
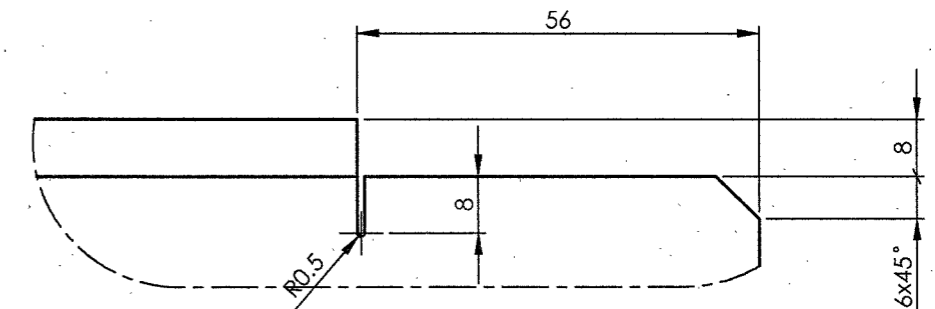
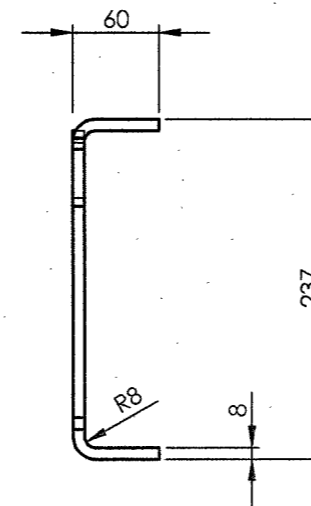
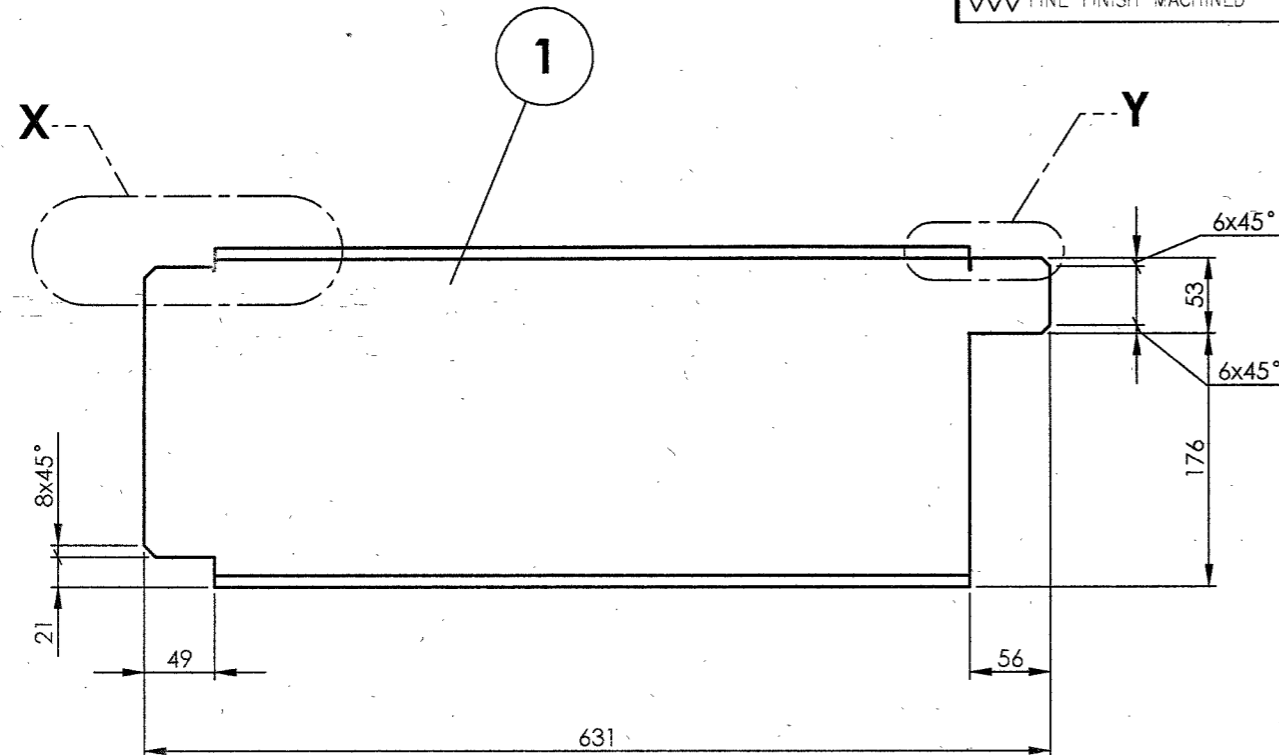
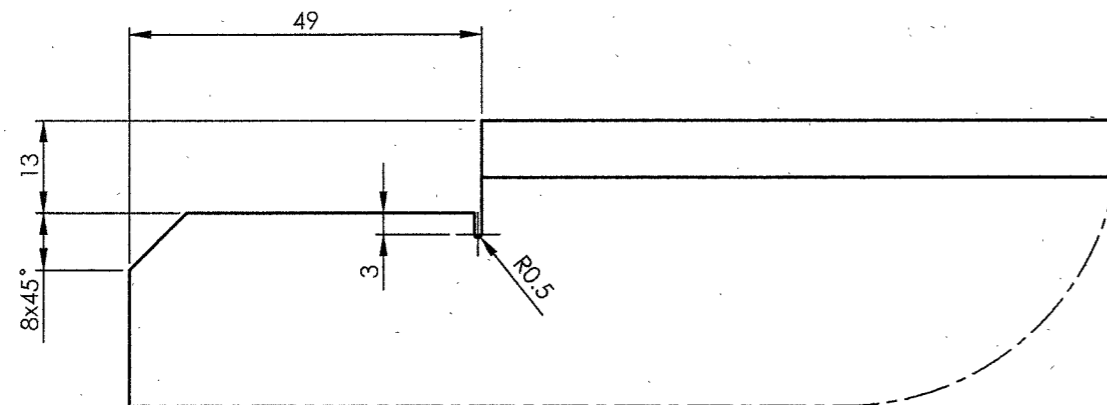


