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: Shanghai, China - Changxing Island **Report No:** NCR-000015
Prime Contractor: American Bridge/Fluor Enterprises, a JV **Date:** 07-Nov-2007
Submitting Contractor: Zhenhua Port Machinery Company, Ltd (ZPMC), Changxing Island **NCR #:** ZPMC-0013

Type of problem:

Welding	☑	**Concrete**	☐	**Other**	☐	
Welding	☑	**Curing**	☐	**Procedural**	☐	**Bridge No:** 34-0006
Joint fit-up	☐	**Coating**	☐	**Other**	☐	**Component:** Orthotropic Box Girder - Bottom Plate
Procedural	☐	**Procedural**	☐	**Descripton:**		

Description of Non-Conformance:
ABF allowed ZPMC welding personnel to weld T-Stiffeners to Orthotropic Box Girder (OBG) bottom plate, panel 42-A, without removing the paint from the weld joint area.

This item of concern was previously discussed with ZPMC Quality Control (QC) personnel Ding Long on Tuesday, November 6, 2007 to which Mr. Long stated the paint in the weld joint area will be removed prior to welding.

Applicable reference:
American Weld Society (AWS), D1.5-2002 standard, Section 3.2 Preparation of Base Metal
Who discovered the problem: Caltrans QA Inspector Jim Cochran
Name of individual from Contractor notified: ABF Representative Art Peterson
Time and method of notification: 0900 - Verbal
Name of Caltrans Engineer notified: Keith Devonport
Time and method of notification: 1000 - Verbal
QC Inspector's Name: ABF Representative Art Peterson
Was QC Inspector aware of the problem: ☐ **Yes** ☑ **No**
Contractor's proposal to correct the problem:
Complete 100% Magnetic Particle Inspection on the affected welds.
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 Patrick Lowry,916-227-5719, who represents the Office of Structural Materials for your project.

Inspected By:	Cochran,Jim	Quality Assurance Inspector
Reviewed By:	McClary,David	QA Reviewer

DEPARTMENT OF TRANSPORTATION - District 4 Toll Bridge
333 Burma Road
Oakland CA 94607
Tel: 510-622-5158 Fax:

NON-CONFORMANCE REPORT TRANSMITTAL

To:	American Bridge/Fluor Enterprises, a JV 375 BURMA ROAD OAKLAND CA 95607	**Date:**	06-Nov-2007
		Contract No:	04-0120F4 04-SF-80-13.2 / 13.9
Dear:	Mr. Charles Kanapicki	**Job Name:**	SAS Superstructure
Attention:	Mr. Michael Flowers Project Executive	**Document No:**	05.03.06-000075
Subject:	NCR No. ZPMC-0013		

Reference Description: Welding electrode used on 89m Strut Sub-Assembly not in compliance

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 - No Response Required.

Material Location: **Lift:**

Remarks:

Originally sent by State letter 05.03.01-000795

Action Required and/or Action Taken:

Transmitted by: Keith Osantowski Sr. Engineer

Attachments: ZPMC-0013

cc:

File: 05.03.06

AMERICAN BRIDGE/FLUOR ENTERPRISES, a JV
P.O. BOX 23223 Oakland, CA 94623
Phone (510) 419-0120 / Fax (510) 839-0666

NCR PROPOSED RESOLUTION

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

Attention: Pursell, Gary
Resident Engineer

Ref: 05.03.06-000075

Subject: NCR No. ZPMC-0013

Dated: **08-Dec-2007**

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

Job Name: SAS Superstructure

Document No.: **ABF-NPR-000008 Rev: 00**

Contractor's Proposed Resolution:

Reference Resolution: ZPMC removed the lower strength filler metal and replaced with the higher strength filler metal E9018.

Wrong filler metal used. Dissimilar welds of Grade 345 to Grade 485 for the Strut Subassemblies require the higher strength filler metal to be used. Contrary to contract documents ZPMC used the lower strength E7018 filler metal. ZPMC has generated an internal NCR, removed the lower strength filler metal and replaced with the higher strength filler metal E9018.

Submitted by: Flowers, Michael

Attachment(s): ABF-NPR-000008R00; ABF-NPR-000008-01

Caltrans' comments:

Status: Approved

Date: 24-Mar-2008

See State Letter 05.03.01-001406

Submitted by: Pursell, Gary

Date: 22-Feb-2008

Attachment(s): 05.03.01-001406

American Bridge / FLUOR
A JOINT VENTURE

375 Burma Road
Oakland, CA 94607 USA
Phone 510-808-4600
Fax 510-808-4601

15-Feb-2008

ABF-CAL-LTR-000446

Mr. Gary Pursell
Resident Engineer
California Department of Transportation
333 Burma Road,
Oakland, CA 94607, USA

PROJECT: **San Francisco Oakland Bay SAS Bridge Superstructure**
Caltrans Contract No. 04-0120F4
ABF Job No. 660110

SUBJECT: **RESPONSE TO NCR-11, 12 AND 13**

Gentlemen:

American Bridge / Fluor Enterprises Inc. a Joint Venture (ABFJV) acknowledges receipt of the Department's Letter No.05.03.01-000795 dated November 6, 2007 forwarding the Department's Non-Compliance Reports NCR-0011, 0012 and 0013.

The attached documents is the response to NCRs 0011, 0012 and 0013. Based on the attached ABFJV is requesting written confirmation from the Engineer that NCRs 0011, 0012 and 0013 are closed.

If you need any more information, please call Chuck Kanapicki at (510) 808-4609.

Sincerely,

AMERICAN BRIDGE/FLUOR ENTERPRISES, INC. A JOINT VENTURE

Michael Flowers
Project Director
MF/CK/cc

File: 02.01, 15.04

American Bridge / FLUOR
A JOINT VENTURE

3740 Pudong Nanlu
Shanghai, China 200120

LETTER OF TRANSMITTAL

To: California Dept. of Transportation
666 Feng Bin Road, Rm. 708
Changxing Island, Shanghai
Attention: Mr. Dave McClary
Project: S.F.O.B.B.
Job # 04-0120F4

Transmittal No: TL-08-0114
Date: 1/9/2008

Enclosed:

Qty.	Item	Qty.	Item
	For Approval		
1	ZPMC Transmittal TL-000513/000514/		
	000515/000516		
	Response to NCR-11/ 12/ 13 & 16		

Sender: Ruby Li Date: 1/9/08

Recipient: Sophy Date: 9. Jan. 2008 9:30

Please indicate receipt of the above mentioned items by signing and returning this transmittal to sender.

American Bridge / FLUOR
A JOINT VENTURE

Date: 08 December 2008 7 CJA 2/14/08

To: Gary Pursell

From: Steve Lawton

Contract No. 04-0120F4

Dear Gary Pursell

NCR's 11, 12, 13, and 16 CJA 2/14/08

This letter is issued to provide formal response addressing the proposed resolution to each of the mentioned NCR's for Engineer's review and approval.

NCR-000011 - Inspection status of fit-up not physically marked on part.

No documentation available at the work area that the fit-up was inspected prior to welding. Physical marking of "Fit-up OK" was not present on part.

ZPMC has acknowledged that the marking was not present on the part, however was able to produce records indicating that the fit-up was inspected. ZPMC has generated an internal NCR to document this non-conformance.

NCR-000012 - 114M Mock-up

Rejects in Stiffener to Skin Plate welds exceeded 10%, repairs were made contrary to contract requirements.

ABFJV has reviewed the Mock-up section of the Special Provisions with ZPMC to gain understanding of this requirement which is different from the requirements for production. Both ABFJV and ZPMC now understand this requirement. ZPMC initiated an internal NCR to address this nonconformance. ZPMC also conducted internal tests and has submitted a plan to improve weld quality. Attached for review is the ZPMC Internal NCR and the written plan to improve weld quality.

NCR-000013 - 89M Mock-up.

Wrong filler metal used. Dissimilar welds of Grade 345 to Grade 485 for the Strut Subassemblies require the higher strength filler metal to be used. Contrary to contract documents ZPMC used the lower strength E7018 filler metal. ZPMC has generated an internal NCR, removed the lower strength filler metal and replaced with the higher strength filler metal E9018.

GJR 2/15/06

NCR-000016 - OBG SPCM Floor Beams Lift 3

SPCM material being used in production was found to not have been check sampled contrary to contract requirements.

ZPMC has generated an internal NCR addressing this issue. Production material was immediately placed on hold remnant material was located in the receiving inspection yard and check samples were taken.
See attached documents

With the above response, ABFJV considers the NCR's mentioned as closed.

If further clarifications are needed, please contact me.

Steve Lawton
Foreign Quality Assurance Manager

TL-000515

TRANSMITTAL LETTER

PROJECT: SAN FRANCISCO OAKLAND BAY BRIDGE

DATE: 12/24/2007

TO: RUBY/ ABFJV QA DEPARTMENT

FROM: ZPMC QA DEPARTMENT

SUBJECT: NCR(NCR-000013) FOR CLOSURE

SUBMITTED FOR YOUR APPROVAL AND SUBMITTAL TO CALTRANS.

ENCLOSED WITH THIS TRANSMITTAL IS ONE

(1) COPY OF LETTER OF RESPONSE FOR CLOSURE NCR (NCR-000013).
(2) COPY OF NCR WITH NUMBER NCR-000013
(3) COPY OF NCR-CT-003
(4) COPY OF WPS

PLEASE SIGN THIS TRANSMITTAL AND RETURN TO ME.

ACKNOWLEGEMENT:

PLAN HOLDER

12/24/07 3:30pm
DATE

ABFJV
COMPANY

PHONE NO.

PLAN NUMBER: N/A
#R787-QCP-102

No.052

LETTER OF RESPONSE

DATE: 2007.12.21

To: AB/F Steve Lawton

From: ZPMC Yang Xuehui

Subject: Response to CT NCR-000013

Mr. Lawton:

ZPMC has generated internal NCR-CT-003 in Response to NCR-000013, Regarding weld with the under matching E7018 electrode, ZPMC has repaired all the welds as according to the approved CWR019-CWR024.

Attached you will find a copy of ZPMC internal NCR, documented training and CWR019-CWR024.

If further information is needed, Please contact me.

Sincerely

Yang Xuehui

Yang Xuehui

2007.12.24

STATE OF CALIFORNIA–BUSINESS,TRANSPORTACTION AND HOUSING AGENCY

Arnold Schwarzenegger, Governor

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: 13.9/14.3,0.0/1.6
File #: 69.25B

QUALITY ASSURANCE -- NON-CONFORMANCE REPORT

Location: ZPMC Changxing Island - Shanghai, China
Prime Contractor: American Bridge/Fluor Enterprises, a JV
Submitting Contractor: Zhenhua Port Machinery Company, Ltd (ZPMC), Changxing Island

Report No: NCR-000013
Date: 15-Oct-2007
NCR #: NCR-000013

Type of problem:

Welding	☑	**Concrete**	☐	**Other**	☐	
Welding	☑	**Curing**	☐	**Procedural**	☐	**Bridge No:** 34-0006
Joint fit-up	☐	**Coating**	☐	**Other**	☐	**Component:** Mock Up 89M
Procedural	☐	**Procedural**	☐	**Descripton:**		

Description of Non-Conformance:
American Bridge/Fluor Enterprises, a JV, allowed ZPMC welding personnel to weld parts of 89M Strut Sub-Assemblies MUSB-MA25 and MUSB-MA26 with an electrode not in compliance with contract specifications. The material welded was ASTM A 709M GR345 to ASTM A709M GR485. The Contract Drawings Sheet numbers MUSB-MA25 and MUSB-MA26, specify in Note 2 "Filler metal matching the higher strength of base metals shall be used". The filler metal actually used was E7018. ZPMC had posted and was following ZPMC approved Weld Procedure Specification (WPS) WPS-B-T-U3b-2 which was for welding the same materials, but in an undermatching condition. The Contract Drawings specified an overmatching condition. The parts in 89M Sub-Assembly MUSB-MA25 which were affected were: piece marks mp209-1 to p516-1 and mp209-2 to p516-2. The parts affected in 89M Sub-Assembly MUSB-MA26 were: piece marks mp517-1 through mp517-4 to p1114-1 through p1114-4. There were 6 weldments in total which were welded with the undermatching E7018 electrode.

Applicable reference:
Shop Drawings Sheet Number MUSB-MA25 and Sheet Number MUSB-MA26

Who discovered the problem: QA Inspector and ABF QA Manager
Name of individual from Contractor notified: John Hamer and Steve Lawton
Time and method of notification: 1000 - Verbal
Name of Caltrans Engineer notified: Stan Ku, Senior Bridge Engineer
Time and method of notification: 10/15/2007, 1300 verbal
QC Inspector's Name: Li Xiu Yang
Was QC Inspector aware of the problem: ☐ Yes ☑ No
Contractor's proposal to correct the problem:

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,(818) 292-0659, who represents the

QUALITY ASSURANCE – NON-CONFORMANCE REPORT

(Continued Page 2 of 2)

Office of Structural Materials for your project.

Inspected By:	Franco,Charlie	Quality Assurance Inspector
Reviewed By:	Cochran,Jim	QA Reviewer

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-CT-003

Item: 89M STRUT SUB-ASSEMBLY 名称描述: 89M 横梁子装配体	**Item Number:** 件号:	**Drawing Number:** 图号: MUSB-MA25，MUSB-MA26

Location: 89M Mock Up 位置: 89 米模型段	**Date:** 日期: 2007-10-15

Description of Nonconformance:

不符合项状态描述:

In 89 Mock up section, the strut sub-sections mp516 and p209, mp517 and p1114 made the A709M-345+HPS 485W butt joint. Because the grade of main material is different, drawing requires"filler metal matching the higher strength of base metal shall be used". Workers used WPS-B-T-4211-B-U3b-2, the filler metal grade is E7018-1, which is different with drawing requirements.

