

DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES

Office of Structural Materials

Quality Assurance and Source Inspection



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

Contract #: 04-0120F4Cty: SF/ALA Rte: 80 PM: 13.2/13.9File #: 69.25B**QUALITY ASSURANCE -- NON-CONFORMANCE REPORT****Location:** Changxing Island, Shanghai, P.R. China**Report No:** NCR-000728**Prime Contractor:** American Bridge/Fluor Enterprises, a JV**Date:** 03-May-2010**Submitting Contractor:** Zhenhua Port Machinery Company, Ltd (ZPMC), Changxing Island**NCR #:** ZPMC-0691**Type of problem:**

Welding	Concrete	Other	
Welding	Curing	Procedural	Bridge No: 34-0006
Joint fit-up	Coating	Other	Component: OBG Segment 12AE & 12AW U-Rib Deck Panel
Procedural	Procedural	Description:	

Reference Description: ZPMC welded some welds in Segment 12AE & 12AW U-Rib Deck Panel without following the approved WPS and shop drawings

Description of Non-Conformance:

During Quality Assurance (QA) random in-process observations of the assembly of Orthotropic Box Girder (OBG) segments 12AW and 12AE, this QA Inspector discovered the following issues:

- ZPMC welded the following weld joints listed below without following the approved Welding Procedure Specification (WPS) as specified in the approved shop drawings.
- The approved shop drawings specify the use of weld detail WD30B with WPS-B-T-2342-U1. This WPS specifies the use of Gas Metal Arc Welding (GMAW) for the root pass and Submerged Arc Welding (SAW) for the cover pass.

-ZPMC personnel told QA Inspector that WPS-B-T-2232-Tc-U4b-F (FCAW) was used for both the root and cover pass for the welds in Segment 12AE:

Weld ID: DP3007-001-001 & 002 (RS3001D to PL3005B)

Weld ID: DP3005-001-009 & 010 (RS3005B to PL3001E)

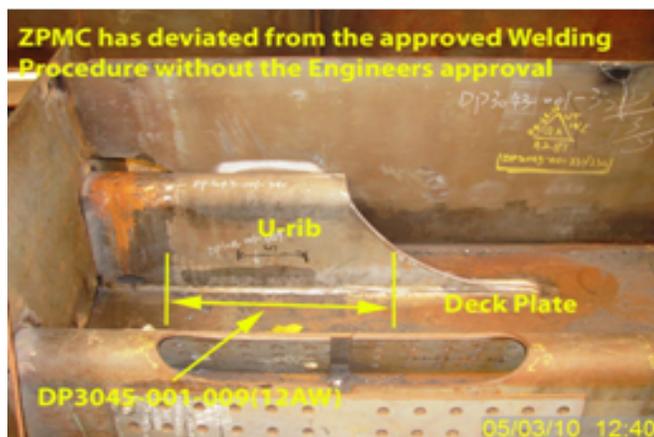
-ZPMC personnel reported the use of WPS-B-T-2342-U5 (GMAW) for the root pass and WPS-B-T-2232-Tc-U4b-F, (FCAW) for the cover pass for the welds in Segment 12AW:

Weld ID: DP3045-001-001 & 002 (RS3031D to PL3108B)

Weld ID: DP3043-001-009 & 010 (RS3031E to PL3106B)

QUALITY ASSURANCE -- NON-CONFORMANCE REPORT

(Continued Page 2 of 2)



Applicable reference:

Approved Shop Drawing SD515, detail 515J

Approved Shop Drawing SD504, detail 504T1

Approved Shop Drawing WD3, detail 30B

Who discovered the problem: Subhasis Bera

Name of individual from Contractor notified: Ti Cai Fang

Time and method of notification: 13:30 hours, 05/03/10, Verbal

Name of Caltrans Engineer notified: Stanley Ku, Sean Eagen

Time and method of notification: 15:00 hours, 05-04-10, Verbal

QC Inspector's Name: Li Ming Yang

Was QC Inspector aware of the problem: Yes No

Contractor's proposal to correct the problem:

N/A

Comments:

This report is for the purpose of determining conformance with the contract documents and is not for the purpose of making repair or fit for purpose recommendations. Should you require recommendations concerning repairs or remedial efforts please contact Mazen Wahbeh, (818) 292-0659, who represents the Office of Structural Materials for your project.

