# WELDING PROCEDURE SPECIFICATION SHEET FOR 72M BSG (WORKSHOP WELDING)

RDSO Drg. No.: RDSO/B-10440 SERIES



M/s HMM Infra Ltd.

Works address :- Village Mandour (Ambala-Naraingarh Road), Ambala City, Haryana





RDSO's Drg. No.: RDSO/B-10440

**BOW STRING GIRDER 60M** 

NDSO 3 DIG. NO NDSC	// D-10 <del>110</del>	BOW STRING GIRDER BUILD		
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#### Welding Procedure Specification Sheet

Name and address of Fabricator: HMM Infra Limited, Village-Mandour, Ambala, Haryana

Welding Procedure Specification Sheet No. : HMM/24/WPSS/BSG/72M/SAW/001

RDSO/B-10440/1 # Bottom Long Beam Ref. Drg No. Section 1-1, Web plate to Flange plate

Weld joint description: 1.0 Fillet (10mm)

25mm & 25mm IS 2062:2011 E350 B0, Fully Killed, 2.0 Base Metal:

Normalized/Control Colled

Welding Process: 3.0 SAW 1F (Flat) 4.0 Welding position: Welding consumables: 5.0 (as below)

5.1 Electrode/wire Class: W-2 as per IRS M39-2020

> Dia: 4mm Drying method: NA

5.2 Flux Class: F-2 as per IRS M39-2020

> Type: Agglomerated

Drying method: 350°C for 2 hrs in baking oven, Holding temp. =100°C

5.3.1 Shielding gas:

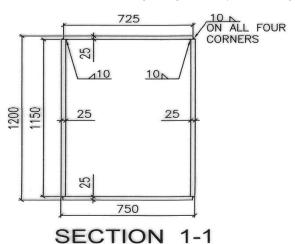
Fusion faces & adjacent surface are cleaned and made free from 6.0 Base Metal preparation:

cracks, notches, mill scales, paints, grease, rust etc. which may affect

weld quality.

6.1 Joint design details:

(Give sketch showing arrangement of parts, welding groove details, weld passes & their sequence etc.)



Welding of flange to web plate of Bottom Long Beam

6.2 Joint preparation: As per IS 4353-1995 CL-7, IRS B1-2001, CL-17.3 & WBC-2001

7.0 Welding current: Type: DC

(BOTTOM LONG BEAM)

Polarity: EP (Electrode Positive)

8.0 Welder qualification: As per IS 7310(part-I)-2019



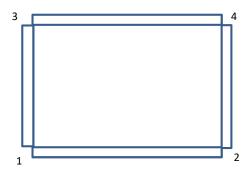
**FABRICATOR** CONTRACTOR S.E.C. RLY. **RDSO** NHAI

Welding Parameters: 9.1

Weld	Electrodes	Current	Arc	Wire	Travel	Electrical	Gas flow
Pass	/wire dia.		Voltage	feed speed	speed	stick out	rate
No.	(mm)	(amp)	(volt)	(m/min)	(m/ min)	(mm)	L.P.M
1	2	3	4	5	6	7	8
1	4mm	475-575A	27-30V	0.8-1.3	0.3-0.5	25-38	NA

9.2 Welding sequence and technique: 1,2,3,4

(Give sketch showing sequence and direction of welding).



Welding not covered by SAW may be done by FCAW process

10.0 Provision of run in and run-off tabs:

11.0 Cleaning of weld bead before laying next weld bead: Yes (in case of multilayer only)

12.0 Root preparation before welding other side of groove weld: NA

Preheating and inter pass temperature: 13.0 150°C - 250°C interpass temp.

14.0 Peening:

15.0 NA Post weld treatment:

By grinding of defective weld & rectify the weld as per 16.0 Rectification of weld defects:

NA

clause 32.2 of IS 9595-1996 using FCAW Class-I wire as

per IRS M46-2020

17.0 Inspection of weld: Visual Inspection, D.P. Test & Macro Etching

18.0 NIL Any other relevant details:



#### **Welding Procedure Specification Sheet**

Name and address of Fabricator: HMM Infra Limited, Village-Mandour, Ambala, Haryana

Welding Procedure Specification Sheet No.: HMM/24/WPSS/BSG/72M/SAW/002A

Ref. Drg No. RDSO/B-10440/9 # Hanger

View F-F, Web plate to Flange plate at Ends

1.0 Weld joint description : Fillet (18mm)

2.0 Base Metal : 25mm & 32mm IS 2062:2011 E350 B0, Fully Killed,

3.0 Welding Process : SAW

4.0 Welding position: 1F (Flat)
5.0 Welding consumables: (as below)

5.1 Electrode/wire Class: W-2 as per IRS M39-2020

Dia: 4mm Drying method: NA

5.2 Flux Class : F-2 as per IRS M39-2020

Type: Agglomerated

Drying method: 350°C for 2 hrs in baking oven, Holding temp. =100°C

5.3.1 Shielding gas: NA

Fusion faces & adjacent surface are cleaned and made free from cracks,

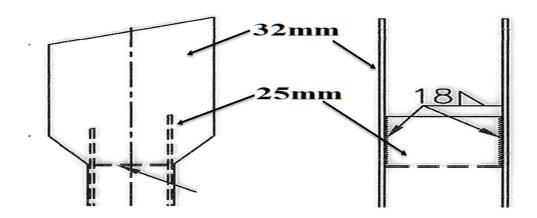
6.0 Base Metal preparation : notches, mill scales, paints, grease, rust etc. which may affect weld

quality.

6.1 Joint design details :

(Welding not covered by SAW will be done by FCAW process)

(Give sketch showing arrangement of parts, welding groove details, weld passes & their sequence etc.)



#### WELDING OF HANGER TOP & BOTTOM FLANGE TO WEB AT ENDS

6.2 Joint preparation : As per IS 4353-1995 CL-7, IRS B1-2001, CL-17.3 & WBC-2001

7.0 Welding current : Type : DC

Polarity : EP (Electrode Positive)

8.0 Welder qualification : As per IS 7310(part-I)-2019



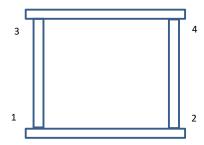
9.1 Welding Parameters :

Weld	Electrodes	Current	Arc	Wire	Travel	Electrical	Gas flow
Pass No.	/wire dia. (mm)	(amp)	Voltage (volt)	feed speed (m/min)	speed (m/min)	stick out (mm)	rate L.P.M
1	2	3	4	5	6	7	8
4-6	4mm	475-575A	27-30V	0.8-1.3	0.3-0.6	25-38	NA

9.2 Welding sequence and technique:

1,2,3,4

(Give sketch showing sequence and direction of welding).



Welding not covered by SAW may be done by FCAW process

10.0 Provision of run in and run-off tabs:

11.0 Cleaning of weld bead before laying next weld bead:

12.0 Root preparation before welding other side of groove weld:

13.0 Preheating and inter pass temperature: 150°C - 250°C interpass temp.

14.0 Peening: NA

15.0 Post weld treatment: NA

By grinding of defective weld & rectify the weld as per clause 32.2 of IS 9595-1996 using FCAW Class-I wire as

clause 32.2 of 15 9595-1990 using FCAW Class-I wire as

per IRS M46-2020

17.0 Inspection of weld: Visual Inspection, D.P. Test & Macro Etching

18.0 Any other relevant details: NIL



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#### **RDSO 72M BOW STRING GIRDER**

#### **Welding Procedure Specification Sheet**

Name and address of Fabricator: HMM Infra Limited, Village-Mandour, Ambala, Haryana

Welding Procedure Specification Sheet No. : HMM/24/WPSS/BSG/72M/SAW/002

RDSO/B-10440/1 # Hanger Ref. Drg No.

Section 2-2, Web plate to Flange plate 1.0 Weld joint description: Fillet (10mm)

25mm & 32mm IS 2062:2011 E350 B0, Fully Killed,

2.0 Base Metal: Normalized/Control Colled

3.0 Welding Process: SAW 4.0 Welding position: 1F (Flat) 5.0 Welding consumables: (as below)

Electrode/wire Class: 5.1 W-2 as per IRS M39-2020

> Dia: 4mm Drying method: NA

Flux Class: F-2 as per IRS M39-2020 5.2

> Type: Agglomerated

Drying method: 350°C for 2 hrs in baking oven, Holding temp. =100°C

Shielding gas: 5.3.1 NA

> Fusion faces & adjacent surface are cleaned and made Base Metal preparation:

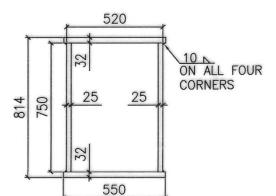
free from cracks, notches, mill scales, paints, grease, rust

etc. which may affect weld quality.

6.1 Joint design details:

6.0

(Give sketch showing arrangement of parts, welding groove details, weld passes & their sequence etc.)



Welding of flange to web plate of Hanger

## SECTION

(HANGER)

6.2 Joint preparation: As per IS 4353-1995 CL-7, IRS B1-2001, CL-17.3 & WBC-2001

7.0 Welding current: Type: DC

> Polarity: EP (Electrode Positive)

8.0 Welder qualification: As per IS 7310(part-I)-2019



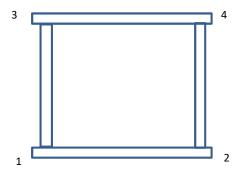
**FABRICATOR CONTRACTOR** S.E.C. RLY. **RDSO** NHAI

9.1 Welding Parameters :

Weld	Electrodes	Current	Arc	Wire	Travel	Electrical	Gas flow
Pass	/wire dia.		Voltage	feed speed	speed	stick out	rate
No.	(mm)	(amp)	(volt)	(m/min)	(m/ min)	(mm)	L.P.M
1	2	3	4	5	6	7	8
1	4mm	475-575A	27-30V	0.8-1.3	0.3-0.5	25-38	NA

9.2 Welding sequence and technique: 1,2,3,4

(Give sketch showing sequence and direction of welding).



Welding not covered by SAW may be done by FCAW process

10.0 Provision of run in and run-off tabs:

11.0 Cleaning of weld bead before laying next weld bead: Yes (in case of multilayer only)

12.0 Root preparation before welding other side of groove weld: NA

13.0 Preheating and inter pass temperature: 150°C - 250°C interpass temp.

14.0 Peening: NA

15.0 Post weld treatment: NA

By grinding of defective weld & rectify the weld as per clause
16.0 Rectification of weld defects: 32.2 of IS 9595-1996 using FCAW Class-I wire as per IRS M46-

2020

17.0 Inspection of weld: Visual Inspection, D.P. Test & Macro Etching

18.0 Any other relevant details: NIL



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#### **RDSO 72M BOW STRING GIRDER**

#### **Welding Procedure Specification Sheet**

Name and address of Fabricator: HMM Infra Limited, Village-Mandour, Ambala, Haryana

Welding Procedure Specification Sheet No. : HMM/24/WPSS/BSG/72M/SAW/003

Ref. Drg No. RDSO/B-10440/1 # Arch

Section 3-3, Web plate to Flange plate

1.0 Weld joint description : Fillet (10mm)

2.0 Base Metal : 32mm & 32mm IS 2062:2011 E350 B0, Fully Killed,

Normalized/Control Colled

3.0 Welding Process: SAW
4.0 Welding position: 1F (Flat)
5.0 Welding consumables: (as below)

5.1 Electrode/wire Class: W-2 as per IRS M39-2020

Dia: 4mm Drying method: NA

5.2 Flux Class: F-2 as per IRS M39-2020

Type: Agglomerated

Drying method: 350°C for 2 hrs in baking oven, Holding temp. =100°C

5.3.1 Shielding gas: NA

Fusion faces & adjacent surface are cleaned and made free

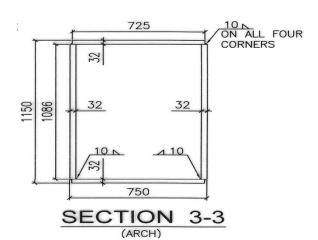
6.0 Base Metal preparation : from cracks, notches, mill scales, paints, grease, rust etc.

which may affect weld quality.

6.1 Joint design details:

(Welding not covered by SAW will be done by FCAW process)

(Give sketch showing arrangement of parts, welding groove details, weld passes & their sequence etc.)



Welding of flange to web plate of Arch

6.2 Joint preparation: As per IS 4353-1995 CL-7, IRS B1-2001, CL-17.3 & WBC-2001

7.0 Welding current: Type: DC

Polarity: EP (Electrode Positive)

8.0 Welder qualification: As per IS 7310(part-I)-2019



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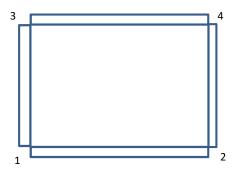
9.0 Welding parameters and technique: (as below)

9.1 Welding Parameters:

Weld	Electrodes	Current	Arc	Wire	Travel	Electrical	Gas flow
Pass	/wire dia.		Voltage	feed speed	speed	stick out	rate
No.	(mm)	(amp)	(volt)	(m/min)	(m/ min)	(mm)	L.P.M
1	2	3	4	5	6	7	8
1	4mm	475-575A	27-30V	0.8-1.3	0.3-0.6	25-38	NA

9.2 Welding sequence and technique: 1,2,3,4

(Give sketch showing sequence and direction of welding).



Welding not covered by SAW may be done by FCAW process

10.0 Provision of run in and run-off tabs:

11.0 Cleaning of weld bead before laying next weld bead: Yes (in case of multilayer only)

12.0 Root preparation before welding other side of groove weld: NA

13.0 Preheating and inter pass temperature: 150°C - 250°C interpass temp.

14.0 Peening: NA

15.0 Post weld treatment: NA

By grinding of defective weld & rectify the weld as per clause
16.0 Rectification of weld defects: 32.2 of IS 9595-1996 using FCAW Class-I wire as per IRS M46-

Nectification of weld defects.

17.0 Inspection of weld: Visual Inspection, D.P. Test & Macro Etching

18.0 Any other relevant details: NIL



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#### **RDSO 72M BOW STRING GIRDER**

#### **Welding Procedure Specification Sheet**

Name and address of Fabricator: HMM Infra Limited, Village-Mandour, Ambala, Haryana

Welding Procedure Specification Sheet No. : HMM/24/WPSS/BSG/72M/SAW/004

RDSO/B-10440/1 # Int. Bottom Cross Beam Ref. Drg No.

Section 4-4, Web plate to Top & Bottom Flange plate

1.0 Weld joint description: Fillet (12mm)

16mm & 20/28mm IS 2062:2011 E350 B0, Fully Killed, Base Metal: 2.0

Normalized/Control Colled

3.0 Welding Process: SAW Welding position: 4.0 1F (Flat) Welding consumables: 5.0 (as below)

5.1 Electrode/wire Class: W-2 as per IRS M39-2020

> Dia: 4mm Drying method:

5.2 Flux Class: F-2 as per IRS M39-2020

> Type: Agglomerated

Drying method: 350°C for 2 hrs in baking oven, Holding temp. =100°C

5.3.1 Shielding gas:

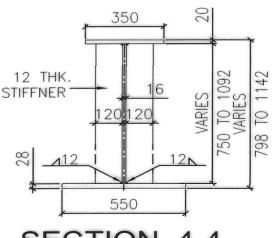
Fusion faces & adjacent surface are cleaned and made 6.0 Base Metal preparation:

free from cracks, notches, mill scales, paints, grease, rust

etc. which may affect weld quality.

6.1 Joint design details:

(Give sketch showing arrangement of parts, welding groove details, weld passes & their sequence etc.)



Welding of flange to web plate of Int. Bottom **Cross Beam** 

(INTERMEDIATE BOTTOM CROSS BEAM)

6.2 Joint preparation: As per IS 4353-1995 CL-7, IRS B1-2001, CL-17.3 & WBC-2001

7.0 Welding current: DC Type:

> Polarity: EP (Electrode Positive)

Welder qualification: 8.0 As per IS 7310(part-I)-2019



**FABRICATOR** CONTRACTOR **RDSO** NHAI S.E.C. RLY.

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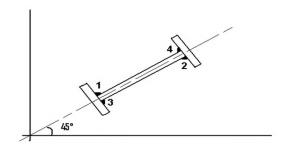
9.0 Welding parameters and technique: (as below)

9.1 Welding Parameters:

Weld	Electrodes	Current	Arc	Wire	Travel	Electrical	Gas flow
Pass	/wire dia.		Voltage	feed speed	speed	stick out	rate
No.	(mm)	(amp)	(volt)	(m/min)	(m/ min)	(mm)	L.P.M
1	2	3	4	5	6	7	8
2	4mm	475-575A	27-30V	0.8-1.3	0.3-0.6	25-38	NA

9.2 Welding sequence and technique: 1,2,3,4

(Give sketch showing sequence and direction of welding).



10.0 Provision of run in and run-off tabs:

11.0 Cleaning of weld bead before laying next weld bead: Yes (in case of multilayer only)

12.0 Root preparation before welding other side of groove weld: NA

13.0 Preheating and inter pass temperature: 150°C - 250°C interpass temp.

14.0 Peening: NA

15.0 Post weld treatment: NA

By grinding of defective weld & rectify the weld as per clause
16.0 Rectification of weld defects: 32.2 of IS 9595-1996 using FCAW Class-I wire as per IRS M46-

2020

17.0 Inspection of weld: Visual Inspection, D.P. Test & Macro Etching

18.0 Any other relevant details: NIL



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#### **RDSO 72M BOW STRING GIRDER**

#### **Welding Procedure Specification Sheet**

Name and address of Fabricator: HMM Infra Limited, Village-Mandour, Ambala, Haryana

Welding Procedure Specification Sheet No. : HMM/24/WPSS/BSG/72M/SAW/005

Ref. Drg No.

RDSO/B-10440/1 # End Bottom Cross Beam

Section 5-5, Web plate to Flange plate

1.0 Weld joint description : Fillet (10mm)

2.0 Base Metal : 25mm & 32mm IS 2062:2011 E350 B0, Fully Killed,

Normalized/Control Colled

3.0 Welding Process: SAW
4.0 Welding position: 1F (Flat)
5.0 Welding consumables: (as below)

5.1 Electrode/wire Class: W-2 as per IRS M39-2020

Dia: 4mm

Drying method : NA

5.2 Flux Class: F-2 as per IRS M39-2020

Type: Agglomerated

Drying method: 350°C for 2 hrs in baking oven, Holding temp. =100°C

5.3.1 Shielding gas:

Fusion faces & adjacent surface are cleaned and made

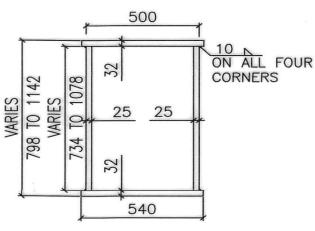
6.0 Base Metal preparation : free from cracks, notches, mill scales, paints, grease, rust

NA

etc. which may affect weld quality.

6.1 Joint design details:

(Give sketch showing arrangement of parts, welding groove details, weld passes & their sequence etc.)



Welding of flange to web plate of End Bottom Cross Beam

SECTION 5-5 (END BOTTOM CROSS BEAM)

6.2 Joint preparation: As per IS 4353-1995 CL-7, IRS B1-2001, CL-17.3 & WBC-2001

7.0 Welding current: Type: DC

Polarity: EP (Electrode Positive)

8.0 Welder qualification : As per IS 7310(part-I)-2019



CONTRACTOR

FABRICATOR

Page 2 of 3 NHAI

S.E.C. RLY.