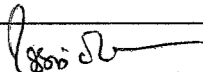
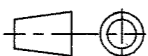
1		2		3		4		5		6		7		8																																																																
AAE11722				▽ ROUGH MACHINED		① ROUGH CLEANED		REVISIONS																																																																						
				▽▽ FINISH MACHINED		①b BURRS REMOVED		ALT.		ZONE		DESCRIPTION		APPROVED & DATE																																																																
				▽▽▽ FINE FINISH MACHINED		①8 CHAMFERED		a				DESIGN REVISED.		[Signature]																																																																
<div>ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE SPECIFIED. FOR UNTOLERANCED DIMENSIONS AND ROUGHNESS VALUES, REFER DRAWING NO ICF/STD-9-0-001. ANY MANUAL ALTERATION SHALL AUTOMATICALLY RENDER THIS DRAWING INVALID. WELDING SYMBOLS ARE AS PER IS: 813:1986. WEIGHT GIVEN IN DRAWING IS FOR INDICATIVE PURPOSE ONLY</div> <div><div><div>2748⁻² -3</div><div>X</div><div>1</div><div>220</div></div><div><div>16</div><div>8</div><div>15°</div></div></div>																																																																														
<table><tr><td>1</td><td>BOTTOM PLATE</td><td>16x220x2748</td><td>1</td><td></td><td>IS:2062-2011 E 250 Cu-C</td><td>75.82</td><td></td></tr><tr><td>QTY.</td><td>DESCRIPTION</td><td>DIMENSIONS</td><td>ITEM NO.</td><td>REF. DRGS</td><td>MATL.SPEC.</td><td>WT/UNIT IN KGS</td><td>REMARKS</td></tr><tr><td colspan="5">GROUP: 1-1</td><td colspan="2">SURFACE AREA IN Sq.m.:</td><td>WT/ASSY IN Kgs:</td></tr><tr><td colspan="5" rowspan="4">BOTTOM PLATE</td><td>SCALE</td><td>SSE/D</td><td rowspan="2">[Signature]</td></tr><tr><td>1:20</td><td>CHD</td></tr><tr><td>ALT.</td><td>ALTD</td><td>P.MURUGAN</td></tr><tr><td>a</td><td>DRN</td><td>P.MURUGAN</td></tr><tr><td colspan="5">INDIAN RAILWAY STANDARDS</td><td colspan="2">SHEET 1 OF 1</td><td></td></tr><tr><td colspan="5">INTEGRAL COACH FACTORY, CHENNAI - 600038</td><td colspan="2"></td><td></td></tr><tr><td colspan="5">REF.DRG.NO.ICF/MRVC/M/SS-1-1-014, ITEM-3</td><td colspan="2">AAE11722</td><td>A3</td></tr></table>															1	BOTTOM PLATE	16x220x2748	1		IS:2062-2011 E 250 Cu-C	75.82		QTY.	DESCRIPTION	DIMENSIONS	ITEM NO.	REF. DRGS	MATL.SPEC.	WT/UNIT IN KGS	REMARKS	GROUP: 1-1					SURFACE AREA IN Sq.m.:		WT/ASSY IN Kgs:	BOTTOM PLATE					SCALE	SSE/D	[Signature]	1:20	CHD	ALT.	ALTD	P.MURUGAN	a	DRN	P.MURUGAN	INDIAN RAILWAY STANDARDS					SHEET 1 OF 1			INTEGRAL COACH FACTORY, CHENNAI - 600038								REF.DRG.NO.ICF/MRVC/M/SS-1-1-014, ITEM-3					AAE11722		A3
1	BOTTOM PLATE	16x220x2748	1		IS:2062-2011 E 250 Cu-C	75.82																																																																								
QTY.	DESCRIPTION	DIMENSIONS	ITEM NO.	REF. DRGS	MATL.SPEC.	WT/UNIT IN KGS	REMARKS																																																																							
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				DATE OF LATEST ALT.		DATE OF FIRST ISSUE		AME/SME																																																																						