89M 模型段横梁子装配体 mp516 与 p209（2 组）、mp517 与 p1114（4 组）均为异种母材 A709M-345+HPS 485W 对接，蓝图要求填充材料应和强度高的母材相匹配，现场焊接采用 WPS-B-T-4211-B-U3b-2，其填充金属级别为 E7018-1,与蓝图要求不符。

Work By: Sul.yacheng 2007.10.15 **Prepared by:** Zhaochen Sun 2007.10.15 **Reviewed by QCE:** Xujun 2007.10.15

施工方: 准备: 质量工程师批准:

☐ **Drawing Error** 图纸错误 ☐ **Material Defect** 材料缺陷 ☐ **Fabrication Error** 制作错误 ☒ **Other** 其他原因

Disposition: 处理措施: ☐ **Use as is** 回用 ☒ **Repair** 返修 ☐ **Reject** 拒收

Recommendation:

建议:

Material for Shear Link shall be welded with matching filler metal in the case of matching base materials, in the case of dissimilar base metals, welds shall be welded with the higher strength weld filler material per drawing MUSB-MA25&MUSB-MA26 shall be used.

Remove all E7018 filler metal from weld joint by air arc and grinding, prepare weld joint in according with the approved weld procedure WPS-B-T-4221-B-U3b-2.

Fit, tack and weld in according with drawing and WQCP requirements using WPS-B-T-4211-B-U3c-S.

Prepared by: Yangzhenhui 07.10.15 **Approved by QCA:** Hu Gang 07.10.15

准备 质量经理批准

Reason for Nonconformance:

不符合原因:

Welding supervisor did not review drawing thoroughly and did not assign welder the correct WPS for the work, QC did not review drawing requirements thoroughly, therefore inspecting to the wrong requirements.

Prevention of Re-occurrence:

预防措施:

If drawings were reviewed thoroughly by production and QC, this non-conformance would not have occurred. ZPMC QA will verbally notify and perform documented training of personnel involved with this non-conformance to prevent re-occurrence.

Approved by/批准: Yangzhenhui 07.10.15

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

See attachment

Reviewed /批准: Lu Wenjun 2007.10.15

Verification: 确认: ☑ **Acceptable** 可接受 ☐ **Unacceptable** 不可接受

Verified by QCI/质检确认: Ye Yongjun 2007.12.28 **Reviewed by QCA/质检主任审核:** Hu Gang 2007.12.28

#R787-QCP-1300

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-CT-003

Item: 89M STRUT SUB-ASSEMBLY 名称描述: 89M 横梁子装配体	**Item Number:** 件号:	**Drawing Number:** 图号: MUSB-MA25，MUSB-MA26

Location: 89M Mock Up 位置: 89 米模型段	**Date:** 日期: 2007-10-15

Description of Nonconformance:

不符合项状态描述:

In 89 Mock up section, the strut sub-sections mp516 and p209, mp517 and p1114 made the A709M-345+HPS 485W butt joint. Because the grade of main material is different, drawing requires"filler metal matching the higher strength of base metal shall be used". Workers used WPS-B-T-4211-B-U3b-2, the filler metal grade is E7018-1, which is different with drawing requirements.

89M 模型段横梁子装配体 mp516 与 p209（2 组）、mp517 与 p1114（4 组）均为异种母材 A709M-345+HPS 485W 对接，蓝图要求填充材料应和强度高的母材相匹配，现场焊接采用 WPS-B-T-4211-B-U3b-2，其填充金属级别为 E7018-1,与蓝图要求不符。

Work By: [illegible] **Prepared by:** zhao chen sun **Reviewed by QCE:** Xu jun 2007.10.15

施工方: 2007.10.15 准备: 2007.10.15 质量工程师批准:

☐ **Drawing Error** 图纸错误 ☐ **Material Defect** 材料缺陷 ☐ **Fabrication Error** 制作错误 ☐ **Other** 其他原因

Disposition: 处理措施: ☐ **Use as is** 回用 ☒ **Repair** 返修 ☐ **Reject** 拒收

Recommendation:

建议:

在匹配不同母材的条件下，连接板的材料应该和相应的焊材匹配。焊缝应该用高强度的焊材焊接。适用图纸 MUSB-MA25&MUSB-MA26.

碳刨掉用 E7018 焊材焊接的焊缝并打磨，根据批准的 WPS-B-T-4221-B-U3b-2 准备焊接接头。

根据 WQCP 要求的 WPS-B-T-4221-B-U3c-S 进行装配、定位焊和焊接。

Prepared by: [illegible] 07.10.15 准备 **Approved by QCA:** [illegible] 07.10.15 质量经理批准

Reason for Nonconformance:

不符合原因:

焊接检验员没有完全审核图纸，并且没有发放正确的 WPS 给焊工，QC 没有完全的审核图纸，因此按照错误的要求检验。

Prevention of Re-occurrence:

预防措施:

如果生产和 QC 完全审核过图纸，那么就不会出现这份不符合项，为了防止不符合项的再次发生，ZPMC 的 QA 将口头通知并对相关人员进行文件的培训。

Approved by/批准: [illegible] 07.10.15

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

见附页。

Reviewed /批准: Luhongyu 2007.10.15

Verification: 确认: ☑ **Acceptable** 可接受 ☐ **Unacceptable** 不可接受

Verified by QCI/质检确认: Xehongjun 2007.12.28 **Reviewed by QCA/质检主任审核:** [illegible] 2007.12.28

#R787-QCP-1300

不符合项报告（NCR-CT-003）回复意见：

1、对于已经点焊的焊缝，要求将点焊缝打磨去除，重新按 WPS-B-T-4221-B-U3c-S 进行焊接。

2、对于已经焊接的焊缝，要求将焊缝碳刨去除，并进行打磨。对于损伤的母材予以修补，要求如下：

a、将堆焊区域表面清理干净，必要时应打磨表面；

b、采用药皮焊条手工电弧焊进行堆焊修补；

c、对于材质为 A709M HPS 485W 的焊条选用 Excalibur 9018M MR（Φ4.0、Φ4.8），具体修补见附页 WPS-485-SMAW-1G(1F)-Repair；对于材质为 A709-50-2 的焊条选用 TL-508(Φ3.2、Φ4.0、Φ5.0)，具体修补见附页 WPS-345-SMAW-1G(1F)-Repair;

d、堆焊表面须高出母材表面 5mm 左右，堆焊完毕后打磨平整光滑，与母材齐平，并做 100%MT 检查。

e、按 WPS-B-T-4221-B-U3c-S 进行焊接。

陆汝西
2007.10.15

Resolution to NCR-CT-003:

1. As to the tacked welds, it is required to grind and remove them and then to weld according to the WPS-B-T-4221-B-U3c-S.
2. For the finished welds, it is required to gouge and remove them and then grind. Repair the damaged base metal. The requirements are as follows:
   a. Clean the surface of the surfacing area. Grind the surface if necessary.
   b. Repair the surfacing by SMAW.
   c. For the plate of A709M HPS 485W, choose the electrode of Excalibur 9018M MR (ϕ4.0、ϕ4.8), The repairing details can be per WPS-485-SMAW-1G(1F)-Repair; For the plate of A709-50-2, choose the electrode of Excalibur TL-508(ϕ3.2、ϕ4.0、ϕ5.0). The repairing details can be per WPS-345-SMAW-1G(1F)-Repair;
   d. Surfacing face should be about 5mm higher than material base, grind smoothly and tidy after surfacing as tall as material base and inform MT inspection.
   e. Welding according to WPS-B-T-4221-B-U3c-S.

LuWenyu
2017.10.15

ZPMC	焊接工艺规程 B* WELDING PROCEDURE SPECIFICATION	编号 No. WPS-345-SMAW-1G(1F)-Repair (返修焊接工艺) 有效期 Period of validity 无期限 No Requirement

母材技术条件（Material specification） ASTM A.709M Gr.345F2
焊接方法（Welding process） 药皮焊条手工电弧焊(SMAW)
手工或机械（Manual or machine or semi-auto） 手工(Manual)
焊接位置（Position of welding） 平焊(1G、1F)
填充金属技术条件（Filler metal specification） AWS A5. 填充金属级别（Filler metal classification） E7018
填充金属牌号（Filler metal brand） TL-508 (Φ3.2、Φ4.0、Φ5.0)
焊剂（Flux） N/A
保护气体（Shielding gas） N/A 流率（Flow rate） N/A
单焊道或多焊道（Single or multiple pass） 多道(Multiple Pass)
单弧或多弧（Single or multiple arc） 单弧(Single arc)
焊接电流（Welding current） 直流(DC) 极性（Polarity） 反接(EP)
焊丝伸出长度（Electrode extension） N/A 焊接方向（Welding progression） N/A
根部处理（Root treatment） N/A
碳刨前预热温度(Preheat temperature before gouging)
非关键性返修（Noncritical repair） N/A *关键性返修（Critical repair）* ≥65℃
焊前最低预热温度和道间温度（Minimum preheat and interpass temperature before welding）
非关键性返修（Noncritical repair） 60℃ [T≤20mm] 100℃ [20mm<T≤40mm] 120℃ [40mm<T≤60mm] 160℃ [60mm<T]
关键性返修（Critical repair） 160℃[T≤40mm] 200℃ [40mm<T]
最高预热和道间温度（Preheat and interpass temperature Max.）230℃
后热温度(Postheat temperature)
非关键性返修（Noncritical repair）N/A
关键性返修（Critical repair） 230℃~315℃ 保温时间(Keep temperature time) 1h/25mm [1h，T<25mm]
热输入（线能量）(Heat input) 最小(Min) 1.50KJ/mm 最大(Max) 3.50KJ/mm

焊 接 工 艺
(Welding procedure)

焊道序号 Pass No.	焊条(丝)规格 Electrode Size (mm)	焊接电流 Welding Current 安培 Amp(s)	焊接电流 Welding Current 伏特 Volts	焊接速度 Travel Speed (mm/min)
1~n	3.2	90~130	18~24	28~124
或 1~n	4.0	140~180	20~27	48~194
或 1~n	5.0	180~240	24~32	75~307

☐ APPROVED
☑ APPROVED AS NOTED
☐ 接头详图 APPROVED
Joint Detail
Pursuant to Section 5-1.02
of the Standard Specifications
见附页(see attached)
State of California
DEPARTMENT OF TRANSPORTATION
Signed for RTM
Structure Representative
Date 7-30-07

选定适用的电流、电压后在 WPS 焊接参数选用表中查到焊接速度范围。
Refer to WPS parameters table to determine operating parameter to stay within the heat input limit.

该工艺可以因制造工序、装配、焊道尺寸等而变化，但应在 AASHTO/AWS D1.5 第 5 章给出的变量限值之内。
(This procedure may vary due to fabrication sequence, fit-up, pass size, etc., within the limitation of variables given in section 5.)

修订号(Revision No.) 1 批准(Authorized by)
工艺评定记录编号(PQR No.) 免除评定 Prequalification 日期(Date) 2007.3.30

* 本 WPS 符合 AASHTO/AWS D1.5 2002，用于桥梁结构。
(This WPS is conformable with the current edition of AASHTO/AWS D1.5 2002, used for BRIDGE structure.)

焊接工艺规程
WELDING PROCEDURE SPECIFICATION

接头详图 JOINT DETAIL

参考 Reference: WPS-345-SMAW-1G(1F)-Repair

所有凿槽的最小斜度为:2:1(45°)
Taper ends of all excavations - 2:1 (45°) min.

凿槽形状最小半径为R=10mm
Shape excavations to 10mm radius min.

☑ APPROVED AS NOTED

☐ NOT APPROVED

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

Signed _____
Structure Representative

注释 NOTES

预热和道间温度必须与产品 WPS 所规定的值相同.对于接头具有此等高的拘束度时,可以要求更高的预热温度.
Preheat and interpass temperatures shall be the same as the production WPS . Higher preheat temperatures may be required for highly restrained joints .

. 焊接修补 Repairs

所有的焊接修补都应符合 AWS D1.5-2002 12.17-焊接修补章节;标准规范以及合同规定.
All repairs are to be made in accordance with the provisions of AWS D1.5-2002,Section 12.17 – Repair Welding; the Standard Specifications and the Special Provisions for Contract.

焊接修补应包括(A)非关键性返修或者(B)关键性返修.它们必须按照已被批准的 WQCP 中包含的工艺进行准备和焊接.QC 人员应在返修开始之前被通知。
Repairs will be deemed as either (A) Non-Critical Repairs or (B) Critical Repairs and shall be prepared and welded in conformance to the procedures contained in approved Welding Quality Control Plan Quality Control is to be notified prior to beginning any repair.

去除焊缝金属以及部分母材对于完成焊接修补是必要的.去除的数量以保证去除缺陷的前提下必须尽可能的少.焊缝以及母材的去除可以采用打磨或者碳刨+打磨的方法进行.
Remove weld metal and any portions of the base material necessary to remove the discontinuity. The amount of material removed shall be the minimum necessary to remove the discontinuity. Removal of weld and base metal may be done by grinding, chipping or gouging+grinding.

对于焊缝或者母材出现的裂纹必须清除裂纹的整个长度加上超出其每一端至少 50mm 的金属.邻近的焊缝金属和母材不能有缺痕,沟槽,或者其它损坏.
Cracks in the weld or the base metal shall be excavated a minimum of 2" into sound metal beyond each end. Adjacent weld and base metal shall not be nicked, gouged or otherwise damaged.

碳刨深度必须限制在 2/3 板厚，若超过该深度需从反面碳刨以完成修补.
The depth of the repair gauge should be limited to 2/3T and gouged from the back side to complete the repair, where possible.

在焊接每道焊缝之前,必须利用铁刷或者其它合适的方法对焊缝以及邻近的焊缝金属的焊渣进行清除.
Before welding over previously deposited weld metal, all slag shall be removed and the weld and the adjacent weld metal shall be cleaned by brushing or other suitable means.

焊接开始之前需对返修区域打磨光亮并执行磁粉探伤.
Grind all repair areas to bright metal and perform Magnetic Particle Testing prior to the start of welding.