RDSO

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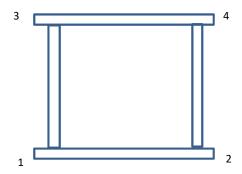
Welding parameters and technique: 9.0 (as below)

Welding Parameters: 9.1

Weld	Electrodes	Current	Arc	Wire	Travel	Electrical	Gas flow
Pass	/wire dia.		Voltage	feed speed	speed	stick out	rate
No.	(mm)	(amp)	(volt)	(m/min)	(m/ min)	(mm)	L.P.M
1	2	3	4	5	6	7	8
2-3	4mm	475-575A	27-30V	0.8-1.3	0.3-0.6	25-38	NA

Welding sequence and technique: 9.2 1,2,3,4

(Give sketch showing sequence and direction of welding).



Welding not covered by SAW may be done by FCAW process

10.0 Provision of run in and run-off tabs: Yes

Cleaning of weld bead before laying next weld bead: Yes (in case of multilayer only) 11.0

12.0 Root preparation before welding other side of groove weld: NA

13.0 Preheating and inter pass temperature: 150°C - 250°C interpass temp.

14.0 Peening: NA

Post weld treatment: NA 15.0

By grinding of defective weld & rectify the weld as per clause 32.2 of IS 9595-1996 using FCAW Class-I wire as per 16.0 Rectification of weld defects:

IRS M46-2020

17.0 Inspection of weld: Visual Inspection, D.P. Test & Macro Etching

18.0 Any other relevant details: NIL



#### **Welding Procedure Specification Sheet**

Name and address of Fabricator: HMM Infra Limited, Village-Mandour, Ambala, Haryana

Welding Procedure Specification Sheet No. : HMM/24/WPSS/BSG/72M/SAW/006

RDSO/B-10440/1 # Top Tie Beam Ref. Drg No. Section 6-6, Web plate to Flange plate

1.0 Weld joint description: Fillet (10mm)

25mm & 25mm IS 2062:2011 E350 B0, Fully Killed, 2.0 Base Metal:

Normalized/Control Colled

3.0 Welding Process: SAW

4.0 Welding position: 1F (Flat) 5.0 Welding consumables: (as below)

Electrode/wire Class: 5.1 W-2 as per IRS M39-2020

> Dia: 4mm

Drying method: NA

5.2 Flux Class: F-2 as per IRS M39-2020

> Type: Agglomerated

Drying method: 350°C for 2 hrs in baking oven, Holding temp. =100°C

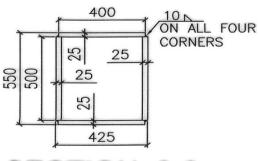
Shielding gas: 5.3.1

Fusion faces & adjacent surface are cleaned and made free from 6.0 Base Metal preparation: cracks, notches, mill scales, paints, grease, rust etc. which may affect

weld quality.

6.1 Joint design details:

(Give sketch showing arrangement of parts, welding groove details, weld passes & their sequence etc.)



Welding of Flange to web plate of Top Tie Beam



Joint preparation: 6.2 As per IS 4353-1995 CL-7, IRS B1-2001, CL-17.3 & WBC-2001

7.0 Welding current: Type: DC

> Polarity: EP (Electrode Positive)

8.0 Welder qualification: As per IS 7310(part-I)-2019



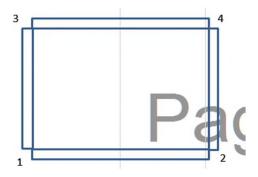
9.1 Welding Parameters:

Weld	Electrodes	Current	Arc	Wire	Travel	Electrical	Gas flow
Pass	/wire dia.		Voltage	feed speed	speed	stick out	rate
No.	(mm)	(amp)	(volt)	(m/min)	(m/ min)	(mm)	L.P.M
1	2	3	4	5	6	7	8
1	4mm	475-575A	27-30V	0.8-1.3	0.3-0.6	25-38	NA

9.2 Welding sequence and technique:

1,2,3,4

(Give sketch showing sequence and direction of welding).



Welding not covered by SAW may be done by FCAW process

10.0 Provision of run in and run-off tabs:

11.0 Cleaning of weld bead before laying next weld bead:

Yes (in case of multilayer only)

12.0 Root preparation before welding other side of groove weld: NA

13.0 Preheating and inter pass temperature: 150°C - 250°C interpass temp.

14.0 Peening:

15.0 Post weld treatment: NA

By grinding of defective weld & rectify the weld as per

Rectification of weld defects: clause 32.2 of IS 9595-1996 using FCAW Class-I wire as

NA

per IRS M46-2020

17.0 Inspection of weld: Visual Inspection, D.P. Test & Macro Etching

18.0 Any other relevant details: NIL



16.0

#### Page 1 of 2 RDSO 72M BOW STRING GIRDER

#### **Welding Procedure Specification Sheet**

Name and address of Fabricator: HMM Infra Limited, Village-Mandour, Ambala, Haryana

Welding Procedure Specification Sheet No. : HMM/24/WPSS/BSG/72M/SAW/007

Ref. Drg No.

RDSO/B-10440/1 # Top Diagonal Tie beam
Section 7-7, Web plate to Flange plate

1.0 Weld joint description : Fillet (08mm)

2.0 Base Metal : 22mm & 22mm IS 2062:2011 E350 B0, Fully Killed,

Normalized/Control Colled

3.0 Welding Process: SAW
4.0 Welding position: 1F (Flat)
5.0 Welding consumables: (as below)

5.1 Electrode/wire Class: W-2 as per IRS M39-2020

Dia: 4mm Drying method: NA

5.2 Flux Class: F-2 as per IRS M39-2020

Type: Agglomerated

Drying method: 350°C for 2 hrs in baking oven, Holding temp. =100°C

5.3.1 Shielding gas: NA

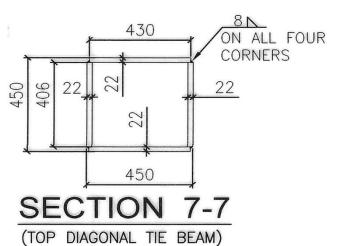
Fusion faces & adjacent surface are cleaned and made free

6.0 Base Metal preparation : from cracks, notches, mill scales, paints, grease, rust etc.

which may affect weld quality.

6.1 Joint design details:

(Give sketch showing arrangement of parts, welding groove details, weld passes & their sequence etc.)



Welding of flange to web plate of Top Diagonal Tie beam

6.2 Joint preparation: As per IS 4353-1995 CL-7, IRS B1-2001, CL-17.3 & WBC-2001

7.0 Welding current: Type: DC

Polarity: EP (Electrode Positive)

8.0 Welder qualification : As per IS 7310(part-I)-2019



9.0 Welding parameters and technique: (as

9.1 Welding Parameters :

(as below)

Weld	Electrodes	Current	Arc	Wire	Travel	Electrical	Gas flow
Pass	/wire dia.		Voltage	feed speed	speed	stick out	rate
No.	(mm)	(amp)	(volt)	(m/min)	(m/ min)	(mm)	L.P.M
1	2	3	4	5	6	7	8
1	4mm	475-575A	27-30V	0.8-1.3	0.3-0.6	25-38	NA

9.2 Welding sequence and technique: 1,2,3,4

(Give sketch showing sequence and direction of welding).



Welding not covered by SAW may be done by FCAW process

10.0 Provision of run in and run-off tabs:

11.0 Cleaning of weld bead before laying next weld bead: Yes (in case of multilayer only)

12.0 Root preparation before welding other side of groove weld: NA

13.0 Preheating and inter pass temperature: 150°C - 250°C interpass temp.

14.0 Peening: NA

15.0 Post weld treatment: NA

By grinding of defective weld & rectify the weld as per clause 32.2 of IS

9595-1996 using FCAW Class-I wire as per IRS M46-2020

17.0 Inspection of weld: Visual Inspection, D.P. Test & Macro Etching

18.0 Any other relevant details: NIL



#### **Welding Procedure Specification Sheet**

Name and address of Fabricator: HMM Infra Limited, Village-Mandour, Ambala, Haryana

Welding Procedure Specification Sheet No.: HMM/24/WPSS/BSG/72M/FCAW/001

RDSO/B-10440/5 # Bottom Long Beam Diaphragm DP1

Section B-B, Diaphragm plate DP1 with Web plate & Top Flange

1.0 Weld joint description : Fillet (10mm)

2.0 Base Metal : 16mm & 25mm IS 2062:2011 E350 B0, Fully Killed,

Normalized/Control Colled

3.0 Welding Process: FCAW

4.0 Welding position: 2F (Horizontal)5.0 Welding consumables: (as below)

5.1 Electrode/wire Class: Class-I as per IRS M46-2020

Dia: 1.2 mm Drying method: NA

5.2 Flux Class: NA

Type: NA
Drying method: NA

5.3.1 Shielding gas: CO2 gas

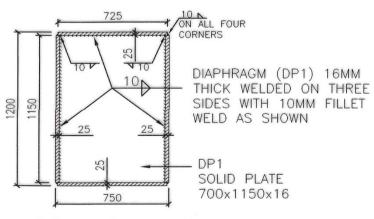
Fusion faces & adjacent surface are cleaned and made free from cracks,

6.0 Base Metal preparation : notches, mill scales, paints, grease, rust etc. which may affect weld

quality.

6.1 Joint design details:

(Give sketch showing arrangement of parts, welding groove details, weld passes & their sequence etc.)



Welding of BLB Diaphragm plate DP1

## SECTION B-B

6.2 Joint preparation : As per IS 10178-1995, Cl.9, IRS B1-2001, Cl.17.3 & WBC-2001

7.0 Welding current: Type: DC

Polarity: EP (Electrode Positive)

8.0 Welder qualification : As per IS 7310(part-I)-2019

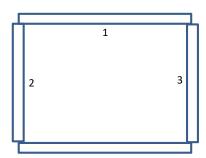


9.1 Welding Parameters:

Weld	Electrodes	Current	Arc	Wire	Travel	Electrical	Gas flow
Pass No.	/wire dia. (mm)	(amp)	Voltage (volt)	feed speed (m/min)	speed (m/min)	stick out (mm)	rate L.P.M
1	2	3	4	5	6	7	8
3	1.2mm	150-300A	24-30V	5-8	0.15-0.30	12	15-25

9.2 Welding sequence and technique: 1,2,3

(Give sketch showing sequence and direction of welding).



Welding not covered by SAW may be done by FCAW process

10.0 Provision of run in and run-off tabs: NA

11.0 Cleaning of weld bead before laying next weld bead: Yes (In case of multilayer only)

12.0 Root preparation before welding other side of groove weld: NA

13.0 Preheating and inter pass temperature: 110°C - 150°C interpass temp.

14.0 NA Peening:

15.0 Post weld treatment:

By grinding of defective weld & rectify the weld as per 16.0 Rectification of weld defects:

clause 32.2 of IS 9595-1996 using FCAW Class-I wire as

per IRS M46-2020

17.0 Inspection of weld: Visual Inspection, D.P. Test

18.0 Any other relevant details: NIL



#### **Welding Procedure Specification Sheet**

Name and address of Fabricator: HMM Infra Limited, Village-Mandour, Ambala, Haryana

Welding Procedure Specification Sheet No.: HMM/24/WPSS/BSG/72M/FCAW/001A

Ref. Drg No. RDSO/B-10440/5 # Bottom Long Beam Diaphragm DP2

Section A-A, Diaphragm plate DP2 with Web plate & Top Flange

1.0 Weld joint description : Fillet (10mm)

2.0 Base Metal : 20mm & 25mm IS 2062:2011 E350 B0, Fully Killed,

Normalized/Control Colled

3.0 Welding Process: FCAW

4.0 Welding position: 2F (Horizontal)5.0 Welding consumables: (as below)

5.1 Electrode/wire Class: Class-I as per IRS M46-2020

Dia : 1.2 mm Drying method : NA

5.2 Flux Class : NA

Type: NA
Drying method: NA

5.3.1 Shielding gas: CO2 gas

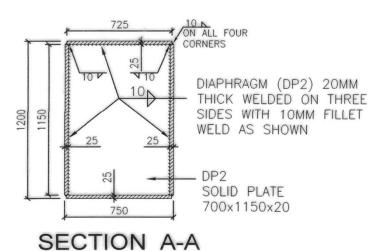
Fusion faces & adjacent surface are cleaned and made free from cracks,

6.0 Base Metal preparation : notches, mill scales, paints, grease, rust etc. which may affect weld

quality.

6.1 Joint design details:

(Give sketch showing arrangement of parts, welding groove details, weld passes & their sequence etc.)



Welding of BLB Diaphragm plate DP2

6.2 Joint preparation : As per IS 10178-1995, Cl.9, IRS B1-2001, Cl.17.3 & WBC-2001

7.0 Welding current: Type: DC

Polarity: EP (Electrode Positive)

8.0 Welder qualification: As per IS 7310(part-I)-2019

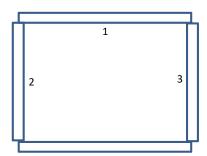


9.1 Welding Parameters:

Weld	Electrodes	Current	Arc	Wire	Travel	Electrical	Gas flow
Pass No.	/wire dia. (mm)	(amp)	Voltage (volt)	feed speed (m/min)	speed (m/min)	stick out (mm)	rate L.P.M
1	2	3	4	5	6	7	8
3	1.2mm	150-300A	24-30V	5-8	0.15-0.30	12	15-25

9.2 Welding sequence and technique: 1,2,3

(Give sketch showing sequence and direction of welding).



Welding not covered by SAW may be done by FCAW process

10.0 Provision of run in and run-off tabs: NA

11.0 Cleaning of weld bead before laying next weld bead: Yes (In case of multilayer only)

12.0 Root preparation before welding other side of groove weld: NA

13.0 Preheating and inter pass temperature: 110°C - 150°C interpass temp.

14.0 NA Peening:

15.0 Post weld treatment:

By grinding of defective weld & rectify the weld as per 16.0 Rectification of weld defects:

clause 32.2 of IS 9595-1996 using FCAW Class-I wire as

per IRS M46-2020

17.0 Inspection of weld: Visual Inspection, D.P. Test

18.0 Any other relevant details: NIL



#### **Welding Procedure Specification Sheet**

Name and address of Fabricator: HMM Infra Limited, Village-Mandour, Ambala, Haryana

HMM/24/WPSS/BSG/72M/FCAW/002 Welding Procedure Specification Sheet No. :

RDSO/B-10440/1 # Bottom Long Beam Inner Top Side Ref. Drg No. Section 1-1, Web plate to Top Flange plate Inner Side

Weld joint description: 1.0 Fillet (10mm)

25mm & 25mm IS 2062:2011 E350 B0, Fully Killed, Base Metal: 2.0

Normalized/Control Colled

3.0 Welding Process: **FCAW** 

4.0 Welding position: 2F (Horizontal) 5.0 Welding consumables: (as below)

5.1 Electrode/wire Class: Class-I as per IRS M46-2020

> Dia: 1.2 mm Drying method: NA

5.2 Flux Class: NA

> Type: NA Drying method: NA

5.3.1 Shielding gas: CO2 gas

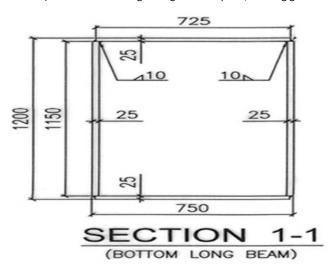
Fusion faces & adjacent surface are cleaned and made free from cracks,

6.0 Base Metal preparation: notches, mill scales, paints, grease, rust etc. which may affect weld

quality.

6.1 Joint design details:

(Give sketch showing arrangement of parts, welding groove details, weld passes & their sequence etc.)



Welding of BLB Inner Side Web to Top **Flange** 

6.2 Joint preparation: As per IS 10178-1995, Cl.9, IRS B1-2001, Cl.17.3 & WBC-2001

7.0 Welding current: DC Type:

> Polarity: EP (Electrode Positive)

Welder qualification: 8.0 As per IS 7310(part-I)-2019



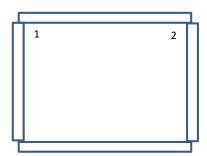
**FABRICATOR** CONTRACTOR S.E.C. RLY. **RDSO** NHAI

9.1 Welding Parameters:

Weld	Electrodes	Current	Arc	Wire	Travel	Electrical	Gas flow
Pass No.	/wire dia. (mm)	(amp)	Voltage (volt)	feed speed (m/min)	speed (m/min)	stick out (mm)	rate L.P.M
1	2	3	4	5	6	7	8
3	1.2mm	150-300A	24-30V	5-8	0.15-0.30	12	15-25

9.2 Welding sequence and technique: 1,2,3

(Give sketch showing sequence and direction of welding).



Welding not covered by SAW may be done by FCAW process

10.0 Provision of run in and run-off tabs: NA

11.0 Cleaning of weld bead before laying next weld bead: Yes (In case of multilayer only)

12.0 Root preparation before welding other side of groove weld: NA

13.0 Preheating and inter pass temperature: 110°C - 150°C interpass temp.

14.0 NA Peening:

15.0 Post weld treatment:

By grinding of defective weld & rectify the weld as per 16.0 Rectification of weld defects:

clause 32.2 of IS 9595-1996 using FCAW Class-I wire as

per IRS M46-2020

17.0 Inspection of weld: Visual Inspection, D.P. Test

18.0 Any other relevant details: NIL



#### **Welding Procedure Specification Sheet**

Name and address of Fabricator: HMM Infra Limited, Village-Mandour, Ambala, Haryana

Welding Procedure Specification Sheet No. : HMM/24/WPSS/BSG/72M/FCAW/003

Ref. Drg No.

RDSO/B-10440/2 # Arch Diaphragm DP

Section B-B, Diaphragm plate DP2 with Web plate & Bottom Flange

1.0 Weld joint description : Fillet (10mm)

2.0 Base Metal : 20mm & 32mm IS 2062:2011 E350 B0, Fully Killed,

Normalized/Control Colled

3.0 Welding Process: FCAW

4.0 Welding position: 2F (Horizontal)5.0 Welding consumables: (as below)

5.1 Electrode/wire Class: Class-I as per IRS M46-2020

Dia: 1.2 mm Drying method: NA

5.2 Flux Class : NA

Type: NA
Drying method: NA

5.3.1 Shielding gas: CO2 gas

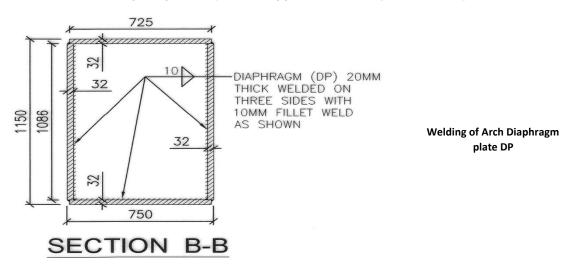
Fusion faces & adjacent surface are cleaned and made free from cracks,

6.0 Base Metal preparation : notches, mill scales, paints, grease, rust etc. which may affect weld

quality.

6.1 Joint design details:

(Give sketch showing arrangement of parts, welding groove details, weld passes & their sequence etc.)



6.2 Joint preparation: As per IS 10178-1995, Cl.9, IRS B1-2001, Cl.17.3 & WBC-2001

7.0 Welding current: Type: DC

Polarity: EP (Electrode Positive)

8.0 Welder qualification : As per IS 7310(part-I)-2019

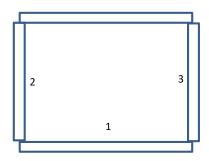


9.1 Welding Parameters:

Weld	Electrodes	Current	Arc	Wire	Travel	Electrical	Gas flow
Pass No.	/wire dia. (mm)	(amp)	Voltage (volt)	feed speed (m/min)	speed (m/min)	stick out (mm)	rate L.P.M
1	2	3	4	5	6	7	8
3	1.2mm	150-300A	24-30V	5-8	0.15-0.30	12	15-25

9.2 Welding sequence and technique: 1,2,3

(Give sketch showing sequence and direction of welding).



