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

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

INDEX

RDSO's Drg. No. : RDSO/B-10440 BOW STRING GIRDER 60M

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

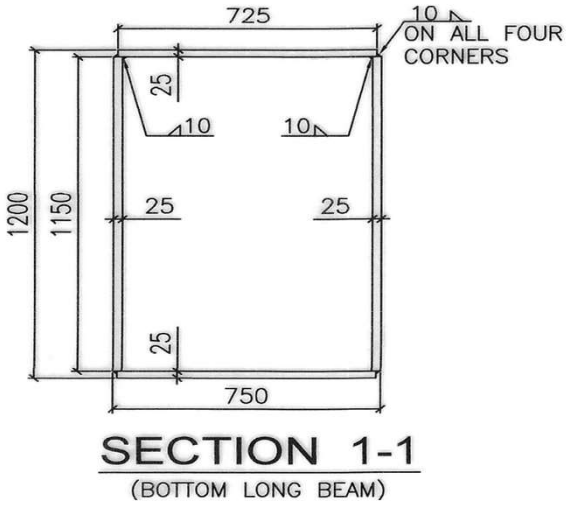
RDSO 72M BOW STRING GIRDER

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/001
Ref. Drg No.		RDSO/B-10440/1 # **Bottom Long Beam** Section 1-1, Web plate to Flange plate
1.0	Weld joint description :	Fillet (10mm)
2.0	Base Metal :	25mm & 25mm 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
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.)



SECTION 1-1
(BOTTOM LONG BEAM)

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
		Polarity :	EP (Electrode Positive)
8.0	Welder qualification :		As per IS 7310(part-I)-2019

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

9.0 Welding parameters and technique: (as below)

9.1 Welding Parameters :

Weld Pass No.	Electrodes /wire dia. (mm)	Current (amp)	Arc Voltage (volt)	Wire feed speed (m/min)	Travel speed (m/ min)	Electrical stick out (mm)	Gas flow rate 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: YES

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

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, D.P. Test & Macro Etching

18.0 Any other relevant details: NIL

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

RDSO 72M BOW STRING GIRDER

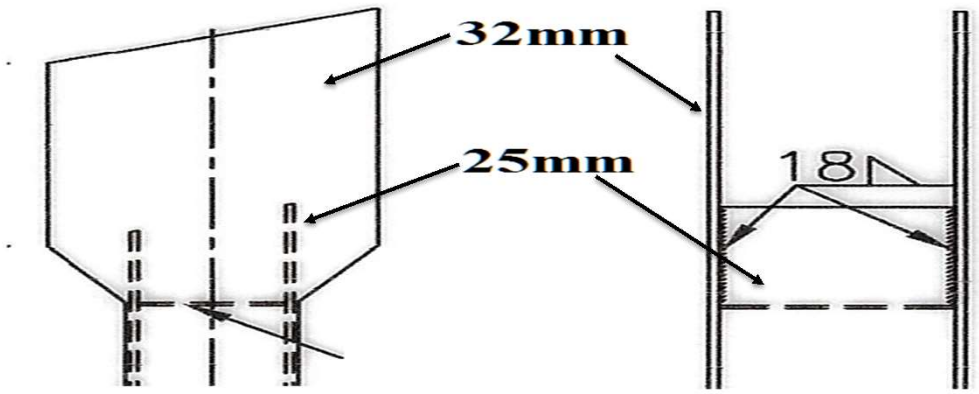
Welding Procedure Specification Sheet

Name and address of Fabricator:		HMM Infra Limited, Village-Mandour, Ambala, Haryana
Welding Procedure Specification Sheet No. :		HMM/24/WPSS/BSG/72M/SAW/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, 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
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 :

(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

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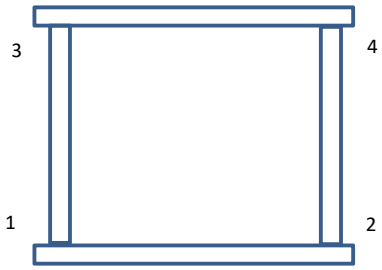
9.0 Welding parameters and technique: (as below)

9.1 Welding Parameters :

Weld Pass No.	Electrodes /wire dia. (mm)	Current (amp)	Arc Voltage (volt)	Wire feed speed (m/min)	Travel speed (m/min)	Electrical stick out (mm)	Gas flow 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: Yes

11.0 Cleaning of weld bead before laying next weld bead:

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

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, D.P. Test & Macro Etching

18.0 Any other relevant details: NIL

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

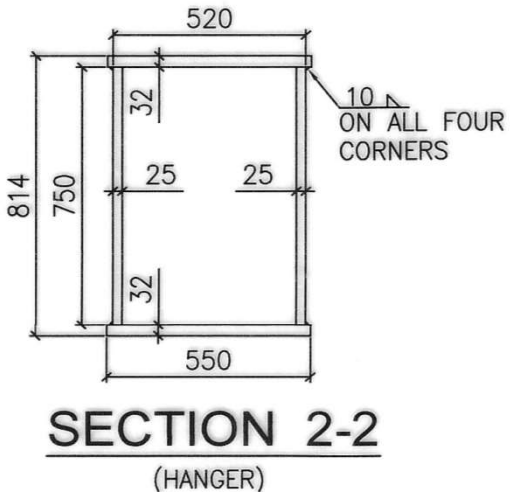
RDSO 72M BOW STRING GIRDER

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
Ref. Drg No.		RDSO/B-10440/1 # **Hanger** Section 2-2, 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 :	NA
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.)



Welding of flange to web plate of 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

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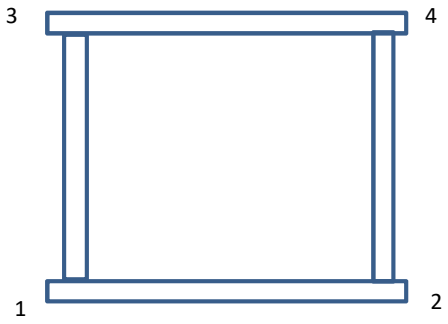
9.0 Welding parameters and technique: (as below)

9.1 Welding Parameters :

Weld Pass No.	Electrodes /wire dia. (mm)	Current (amp)	Arc Voltage (volt)	Wire feed speed (m/min)	Travel speed (m/ min)	Electrical stick out (mm)	Gas flow rate 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: Yes

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

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, D.P. Test & Macro Etching

18.0 Any other relevant details: NIL

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

RDSO 72M BOW STRING GIRDER

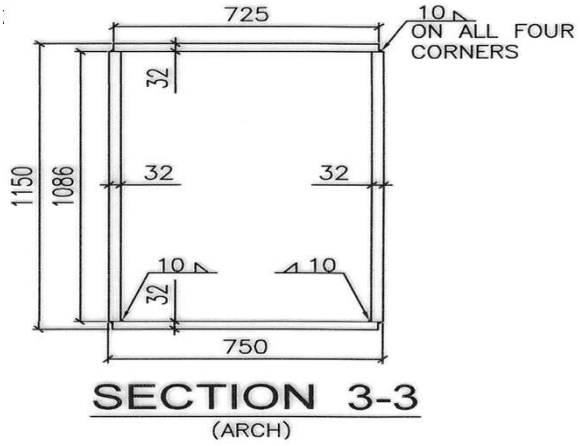
Welding Procedure Specification Sheet

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
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 :

(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

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

9.0 Welding parameters and technique: (as below)

9.1 Welding Parameters :

Weld Pass No.	Electrodes /wire dia. (mm)	Current (amp)	Arc Voltage (volt)	Wire feed speed (m/min)	Travel speed (m/ min)	Electrical stick out (mm)	Gas flow rate 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: Yes

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

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, D.P. Test & Macro Etching

18.0 Any other relevant details: NIL

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

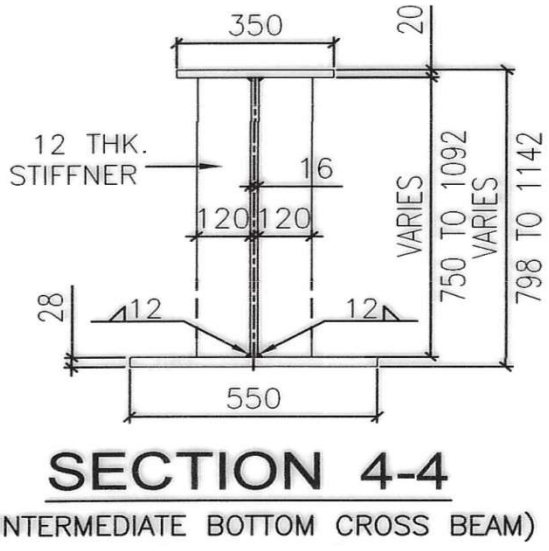
RDSO 72M BOW STRING GIRDER

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
Ref. Drg No.		RDSO/B-10440/1 # Int. Bottom Cross Beam Section 4-4, Web plate to Top & Bottom Flange plate
1.0	Weld joint description :	Fillet (12mm)
2.0	Base Metal :	16mm & 20/28mm 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
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.)



Welding of flange to web plate of Int. 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

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

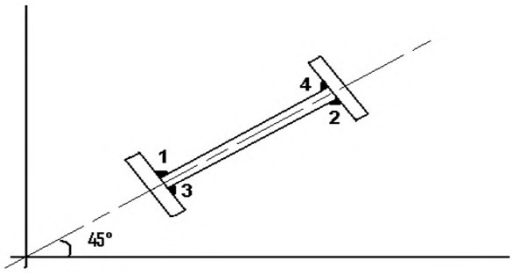
9.0 Welding parameters and technique: (as below)

9.1 Welding Parameters :

Weld Pass No.	Electrodes /wire dia. (mm)	Current (amp)	Arc Voltage (volt)	Wire feed speed (m/min)	Travel speed (m/ min)	Electrical stick out (mm)	Gas flow rate 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: Yes

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

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, D.P. Test & Macro Etching

18.0 Any other relevant details: NIL

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

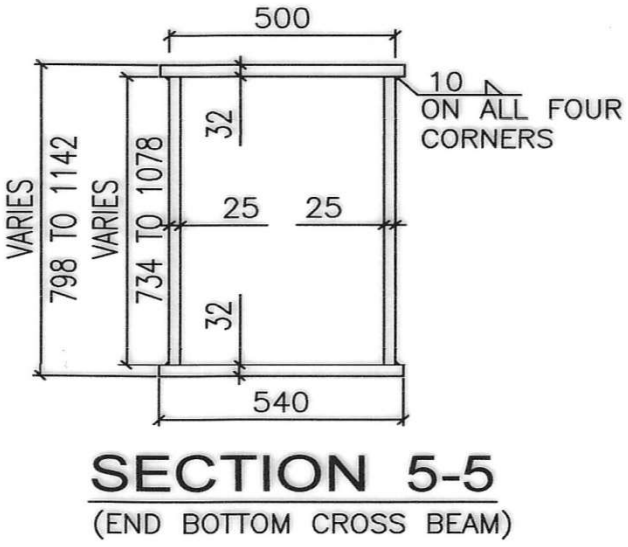
RDSO 72M BOW STRING GIRDER

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 :	NA
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.)



Welding of flange to web plate of 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

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

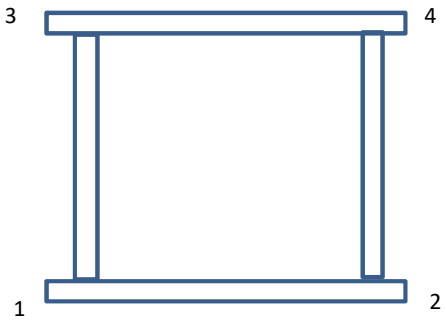
9.0 Welding parameters and technique: (as below)

9.1 Welding Parameters :

Weld Pass No.	Electrodes /wire dia. (mm)	Current (amp)	Arc Voltage (volt)	Wire feed speed (m/min)	Travel speed (m/ min)	Electrical stick out (mm)	Gas flow rate 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

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: Yes

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

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, D.P. Test & Macro Etching

18.0 Any other relevant details: NIL

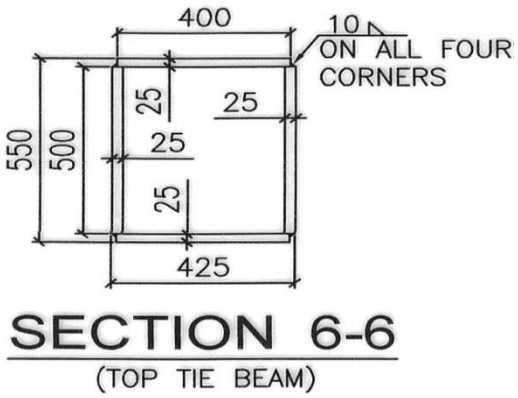
FABRICATOR CONTRACTOR NHAI S.E.C. RLY. RDSO

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
Ref. Drg No.		RDSO/B-10440/1 # Top Tie Beam Section 6-6, Web plate to Flange plate
1.0	Weld joint description :	Fillet (10mm)
2.0	Base Metal :	25mm & 25mm 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
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.)