在确认清除所有缺陷后,必须填充额外的焊缝金属.母材必须恢复至原金属表面并且光滑过渡.焊缝必须恢复至规定的外形.所有焊缝都需按照 AWS D1.5-2002 第 6.26 章节要求进行目检.
After removal of the discontinuity, additional weld metal shall be deposited. Base metal shall be restored to the original surface and ground smooth. Welds shall be restored to the specified profile. All welding is subject to the visual inspection requirements of AWS D1.5-2002, section 6.26.

焊接修补必须按照规定的无损探伤要求进行.
Repair welding shall be subject to the specified NDE testing required.

2007.3.30

ZPMC	焊接参数选用表 B# SELECTED LIST OF WELDING PARAMETER	编号 No. WPS-345-SMAW-1G(1F)-Repair (返修焊接工艺)

PQR 编号: PQR No.	对于免除评定Φ3.2 焊条 WPS For WPS Prequalified For SMAW Φ3.2 Electrode

	电流 Amps	电压 Volts	焊接速度 Travel Speed (mm/min)	热输入 Heat Input (KJ/mm)						
平均值 Average										
范围 Range										
最大值 Maximum	130.0	24.0	124.0	3.50						
最小值 Minimum	90.0	18.0	28.0	1.50						

WPS 焊接参数选用表
WPS Parameters Table

电压 Volts	电流 Amps									
	90.0		100.0		110.0		120.0		130.0	
18.0	28.0	64.8	30.9	72.0	33.9	79.2	37.0	86.4	40.1	93.6
19.5	30.1	70.2	33.4	78.0	36.8	85.8	40.1	93.6	43.5	101.4
20.0	30.9	72.0	34.3	80.0	37.7	88.0	41.1	96.0	44.6	104.0
22.5	34.7	81.0	38.6	90.0	42.4	99.0	46.3	108.0	50.1	117.0
24.0	37.0	86.4	41.1	96.0	45.3	105.6	49.4	115.2	53.5	124.0
	焊接速度 Travel Speed in mm/min									

选用示例：如选用 110A 和 20V，在表中纵横相交查到的焊接速度范围为 37.7~88.0mm/min.
EX:110A×20V×Travel speed Range 37.7~88.0mm/min.

☐ APPROVED
☑ APPROVED AS NOTED
☐ NOT APPROVED

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

Signed _____
Structure Representative

Date _____

批准(Authorized By): _____

日期(Date): 2007.3.30

ZPMC	焊接参数选用表 B* SELECTED LIST OF WELDING PARAMETER	编号 No. WPS-345-SMAW-1G(1F)-Repair (返修焊接工艺)

PQR 编号: PQR No.					对于免除评定Φ4.0 焊条 WPS For WPS Prequalified For SMAW Φ4.0 Electrode					
	电流 Amps	电压 Volts	焊接速度 Travel Speed (mm/min)	热输入 Heat Input (KJ/mm)						
平均值 Average										
范围 Range										
最大值 Maximum	180.0	27.0	194.0	3.50						
最小值 Minimum	140.0	20.0	48.0	1.50						

WPS 焊接参数选用表
WPS Parameters Table

电压 Volts	电流 Amps									
	140.0		150.0		160.0		170.0		180.0	
20.0	48.0	112.0	51.4	120.0	54.9	128.0	58.3	136.0	61.7	144.0
21.8	52.2	121.8	55.9	130.5	59.7	139.2	63.4	147.9	67.1	156.6
22.3	53.6	125.1	57.4	134.0	61.3	142.9	65.1	151.9	68.9	160.8
25.3	60.6	141.4	64.9	151.5	69.3	161.6	73.6	171.7	77.9	181.8
27.0	64.8	151.2	69.4	162.0	74.1	172.8	78.7	183.6	83.3	194.0
	焊接速度 Travel Speed in mm/min									

选用示例：如选用 160A 和 25.3V，在表中纵横相交查到的焊接速度范围为 69.3~161.6mm/min.
EX:160A×25.3V×Travel speed Range 69.3~161.6mm/min.

☐ APPROVED
☑ APPROVED AS NOTED
☐ NOT APPROVED

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

Signed _____
Structure Representative

批准(Authorized By): [illegible]

日期(Date): 2007.3.30

ZPMC	焊接参数选用表 B* SELECTED LIST OF WELDING PARAMETER	编号 No. WPS-345-SMAW-1G(1F)-Repair (返修焊接工艺)

PQR 编号:
PQR No.

对于免除评定 Φ5.0 焊条 WPS
For WPS Prequalified For SMAW Φ5.0 Electrode

	电流 Amps	电压 Volts	焊接速度 Travel Speed (mm/min)	热输入 Heat Input (KJ/mm)						
平均值 Average										
范围 Range										
最大值 Maximum	240.0	32.0	307.0	3.50						
最小值 Minimum	180.0	24.0	75.0	1.50						

WPS 焊接参数选用表
WPS Parameters Table

电压 Volts	电流 Amps									
	180.0		195.0		210.0		225.0		240.0	
24.0	75.0	172.8	80.2	187.2	86.4	201.6	92.6	216.0	98.7	230.4
26.0	80.2	187.2	86.9	202.8	93.6	218.4	100.3	234.0	107.0	249.6
26.7	82.3	192.0	89.1	208.0	96.0	224.0	102.9	240.0	109.7	256.0
30.0	92.6	216.0	100.3	234.0	108.0	252.0	115.7	270.0	123.4	288.0
32.0	98.7	230.4	107.0	249.6	115.2	268.8	123.4	288.0	131.7	307.0
	焊接速度 Travel Speed in mm/min									

选用示例：如选用 210A 和 26.7V，在表中纵横相交查到的焊接速度范围为 96.0~224.0mm/min.
EX.:210A×26.7V×Travel speed Range 96.0~224.0mm/min.

☐ APPROVED
☑ APPROVED AS NOTED
☐ NOT APPROVED

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

Signed _____
Structure Representative

Date _____

批准(Authorized By): 周晓聚

日期(Date): 2007.3.30

R787-QCP-1602

ZPMC	焊接工艺规程 B* WELDING PROCEDURE SPECIFICATION	编号 No. WPS-B-T-4221-B-U3c-S 有效期 Period of validity FCM :2007.1~2010.1 NON-FCM :2007.1~2012.1

母材技术条件（Material specification） SHEAR LINK GRADE 485+ ASTM A.709M Gr.345F2

焊接方法（Welding process） 埋弧自动焊(SAW)

手工或机械（Manual or machine or semi-auto）.... 机械(Machine)

焊接位置（Position of welding） 平焊(1G)

填充金属技术条件（Filler metal specification） AWS A5.23

填充金属级别（Filler metal classification） ENi5

填充金属牌号（Filler metal brand）LA-85(Φ4.8)

焊剂牌号（Flux brand） MIL800-HPNi 焊剂级别（Flux classification） F9A4

保护气体（Shielding gas） N/A 流率（Flow rate） N/A

单焊道或多焊道（Single or multiple pass） 多道(Multiple Pass)

单弧或多弧（Single or multiple arc） 单弧(Single arc)

焊接电流（Welding current） 直流(DC)

极性（Polarity） 反接(EP)

焊丝伸出长度（Electrode extension） 30mm

焊接方向（Welding progression） N/A

根部处理（Root treatment） 碳弧气刨(Carbon Arc Air Gouging)

最低预热和道间温度（Preheat and interpass temperature Min）

40℃ [T≤20mm] 100℃ [20mm<T≤40mm] 140℃ [40mm<T≤60mm] 180℃ [60mm<T]

最高预热和道间温度（Preheat and interpass temperature Max）230℃

后热温度(Postheat temperature) N/A

热输入（线能量）(Heat input) 最小(Min) 1.77KJ/mm 最大(Max) 2.72KJ/mm

☐ APPROVED
☑ APPROVED AS NOTED
☐ NOT APPROVED

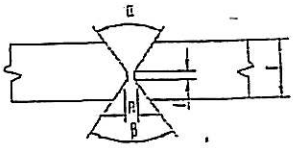
Pursuant to Section 5-1.02 of the Standard Specifications
State of California
DEPARTMENT OF TRANSPORTATION

Signed Chris Powell for RTM
Structure Representative

Date 7-30-07

焊 接 工 艺

(Welding procedure)

焊道序号 Pass No.	焊条(丝)规格 Electrode Size (mm)	焊接电流 Welding Current 安培 Amp(s)	焊接电流 Welding Current 伏特 Volts	焊接速度 Travel Speed (mm/min)	接头详图 Joint Detail
1~n	4.8	548.2~659.1	28.8~33	382.5~513.5	T=3~75mm R=0(+2, -0) f=6 最小 min(+6, -0) α=β=60° (+10°, -5°) 

选定运用的电流、电压后在 WPS 焊接参数选用表中查到焊接速度范围。

Refer to WPS parameters table to determine operating parameter to stay within the heat input limit.

该工艺可以因制造工序、装配、焊道尺寸等而变化，但应在 AASHTO/AWS D1.5 第 5 章给出的变量限值之内。

(This procedure may vary due to fabrication sequence, fit-up, pass size, etc., within the limitation of variables in Section 5.)

修订号(Revision No.) 0 批准(Authorized by)

工艺评定记录编号(PQR No.) HP2006130/HP200746-3 日期(Date) 2007.6.7

* 本 WPS 符合 AASHTO/AWS D1.5 2002，用于桥梁结构。

(This WPS is conformable with the current edition of AASHTO/AWS D1.5 2002, used for BRIDGE structure.)

ZPMC	焊接参数选用表 B* SELECTED LIST OF WELDING PARAMETER	编号 No. WPS-B-T-4221-B-U3c-S

PQR 编号: HP200746-3
PQR No.

根据 5.13 评定的 WPS
For WPS qualified to 5.13

	电流 Amps	电压 Volts	焊接速度 Travel Speed (mm/min)	热输入 Heat Input (KJ/mm)						
平均值 Average	599.2	31.0	450.0	2.48						
范围 Range										
最大值 Maximum	659.1	33.2	517.5	2.72						
最小值 Minimum	539.3	28.8	382.5	1.73						

经过评定合格的 WPS 焊接参数选用表
WPS Parameters Table

电压 Volts	电流 Amps									
	539.3		569.2		599.2		629.1		659.1	
28.8	382.5	517.5	382.5	517.5	382.5	517.5	399.5	517.5	418.5	517.5
29.9	382.5	517.5	382.5	517.5	394.8	517.5	414.5	517.5	434.3	517.5
30.3	382.5	517.5	382.5	517.5	399.5	517.5	419.5	517.5	439.5	517.5
32.1	382.5	517.5	402.2	517.5	423.4	517.5	444.6	517.5	465.8	517.5
33.2	394.0	517.5	415.8	517.5	437.7	517.5	459.6	517.5	481.5	517.5
	焊接速度 Travel Speed in mm/min									

选用示例：如选用 599.2A 和 30.3V，在表中纵横相交击到的焊接速度范围为 399.5~517.5mm/min.
EX.: 599.2A×30.3V×Travel speed Range 399.5~517.5mm/min.

☐ APPROVED
☑ APPROVED AS NOTED
☐ NOT APPROVED

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

Signed _____
Structure Representative

Date _____

批准(Authorized By): 周晓邦

日期(Date): 2007-6-7

ZPMC	焊接参数选用表 B* SELECTED LIST OF WELDING PARAMETER	编号 No. WPS-B-T-4221-B-U3c-S

PQR 编号：HP2006130
PQR No.

根据 5.13 评定的关于 SAW 的 WPS
For WPS qualified to 5.13 for SAW

	电流 Amps	电压 Volts	焊接速度 Travel Speed (mm/min)	热输入 Heat Input (KJ/mm)						
平均值 Average	609.1	30.8	446.5	2.52						
范围 Range										
最大值 Maximum	670.0	33.0	513.5	2.78						
最小值 Minimum	548.2	28.7	379.5	1.77						

经过评定合格的 WPS 焊接参数选用表
WPS Parameters Qualified

电压 Volts	电流 Amps									
	548.2		578.6		609.1		639.5		670.0	
28.7	379.5	513.5	379.5	513.5	379.5	513.5	396.4	513.5	415.2	513.5
29.8	379.5	513.5	379.5	513.5	391.7	513.5	411.3	513.5	430.9	513.5
30.1	379.5	513.5	379.5	513.5	396.4	513.5	416.2	513.5	436.1	513.5
31.9	379.5	513.5	399.1	513.5	420.1	513.5	441.1	513.5	462.1	513.5
33.0	390.9	513.5	412.6	513.5	434.3	513.5	456.0	513.5	477.7	513.5
	焊接速度 Travel Speed in mm/min									

选用示例：如选用 578.6A 和 30.1V，在表中纵横相交查到的焊接速度范围为 379.5~513.5mm/min.
EX.: 578.6A×30.1V×Travel speed Range 379.5~513.5mm/min.

☐ APPROVED
☑ APPROVED AS NOTED
☐ NOT APPROVED

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

Signed _____
Structure Representative

Date _____

批准(Authorized By): 周晓东

日期(Date): 2007.6.7

R787-QCP-1602

115B

ZPMC	焊接参数选用表 B* SELECTED LIST OF WELDING PARAMETER	编号 No. WPS-B-T-4221-B-U3c-S

PQR 编号：HP2006130+HP200746-3
PQR No.