Welding not covered by SAW may be done by FCAW process

10.0 Provision of run in and run-off tabs: NA

11.0 Cleaning of weld bead before laying next weld bead: Yes (In case of multilayer only)

12.0 Root preparation before welding other side of groove weld: NA

13.0 Preheating and inter pass temperature: 110°C - 150°C interpass temp.

14.0 NA Peening:

15.0 Post weld treatment:

By grinding of defective weld & rectify the weld as per 16.0 Rectification of weld defects:

clause 32.2 of IS 9595-1996 using FCAW Class-I wire as

per IRS M46-2020

17.0 Inspection of weld: Visual Inspection, D.P. Test

18.0 Any other relevant details: NIL



#### **Welding Procedure Specification Sheet**

Name and address of Fabricator: HMM Infra Limited, Village-Mandour, Ambala, Haryana

Welding Procedure Specification Sheet No.: HMM/24/WPSS/BSG/72M/FCAW/004

Ref. Drg No.

RDSO/B-10440/1 # Arch Inner Bottom Side
Section 3-3, Web plate to Bottom Flange plate Inner Side

1.0 Weld joint description : Fillet (10mm)

2.0 Base Metal : 32mm & 32mm IS 2062:2011 E350 B0, Fully Killed,

Normalized/Control Colled

3.0 Welding Process: FCAW

4.0 Welding position: 2F (Horizontal)5.0 Welding consumables: (as below)

5.1 Electrode/wire Class: Class-I as per IRS M46-2020

Dia: 1.2 mm Drying method: NA

5.2 Flux Class: NA

Type : NA

Drying method: NA 5.3.1 Shielding gas: CO2 gas

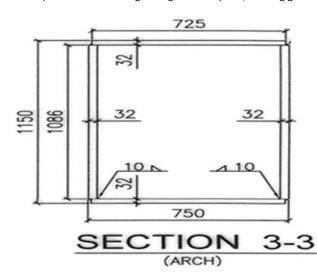
5.3.1 Shielding gas: CO2 gas
Fusion faces & adjacent surface are cleaned and made free from cracks,

6.0 Base Metal preparation : notches, mill scales, paints, grease, rust etc. which may affect weld

quality.

6.1 Joint design details:

(Give sketch showing arrangement of parts, welding groove details, weld passes & their sequence etc.)



Welding of Arch Inner Side Web to Bottom Flange

6.2 Joint preparation : As per IS 10178-1995, Cl.9, IRS B1-2001, Cl.17.3 & WBC-2001

7.0 Welding current : Type : DC

Polarity: EP (Electrode Positive)

8.0 Welder qualification : As per IS 7310(part-I)-2019



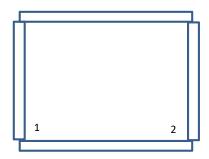
9.1 Welding Parameters:

Weld	Electrodes	Current	Arc	Wire	Travel	Electrical	Gas flow
Pass No.	/wire dia. (mm)	(amp)	Voltage (volt)	feed speed (m/min)	speed (m/min)	stick out (mm)	rate L.P.M
1	2	3	4	5	6	7	8
3	1.2mm	150-300A	24-30V	5-8	0.15-0.30	12	15-25

9.2 Welding sequence and technique: 1,2,3

NA

(Give sketch showing sequence and direction of welding).



Welding not covered by SAW may be done by FCAW process

10.0 Provision of run in and run-off tabs: NA

11.0 Cleaning of weld bead before laying next weld bead: Yes (In case of multilayer only)

12.0 Root preparation before welding other side of groove weld: NA

13.0 Preheating and inter pass temperature: 110°C - 150°C interpass temp.

14.0 Peening:

15.0 Post weld treatment:

By grinding of defective weld & rectify the weld as per 16.0 Rectification of weld defects:

clause 32.2 of IS 9595-1996 using FCAW Class-I wire as

per IRS M46-2020

17.0 Inspection of weld: Visual Inspection, D.P. Test

18.0 Any other relevant details: NIL



#### **Welding Procedure Specification Sheet**

Name and address of Fabricator: HMM Infra Limited, Village-Mandour, Ambala, Haryana

Welding Procedure Specification Sheet No.: HMM/24/WPSS/BSG/72M/FCAW/005

Ref. Drg No.

RDSO/B-10440/9 # Hanger Diaphragm DP1

Costion R.P. Diaphragm and Late DP1 with Web

Section B-B, Diaphragm plate DP1 with Web plate & Flange Plate

1.0 Weld joint description : Fillet (10mm)

2.0 Base Metal : 16mm & 25/32mm IS 2062:2011 E350 B0, Fully Killed,

Normalized/Control Colled

3.0 Welding Process: FCAW

4.0 Welding position: 2F (Horizontal)5.0 Welding consumables: (as below)

5.1 Electrode/wire Class: Class-I as per IRS M46-2020

Dia: 1.2 mm Drying method: NA

5.2 Flux Class: NA

Type: NA
Drying method: NA

5.3.1 Shielding gas: CO2 gas

Fusion faces & adjacent surface are cleaned and made free from cracks,

Base Metal preparation : notches, mill scales, paints, grease, rust etc. which may affect weld

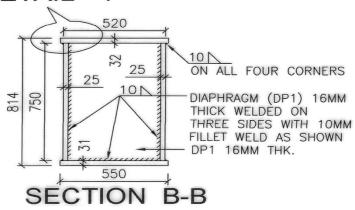
quality.

6.1 Joint design details:

6.0

(Give sketch showing arrangement of parts, welding groove details, weld passes & their sequence etc.)

### **DETAIL - 1**



Welding of Hanger Diaphragm plate DP1

6.2 Joint preparation : As per IS 10178-1995, Cl.9, IRS B1-2001, Cl.17.3 & WBC-2001

7.0 Welding current: Type: DC

Polarity: EP (Electrode Positive)

8.0 Welder qualification : As per IS 7310(part-I)-2019

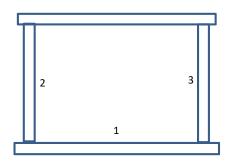


9.1 Welding Parameters:

Weld	Electrodes	Current	Arc	Wire	Travel	Electrical	Gas flow
Pass No.	/wire dia. (mm)	(amp)	Voltage (volt)	feed speed (m/min)	speed (m/min)	stick out (mm)	rate L.P.M
1	2	3	4	5	6	7	8
3	1.2mm	150-300A	24-30V	5-8	0.15-0.30	12	15-25

9.2 Welding sequence and technique: 1,2,3

(Give sketch showing sequence and direction of welding).



Welding not covered by SAW may be done by FCAW process

10.0 Provision of run in and run-off tabs: NA

11.0 Cleaning of weld bead before laying next weld bead: Yes (In case of multilayer only)

12.0 Root preparation before welding other side of groove weld: NA

13.0 Preheating and inter pass temperature: 110°C - 150°C interpass temp.

14.0 NA Peening:

15.0 Post weld treatment:

By grinding of defective weld & rectify the weld as per 16.0 Rectification of weld defects:

clause 32.2 of IS 9595-1996 using FCAW Class-I wire as

per IRS M46-2020

17.0 Inspection of weld: Visual Inspection, D.P. Test

18.0 Any other relevant details: NIL



#### **Welding Procedure Specification Sheet**

Name and address of Fabricator: HMM Infra Limited, Village-Mandour, Ambala, Haryana

Welding Procedure Specification Sheet No. : HMM/24/WPSS/BSG/72M/FCAW/006

Ref. Drg No.

RDSO/B-10440/3 # Top Tie Beam Diaphragm

Section B-B, Diaphragm plate with Web plate & Flange Plate

1.0 Weld joint description: Fillet (08mm)

2.0 Base Metal : 10mm & 25mm IS 2062:2011 E350 B0, Fully Killed,

Normalized/Control Colled

3.0 Welding Process: FCAW

4.0 Welding position: 2F (Horizontal)5.0 Welding consumables: (as below)

5.1 Electrode/wire Class: Class-I as per IRS M46-2020

Dia: 1.2 mm Drying method: NA

5.2 Flux Class: NA

Type: NA
Drying method: NA

5.3.1 Shielding gas: CO2 gas

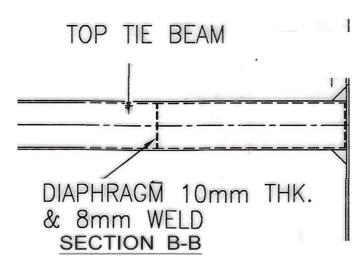
Fusion faces & adjacent surface are cleaned and made free from cracks,

6.0 Base Metal preparation : notches, mill scales, paints, grease, rust etc. which may affect weld

uality.

6.1 Joint design details:

(Give sketch showing arrangement of parts, welding groove details, weld passes & their sequence etc.)



Welding of Top Tie Beam Diaphragm plate

6.2 Joint preparation : As per IS 10178-1995, Cl.9, IRS B1-2001, Cl.17.3 & WBC-2001

7.0 Welding current: Type: DC

Polarity: EP (Electrode Positive)

8.0 Welder qualification: As per IS 7310(part-I)-2019

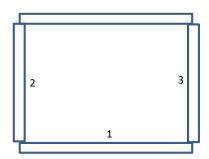


9.1 Welding Parameters:

Weld	Electrodes	Current	Arc	Wire	Travel	Electrical	Gas flow
Pass No.	/wire dia. (mm)	(amp)	Voltage (volt)	feed speed (m/min)	speed (m/min)	stick out (mm)	rate L.P.M
1	2	3	4	5	6	7	8
2	1.2mm	150-300A	24-30V	5-8	0.15-0.30	12	15-25

9.2 Welding sequence and technique: 1,2,3

(Give sketch showing sequence and direction of welding).



Welding not covered by SAW may be done by FCAW process

10.0 Provision of run in and run-off tabs: NA

11.0 Cleaning of weld bead before laying next weld bead: Yes (In case of multilayer only)

12.0 Root preparation before welding other side of groove weld: NA

13.0 Preheating and inter pass temperature: 110°C - 150°C interpass temp.

14.0 NA Peening:

15.0 Post weld treatment:

By grinding of defective weld & rectify the weld as per 16.0 Rectification of weld defects:

clause 32.2 of IS 9595-1996 using FCAW Class-I wire as

per IRS M46-2020

17.0 Inspection of weld: Visual Inspection, D.P. Test

18.0 Any other relevant details: NIL



#### **Welding Procedure Specification Sheet**

Name and address of Fabricator: HMM Infra Limited, Village-Mandour, Ambala, Haryana

Welding Procedure Specification Sheet No.: HMM/24/WPSS/BSG/72M/FCAW/007

Ref. Drg No.

RDSO/B-10440/3 # Top Diagonal Tie Beam Diaphragm

Diaphragm plate with Web plate & Flange Plate

1.0 Weld joint description : Fillet (08mm)

2.0 Base Metal : 10mm & 22mm IS 2062:2011 E350 B0, Fully Killed,

Normalized/Control Colled

3.0 Welding Process: FCAW

4.0 Welding position: 2F (Horizontal)5.0 Welding consumables: (as below)

5.1 Electrode/wire Class: Class-I as per IRS M46-2020

Dia : 1.2 mm

Drying method : NA

5.2 Flux Class: NA

Type: NA
Drying method: NA

5.3.1 Shielding gas: CO2 gas

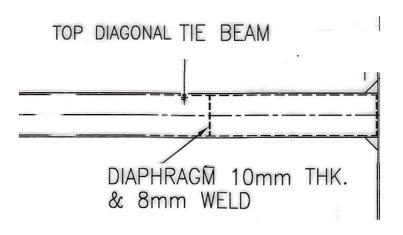
Fusion faces & adjacent surface are cleaned and made free from cracks,

6.0 Base Metal preparation : notches, mill scales, paints, grease, rust etc. which may affect weld

quality.

6.1 Joint design details :

(Give sketch showing arrangement of parts, welding groove details, weld passes & their sequence etc.)



Welding of Top Diagonal Tie Beam Diaphragm plate

6.2 Joint preparation : As per IS 10178-1995, Cl.9, IRS B1-2001, Cl.17.3 & WBC-2001

7.0 Welding current : Type : DC

Polarity: EP (Electrode Positive)

8.0 Welder qualification : As per IS 7310(part-I)-2019

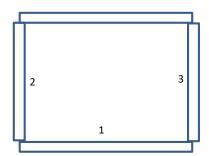


9.1 Welding Parameters:

Weld	Electrodes	Current	Arc	Wire	Travel	Electrical	Gas flow
Pass No.	/wire dia. (mm)	(amp)	Voltage (volt)	feed speed (m/min)	speed (m/min)	stick out (mm)	rate L.P.M
1	2	3	4	5	6	7	8
2	1.2mm	150-300A	24-30V	5-8	0.15-0.30	12	15-25

9.2 Welding sequence and technique: 1,2,3

(Give sketch showing sequence and direction of welding).



Welding not covered by SAW may be done by FCAW process

10.0 Provision of run in and run-off tabs: NA

11.0 Cleaning of weld bead before laying next weld bead: Yes (In case of multilayer only)

12.0 Root preparation before welding other side of groove weld: NA

13.0 Preheating and inter pass temperature: 110°C - 150°C interpass temp.

14.0 NA Peening:

15.0 Post weld treatment:

By grinding of defective weld & rectify the weld as per 16.0 Rectification of weld defects:

clause 32.2 of IS 9595-1996 using FCAW Class-I wire as

per IRS M46-2020

17.0 Inspection of weld: Visual Inspection, D.P. Test

18.0 Any other relevant details: NIL



#### Page 1 of 2 **RDSO 72M BOW STRING GIRDER**

#### **Welding Procedure Specification Sheet**

Name and address of Fabricator: HMM Infra Limited, Village-Mandour, Ambala, Haryana

Welding Procedure Specification Sheet No.: HMM/24/WPSS/BSG/72M/FCAW/008

RDSO/B-10440/7 # Int. Bottom Cross Beam Stiffener Ref. Drg No.

Section A-A, Stiffener with Web Plate

Weld joint description: 1.0 Fillet (08mm)

12mm & 16mm IS 2062:2011 E350 B0, Fully Killed, 2.0 Base Metal:

Normalized/Control Colled

Welding Process: 3.0

4.0 Welding position: 2F (HorizontaL) Welding consumables: 5.0 (as below)

Electrode/wire Class: 5.1 Class-I as per IRS M46-2020

> Dia: 1.2 mm Drying method: NA

5.2 Flux Class: NA

> Type: NA Drying method: NA

5.3.1 Shielding gas: CO2 gas

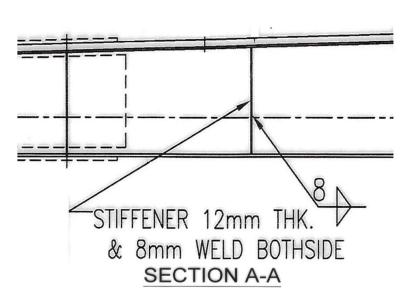
Fusion faces & adjacent surface are cleaned and made free from 6.0 Base Metal preparation:

cracks, notches, mill scales, paints, grease, rust etc. which may affect

weld quality.

6.1 Joint design details:

(Give sketch showing arrangement of parts, welding groove details, weld passes & their sequence etc.)



Welding of Stiffener Plate to Int. **Bottom Cross Beam** 

6.2 Joint preparation: As per IS 4353-1995 CL-7, IRS B1-2001, CL-17.3 & WBC-2001

Welding current: 7.0 Type:

> Polarity: EP (Electrode Positive)

8.0 Welder qualification: As per IS 7310(part-I)-2019



Welding Parameters: 9.1

Weld	Electrodes	Current	Arc	Wire	Travel	Electrical	Gas flow
Pass No.	/wire dia. (mm)	(amp)	Voltage (volt)	feed speed (m/min)	speed (m/min)	stick out (mm)	rate L.P.M
1	2	3	4	5	6	7	8
2	1.2mm	150-300A	24-30V	5-8	0.15-0.30	12	15-25

#### 9.2 Welding sequence and technique:

(Give sketch showing sequence and direction of welding).

NA

Welding not covered by SAW may be done by FCAW process 10.0 Provision of run in and run-off tabs: NA

Cleaning of weld bead before laying next weld bead: Yes (In case of multilayer only) 11.0

Root preparation before welding other side of groove weld: 12.0 NA

13.0 Preheating and inter pass temperature: 110°C - 150°C interpass temp.

14.0 Peening: NA Post weld treatment: NA 15.0

By grinding of defective weld & rectify the weld as per 16.0 Rectification of weld defects:

clause 32.2 of IS 9595-1996 using FCAW Class-I wire as

per IRS M46-2020

17.0 Inspection of weld: Visual Inspection, D.P. Test

18.0 Any other relevant details: NIL



CONTRACTOR RDSO **FABRICATOR** NHAI S.E.C. RLY.

#### Page 1 of 2 **RDSO 72M BOW STRING GIRDER**

#### **Welding Procedure Specification Sheet**

HMM Infra Limited, Village-Mandour, Ambala, Haryana Name and address of Fabricator:

Welding Procedure Specification Sheet No. : HMM/24/WPSS/BSG/72M/FCAW/008A

RDSO/B-10440/6 # End Bottom Cross Beam Stiffener Ref. Drg No.

Section E-E, Stiffener with Web Plate

Weld joint description: 1.0 Fillet (08mm)

12mm & 25mm IS 2062:2011 E350 B0, Fully Killed, 2.0 Base Metal:

Normalized/Control Colled

Welding Process: 3.0

4.0 Welding position: 2F (HorizontaL) Welding consumables: 5.0 (as below)

Electrode/wire Class: 5.1 Class-I as per IRS M46-2020

> Dia: 1.2 mm Drying method: NA

Flux Class:

5.2 NA

Type: NA Drying method: NA

5.3.1 Shielding gas: CO2 gas

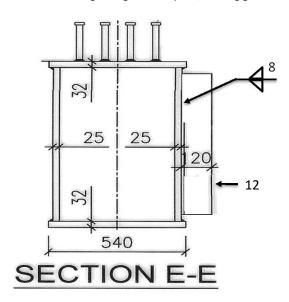
Fusion faces & adjacent surface are cleaned and made free from 6.0 Base Metal preparation :

cracks, notches, mill scales, paints, grease, rust etc. which may affect

weld quality.

6.1 Joint design details:

(Give sketch showing arrangement of parts, welding groove details, weld passes & their sequence etc.)



Welding of Stiffener Plate to End **Bottom Cross Beam** 

6.2 Joint preparation: As per IS 4353-1995 CL-7, IRS B1-2001, CL-17.3 & WBC-2001

Welding current: 7.0 Type:

> Polarity: EP (Electrode Positive)

8.0 Welder qualification: As per IS 7310(part-I)-2019



Welding Parameters: 9.1

Weld	Electrodes	Current	Arc	Wire	Travel	Electrical	Gas flow
Pass No.	/wire dia. (mm)	(amp)	Voltage (volt)	feed speed (m/min)	speed (m/min)	stick out (mm)	rate L.P.M
1	2	3	4	5	6	7	8
2	1.2mm	150-300A	24-30V	5-8	0.15-0.30	12	15-25

#### 9.2 Welding sequence and technique:

(Give sketch showing sequence and direction of welding).