Welding of Flange to web plate of Top 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

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

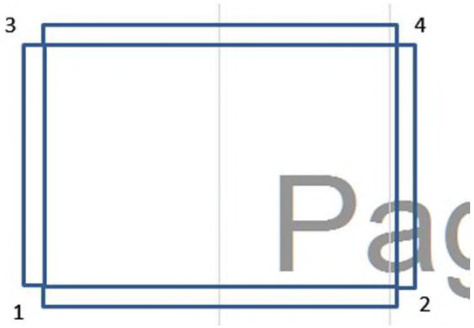
9.0 Welding parameters and technique: (as below)

9.1 Welding Parameters :

Weld Pass No.	Electrodes /wire dia. (mm)	Current (amp)	Arc Voltage (volt)	Wire feed speed (m/min)	Travel speed (m/ min)	Electrical stick out (mm)	Gas flow rate 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: Yes

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

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, D.P. Test & Macro Etching

18.0 Any other relevant details: NIL

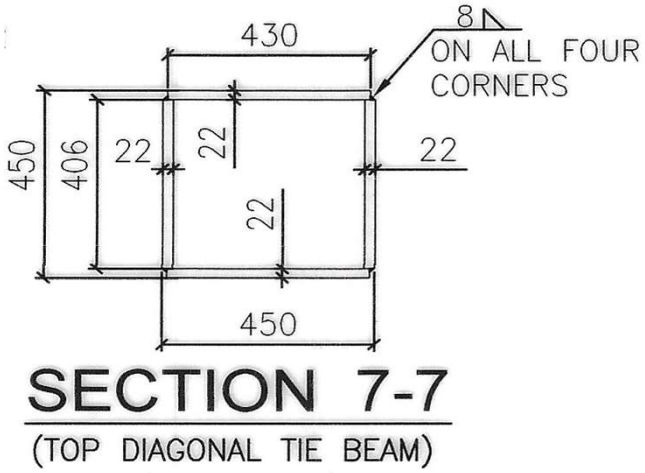
FABRICATOR CONTRACTOR NHAI S.E.C. RLY. RDSO

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
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.)



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

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

9.0 Welding parameters and technique: (as below)

9.1 Welding Parameters :

Weld Pass No.	Electrodes /wire dia. (mm)	Current (amp)	Arc Voltage (volt)	Wire feed speed (m/min)	Travel speed (m/ min)	Electrical stick out (mm)	Gas flow rate 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: Yes

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

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, D.P. Test & Macro Etching

18.0 Any other relevant details: NIL

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

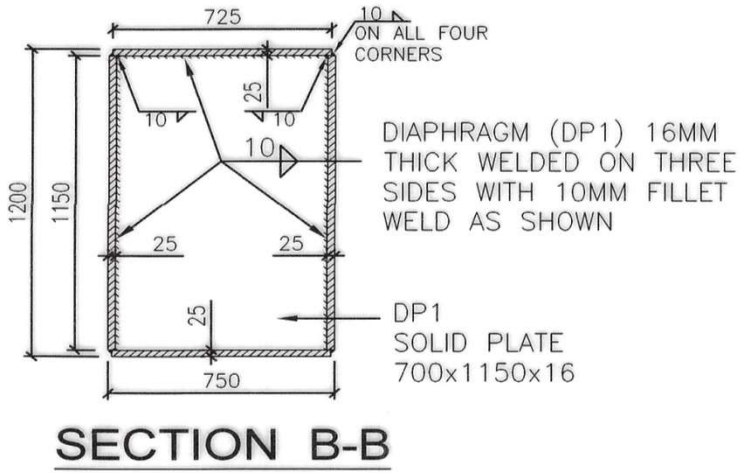
RDSO 72M BOW STRING GIRDER

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/001
Ref. Drg No.		RDSO/B-10440/5 # **Bottom Long Beam Diaphragm DP1** Section B-B, Diaphragm plate DP1 with Web plate & Top Flange Fillet (10mm)
1.0	Weld joint description :	16mm & 25mm IS 2062:2011 E350 B0, Fully Killed, Normalized/Control Colled
2.0	Base Metal :	FCAW
3.0	Welding Process :	2F (Horizontal)
4.0	Welding position :	(as below)
5.0	Welding consumables :	Class-I as per IRS M46-2020
5.1	Electrode/wire Class :	1.2 mm
	Dia :	NA
	Drying method :	NA
5.2	Flux Class :	NA
	Type :	NA
	Drying method :	CO2 gas
5.3.1	Shielding gas :	Fusion faces & adjacent surface are cleaned and made free from cracks, notches, mill scales, paints, grease, rust etc. which may affect weld quality.
6.0	Base Metal preparation :	

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

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 S.E.C. RLY. RDSO

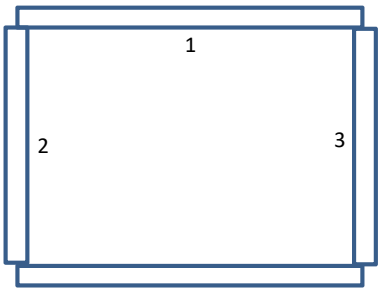
9.0 Welding parameters and technique: (as below)

9.1 Welding Parameters :

Weld Pass No.	Electrodes /wire dia. (mm)	Current (amp)	Arc Voltage (volt)	Wire feed speed (m/min)	Travel speed (m/min)	Electrical stick out (mm)	Gas flow 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 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, D.P. Test

18.0 Any other relevant details: NIL

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

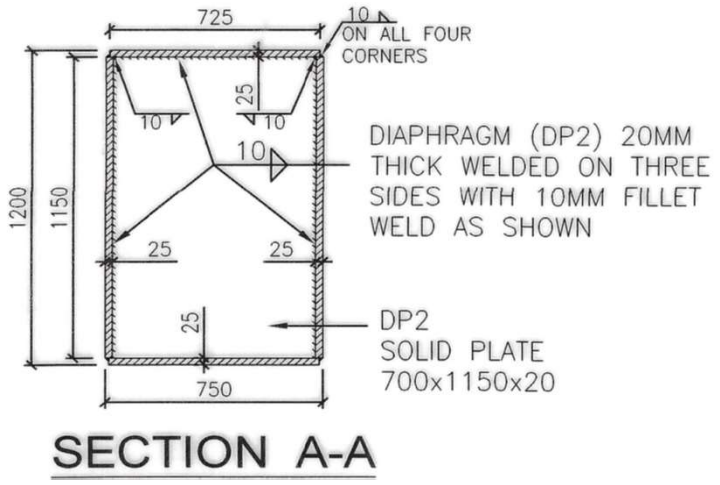
RDSO 72M BOW STRING GIRDER

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/001A
Ref. Drg No.		RDSO/B-10440/5 # **Bottom Long Beam Diaphragm DP2**
1.0	Weld joint description :	Section A-A, Diaphragm plate DP2 with Web plate & Top Flange 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
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.)



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

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

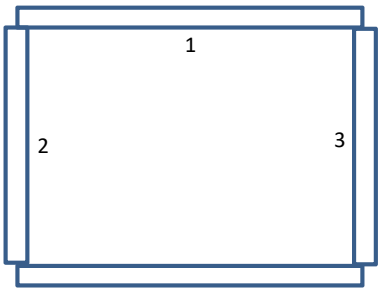
9.0 Welding parameters and technique: (as below)

9.1 Welding Parameters :

Weld Pass No.	Electrodes /wire dia. (mm)	Current (amp)	Arc Voltage (volt)	Wire feed speed (m/min)	Travel speed (m/min)	Electrical stick out (mm)	Gas flow 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 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, D.P. Test

18.0 Any other relevant details: NIL

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

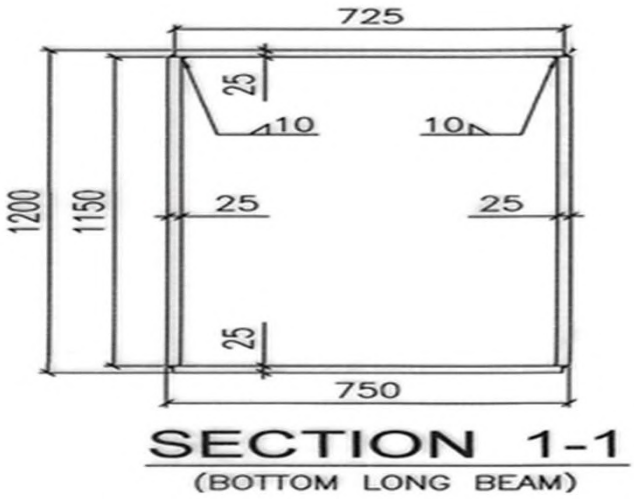
RDSO 72M BOW STRING GIRDER

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/002
Ref. Drg No.		RDSO/B-10440/1 # **Bottom Long Beam Inner Top Side** Section 1-1, Web plate to Top Flange plate Inner Side
1.0	Weld joint description :	Fillet (10mm)
2.0	Base Metal :	25mm & 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
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.)



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 :	Type :	DC
		Polarity :	EP (Electrode Positive)
8.0	Welder qualification :		As per IS 7310(part-I)-2019

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

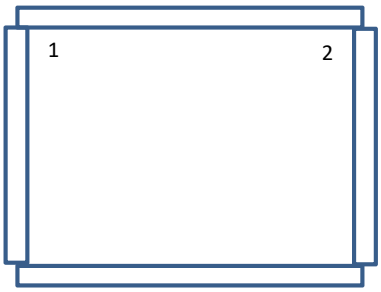
9.0 Welding parameters and technique: (as below)

9.1 Welding Parameters :

Weld Pass No.	Electrodes /wire dia. (mm)	Current (amp)	Arc Voltage (volt)	Wire feed speed (m/min)	Travel speed (m/min)	Electrical stick out (mm)	Gas flow 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 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, D.P. Test

18.0 Any other relevant details: NIL

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

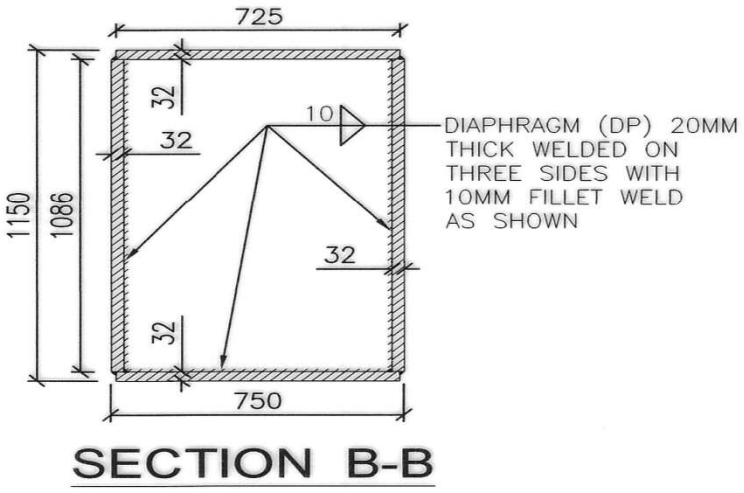
RDSO 72M BOW STRING GIRDER

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/003
Ref. Drg No.		RDSO/B-10440/2 # **Arch Diaphragm DP**
1.0	Weld joint description :	Section B-B, Diaphragm plate DP2 with Web plate & Bottom Flange 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
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.)