Inspected By:	Tsang, Eric	SMR
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Reviewed By:	Wahbeh, Mazen	SMR
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DEPARTMENT OF TRANSPORTATION - District 4 Toll Bridge
 666 Feng Bin Road Room 708, Changxing Island
 Shanghai 201913 PR China
 Tel: 021-56856666 ext 207061 Fax:

NON-CONFORMANCE REPORT TRANSMITTAL

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

Date: 05-May-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: 05.03.06-000686

Subject: NCR No. ZPMC-0691

Reference Description: ZPMC welded some welds in Segment 12AE & 12AW U-Rib Deck Panel without following the approved WPS and shop drawings

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

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

Material Location: OBG **Lift:** 12

Remarks:

During Quality Assurance (QA) random in-process observations of the assembly of Orthotropic Box Girder (OBG) segments 12AW and 12AE, this QA Inspector discovered the following issues:

- ZPMC welded the following weld joints listed below without following the approved Welding Procedure Specification (WPS) as specified in the approved shop drawings.
- The approved shop drawings specify the use of weld detail WD30B with WPS-B-T-2342-U1. This WPS specify the use of Gas Metal Arc Welding (GMAW) for the root pass and Submerged Arc Welding (SAW) for the cover pass.
- ZPMC personnel told QA Inspector that WPS-B-T-2232-Tc-U4b-F (FCAW) was used for both the root and over pass for the welds in Segment 12AE:
 - Weld ID: DP3007-001-001 & 002 (RS3001D to PL3005B)
 - Weld ID: DP3005-001-009 & 010 (RS3005B to PL3001E)
- ZPMC personnel reported the use of WPS-B-T-2342-U5 (GMAW) for the root pass and WPS-B-T-2232-Tc-U4b-F, (FCAW) for the cover pass for the welds in Segment 12AW:
 - Weld ID: DP3045-001-001 & 002 (RS3031D to PL3108B)
 - Weld ID: DP3043-001-009 & 010 (RS3031E to PL3106B)

Action Required and/or Action Taken:

Propose a resolution for the identified non-conformance with revised procedures to prevent future occurrences. A response for the resolution of this issue is expected within 7 days.

Transmitted by: Sean Eagen Transportation Engineer
Attachments: ZPMC-0691

NCT

(Continued Page 2 of 2)

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

File: 05.03.06

NCR PROPOSED RESOLUTION

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

Attention: Siegenthaler, Peter
Resident Engineer

Ref: 05.03.06-000686

Subject: NCR No. ZPMC-0691

Dated: 24-Sep-2010

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

Job Name: SAS Superstructure

Document No.: ABF-NPR-000794 Rev: 00

Contractor's Proposed Resolution:

Reference Resolution: ABFJV has performed depth of penetration UT testing to show that the weld has achieved a depth of penetration of seventy percent or higher in both welds as well as MT of the cover pass.

Although the different WPS were used during welding observed in the non conformance ABFJV has performed depth of penetration UT testing to show that the weld has achieved a depth of penetration of seventy percent or higher in both welds as well as MT of the cover pass. As the WPS used to weld were approved and the minimum depth of penetration was achieved, ZPMC requests that this NCR be closed.

Submitted by: Ishibashi, Joshua

Attachment(s): ABF-NPR-000794R00;

Caltrans' comments:

Status: CLO

Date: 12-Oct-2010

The welds were welded with the approved WPS with subsequent NDT verifications. This NCR is closed.

Submitted by: Woo, Laraine

Date: 12-Oct-2010

Attachment(s):

PJP U-Rib Verification Inspection Report

Ultrasonic examination test performed by Ding Baohua

12AE

DP3007-001-001, 002 L=900mm

Weld #		ABF/JV UT Operator					Total length
Length	5	16	5	001	001	002	
% Amp	365	455	785	820		6	
Thickness	25%	32%	25%	23%		550	
LOP	12.08	12.12	12.1	12.1		23%	
DOP	2.65	2.86	2.65	2.58		12.13	
	9.43	9.26	9.45	9.52		2.58	
						9.55	