NA

Welding not covered by SAW may be done by FCAW process 10.0 Provision of run in and run-off tabs: NA

Cleaning of weld bead before laying next weld bead: Yes (In case of multilayer only) 11.0

Root preparation before welding other side of groove weld: 12.0 NA

13.0 Preheating and inter pass temperature: 110°C - 150°C interpass temp.

14.0 Peening: NA Post weld treatment: NA 15.0

By grinding of defective weld & rectify the weld as per 16.0 Rectification of weld defects:

clause 32.2 of IS 9595-1996 using FCAW Class-I wire as

per IRS M46-2020

17.0 Inspection of weld: Visual Inspection, D.P. Test

18.0 Any other relevant details: NIL



CONTRACTOR RDSO **FABRICATOR** NHAI S.E.C. RLY.

# Page 1 of 2 RDSO 72M BOW STRING GIRDER

#### **Welding Procedure Specification Sheet**

Name and address of Fabricator: HMM Infra Limited, Village-Mandour, Ambala, Haryana

Welding Procedure Specification Sheet No. : HMM/24/WPSS/BSG/72M/FCAW/009

Ref. Drg No. RDSO/B-10440/6 # End Bottom Cross Beam Diaphragm

Section D-D, Diaphragm plate with Web & Bottom Flange

1.0 Weld joint description : Fillet (08mm

2.0 Base Metal : 16mm & 25/32mm IS 2062:2011 E350 B0, Fully Killed,

Normalized/Control Colled

3.0 Welding Process: FCAW

4.0 Welding position: 2F (Horizontal)5.0 Welding consumables: (as below)

5.1 Electrode/wire Class: Class-I as per IRS M46-2020

Dia: 1.2 mm

Drying method: NA

5.2 Flux Class : NA

Type: NA
Drying method: NA

5.3.1 Shielding gas: CO2 gas

Fusion faces & adjacent surface are cleaned and made free from

cracks, notches, mill scales, paints, grease, rust etc. which may affect

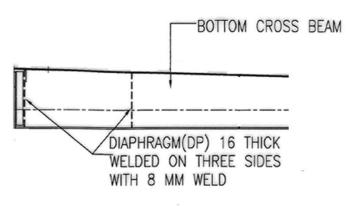
weld quality.

6.1 Joint design details:

Base Metal preparation:

6.0

(Give sketch showing arrangement of parts, welding groove details, weld passes & their sequence etc.)



Welding of Diaphragm Plate to End Bottom Cross Beam

# SECTION D-D

6.2 Joint preparation: As per IS 4353-1995 CL-7, IRS B1-2001, CL-17.3 & WBC-2001

7.0 Welding current: Type: DC

Polarity: EP (Electrode Positive)

8.0 Welder qualification : As per IS 7310(part-I)-2019

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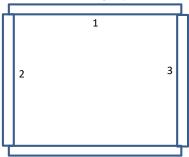
Welding Parameters: 9.1

Weld	Electrodes	Current	Arc	Wire	Travel	Electrical	Gas flow
Pass	/wire dia.		Voltage	feed speed	speed	stick out	rate
No.	(mm)	(amp)	(volt)	(m/min)	(m/min)	(mm)	L.P.M
1	2	3	4	5	6	7	8
2	1.2mm	150-300A	24-30V	5-8	0.15-0.30	12	15-25

9.2 Welding sequence and technique: 1,2,3

NA

(Give sketch showing sequence and direction of welding).



Welding not covered by SAW may be done by FCAW process

10.0 Provision of run in and run-off tabs: NA

11.0 Cleaning of weld bead before laying next weld bead: Yes (In case of multilayer only)

12.0 Root preparation before welding other side of groove weld: NA

13.0 Preheating and inter pass temperature: 110°C - 150°C interpass temp.

14.0 Peening:

15.0 Post weld treatment: NA

By grinding of defective weld & rectify the weld as per 16.0 Rectification of weld defects:

clause 32.2 of IS 9595-1996 using FCAW Class-I wire as

per IRS M46-2020

17.0 Inspection of weld: Visual Inspection, D.P. Test

18.0 Any other relevant details: NIL



#### Page 1 of 2 RDSO 72M BOW STRING GIRDER

#### **Welding Procedure Specification Sheet**

Name and address of Fabricator: HMM Infra Limited, Village-Mandour, Ambala, Haryana

Welding Procedure Specification Sheet No. : HMM/24/WPSS/BSG/72M/FCAW/010

RDSO/B-10440/1 # ISMC 150 Ref. Drg No. 12mm Plate to ISMC 150

1.0 Weld joint description: Fillet (06mm)

Base Metal: 12mm & ISMC 150 IS 2062:2011 E350 B0, Fully Killed, 2.0

Welding Process: 3.0 **FCAW** 

4.0 Welding position: 2F (HorizontaL) 5.0 Welding consumables: (as below)

Electrode/wire Class: 5.1 Class-I as per IRS M46-2020

> Dia: 1.2 mm Drying method: NA

5.2 Flux Class: NA

> Type: NA Drying method: NA

5.3.1 Shielding gas: CO2 gas

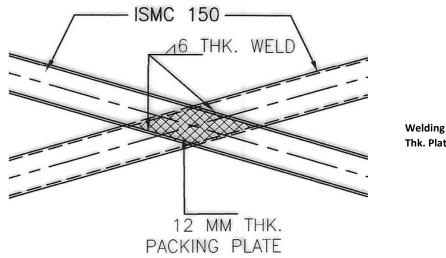
Fusion faces & adjacent surface are cleaned and made free from Base Metal preparation : 6.0

cracks, notches, mill scales, paints, grease, rust etc. which may affect

weld quality.

Joint design details: 6.1

(Give sketch showing arrangement of parts, welding groove details, weld passes & their sequence etc.)



Welding of ISMC 150 to 12mm Thk. Plate

6.2 Joint preparation: As per IS 4353-1995 CL-7, IRS B1-2001, CL-17.3 & WBC-2001

7.0 Welding current: Type: DC

> Polarity: EP (Electrode Positive)

Welder qualification: As per IS 7310(part-I)-2019 8.0



**FABRICATOR RDSO** CONTRACTOR NHAI S.E.C. RLY.

Welding Parameters: 9.1

Weld	Electrodes	Current	Arc	Wire	Travel	Electrical	Gas flow
Pass No.	/wire dia. (mm)	(amp)	Voltage (volt)	feed speed (m/min)	speed (m/min)	stick out (mm)	rate L.P.M
1	2	3	4	5	6	7	8
2	1.2mm	150-300A	24-30V	5-8	0.15-0.30	12	15-25

#### 9.2 Welding sequence and technique:

(Give sketch showing sequence and direction of welding).

NA

Welding not covered by SAW may be done by FCAW process 10.0 Provision of run in and run-off tabs: NA

Cleaning of weld bead before laying next weld bead: Yes (In case of multilayer only) 11.0

Root preparation before welding other side of groove weld: 12.0 NA

13.0 Preheating and inter pass temperature: 110°C - 150°C interpass temp.

14.0 Peening: NA Post weld treatment: NA 15.0

By grinding of defective weld & rectify the weld as per 16.0 Rectification of weld defects:

clause 32.2 of IS 9595-1996 using FCAW Class-I wire as

per IRS M46-2020

17.0 Inspection of weld: Visual Inspection, D.P. Test

18.0 Any other relevant details: NIL



CONTRACTOR RDSO **FABRICATOR** NHAI S.E.C. RLY.

#### Page 1 of 2 RDSO 72M BOW STRING GIRDER

#### **Welding Procedure Specification Sheet**

Name and address of Fabricator: HMM Infra Limited, Village-Mandour, Ambala, Haryana

Welding Procedure Specification Sheet No.: HMM/24/WPSS/BSG/72M/DSAW/01

Ref. Drg No. RDSO/B-10440/6

1.0 Weld joint description: Fillet joint - Stud Welding2.0 Base Metal: IS 2062:2011 E350 B0

3.0 Welding Process: Drawn Arc Stud Welding with Ceramic ferrule technique

4.0 Welding position: 1S

5.0 Welding consumables : (as below)

5.1 Electrode/wire Class: NA (Metal of stud itself fuses with Base metal)

Dia: NA

Drying method: NA

5.2 Flux Class: NA

Type: NA

Drying method : NA

5.3.1 Shielding gas: NA

Fusion faces & adjacent surface are cleaned and made free

from cracks, notches, mill scales, paints, grease, rust etc. which

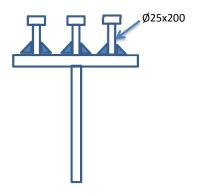
may affect weld quality.

6.1 Joint design details :

Base Metal preparation:

6.0

(Give sketch showing arrangement of parts, welding groove details, weld passes & their sequence etc.)



Fillet welding of Ø25x200 stud with various thicknesses

6.2 Joint preparation: As per IS 4353-1995 CL-7, IRS B1-2001, CL-17.3 & WBC-2001

7.0 Welding current: Type: DC

Polarity: EP (Electrode Positive)

8.0 Welder qualification : DASW (as per IS 7310(part-I)-1974, IS 7307(part-I)-1974



# 9.1 Welding Parameters :

Weld	Electrodes	Current	Arc	Wire	Travel	Electrical	Gas flow
Pass No.	/wire dia. (mm)	(amp)	Voltage (volt)	feed speed (m/min)	speed (m/min)	stick out (mm)	rate L.P.M
1	2	3	4	5	6	7	8
1	NA	2200	420V (Input Voltage)	NA	NA	NA	NA

 $\label{lem:current with continuous} \mbox{Current \& Voltage as per recommendations of machine manufacturer.}$ 

9.2	Welding sequence and technique:	NA
	(Give sketch showing sequence and direction of welding).	
10.0	Provision of run in and run-off tabs:	NA
11.0	Cleaning of weld bead before laying next weld bead:	NA
12.0	Root preparation before welding other side of groove weld	d: NA
13.0	Preheating and inter pass temperature:	NA
14.0	Peening:	NA
15.0	Post weld treatment:	NA
16.0	Rectification of weld defects:	By grinding of defective weld $\&$ rectify the weld as per clause 32.2 of IS 9595-1996 using FCAW Class-I wire as per IRS M46-2020
17.0	Inspection of weld:	Visual Inspection, Ring test & Bend Test as per BS-115
18.0	Any other relevant details:	NIL



# WELDING PROCEDURE SPECIFICATION SHEET FOR 72m BSG (SITE WELDING)

RDSO Drg. No.: RDSO/B-10440 SERIES



M/s HMM Infra Ltd.

Works address :- Village Mandour (Ambala-Naraingarh Road), Ambala City, Haryana





RDSO's Drg. No.: RDSO/B-10440 BOW STRING GIRDER 72m

	NDSO 3 DIG. NO NDSO/		DOW STRING GIRDER 72III	
SR. NO.	WELD JOINT CONNECTION DETAIL	DRAWING NO.	WPSS NO.	PAGE NOs.
1	Front page	-	-	1
2	Index	-	-	2
3	Welding of Arch to Splice Plates	RDSO/B-10440/2	HMM/24/WPSS/BSG/72m/FCAW/011	3 - 4
4	Welding of Arch to Hanger	RDSO/B-10440/2	HMM/24/WPSS/BSG/72m/FCAW/012	5 - 6
5	Welding of Arch, Hanger, Tie Beam to Stiffeners	RDSO/B-10440/2	HMM/24/WPSS/BSG/72m/FCAW/013	7 - 8
6	Welding of Top Tie Beam to Splice Plates	RDSO/B-10440/3	HMM/24/WPSS/BSG/72m/FCAW/014	9 - 10
7	Welding of Top Tie Beam to Hanger Plate	RDSO/B-10440/3	HMM/24/WPSS/BSG/72m/FCAW/015	11 - 12
8	Welding of Top Diagonal Tie Beam to TTB/Hanger Plate/Arch	RDSO/B-10440/3	HMM/24/WPSS/BSG/72m/FCAW/016	13 - 14
9	Welding of Top Tie Chord to Top Tie Beam	RDSO/B-10440/3	HMM/24/WPSS/BSG/72m/FCAW/017	15 - 16
10	Welding of TopTie Beam /Hanger to Stiffeners	RDSO/B-10440/3	HMM/24/WPSS/BSG/72m/FCAW/018	17 - 18
11	Beam /Hanger/Arch to	RDSO/B-10440/3	HMM/24/WPSS/BSG/72m/FCAW/019	19 - 20
12	Welding of Arch to Bottom Long Beam at LO Location	RDSO/B-10440/4	HMM/24/WPSS/BSG/72m/FCAW/020	21 - 22
13	Welding of Cover Plate to Bottom Long Beam/Arch at LO Location	RDSO/B-10440/4	HMM/24/WPSS/BSG/72m/FCAW/021	23 - 24
14	Welding of 6 mm Cover Plate to Bottom Long Beam/Arch at LO Location	RDSO/B-10440/4	HMM/24/WPSS/BSG/72m/FCAW/022	25 - 26
15	Welding of Stiffeners to Bottom Long Beam/Arch at LO Location	RDSO/B-10440/4	HMM/24/WPSS/BSG/72m/FCAW/023	27 - 28
16	Welding of Splice Plates & Bottom Long Beam	RDSO/B-10440/5	HMM/24/WPSS/BSG/72m/FCAW/024	29 - 30
17	Welding of Hanger to Bottom Long Beam	RDSO/B-10440/5	HMM/24/WPSS/BSG/72m/FCAW/025	31 - 32
18	Welding of Hanger/Bottom Long Beam to Stiffeners	RDSO/B-10440/5	HMM/24/WPSS/BSG/72m/FCAW/026	33 - 34
19	Welding of Bottom Cross Beam/Hanger/Bottom Long Beam to Stiffeners	RDSO/B-10440/5	HMM/24/WPSS/BSG/72m/FCAW/027	35 - 36
20	Welding of Bottom Cross Beam to Web Splice Plates/Bottom Inner Splice (SP1 & SP2)	RDSO/B-10440/6	HMM/24/WPSS/BSG/72m/FCAW/028	35 - 36
21	Welding of Bottom Cross Beam to Top Splice Plates (SP1 & SP2)	RDSO/B-10440/6	HMM/24/WPSS/BSG/72m/FCAW/029	37 - 38
22	Welding of Bottom Cross Beam to Bottom Outer Splice Plates (SP1 & SP2)	RDSO/B-10440/6	HMM/24/WPSS/BSG/72m/FCAW/030	39 - 40
23	Welding of End Bottom Cross Beam to Web Splice Plates (SP3)	RDSO/B-10440/6	HMM/24/WPSS/BSG/72m/FCAW/031	41 - 42
24	Welding of End Bottom Cross Beam to Top/Bottom Splice Plates (SP3)	RDSO/B-10440/6	HMM/24/WPSS/BSG/72m/FCAW/032	43 - 44
25	Welding of Stiffeners/ BCB 1/BCB 2/BCB 3 to Hanger/BLB	RDSO/B-10440/6	HMM/24/WPSS/BSG/72m/FCAW/033	47 - 48
26	Welding of Angles to BCB 1/BCB 2/Hanger/BLB	RDSO/B-10440/6	HMM/24/WPSS/BSG/72m/FCAW/034	49 - 50
27	Welding of Stiffeners to BCB 3/BLB Cover Plate	RDSO/B-10440/6	HMM/24/WPSS/BSG/72m/FCAW/035	51 - 52
28	Welding of ISMC 150 to BCB 1/BCB 2 Stiffeners	RDSO/B-10440/6	HMM/24/WPSS/BSG/72m/FCAW/036	53 - 54
29	Welding of ISMC 150 to Packing Plate	RDSO/B-10440/1	HMM/24/WPSS/BSG/72m/FCAW/037	55 - 56



# **Welding Procedure Specification Sheet**

Name and address of Fabricator: HMM Infra Limited, Village-Mandour, Ambala, Haryana

Welding Procedure Specification Sheet No. : HMM/24/WPSS/BSG/72m/FCAW/011

RDSO/B-10440/2 # Arch to Splice Plates Ref. Drg No.

1.0 Weld joint description: Fillet (26 mm)

40 mm & 32 mm IS 2062-11: E350 B0, Fully Killed, Normalized/Control cooled 2.0 Base Metal:

3.0 Welding Process: **FCAW** 

4.0 Welding position: Horizontal, Vertical, Overhead

5.0 Welding consumables: (as below)

5.1 Electrode/wire Class: Class-I as per IRS M46-2020

> 1.2 mm Drying method: NA

5.2 Flux Class: NA

> Type: NA Drying method: NA

Shielding gas: 5.3.1 CO2 gas

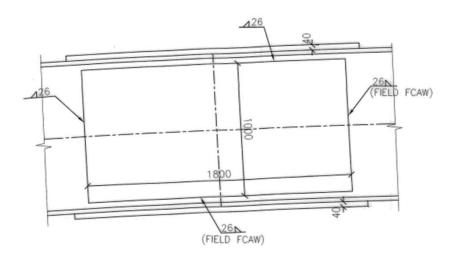
Fusion faces & adjacent surface are cleaned and made free from cracks, Base Metal preparation: 6.0

notches, mill scales, paints, grease, rust etc. which may affect weld

quality.

Joint design details: 6.1

(Give sketch showing arrangement of parts, welding groove details, weld passes & their sequence etc.)



6.2 Joint preparation: As per IS 10178-1995, Cl.9, IRS B1-2001, Cl.17.3 & WBC-2001

7.0 Welding current: Type: DC

> Polarity: EP (Electrode Positive)

8.0 Welder qualification : As per IS 7310(part-I)-2019



9.1 Welding Parameters:

Weld	Electrodes	Current	Arc	Wire	Travel	Electrical	Gas flow
Pass No.	/wire dia. (mm)	(amp)	Voltage (volt)	feed speed (m/min)	speed (m/min)	stick out (mm)	rate L.P.M
1	2	3	4	5	6	7	8
9-11 passes	1.2mm	150-300A	24-30V	5-8	0.15-0.30	10-15	15-25

# 9.2 Welding sequence and technique:

Any other relevant details:

(Give sketch showing sequence and direction of welding).

NA

10.0 Provision of run in and run-off tabs: NA 11.0 Cleaning of weld bead before laying next weld bead: Yes (In case of multilayer only) 12.0 Root preparation before welding other side of groove weld: NA 110°-150°C 13.0 Preheating and inter pass temperature: 14.0 Peening: NA 15.0 Post weld treatment: NA By grinding of defective weld & rectify the weld as per 16.0 Rectification of weld defects: clause 32.2 of IS 9595-1996 using FCAW Class-I wire as per IRS M46-2020 17.0 Inspection of weld: Visual Inspection, D.P. Test

NIL



18.0

#### **Welding Procedure Specification Sheet**

Name and address of Fabricator: HMM Infra Limited, Village-Mandour, Ambala, Haryana

Welding Procedure Specification Sheet No. : HMM/24/WPSS/BSG/72m/FCAW/012

Ref. Drg No. RDSO/B-10440/2 # Arch to Hanger

1.0 Weld joint description : Fillet (22 mm)

2.0 Base Metal: 32 mm & 32 mm IS 2062-11: E350 B0, Fully Killed, Normalized/Control cooled

3.0 Welding Process: FCAW

4.0 Welding position : Horizontal, Vertical, Overhead

5.0 Welding consumables : (as below)

5.1 Electrode/wire Class: Class-I as per IRS M46-2020

Dia: 1.2 mm Drying method: NA

5.2 Flux Class: NA

Type: NA
Drying method: NA

5.3.1 Shielding gas: CO2 gas

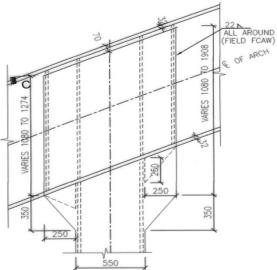
Fusion faces & adjacent surface are cleaned and made free from cracks,

6.0 Base Metal preparation : notches, mill scales, paints, grease, rust etc. which may affect weld

quality.