根据 5.13 评定的关于 SAW 的 WPS
For WPS qualified to 5.13 for SAW

	电流 Amps	电压 Volts	焊接速度 Travel Speed (mm/min)	热输入 Heat Input (KJ/mm)						
平均值 Average										
范围 Range										
最大值 Maximum	659.1	33.0	513.5	2.72						
最小值 Minimum	548.2	28.8	382.5	1.77						

经过评定合格的 WPS 焊接参数选用表
WPS Parameters Qualified

电压 Volts	电流 Amps									
	548.2		575.9		603.7		631.4		659.1	
28.8	382.5	513.5	382.5	513.5	383.5	513.5	401.1	513.5	418.7	513.5
29.9	382.5	513.5	382.5	513.5	397.5	513.5	415.7	513.5	434.0	513.5
30.2	382.5	513.5	383.7	513.5	402.1	513.5	420.6	513.5	439.1	513.5
32.0	386.4	513.5	405.9	513.5	425.4	513.5	445.0	513.5	464.5	513.5
33.0	399.1	513.5	419.2	513.5	439.4	513.5	459.6	513.5	479.8	513.5
	焊接速度 Travel Speed in mm/min									

选用示例：如选用 603.7A 和 30.2V，在表中纵横相交查到的焊接速度范围为 402.1~513.5mm/min.
EX.: 603.7A×30.2V×Travel speed Range 402.1~513.5mm/min.

☐ APPROVED
☑ APPROVED AS NOTED
☐ NOT APPROVED

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

Signed _____
Structure Representative

批准(Authorized By): 陈[illegible]

日期(Date): 2007.6.7

R787-QCP-1602

115C

ZPMC	焊接工艺规程 B* WELDING PROCEDURE SPECIFICATION	编号 No. WPS-485-SMAW-1G(1F)-Repair (非 FCM 返修焊接工艺) 有效期 Period of validity NON-FCM: 2007.5~2012.5

母材技术条件（Material specification） A.709M HPS 485WT2 / SHEAR LINK GRADE 485

焊接方法（Welding process） 药皮焊条手工电弧焊(SMAW)

手工或机械（Manual or machine or semi-auto） 手工(Manual)

焊接位置（Position-of welding） 平焊(1G、1F)

填充金属技术条件(Filler metal specification) AWS A5.5 填充金属级别(Filler metal classification) E9018M-H4R

填充金属牌号（Filler metal brand） Excalibur 9018M MR (Φ4.0、Φ4.8)

焊剂（Flux） N/A

保护气体（Shielding gas） N/A 流量（Flow rate） N/A

单焊道或多焊道（Single or multiple pass） 多道(Multiple Pass)

单弧或多弧（Single or multiple arc） 单弧(Single arc)

焊接电流（Welding current） 直流(DC) 极性（Polarity） 反接(EP)

焊丝伸出长度（Electrode extension） N/A

焊接方向（Welding progression） N/A

根部处理（Root treatment） N/A

焊前最低预热温度和道间温度（Minimum preheat and interpass temperature before welding）

40℃ [T≤20mm] 80℃ [20mm<T≤40mm] 140℃ [40mm<T≤60mm] 160℃ [60mm<T]

最高预热和道间温度（Preheat and interpass temperature Max.） 230℃

后热温度(Postheat temperature) N/A

热输入（线能量）(Heat input) 最小(Min) 2.05KJ/mm 最大(Max) 3.22KJ/mm

焊 接 工 艺

(Welding procedure)

焊道序号 Pass No.	焊条(丝)规格 Electrode Size (mm)	焊接电流 Welding Current 安培 Amp(s)	焊接电流 Welding Current 伏特 Volts	焊接速度 Travel Speed (mm/min)
1~n	4.0	130~210	19~27	46~166
或				
1~n	4.8	180~300	20~28	67.1~245.9

☐ APPROVED

☑ APPROVED AS NOTED

☐ 接头细部 APPROVED

Joint Detail

Pursuant to Section 5-1.02 of the Standard Specifications

见附页(see attachment) State of California

DEPARTMENT OF TRANSPORTATION

Signed Chris Hamel for RTM

Structure Representative

Date 7-30-07

运定适用的电流、电压后在 WPS 焊接参数运用表中查到焊接速度范围。

Refer to WPS parameters table to determine operating parameter to stay within the heat input limit.

该工艺可以因制造工序、装配、焊道尺寸等而变化，但应在 AASHTO/AWS D1.5 第 5 章给出的变量限值之内。

(This procedure may vary due to fabrication sequence, fit-up, pass size, etc., within the limitation of variables given in section 5.)

修订号(Revision No.) 0 批准(Authorized by)

工艺评定记录编号(PQR No.) HP200776-1 日期(Date) 2007.6.7

* 本 WPS 符合 AASHTO/AWS D1.5 2002，用于桥梁结构。

(This WPS is conformeble with the current edition of AASHTO/AWS D1.5 2002, used for BRIDGE structure.)

焊接工艺规程
WELDING PROCEDURE SPECIFICATION

☐ APPROVED
☑ APPROVED AS NOTED
☐ NOT APPROVED

接头详图 JOINT DETAIL

参考 Reference: WPS-485-SMAW-1G(1F)-Repair

凿槽形状最小半径为R=10mm
Shape excavations to 10mm radius minimum

所有凿槽的最小斜度为:2:1(45°)
Taper ends of all excavations - 2:1 (45°) min.

State of California
DEPARTMENT OF TRANSPORTATION
15

Signed _____ R=10
Structure Representative

Date _____

注释 NOTES

预热和道间温度必须与产品 WPS 所规定的值相同.对于接头具有比较高的拘束度时,可以要求更高的预热温度. Preheat and interpass temperatures shall be the same as the production WPS . Higher preheat temperatures may be required for highly restrained joints .
焊接修补 Repairs
所有的焊接修补都应符合 AWS D1.5-2002 3.2、3.7 焊接修补章节;标准规范以及合同规定. All repairs are to be made in accordance with the provisions of AWS D1.5-2002,Section 3.2、3.7 – Repair Welding; the Standard Specifications and the Special Provisions for Contract.
焊接修补应按照已被批准的 WQCP 中包含的工艺进行准备和焊接.QC 人员应在返修开始之前被通知。 Repairs shall be prepared and welded in conformance to the procedures contained in approved Welding Quality Control Plan Quality Control is to be notified prior to beginning any repair.
去除焊缝金属以及部分母材对于完成焊接修补是必要的.去除的数量以保证去除缺陷的前提下必须尽可能的少.焊缝以及母材的去除可以采用打磨或者碳刨+打磨的方法进行. Remove weld metal and any portions of the base material necessary to remove the discontinuity. The amount of material removed shall be the minimum necessary to remove the discontinuity. Removal of weld and base metal may be done by grinding, chipping or gouging+grinding.
对于焊缝或者母材出现的裂纹必须清除裂纹的整个长度加上超出其每一端至少 50mm 的金属.邻近的焊缝金属和母材不能有缺痕,沟槽,或者其它损坏. Cracks in the weld or the base metal shall be excavated a minimum of 2" into sound metal beyond each end.Adjacent weld and base metal shall not be nicked, gouged or otherwise damaged.
碳刨深度必须限制在 2/3 板厚，若超过该深度需从反面碳刨以完成修补. The depth of the repair gouge should be limited to 2/3T and gouged from the back side to complete the repair, where possible.
在焊接每道焊缝之前,必须利用铁刷或者其它合适的方法对焊缝以及邻近的焊缝金属的焊渣进行清除. Before welding over previously deposited weld metal, all slag shall be removed and the weld and the adjacent weld metal shall be cleaned by brushing or other suitable means.
焊接开始之前需对返修区域打磨光亮并执行磁粉探伤. Grind all repair areas to bright metal and perform Magnetic Particle Testing prior to the start of welding.
在确认清除所有缺陷后,必须填充额外的焊缝金属.母材必须恢复至原金属表面并且光滑过渡.焊缝必须恢复至规定的外形.所有焊缝都需按照 AWS D1.5-2002 第 6.26 章节要求进行目检. After removal of the discontinuity, additional weld metal shall be deposited. Base metal shell be restored to the original surface and ground smooth. Welds shall be restored to the specified profile. All welding is subject to the visual inspection requirements of AWS D1.5-2002, section 6.26.
焊接修补必须按照规定的无损探伤要求进行. Repair welding shall be subject to the specified NDE testing required.

2007.6.7

R7B7-QCP-1601

ZPMC	焊接参数选用表 B* SELECTED LIST OF WELDING PARAMETER	编号 No. WPS-485-SMAW-1G(1F)-Repair (非 FCM 返修焊接工艺)

PQR 编号：HP200776-1
PQR No.

根据 5.13 评定的Φ4.0 焊条 WPS
For WPS qualified to 5.13 For SMAW Φ4.0 Electrode

☑ APPROVED AS NOTED
☐ NOT APPROVED

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

Signed _____
Structure Representative

Date _____

	电流 Amps	电压 Volts	焊接速度 Travel Speed (mm/min)	热输入 Heat Input (KJ/mm)						
平均值 Average										
范围 Range										
最大值 Maximum	210.0	27.0	166.0	3.22						
最小值 Minimum	130.0	19.0	46.0	2.05						

WPS 焊接参数选用表
WPS Parameters Table

电压 Volts	电流 Amps									
	130.0		150.0		170.0		190.0		210.0	
19.0	46.0	72.3	53.1	83.4	60.2	94.5	67.3	105.7	74.3	116.8
21.0	50.9	79.9	58.7	92.2	66.5	104.5	74.3	116.8	82.2	129.1
21.7	52.5	82.4	60.6	95.1	68.6	107.8	76.7	120.5	84.8	133.2
25.0	60.6	95.1	69.9	109.8	79.2	124.4	88.5	139.0	97.8	153.7
27.0	65.4	102.7	75.5	118.5	85.5	134.3	95.6	150.1	105.7	166.0
	焊接速度 Travel Speed in mm/min									

选用示例：如选用 170A 和 21.7V，在表中纵横相交查到的焊接速度范围为 68.6~107.8mm/min.
EX.: 170A×21.7V×Travel speed Range 68.6~107.8mm/min.

批准(Authorized By): 杨[illegible]

日期(Date): 2007-6-7

ZPMC	焊接参数选用表 B* SELECTED LIST OF WELDING PARAMETER	编号 No. WPS-485-SMAW-1G(1F)-Repair (非 FCM 返修焊接工艺)

PQR 编号：HP200776-1 PQR No.	根据 5.13 评定的Φ4.8 焊条 WPS For WPS qualified to 5.13 For SMAWΦ4.8 Electrode

	电流 Amps	电压 Volts	焊接速度 Travel Speed (mm/min)	热输入 Heat Input (KJ/mm)						
平均值 Average										
范围 Range										
最大值 Maximum	300.0	28.0	245.9	3.22						
最小值 Minimum	180.0	20.0	67.1	2.05						

WPS 焊接参数选用表
WPS Parameters Table

电压 Volts	电流 Amps									
	180.0		210.0		240.0		270.0		300.0	
20.0	67.1	105.4	78.3	122.9	89.4	140.5	100.6	158.0	111.8	175.6
22.0	73.8	115.9	86.1	135.2	98.4	154.5	110.7	173.9	123.0	193.2
22.7	76.0	119.4	88.7	139.3	101.4	159.2	114.0	179.1	126.7	199.0
26.0	87.2	137.0	101.7	159.8	116.3	182.6	130.8	205.5	145.3	228.3
28.0	93.9	147.5	109.6	172.1	125.2	196.7	140.9	221.3	156.5	245.9
	焊接速度 Travel Speed in mm/min									

选用示例：如选用 240A 和 22.7V，在表中纵横相交处到的焊接速度范围为 101.4~159.2mm/min.

EX.: 240A×22.7V×Travel speed Range 101.4~159.2mm/min.

☐ APPROVED
☑ APPROVED AS NOTED
☐ NOT APPROVED

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

Signed R-787-OCP-1602 Structure Representative

批准(Authorized By):

日期(Date): 2007.6.7

148B

Meeting minutes about training

Training Room	Steel Bridge Meeting room	Date	2007－12－13	Trainer	Fu Yuhong
main problems	1、Didn't review drawing thoroughly . 2、Didn't assign welder the correct WPS for the work. 3、QC didn't review drawing requirements thoroughly.				
content of training	1、Before welding please know well about the associated WPS, and perform strictly. 2、Assemble and weld strictly in requirements of technical procedure. 3、Let welders know the specification of electrode storage and application. Improve monitoring and punishing method. 4、If any information is not clearly before welding, mark it clearly in time.				
Remark	attachment: training sign-notes。				

Training Sign Notes

Name	Date	Name	Date	Name	Date	Name	Date
Fu Yulong	2007.12.13						
Zhang Jiadi	2007.12.13						
zhaodiansun	2007.12.13						
Pu Wenling	2007.12.13						
Ma Qian Li	2007.12.13						
Jiang Lei	2007.12.13						
Liu Huajie	2007.12.13						
chenhao	2007.12.13						
JIANG JIANFEI	2008.12.13						
FU GUOGANG	2008.12.13						

ZPMC	关键焊缝返修报告 Critical Welding Repair Report				版本 Rev. No. 0
项目名称 Project Name	美国海湾大桥 SFOBB	部件图号 Drawing No	P209-2 MP516-2	报告编号 Report No.	CWR024
合同号 Contract No.:	04-0120F4	部件名称 Items Name	8 9 m strut sub-sections	NDT报告编号 Report No.of NDT	
项目编号 Project No.:	ZP06-787				

焊缝缺陷描述：

Description of welding discontinuity:

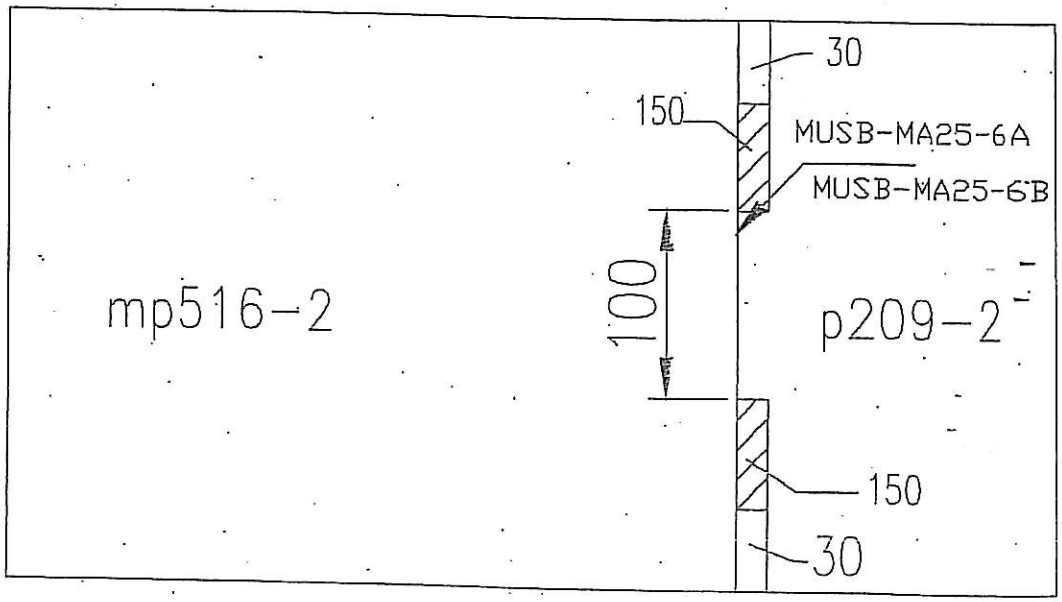
连系梁在制作过程中焊接材料用错，看NCR-CT-003.

