

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



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

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

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

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

**Report No:** NCR-000760

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

**Date:** 09-Jun-2010

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

**NCR #:** ZPMC-0722

**Type of problem:**

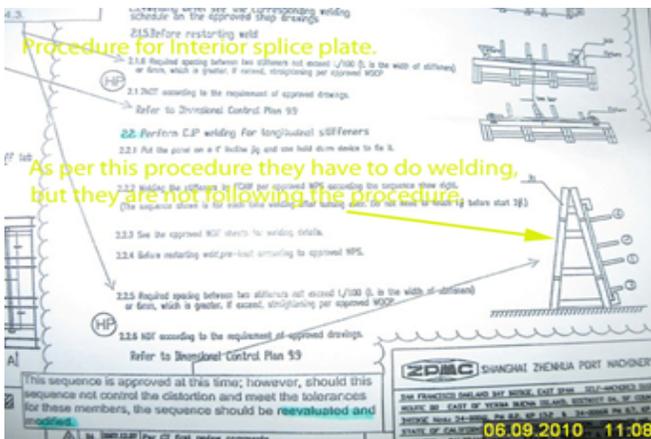
<b>Welding</b>	<b>Concrete</b>	<b>Other</b>	
<b>Welding</b>	<b>Curing</b>	<b>Procedural</b>	<b>Bridge No:</b> 34-0006
<b>Joint fit-up</b>	<b>Coating</b>	<b>Other</b>	<b>Component:</b> North Shaft Lift 5 Interior Splice Plate
<b>Procedural</b>	<b>Procedural</b>	<b>Description:</b>	

**Reference Description:** Welding not in accordance with approved procedure

**Description of Non-Conformance:**

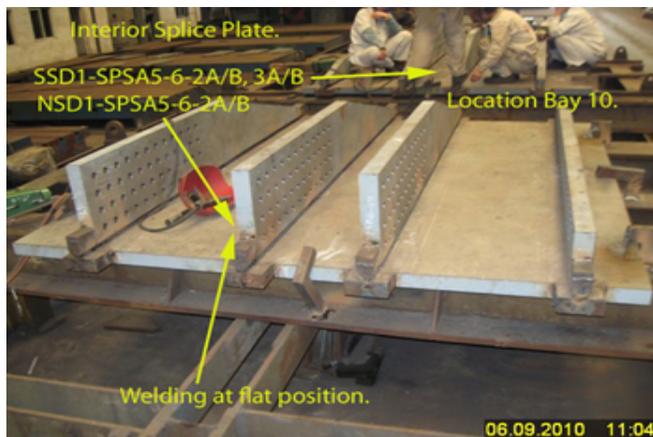
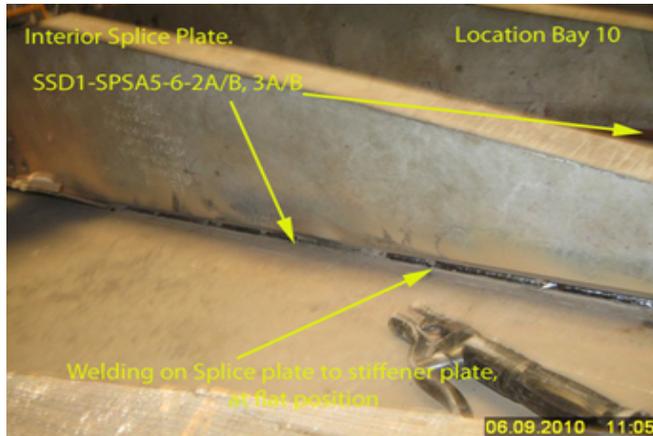
During random visual inspection in Bay 10, this Quality Assurance Inspector discovered the following issues:

- Qualified Welder welding on Interior Splice Plate without following the approved WPS (WPS-B-T-3211-TC-056-1)
- Welding was performed in the 2(G) position, WPS is approved for in the 1(G) position only
- Preheat requirement of 180 Celsius was not performed.
- Approved fabrication procedure was not followed
- Vertical T-jig was not utilized to weld stiffeners in the 1(G) position
- Flat jig was used and welding was performed in the 2(G) position
- The complete joint penetration welds are identified as NSD1-SPSA5-6-2A/B, and SSD1-SPSA5-6-2A/B, 3A/B.
- Interior Splice Plate identified for, North Tower lift 5 skin A, and South Tower lift 5 skin A.
- The member is located in Bay#10.