DP3005-001-009, 010 L=900mm

Weld #		ABF/JV UT Operator					Total length
Length	8					010	
% Amp	130						
Thickness	35%						
LOP	12.52					12.5	
DOP	2.95						
	9.57					>9.6	

Weld #		ABF/JV UT Operator					Total length
Length							
% Amp							
Thickness							
LOP							
DOP							

This Weld is Acceptable or Rejectable= Acc 2010.9.23

PJP U-Rib Verification Inspection Report

Ultrasonic examination test performed by Ding Bao hua

12AW

DP 3043-001-001, 010 L=950 mm

ABF/JV UT Operator

Weld #	009	009	009	009	010	010	Total length
Length	8	6	20		5	6	
% Amp	540	680	890		135	265	
Thickness	35%	30%	37%		23%	24%	
LOP	12.13	12.1	12.1		12.12	12.13	
DOP	2.95	2.8	3.02		2.58	2.62	
	9.18	9.3	9.08		9.54	9.51	

DP 3045-001-001, 002 L=950 mm

Weld #	001	002	Total length
Length			
% Amp			
Thickness	12.26	12.27	
LOP			
DOP	79.6	79.6	

Weld #	Total length
Length	
% Amp	
Thickness	
LOP	
DOP	

This Weld is Acceptable or Rejectable=

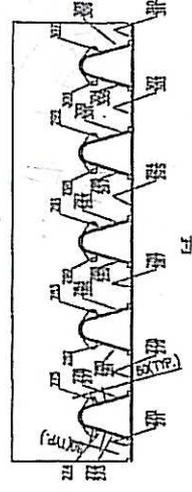
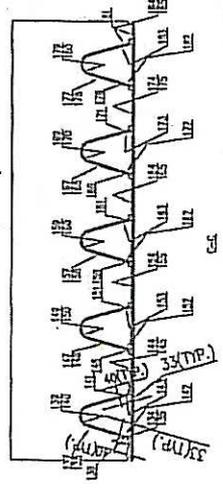
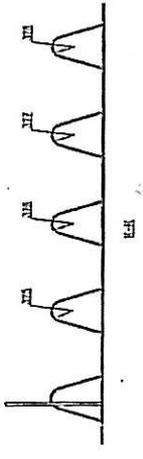
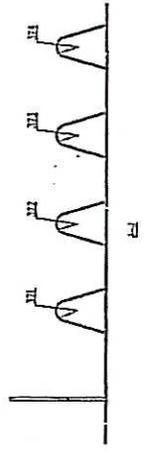
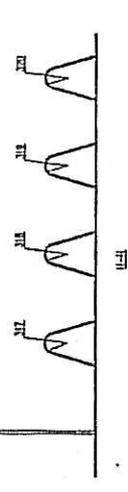
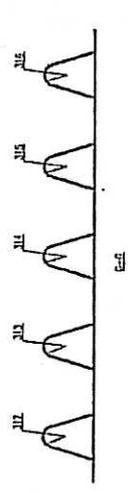
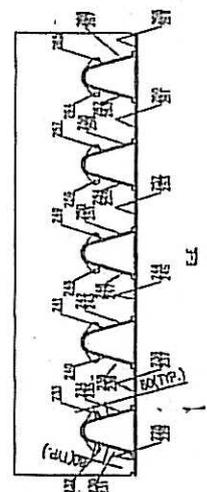
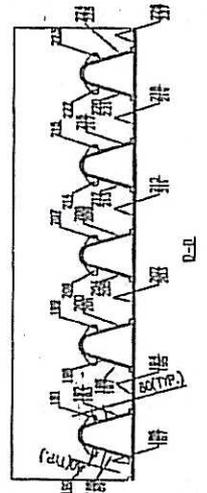
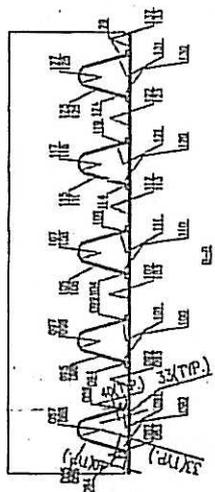
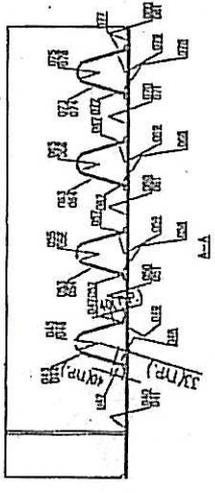
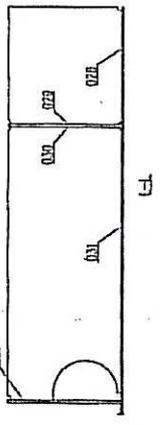
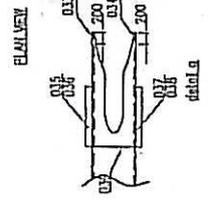
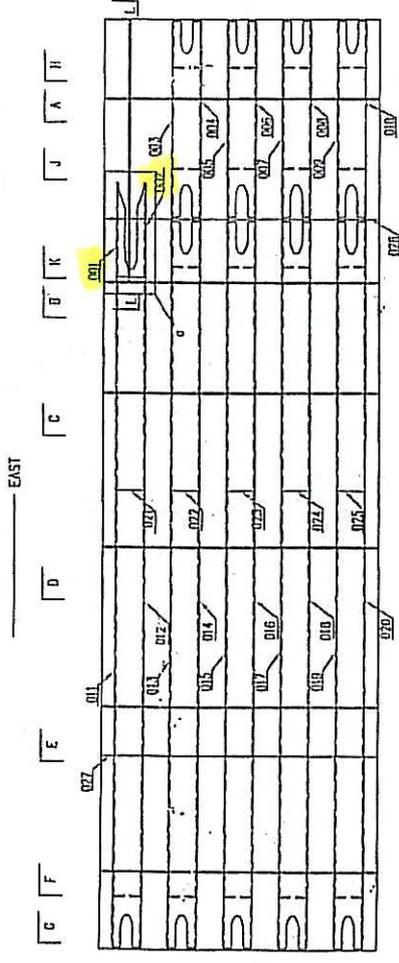
Acc
2010.9.23