6.1 Joint design details :

(Give sketch showing arrangement of parts, welding groove details, weld passes & their sequence etc.)



6.2 Joint preparation: As per IS 10178-1995, Cl.9, IRS B1-2001, Cl.17.3 & WBC-2001

7.0 Welding current : Type : DC

Polarity: EP (Electrode Positive)

8.0 Welder qualification: As per IS 7310(part-I)-2019



9.1 Welding Parameters:

Weld	Electrodes	Current	Arc	Wire	Travel	Electrical	Gas flow
Pass No.	/wire dia. (mm)	(amp)	Voltage (volt)	feed speed (m/min)	speed (m/min)	stick out (mm)	rate L.P.M
1	2	3	4	5	6	7	8
8-10 passes	1.2mm	150-300A	24-30V	5-8	0.15-0.30	10-15	15-25

# 9.2 Welding sequence and technique:

(Give sketch showing sequence and direction of welding).

NA

10.0 Provision of run in and run-off tabs: NA
 11.0 Cleaning of weld bead before laying next weld bead: Yes (In case of multilayer only)

12.0 Root preparation before welding other side of groove weld: NA

13.0 Preheating and inter pass temperature: 110°-150°C

14.0Peening:NA15.0Post weld treatment:NA

By grinding of defective weld & rectify the weld as per clause 32.2 of IS 9595-1996 using FCAW Class-I wire as

per IRS M46-2020

17.0 Inspection of weld: Visual Inspection, D.P. Test

18.0 Any other relevant details: NIL



#### **Welding Procedure Specification Sheet**

Name and address of Fabricator: HMM Infra Limited, Village-Mandour, Ambala, Haryana

Welding Procedure Specification Sheet No.: HMM/24/WPSS/BSG/72m/FCAW/013

Ref. Drg No. RDSO/B-10440/2 # Arch, Hanger & Tie Beam to Stiffeners

1.0 Weld joint description : Fillet (20 mm)

2.0 Base Metal: 25 mm & 32 mm IS 2062-11 : E350 B0, Fully Killed, Normalized/Control cooled

3.0 Welding Process: FCAW

4.0 Welding position : Horizontal, Vertical, Overhead

5.0 Welding consumables : (as below)

5.1 Electrode/wire Class: Class-I as per IRS M46-2020

Dia: 1.2 mm Drying method: NA

5.2 Flux Class: NA

Type: NA
Drying method: NA

5.3.1 Shielding gas : CO2 gas

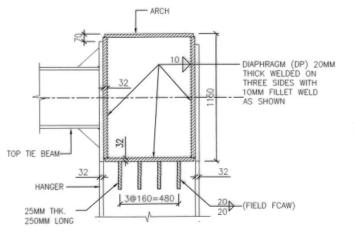
Fusion faces & adjacent surface are cleaned and made free from cracks,

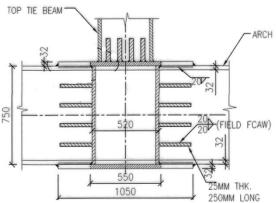
6.0 Base Metal preparation : notches, mill scales, paints, grease, rust etc. which may affect weld

quality.

6.1 Joint design details :

(Give sketch showing arrangement of parts, welding groove details, weld passes & their sequence etc.)





6.2 Joint preparation : As per IS 10178-1995, Cl.9, IRS B1-2001, Cl.17.3 & WBC-2001

7.0 Welding current : Type : DC

Polarity: EP (Electrode Positive)

8.0 Welder qualification : As per IS 7310(part-I)-2019



9.1 Welding Parameters:

Weld	Electrodes	Current	Arc	Wire	Travel	Electrical	Gas flow
Pass No.	/wire dia. (mm)	(amp)	Voltage (volt)	feed speed (m/min)	speed (m/min)	stick out (mm)	rate L.P.M
1	2	3	4	5	6	7	8
8-10 passes	1.2mm	150-300A	24-30V	5-8	0.15-0.30	10-15	15-25

# 9.2 Welding sequence and technique:

(Give sketch showing sequence and direction of welding).

NA

10.0 Provision of run in and run-off tabs: NA

11.0 Cleaning of weld bead before laying next weld bead: Yes (In case of multilayer only)

12.0 Root preparation before welding other side of groove weld: NA

13.0 Preheating and inter pass temperature: 110°-150°C

14.0 Peening: NA15.0 Post weld treatment: NA

\_ ...

By grinding of defective weld & rectify the weld as per clause 32.2 of IS 9595-1996 using FCAW Class-I wire as

per IRS M46-2020

17.0 Inspection of weld: Visual Inspection, D.P. Test

18.0 Any other relevant details: NIL



#### **Welding Procedure Specification Sheet**

Name and address of Fabricator: HMM Infra Limited, Village-Mandour, Ambala, Haryana

Welding Procedure Specification Sheet No. : HMM/24/WPSS/BSG/72m/FCAW/014

Ref. Drg No. RDSO/B-10440/3 # Top Tie Beam to Splice Plates

Weld joint description: 1.0 Fillet (20 mm)

2.0 Base Metal: 25 mm & 32 mm IS 2062-11: E350 B0, Fully Killed, Normalized/Control cooled

3.0 Welding Process: **FCAW** 

4.0 Welding position: Horizontal, Vertical, Overhead

5.0 Welding consumables: (as below)

5.1 Electrode/wire Class: Class-I as per IRS M46-2020

> 1.2 mm Drying method: NA

5.2 Flux Class: NA

> Type: NA Drying method: NA

5.3.1 Shielding gas: CO2 gas

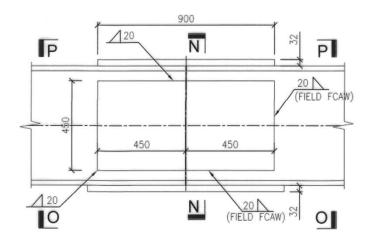
Fusion faces & adjacent surface are cleaned and made free from cracks, Base Metal preparation: 6.0

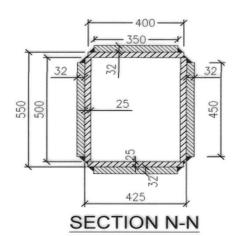
notches, mill scales, paints, grease, rust etc. which may affect weld

quality.

Joint design details: 6.1

(Give sketch showing arrangement of parts, welding groove details, weld passes & their sequence etc.)





6.2 Joint preparation: As per IS 10178-1995, Cl.9, IRS B1-2001, Cl.17.3 & WBC-2001

7.0 Welding current: Type: DC

> Polarity: EP (Electrode Positive)

8.0 Welder qualification : As per IS 7310(part-I)-2019



9.1 Welding Parameters :

Weld	Electrodes	Current	Arc	Wire	Travel	Electrical	Gas flow
Pass No.	/wire dia. (mm)	(amp)	Voltage (volt)	feed speed (m/min)	speed (m/min)	stick out (mm)	rate L.P.M
1	2	3	4	5	6	7	8
8-10 passes	1.2mm	150-300A	24-30V	5-8	0.15-0.30	10-15	15-25

# 9.2 Welding sequence and technique:

(Give sketch showing sequence and direction of welding).

NA

10.0 Provision of run in and run-off tabs: NA 11.0 Cleaning of weld bead before laying next weld bead: Yes (In case of multilayer only) 12.0 Root preparation before welding other side of groove weld: NA 110°-150°C 13.0 Preheating and inter pass temperature: 14.0 Peening: NA 15.0 Post weld treatment: NA By grinding of defective weld & rectify the weld as per 16.0 Rectification of weld defects: clause 32.2 of IS 9595-1996 using FCAW Class-I wire as per IRS M46-2020

17.0 Inspection of weld: Visual Inspection, D.P. Test

18.0 Any other relevant details: NIL



#### **Welding Procedure Specification Sheet**

Name and address of Fabricator: HMM Infra Limited, Village-Mandour, Ambala, Haryana

Welding Procedure Specification Sheet No.: HMM/24/WPSS/BSG/72m/FCAW/015

Ref. Drg No. RDSO/B-10440/3 # Top Tie Beam to Hanger Plate

1.0 Weld joint description : Fillet (22 mm)

2.0 Base Metal: 25 mm & 32 mm IS 2062-11: E350 B0, Fully Killed, Normalized/Control cooled

3.0 Welding Process: FCAW

4.0 Welding position : Horizontal, Vertical, Overhead

5.0 Welding consumables: (as below)

5.1 Electrode/wire Class: Class-I as per IRS M46-2020

Dia: 1.2 mm Drying method: NA

5.2 Flux Class: NA

Type: NA Drying method: NA

5.3.1 Shielding gas: CO2 gas

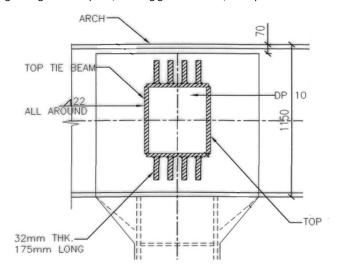
Fusion faces & adjacent surface are cleaned and made free from cracks,

6.0 Base Metal preparation : notches, mill scales, paints, grease, rust etc. which may affect weld

quality.

6.1 Joint design details :

(Give sketch showing arrangement of parts, welding groove details, weld passes & their sequence etc.)



6.2 Joint preparation : As per IS 10178-1995, Cl.9, IRS B1-2001, Cl.17.3 & WBC-2001

7.0 Welding current: Type: DC

Polarity: EP (Electrode Positive)

8.0 Welder qualification : As per IS 7310(part-I)-2019



9.1 Welding Parameters:

Weld	Electrodes	Current	Arc	Wire	Travel	Electrical	Gas flow
Pass No.	/wire dia. (mm)	(amp)	Voltage (volt)	feed speed (m/min)	speed (m/min)	stick out (mm)	rate L.P.M
1	2	3	4	5	6	7	8
7-9 passes	1.2mm	150-300A	24-30V	5-8	0.15-0.30	10-15	15-25

#### 9.2 Welding sequence and technique:

(Give sketch showing sequence and direction of welding).

NA

10.0 Provision of run in and run-off tabs: NA

11.0 Cleaning of weld bead before laying next weld bead: Yes (In case of multilayer only)

12.0 Root preparation before welding other side of groove weld: NA

110°-150°C 13.0 Preheating and inter pass temperature:

14.0 Peening: NA 15.0 Post weld treatment: NA

By grinding of defective weld & rectify the weld as per 16.0 Rectification of weld defects:

clause 32.2 of IS 9595-1996 using FCAW Class-I wire as

per IRS M46-2020

17.0 Inspection of weld: Visual Inspection, D.P. Test

18.0 Any other relevant details: NIL



#### **Welding Procedure Specification Sheet**

Name and address of Fabricator: HMM Infra Limited, Village-Mandour, Ambala, Haryana

Welding Procedure Specification Sheet No. : HMM/24/WPSS/BSG/72m/FCAW/016

Ref. Drg No. RDSO/B-10440/3 # Top Diagonal Tie Beam to TTB/Hanger Plate/Arch

1.0 Weld joint description : Fillet (20 mm)

2.0 Base Metal: 25 mm & 32 mm IS 2062-11: E350 B0, Fully Killed, Normalized/Control cooled

3.0 Welding Process: FCAW

4.0 Welding position : Horizontal, Vertical, Overhead

5.0 Welding consumables: (as below)

5.1 Electrode/wire Class: Class-I as per IRS M46-2020

Dia : 1.2 mm

Drying method : NA

5.2 Flux Class : NA

Type: NA
Drying method: NA

Shielding gas: CO2 gas

Fusion faces & adjacent surface are cleaned and made free from cracks,

Base Metal preparation : notches, mill scales, paints, grease, rust etc. which may affect weld

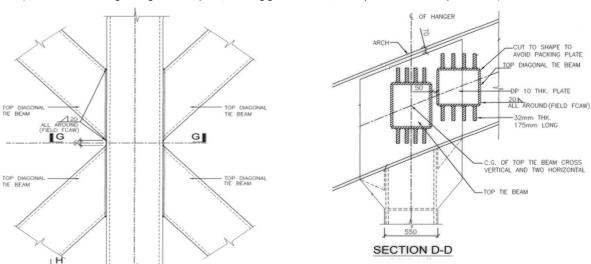
quality.

6.1 Joint design details:

5.3.1

6.0

(Give sketch showing arrangement of parts, welding groove details, weld passes & their sequence etc.)



6.2 Joint preparation : As per IS 10178-1995, Cl.9, IRS B1-2001, Cl.17.3 & WBC-2001

7.0 Welding current: Type: DC

Polarity: EP (Electrode Positive)

8.0 Welder qualification : As per IS 7310(part-I)-2019



9.1 Welding Parameters:

Weld	Electrodes	Current	Arc	Wire	Travel	Electrical	Gas flow
Pass No.	/wire dia. (mm)	(amp)	Voltage (volt)	feed speed (m/min)	speed (m/min)	stick out (mm)	rate L.P.M
1	2	3	4	5	6	7	8
7-9 passes	1.2mm	150-300A	24-30V	5-8	0.15-0.30	10-15	15-25

# 9.2 Welding sequence and technique:

(Give sketch showing sequence and direction of welding).

NA

10.0 Provision of run in and run-off tabs: NA 11.0 Cleaning of weld bead before laying next weld bead: Yes (In case of multilayer only) 12.0 Root preparation before welding other side of groove weld: NA 110°-150°C 13.0 Preheating and inter pass temperature: 14.0 Peening: NA 15.0 Post weld treatment: NA

By grinding of defective weld & rectify the weld as per clause 32.2 of IS 9595-1996 using FCAW Class-I wire as

per IRS M46-2020

17.0 Inspection of weld: Visual Inspection, D.P. Test

18.0 Any other relevant details: NIL



# **Welding Procedure Specification Sheet**

Name and address of Fabricator: HMM Infra Limited, Village-Mandour, Ambala, Haryana

Welding Procedure Specification Sheet No.: HMM/24/WPSS/BSG/72m/FCAW/017

Ref. Drg No. RDSO/B-10440/3 # **Top Tie Chord to Top Tie Beam** 

1.0 Weld joint description : Fillet (20 mm)

2.0 Base Metal: 22 mm & 25 mm IS 2062-11: E350 B0, Fully Killed, Normalized/Control cooled

3.0 Welding Process: FCAW

4.0 Welding position : Horizontal, Vertical, Overhead

5.0 Welding consumables : (as below)

5.1 Electrode/wire Class: Class-I as per IRS M46-2020

Dia: 1.2 mm Drying method: NA

Drying method: NA
5.2 Flux Class: NA

Type: NA

Drying method : NA

5.3.1 Shielding gas: CO2 gas

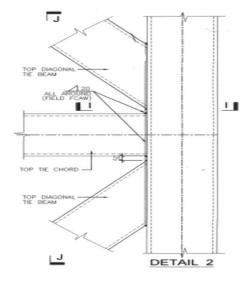
Fusion faces & adjacent surface are cleaned and made free from cracks,

6.0 Base Metal preparation: notches, mill scales, paints, grease, rust etc. which may affect weld

quality.

6.1 Joint design details:

(Give sketch showing arrangement of parts, welding groove details, weld passes & their sequence etc.)



6.2 Joint preparation : As per IS 10178-1995, Cl.9, IRS B1-2001, Cl.17.3 & WBC-2001

7.0 Welding current: Type: DC

Polarity: EP (Electrode Positive)

8.0 Welder qualification: As per IS 7310(part-I)-2019



9.1 Welding Parameters:

Weld	Electrodes	Current	Arc	Wire	Travel	Electrical	Gas flow
Pass No.	/wire dia. (mm)	(amp)	Voltage (volt)	feed speed (m/min)	speed (m/min)	stick out (mm)	rate L.P.M
1	2	3	4	5	6	7	8
7-9 passes	1.2mm	150-300A	24-30V	5-8	0.15-0.30	10-15	15-25

# 9.2 Welding sequence and technique:

(Give sketch showing sequence and direction of welding).

NA

10.0 Provision of run in and run-off tabs: NA
 11.0 Cleaning of weld bead before laying next weld bead: Yes (In case of multilayer only)
 12.0 Root preparation before welding other side of groove weld: NA
 13.0 Preheating and inter pass temperature: 110°-150°C

14.0Peening:NA15.0Post weld treatment:NA

By grinding of defective weld & rectify the weld as per clause 32.2 of IS 9595-1996 using FCAW Class-I wire as

per IRS M46-2020

17.0 Inspection of weld: Visual Inspection, D.P. Test

18.0 Any other relevant details: NIL



#### **Welding Procedure Specification Sheet**

Name and address of Fabricator: HMM Infra Limited, Village-Mandour, Ambala, Haryana

Welding Procedure Specification Sheet No. : HMM/24/WPSS/BSG/72m/FCAW/018

Ref. Drg No. RDSO/B-10440/3 # TopTie Beam /Hanger to Stiffeners

Weld joint description: 1.0 Fillet (22 mm)

2.0 Base Metal: 25 mm & 32 mm IS 2062-11: E350 B0, Fully Killed, Normalized/Control cooled

Welding Process: 3.0

4.0 Welding position: Horizontal, Vertical, Overhead

Welding consumables: 5.0 (as below)

Electrode/wire Class: 5.1 Class-I as per IRS M46-2020

> 1.2 mm Drying method: NA

5.2

Flux Class: NA Type: NA

> Drying method: NA

5.3.1 Shielding gas: CO2 gas

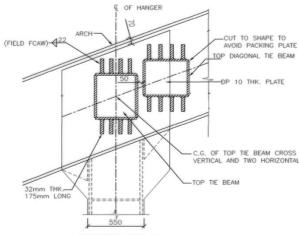
Fusion faces & adjacent surface are cleaned and made free from cracks,

notches, mill scales, paints, grease, rust etc. which may affect weld Base Metal preparation: 6.0

quality.

6.1 Joint design details:

(Give sketch showing arrangement of parts, welding groove details, weld passes & their sequence etc.)



SECTION D-D

6.2 Joint preparation: As per IS 10178-1995, Cl.9, IRS B1-2001, Cl.17.3 & WBC-2001

7.0 Welding current: Type: DC

> Polarity: EP (Electrode Positive)

8.0 Welder qualification: As per IS 7310(part-I)-2019



**FABRICATOR** CONTRACTOR S.E.C. RLY. RDSO NHAI

9.1 Welding Parameters:

Weld	Electrodes	Current	Arc	Wire	Travel	Electrical	Gas flow
Pass No.	/wire dia. (mm)	(amp)	Voltage (volt)	feed speed (m/min)	speed (m/min)	stick out (mm)	rate L.P.M
1	2	3	4	5	6	7	8
9-11 passes	1.2mm	150-300A	24-30V	5-8	0.15-0.30	10-15	15-25

# 9.2 Welding sequence and technique:

(Give sketch showing sequence and direction of welding).