Welding of Arch Diaphragm plate DP

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 S.E.C. RLY. RDSO

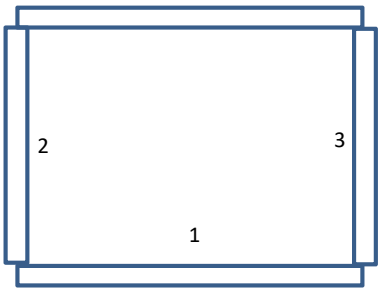
9.0 Welding parameters and technique: (as below)

9.1 Welding Parameters :

Weld Pass No.	Electrodes /wire dia. (mm)	Current (amp)	Arc Voltage (volt)	Wire feed speed (m/min)	Travel speed (m/min)	Electrical stick out (mm)	Gas flow 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 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, D.P. Test

18.0 Any other relevant details: NIL

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

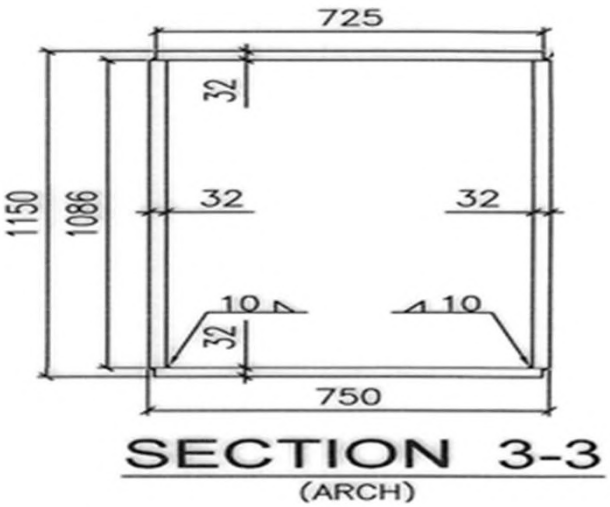
RDSO 72M BOW STRING GIRDER

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/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
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.)



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

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

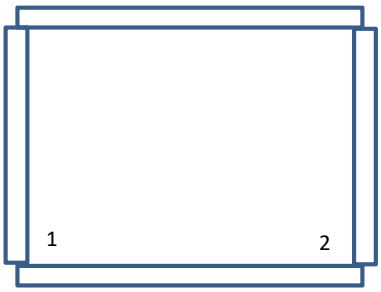
9.0 Welding parameters and technique: (as below)

9.1 Welding Parameters :

Weld Pass No.	Electrodes /wire dia. (mm)	Current (amp)	Arc Voltage (volt)	Wire feed speed (m/min)	Travel speed (m/min)	Electrical stick out (mm)	Gas flow 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 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, D.P. Test

18.0 Any other relevant details: NIL

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

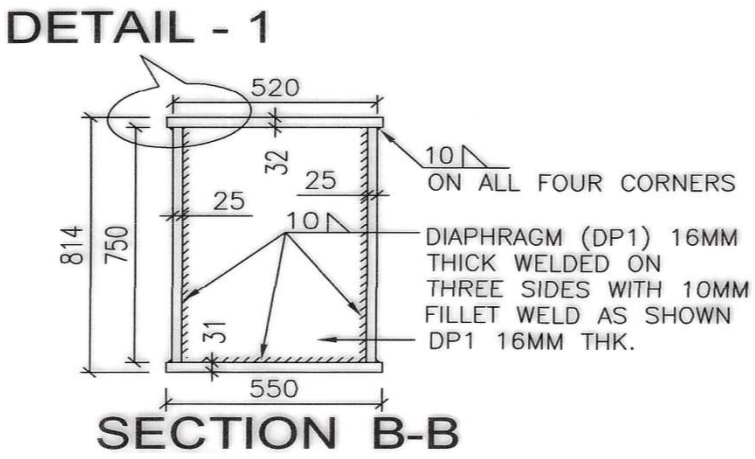
RDSO 72M BOW STRING GIRDER

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/005
Ref. Drg No.		RDSO/B-10440/9 # **Hanger Diaphragm DP1** 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
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.)



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

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

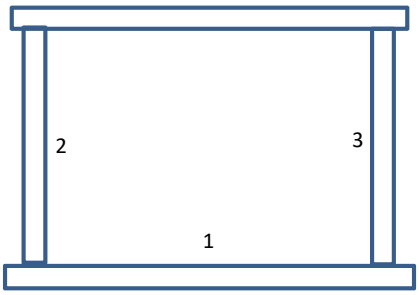
9.0 Welding parameters and technique: (as below)

9.1 Welding Parameters :

Weld Pass No.	Electrodes /wire dia. (mm)	Current (amp)	Arc Voltage (volt)	Wire feed speed (m/min)	Travel speed (m/min)	Electrical stick out (mm)	Gas flow 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 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, D.P. Test

18.0 Any other relevant details: NIL

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

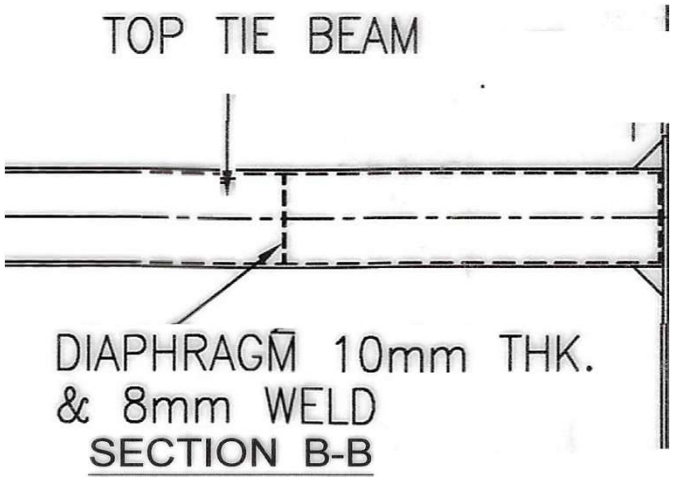
RDSO 72M BOW STRING GIRDER

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/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
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.)



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

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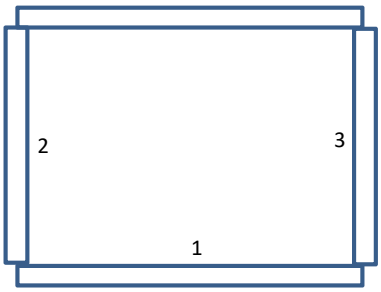
9.0 Welding parameters and technique: (as below)

9.1 Welding Parameters :

Weld Pass No.	Electrodes /wire dia. (mm)	Current (amp)	Arc Voltage (volt)	Wire feed speed (m/min)	Travel speed (m/min)	Electrical stick out (mm)	Gas flow 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 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, D.P. Test

18.0 Any other relevant details: NIL

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

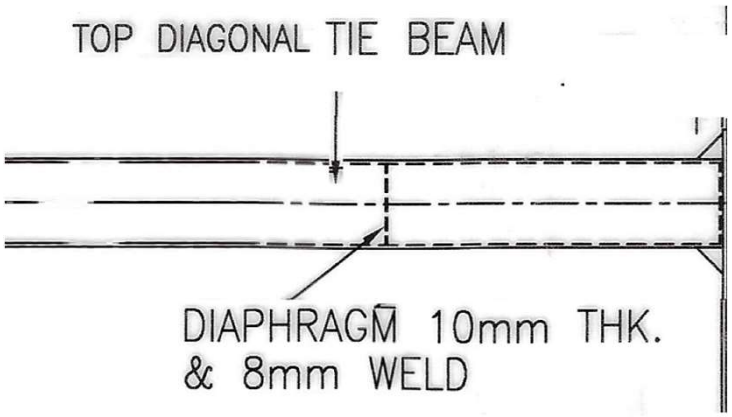
RDSO 72M BOW STRING GIRDER

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/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
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.)



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

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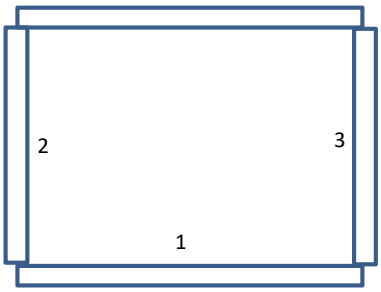
9.0 Welding parameters and technique: (as below)

9.1 Welding Parameters :

Weld Pass No.	Electrodes /wire dia. (mm)	Current (amp)	Arc Voltage (volt)	Wire feed speed (m/min)	Travel speed (m/min)	Electrical stick out (mm)	Gas flow 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 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, D.P. Test

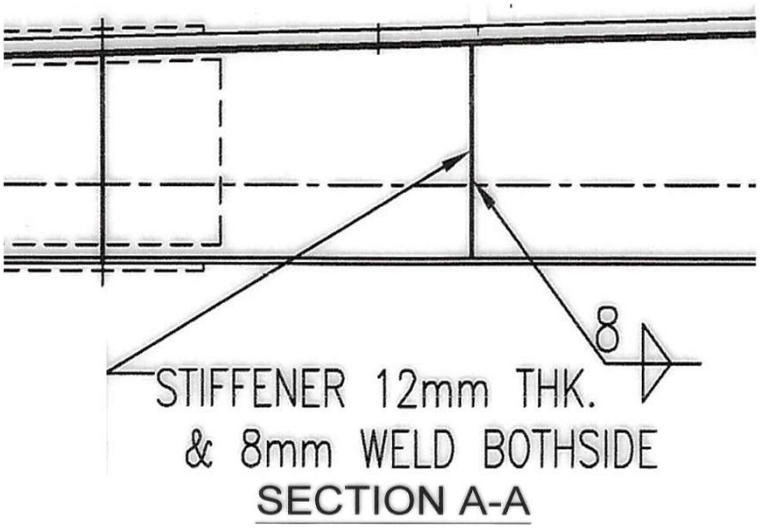
18.0 Any other relevant details: NIL

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

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
Ref. Drg No.		RDSO/B-10440/7 # **Int. Bottom Cross Beam Stiffener Section A-A,** Stiffener with Web Plate
1.0	Weld joint description :	Fillet (08mm)
2.0	Base Metal :	12mm & 16mm 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
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.)



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
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 Pass No.	Electrodes /wire dia. (mm)	Current (amp)	Arc Voltage (volt)	Wire feed speed (m/min)	Travel speed (m/min)	Electrical stick out (mm)	Gas flow 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
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:	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, D.P. Test
18.0	Any other relevant details:	NIL

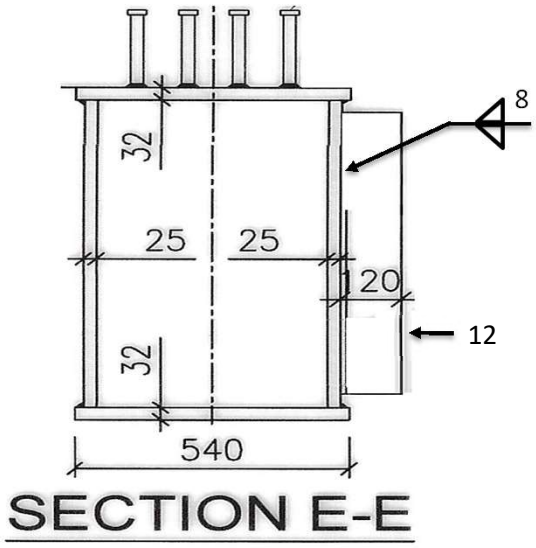
FABRICATOR CONTRACTOR NHAI S.E.C. RLY. RDSO

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/008A
Ref. Drg No.		RDSO/B-10440/6 # **End Bottom Cross Beam Stiffener Section E-E,** Stiffener with Web Plate
1.0	Weld joint description :	Fillet (08mm)
2.0	Base Metal :	12mm & 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
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.)