PJP U-Rib Calibration 2010-09-23 1406 hours 150 Ohm @4Mhz settings

Corr.factor 1.2
39.2 db

100	5.40	50	3.42
99	5.36	49	3.38
98	5.32	48	3.35
97	5.28	47	3.32
96	5.24	46	3.29
95	5.20	45	3.26
94	5.16	44	3.23
93	5.12	43	3.20
92	5.08	42	3.17
91	5.04	41	3.14
90	5.00	40	3.11
89	4.96	39	3.08
88	4.92	38	3.05
87	4.88	37	3.02
86	4.84	36	2.98
85	4.80	35	2.95
84	4.75	34	2.92
83	4.71	33	2.89
82	4.66	32	2.86
81	4.62	31	2.83
80	4.57	30	2.80
79	4.53	29	2.77
78	4.48	28	2.74
77	4.44	27	2.71
76	4.39	26	2.68
75	4.35	25	2.65
74	4.30	24	2.62
73	4.26	23	2.58
72	4.22	22	2.55
71	4.18	21	2.52
70	4.14	20	2.49
69	4.11	19	2.46
68	4.07	18	2.43
67	4.03	17	2.40
66	3.99	16	2.26
65	3.95	15	2.12
64	3.91	14	1.98
63	3.87	13	1.84
62	3.83	12	1.69
61	3.79	11	1.55
60	3.76	10	1.41
59	3.72	9	1.27
58	3.68	8	1.13
57	3.64	7	0.99
56	3.60	6	0.85
55	3.57	5	0.71
54	3.54	4	0.56
53	3.51	3	0.42
52	3.48	2	0.28
51	3.45	1	0.14
50	3.42	0	0.00

MT-NCR-12E-001 (3 of 3)



注意:

如有遗漏或重复标注的焊缝, 请
QC人员通知工艺进行补标或删标.