NA

10.0 Provision of run in and run-off tabs: NA
 11.0 Cleaning of weld bead before laying next weld bead: Yes (In case of multilayer only)

12.0 Root preparation before welding other side of groove weld: NA

13.0 Preheating and inter pass temperature: 110°-150°C

14.0Peening:NA15.0Post weld treatment:NA

By grinding of defective weld & rectify the weld as per clause 32.2 of IS 9595-1996 using FCAW Class-I wire as

per IRS M46-2020

17.0 Inspection of weld: Visual Inspection, D.P. Test

18.0 Any other relevant details: NIL



#### **Welding Procedure Specification Sheet**

Name and address of Fabricator: HMM Infra Limited, Village-Mandour, Ambala, Haryana

Welding Procedure Specification Sheet No. : HMM/24/WPSS/BSG/72m/FCAW/019

Ref. Drg No. RDSO/B-10440/3 # Top Diagonal Tie Beam /Hanger/Arch to Stiffeners

1.0 Weld joint description: Fillet (20 mm)

2.0 Base Metal: 22 mm & 32 mm IS 2062-11: E350 B0, Fully Killed, Normalized/Control cooled

Welding Process: 3.0

4.0 Welding position: Horizontal, Vertical, Overhead

Welding consumables: 5.0 (as below)

Electrode/wire Class: 5.1 Class-I as per IRS M46-2020

> Dia: 1.2 mm Drying method: NA

Flux Class: 5.2 NA

> Type: NA Drying method: NA

Shielding gas: 5.3.1 CO2 gas

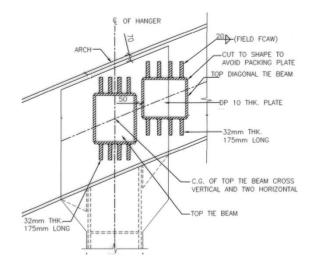
Fusion faces & adjacent surface are cleaned and made free from cracks, 6.0 Base Metal preparation:

notches, mill scales, paints, grease, rust etc. which may affect weld

quality.

6.1 Joint design details:

(Give sketch showing arrangement of parts, welding groove details, weld passes & their sequence etc.)



6.2 Joint preparation: As per IS 10178-1995, Cl.9, IRS B1-2001, Cl.17.3 & WBC-2001

7.0 Welding current: Type: DC

> Polarity: EP (Electrode Positive)

Welder qualification: 8.0 As per IS 7310(part-I)-2019



**RDSO FABRICATOR** CONTRACTOR NHAI S.E.C. RLY.

9.1 Welding Parameters:

Weld	Electrodes	Current	Arc	Wire	Travel	Electrical	Gas flow
Pass No.	/wire dia. (mm)	(amp)	Voltage (volt)	feed speed (m/min)	speed (m/min)	stick out (mm)	rate L.P.M
1	2	3	4	5	6	7	8
9-11 passes	1.2mm	150-300A	24-30V	5-8	0.15-0.30	10-15	15-25

#### 9.2 Welding sequence and technique:

(Give sketch showing sequence and direction of welding).

NA

10.0 Provision of run in and run-off tabs: NA

11.0 Cleaning of weld bead before laying next weld bead: Yes (In case of multilayer only)

12.0 Root preparation before welding other side of groove weld: NA

110°-150°C 13.0 Preheating and inter pass temperature:

14.0 Peening: NA 15.0 Post weld treatment: NA

By grinding of defective weld & rectify the weld as per 16.0 Rectification of weld defects:

clause 32.2 of IS 9595-1996 using FCAW Class-I wire as

per IRS M46-2020

17.0 Inspection of weld: Visual Inspection, D.P. Test

18.0 Any other relevant details: NIL



#### **Welding Procedure Specification Sheet**

Name and address of Fabricator: HMM Infra Limited, Village-Mandour, Ambala, Haryana

Welding Procedure Specification Sheet No. : HMM/24/WPSS/BSG/72m/FCAW/020

Ref. Drg No. RDSO/B-10440/4 # Arch to Bottom Long Beam at LO Location

Weld joint description: 1.0 Fillet (22 mm)

2.0 Base Metal: 32 mm & 25 mm IS 2062-11: E350 B0, Fully Killed, Normalized/Control cooled

Welding Process: 3.0

Welding position: 4.0 Horizontal, Vertical, Overhead

5.0 Welding consumables: (as below)

Electrode/wire Class: 5.1 Class-I as per IRS M46-2020

> 1.2 mm Drying method: NA

NA

5.2 Flux Class:

> Type: NA Drying method: NA

5.3.1 Shielding gas: CO2 gas

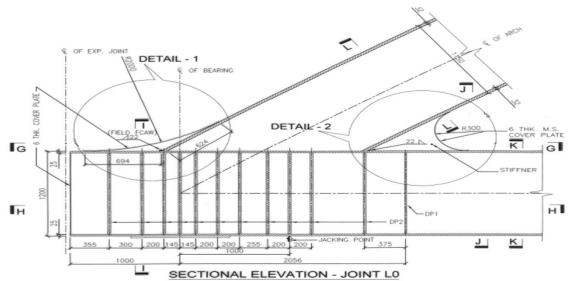
Fusion faces & adjacent surface are cleaned and made free from cracks,

6.0 Base Metal preparation: notches, mill scales, paints, grease, rust etc. which may affect weld

quality.

6.1 Joint design details:

(Give sketch showing arrangement of parts, welding groove details, weld passes & their sequence etc.)



6.2 Joint preparation: As per IS 10178-1995, Cl.9, IRS B1-2001, Cl.17.3 & WBC-2001

7.0 Welding current: Type: DC

> Polarity: EP (Electrode Positive)

8.0 Welder qualification: As per IS 7310(part-I)-2019



**FABRICATOR** CONTRACTOR NHAI **RDSO** S.E.C. RLY.

9.1 Welding Parameters:

Weld	Electrodes	Current	Arc	Wire	Travel	Electrical	Gas flow
Pass No.	/wire dia. (mm)	(amp)	Voltage (volt)	feed speed (m/min)	speed (m/min)	stick out (mm)	rate L.P.M
1	2	3	4	5	6	7	8
8-10 passes	1.2mm	150-300A	24-30V	5-8	0.15-0.30	10-15	15-25

# 9.2 Welding sequence and technique:

(Give sketch showing sequence and direction of welding).

NA

10.0 Provision of run in and run-off tabs: NA 11.0 Cleaning of weld bead before laying next weld bead: Yes (In case of multilayer only) 12.0 Root preparation before welding other side of groove weld: NA 110°-150°C 13.0 Preheating and inter pass temperature: 14.0 Peening: NA 15.0 Post weld treatment: NA

By grinding of defective weld & rectify the weld as per clause 32.2 of IS 9595-1996 using FCAW Class-I wire as

per IRS M46-2020

17.0 Inspection of weld: Visual Inspection, D.P. Test

18.0 Any other relevant details: NIL



#### **Welding Procedure Specification Sheet**

Name and address of Fabricator: HMM Infra Limited, Village-Mandour, Ambala, Haryana

Welding Procedure Specification Sheet No.: HMM/24/WPSS/BSG/72m/FCAW/021

RDSO/B-10440/4 # Cover Plate to Bottom Long Beam/Arch at LO

Location
1.0 Weld joint description: Fillet (22 mm)

2.0 Base Metal : 36 mm & 25/32 mm IS 2062-11 : E350 B0, Fully Killed, Normalized/Control cooled

3.0 Welding Process: FCAW

4.0 Welding position : Horizontal, Vertical, Overhead

5.0 Welding consumables: (as below)

5.1 Electrode/wire Class: Class-I as per IRS M46-2020

Dia: 1.2 mm Drying method: NA

5.2 Flux Class : NA

Type: NA Drying method: NA

5.3.1 Shielding gas: CO2 gas

Fusion faces & adjacent surface are cleaned and made free from cracks,

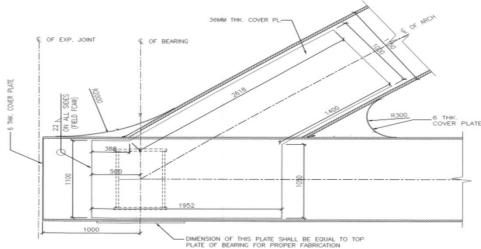
6.0 Base Metal preparation : notches, mill scales, paints, grease, rust etc. which may affect weld

quality.

6.1 Joint design details :

Ref. Drg No.

(Give sketch showing arrangement of parts, welding groove details, weld passes & their sequence etc.)



# **ELEVATION - JOINT LO**

6.2 Joint preparation: As per IS 10178-1995, Cl.9, IRS B1-2001, Cl.17.3 & WBC-2001

7.0 Welding current: Type: DC

Polarity: EP (Electrode Positive)

8.0 Welder qualification: As per IS 7310(part-I)-2019



9.1 Welding Parameters:

Weld	Electrodes	Current	Arc	Wire	Travel	Electrical	Gas flow
Pass No.	/wire dia. (mm)	(amp)	Voltage (volt)	feed speed (m/min)	speed (m/min)	stick out (mm)	rate L.P.M
1	2	3	4	5	6	7	8
9-11 passes	1.2mm	150-300A	24-30V	5-8	0.15-0.30	10-15	15-25

#### 9.2 Welding sequence and technique:

(Give sketch showing sequence and direction of welding).

NA

10.0 Provision of run in and run-off tabs: NA 11.0 Cleaning of weld bead before laying next weld bead: Yes (In case of multilayer only) 12.0 Root preparation before welding other side of groove weld: NA 110°-150°C 13.0 Preheating and inter pass temperature: 14.0 Peening: NA 15.0 Post weld treatment: NA By grinding of defective weld & rectify the weld as per

16.0 Rectification of weld defects: clause 32.2 of IS 9595-1996 using FCAW Class-I wire as per IRS M46-2020

17.0 Inspection of weld: Visual Inspection, D.P. Test

18.0 Any other relevant details: NIL



#### **Welding Procedure Specification Sheet**

Name and address of Fabricator: HMM Infra Limited, Village-Mandour, Ambala, Haryana

Welding Procedure Specification Sheet No. : HMM/24/WPSS/BSG/72m/FCAW/022

RDSO/B-10440/4 # 6 mm Cover Plate to Bottom Long Beam/Arch at LO Ref. Drg No. Location

1.0 Weld joint description: Fillet (6 mm)

6 mm & 25/32 mm IS 2062-11: E350 B0, Fully Killed, Normalized/Control cooled 2.0 Base Metal:

3.0 Welding Process:

4.0 Welding position: Horizontal, Vertical, Overhead

5.0 Welding consumables: (as below)

5.1 Electrode/wire Class: Class-I as per IRS M46-2020

> 1.2 mm Drying method: NA

5.2 Flux Class: NA

> Type: NA Drying method: NA

5.3.1 Shielding gas: CO2 gas

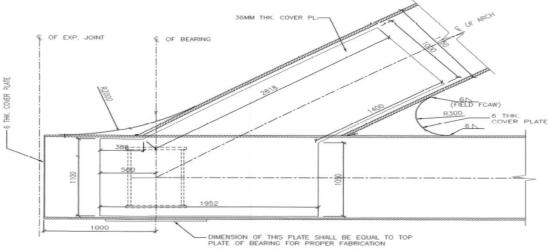
Fusion faces & adjacent surface are cleaned and made free from cracks, Base Metal preparation: 6.0

notches, mill scales, paints, grease, rust etc. which may affect weld

quality.

Joint design details: 6.1

(Give sketch showing arrangement of parts, welding groove details, weld passes & their sequence etc.)



ELEVATION - JOINT LO

As per IS 10178-1995, Cl.9, IRS B1-2001, Cl.17.3 & WBC-2001 6.2 Joint preparation:

7.0 Welding current: Type: DC

> Polarity: EP (Electrode Positive)

8.0 Welder qualification : As per IS 7310(part-I)-2019



CONTRACTOR S.E.C. RLY. **RDSO FABRICATOR** NHAI

9.1 Welding Parameters:

Weld	Electrodes	Current	Arc	Wire	Travel	Electrical	Gas flow
Pass No.	/wire dia. (mm)	(amp)	Voltage (volt)	feed speed (m/min)	speed (m/min)	stick out (mm)	rate L.P.M
1	2	3	4	5	6	7	8
1-2 passes	1.2mm	150-300A	24-30V	5-8	0.15-0.30	10-15	15-25

# 9.2 Welding sequence and technique:

(Give sketch showing sequence and direction of welding).

NA

10.0 Provision of run in and run-off tabs:

NA

NA

Voc (In each of the second of the

11.0 Cleaning of weld bead before laying next weld bead: Yes (In case of multilayer only)

12.0 Root preparation before welding other side of groove weld: NA

13.0 Preheating and inter pass temperature: 110°-150°C

14.0 Peening: NA15.0 Post weld treatment: NA

By grinding of defective weld & rectify the weld as per clause 32.2 of IS 9595-1996 using FCAW Class-I wire as

per IRS M46-2020

17.0 Inspection of weld: Visual Inspection, D.P. Test

18.0 Any other relevant details: NIL



#### **Welding Procedure Specification Sheet**

Name and address of Fabricator: HMM Infra Limited, Village-Mandour, Ambala, Haryana

HMM/24/WPSS/BSG/72m/FCAW/023 Welding Procedure Specification Sheet No.:

Ref. Drg No. RDSO/B-10440/4 # Stiffeners to Bottom Long Beam/Arch at LO Location

Weld joint description: 1.0 Fillet (20 mm)

2.0 Base Metal: 25 mm & 25/32 mm IS 2062-11: E350 B0, Fully Killed, Normalized/Control cooled

3.0 Welding Process: **FCAW** 

Welding position: 4.0 Horizontal, Vertical, Overhead

Welding consumables: 5.0 (as below)

5.1 Electrode/wire Class: Class-I as per IRS M46-2020

> Dia: 1.2 mm Drying method: NA

5.2 Flux Class: NA

> Type: NA Drying method: NA

5.3.1 Shielding gas: CO2 gas

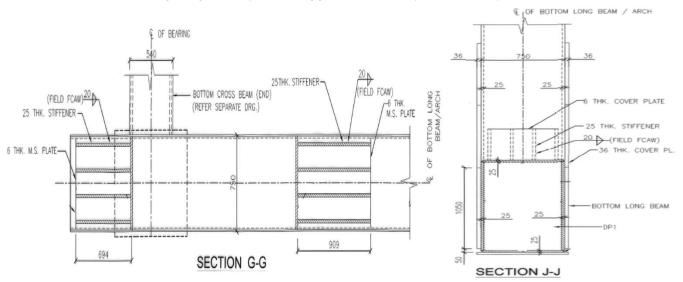
Fusion faces & adjacent surface are cleaned and made free from cracks, 6.0 Base Metal preparation:

notches, mill scales, paints, grease, rust etc. which may affect weld

quality.

6.1 Joint design details:

(Give sketch showing arrangement of parts, welding groove details, weld passes & their sequence etc.)



6.2 Joint preparation: As per IS 10178-1995, Cl.9, IRS B1-2001, Cl.17.3 & WBC-2001

DC 7.0 Welding current: Type:

> Polarity: EP (Electrode Positive)

Welder qualification: 8.0 As per IS 7310(part-I)-2019



CONTRACTOR S.E.C. RLY. **RDSO FABRICATOR** NHAI

9.1 Welding Parameters:

Weld	Electrodes	Current	Arc	Wire	Travel	Electrical	Gas flow
Pass No.	/wire dia. (mm)	(amp)	Voltage (volt)	feed speed (m/min)	speed (m/min)	stick out (mm)	rate L.P.M
1	2	3	4	5	6	7	8
8-10 passes	1.2mm	150-300A	24-30V	5-8	0.15-0.30	10-15	15-25

#### 9.2 Welding sequence and technique:

(Give sketch showing sequence and direction of welding).

NA

10.0 Provision of run in and run-off tabs: NA

11.0 Cleaning of weld bead before laying next weld bead: Yes (In case of multilayer only)

12.0 Root preparation before welding other side of groove weld: NA

110°-150°C 13.0 Preheating and inter pass temperature:

14.0 Peening: NA 15.0 Post weld treatment: NA

By grinding of defective weld & rectify the weld as per 16.0 Rectification of weld defects:

clause 32.2 of IS 9595-1996 using FCAW Class-I wire as

per IRS M46-2020

17.0 Inspection of weld: Visual Inspection, D.P. Test

18.0 Any other relevant details: NIL



## **Welding Procedure Specification Sheet**

Name and address of Fabricator: HMM Infra Limited, Village-Mandour, Ambala, Haryana

Welding Procedure Specification Sheet No. : HMM/24/WPSS/BSG/72m/FCAW/024

Ref. Drg No. RDSO/B-10440/5 # Splice Plates to Bottom Long Beam

1.0 Weld joint description : Fillet (22 mm)

2.0 Base Metal : 25 mm & 32 mm IS 2062-11 : E350 B0, Fully Killed, Normalized/Control cooled

3.0 Welding Process: FCAW

4.0 Welding position : Horizontal, Vertical, Overhead

5.0 Welding consumables: (as below)

5.1 Electrode/wire Class: Class-I as per IRS M46-2020

Dia: 1.2 mm Drying method: NA

5.2 Flux Class: NA

Type: NA
Drying method: NA

5.3.1 Shielding gas: CO2 gas

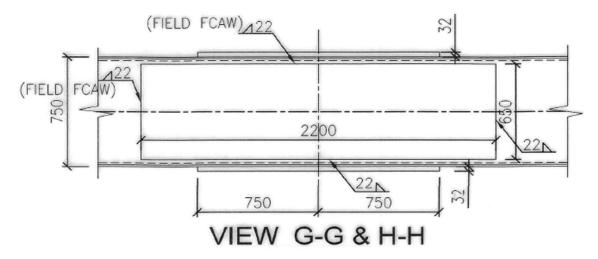
Fusion faces & adjacent surface are cleaned and made free from cracks,

6.0 Base Metal preparation : notches, mill scales, paints, grease, rust etc. which may affect weld

quality.

6.1 Joint design details :

(Give sketch showing arrangement of parts, welding groove details, weld passes & their sequence etc.)



6.2 Joint preparation : As per IS 10178-1995, Cl.9, IRS B1-2001, Cl.17.3 & WBC-2001

7.0 Welding current : Type : DC

Polarity: EP (Electrode Positive)

8.0 Welder qualification : As per IS 7310(part-I)-2019



9.1 Welding Parameters:

Weld	Electrodes	Current	Arc	Wire	Travel	Electrical	Gas flow
Pass No.	/wire dia. (mm)	(amp)	Voltage (volt)	feed speed (m/min)	speed (m/min)	stick out (mm)	rate L.P.M
1	2	3	4	5	6	7	8
9-11 passes	1.2mm	150-300A	24-30V	5-8	0.15-0.30	10-15	15-25

#### 9.2 Welding sequence and technique:

(Give sketch showing sequence and direction of welding).

NA

10.0 Provision of run in and run-off tabs: NA

11.0 Cleaning of weld bead before laying next weld bead: Yes (In case of multilayer only)

12.0 Root preparation before welding other side of groove weld: NA

110°-150°C 13.0 Preheating and inter pass temperature:

14.0 Peening: NA 15.0 Post weld treatment: NA

By grinding of defective weld & rectify the weld as per 16.0 Rectification of weld defects:

clause 32.2 of IS 9595-1996 using FCAW Class-I wire as

per IRS M46-2020

17.0 Inspection of weld: Visual Inspection, D.P. Test

18.0 Any other relevant details: NIL



### **Welding Procedure Specification Sheet**

Name and address of Fabricator: HMM Infra Limited, Village-Mandour, Ambala, Haryana

Welding Procedure Specification Sheet No. : HMM/24/WPSS/BSG/72m/FCAW/025

Ref. Drg No. RDSO/B-10440/5 # Hanger to Bottom Long Beam

1.0 Weld joint description: 32 mm & 25 mm IS 2062-11: E350 B0, Fully Killed, Normalized/Control cooled

2.0 Base Metal: IS 2062:2011 E350 Fe490

3.0 Welding Process: **FCAW** 

4.0 Welding position: Horizontal, Vertical, Overhead

Welding consumables: 5.0 (as below)

Electrode/wire Class: 5.1 Class-I as per IRS M46-2020

1.2 mm

Drying method: NA

5.2 Flux Class: NA

> Type: NA Drying method: NA

5.3.1 Shielding gas: CO2 gas

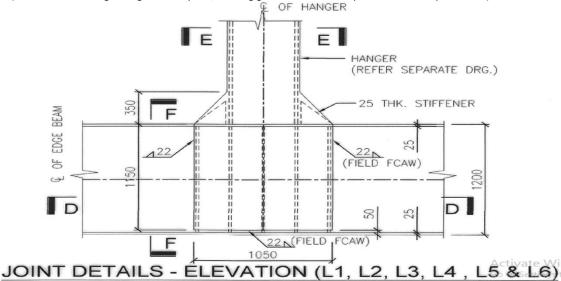
Fusion faces & adjacent surface are cleaned and made free from cracks, 6.0

Base Metal preparation: notches, mill scales, paints, grease, rust etc. which may affect weld

quality.