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
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 Pass No.	Electrodes /wire dia. (mm)	Current (amp)	Arc Voltage (volt)	Wire feed speed (m/min)	Travel speed (m/min)	Electrical stick out (mm)	Gas flow 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
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:	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, D.P. Test
18.0	Any other relevant details:	NIL

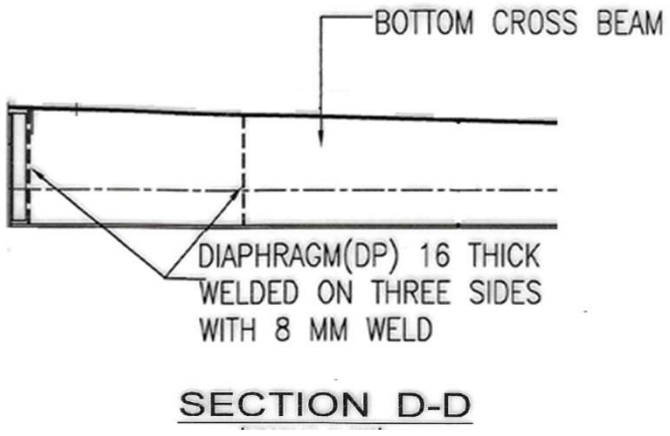
FABRICATOR CONTRACTOR NHAI S.E.C. RLY. RDSO

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 Fillet (08mm)
1.0	Weld joint description :	
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
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.)



Welding of Diaphragm 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
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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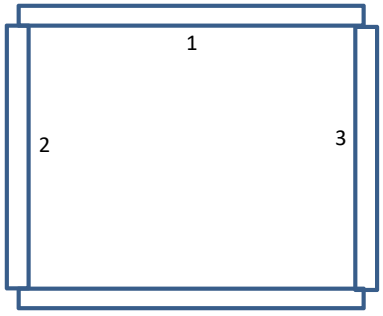
9.0 Welding parameters and technique: (as below)

9.1 Welding Parameters :

Weld Pass No.	Electrodes /wire dia. (mm)	Current (amp)	Arc Voltage (volt)	Wire feed speed (m/min)	Travel speed (m/min)	Electrical stick out (mm)	Gas flow 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 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, D.P. Test

18.0 Any other relevant details: NIL

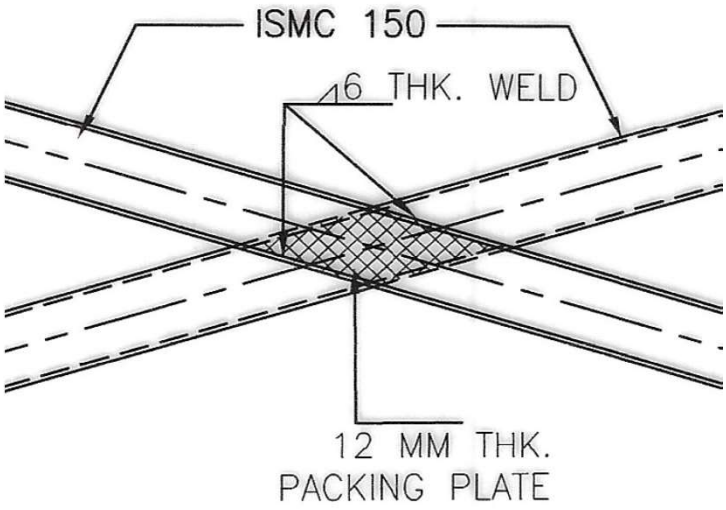
FABRICATOR CONTRACTOR NHAI S.E.C. RLY. RDSO

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
Ref. Drg No.		RDSO/B-10440/1 # **ISMC 150** 12mm Plate to ISMC 150
1.0	Weld joint description :	Fillet (06mm)
2.0	Base Metal :	12mm & ISMC 150 IS 2062:2011 E350 B0, Fully Killed,
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
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.)



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)
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 Pass No.	Electrodes /wire dia. (mm)	Current (amp)	Arc Voltage (volt)	Wire feed speed (m/min)	Travel speed (m/min)	Electrical stick out (mm)	Gas flow 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
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:	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, D.P. Test
18.0	Any other relevant details:	NIL

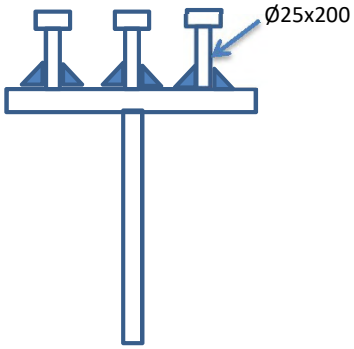
FABRICATOR CONTRACTOR NHAI S.E.C. RLY. RDSO

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 Welding
2.0	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
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.)



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

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9.1 Welding Parameters :

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

Current & Voltage as per recommendations of machine manufacturer.

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

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

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

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

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

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

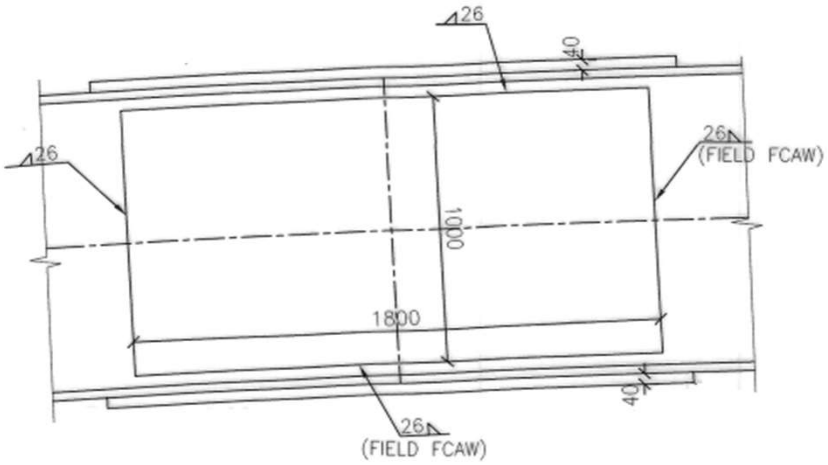
RDSO 72m BOW STRING GIRDER

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/011
Ref. Drg No.		RDSO/B-10440/2 # **Arch to Splice Plates**
1.0	Weld joint description :	Fillet (26 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
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

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

9.0 Welding parameters and technique: (as below)

9.1 Welding Parameters :

Weld Pass No.	Electrodes /wire dia. (mm)	Current (amp)	Arc Voltage (volt)	Wire feed speed (m/min)	Travel speed (m/min)	Electrical stick out (mm)	Gas flow 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
14.0	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, D.P. Test
18.0	Any other relevant details:	NIL

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

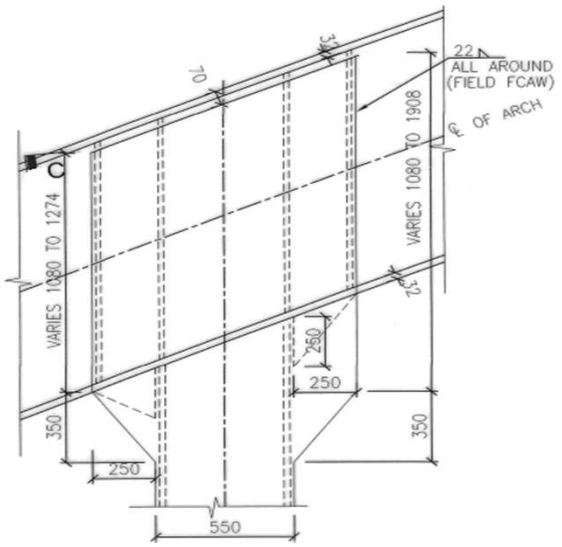
RDSO 72m BOW STRING GIRDER

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/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
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

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

9.0 Welding parameters and technique: (as below)

9.1 Welding Parameters :

Weld Pass No.	Electrodes /wire dia. (mm)	Current (amp)	Arc Voltage (volt)	Wire feed speed (m/min)	Travel speed (m/min)	Electrical stick out (mm)	Gas flow 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:	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, D.P. Test
18.0	Any other relevant details:	NIL

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

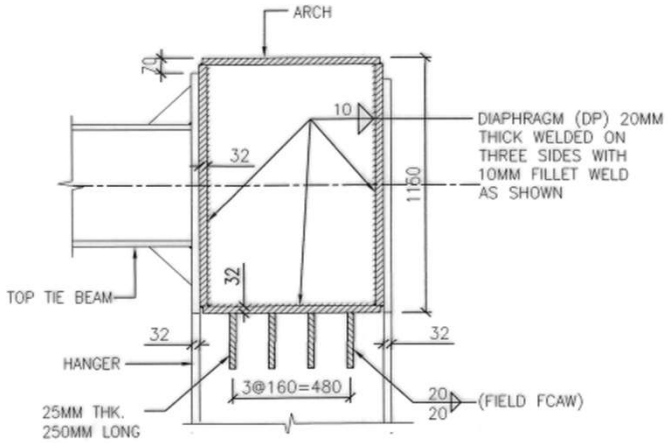
RDSO 72m BOW STRING GIRDER

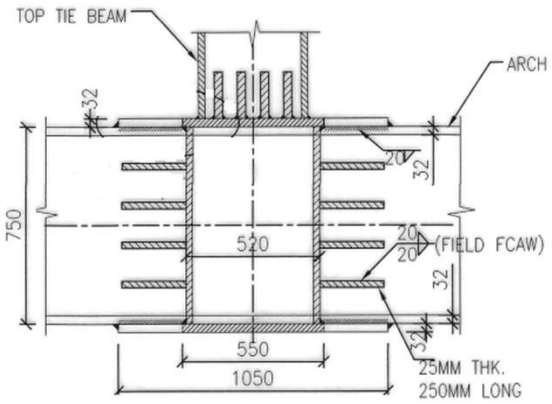
Welding Procedure Specification Sheet

Name and address of Fabricator:		HMM Infra Limited, Village-Mandour, Ambala, Haryana
Welding Procedure Specification Sheet No. :		HMM/24/WPSS/BSG/72m/FCAW/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
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

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

9.0 Welding parameters and technique: (as below)

9.1 Welding Parameters :

Weld Pass No.	Electrodes /wire dia. (mm)	Current (amp)	Arc Voltage (volt)	Wire feed speed (m/min)	Travel speed (m/min)	Electrical stick out (mm)	Gas flow 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:	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, D.P. Test
18.0	Any other relevant details:	NIL

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

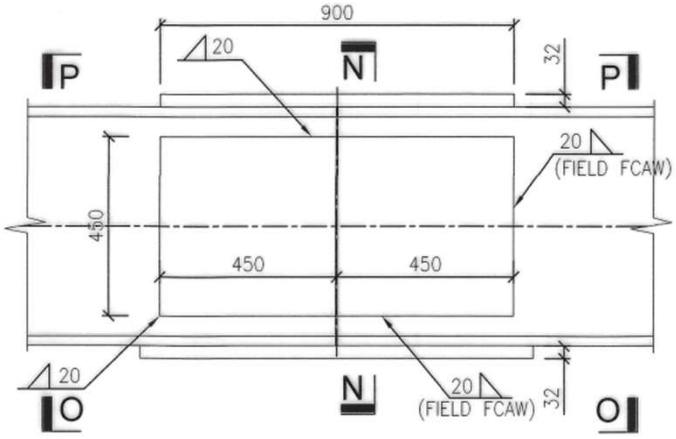
RDSO 72m BOW STRING GIRDER

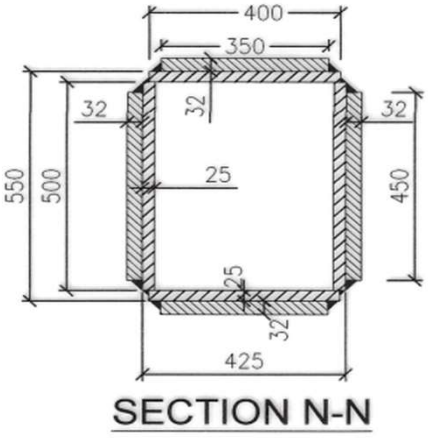
Welding Procedure Specification Sheet

Name and address of Fabricator:		HMM Infra Limited, Village-Mandour, Ambala, Haryana
Welding Procedure Specification Sheet No. :		HMM/24/WPSS/BSG/72m/FCAW/014
Ref. Drg No.		RDSO/B-10440/3 # **Top Tie Beam to Splice Plates**
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
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