# QUALITY ASSURANCE -- NON-CONFORMANCE REPORT

( Continued Page 2 of 3 )



## Applicable reference:

AWS D1.5 Section 1.9 - All production welding shall be performed in conformance with the provisions of an approved Welding Procedure Specification (WPS)

- 2.2 Perform CJP welding for longitudinal stiffeners.

2.2.1 Put the panel in a "T" incline jig and use hold down device to fix it.

- "This sequence is approved at this time; however should this sequence not control the distortion and meet the tolerances for this members, the sequence should be reevaluated and modified."

- Special Provisions: Section 10-1.59 "Working Drawings" Item E: Details of tack welds and the sequence of all welding; The welding sequences and processes and specified NDT of shop fabrication shall be summarized in a separate shop drawing or fabrication procedure for each welded joint.

**Who discovered the problem:** Shailesh D. Gaikwad

**Name of individual from Contractor notified:** Lu Wei Chao

**Time and method of notification:** 06/09/10 /11:00 Hrs/Verbal

**Name of Caltrans Engineer notified:** Ken Lee

**Time and method of notification:** 6/10/10/1440Hrs/Verbal

**QC Inspector's Name:** Yang Hi Heng

**Was QC Inspector aware of the problem:**

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# QUALITY ASSURANCE -- NON-CONFORMANCE REPORT

( Continued Page 3 of 3 )

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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, (818) 292-0659, who represents the Office of Structural Materials for your project.

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**Inspected By:** Ng,Michael

QA Inspector

**Reviewed By:** Devey,Jim

SMR



**DEPARTMENT OF TRANSPORTATION - District 4 Toll Bridge**  
333 Burma Road  
Oakland CA 94607  
Tel: 510-286-0539 Fax: 510-286-0550

## NON-CONFORMANCE REPORT TRANSMITTAL

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

**Date:** 11-Jun-2010

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

**Dear:** Mr. Charles Kanapicki

**Job Name:** SAS Superstructure

**Attention:** Mr. Thomas Nilsson Project/Fabrication Manager

**Document No:** 05.03.06-000718

**Subject:** NCR No. ZPMC-0722

**Reference Description:** Welding not in accordance with approved procedure/Tower/Lift 5 Internal Splice

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:** Tower **Lift:** 05

### Remarks:

- Qualified Welder welding on Interior Splice Plate without following the approved WPS (WPS-B-T-3211-TC-056-1)
- Welding was performed in the 2(G) position, WPS is approved for in the 1(G) position only
- Preheat requirement of 180 Celsius was not performed.
- Approved fabrication procedure was not followed
- Vertical T-jig was not utilized to weld stiffeners in the 1(G) position
- Flat jig was used and welding was performed in the 2(G) position
- The complete joint penetration welds are identified as NSD1-SPSA5-6-2A/B, and SSD1-SPSA5-6-2A/B, 3A/B.
- Interior Splice Plate identified for, North Tower lift 5 skin A, and South Tower lift 5 skin A.
- The member is located in Bay#10.

### References:

- AWS D1.5 Section 1.9 - All production welding shall be performed in conformance with the provisions of an approved Welding Procedure Specification (WPS)
- WPS Section 2.2 Perform CJP welding for longitudinal stiffeners.
- WPS Section 2.2.1 Put the panel in a "T" incline jig and use hold down device to fix it.
- "This sequence is approved at this time; however should this sequence not control the distortion and meet the tolerances for this members, the sequence should be reevaluated and modified."
- Special Provisions: Section 10-1.59 "Working Drawings" Item E: Details of tack welds and the sequence of all welding; The welding sequences and processes and specified NDT of shop fabrication shall be summarized in a separate shop drawing or fabrication procedure for each welded joint.