Joint design details: 6.1

(Give sketch showing arrangement of parts, welding groove details, weld passes & their sequence etc.)



6.2 Joint preparation: As per IS 10178-1995, Cl.9, IRS B1-2001, Cl.17.3 & WBC-2001

7.0 Welding current: Type: DC

> Polarity: EP (Electrode Positive)

8.0 Welder qualification: As per IS 7310(part-I)-2019



9.1 Welding Parameters:

Weld	Electrodes	Current	Arc	Wire	Travel	Electrical	Gas flow
Pass No.	/wire dia. (mm)	(amp)	Voltage (volt)	feed speed (m/min)	speed (m/min)	stick out (mm)	rate L.P.M
1	2	3	4	5	6	7	8
8-10 passes	1.2mm	150-300A	24-30V	5-8	0.15-0.30	10-15	15-25

#### 9.2 Welding sequence and technique:

(Give sketch showing sequence and direction of welding).

NA

10.0 Provision of run in and run-off tabs: NA

11.0 Cleaning of weld bead before laying next weld bead: Yes (In case of multilayer only)

12.0 Root preparation before welding other side of groove weld: NA

110°-150°C 13.0 Preheating and inter pass temperature:

14.0 Peening: NA 15.0 Post weld treatment: NA

By grinding of defective weld & rectify the weld as per 16.0 Rectification of weld defects:

clause 32.2 of IS 9595-1996 using FCAW Class-I wire as

per IRS M46-2020

17.0 Inspection of weld: Visual Inspection, D.P. Test

18.0 Any other relevant details: NIL



## **Welding Procedure Specification Sheet**

Name and address of Fabricator: HMM Infra Limited, Village-Mandour, Ambala, Haryana

Welding Procedure Specification Sheet No.: HMM/24/WPSS/BSG/72m/FCAW/026

Ref. Drg No. RDSO/B-10440/5 # Hanger/Bottom Long Beam to Stiffeners

1.0 Weld joint description : Fillet (20 mm)

2.0 Base Metal: 32 mm & 25 mm IS 2062-11: E350 B0, Fully Killed, Normalized/Control cooled

3.0 Welding Process: FCAW

4.0 Welding position : Horizontal, Vertical, Overhead

5.0 Welding consumables : (as below)

5.1 Electrode/wire Class: Class-I as per IRS M46-2020

Dia: 1.2 mm Drying method: NA

5.2 Flux Class: NA

Type: NA
Drying method: NA

5.3.1 Shielding gas: CO2 gas

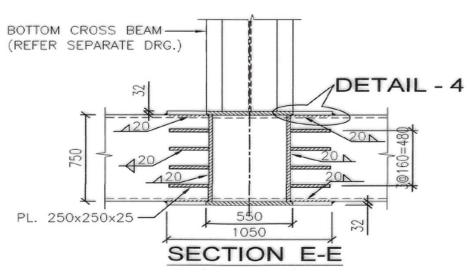
Fusion faces & adjacent surface are cleaned and made free from cracks,

6.0 Base Metal preparation : notches, mill scales, paints, grease, rust etc. which may affect weld

quality.

6.1 Joint design details:

(Give sketch showing arrangement of parts, welding groove details, weld passes & their sequence etc.)



6.2 Joint preparation : As per IS 10178-1995, Cl.9, IRS B1-2001, Cl.17.3 & WBC-2001

7.0 Welding current : Type : DC

Polarity: EP (Electrode Positive)

8.0 Welder qualification : As per IS 7310(part-I)-2019



9.1 Welding Parameters:

Weld	Electrodes	Current	Arc	Wire	Travel	Electrical	Gas flow
Pass No.	/wire dia. (mm)	(amp)	Voltage (volt)	feed speed (m/min)	speed (m/min)	stick out (mm)	rate L.P.M
1	2	3	4	5	6	7	8
8-10 passes	1.2mm	150-300A	24-30V	5-8	0.15-0.30	10-15	15-25

#### 9.2 Welding sequence and technique:

(Give sketch showing sequence and direction of welding).

NA

10.0 Provision of run in and run-off tabs: NA

11.0 Cleaning of weld bead before laying next weld bead: Yes (In case of multilayer only)

12.0 Root preparation before welding other side of groove weld: NA

110°-150°C 13.0 Preheating and inter pass temperature:

14.0 Peening: NA 15.0 Post weld treatment: NA

By grinding of defective weld & rectify the weld as per 16.0 Rectification of weld defects:

clause 32.2 of IS 9595-1996 using FCAW Class-I wire as

per IRS M46-2020

17.0 Inspection of weld: Visual Inspection, D.P. Test

18.0 Any other relevant details: NIL



## **Welding Procedure Specification Sheet**

Name and address of Fabricator: HMM Infra Limited, Village-Mandour, Ambala, Haryana

Welding Procedure Specification Sheet No.: HMM/24/WPSS/BSG/72m/FCAW/027

Ref. Drg No. RDSO/B-10440/5 # Bottom Cross Beam/Hanger/Bottom Long Beam to

Stiffeners

1.0 Weld joint description : Fillet (20 mm)

2.0 Base Metal : 28/32 mm & 25 mm IS 2062-11 : E350 B0, Fully Killed, Normalized/Control cooled

3.0 Welding Process: FCAW

4.0 Welding position : Horizontal, Vertical, Overhead

5.0 Welding consumables: (as below)

5.1 Electrode/wire Class: Class-I as per IRS M46-2020

Dia: 1.2 mm Drying method: NA

5.2 Flux Class : NA

Type: NA
Drying method: NA

5.3.1 Shielding gas: CO2 gas

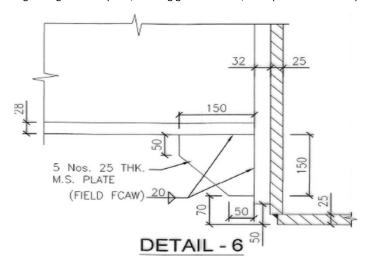
Fusion faces & adjacent surface are cleaned and made free from cracks,

6.0 Base Metal preparation : notches, mill scales, paints, grease, rust etc. which may affect weld

quality.

6.1 Joint design details:

(Give sketch showing arrangement of parts, welding groove details, weld passes & their sequence etc.)



6.2 Joint preparation : As per IS 10178-1995, Cl.9, IRS B1-2001, Cl.17.3 & WBC-2001

7.0 Welding current : Type : DC

Polarity: EP (Electrode Positive)

8.0 Welder qualification : As per IS 7310(part-I)-2019



9.1 Welding Parameters:

Weld	Electrodes	Current	Arc	Wire	Travel	Electrical	Gas flow
Pass No.	/wire dia. (mm)	(amp)	Voltage (volt)	feed speed (m/min)	speed (m/min)	stick out (mm)	rate L.P.M
1	2	3	4	5	6	7	8
8-10 passes	1.2mm	150-300A	24-30V	5-8	0.15-0.30	10-15	15-25

# 9.2 Welding sequence and technique:

(Give sketch showing sequence and direction of welding).

NA

10.0 Provision of run in and run-off tabs: NA 11.0 Cleaning of weld bead before laying next weld bead: Yes (In case of multilayer only) 12.0 Root preparation before welding other side of groove weld: NA 110°-150°C 13.0 Preheating and inter pass temperature: 14.0 Peening: NA 15.0 Post weld treatment: NA By grinding of defective weld & rectify the weld as per 16.0 Rectification of weld defects: clause 32.2 of IS 9595-1996 using FCAW Class-I wire as per IRS M46-2020

17.0 Inspection of weld: Visual Inspection, D.P. Test

18.0 Any other relevant details: NIL



## **Welding Procedure Specification Sheet**

Name and address of Fabricator: HMM Infra Limited, Village-Mandour, Ambala, Haryana

Welding Procedure Specification Sheet No. : HMM/24/WPSS/BSG/72m/FCAW/028

Ref. Drg No. RDSO/B-10440/6 # Bottom Cross Beam to Web Splice Plates/Bottom Inner Splice (SP1 & SP2)

1.0 Weld joint description : Fillet (14 mm)

2.0 Base Metal : 16/16 mm & 20/28 mm IS 2062-11 : E350 B0, Fully Killed, Normalized/Control cooled

3.0 Welding Process: FCAW

4.0 Welding position : Horizontal, Vertical, Overhead

5.0 Welding consumables: (as below)

5.1 Electrode/wire Class: Class-I as per IRS M46-2020

 $\begin{array}{ll} \mbox{Dia}: & \mbox{1.2 mm} \\ \mbox{Drying method}: & \mbox{NA} \end{array}$ 

5.2 Flux Class : NA

Type: NA
Drying method: NA
Shielding gas: CO2 gas

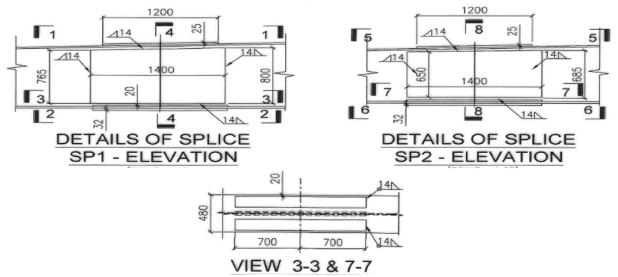
6.0 Base Metal preparation : Fusion faces & adjacent surface are cleaned and made free from cracks,

notches, mill scales, paints, grease, rust etc. which may affect weld quality.

6.1 Joint design details:

5.3.1

(Give sketch showing arrangement of parts, welding groove details, weld passes & their sequence etc.)



6.2 Joint preparation : As per IS 10178-1995, Cl.9, IRS B1-2001, Cl.17.3 & WBC-2001

7.0 Welding current : Type : DC

Polarity: EP (Electrode Positive)

8.0 Welder qualification : As per IS 7310(part-I)-2019



9.1 Welding Parameters:

Weld	Electrodes	Current	Arc	Wire	Travel	Electrical	Gas flow
Pass No.	/wire dia. (mm)	(amp)	Voltage (volt)	feed speed (m/min)	speed (m/min)	stick out (mm)	rate L.P.M
1	2	3	4	5	6	7	8
4-11 passes	1.2mm	150-300A	24-30V	5-8	0.15-0.30	10-15	15-25

## 9.2 Welding sequence and technique:

Any other relevant details:

(Give sketch showing sequence and direction of welding).

NA

10.0 Provision of run in and run-off tabs: NA 11.0 Cleaning of weld bead before laying next weld bead: Yes (In case of multilayer only) Root preparation before welding other side of groove weld: 12.0 NA 13.0 Preheating and inter pass temperature: 110°-150°C 14.0 NA Peening: 15.0 Post weld treatment: NA By grinding of defective weld & rectify the weld as per 16.0 Rectification of weld defects: clause 32.2 of IS 9595-1996 using FCAW Class-I wire as per IRS M46-2020 17.0 Inspection of weld: Visual Inspection, D.P. Test

NIL

Pax Gry Strong

18.0

## **Welding Procedure Specification Sheet**

Name and address of Fabricator: HMM Infra Limited, Village-Mandour, Ambala, Haryana

Welding Procedure Specification Sheet No. : HMM/24/WPSS/BSG/72m/FCAW/029

Ref. Drg No. RDSO/B-10440/6 # Bottom Cross Beam to Top Splice Plates (SP1 & SP2)

Weld joint description: Fillet (16 mm) 1.0

Base Metal: 25 mm & 20 mm IS 2062-11: E350 B0, Fully Killed, Normalized/Control cooled 2.0

Welding Process: 3.0

4.0 Welding position: Horizontal, Vertical, Overhead

Welding consumables: 5.0 (as below)

Electrode/wire Class: Class-I as per IRS M46-2020 5.1

> Dia: 1.2 mm Drying method: NA

Flux Class: 5.2 NA

> NA Type: Drying method: NA

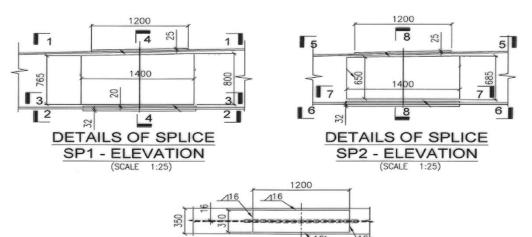
5.3.1 Shielding gas: CO2 gas

Fusion faces & adjacent surface are cleaned and made free from cracks, 6.0 Base Metal preparation:

notches, mill scales, paints, grease, rust etc. which may affect weld quality.

Joint design details: 6.1

(Give sketch showing arrangement of parts, welding groove details, weld passes & their sequence etc.)





6.2 Joint preparation: As per IS 10178-1995, Cl.9, IRS B1-2001, Cl.17.3 & WBC-2001

7.0 Welding current: Type: DC

> Polarity: EP (Electrode Positive)

8.0 Welder qualification: As per IS 7310(part-I)-2019



**FABRICATOR** S.E.C. RLY. **RDSO** CONTRACTOR NHAI

9.1 Welding Parameters:

Weld	Electrodes	Current	Arc	Wire	Travel	Electrical	Gas flow
Pass No.	/wire dia. (mm)	(amp)	Voltage (volt)	feed speed (m/min)	speed (m/min)	stick out (mm)	rate L.P.M
1	2	3	4	5	6	7	8
4-11 passes	1.2mm	150-300A	24-30V	5-8	0.15-0.30	10-15	15-25

## 9.2 Welding sequence and technique:

Any other relevant details:

(Give sketch showing sequence and direction of welding).

NA

10.0 Provision of run in and run-off tabs: NA 11.0 Cleaning of weld bead before laying next weld bead: Yes (In case of multilayer only) Root preparation before welding other side of groove weld: 12.0 NA 110°-150°C 13.0 Preheating and inter pass temperature: 14.0 NA Peening: 15.0 Post weld treatment: NA By grinding of defective weld & rectify the weld as per 16.0 Rectification of weld defects: clause 32.2 of IS 9595-1996 using FCAW Class-I wire as per IRS M46-2020 17.0 Inspection of weld: Visual Inspection, D.P. Test

NIL



18.0

## **Welding Procedure Specification Sheet**

Name and address of Fabricator: HMM Infra Limited, Village-Mandour, Ambala, Haryana

Welding Procedure Specification Sheet No. : HMM/24/WPSS/BSG/72m/FCAW/030

Ref. Drg No. RDSO/B-10440/6 # Bottom Cross Beam to Bottom Outer Splice Plates (SP1

& SP2)

1.0 Weld joint description: Fillet (22 mm)

2.0 Base Metal : 32 mm & 28 mm IS 2062-11 : E350 B0, Fully Killed, Normalized/Control cooled

3.0 Welding Process: FCAW

4.0 Welding position : Horizontal, Vertical, Overhead

5.0 Welding consumables: (as below)

5.1 Electrode/wire Class: Class-I as per IRS M46-2020

Dia : 1.2 mm

Drying method : NA

5.2 Flux Class: NA

Type: NA
Drying method: NA

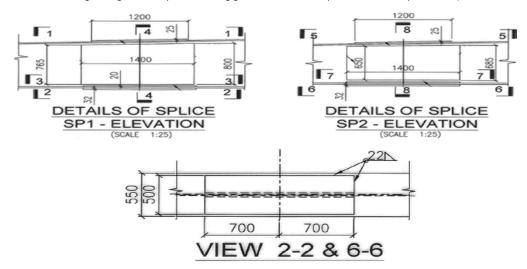
5.3.1 Shielding gas: CO2 gas

6.0 Base Metal preparation : Fusion faces & adjacent surface are cleaned and made free from cracks,

 $notches, \, mill \, scales, \, paints, \, grease, \, rust \, etc. \, \, which \, may \, \, affect \, weld \, quality.$ 

### 6.1 Joint design details :

(Give sketch showing arrangement of parts, welding groove details, weld passes & their sequence etc.)



6.2 Joint preparation : As per IS 10178-1995, Cl.9, IRS B1-2001, Cl.17.3 & WBC-2001

7.0 Welding current : Type : DC

Polarity: EP (Electrode Positive)

8.0 Welder qualification : As per IS 7310(part-I)-2019



9.1 Welding Parameters:

Weld	Electrodes	Current	Arc	Wire	Travel	Electrical	Gas flow
Pass No.	/wire dia. (mm)	(amp)	Voltage (volt)	feed speed (m/min)	speed (m/min)	stick out (mm)	rate L.P.M
1	2	3	4	5	6	7	8
4-11 passes	1.2mm	150-300A	24-30V	5-8	0.15-0.30	10-15	15-25

## 9.2 Welding sequence and technique:

Any other relevant details:

(Give sketch showing sequence and direction of welding).

NA

10.0 Provision of run in and run-off tabs: NA 11.0 Cleaning of weld bead before laying next weld bead: Yes (In case of multilayer only) Root preparation before welding other side of groove weld: 12.0 NA 110°-150°C 13.0 Preheating and inter pass temperature: 14.0 NA Peening: 15.0 Post weld treatment: NA By grinding of defective weld & rectify the weld as per 16.0 Rectification of weld defects: clause 32.2 of IS 9595-1996 using FCAW Class-I wire as per IRS M46-2020 17.0 Inspection of weld: Visual Inspection, D.P. Test

NIL



18.0

### **Welding Procedure Specification Sheet**

Name and address of Fabricator: HMM Infra Limited, Village-Mandour, Ambala, Haryana

Welding Procedure Specification Sheet No.: HMM/24/WPSS/BSG/72m/FCAW/031

Ref. Drg No. RDSO/B-10440/6 # End Bottom Cross Beam to Web Splice Plates (SP3)

1.0 Weld joint description : Fillet (18 mm)

2.0 Base Metal: 25 mm & 28 mm IS 2062-11 : E350 B0, Fully Killed, Normalized/Control cooled

3.0 Welding Process: FCAW

4.0 Welding position : Horizontal, Vertical, Overhead

5.0 Welding consumables : (as below)

5.1 Electrode/wire Class: Class-I as per IRS M46-2020

Dia: 1.2 mm Drying method: NA

5.2 Flux Class : NA

Type: NA
Drying method: NA

5.3.1 Shielding gas : CO2 gas

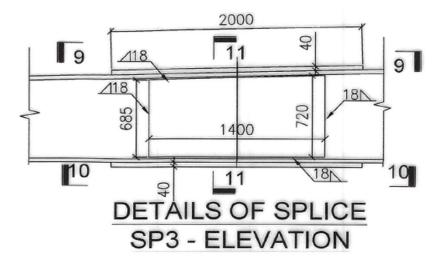
Fusion faces & adjacent surface are cleaned and made free from cracks,

6.0 Base Metal preparation : notches, mill scales, paints, grease, rust etc. which may affect weld

quality.

6.1 Joint design details :

(Give sketch showing arrangement of parts, welding groove details, weld passes & their sequence etc.)