AAE11723

▽ ROUGH MACHINED	① ROUGH CLEANED
▽▽ FINISH MACHINED	①b BURRS REMOVED
▽▽▽ FINE FINISH MACHINED	①8 CHAMFERED

REVISIONS			
ALT.	ZONE	DESCRIPTION	APPROVED & DATE
a		HEIGHT OF CHANNEL REDUCED FROM 247 TO 237. R.M SIZE ALTD ACCORDINGLY.	

DETAIL Y
SCALE 1 : 1DETAIL X
SCALE 1 : 1


1.	STIFFENING CHANNEL	8x325x631	1		IRS M-41-1997	11.73	
QTY.	DESCRIPTION	DIMENSIONS	ITEM NO.	REF. DRGS	MATL.SPEC.	WT/UNIT IN KGS	REMARKS
GROUP: 1-1		SURFACE AREA IN Sq.m.:			WT/ASSY IN Kgs:		
STIFFENING CHANNEL					SCALE	SSE/D	
					1:5	CHD	
					ALT.	ALTD.	P.MUREUGAN
					a	DRN	3D: V.S.SRIDHARAN 2D: SATISH KUMAR
INDIAN RAILWAY STANDARDS							
INTEGRAL COACH FACTORY, CHENNAI - 600088					SHEET 1 OF 1		AAE11723
							A3