### Action Required and/or Action Taken:

Propose resolutions for the identified non-conformance items and document that the various deficiencies have been brought in compliance with contract requirements. Also propose a resolution that addresses the apparent failure of Quality Control to identify the non-conformance with the appropriate Welding Procedure Specification (WPS). Provide documentation of the steps taken by the Quality Control Manager to prevent future occurrences.

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# NCT

( *Continued Page 2 of 2* )

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The response for the resolution of this issue is requested within 7 days.

**Transmitted by:** Gina Rizzardo      Transportation Engineer

**Attachments:**    ZPMC-0722

**cc:**    Rick Morrow, Gary Pursell, Mark Woods

**File:**    05.03.06

## NCR PROPOSED RESOLUTION

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

**Attention:** Pursell, Gary  
Resident Engineer

**Ref:** 05.03.06-000718

**Subject:** NCR No. ZPMC-0722

**Dated:** 08-Sep-2010

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

**Job Name:** SAS Superstructure

**Document No.:** ABF-NPR-000773 Rev: 00

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**Contractor's Proposed Resolution:**

**Reference Resolution:** ZPMC is providing NDT of the welds in question to show they are acceptable.

ZPMC is providing NDT of the welds in question to show they are acceptable. Included is the 2G WPS used to weld the tack welds observed by the Department and the 1G WPS. When compared both WPS have identical welding parameters. In the future the ZPMC foreman will be sure to post relevant WPS so they are visible and can be referred to easily if asked, to address the insufficient preheat ZPMC has in place a refresher training to identify workers who need additional training. Based on these actions, ZPMC requests closure of this NCR.

**Submitted by:** Ishibashi, Joshua

**Attachment(s):** ABF-NPR-000773R00;

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**Caltrans' comments:**

**Status:** CLO

**Date:** 12-Sep-2010

This proposed resolution is acceptable. The documentation received is sufficient and the Department concurs that Non-Conformance ZPMC-0722 is closed.

**Submitted by:** Eagen, Sean

**Attachment(s):**

**Date:** 12-Sep-2010



No. T-162

## LETTER OF RESPONSE

**TO: American Bridge/Flour JV**

**DATE: 2010-09-06**

**REGARDING: NCR-000760(ZPMC-0722)**

ZPMC received NCR-000760(ZPMC-0722), it mentioned that CT inspectors found ZPMC used incorrect WPS.

Here ZPMC clarified as below. On ZPMC's fabrication procedure, it required a vertical T-jig which utilized to weld stiffeners in 1G position. But in order to reduce root pass cracking, ZPMC previously made temporary reinforcement tack weld on the ground which utilized to weld stiffeners in 2G position. Both of these two positions, ZPMC all has the corresponding WPS for utilization.

To be responsible, we have already inculcated the foreman to paste WPS on visible position, before and during welding, temperature must be checked by QC. Also necessary preventive step had been adopted by ZPMC, such as education and internal warning and punishment. We can believe it will be improve in the future.

Finally these welds were checked and green tagged by CT, here attached WPS and related NDT reports show the welds are sound finally.

Basing on above information, ZPMC hope CT could take a review and close the NCR.

**ATTACHMENT:**

**NCR-000760(ZPMC-0722)**

**T787-UT-3058**

**T787-UT-3059**

**T787-UT-3059R1**

**T787-MT-10281**

**T787-MT-10013**

*Zhang Wei*

*2010.09.08*



# REPORT OF ULTRASONIC EXAMINATION

## UT探伤报告

REPORT NO. 报告编号 T787-UT-3058      DATE 2010.07.11      PAGE 1 OF 2      Revision No: 0

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

ITEMS NAME: THE 4&5 LIFTING TOWER(N)      DRAWING NO.: NSD1-SPSA5-6      CALTRANS CONTRACT NO.: 04-0120F4  
 部件名称      图号      加州工程编号

REFERENCING CODE 参考规范      ACCEPTANCE STANDARD 接受标准      PROCEDURE NO. 程序编号  
 AWS D1.5-2002      AWS D1.5-2002(Table 6.3)      ZPQC-UT-01