6.2 Joint preparation : As per IS 10178-1995, Cl.9, IRS B1-2001, Cl.17.3 & WBC-2001

7.0 Welding current : Type : DC

Polarity: EP (Electrode Positive)

8.0 Welder qualification : As per IS 7310(part-I)-2019



9.1 Welding Parameters:

Weld	Electrodes	Current	Arc	Wire	Travel	Electrical	Gas flow
Pass No.	/wire dia. (mm)	(amp)	Voltage (volt)	feed speed (m/min)	speed (m/min)	stick out (mm)	rate L.P.M
1	2	3	4	5	6	7	8
4-11 passes	1.2mm	150-300A	24-30V	5-8	0.15-0.30	10-15	15-25

# 9.2 Welding sequence and technique:

(Give sketch showing sequence and direction of welding).

NA

10.0 Provision of run in and run-off tabs: NA 11.0 Cleaning of weld bead before laying next weld bead: Yes (In case of multilayer only) 12.0 Root preparation before welding other side of groove weld: NA 110°-150°C 13.0 Preheating and inter pass temperature: 14.0 Peening: NA 15.0 Post weld treatment: NA By grinding of defective weld & rectify the weld as per 16.0 Rectification of weld defects: clause 32.2 of IS 9595-1996 using FCAW Class-I wire as per IRS M46-2020

Visual Inspection, D.P. Test

NIL



17.0

18.0

Inspection of weld:

Any other relevant details:

### **Welding Procedure Specification Sheet**

Name and address of Fabricator: HMM Infra Limited, Village-Mandour, Ambala, Haryana

Welding Procedure Specification Sheet No.: HMM/24/WPSS/BSG/72m/FCAW/032

Ref. Drg No. RDSO/B-10440/6 # End Bottom Cross Beam & Top/Bottom Splice Plates

(SP3)

1.0 Weld joint description : Fillet (24 mm)

2.0 Base Metal: 40 mm & 32 mm IS 2062-11 : E350 B0, Fully Killed, Normalized/Control cooled

3.0 Welding Process: FCAW

4.0 Welding position : Horizontal, Vertical, Overhead

5.0 Welding consumables: (as below)

5.1 Electrode/wire Class: Class-I as per IRS M46-2020

Dia: 1.2 mm Drying method: NA

5.2 Flux Class: NA

Type: NA
Drying method: NA

5.3.1 Shielding gas: CO2 gas

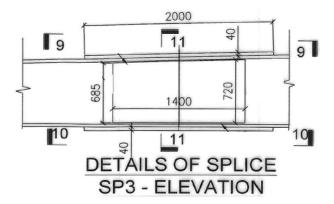
Fusion faces & adjacent surface are cleaned and made free from cracks,

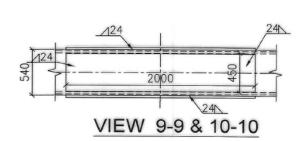
6.0 Base Metal preparation : notches, mill scales, paints, grease, rust etc. which may affect weld

quality.

6.1 Joint design details:

(Give sketch showing arrangement of parts, welding groove details, weld passes & their sequence etc.)





6.2 Joint preparation: As per IS 10178-1995, Cl.9, IRS B1-2001, Cl.17.3 & WBC-2001

7.0 Welding current : Type : DC

Polarity: EP (Electrode Positive)

8.0 Welder qualification: As per IS 7310(part-I)-2019



9.1 Welding Parameters:

Weld	Electrodes	Current	Arc	Wire	Travel	Electrical	Gas flow
Pass No.	/wire dia. (mm)	(amp)	Voltage (volt)	feed speed (m/min)	speed (m/min)	stick out (mm)	rate L.P.M
1	2	3	4	5	6	7	8
4-11 passes	1.2mm	150-300A	24-30V	5-8	0.15-0.30	10-15	15-25

# 9.2 Welding sequence and technique:

(Give sketch showing sequence and direction of welding).

NA

10.0 Provision of run in and run-off tabs: NA 11.0 Cleaning of weld bead before laying next weld bead: Yes (In case of multilayer only) 12.0 Root preparation before welding other side of groove weld: NA 110°-150°C 13.0 Preheating and inter pass temperature: 14.0 Peening: NA 15.0 Post weld treatment: NA By grinding of defective weld & rectify the weld as per 16.0 Rectification of weld defects: clause 32.2 of IS 9595-1996 using FCAW Class-I wire as per IRS M46-2020

Visual Inspection, D.P. Test

NIL



17.0

18.0

Inspection of weld:

Any other relevant details:

## **Welding Procedure Specification Sheet**

Name and address of Fabricator: HMM Infra Limited, Village-Mandour, Ambala, Haryana

Welding Procedure Specification Sheet No. : HMM/24/WPSS/BSG/72m/FCAW/033

Ref. Drg No. RDSO/B-10440/6 # Stiffeners/ BCB 1/BCB 2/BCB 3 to Hanger/BLB

1.0 Weld joint description: Fillet (20 mm)

2.0 Base Metal: 25 mm & 28/32/25 mm IS 2062-11: E350 B0, Fully Killed, Normalized/Control cooled

3.0 Welding Process:

4.0 Welding position: Horizontal, Vertical, Overhead

5.0 Welding consumables: (as below)

5.1 Electrode/wire Class: Class-I as per IRS M46-2020

> Dia: 1.2 mm Drying method: NA

5.2 Flux Class: NA

> Type: NA Drying method: NA

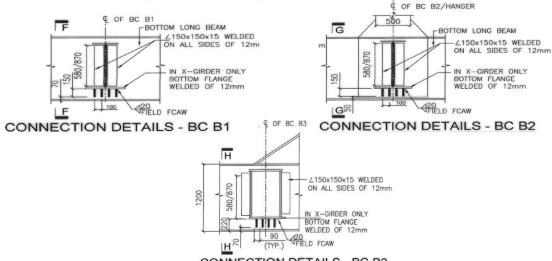
5.3.1 Shielding gas: CO2 gas

Fusion faces & adjacent surface are cleaned and made free from cracks, 6.0 Base Metal preparation:

notches, mill scales, paints, grease, rust etc. which may affect weld quality.

#### Joint design details: 6.1

(Give sketch showing arrangement of parts, welding groove details, weld passes & their sequence etc.)



CONNECTION DETAILS - BC B3

Joint preparation: 6.2 As per IS 10178-1995, Cl.9, IRS B1-2001, Cl.17.3 & WBC-2001

7.0 Welding current: Type: DC

> Polarity: EP (Electrode Positive)

8.0 Welder qualification: As per IS 7310(part-I)-2019



9.1 Welding Parameters:

Weld	Electrodes	Current	Arc	Wire	Travel	Electrical	Gas flow
Pass No.	/wire dia. (mm)	(amp)	Voltage (volt)	feed speed (m/min)	speed (m/min)	stick out (mm)	rate L.P.M
1	2	3	4	5	6	7	8
8-10 passes	1.2mm	150-300A	24-30V	5-8	0.15-0.30	10-15	15-25

## 9.2 Welding sequence and technique:

(Give sketch showing sequence and direction of welding).

NA

10.0 Provision of run in and run-off tabs: NA 11.0 Cleaning of weld bead before laying next weld bead: Yes (In case of multilayer only) Root preparation before welding other side of groove weld: 12.0 NA 110°-150°C 13.0 Preheating and inter pass temperature: 14.0 NA Peening: 15.0 Post weld treatment: NA By grinding of defective weld & rectify the weld as per 16.0 Rectification of weld defects: clause 32.2 of IS 9595-1996 using FCAW Class-I wire as

Visual Inspection, D.P. Test

per IRS M46-2020

18.0 Any other relevant details: NIL



17.0

Inspection of weld:

## **Welding Procedure Specification Sheet**

Name and address of Fabricator: HMM Infra Limited, Village-Mandour, Ambala, Haryana

Welding Procedure Specification Sheet No. : HMM/24/WPSS/BSG/72m/FCAW/034

Ref. Drg No. RDSO/B-10440/6 # Angles to BCB 1/BCB 2/Hanger/BLB

NA

1.0 Weld joint description: Fillet (12 mm)

2.0 Base Metal: 12 mm & 16/32/25 mm IS 2062-11: E350 B0, Fully Killed, Normalized/Control cooled

3.0 Welding Process:

Welding position: Horizontal, Vertical, Overhead 4.0

5.0 Welding consumables: (as below)

5.1 Electrode/wire Class: Class-I as per IRS M46-2020

> 1.2 mm Drying method:

Flux Class: NA

5.2

Type: NA Drying method: NA

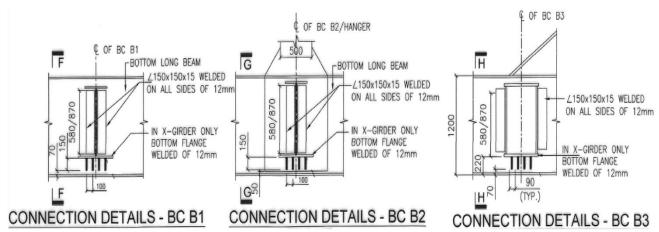
5.3.1 Shielding gas: CO2 gas

Fusion faces & adjacent surface are cleaned and made free from cracks, Base Metal preparation: 6.0

notches, mill scales, paints, grease, rust etc. which may affect weld quality.

Joint design details: 6.1

(Give sketch showing arrangement of parts, welding groove details, weld passes & their sequence etc.)



6.2 Joint preparation: As per IS 10178-1995, Cl.9, IRS B1-2001, Cl.17.3 & WBC-2001

7.0 Welding current: Type: DC

> Polarity: EP (Electrode Positive)

Welder qualification: 8.0 As per IS 7310(part-I)-2019



**FABRICATOR** NHAI S.E.C. RLY. RDSO CONTRACTOR

9.1 Welding Parameters:

Weld	Electrodes	Current	Arc	Wire	Travel	Electrical	Gas flow
Pass No.	/wire dia. (mm)	(amp)	Voltage (volt)	feed speed (m/min)	speed (m/min)	stick out (mm)	rate L.P.M
1	2	3	4	5	6	7	8
3-4 passes	1.2mm	150-300A	24-30V	5-8	0.15-0.30	10-15	15-25

## 9.2 Welding sequence and technique:

Any other relevant details:

(Give sketch showing sequence and direction of welding).

NA

10.0 Provision of run in and run-off tabs: NA 11.0 Cleaning of weld bead before laying next weld bead: Yes (In case of multilayer only) Root preparation before welding other side of groove weld: 12.0 NA 110°-150°C 13.0 Preheating and inter pass temperature: 14.0 NA Peening: 15.0 Post weld treatment: NA By grinding of defective weld & rectify the weld as per 16.0 Rectification of weld defects: clause 32.2 of IS 9595-1996 using FCAW Class-I wire as per IRS M46-2020 17.0 Inspection of weld: Visual Inspection, D.P. Test

NIL



18.0

### **Welding Procedure Specification Sheet**

Name and address of Fabricator: HMM Infra Limited, Village-Mandour, Ambala, Haryana

Welding Procedure Specification Sheet No.: HMM/24/WPSS/BSG/72m/FCAW/035

Ref. Drg No. RDSO/B-10440/6 # Stiffeners to BCB 3/BLB Cover Plate

1.0 Weld joint description : Fillet (20 mm)

2.0 Base Metal: 25 mm & 32 mm IS 2062-11: E350 B0, Fully Killed, Normalized/Control cooled

3.0 Welding Process: FCAW

4.0 Welding position : Horizontal, Vertical, Overhead

5.0 Welding consumables : (as below)

5.1 Electrode/wire Class: Class-I as per IRS M46-2020

Dia: 1.2 mm Drying method: NA

Flux Class : NA

Type: NA
Drying method: NA

5.3.1 Shielding gas : CO2 gas

Fusion faces & adjacent surface are cleaned and made free from cracks,

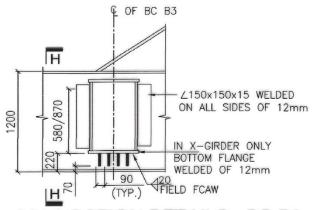
6.0 Base Metal preparation : notches, mill scales, paints, grease, rust etc. which may affect weld

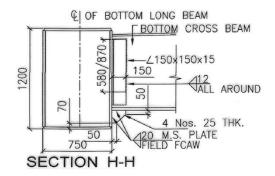
quality.

6.1 Joint design details:

5.2

(Give sketch showing arrangement of parts, welding groove details, weld passes & their sequence etc.)





**CONNECTION DETAILS - BC B3** 

6.2 Joint preparation: As per IS 10178-1995, Cl.9, IRS B1-2001, Cl.17.3 & WBC-2001

7.0 Welding current : Type : DC

Polarity: EP (Electrode Positive)

8.0 Welder qualification: As per IS 7310(part-I)-2019



9.1 Welding Parameters:

Weld	Electrodes	Current	Arc	Wire	Travel	Electrical	Gas flow
Pass No.	/wire dia. (mm)	(amp)	Voltage (volt)	feed speed (m/min)	speed (m/min)	stick out (mm)	rate L.P.M
1	2	3	4	5	6	7	8
8-10 passes	1.2mm	150-300A	24-30V	5-8	0.15-0.30	10-15	15-25

# 9.2 Welding sequence and technique:

(Give sketch showing sequence and direction of welding).

NA

10.0 Provision of run in and run-off tabs: NA
 11.0 Cleaning of weld bead before laying next weld bead: Yes (In case of multilayer only)
 12.0 Root preparation before welding other side of groove weld: NA
 13.0 Preheating and inter pass temperature: 110°-150°C

14.0Peening:NA15.0Post weld treatment:NA

By grinding of defective weld & rectify the weld as per clause 32.2 of IS 9595-1996 using FCAW Class-I wire as

per IRS M46-2020

17.0 Inspection of weld: Visual Inspection, D.P. Test

18.0 Any other relevant details: NIL



## **Welding Procedure Specification Sheet**

Name and address of Fabricator: HMM Infra Limited, Village-Mandour, Ambala, Haryana

Welding Procedure Specification Sheet No. : HMM/24/WPSS/BSG/72m/FCAW/036

Ref. Drg No. RDSO/B-10440/6 # ISMC 150 to BCB 1/BCB 2 Stiffeners

1.0 Weld joint description : Fillet (6 mm)

2.0 Base Metal : ISMC 150 & 12 mm IS 2062-11 : E350 B0, Fully Killed, Normalized/Control cooled

3.0 Welding Process: FCAW

4.0 Welding position : Horizontal, Vertical, Overhead

5.0 Welding consumables : (as below)

5.1 Electrode/wire Class: Class-I as per IRS M46-2020

Dia : 1.2 mm

Drying method : NA

5.2 Flux Class : NA

Type: NA
Drying method: NA

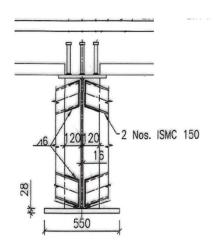
5.3.1 Shielding gas : CO2 gas

6.0 Base Metal preparation : Fusion faces & adjacent surface are cleaned and made free from cracks,

notches, mill scales, paints, grease, rust etc. which may affect weld quality.

6.1 Joint design details:

(Give sketch showing arrangement of parts, welding groove details, weld passes & their sequence etc.)



6.2 Joint preparation : As per IS 10178-1995, Cl.9, IRS B1-2001, Cl.17.3 & WBC-2001

7.0 Welding current : Type : DC

Polarity : EP (Electrode Positive)

8.0 Welder qualification : As per IS 7310(part-I)-2019



9.1 Welding Parameters:

Weld	Electrodes	Current	Arc	Wire	Travel	Electrical	Gas flow
Pass No.	/wire dia. (mm)	(amp)	Voltage (volt)	feed speed (m/min)	speed (m/min)	stick out (mm)	rate L.P.M
1	2	3	4	5	6	7	8
1-2 passes	1.2mm	150-300A	24-30V	5-8	0.15-0.30	10-15	15-25

## 9.2 Welding sequence and technique:

(Give sketch showing sequence and direction of welding).

NA

10.0 Provision of run in and run-off tabs: NA 11.0 Cleaning of weld bead before laying next weld bead: Yes (In case of multilayer only) Root preparation before welding other side of groove weld: 12.0 NA 110°-150°C 13.0 Preheating and inter pass temperature: 14.0 NA Peening: 15.0 Post weld treatment: NA

By grinding of defective weld & rectify the weld as per clause 32.2 of IS 9595-1996 using FCAW Class-I wire as

per IRS M46-2020

17.0 Inspection of weld: Visual Inspection, D.P. Test

18.0 Any other relevant details: NIL



## **Welding Procedure Specification Sheet**

HMM Infra Limited, Village-Mandour, Ambala, Haryana Name and address of Fabricator:

Welding Procedure Specification Sheet No. : HMM/24/WPSS/BSG/72m/FCAW/037

Ref. Drg No. RDSO/B-10440/6 # ISMC 150 to Packing Plate

Weld joint description: 1.0 Fillet (6 mm)

2.0 Base Metal: ISMC 150 & 12 mm IS 2062-11: E350 B0, Fully Killed, Normalized/Control cooled

3.0 Welding Process:

4.0 Welding position: Horizontal, Vertical, Overhead

Welding consumables: 5.0 (as below)

Electrode/wire Class: Class-I as per IRS M46-2020 5.1

> 1.2 mm Drying method: NA

NA

Flux Class: 5.2

Type: NA Drying method: NA

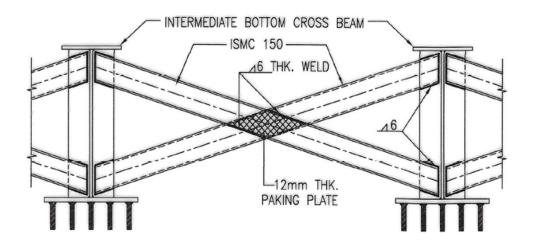
5.3.1 Shielding gas: CO2 gas

Fusion faces & adjacent surface are cleaned and made free from cracks, 6.0 Base Metal preparation:

notches, mill scales, paints, grease, rust etc. which may affect weld quality.

6.1 Joint design details:

(Give sketch showing arrangement of parts, welding groove details, weld passes & their sequence etc.)



6.2 Joint preparation: As per IS 10178-1995, Cl.9, IRS B1-2001, Cl.17.3 & WBC-2001

Welding current: 7.0 Type:

> Polarity: EP (Electrode Positive)

Welder qualification : 8.0 As per IS 7310(part-I)-2019



9.1 Welding Parameters:

Weld	Electrodes	Current	Arc	Wire	Travel	Electrical	Gas flow
Pass No.	/wire dia. (mm)	(amp)	Voltage (volt)	feed speed (m/min)	speed (m/min)	stick out (mm)	rate L.P.M
1	2	3	4	5	6	7	8
1-2 passes	1.2mm	150-300A	24-30V	5-8	0.15-0.30	10-15	15-25

## 9.2 Welding sequence and technique:

Any other relevant details:

(Give sketch showing sequence and direction of welding).

NA

10.0 Provision of run in and run-off tabs: NA 11.0 Cleaning of weld bead before laying next weld bead: Yes (In case of multilayer only) Root preparation before welding other side of groove weld: 12.0 NA 13.0 Preheating and inter pass temperature: 110°-150°C 14.0 NA Peening: 15.0 Post weld treatment: NA By grinding of defective weld & rectify the weld as per 16.0 Rectification of weld defects: clause 32.2 of IS 9595-1996 using FCAW Class-I wire as per IRS M46-2020 17.0 Inspection of weld: Visual Inspection, D.P. Test

NIL



18.0