Use the wrong WPS, see NCR-CT-003. （MUSB-MA25-6 A, MUSB-MA25-6 B）.

检验员（Inspector）：Zhang Lei 日期(Date)：2007-10-26

焊缝返修位置示意图：

Draft of welding discontinuity:



Remark: tack welding in shadow

This document is APPROVED
State of California
DEPARTMENT OF TRANSPORTATION
Pursuant Section 5-1.02 of the
Standard Specifications
Initial
Date

产生原因:

Caused:

Welding supervisor did not review drawing thoroughly and did not assign welder the correct WPS for the work, QC did not review drawing requirements thoroughly, therefore inspecting to the wrong requirements.

车间负责人(Foreman): Yang Xuehui 日期(Date):2007.10.26

处理意见

Disposition:

1, Preheaf before gouging, the temperature is not below 65°C;

2, As to the tacked welds, it is required to grind and remove them ;

3, Welding according to WPS-B-T-4221-B-U3c-S.

工 艺: Luwenyu 2007.10.26 审核: Hu Guang 日期 2007.10.26

Technical engineer Approved by Date

#R787-QCP-701

This document is APPROVED
State of California
DEPARTMENT OF TRANSPORTATION
Pursuant section 6-1.02 of the
Standard Specifications
Initial Date: 31 Oct 07

ZPMC	关键焊缝返修报告 Critical Welding Repair Report	版本 Rev. No 0

项目名称 Project Name	美国海湾大桥 SFOBB	部件图号 Drawing No.	P209-2 MP516-2	报告编号 Report No.	CWR024
合同号 Contract No.:	04-0120F4	部件名称 Items Name	89m strut sub-sections.	NDT报告编号 Report No.of NDT	
项目编号 Project No.:	ZP06-787				

纠正措施:

Correction action to prevent re occurrence:

If drawings were reviewed thoroughly by production and QC, this non-conformance would not have occurred. ZPMC QA will verbally notify and perform documented training of personnel involved with this non-conformance to prevent re-occurrence.

车间负责人(Foreman): Yang Xuehua 期(Date): 2007.10.26

参照的WPS编号 Repair WPS No.	WPS-B-T-4221-B-U3c-S	工艺员 technologist	Luwenyu 2007.10.26
返修（碳刨）前预热温度 Preheat temperature before gouging	NA	返修的缺陷 Description of discontinuity	焊材对用位置
焊前处理检查 Inspection before welding	All	焊前预热温度 Preheat temperature before welding	190
最大碳刨深度 Max. depth of gouging	NA	碳刨总长 Total length of gouging	NA

焊工 welder 053748	焊接类型 welding type SAW	焊接位置 position 1G
焊接电流 Current 598A	焊接电压 Voltage 31.8 V	焊接速度 Speed 425

返修后检查

Inspection After repairing:

外观检查 VT result All	检验员 Inspector Yang Yun 07031561	日期 Date 2007.11.27
NDT复检 NDT result UT Acc	探伤员 NDT person Li Liwei	日期 Date 2007.11.27

见证:
Witness/Review:

备注:
Remark:

#R787-QCP-701

This document is: APPROVED
State of California
DEPARTMENT OF TRANSPORTATION
Pursuant Section 5-1.02 of the
Standard Specifications
Initial W Date: 21 [illegible]

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-CT-003

Item: 89M STRUT SUB-ASSEMBLY 名称描述: 89M 横梁子装配体	**Item Number:** 件号:	**Drawing Number:** 图号: MUSB-MA25, MUSB-MA26

Location: 89M Mock Up 位置: 89 米模型段	**Date:** 日期: 2007-10-15

Description of Nonconformance:

不符合项状态描述:

In 89 Mock up section, the strut sub-sections mp516 and p209, mp517 and p1114 made the A709M-345+HPS 485W butt joint. Because the grade of main material is 'different, drawing requires"filler metal matching the higher strength of base metal shall be used". Workers used WPS-B-T-4211-B-U3b-2, the filler metal grade is E7018-1, which is different with drawing requirements.

89M 模型段横梁子装配体 mp516 与 p209（2 组）、mp517 与 p1114（4 组）均为异种母材 A709M-345+HPS 485W 对接，蓝图要求填充材料应和强度高的母材相匹配，现场焊接采用 WPS-B-T-4211-B-U3b-2，其填充金属级别为 E7018-1,与蓝图要求不符。

Work By: Xue Jacheng **Prepared by:** Zhao Chen Sun **Reviewed by QCE:** Xu Jun 2007.10.15

施工方: 2007.10.15 准备: 2007.10.15 质量工程师批准:

☐ **Drawing Error** 图纸错误 ☐ **Material Defect** 材料缺陷 ☐ **Fabrication Error** 制作错误 ☐ **Other** 其他原因 /

Disposition: ☐ **Use as is** 回用 ☐ **Repair** 返修 ☐ **Reject** 拒收 /

Recommendation:

建议:

Material for Shear Link shall be welded with matching filler metal in the case of matching base materials, in the case of dissimilar base metals, welds shall be welded with the higher strength weld filler material per drawing MUSB-MA25&MUSB-MA26 shall be used.

Remove all E7018 filler metal from weld joint by air arc and grinding, prepare weld joint in according with the approved weld procedure WPS-B-T-4221-B-U3c-S.

Fit, tack and weld in according with drawing and WQCP requirements using WPS-B-T-4211-B-U3c-S and WPS-485-SMAW-1G(1F)-Repair.

Prepared by: Yongxiang Lin 07.10.15 **Approved by QCA:** Hu Gang 07.10.15

准备 质量经理批准

Reason for Nonconformance:

不符合原因:

Welding supervisor did not review drawing thoroughly and did not assign welder the correct WPS for the work, QC did not review drawing requirements thoroughly, therefore inspecting to the wrong requirements.

Prevention of Re-occurrence:

预防措施:

If drawings were reviewed thoroughly by production and QC, this non-conformance would not have occurred. ZPMC QA will verbally notify and perform documented training of personnel involved with this non-conformance to prevent re-occurrence.

Approved by/批准: Yongxiang Lin 07.10.15

Technical Justification for Use-As-Is/Repair: ☐ **Attachment** 附件 ☐ **Non-attachment** 无附件

回用或返修的技术依据:

See attachment

Reviewed /批准: Lu Wenjun 2007.10.15

Verification: ☐ **Acceptable** 可接受 ☐ **Unacceptable** 不可接受

确认:

Verified by QCI/质检确认: _____ **Reviewed by QCA/质检主任审核:** _____

#R787-QCP-1300

This document is: APPROVED
State of California
DEPARTMENT OF TRANSPORTATION
Pursuant Section 5-1.02 of the
Standard Specifications
Initial: [illegible] Date: [illegible]

ZPMC	关键焊缝返修报告 Critical Welding Repair Report				版本 Rev. No. 0
项目名称 Project Name	美国海湾大桥 SFOBB	部件图号 Drawing No	P209-1 MP516-1	报告编号 Report No.	CWR023
合同号 Contract No.:	04-0120F4	部件名称 Items Name	89m strut sub-sections	NDT报告编号 Report No.of NDT	
项目编号 Project No.:	ZP06-787				

焊缝缺陷描述：

Description of welding discontinuity:

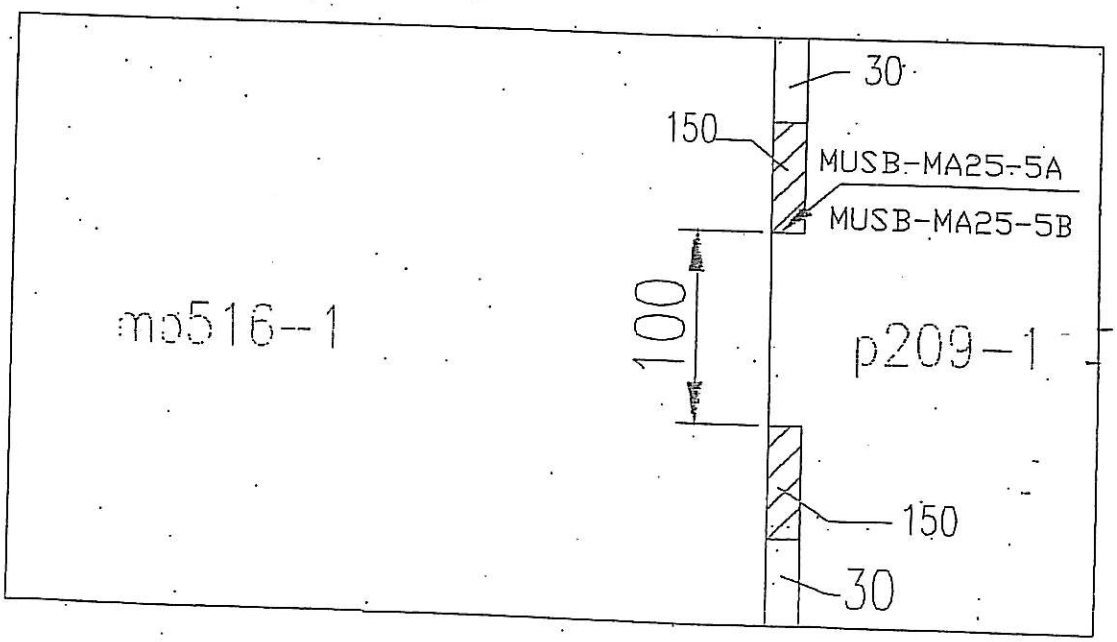
连系梁在制作过程中焊接材料用错，看NCR-CT-003.

Use the wrong WPS, see NCR-CT-003. （MUSB-MA25-5A, MUSB-MA25-5B）.

检验员（Inspector）：Zhang Lei Zhang Lei 日期(Date)：2007-10-26

焊缝返修位置示意图：

Draft of welding discontinuity:



Remark: tack welding in shadow

This document is: APPROVED
State of California
DEPARTMENT OF TRANSPORTATION
Pursuant Section 54.06 of the
Standard Specifications
Initial [illegible] Date 3/10/09

ZPMC

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-CT-003

Item: 89M STRUT SUB-ASSEMBLY 名称描述: 89M 横梁子装配体	Item Number: 件号:	Drawing Number: 图号: MUSB-MA25, MUSB-MA26

Location: 89M Mock Up 位置: 89 米模型段	Date: 日期: 2007-10-15

Description of Nonconformance:
不符合项状态描述:

In 89 Mock up section, the strut sub-sections mp516 and p209, mp517 and p1114 made the A709M-345+HPS 485W butt joint. Because the grade of main material is different, drawing requires"filler metal matching the higher strength of base metal shall be used". Workers used WPS-B-T-4211-B-U3b-2, the filler metal grade is E7018-1, which is different with drawing requirements.

89M 模型段横梁子装配体 mp516 与 p209（2 组）、mp517 与 p1114（4 组）均为异种母材 A709M-345+HPS 485W 对接，蓝图要求填充材料应和强度高的母材相匹配，现场焊接采用 WPS-B-T-4211-B-U3b-2，其填充金属级别为 E7018-1,与蓝图要求不符。

Work By: Xu Jucheng Prepared by: zhao chen San Reviewed by QCE: Xu Jun 2007.10.15
施工方: 2007.10.15 准备: 2007.10.15 质量工程师批准:

☐ Drawing Error 图纸错误 ☐ Material Defect 材料缺陷 ☐ Fabrication Error 制作错误 ☐ Other 其他原因

Disposition: 处理措施: ☐ Use as is 回用 ☐ Repair 返修 ☐ Reject 拒收

Recommendation:
建议:

Material for Shear Link shall be welded with matching filler metal in the case of matching base materials, in the case of dissimilar base metals, welds shall be welded with the higher strength weld filler material per drawing MUSB-MA25&MUSB-MA26 shall be used.

Remove all E7018 filler metal from weld joint by air arc and grinding, prepare weld joint in according with the approved weld procedure WPS-B-T-4221-B-U3c-S.

Fit, tack and weld in according with drawing and WQCP requirements using WPS-B-T-4211-B-U3c-S and WPS-485-SMAW-1G(1F)-Repair.

Prepared by: Yang Xuek Lin 07.10.15 Approved by QCA: Hu Gang 07.10.15
准备 质量经理批准

Reason for Nonconformance:
不符合原因:

Welding supervisor did not review drawing thoroughly and did not assign welder the correct WPS for the work, QC did not review drawing requirements thoroughly, therefore inspecting to the wrong requirements.

Prevention of Re-occurrence:
预防措施:

If drawings were reviewed thoroughly by production and QC, this non-conformance would not have occurred. ZPMC QA will verbally notify and perform documented training of personnel involved with this non-conformance to prevent re-occurrence.