WELDING PROCESS 焊接方法      JOINT TYPE 焊缝类型      CALIBRATION DUE DATE 仪器校正有效期  
 SMAW      T-JOINT      Dec. 28<sup>ST</sup>, 2010

EQUIPMENT 设备      MANUFACTURER 制造商      MODEL NO. 样式编号      SERIAL NO. 序列编号  
 UT SCOPE      PANAMETRICS      EPOCH-4B      071565311, 061488510, 061495811, 070152011,

CALIBRATION BLOCK 试块      COUPLANT 耦合剂      MATERIAL/THICKNESS 材料厚度  
 AWS IIV BLOCK TYPE II      C.M.C      A709M-HPS-485WT2-Z      60/65mm

### TRANSDUCER 探头

MANUFACTURER 制造商	ANGLE 角度	FREQUENCY 频率	SIZE 尺寸	MANUFACTURER 制造商	ANGLE 角度	FREQUENCY 频率	SIZE 尺寸
Changchao	70°	2.5MHz	18×18mm	Changchao	60°	2.5MHz	18×18mm
Changchao	0°	2.5MHz	20mm	Changchao	45°	2.5MHz	18×18mm
Reference Level 参考灵敏度				20dB			

Base metal inspected per AWS D1.5-2002 Section 6.19.5      0° UT OK.

WELD IDENTIFICATION 焊缝部件编号	INDICATION NO. 指示号	PROBE ANGLE 探测角度	FROM FACE 检测面	LEG (次数)	DECIBELS 分贝				DISCONTINUITY 不连续性					Discontinuity Evaluation 缺陷估计	Remark 备注	
					Indication Level	Reference Level	Attenuation Factor	Indication Rating	LOCATION OF DISCONTINUITY 不连续位置(mm)							
					a	b	c	d	Length 长度	Sound Path 声程	Depth from Surface 距表面深度	From X 距X	From Y 距Y			
NSD1-SPSA5-6-1A/B		70				34									ACC.	100%
		60				33									ACC.	100%
		45	C			32									ACC.	100%
		0				20									ACC.	100%
NSD1-SPSA5-6-2A/B		70				34									ACC.	100%
		60				33									ACC.	100%
		45	C			32									ACC.	100%

EXAMINED BY 主探 <i>Van Gungsheng</i>	REVIEWED BY 审核 <i>Wu Rong</i>
LEVEL - II SIGN / DATE <i>2010.7.11</i>	LEVEL - II SIGN / DATE <i>2010.7.11</i>
质量经理 / QCM <i>2010.7.11</i>	用户 CUSTOMER
签字 SIGN / 日期 DATE	签字 SIGN / 日期 DATE



# REPORT OF ULTRASONIC EXAMINATION

## UT探伤报告

REPORT NO. 报告编号 T787-UT-3059      DATE 2010.07.13      PAGE 1 OF 2      Revision No: 0

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

ITEMS NAME: THE 4&5 LIFTING 146M TOWER(S)      DRAWING NO.: SSD1-SPSA5-6      CALTRANS CONTRACT NO.: 04-0120F4  
 部件名称      图号      加州工程编号

REFERENCING CODE 参考规范      ACCEPTANCE STANDARD 接受标准      PROCEDURE NO. 程序编号  
 AWS D1.5-2002      AWS D1.5-2002(Table 6.4)      ZPQC-UT-01

WELDING PROCESS 焊接方法      JOINT TYPE 焊缝类型      CALIBRATION DUE DATE 仪器校正有效期  
 SMAW      T-JOINT      Dec. 28<sup>ST</sup>, 2009

EQUIPMENT 设备      MANUFACTURER 制造商      MODEL NO. 样式编号      SERIAL NO. 序列编号  
 UT SCOPE      PANAMETRICS      EPOCH-4B      071565311, 061488510, 061495811, 070152011,

CALIBRATION BLOCK 试块      COUPLANT 耦合剂      MATERIAL/THICKNESS 材料厚度  
 AWS IIW BLOCK TYPE II      C.M.C      A709M-HPS-485WT2-Z      60/65mm

### TRANSDUCER 探头

MANUFACTURER 制造商	ANGLE 角度	FREQUENCY 频率	SIZE 尺寸	MANUFACTURER 制造商	ANGLE 角度	FREQUENCY 频率	SIZE 尺寸
Changchao	70°	2.5MHz	18×18mm	Changchao	45°	2.5MHz	18×18mm
Changchao	0°	2.5MHz	20mm				

Reference Level 参考灵敏度      20dB

Base metal inspected per AWS D1.5-2002 Section 6.19.5      0° UT OK.