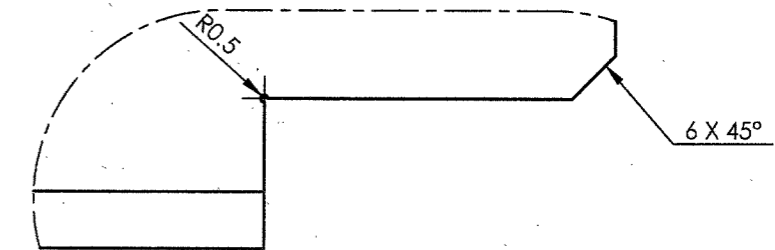
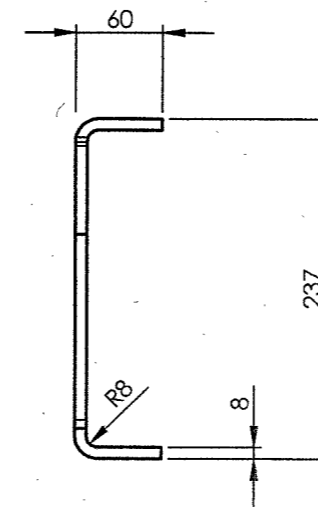
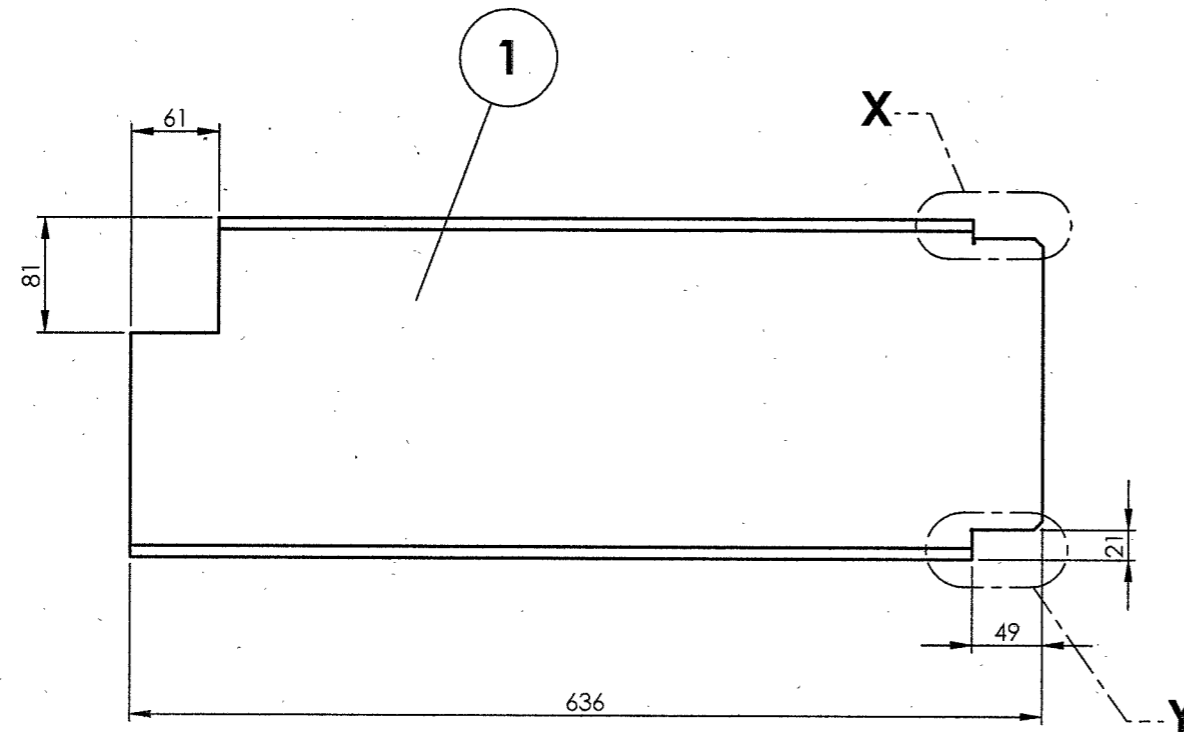
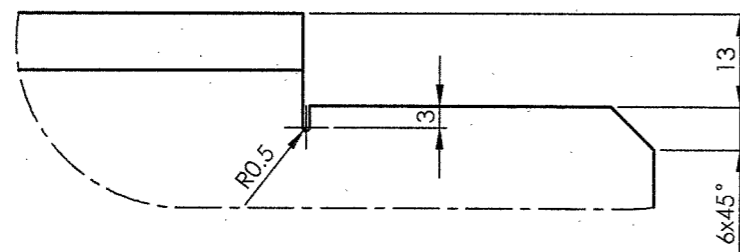
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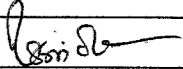
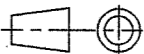
AAE11724

▽ ROUGH MACHINED	① ROUGH CLEANED
▽▽ FINISH MACHINED	①b BURRS REMOVED
▽▽▽ FINE FINISH MACHINED	①8 CHAMFERED

REVISIONS

ALT.	ZONE	DESCRIPTION	APPROVED & DATE
a		HEIGHT OF CHANNEL REDUCED FROM 247 TO 237. R.M SIZE ALTD ACCORDINGLY.	

DETAIL Y
SCALE 1 : 1DETAIL X
SCALE 1 : 1

1	STIFFENING CHANNEL	8x325x636	1		IRS M-41-1997	12.32	
QTY.	DESCRIPTION	DIMENSIONS	ITEM NO.	REF. DRGS	MATL.SPEC.	WT/UNIT IN KGS	REMARKS
GROUP: 1-1		SURFACE AREA IN Sq.m.:			WT/ASSY IN Kgs:		
STIFFENING CHANNEL					SCALE	SSE/D	
					1:5	CHD	
					ALT.	ALTD	P. MURUGAN
					a	DRN	3D: V.S.SRIDHARAN 2D: SATISH KUMAR
INDIAN RAILWAY STANDARDS INTEGRAL COACH FACTORY, CHENNAI - 600038				SHEET 1 OF 1			
					AAE11724		A3

REF.DRG.NO.ICF/MRVC/M-1-1-020/ITEM-7

ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE SPECIFIED. FOR UNTOLERANCED DIMENSIONS AND ROUGHNESS VALUES, REFER DRAWING NO ICF/STD-9-0-001.
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WEIGHT GIVEN IN DRAWING IS FOR INDICATIVE PURPOSE ONLY