Approved by/批准: Yang Xuek Lin 07.10.15

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

See attachment

Reviewed /批准: Liu Wenjin 2007.10.15

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

This document is: APPROVED
State of California
DEPARTMENT OF TRANSPORTATION
Pursuant Section 5-1.02 of the Standard Specifications
Initial: [illegible] Date: 3/04/07

ZPMC	关键焊缝返修报告 Critical Welding Repair Report				版本 Rev. No. 0
项目名称 Project Name	美国海湾大桥 SFOBB	部件图号 Drawing No	P1114-3 MP517-3	报告编号 Report No.	CWR022
合同号 Contract No.:	04-0120F4	部件名称 Items Name	8 9 m strut sub-sections	NDT报告编号 Report No.of NDT	
项目编号 Project No.:	ZP06-787				

焊缝缺陷描述：

Description of welding discontinuity:

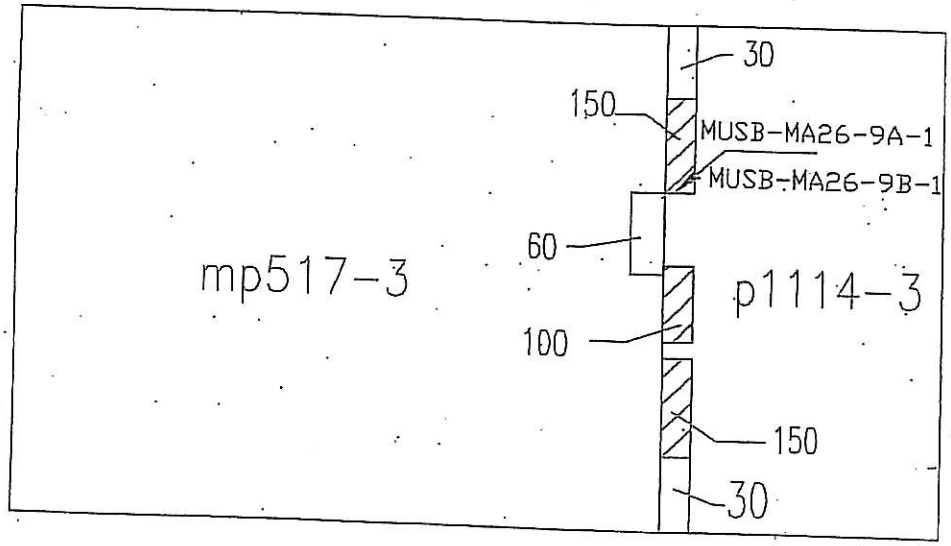
连系梁在制作过程中焊接材料用错，看NCR-CT-003.

Use the wrong WPS, see NCR-CT-003.（MUSB-MA26-9A-1, MUSB-MA26-9B-1）.

检验员（Inspector）：Zhang Lei 日期(Date)：2007-10-26

焊缝返修位置示意图：

Draft of welding discontinuity:



Remark: tack welding in shadow

This document is APPROVED
State of California
DEPARTMENT OF TRANSPORTATION
Pursuant Section 5-1.02 of the
Standard Specifications
Initial
Date:

产生原因:

Caused:

1. Welding supervisor did not review drawing thoroughly and did not assign welder the correct WPS for the work
2. QC did not review drawing requirements thoroughly, therefore inspecting to the wrong requirements.

车间负责人(Foreman): Yang Xuekun 日期(Date):2007.10.26

处理意见

Disposition :

1, Preheat before gouging, the temperature is not below 65°C;
2, As to the tacked welds, it is required to grind and remove them ;
3, Welding according to WPS-B-T-4221-B-U3c-S.

工 艺: Liu Weiyu 2007.10.26
Technical engineer

审核: Hu Gang
Approved by

日期 2007.10.26
Date

#R787-QCP-701

This document is: APPROVED
State of California
DEPARTMENT OF TRANSPORTATION
Pursuant Section 5-1.02 of the
Standard Specifications

ZPMC	关键焊缝返修报告 Critical Welding Repair Report				版本 Rev. No. 0
项目名称 Project Name	美国海湾大桥 SFOBB	部件图号 Drawing No.	P1114-3 MP517-	报告编号 Report No.	CWR022
合同号 Contract No.:	04-0120F4	部件名称 Items Name	89m strut sub-sections	NDT报告编号 Report No.of NDT	
项目编号 Project No.:	ZP06-787				

纠正措施:

Correction action to prevent re occurrence:

If drawings were reviewed thoroughly by production and QC, this non-conformance would not have occurred.

ZPMC QA will verbally notify and perform documented training of personnel involved with this non-conformance to prevent re-occurrence.

车间负责人(Foreman): Yang Xuehua 日期(Date): 2007.10.26

参照的WPS编号 Repair WPS No.	WPS-B-T-4221-B-U3c-S	工艺员 technologist	Luwenyu 2007.10.26
返修（碳刨）前预热温度 Preheat temperature before gouging	NA	返修的缺陷 Description of discontinuity	焊材用完
焊前处理检查 Inspection before welding	ACC	焊前预热温度 Preheat temperature before welding	180°C
最大碳刨深度 Max. depth of gouging	NA	碳刨总长 Total length of gouging	NA

焊工 welder 053748	焊接类型 welding type SAW	焊接位置 position 1G
焊接电流 Current 592A	焊接电压 Voltage 34V	焊接速度 Speed 438

返修后检查
Inspection After repairing:

外观检查 VT result ACC	检验员 Inspector 07031451	日期 Date 2007.11.27
NDT复检 NDT result UT ACC	探伤员 NDT person Liu Qiming	日期 Date 2007.11.27
见证: Witness/Review:		
备注: Remark:		

#R787-QCP-701

This document has been approved
State of California
DEPARTMENT OF TRANSPORTATION
Pursuant Section 5-1.02 of the
Standard Specifications

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-CT-003
Item: 89M STRUT SUB-ASSEMBLY 名称描述: 89M 横梁子装配体	Item Number: 件号:
Drawing Number: 图号: MUSB-MA25, MUSB-MA26	
Location: 89M Mock Up 位置: 89 米模型段	Date: 日期: 2007-10-15

Description of Nonconformance:
不符合项状态描述:

In 89 Mock up section, the strut sub-sections mp516 and p209, mp517 and p1114 made the A709M-345+HPS 485W butt joint. Because the grade of main material is different, drawing requires"filler metal matching the higher strength of base metal shall be used". Workers used WPS-B-T-4211-B-U3b-2, the filler metal grade is E7018-1, which is different with drawing requirements.

89M 模型段横梁子装配体 mp516 与 p209（2 组）、mp517 与 p1114（4 组）均为异种母材 A709M-345+HPS 485W 对接，蓝图要求填充材料应和强度高的母材相匹配，现场焊接采用 WPS-B-T-4211-B-U3b-2，其填充金属级别为 E7018-1,与蓝图要求不符。

Work By: Xie Yucheng Prepared by: Zhaoshen Sun Reviewed by QCE: Xu Jun 2007.10.15
施工方: 2007.10.15 准备: 2007.10.15 质量工程师批准:

☐ Drawing Error 图纸错误 ☐ Material Defect 材料缺陷 ☐ Fabrication Error 制作错误 ☐ Other 其他原因

Disposition: ☐ Use as is 回用 ☐ Repair 返修 ☐ Reject 拒收
处理措施:

Recommendation:
建议:

Material for Shear Link shall be welded with matching filler metal in the case of matching base materials, in the case of dissimilar base metals, welds shall be welded with the higher strength weld filler material per drawing MUSB-MA25&MUSB-MA26 shall be used.

Remove all E7018 filler metal from weld joint by air arc and grinding, prepare weld joint in according with the approved weld procedure WPS-B-T-4221-B-U3c-S.

Fit, tack and weld in according with drawing and WQCP requirements using WPS-B-T-4211-B-U3c-S and WPS-485-SMAW-1G(1F)-Repair.

Prepared by: Yongxuel Lin 07.10.15 Approved by QCA: Hu Gang 07.10.15
准备 质量经理批准

Reason for Nonconformance:
不符合原因:

Welding supervisor did not review drawing thoroughly and did not assign welder the correct WPS for the work, QC did not review drawing requirements thoroughly, therefore inspecting to the wrong requirements.

Prevention of Re-occurrence:
预防措施:

If drawings were reviewed thoroughly by production and QC, this non-conformance would not have occurred. ZPMC QA will verbally notify and perform documented training of personnel involved with this non-conformance to prevent re-occurrence.

Approved by/批准: Yongxuel Lin 07.10.15

Technical Justification for Use-As-Is/Repair: ☐ Attachment 附件 ☐ Non-attachment 无附件
回用或返修的技术依据:
See attachment

Reviewed /批准: Lu Wenjun 2007.10.15

Verification: ☐ Acceptable 可接受 ☐ Unacceptable 不可接受
确认:

Verified by QCI/质检确认: Reviewed by QCA/质检主任审核:

#R787-QCP-1300

This document is: APPROVED
State of California
DEPARTMENT OF TRANSPORTATION
Pursuant Section 6-1.02 of the
Standard Specifications
Initial: hr Date: 31 Oct 07

ZPMC	关键焊缝返修报告 Critical Welding Repair Report				版本 Rev. No. 0
项目名称 Project Name	美国海湾大桥 SFOBB	部件图号 Drawing No	P1114-1 MP517-1	报告编号 Report No.	CWR021
合同号 Contract No.:	04-0120F4	部件名称 Items Name	89m strut sub-sections	NDT报告编号 Report No.of NDT	
项目编号 Project No.:	ZP06-787				

焊缝缺陷描述：

Description of welding discontinuity:

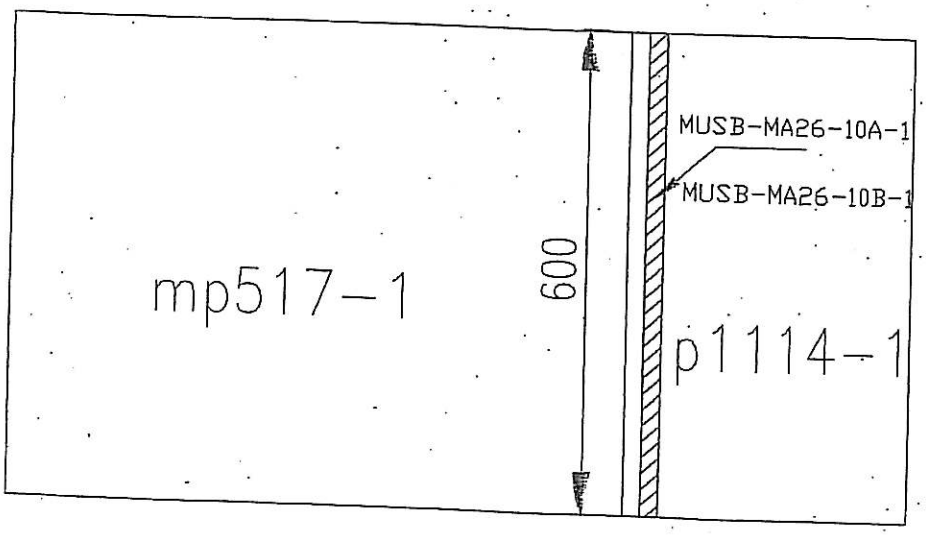
连系梁在制作过程中焊接材料用错，看NCR-CT-003.

Use the wrong WPS, see NCR-CT-003.（MUSB26-10A-1, MUSB-MA26-10B-1）

检验员（Inspector）：Zhang Lei 日期(Date)：2007-10-26

A焊缝返修位置示意图：

Draft of welding discontinuity:



Remark: root welding in shadow

DEPARTMENT OF TRANSPORTATION
Pursuant Section 5-1.02 of the

产生原因:

Caused:

1. Welding supervisor did not review drawing thoroughly and did not assign welder the correct WPS for the work
2. QC did not review drawing requirements thoroughly, therefore inspecting to the wrong requirements.

车间负责人(Foreman): Yang Xue hui 日期(Date):2007.10.26

处理意见

Disposition :

1, Preheat before gouging, the temperature is not below 65°C;

2, For the finished welds, it is required to gouge and remove them and then grind.

3, Repair the damaged base metal. The requirements are as follows:
Clean the surface of the surfacing area. Grind the surface if necessary.

4, Repair the surfacing by SMAW:
For the plate of A709M HPS 485W, choose the electrode of Excalibur 9018M MR(Φ 4.0, Φ 4.8),The repairing details can be per WPS-485-SMAW-1G(1F)-Repair; For the plate of A709-50-2, choose the electrode of Excalibur TL-508(Φ 3.2, Φ 4.0, Φ 5.0). The repairing details can be per WPS-345-SMAW-1G(1F)-Repair;

5, Surfacing face should be about 5mm higher than material base, grind smoothly and tidy after surfacing as tall as material base and inform 100% MT inspection.

6, Welding according to WPS-B-T-4221-B-U3c-S.

工 艺: Lu Wenju 2007.10.26
Technical engineer

审核: Hu Gang
Approved by

日期 2007.10.26
Date

#B787-QCP-701

...ment is: APPROVED
State of California
DEPARTMENT OF TRANSPORTATION

ZPMC	关键焊缝返修报告 Critical Welding Repair Report	版本 Rev. No. 0

项目名称 Project Name	美国海湾大桥 SFOBB	部件图号 Drawing No.	P1114-1 MP517-	报告编号 Report No.	CWR021
合同号 Contract No.:	04-0120F4	部件名称 Items Name.	89m strut sub-sections	NDT报告编号 Report No.of NDT	
项目编号 Project No.:	ZP06-787				

纠正措施:

Correction action to prevent re occurrence:

If drawings were reviewed thoroughly by production and QC, this non-conformance would not have occurred.

ZPMC QA will verbally notify and perform documented training of personnel involved with this non-conformance to prevent re-occurrence.