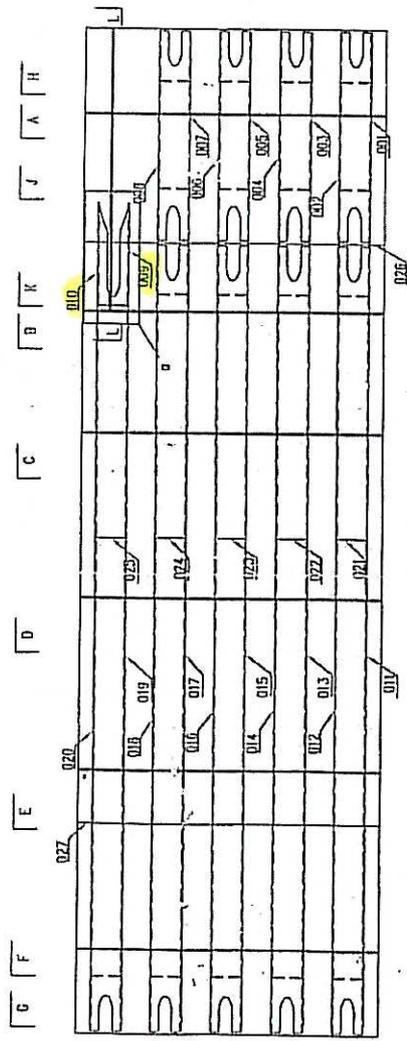
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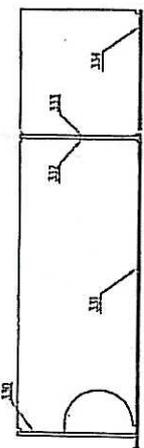
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MT-NCR-12W-001 (2 of 3)

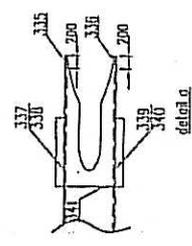
EAST



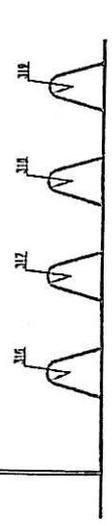
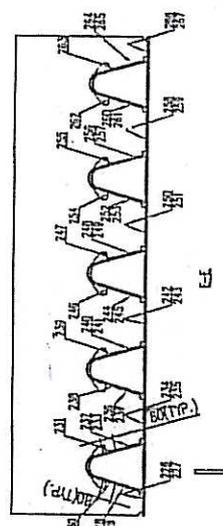
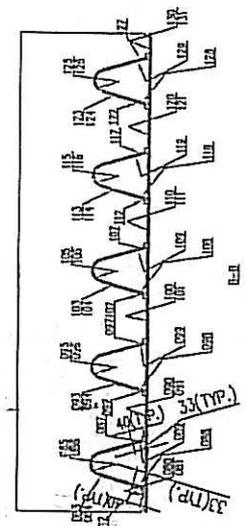
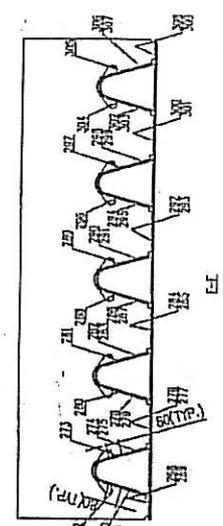
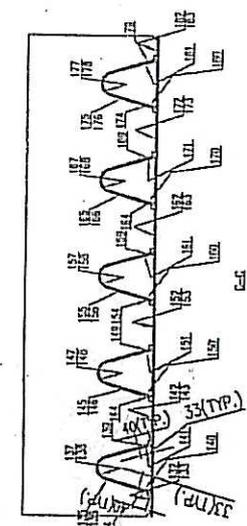
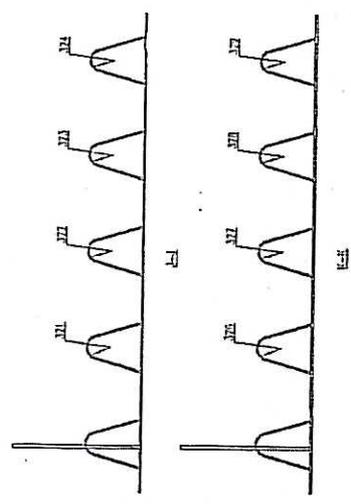
PLAN VIEW



A-A



B-B



B-B



A-A

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注意:
 如有遗漏或修改标注的焊缝, 请
 QC人员通知加工人员进行补焊或返工。