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

9.0 Welding parameters and technique: (as below)

9.1 Welding Parameters :

Weld Pass No.	Electrodes /wire dia. (mm)	Current (amp)	Arc Voltage (volt)	Wire feed speed (m/min)	Travel speed (m/min)	Electrical stick out (mm)	Gas flow 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:	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, D.P. Test
18.0	Any other relevant details:	NIL

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

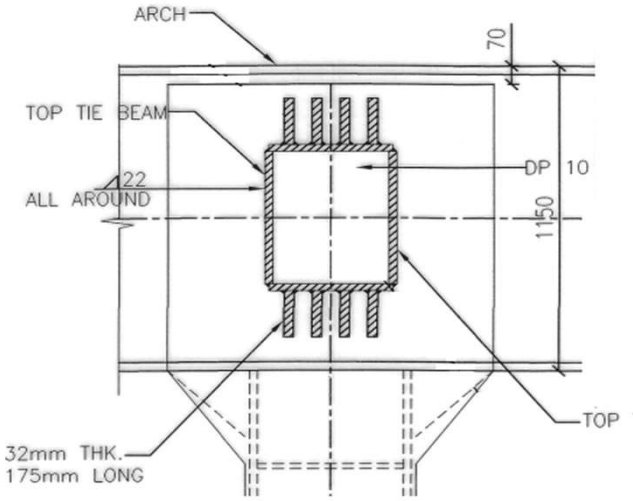
RDSO 72m BOW STRING GIRDER

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/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
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

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

9.0 Welding parameters and technique: (as below)

9.1 Welding Parameters :

Weld Pass No.	Electrodes /wire dia. (mm)	Current (amp)	Arc Voltage (volt)	Wire feed speed (m/min)	Travel speed (m/min)	Electrical stick out (mm)	Gas flow 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
14.0	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, D.P. Test
18.0	Any other relevant details:	NIL

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

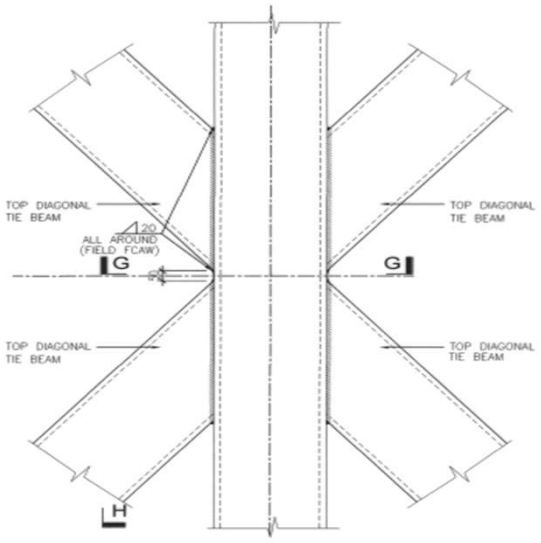
RDSO 72m BOW STRING GIRDER

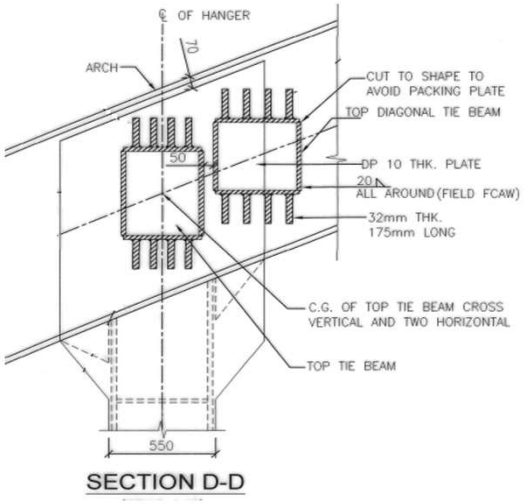
Welding Procedure Specification Sheet

Name and address of Fabricator:		HMM Infra Limited, Village-Mandour, Ambala, Haryana
Welding Procedure Specification Sheet No. :		HMM/24/WPSS/BSG/72m/FCAW/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
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

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

9.0 Welding parameters and technique: (as below)

9.1 Welding Parameters :

Weld Pass No.	Electrodes /wire dia. (mm)	Current (amp)	Arc Voltage (volt)	Wire feed speed (m/min)	Travel speed (m/min)	Electrical stick out (mm)	Gas flow 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
14.0	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, D.P. Test
18.0	Any other relevant details:	NIL

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

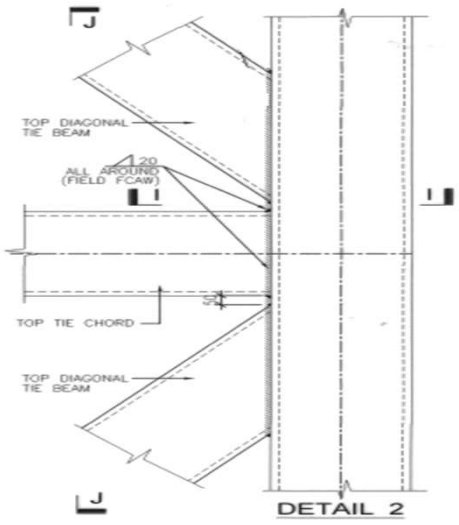
RDSO 72m BOW STRING GIRDER

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/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
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

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

9.0 Welding parameters and technique: (as below)

9.1 Welding Parameters :

Weld Pass No.	Electrodes /wire dia. (mm)	Current (amp)	Arc Voltage (volt)	Wire feed speed (m/min)	Travel speed (m/min)	Electrical stick out (mm)	Gas flow 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
14.0	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, D.P. Test
18.0	Any other relevant details:	NIL

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

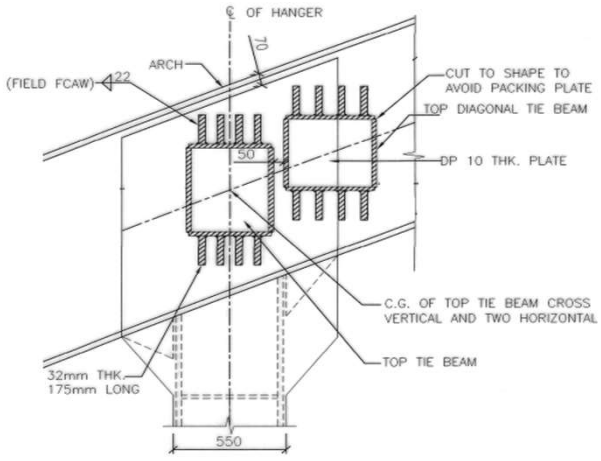
RDSO 72m BOW STRING GIRDER

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/018
Ref. Drg No.		RDSO/B-10440/3 # **TopTie Beam /Hanger to Stiffeners**
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
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.)



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 NHAI S.E.C. RLY. RDSO

9.0 Welding parameters and technique: (as below)

9.1 Welding Parameters :

Weld Pass No.	Electrodes /wire dia. (mm)	Current (amp)	Arc Voltage (volt)	Wire feed speed (m/min)	Travel speed (m/min)	Electrical stick out (mm)	Gas flow 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
14.0	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, D.P. Test
18.0	Any other relevant details:	NIL

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

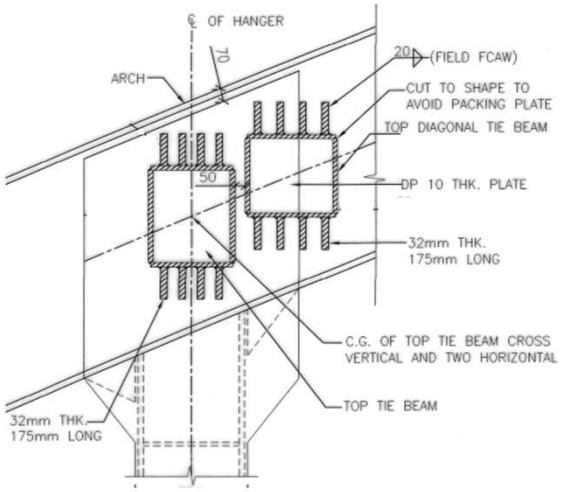
RDSO 72m BOW STRING GIRDER

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/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
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

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

9.0 Welding parameters and technique: (as below)

9.1 Welding Parameters :

Weld Pass No.	Electrodes /wire dia. (mm)	Current (amp)	Arc Voltage (volt)	Wire feed speed (m/min)	Travel speed (m/min)	Electrical stick out (mm)	Gas flow 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
14.0	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, D.P. Test
18.0	Any other relevant details:	NIL

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

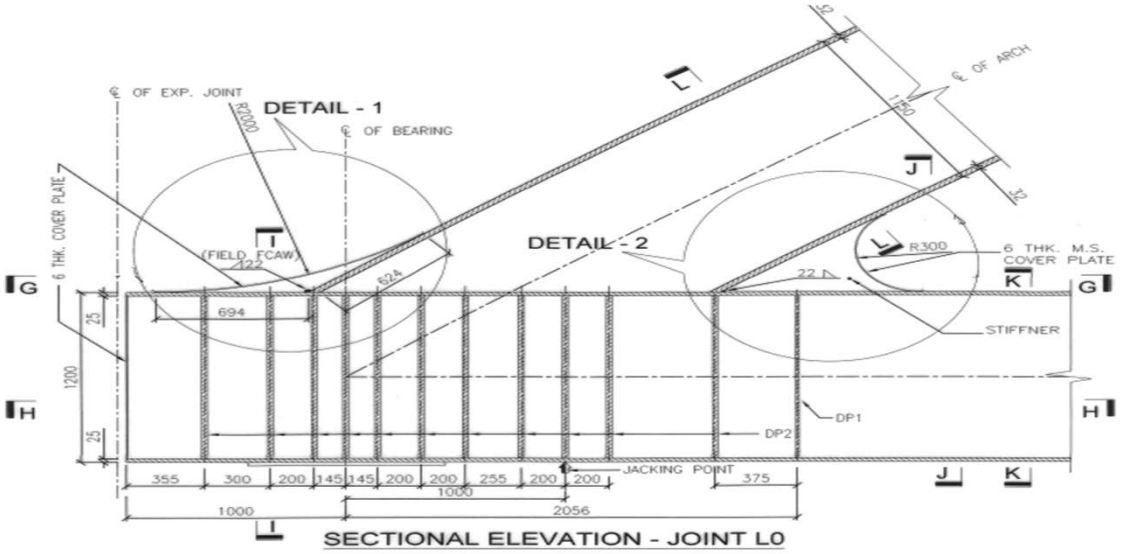
RDSO 72m BOW STRING GIRDER

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/020
Ref. Drg No.		RDSO/B-10440/4 # **Arch to Bottom Long Beam at LO Location**
1.0	Weld joint description :	Fillet (22 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
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

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

9.0 Welding parameters and technique: (as below)

9.1 Welding Parameters :

Weld Pass No.	Electrodes /wire dia. (mm)	Current (amp)	Arc Voltage (volt)	Wire feed speed (m/min)	Travel speed (m/min)	Electrical stick out (mm)	Gas flow 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:	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, D.P. Test
18.0	Any other relevant details:	NIL

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

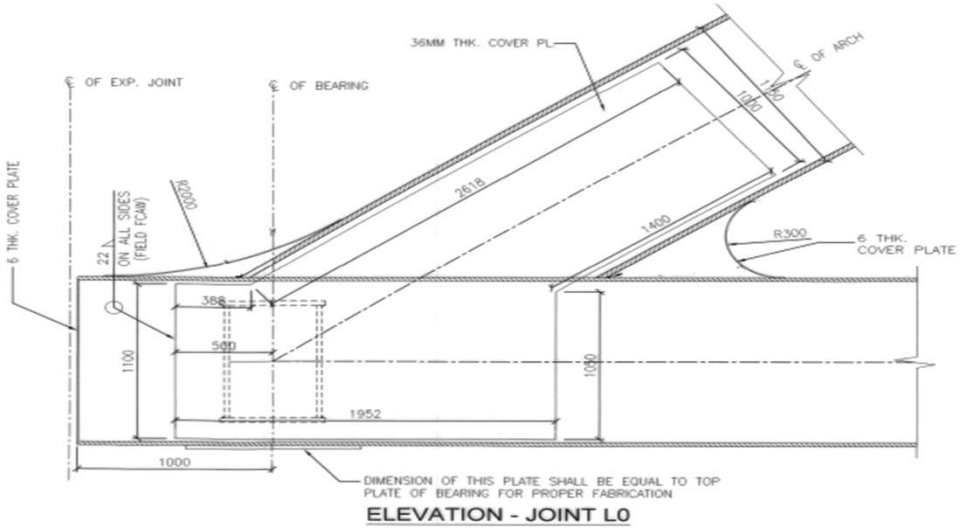
RDSO 72m BOW STRING GIRDER

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/021
Ref. Drg No.		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
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.)