WELD IDENTIFICATION 焊缝部件编号	INDICATION NO. 指示号	PROBE ANGLE 探测角度	FROM FACE 检测面	LEG (次数)	DECIBELS分贝				DISCONTINUITY 不连续性					Discontinuity Evaluation 缺陷估计	Remark 备注	
					Indication Level	Reference Level	Attenuation Factor	Indication Rating	LOCATION OF DISCONTINUITY 不连续位置(mm)							
					a	b	c	d	Length 长度	Sound Path 声程	Depth from Surface 距表面深度	From X 距X	From Y 距Y			
SSD1-SPSA5-6-1A/B		70				34									ACC.	100%
		45				32									ACC.	100%
SSD1-SPSA5-6-2A/B		70				34									ACC.	100%
	1	45	A	1	35	32	3	0	50	65	48	0	130		REJ.	100%
SSD1-SPSA5-6-3A/B		70				34									ACC.	100%
		45				32									ACC.	100%
SSD1-SPSA5-6-4A/B		70				34									ACC.	100%
		45				32									ACC.	100%

EXAMINED BY 主检 Dan Gongsheng

REVIEWED BY 审核 [Signature]

LEVEL - II SIGN / DATE 10.07.13

LEVEL - II SIGN / DATE 10.07.13

质量经理 / QCM [Signature] 2010.7.13

用户CUSTOMER

签字 SIGN / 日期 DATE

签字 SIGN / 日期 DATE





# REPORT OF ULTRASONIC EXAMINATION

## UT探伤报告

REPORT NO. 报告编号 T787-UT-3059R1      DATE 2010.07.15      PAGE 1 OF 1      Revision No: 0

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

ITEMS NAME: THE 4&5 LIFTING 146M TOWER(S)      DRAWING NO.: SSD1-SPSA5-6      CALTRANS CONTRACT NO.: 04-0120F4  
 部件名称      图号      加州工程编号

REFERENCING CODE 参考规范      ACCEPTANCE STANDARD 接受标准      PROCEDURE NO. 程序编号  
 AWS D1.5-2002      AWS D1.5-2002(Table 6.4)      ZPQC-UT-01

WELDING PROCESS 焊接方法      JOINT TYPE 焊缝类型      CALIBRATION DUE DATE 仪器校正有效期  
 SMAW      T-JOINT      Dec. 28<sup>ST</sup>, 2009

EQUIPMENT 设备      MANUFACTURER 制造商      MODEL NO. 样式编号      SERIAL NO. 序列编号  
 UT SCOPE      PANAMETRICS      EPOCH-4B      071565311, 061488510, 061495811, 070152011,

CALIBRATION BLOCK 试块      COUPLANT 耦合剂      MATERIAL/THICKNESS 材料厚度  
 AWS IIW BLOCK TYPE II      C.M.C      A709M-HPS-485WT2-Z      60/65mm

### TRANSDUCER 探头

MANUFACTURER 制造商	ANGLE 角度	FREQUENCY 频率	SIZE 尺寸	MANUFACTURER 制造商	ANGLE 角度	FREQUENCY 频率	SIZE 尺寸
Changchao	70°	2.5MHz	18×18mm	Changchao	45°	2.5MHz	18×18mm
Changchao	0°	2.5MHz	20mm				

Reference Level 参考灵敏度      20dB

Base metal inspected per AWS D1.5-2002 Section 6.19.5      0° UT OK.