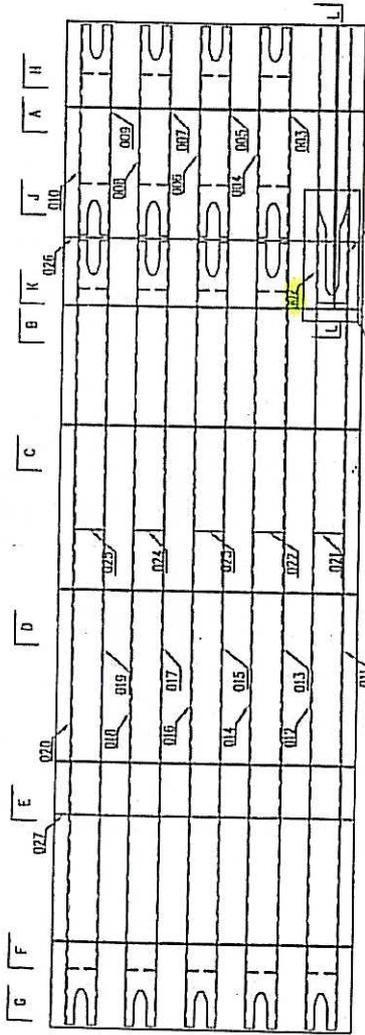


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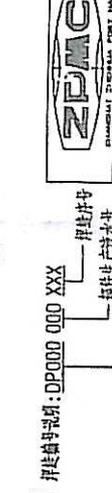
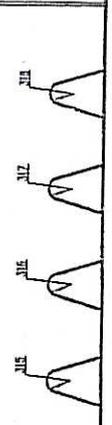
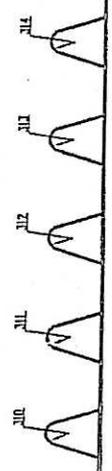
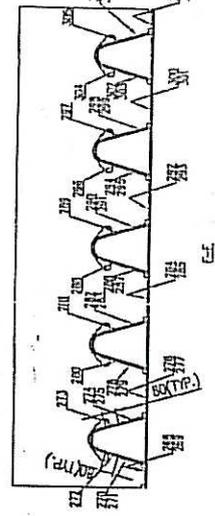
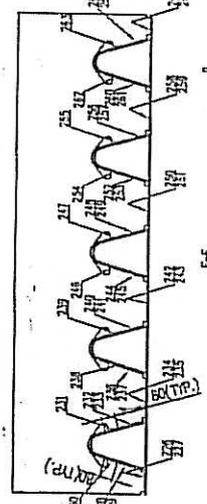
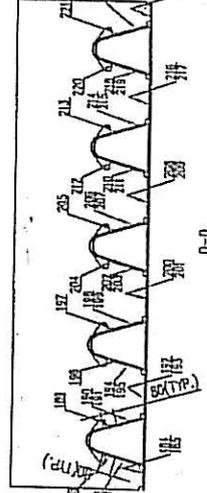
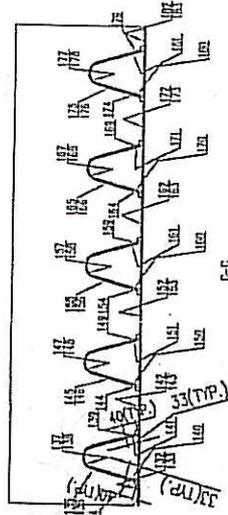
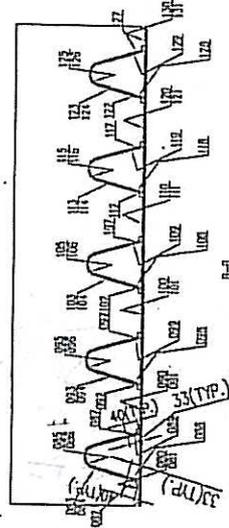
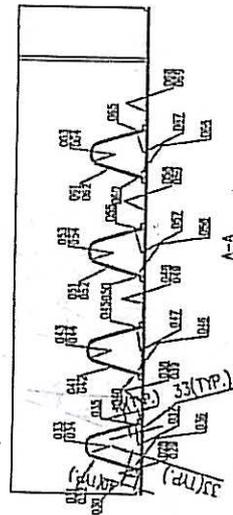
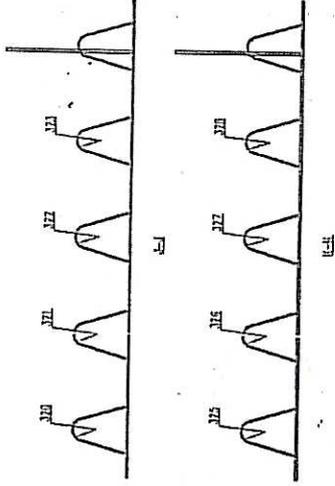
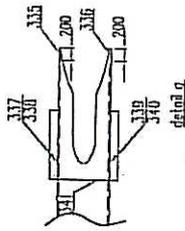
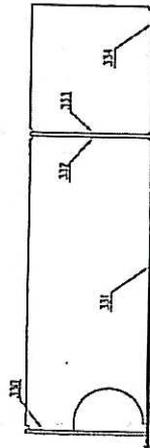
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MT-AKR-12W-001 (3 of 3)