ELEVATION - JOINT L0

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 S.E.C. RLY. RDSO

9.0 Welding parameters and technique: (as below)

9.1 Welding Parameters :

Weld Pass No.	Electrodes /wire dia. (mm)	Current (amp)	Arc Voltage (volt)	Wire feed speed (m/min)	Travel speed (m/min)	Electrical stick out (mm)	Gas flow 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
14.0	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, D.P. Test
18.0	Any other relevant details:	NIL

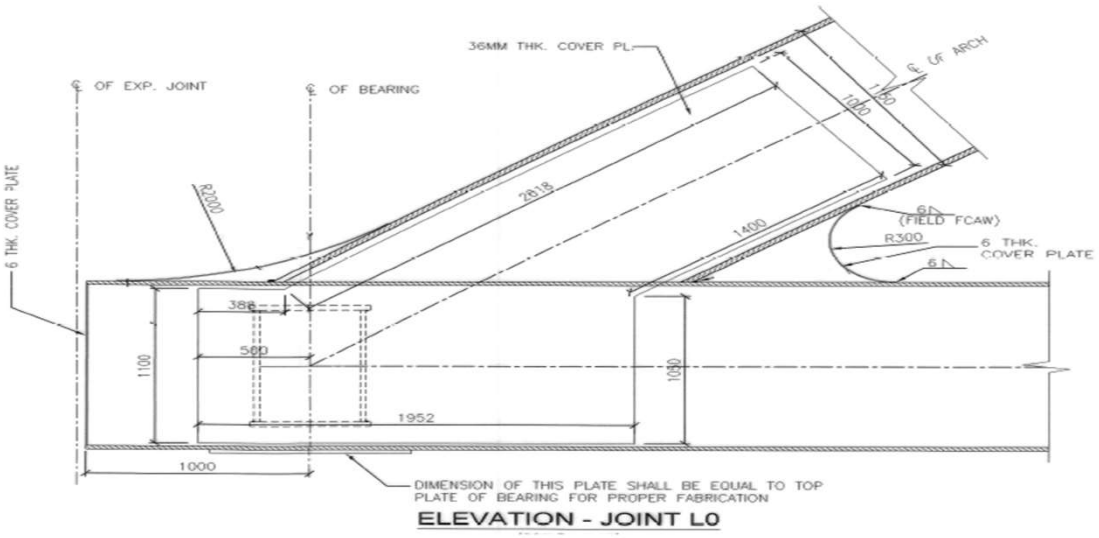
FABRICATOR CONTRACTOR NHAI S.E.C. RLY. RDSO

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/022
Ref. Drg No.		RDSO/B-10440/4 # **6 mm Cover Plate to Bottom Long Beam/Arch at L0 Location**
1.0	Weld joint description :	Fillet (6 mm)
2.0	Base Metal :	6 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
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.)



ELEVATION - JOINT L0

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

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9.0 Welding parameters and technique: (as below)

9.1 Welding Parameters :

Weld Pass No.	Electrodes /wire dia. (mm)	Current (amp)	Arc Voltage (volt)	Wire feed speed (m/min)	Travel speed (m/min)	Electrical stick out (mm)	Gas flow 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)
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:	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, D.P. Test
18.0	Any other relevant details:	NIL

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

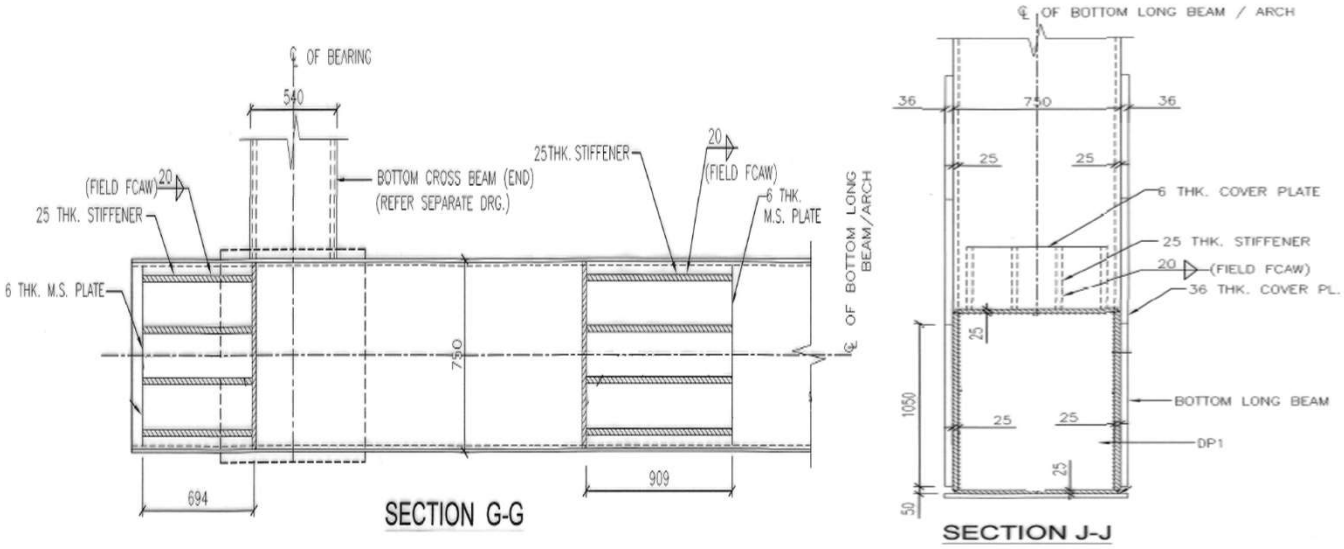
RDSO 72m BOW STRING GIRDER

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/023
Ref. Drg No.		RDSO/B-10440/4 # **Stiffeners to Bottom Long Beam/Arch at LO Location**
1.0	Weld joint description :	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
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

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

9.0 Welding parameters and technique: (as below)

9.1 Welding Parameters :

Weld Pass No.	Electrodes /wire dia. (mm)	Current (amp)	Arc Voltage (volt)	Wire feed speed (m/min)	Travel speed (m/min)	Electrical stick out (mm)	Gas flow 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:	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, D.P. Test
18.0	Any other relevant details:	NIL

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

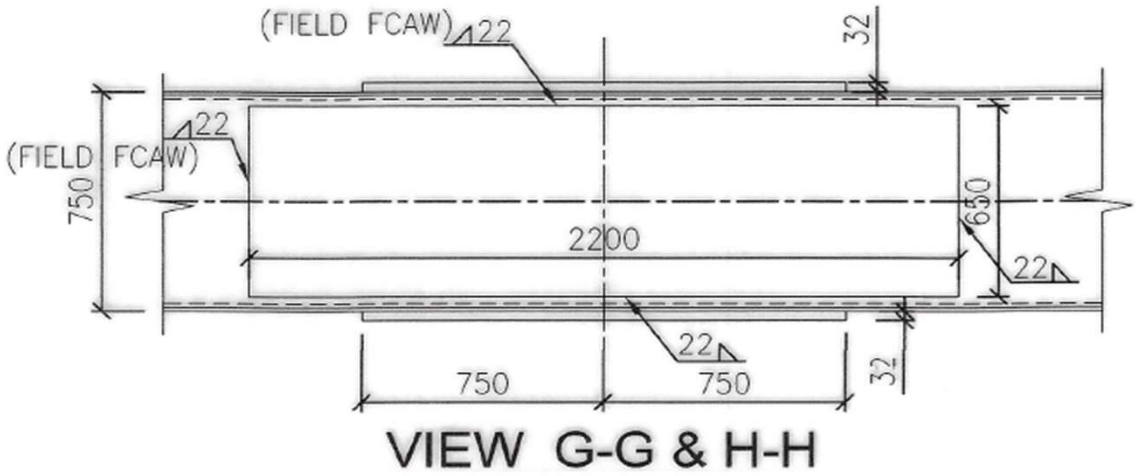
RDSO 72m BOW STRING GIRDER

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/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
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.)



VIEW G-G & H-H

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 S.E.C. RLY. RDSO

9.0 Welding parameters and technique: (as below)

9.1 Welding Parameters :

Weld Pass No.	Electrodes /wire dia. (mm)	Current (amp)	Arc Voltage (volt)	Wire feed speed (m/min)	Travel speed (m/min)	Electrical stick out (mm)	Gas flow 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
14.0	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, D.P. Test
18.0	Any other relevant details:	NIL

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

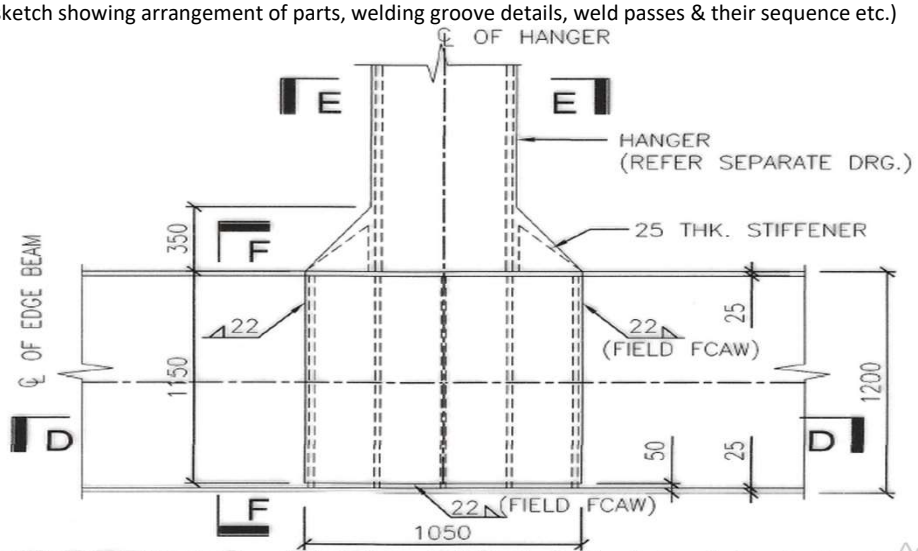
RDSO 72m BOW STRING GIRDER

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/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
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.)