WELD IDENTIFICATION 焊缝部件编号	INDICATION NO. 指示号	PROBE ANGLE 探测角度	FROM FACE 检测面	LEG (次数)	DECIBELS分贝				DISCONTINUITY 不连续性					Discontinuity Evaluation 缺陷估计	Remark 备注	
					Indication Level	Reference Level	Attenuation Factor	Indication Rating	LOCATION OF DISCONTINUITY 不连续位置(mm)							
									a	b	c	d	Length 长度			Sound Path 声程
SSD1-SPSA5-6-2A/B		70				34									ACC.	100%
	1R1	45				32									ACC.	100%

AFTER T-WR3468

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EXAMINED BY 主探 <i>Don Guangsheng</i> LEVEL - II SIGN / DATE      1007.15	REVIEWED BY 审核 <i>Yan Peng</i> LEVEL - II SIGN / DATE      1007.15
质量经理 / QCM <i>W. Linhua</i> 10.7.15	用户 CUSTOMER _____
签字 SIGN / 日期 DATE	签字 SIGN / 日期 DATE



# REPORT OF MAGNETIC PARTICLE EXAMINATION

## 磁粉检测报告

REPORT NO. 报告编号 T787-MT-10281      DATE日期 2010.07.18      PAGE OF页码 1/1      Revision No: 0

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

DRAWING NO. 图号: SSD1-SPSA5-6  
146m inner connection plate      CALTRANS CONTRACT NO.: 加州工程编号 04-0120F4

REFERENCING CODE 参考规范编码 AWS D1.5-2002	ACCEPTANCE STANDARD 接受标准 AWS D1.5-2002	PROCEDURE NO. 程序编号 ZPQC-MT-01	CALIBRATION DUE DATE 仪器校正有效期 Dec. 28 <sup>ST</sup> , 2010
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EQUIPMENT 设备 MT YOKE	MANUFACTURER 制造商 PARKER	MODEL NO. 样式编号 B310S	SERIAL NO. 连续编号 5620 5395 5617
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MAGNETIZING METHOD 磁化方法	Continuous magnetic yoke 磁轭式连续法	CURRENT 电流	AC
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PARTICLE TYPE 磁粉类型	Dry magnet powder 干磁粉	YOKE SPACING 磁轭间距	70~150mm
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MATERIAL TO BE EXAMINED 检测材料	<input checked="" type="checkbox"/> WELDING 焊接件 <input type="checkbox"/> CASTING 铸件 <input type="checkbox"/> FORGING 锻造	Material & thickness 母材, 厚度	A709M-HPS-485WT2-Z 65/60mm
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WELDING PROCESS 焊接方法	SMAW	TYPE OF JOINT 焊缝类型	T-JOINT
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WELD I.D. 焊缝编号	DISCONTINUITY 不连续性			ACCEPT 接受	REJECT 拒收	REMARKS 备注
	INDICATION 指示	TYPE 类型	LENGTH IN mm 长度			
SSD1-SPSA5-6-1A/B				ACC.		100%MT
SSD1-SPSA5-6-2A/B				ACC.		100%MT
SSD1-SPSA5-6-3A/B				ACC.		100%MT
SSD1-SPSA5-6-4A/B				ACC.		100%MT

AFTER HSR1(T)-11450-11452

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EXAMINED BY 主探 Cai Xinxin <i>Cai Xinxin</i>	REVIEWED BY 审核 <i>Kan Bin</i>
LEVEL-II SIGN 签名 / DATE日期 <i>Cai Xinxin</i> 2010.7.18	LEVEL-II SIGN / DATE日期 <i>Kan Bin</i> 2010.7.18
质量经理 / QCM <i>Wu Jianhua</i> 2010.7.18	用户 CUSTOMER
签字 SIGN / 日期 DATE	签字 SIGN / 日期 DATE



REPORT OF MAGNETIC PARTICLE EXAMINATION

磁粉检测报告

REPORT NO. 报告编号 T787-MT-10013      DATE日期 2010.07.11      PAGE OF 页码 1/1      Revision No: 0

