requirements of table 1 for a minimum of one hour.

焊接完成后, 按照表 1 的要求对焊缝进行后热处理, 处理时间至少 1 小时。

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- vii once repair has undergone the required PWHT, allow weld to cool gradually by automatic control of the heat machine. And the cooling speed has a maximum of 50°C per hour. 后热结束后, 需要对焊缝进行保温, 进行缓冷处理, 最大冷去速度为 50°C/h.
- b. repair of opposite side  
反面的返修
  - i preheat repair area to 65°C prior to performing any gouging.  
碳刨前加热到 65 度.
  - ii excavation of material shall be limited to no more than 4mm per pass.  
碳刨的过程要注意每层刨除掉的焊缝厚度不能大于 4mm.
  - iii prepare excavation such that all metal is ground clean to a smooth, shiny metal finish and starts and stops are tapered to a 1:1 slope.  
对碳刨出的坡口要进行打磨平滑, 确保连个端头有 1:1 的斜式过渡.
  - iv preheat to 160°C in accordance with table 1 and maintain this temperature throughout the entire repair procedure.  
按照表一的要求预热到 160 度, 并且该温度要求持续整个焊接过程.
  - v perform 100% MT of excavation to ensure crack has been removed entirely.  
100%MT 确保所有的裂纹已经彻底移除干净.
  - vi weld opposite side of repair in accordance with the approved WPS.  
按照 WPS 的要求进行反面的焊接.
  - vii after weld has been completed, apply post weld heat treatment (PWHT) in accordance with the temperature requirements of table 1 for a minimum of one hour.  
焊接完成后, 按照表 1 的要求对焊缝进行后热处理, 处理时间至少 1 小时.
  - viii once repair has undergone the required PWHT, allow weld to cool gradually by automatic control of the heat machine. And the cooling speed has a maximum of 50°C per hour. 后热结束后, 需要对焊缝进行保温, 进行缓冷处理, 最大冷去速度为 50°C/h.

- i. When the weld defect appears to have been removed the groove shall be ground clean to bright metal and the excavation shall be tested for complete defect removal using 100% MT per approved procedure.  
当缺陷看似被清理后, 对清理区域进行打磨到金属光泽并使用 100%MT 确认缺陷移除干净.
- j. If all indications are removed, the weld defect is considered to have been removed. No welding shall begin except on two sided repairs until all 100% MT indications have been removed.  
如果所有的 MT 指示均被移除, 则认为所有的缺陷均被移除。在 MT 指示均被移除之前, 不得进行任何焊接。除非是双面返修.
- k. Once the proper depth is reached, the groove shall be tapered to the surface of the existing weld by grinding at a slope of 1 to 1. The excavation of the defect shall extend a minimum of 50mm beyond each end of the defect including the taper.  
当碳刨达完成后, 碳刨表面应打磨成 1:1 的斜势。而且碳刨应在缺陷位置向两边各延伸 50mm, 包括斜势.
- l. k. When all grinding is completed in the area to be repaired, a final 100%MT test will be run by QC personnel to verify that all indications have been removed.  
返修区域打磨完成后, 应有 QC 进行 100%MT, 以确认所有的指示都已清除.
- m. After the gouge is accepted by QC, the entire area shall be cleaned to remove all traces of loose debris and MT powder.  
碳刨得到 QC 的验收后, 整个范围内的杂物比如小碎片和 MT 干磁粉等均需清理干净.

### 3. Welding.

#### 焊接

- a. Preheat shall be applied to the repair area in such a way that the entire area to be repaired and all adjacent material out to a distance of 75mm in all directions of excavation, heated to the higher of the appropriate value shown in Table 1. Preheat application is always stated as a minimum value. Higher preheat values

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Disposition:

处理方法:

必须对返修区域, 包括返修点周边 75mm 范围内进行预热, 预热温度应高于下面表 1 中的规定温度。预热温度要求始终只是一个最低值。如果接头的拘束应力很大的话, 也可以要求更高的预热温度值。

b. SMAW filler metal shall be rated to a hydrogen level of H4 or better.  
SMAW 焊材的扩散氢等级必须等于或低于 H4。

c. The groove shall be filled using the approved SMAW or SAW filler metal in accordance with an approved WPS.