JOINT DETAILS - ELEVATION (L1, L2, L3, L4 , L5 & L6)

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 S.E.C. RLY. RDSO

9.0 Welding parameters and technique: (as below)

9.1 Welding Parameters :

Weld Pass No.	Electrodes /wire dia. (mm)	Current (amp)	Arc Voltage (volt)	Wire feed speed (m/min)	Travel speed (m/min)	Electrical stick out (mm)	Gas flow 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:	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, D.P. Test
18.0	Any other relevant details:	NIL

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

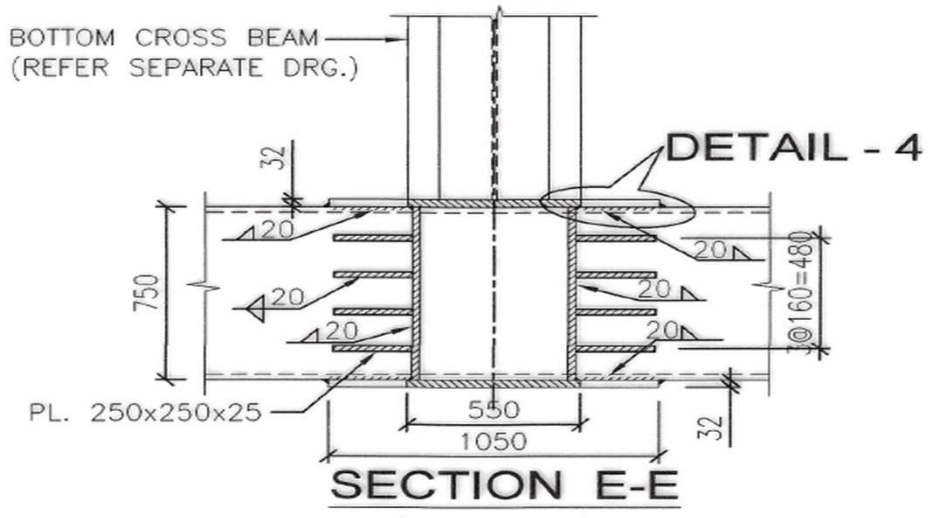
RDSO 72m BOW STRING GIRDER

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/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
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

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9.0 Welding parameters and technique: (as below)

9.1 Welding Parameters :

Weld Pass No.	Electrodes /wire dia. (mm)	Current (amp)	Arc Voltage (volt)	Wire feed speed (m/min)	Travel speed (m/min)	Electrical stick out (mm)	Gas flow 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:	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, D.P. Test
18.0	Any other relevant details:	NIL

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

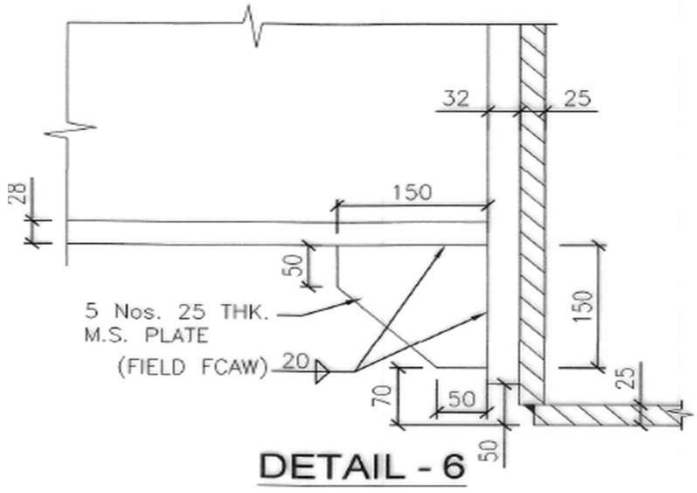
RDSO 72m BOW STRING GIRDER

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/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
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

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9.0 Welding parameters and technique: (as below)

9.1 Welding Parameters :

Weld Pass No.	Electrodes /wire dia. (mm)	Current (amp)	Arc Voltage (volt)	Wire feed speed (m/min)	Travel speed (m/min)	Electrical stick out (mm)	Gas flow 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:	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, D.P. Test
18.0	Any other relevant details:	NIL

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

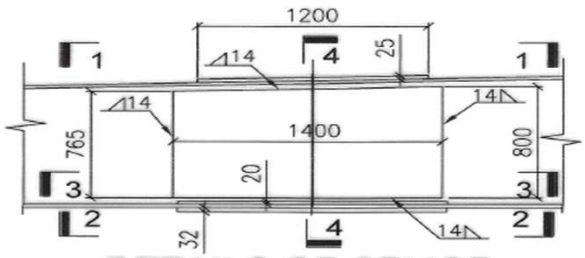
RDSO 72m BOW STRING GIRDER

Welding Procedure Specification Sheet

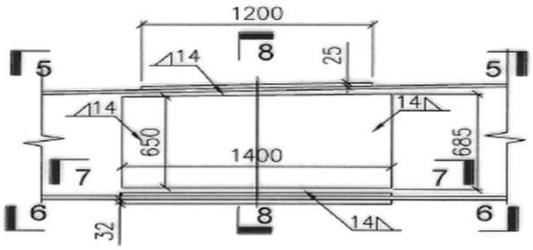
Name and address of Fabricator:		HMM Infra Limited, Village-Mandour, Ambala, Haryana
Welding Procedure Specification Sheet No. :		HMM/24/WPSS/BSG/72m/FCAW/028
Ref. Drg No.		RDSO/B-10440/6 # **Bottom Cross Beam to Web Splice Plates/Bottom Inner Splice (SP1 & SP2)**
1.0	Weld joint description :	Fillet (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
	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 :

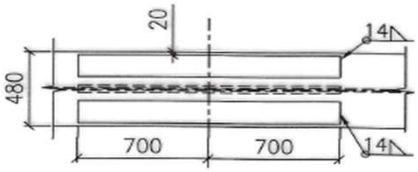
(Give sketch showing arrangement of parts, welding groove details, weld passes & their sequence etc.)



DETAILS OF SPLICE
SP1 - ELEVATION



DETAILS OF SPLICE
SP2 - ELEVATION



VIEW 3-3 & 7-7

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 S.E.C. RLY. RDSO

9.0 Welding parameters and technique: (as below)

9.1 Welding Parameters :

Weld Pass No.	Electrodes /wire dia. (mm)	Current (amp)	Arc Voltage (volt)	Wire feed speed (m/min)	Travel speed (m/min)	Electrical stick out (mm)	Gas flow 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
13.0	Preheating and inter pass temperature:	110°-150°C
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, D.P. Test
18.0	Any other relevant details:	NIL

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

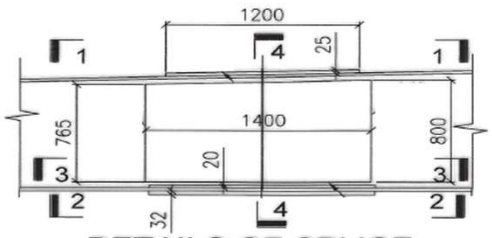
RDSO 72m BOW STRING GIRDER

Welding Procedure Specification Sheet

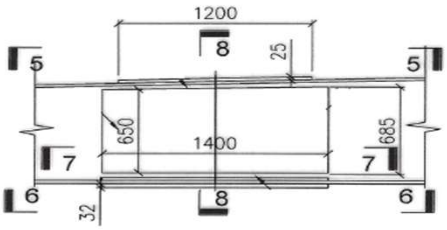
Name and address of Fabricator:		HMM Infra Limited, Village-Mandour, Ambala, Haryana
Welding Procedure Specification Sheet No. :		HMM/24/WPSS/BSG/72m/FCAW/029
Ref. Drg No.		RDSO/B-10440/6 # **Bottom Cross Beam to Top Splice Plates (SP1 & SP2)**
1.0	Weld joint description :	Fillet (16 mm)
2.0	Base Metal :	25 mm & 20 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 :

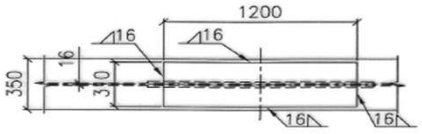
(Give sketch showing arrangement of parts, welding groove details, weld passes & their sequence etc.)



DETAILS OF SPLICE
SP1 - ELEVATION
(SCALE 1:25)



DETAILS OF SPLICE
SP2 - ELEVATION
(SCALE 1:25)



VIEW 1-1 & 5-5

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 S.E.C. RLY. RDSO

9.0 Welding parameters and technique: (as below)

9.1 Welding Parameters :

Weld Pass No.	Electrodes /wire dia. (mm)	Current (amp)	Arc Voltage (volt)	Wire feed speed (m/min)	Travel speed (m/min)	Electrical stick out (mm)	Gas flow 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
13.0	Preheating and inter pass temperature:	110°-150°C
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, D.P. Test
18.0	Any other relevant details:	NIL

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

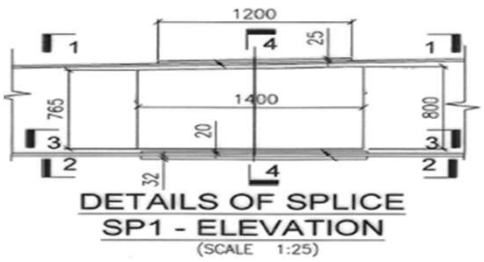
RDSO 72m BOW STRING GIRDER

Welding Procedure Specification Sheet

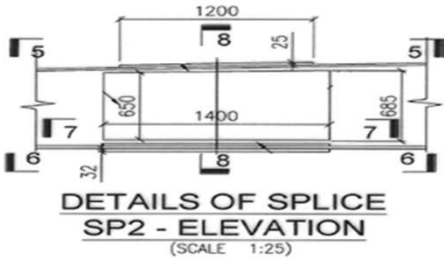
Name and address of Fabricator:		HMM Infra Limited, Village-Mandour, Ambala, Haryana
Welding Procedure Specification Sheet No. :		HMM/24/WPSS/BSG/72m/FCAW/030
Ref. Drg No.		RDSO/B-10440/6 # **Bottom Cross Beam to Bottom Outer Splice Plates (SP1 & SP2)**
1.0	Weld joint description :	Fillet (22 mm)
2.0	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 :

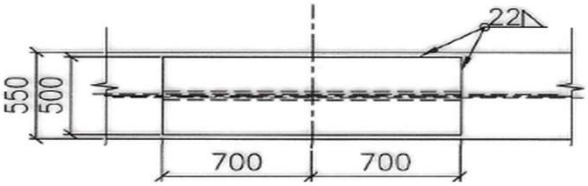
(Give sketch showing arrangement of parts, welding groove details, weld passes & their sequence etc.)



DETAILS OF SPLICE
SP1 - ELEVATION
(SCALE 1:25)



DETAILS OF SPLICE
SP2 - ELEVATION
(SCALE 1:25)



VIEW 2-2 & 6-6

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 S.E.C. RLY. RDSO

9.0 Welding parameters and technique: (as below)

9.1 Welding Parameters :

Weld Pass No.	Electrodes /wire dia. (mm)	Current (amp)	Arc Voltage (volt)	Wire feed speed (m/min)	Travel speed (m/min)	Electrical stick out (mm)	Gas flow 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
13.0	Preheating and inter pass temperature:	110°-150°C
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, D.P. Test
18.0	Any other relevant details:	NIL

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

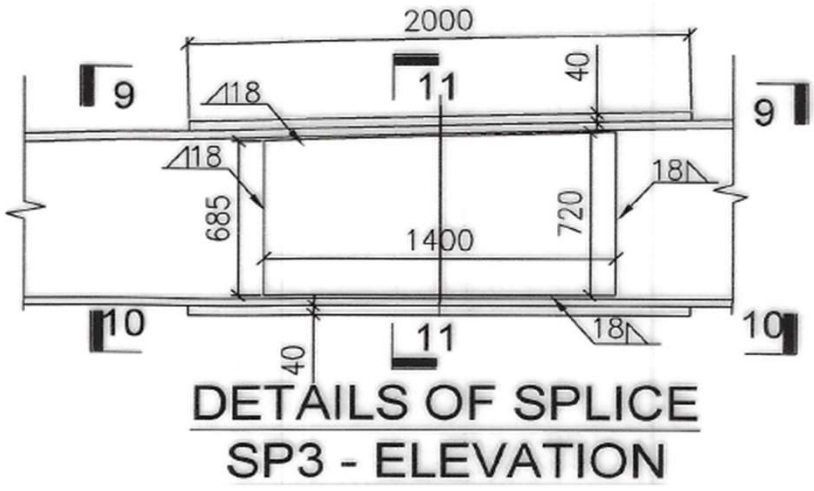
RDSO 72m BOW STRING GIRDER

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/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
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.)