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

DRAWING NO. 图号: NSD1-SPSA5-6  
146M INNER CONNECTION PLATE      CALTRANS CONTRACT NO.: 04-0120F4  
加州工程编号

REFERENCING CODE 参考规范编码 AWS D1.5-2002	ACCEPTANCE STANDARD 接受标准 AWS D1.5-2002	PROCEDURE NO. 程序编号 ZPQC-MT-01	CALIBRATION DUE DATE 仪器校正有效期 Dec. 28 <sup>th</sup> , 2010
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EQUIPMENT 设备 MT YOKE	MANUFACTURER 制造商 PARKER	MODEL NO. 样式编号 B310S	SERIAL NO. 连续编号 5620 5395 5617
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MAGNETIZING METHOD 磁化方法	Continuous magnetic yoke 磁轭式连续法	CURRENT 电流	AC
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PARTICLE TYPE 磁粉类型	Dry magnet powder 干磁粉	YOKE SPACING 磁轭间距	70~150mm
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MATERIAL TO BE EXAMINED 检测材料	<input checked="" type="checkbox"/> WELDING 焊接件 <input type="checkbox"/> CASTING 铸件 <input type="checkbox"/> FORGING 锻造	Material & thickness 母材, 厚度	A709M-HPS-485WT2-Z 60/65mm
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WELDING PROCESS 焊接方法	SMAW	TYPE OF JOINT 焊缝类型	T JOINT
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WELD I.D. 焊缝编号	DISCONTINUITY 不连续性			ACCEPT 接受	REJECT 拒收	REMARKS 备注
	INDICATION 指示	TYPE 类型	LENGTH IN mm 长度			
NSD1-SPSA5-6-1A/B				ACC.		100%MT
NSD1-SPSA5-6-2A/B				ACC.		100%MT
NSD1-SPSA5-6-3A/B				ACC.		100%MT
NSD1-SPSA5-6-4A/B				ACC.		100%MT

AFTER HSR1(T)-11451/11453/11454

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EXAMINED BY 主操 Cai Xinxin <i>Cai Xinxin</i>	REVIEWED BY 审核 <i>[Signature]</i>
LEVEL-II SIGN 签名 / DATE日期 <i>[Signature]</i> 2010.7.11	LEVEL-II SIGN / DATE日期 <i>[Signature]</i> 2010.7.11
质量经理 / QCM <i>[Signature]</i> 2010.7.11	用户 CUSTOMER
签字 SIGN / 日期 DATE	签字 SIGN / 日期 DATE



焊接工艺规程 B\*  
WELDING PROCEDURE SPECIFICATION

编号 No.  
WPS-B-T-3212-TC-U5b-1

有效期 Period of validity  
FCM: 2007.5-2010.5  
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) 横焊(2G)

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 流率 (Flow rate)

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) 碳弧气刨(Carbon Arc Air Gouging)

最低预热和道间温度 (Preheat and interpass temperature Min) 40°C [T≤20mm] 100°C [20mm<T≤40mm] 140°C [40mm<T≤60mm] 180°C [60mm<T]

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

后热温度 (Postheat temperature) N/A

热输入 (线能量) (Heat input) 最小(Min) 1.87KJ/mm

最大(Max) 2.94KJ/mm

焊接工艺  
(Welding procedure)

- APPROVED
- APPROVED AS NOTED
- NOT APPROVED

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

~~N/A~~ DEPARTMENT OF TRANSPORTATION

Signed [Signature]  
Structure Representative

Date 31 Aug 2007

焊道序号 Pass No.	焊条(丝)规格 Electrode Size (mm)	焊接电流 Welding Current		焊接速度 Travel Speed (mm/min)	接头详图 Joint Detail
		安培 Amp(s)	伏特 Volts		
1~n 或 1~n	4.0  4.8	130-240  180-300	19-27  20-28	51-181  74-269	

选定适用的电流、电压应在 WPS 焊接参数选用表中高到焊接速度范围。  
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。

修订号 (Revision No.) 0

工艺评定记录编号 (PQR No.) HP2007143-1

批准 (Authorized by) [Signature]  
日期 (Date) 2007.7.20

\* 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 B<sup>\*</sup>  
WELDING PROCEDURE SPECIFICATION