车间负责人(Foreman): Yang Xue hui 日期(Date): 2007.10.26

参照的WPS编号 Repair WPS No.	WPS-485-SMAW-1G (1F) -Repair WPS-345-SMAW-1G (1F) -Repair WPS-B-T-4221-B-U3c-S	工艺员 technologist	Luwenyu 2007.10.26
返修（碳刨）前预热温度 Preheat temperature before gouging	90°c	返修的缺陷 Description of discontinuity	焊材相关
焊前处理检查 Inspection before welding	ALL	焊前预热温度 Preheat temperature before welding	200°c
最大碳刨深度 Max. depth of gouging		碳刨总长 Total length of gouging	600mm

焊工 welder hai xiao Feng 054467	焊接类型 welding type SMAW	焊接位置 position 1G
焊接电流 Current 189 A	焊接电压 Voltage 24.5V	焊接速度 Speed 121

返修后检查

Inspection After repairing:

外观检查 VT result ALL	检验员 Inspector Ye Yongjun 07031461	日期 Date 2007-11.09
NDT复检 NDT result MT OK	探伤员 NDT person zhou Dongjun	日期 Date 2007.11.09

见证:

Witness/Review:

备注:

Remark:

#R787-QCP-701

This document is: APPROVED
State of California
DEPARTMENT OF TRANSPORTATION
Pursuant Section 5-1.02 of the
Standard Specifications
Initial [illegible] Date: [illegible]

ZPMC

Nonconformance Report

不符合项报告

Project Name: 项目名称: S.F.O.B.B 美国加州海湾大桥	**NCR Number:** NCR 编号: NCR-CT-003
Item: 89M STRUT SUB-ASSEMBLY 名称描述: 89M 横梁子装配体	**Item Number:** 件号: / **Drawing Number:** 图号: MUSB-MA25, MUSB-MA26
Location: 位置: 89M Mock Up 89 米模型段	**Date:** 日期: 2007-10-15

Description of Nonconformance:
不符合项状态描述:

In 89 Mock up section, the strut sub-sections mp516 and p209, mp517 and p1114 made the A709M-345+HPS 485W butt joint. Because the grade of main material is different, drawing requires"filler metal matching the higher strength of base metal shall be used". Workers used WPS-B-T-4211-B-U3b-2, the filler metal grade is E7018-1, which is different with drawing requirements.

89M 模型段横梁子装配体 mp516 与 p209（2 组）、mp517 与 p1114（4 组）均为异种母材 A709M-345+HPS 485W 对接，蓝图要求填充材料应和强度高的母材相匹配，现场焊接采用 WPS-B-T-4211-B-U3b-2，其填充金属级别为 E7018-1,与蓝图要求不符。

Work By: Xie Jacheng 施工方: 2007.10.15 **Prepared by:** zhaochenSun 准备: 2007.10.15 **Reviewed by QCE:** Xujun 2007.10.15 质量工程师批准:

☐ **Drawing Error** 图纸错误 ☐ **Material Defect** 材料缺陷 ☐ **Fabrication Error** 制作错误 ☐ **Other** 其他原因

Disposition: 处理措施: ☐ **Use as is** 回用 ☐ **Repair** 返修 ☐ **Reject** 拒收

Recommendation:
建议:

Material for Shear Link shall be welded with matching filler metal in the case of matching base materials, in the case of dissimilar base metals, welds shall be welded with the higher strength weld filler material per drawing MUSB-MA25&MUSB-MA26 shall be used.

Remove all E7018 filler metal from weld joint by air arc and grinding, prepare weld joint in according with the approved weld procedure WPS-B-T-4221-B-U3c-S.

Fit, tack and weld in according with drawing and WQCP requirements using WPS-B-T-4211-B-U3c-S and WPS-485-SMAW-1G(1F)-Repair.

Prepared by: 准备 YongXuLi 07.10.15 **Approved by QCA:** 质量经理批准 Hu Gang 07.10.15

Reason for Nonconformance:
不符合原因:

Welding supervisor did not review drawing thoroughly and did not assign welder the correct WPS for the work, QC did not review drawing requirements thoroughly, therefore inspecting to the wrong requirements.

Prevention of Re-occurrence:
预防措施:

If drawings were reviewed thoroughly by production and QC, this non-conformance would not have occurred. ZPMC QA will verbally notify and perform documented training of personnel involved with this non-conformance to prevent re-occurrence.

Approved by/批准: YongXuLi 07.10.15

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

See attachment

Reviewed /批准: Lu Wenjie 2007.10.15

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

This document is APPROVED
State of California
DEPARTMENT OF TRANSPORTATION
Pursuant Section 5-1.02 of the

ZPMC	关键焊缝返修报告 Critical Welding Repair Report				版本 Rev. No. 0
项目名称 Project Name	美国海湾大桥 SFOBB	部件图号 Drawing No	P1114-4 MP517-4	报告编号 Report No.	CWR020
合同号 Contract No.:	04-0120F4	部件名称 Items Name	89m strut sub-sections	NDT报告编号 Report No.of NDT	
项目编号 Project No.:	ZP06-787				

焊缝缺陷描述：

Description of welding discontinuity:

连系梁在制作过程中焊接材料用错，看NCR-CT-003.

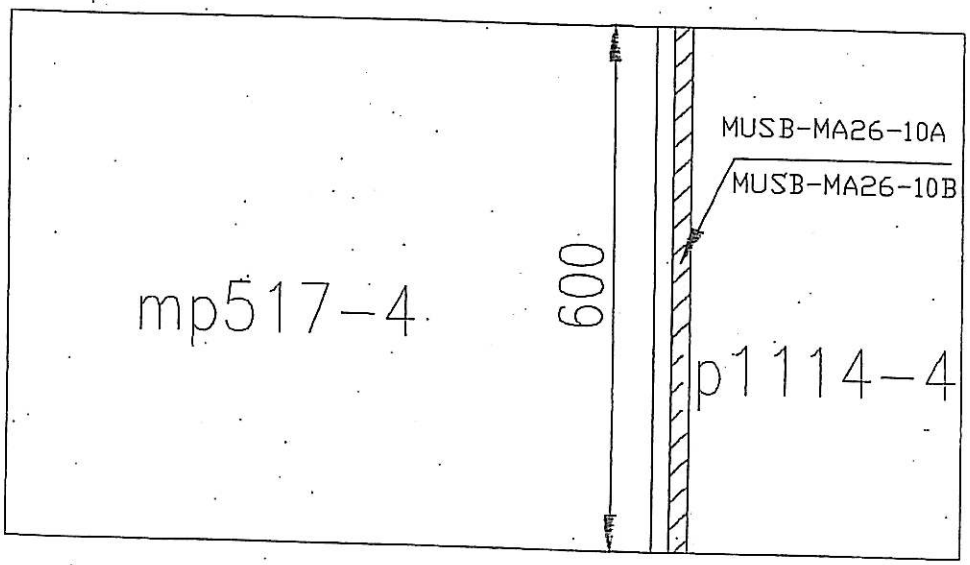
Use the wrong WPS, see NCR-CT-003. （MUSB-MA26-10A,MUSB-MA26-10B）.

zhang Lei

检验员（Inspector）：zhang Lei 日期(Date)：2007-10-26

焊缝返修位置示意图：

Draft of welding discontinuity:



Remark: root welding in shadow

This document is APPROVED
State of California
DEPARTMENT OF TRANSPORTATION
Pursuant Section 5-1.02 of the

产生原因:

Caused:

1. Welding supervisor did not review drawing thoroughly and did not assign welder the correct WPS for the work.
2. QC did not review drawing requirements thoroughly, therefore inspecting to the wrong requirements.

车间负责人(Foreman): Yang Xuehui 日期(Date):2007.10.26

处理意见

Disposition:

1, Preheat before gouging, the temperature is not below 65°C;

2, For the finished welds, it is required to gouge and remove them and then grind.

3, Repair the damaged base metal. The requirements are as follows:
Clean the surface of the surfacing area. Grind the surface if necessary.

4, Repair the surfacing by SMAW:
For the plate of A709M HPS 485W, choose the electrode of Excalibur 9018M MR(Φ 4.0, Φ 4.8),The repairing details can be per WPS-485-SMAW-1G(1F)-Repair; For the plate of A709-50-2, choose the electrode of Excalibur TL-508(Φ 3.2, Φ 4.0, Φ 5.0). The repairing details can be per WPS-345-SMAW-1G(1F)-Repair;

5, Surfacing face should be about 5mm higher than material base, grind smoothly and tidy after surfacing as tall as material base and inform 100% MT inspection.

6, Welding according to WPS-B-T-4221-B-U3c-S.

工 艺: LaWenyu 2007.10.26 Technical engineer

审核: Hutiang Approved by

日期 2007.10.26 Date

#R787-QCP-701

This document is APPROVED
State of California
DEPARTMENT OF TRANSPORTATION
Pursuant Section 5-1.02 of the

ZPMC	关键焊缝返修报告 Critical Welding Repair Report	版本 Rev. No. 0

项目名称 Project Name	美国海湾大桥 SFOBB	部件图号 Drawing No.	P1114-4 MP517-	报告编号 Report No.	CWR020
合同号 Contract No.:	04-0120F4	部件名称 Items Name	89m strut sub-sections	NDT报告编号 Report No.of NDT	
项目编号 Project No.:	ZP06-787				

纠正措施:

Correction action to prevent re occurrence:

If drawings were reviewed thoroughly by production and QC, this non-conformance would not have occurred.

ZPMC QA will verbally notify and perform documented training of personnel involved with this non-conformance to prevent re-occurrence.

车间负责人(Foreman): Yang Xue hui 日期(Date): 2007.10.26

参照的WPS编号 Repair WPS No.	WPS-485-SMAW-1G (1F) -Repair WPS-345-SMAW-1G (1F) -Repair WPS-B-T-4221-B-U3c-S	工艺员 technologist	Liu Wenyu 2007.10.26
返修（碳刨）前预热温度 Preheat temperature before gouging	90°C	返修的缺陷 Description of discontinuity	焊材附着
焊前处理检查 Inspection before welding	All	焊前预热温度 Preheat temperature before welding	200°C
最大碳刨深度 Max. depth of gouging		碳刨总长 Total length of gouging	600mm

焊工 welder wang zhong hua 053755	焊接类型 welding type SMAW	焊接位置 position 1G
焊接电流 Current 185A	焊接电压 Voltage 23.7V	焊接速度 Speed 125

返修后检查

Inspection After repairing:

外观检查 VT result All	检验员 Inspector Ye Tong Jun 07021461	日期 Date 2007-11-09
NDT复检 NDT result MT OK	探伤员 NDT person Zhou Dongjun	日期 Date 2007.11.09

见证：
Witness/Review:

备注：
Remark：

This document is: APPROVED
State of California
DEPARTMENT OF TRANSPORTATION
Pursuant Section 5-1.02 of the
Standard Specifications

ZPMC

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-CT-003

Item: 89M STRUT SUB-ASSEMBLY 名称描述: 89M 横梁子装配体	**Item Number:** 件号:	**Drawing Number:** 图号: MUSB-MA25, MUSB-MA26

Location: 89M Mock Up 位置: 89 米模型段	**Date:** 日期: 2007-10-15

Description of Nonconformance:
不符合项状态描述:

In 89 Mock up section, the strut sub-sections mp516 and p209, mp517 and p1114 made the A709M-345+HPS 485W butt joint. Because the grade of main material is different, drawing requires"filler metal matching the higher strength of base metal shall be used". Workers used WPS-B-T-4211-B-U3b-2, the filler metal grade is E7018-1, which is different with drawing requirements.

89M 模型段横梁子装配体 mp516 与 p209（2 组）、mp517 与 p1114（4 组）均为异种母材 A709M-345+HPS 485W 对接，蓝图要求填充材料应和强度高的母材相匹配，现场焊接采用 WPS-B-T-4211-B-U3b-2，其填充金属级别为 E7018-1,与蓝图要求不符。

Work By: Xue Jacheng **Prepared by:** zhaodongsun **Reviewed by QCE:** Xu Jun 2007.10.15
施工方: 2007.10.15 准备: 2007.10.15 质量工程师批准:

☐ **Drawing Error** 图纸错误 ☐ **Material Defect** 材料缺陷 ☐ **Fabrication Error** 制作错误 ☐ **Other** 其他原因

Disposition: 处理措施: ☐ **Use as is** 回用 ☐ **Repair** 返修 ☐ **Reject** 拒收

Recommendation:
建议:
Material for Shear Link shall be welded with matching filler metal in the case of matching base materials, in the case of dissimilar base metals, welds shall be welded with the higher strength weld filler material per drawing MUSB-MA25&MUSB-MA26 shall be used.
Remove all E7018 filler metal from weld joint by air arc and grinding, prepare weld joint in according with the approved weld procedure WPS-B-T-4221-B-U3c-S.
Fit, tack and weld in according with drawing and WQCP requirements using WPS-B-T-4211-B-U3c-S and WPS-485-SMAW-1G(1F)-Repair.

Prepared by: Yongxue Lin 07.10.15 **Approved by QCA:** Hu Gang 07.10.15
准备 质量经理批准

Reason for Nonconformance:
不符合原因:
Welding supervisor did not review drawing thoroughly and did not assign welder the correct WPS for the work, QC did not review drawing requirements thoroughly, therefore inspecting to the wrong requirements.

Prevention of Re-occurrence:
预防措施:
If drawings were reviewed thoroughly by production and QC, this non-conformance would not have occurred. ZPMC QA will verbally notify and perform documented training of personnel involved with this non-conformance to prevent re-occurrence.

Approved by/批准: Yongxue Lin 07-10-15

Technical Justification for Use-As-Is/Repair: ☐ **Attachment** 附件 ☐ **Non-attachment** 无附件
回用或返修的技术依据:
See attachment

Reviewed /批准: Lu Wenjun 2007.10.15

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

This document is APPROVED
State of California
DEPARTMENT OF TRANSPORTATION
Pursuant Section 5-1.02 of the
Standard Specifications

ZPMC	关键焊缝返修报告 Critical Welding Repair Report				版本 Rev. No. 0
项目名称 Project Name	美国海湾大桥 SFOBB	部件图号 Drawing No	P1114-2 MP517-2	报告编号 Report No.	CWR019
合同号 Contract No.:	04-0120F4	部件名称 Items Name	89m strut sub-sections	NDT报告编号 Report No.of NDT	
项目编号 Project No.:	ZP06-787				

焊缝缺陷描述：

Description of welding discontinuity:

连系梁在制作过程中焊接材料用错，看NCR-CT-003.