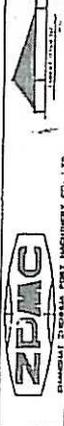
EAST



PLAN VIEW



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 焊接符号
 特征生产流水号
 特征车间流水号



WELDING MAP
 DP3045

注: 如有变更或多条送检样件, 请QC人员通知工艺进行样件取送。

2009-8-9 15:41:49



焊接工艺规程 B*
WELDING PROCEDURE SPECIFICATION

编号 No. WPS-B-T-2342-U5 (U-rib)
有效期 Period of validity
FCM :2008.10~2011.10
NON-FCM :2008.10~2013.10

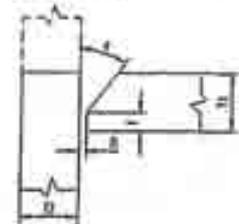
母材技术条件 (Material specification) ASTMA.709M Gr.345F2
 焊接方法 (Welding process) 实芯焊丝混合气体保护焊(GMAW)
 手工或机械 (Manual or machine or semi-auto) 半自动(Semi-auto)
 焊接位置 (Position of welding) 横焊(2G)
 填充金属技术条件 (Filler metal specification) AWS A5.11
 填充金属级别 (Filler metal classification) ER70S-G
 填充金属牌号 (Filler metal brand) JM-56(Φ1.4)
 焊剂 (Flux) N/A
 保护气体 (Shielding gas) 80%Ar+15%CO₂+5%O₂ 流量 (Flow rate) 20~25L/min
 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) 过渡模式(Transfer mode) 射流过渡(Spray)
 焊丝伸出长度 (Electrode extension) 20mm
 焊接方向 (Welding progression) N/A
 根部处理 (Root treatment) N/A
 最低预热和道间温度 (Preheat and interpass temperature Min)
非断裂危险(NON-FCM) 10°C [T≤20mm] 20°C [20mm<T≤40mm] 65°C [40mm<T≤60mm] 110°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) 0.83KJ/mm

焊接工艺
(Welding procedure)

最大热输入 Max Heat Input 3.1KJ/mm
 APPROVED AS NOTED
 RETURNED FOR CORRECTION
 Pursuant to Section 5-1.02
 of the Standard Specifications
 State of California
 DEPARTMENT OF TRANSPORTATION
 Division of Engineering Service
 Office of Structure Construction
 10/10/08
 10/10/08

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)
		安培 Amp(s)	伏特 Volts	
1-n	1.4	330~350	25~28	495.6~605.8

T1=T2=3~mm R=0~0.5 f=1.8mm(±0.4)
 $\alpha=43.2^{\circ} (+1^{\circ}, -1^{\circ})$



确定通用的电流、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.