编号 No.  
WRS-B-T-3211-TC-U5b-1

有效期 Period of validity  
FCM: 2007.5~2010.5  
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)  
 填充金属技术条件 (Filler metal specification) AWS A5.5  
 填充金属级别 (Filler metal classification) E9018M-E4R  
 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) 碳弧气刨(Carbon Arc Air Gouging)  
 最低预热和道间温度 (Preheat and interpass temperature Min) 40°C [T≤20mm] 100°C [20mm<T≤40mm] 140°C [40mm<T≤60mm] 180°C [60mm<T]  
 最高预热和道间温度 (Preheat and interpass temperature Max) 230°C  
 后热温度 (Postheat temperature) N/A  
 热输入 (线能量) (Heat input) 最小(Min) 1.87KJ/mm 最大(Max) 2.94KJ/mm

APPROVED  
 APPROVED AS NOTED  
 NOT APPROVED

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

Signed [Signature]  
 Structure Representative

Date 31 Aug 2007

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		焊接速度 Travel Speed (mm/min)	接头详图 Joint Detail
		安培 Amp(s)	伏特 Volts		
1~n 或 1~n	4.0 4.8	130~210 180~300	19~27 20~28	51~181 74~260	

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、焊道尺寸等而變化，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 variable given in (1) 5.)

修订号 (Revision No.) 0  
 工艺评定记录编号 (PQR No.) HP2007143-1  
 \* 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.)

批准 (Authorized by) [Signature]  
 日期 (Date) 2007.7.25

**DEPARTMENT OF TRANSPORTATION**

DIVISION OF ENGINEERING SERVICES

Office of Structural Materials

Quality Assurance and Source Inspection



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

Contract #: 04-0120F4Cty: SF/ALA Rte: 80 PM: 13.2/13.9File #: xx.25A**QUALITY ASSURANCE -- NON-CONFORMANCE RESOLUTION****Location:** Changxing Island, Shanghai, P.R. China**Report No:** NCS-000853**Prime Contractor:** American Bridge/Fluor Enterprises, a JV**Date:** 08-Sep-2010**Submitting Contractor:** Zhenhua Port Machinery Company, Ltd (ZPMC), Changxing Island **NCR #:** ZPMC-0722**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>Description:</b>	

**Date the Non-Conformance Report was written:** 09-Jun-2010**Description of Non-Conformance:**

During random visual inspection in Bay 10, this Quality Assurance Inspector discovered the following issues:

- Qualified Welder welding on Interior Splice Plate without following the approved WPS (WPS-B-T-3211-TC-056-1)
- Welding was performed in the 2(G) position, WPS is approved for in the 1(G) position only
- Preheat requirement of 180 Celsius was not performed.
- Approved fabrication procedure was not followed
- Vertical T-jig was not utilized to weld stiffeners in the 1(G) position
- Flat jig was used and welding was performed in the 2(G) position
- The complete joint penetration welds are identified as NSD1-SPSA5-6-2A/B, and SSD1-SPSA5-6-2A/B, 3A/B.
- Interior Splice Plate identified for, North Tower lift 5 skin A, and South Tower lift 5 skin A.
- The member is located in Bay#10.

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

Contractor proposes to provide the NDT report for the welds in question. Contractor considers the WPS employed-2(G) position has similar parameters to the approved WPS 1(G) position and therefore should have no impact on the weld. However, ZPMC will post the relevant WPS in suitable locations for the welders.

Regarding the insufficient preheat, Contractor will provide refresher training to the identified workers.

**Corrective action taken:**

Contractor provided the NDT report to prove the weld is acceptable. Contractor posted the WPS in a visible place. In addition, training on pre-heat is provided to the workers.

**Did corrective action require Engineer's approval?** Yes No**If so, name of Engineer providing approval:****Date:****Is Engineer's approval attached?**

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## QUALITY ASSURANCE -- NON-CONFORMANCE RESOLUTION

( *Continued Page 2 of 2* )

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**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 Wahbeh, Mazen 818-292-0659, who represents the Office of Structural Materials for your project.

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**Inspected By:**    Ng,Michael

Quality Assurance Inspector

**Reviewed By:**    Devey,Jim

QA Reviewer

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