DETAILS OF SPLICE
SP3 - ELEVATION

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 S.E.C. RLY. RDSO

9.0 Welding parameters and technique: (as below)

9.1 Welding Parameters :

Weld Pass No.	Electrodes /wire dia. (mm)	Current (amp)	Arc Voltage (volt)	Wire feed speed (m/min)	Travel speed (m/min)	Electrical stick out (mm)	Gas flow 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
13.0	Preheating and inter pass temperature:	110°-150°C
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, D.P. Test
18.0	Any other relevant details:	NIL

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

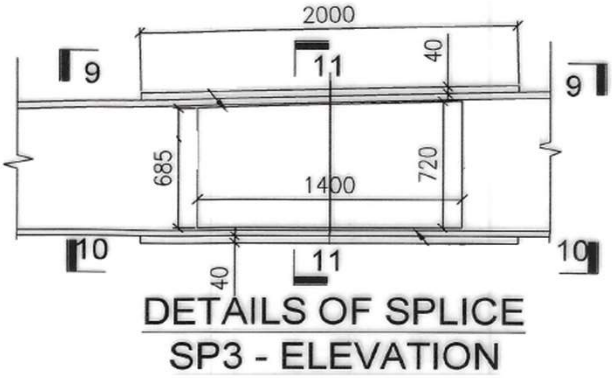
RDSO 72m BOW STRING GIRDER

Welding Procedure Specification Sheet

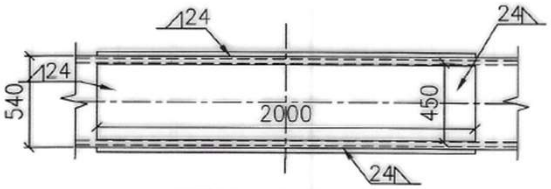
Name and address of Fabricator:		HMM Infra Limited, Village-Mandour, Ambala, Haryana
Welding Procedure Specification Sheet No. :		HMM/24/WPSS/BSG/72m/FCAW/032
Ref. Drg No.		RDSO/B-10440/6 # **End Bottom Cross Beam & Top/Bottom Splice Plates (SP3)**
1.0	Weld joint description :	Fillet (24 mm)
2.0	Base 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
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.)



DETAILS OF SPLICE
SP3 - ELEVATION



VIEW 9-9 & 10-10

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 | S.E.C. RLY. | RDSO

9.0 Welding parameters and technique: (as below)

9.1 Welding Parameters :

Weld Pass No.	Electrodes /wire dia. (mm)	Current (amp)	Arc Voltage (volt)	Wire feed speed (m/min)	Travel speed (m/min)	Electrical stick out (mm)	Gas flow 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
13.0	Preheating and inter pass temperature:	110°-150°C
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, D.P. Test
18.0	Any other relevant details:	NIL

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

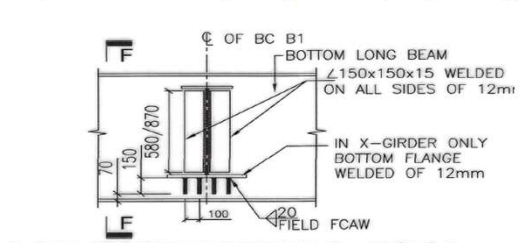
RDSO 72m BOW STRING GIRDER

Welding Procedure Specification Sheet

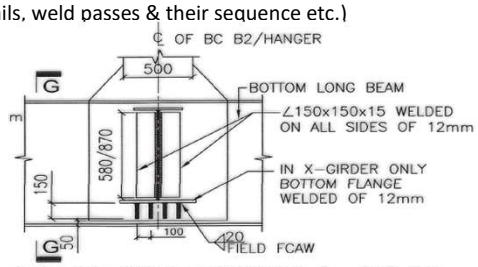
Name and address of Fabricator:		HMM Infra Limited, Village-Mandour, Ambala, Haryana
Welding Procedure Specification Sheet No. :		HMM/24/WPSS/BSG/72m/FCAW/033
Ref. Drg No.		RDSO/B-10440/6 # **Stiffeners/ BCB 1/BCB 2/BCB 3 to Hanger/BLB**
1.0	Weld joint description :	Fillet (20 mm)
2.0	Base Metal :	25 mm & 28/32/25 mm IS 2062-11 : E350 B0, Fully Killed, Normalized/Control cooled
3.0	Welding Process :	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 :

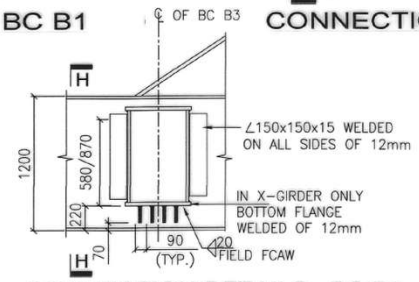
(Give sketch showing arrangement of parts, welding groove details, weld passes & their sequence etc.)



CONNECTION DETAILS - BC B1



CONNECTION DETAILS - BC B2



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

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

9.0 Welding parameters and technique: (as below)

9.1 Welding Parameters :

Weld Pass No.	Electrodes /wire dia. (mm)	Current (amp)	Arc Voltage (volt)	Wire feed speed (m/min)	Travel speed (m/min)	Electrical stick out (mm)	Gas flow 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:	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, D.P. Test
18.0	Any other relevant details:	NIL

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

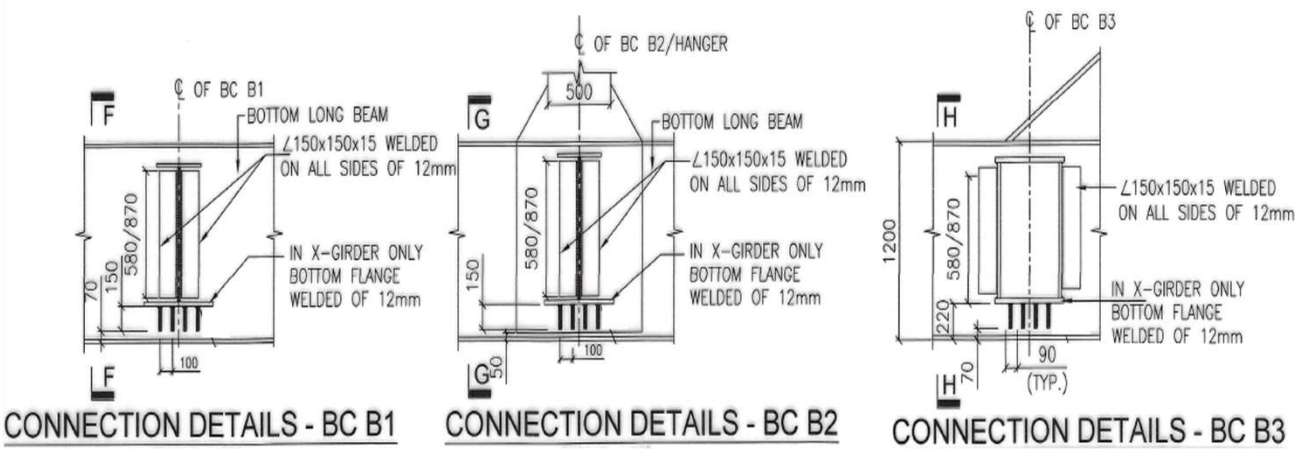
RDSO 72m BOW STRING GIRDER

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/034
Ref. Drg No.		RDSO/B-10440/6 # **Angles to BCB 1/BCB 2/Hanger/BLB**
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 :	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

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

9.0 Welding parameters and technique: (as below)

9.1 Welding Parameters :

Weld Pass No.	Electrodes /wire dia. (mm)	Current (amp)	Arc Voltage (volt)	Wire feed speed (m/min)	Travel speed (m/min)	Electrical stick out (mm)	Gas flow 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:

(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:	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, D.P. Test
18.0	Any other relevant details:	NIL

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

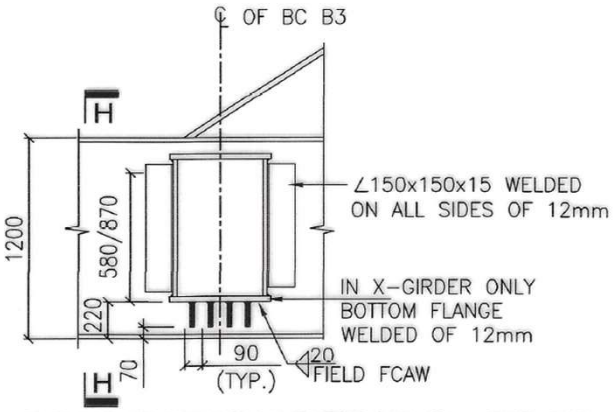
RDSO 72m BOW STRING GIRDER

Welding Procedure Specification Sheet

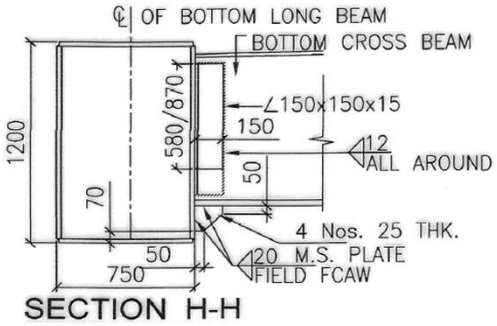
Name and address of Fabricator:		HMM Infra Limited, Village-Mandour, Ambala, Haryana
Welding Procedure Specification Sheet No. :		HMM/24/WPSS/BSG/72m/FCAW/035
Ref. Drg No.		RDSO/B-10440/6 # **Stiffeners to BCB 3/BLB Cover Plate**
1.0	Weld joint description :	Fillet (20 mm)
2.0	Base Metal :	25 mm & 32 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
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.)



CONNECTION DETAILS - BC B3



SECTION H-H

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 S.E.C. RLY. RDSO

9.0 Welding parameters and technique: (as below)

9.1 Welding Parameters :

Weld Pass No.	Electrodes /wire dia. (mm)	Current (amp)	Arc Voltage (volt)	Wire feed speed (m/min)	Travel speed (m/min)	Electrical stick out (mm)	Gas flow 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:	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, D.P. Test
18.0	Any other relevant details:	NIL

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

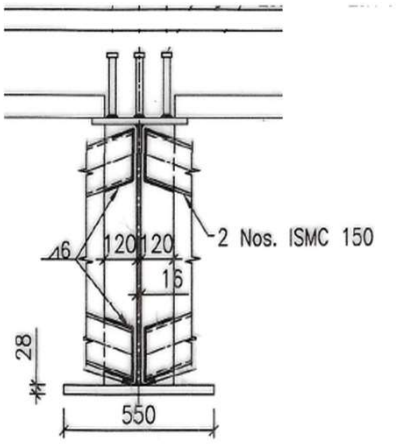
RDSO 72m BOW STRING GIRDER

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/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

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

9.0 Welding parameters and technique: (as below)

9.1 Welding Parameters :

Weld Pass No.	Electrodes /wire dia. (mm)	Current (amp)	Arc Voltage (volt)	Wire feed speed (m/min)	Travel speed (m/min)	Electrical stick out (mm)	Gas flow 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)
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:	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, D.P. Test
18.0	Any other relevant details:	NIL

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

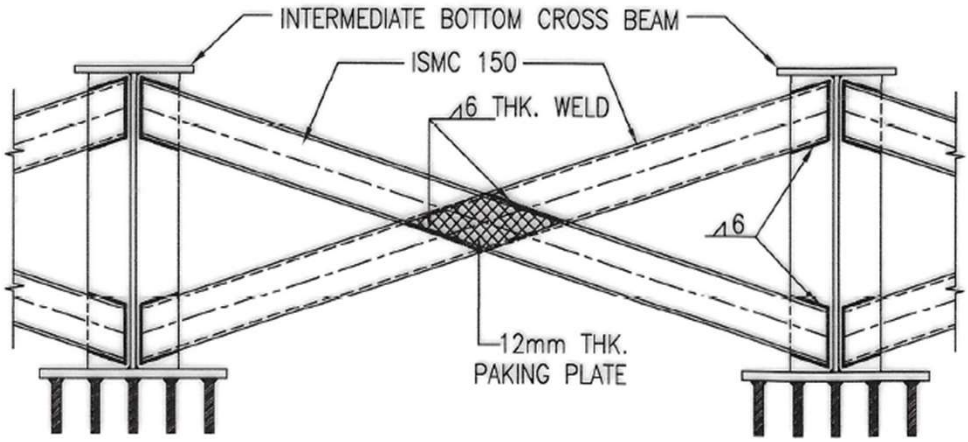
RDSO 72m BOW STRING GIRDER

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/037
Ref. Drg No.		RDSO/B-10440/6 # **ISMC 150 to Packing Plate**
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

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

9.0 Welding parameters and technique: (as below)

9.1 Welding Parameters :

Weld Pass No.	Electrodes /wire dia. (mm)	Current (amp)	Arc Voltage (volt)	Wire feed speed (m/min)	Travel speed (m/min)	Electrical stick out (mm)	Gas flow 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)
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:	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, D.P. Test
18.0	Any other relevant details:	NIL

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