该工艺可以随制造工序、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) [Signature]
 工艺评定记录编号(PQR No.) HP2007370 日期(Date) 2008.10.9

* 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*

WELDING PROCEDURE SPECIFICATION

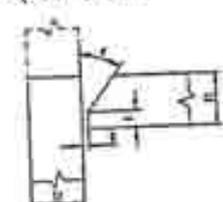
编号 No.
WPS-B-T-2232-TC-U4b-F

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) ASTMA 709M Gr.345F2
 焊接方法 (Welding process) 药芯焊丝 CO₂ 气体保护焊(FCAW)
 手工或机械 (Manual or machine or semi-auto) 半自动(Semi-auto)
 焊接位置 (Position of welding) 横焊(2G)
 填充金属技术条件 (Filler metal specification) AWS A5.20
 填充金属级别 (Filler metal classification) E71T-1
 填充金属牌号 (Filler metal brand) Supercored 71H (Φ1.4)
 焊剂 (Flux) N/A
 保护气体 (Shielding gas) 100%CO₂ 流率 (Flow rate) 18-25L/min
 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) 20mm
 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)
 非断裂危险(NON-FCM) 10°C [T≤20mm] 20°C [20mm<T≤40mm] 65°C [40mm<T≤60mm] 110°C [60mm<T]
 断裂危险(FCM) 60°C [T≤20mm] 100°C [20mm<T≤40mm] 120°C [40mm<T≤60mm] 160°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) 1.54KJ/mm 最大(Max) 2.57KJ/mm

焊接工艺 (Welding procedure)

This document is the property of ZPMC
 DEPARTMENT OF TRAINING
 Pursuant Section 5.1.02 of the
 Standard Specifications
 Initial SJE Date 10/26/07

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	1.4	280-350	28-32.5	182.6-442.4	$T1-T2=3 \pm 0.3$ $R=0.3(+2, -0)$ $f=0.3(+2, -0)$ $\alpha=45^{\circ}(+10^{\circ}, -0^{\circ})$ 

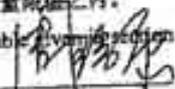
选定适当的电流, 电压后在 WPS 焊接参数选用表中查到焊接速度范围。
 Refer to WPS parameters table to determine operating parameter to stay within the heat input limit.

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 variable given in section 5.)

修订号(Revision No.) 1

工艺评定记录编号(PQR No.) HP2006107-10

* 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) 
 日期(Date) 2007.3.20

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-000819**Prime Contractor:** American Bridge/Fluor Enterprises, a JV**Date:** 12-Oct-2010**Submitting Contractor:** Zhenhua Port Machinery Company, Ltd (ZPMC), Changxing Island **NCR #:** ZPMC-0691**Type of problem:**

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

Date the Non-Conformance Report was written: 03-May-2010**Description of Non-Conformance:**

During Quality Assurance (QA) random in-process observations of the assembly of Orthotropic Box Girder (OBG) segments 12AW and 12AE, this QA Inspector discovered the following issues:

- ZPMC welded the following weld joints listed below without following the approved Welding Procedure Specification (WPS) as specified in the approved shop drawings.
- The approved shop drawings specify the use of weld detail WD30B with WPS-B-T-2342-U1. This WPS specify the use of Gas Metal Arc Welding (GMAW) for the root pass and Submerged Arc Welding (SAW) for the cover pass.

- ZPMC personnel told QA Inspector that WPS-B-T-2232-Tc-U4b-F (FCAW) was used for both the root and over pass for the welds in Segment 12AE:

Weld ID: DP3007-001-001 & 002 (RS3001D to PL3005B)

Weld ID: DP3005-001-009 & 010 (RS3005B to PL3001E)

- ZPMC personnel reported the use of WPS-B-T-2342-U5 (GMAW) for the root pass and WPS-B-T-2232-Tc-U4b-F, (FCAW) for the cover pass for the welds in Segment 12AW:

Weld ID: DP3045-001-001 & 002 (RS3031D to PL3108B)

Weld ID: DP3043-001-009 & 010 (RS3031E to PL3106B)

Contractor's proposal to correct the problem:

Contractor proposes to reweld the welds with approved WPS, perform UT and MT to show that the weld has achieved a depth of penetration.

Corrective action taken:

Contractor rewelded the weld with approved WPS, and provided the NDT report to prove the weld is acceptable.

Did corrective action require Engineer's approval?

QUALITY ASSURANCE -- NON-CONFORMANCE RESOLUTION

(Continued Page 2 of 2)

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

Inspected By: Ng,Michael

Quality Assurance Inspector

Reviewed By: Wahbeh,Mazen

QA Reviewer