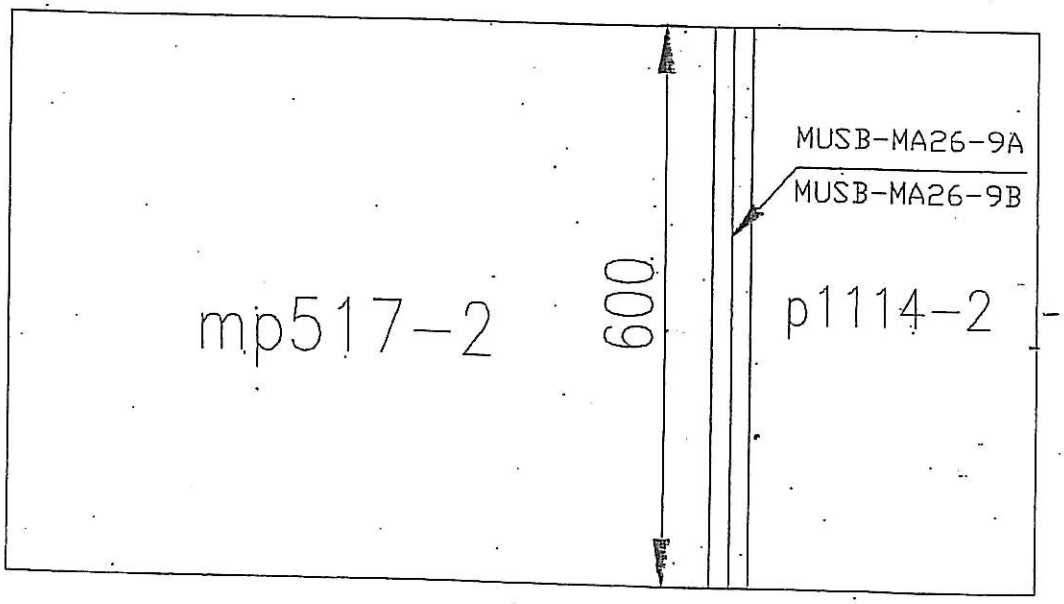
Use the wrong WPS, see NCR-CT-003.（MUSB-MA26-9A,MUSB-MA26-9B）.

检验员（Inspector）：Zhang Lei 日期(Date)：2007-10-26

Zhang Lei 2007.10.26

焊缝返修位置示意图：

Draft of welding discontinuity:



This document is: APPROVED
State of California
DEPARTMENT OF TRANSPORTATION
Pursuant Section 5-1.02 of the
Standard Specifications
Initial JV Date: 2/10/07

产生原因:

Caused:

1. Welding supervisor did not review drawing thoroughly and did not assign welder the correct WPS for the work
2. QC did not review drawing requirements thoroughly, therefore inspecting to the wrong requirements.

车间负责人(Foreman): Yang Xue hui 日期(Date):2007.10.26

处理意见

Disposition:

1, Preheat before gouging, the temperature is not below 65°C;

2, For the finished welds, it is required to gouge and remove them and then grind.

3, Repair the damaged base metal. The requirements are as follows:

Clean the surface of the surfacing area. Grind the surface if necessary.

4, Repair the surfacing by SMAW:

For the plate of A709M HPS 485W, choose the electrode of Excalibur 9018M MR(Φ 4.0, Φ 4.8),The repairing details can be per WPS-485-SMAW-1G(1F)-Repair; For the plate of A709-50-2, choose the electrode of Excalibur TL-508(Φ 3.2, Φ 4.0, Φ 5.0). The repairing details can be per WPS-345-SMAW-1G(1F)-Repair;

5, Surfacing face should be about 5mm higher than material base, grind smoothly and tidy after surfacing as tall as material base and inform 100% MT inspection.

6, Welding according to WPS-B-T-4221-B-U3c-S.

工 艺: Technical engineer [illegible] 10.26

审核: Approved by Hu Gang

日期 Date 2007.10.26

#R787-QCP-701

This document is: APPROVED
State of California
DEPARTMENT OF TRANSPORTATION
Pursuant Section 5-1.02 of the
Standard Specifications

ZPMC	关键焊缝返修报告 Critical Welding Repair Report				版本 Rev. No. 0
项目名称 Project Name	美国海湾大桥 SFOBB	部件图号 Drawing No.	P1114-2 MP517-	报告编号 Report No.	CWR019
合同号 Contract No.:	04-0120F4	部件名称 Items Name	89m strut sub-sections	NDT报告编号 Report No.of NDT	
项目编号 Project No.:	ZP06-787				

纠正措施:

Correction action to prevent re occurrence:

If drawings were reviewed thoroughly by production and QC, this non-conformance would not have occurred.

ZPMC QA will verbally notify and perform documented training of personnel involved with this non-conformance to prevent re-occurrence.

车间负责人(Foreman): Yang Xuehua 日期(Date): 2007.10.26

参照的WPS编号 Repair WPS No.	WPS-485-SMAW-1G (1F) -Repair WPS-345-SMAW-1G (1F) -Repair WPS-B-T-4221-B-U3c-S	工艺员 technologist	Liukeyu 2007.10.26
返修（碳刨）前预热温度 Preheat temperature before gouging	97°C	返修的缺陷 Description of discontinuity	焊材用错
焊前处理检查 Inspection before welding	All	焊前预热温度 Preheat temperature before welding	200°C
最大碳刨深度 Max. depth of gouging		碳刨总长 Total length of gouging	600mm

焊工 welder Dai Zu 048659	焊接类型 welding type SMAW	焊接位置 position 1G
焊接电流 Current 187A	焊接电压 Voltage 24.5 V	焊接速度 Speed 138

返修后检查

Inspection After repairing:

外观检查 VT result ALL	检验员 Inspector Ye Yong Jun 07031741	日期 Date 2007.11.09
NDT复检 NDT result MT OK.	探伤员 NDT person Zhou Dongjun	日期 Date 2007.11.09

见证：
Witness/Review:

备注：
Remark：

#R787-QCP-701

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

ZPMC

Nonconformance Report

不符合项报告

Project Name: 项目名称: S.F.O.B.B 美国加州海湾大桥	**NCR Number:** NCR 编号: NCR-CT-003

Item: 89M STRUT SUB-ASSEMBLY 名称描述: 89M 横梁子装配体	**Item Number:** 件号:	**Drawing Number:** 图号: MUSB-MA25, MUSB-MA26

Location: 位置: 89M Mock Up 89 米模型段	**Date:** 日期: 2007-10-15

Description of Nonconformance:
不符合项状态描述:

In 89 Mock up section, the strut sub-sections mp516 and p209, mp517 and p1114 made the A709M-345+HPS 485W butt joint. Because the grade of main material is different, drawing requires"filler metal matching the higher strength of base metal shall be used". Workers used WPS-B-T-4211-B-U3b-2, the filler metal grade is E7018-1, which is different with drawing requirements.

89M 模型段横梁子装配体 mp516 与 p209（2 组）、mp517 与 p1114（4 组）均为异种母材 A709M-345+HPS 485W 对接，蓝图要求填充材料应和强度高的母材相匹配，现场焊接采用 WPS-B-T-4211-B-U3b-2，其填充金属级别为 E7018-1,与蓝图要求不符。

Work By: Xue Yacheng 施工方: 2007.10.15 **Prepared by:** zhaozhensun 准备: 2007.10.15 **Reviewed by QCE:** Xu Jun 2007.10.15 质量工程师批准:

☐ **Drawing Error** 图纸错误 ☐ **Material Defect** 材料缺陷 ☐ **Fabrication Error** 制作错误 ☐ **Other** 其他原因

Disposition: 处理措施: ☐ **Use as is** 回用 ☐ **Repair** 返修 ☐ **Reject** 拒收

Recommendation:
建议:

Material for Shear Link shall be welded with matching filler metal in the case of matching base materials, in the case of dissimilar base metals, welds shall be welded with the higher strength weld filler material per drawing MUSB-MA25&MUSB-MA26 shall be used.

Remove all E7018 filler metal from weld joint by air arc and grinding, prepare weld joint in according with the approved weld procedure WPS-B-T-4221-B-U3c-S.

Fit, tack and weld in according with drawing and WQCP requirements using WPS-B-T-4211-B-U3c-S and WPS-485-SMAW-1G(1F)-Repair.

Prepared by: 准备 Yang Xue Lin 07.10.15 **Approved by QCA:** 质量经理批准 Hu Gang 07.10.15

Reason for Nonconformance:
不符合原因:

Welding supervisor did not review drawing thoroughly and did not assign welder the correct WPS for the work, QC did not review drawing requirements thoroughly, therefore inspecting to the wrong requirements.

Prevention of Re-occurrence:
预防措施:

If drawings were reviewed thoroughly by production and QC, this non-conformance would not have occurred. ZPMC QA will verbally notify and perform documented training of personnel involved with this non-conformance to prevent re-occurrence.

Approved by/批准: Yang Xue Lin 07.10.15

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

See attachment

Reviewed /批准: Lu Wenjun 2007.10.15

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

This document is: APPROVED
State of California
DEPARTMENT OF TRANSPORTATION
Pursuant Section 5-1.02 of the
Standard Specifications

STATE OF CALIFORNIA-BUSINESS, TRANSPORTATION AND HOUSING AGENCY ARNOLD SCHWARZENEGGER, Governor

DEPARTMENT OF TRANSPORTATION - District 4 Toll Bridge Program
333 Burma Rd.
Oakland, CA 94607
(510) 622-5660, (510) 286-0550 fax

Flex your power
Be energy efficient!

February 22, 2008

Contract No. 04-0120F4
04-SF-80-13.2 / 13.9
Self-Anchored Suspension Bridge
Letter No. 05.03.01-001406

Michael Flowers
Project Executive
American Bridge/Fluor Enterprises, a JV
375 Burma Road
Oakland, CA 94607

Dear Michael Flowers,

Response to NCRs 1, 5, 7, 8, 9, 10, 11, 12 & 13

This letter is issued as a response to ABF-CAL-LTR-000443, 444, 445, dated February 14, 2008, and ABF-CAL-LTR-000446, dated February 15, 2008, requesting written confirmation from the Engineer that the referenced Non-Conformance Reports (NCRs) at Zhenhua Port Machinery Company, Ltd (ZPMC) have been closed. The Department considers the following ZPMC NCRs closed:

NCR No.	State Letter No.	ABF Document No.	Description
1	05.03.01-000123	ABF-CAL-LTR-000443	Radiographic Testing issues (IQI placement, source type, etc.)
5	05.03.01-000757	ABF-CAL-LTR-000444	Repairs to longitudinal stiffener welds greater than 10% in length on the 77m Mock-up
7	05.03.01-000757	ABF-CAL-LTR-000444	QC not following the approved UT procedure on 114m Mock-up
8	05.03.01-000757	ABF-CAL-LTR-000444	Repairs to skin plate welds greater than 10% in length on the 114m Mock-up
9	05.03.01-000795	ABF-CAL-LTR-000445	Third time repairs to Skin B sub-assemblies on the 114m Mock-up without Engineer approval
10	05.03.01-000795	ABF-CAL-LTR-000445	Repairs to longitudinal stiffener welds greater than 10% in length on the 114m Mock-up
11	05.03.01-000795	ABF-CAL-LTR-000446	Failure to document fit-up of longitudinal stiffener on Mock-up
12	05.03.01-000795	ABF-CAL-LTR-000446	Repairs to skin plate welds greater than 10% in length on the 114m Mock-up
13	05.03.01-000795	ABF-CAL-LTR-000446	Welding electrode used on 89m Strut Sub-Assembly not in compliance

Please contact us if you have any questions.

Sincerely,

GARY PURSELL
Resident Engineer

cc: Rick Morrow
Brian Boal
Gary Lai
Mark Woods

file: 05.03.01

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 #: xx.25A

QUALITY ASSURANCE -- NON-CONFORMANCE RESOLUTION

Location: Shanghai, China - Changxing Island **Report No:** NCS-000031
Prime Contractor: American Bridge/Fluor Enterprises, a JV **Date:** 28-Nov-2007
Submitting Contractor: Zhenhua Port Machinery Company, Ltd (ZPMC), Changxing Island **NCR #:** ZPMC-0013

Type of problem:

Welding	☑	**Concrete**	☐	**Other**	☐	
Welding	☑	**Curing**	☐	**Procedural**	☐	**Bridge No:** 34-0006
Joint fit-up	☐	**Coating**	☐	**Other**	☐	**Component:**
Procedural	☐	**Procedural**	☐	**Descripton:**		

Date the Non-Conformance Report was written: 07-Nov-2007

Description of Non-Conformance:

ABF allowed ZPMC welding personnel to weld T-Stiffeners to Orthotropic Box Girder (OBG) bottom plate, panel 42-A, without removing the paint from the weld joint area.

This item of concern was previously discussed with ZPMC Quality Control (QC) personnel Ding Long on Tuesday, November 6, 2007 to which Mr. Long stated the paint in the weld joint area will be removed prior to welding.

Contractor's proposal to correct the problem:

Remove the paint in the weld joint area prior to welding and complete 100% Magnetic Particle Inspection on the affected welds.

If this issue becomes systemic, METS will elevate this issue to second-tier and request a response from the Contractor.

Corrective action taken:

The Contractor would ensure the paint in the weld joint area being removed prior to welding.

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 Patrick Lowry, (858) 344-2712, who represents the Office of Structural Materials for your project.

Inspected By: Liu,Chengwen Quality Assurance Inspector

Reviewed By: Lowry,Patrick QA Reviewer