坡口应使用并根据批准的 SMAW 或者 SAW 进行焊接。

d. d. Once the preheating process is started the repair area shall be maintained at this preheat level until all welding is completed. This includes any additional time to remove the defect from the second side gouge. 当预热开始直到焊接结束, 返修区域的温度应始终维持。这也包括从反面碳刨将缺陷移除的预热时间。

e. The CWI shall verify that the welder understands all starts and stops which has bad formation are to be ground before an arc is struck on them to provide a means to tie the next weld pass into the end of the weld.

CWI 应该确保焊工在层间清理时能对层间成型不好的位置进行适当的打磨, 以使下一道焊接能融合到前一道。

f. Before welding over previously deposited metal, all slag shall be removed and the weld and adjacent base metal shall be brushed clean.

开始下一道焊接前, 所有的焊渣必须清理, 而且焊道和周边母材必须刷干净。

g. Preheat shall be maintained on the repair continuously once it is first applied until the weld is complete and the postweld heating phase begins at once.

预热温度在整个返修过程中必须维持好, 直到焊接结束。结束后, 立即就开始后热处理。

4. Postweld Heat Treatment.

后热处理

a. After welding is completed but before the temperature falls below that of the preheat value from Table 1, it shall be maintained at the post heat temperature shown in Table 1.

当焊接结束后, 等温度降到表1规定的最低预热温度前, 后热温度必须保持在表1中的规定温度。

b. Post weld heating shall be maintained for a minimum of 1 hour.

后热处理至少1小时。

c. After the post weld heating time has been reached the repair shall be cooled by removing the heating source and leaving the blankets in place or by another method that will insure the temperature is cooling down gradually. And the cooling speed has a maximum of 50°C per hour.

后热结束后, 通过移除加热源并用保温毯放在焊缝上或者其他方法, 使焊缝能够缓冷, 最大冷去速度为50°C/h。

d. Per the specification require performing the Final UT, MT and Visual inspections, which shall be done at least after 48 hours have passed after the weld repair area has cooled to ambient temperature.

只有当焊缝冷却到室温后的48小时之后, 才能开始最终的UT, MT和VT检测。

e. Perform all NDT in accordance with contract plans as well as ABF approved procedure by ABF/CT, ZPMC will coordinate.

返修结束之后, ABF和CT 按照标书要求和ABF批准的工艺对焊缝进行NDT检测, ZPMC进行配合。

f. All inspection activities shall be documented which includes backgouge inspections.

所有的检验工作均应被记录成文件, 也包括碳刨的检验。

工艺: *Nichte feng*  
Technical Engineer: 2010.01.19

审核: *Luy Jianhua*  
Approved By:

日期: 1/19/10  
Date:

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

版本  
Rev. No.:

2

项目名称 Project Name:	美国海湾大桥 SFOBB	部件图号 Drawing No.:	Lift 5E	报告编号 Report No.:	B-CWR1048
合同号 Contract No.:	04-0120F4	部件名称 Item Name:	5AE corner split weld	NDT 报告编号 NDT Report No.:	NA
项目编号 Project No.:	ZP06-787				

纠正措施:

Corrective Action to Prevent Re-occurrence:

- All new segments splice welds shall be strictly controlled by the Lead CWI  
所有新的箱体拼缝的焊接应有LEAD CWI严格监控。
- All welding parameters shall be verified and recorded.  
所有的焊接参数应被确认并记录成报告。
- Welds shall be made using SMAW (H4) and / or SAW only. FCAW WPS using Supercored 71H shall be approved by ABF JV prior to use. Elevated preheats and postheats may be required by this procedure above what is required for normal SMAW or SAW welding.  
必须只能使用SMAW (H4) 和/或SAW进行焊接。FCAW的方法必须通过ABF的审核后才能使用, 而且, FCAW的预热温度和后热温度可能相对普通的SMAW和SAW情况时, 需要适当提高。
- ZPMC shall document and provide results of all the inspections conducted  
ZPMC必须记录所有的检验, 并将所有检验报告提交。
  - 100%VT of excavation and 50mm either side of the weld excavation.  
对碳刨区域和两边50mm范围内碳刨后进行100%VT
  - 100%MT of excavation and 50mm either side of the weld excavation.  
对碳刨区域和两边 50mm 范围内碳刨后进行 100%MT
  - Interpass cleaning.  
层间清理
  - VT of repaired area.  
返修区域返修后的VT
  - MT of repaired area.  
返修区域返修后的MT
  - UT of repaired area.  
返修区域返修后的UT
- All the new segment splice weld joint shall be under the fabrication and control according to the revised welding procedure which all agreed by three parties.  
以后环缝烧焊要按照三方同意的最新的焊接工艺的要求进行生产和监控。

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Table 1: Preheat & Postheat Requirements for Various Metal Thicknesses

表1 预热和后热温度表

Base Metal Thickness 母材厚度	Minimum Preheat 最低预热温度	Minimum Postheat 最低后热温度
T ≤ 40mm	160°C	160°C
40mm < T	200°C	200°C

车间负责人 (Foreman): *Marquian*

日期 (Date): 2010.1.19

参照的WPS编号 Repair WPS No.:		WPS-345-SMAW-1 G(1F)-FCM-Repair -1 WPS-345-SMAW-4 G(4F)-FCM-Repair -1		工艺员 Technologist:		NiuBiefeng 2010.01.19	
返修(碳刨)前预热温度 Preheat Temperature Before Gouging:				返修的缺陷 Description of Discontinuity:			
焊前处理检查 Inspection Before Welding:				焊前预热温度 Preheat Temperature Before Welding:			
最大碳刨深度 Max. Depth of Gouge:				碳刨总长 Total Length of Gouge:			
焊工 Welder:		焊接类型 Welding Type:		焊接位置 Position:			
焊接电流 Current:		焊接电压 Voltage:		焊接速度 Speed:			
返修后检查 Inspection After Repair:							
外观检查 VT Result:		检验员 Inspector:		日期 Date:			
NDT复检 NDT Result:		探伤员 NDT Person:		日期 Date:			
见证: Witness/Review:							
备注: Remark:							

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**DEPARTMENT OF TRANSPORTATION**

DIVISION OF ENGINEERING SERVICES

Office of Structural Materials

Quality Assurance and Source Inspection



Bay Area Branch  
690 Walnut Ave. St. 150  
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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-000602**Prime Contractor:** American Bridge/Fluor Enterprises, a JV**Date:** 14-Apr-2010**Submitting Contractor:** Zhenhua Port Machinery Company, Ltd (ZPMC), Changxing Island **NCR #:** ZPMC-0595**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:** 11-Jan-2010**Description of Non-Conformance:**

During the Quality Assurance in-process observations of the fabrication of lift 5 East, the QA inspector discovered the following issues:

- Weld repair of transverse cracks without the Engineer's approval.
- No approved welding procedure specification (WPS) was onsite during the welding repair process.
- The weld is identified as "Hold Back" weld #SEG022A-007
- The weld is a Complete Joint Penetration (CJP) weld.
- The weld is joining bottom panel identified as BP110A to the side panel identified as SP558A
- Location is nearest to panel point 032 on the bike path side of segment (@ E3 line).
- Repair is being performed due to eleven (11) transverse indications being discovered in a 325mm area by the contractor using the Ultrasonic Testing (UT) method.
- Y location of repair is noted to be between 20mm~345mm near the 5AE+4BE field splice.
- Lift 5 East is located in the OGB Trial Assembly Area.

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- Y location of repair is noted to be between 20mm~345mm near the 5AE+4BE field splice.
- Lift 5 East is located in the OGB Trial Assembly Area.

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

Submit CWR and perform NDT required to verify weld quality.

**Corrective action taken:**

Contractor submitted CWR after repairs were completed. Additional repairs were required after said incident. NDT documentation was submitted verifying the weld is now in conformance with Contract specifications.