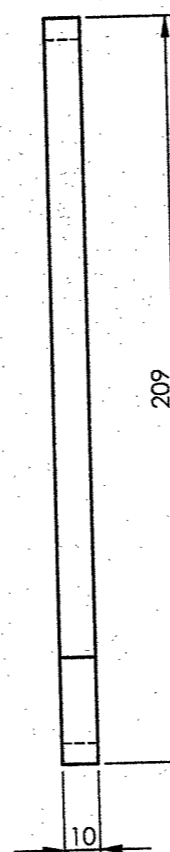
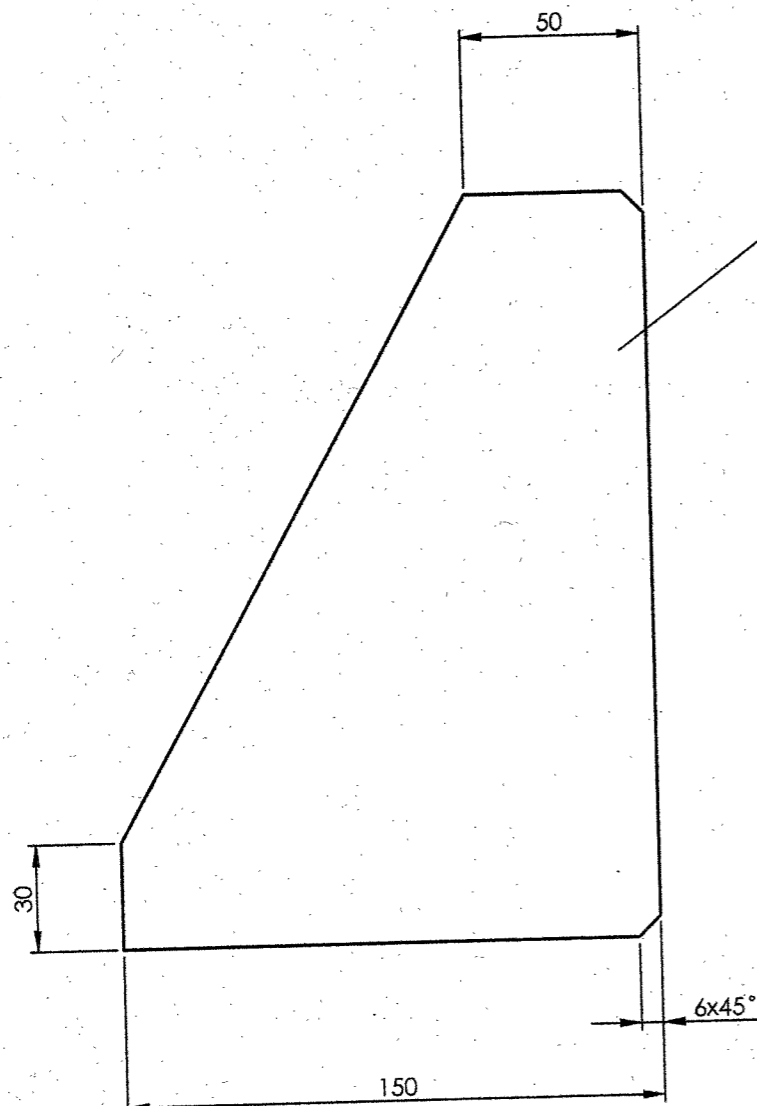
AAE11725

▽ ROUGH MACHINED
▽▽ FINISH MACHINED
▽▽▽ FINE FINISH MACHINED

① ROUGH CLEANED
①b BURRS REMOVED
⑱ CHAMFERED

REVISIONS

ALT.	ZONE	DESCRIPTION
A		R.M SIZE ALTD FROM 10x150x215 TO 10x150x209.

APPROVED &
DATE

1	RIB	10x150x209	1		IRS M-41-1997	1.76		
QTY.	DESCRIPTION	DIMENSIONS	ITEM NO.	REF. DRGS	MATL.SPEC.	WT/UNIT IN KGS	REMARKS	
GROUP: 1-0			SURFACE AREA IN Sq.m.:			WT/ASSY IN Kgs:		
RIB						SCALE	SSE/D	
						1:2	CHD	
						ALT. a	ALTD	P.MURUGAN
							DRN	3D: P.MURUGAN 2D: SATISH KUMAR
						INDIAN RAILWAY STANDARDS INTEGRAL COACH FACTORY, CHENNAI - 600038		
SHEET 1 OF 1								
						AAE11725		A3


REF.DRG.NO.ICF/MRVC/M-1-1-003, ITEM-3

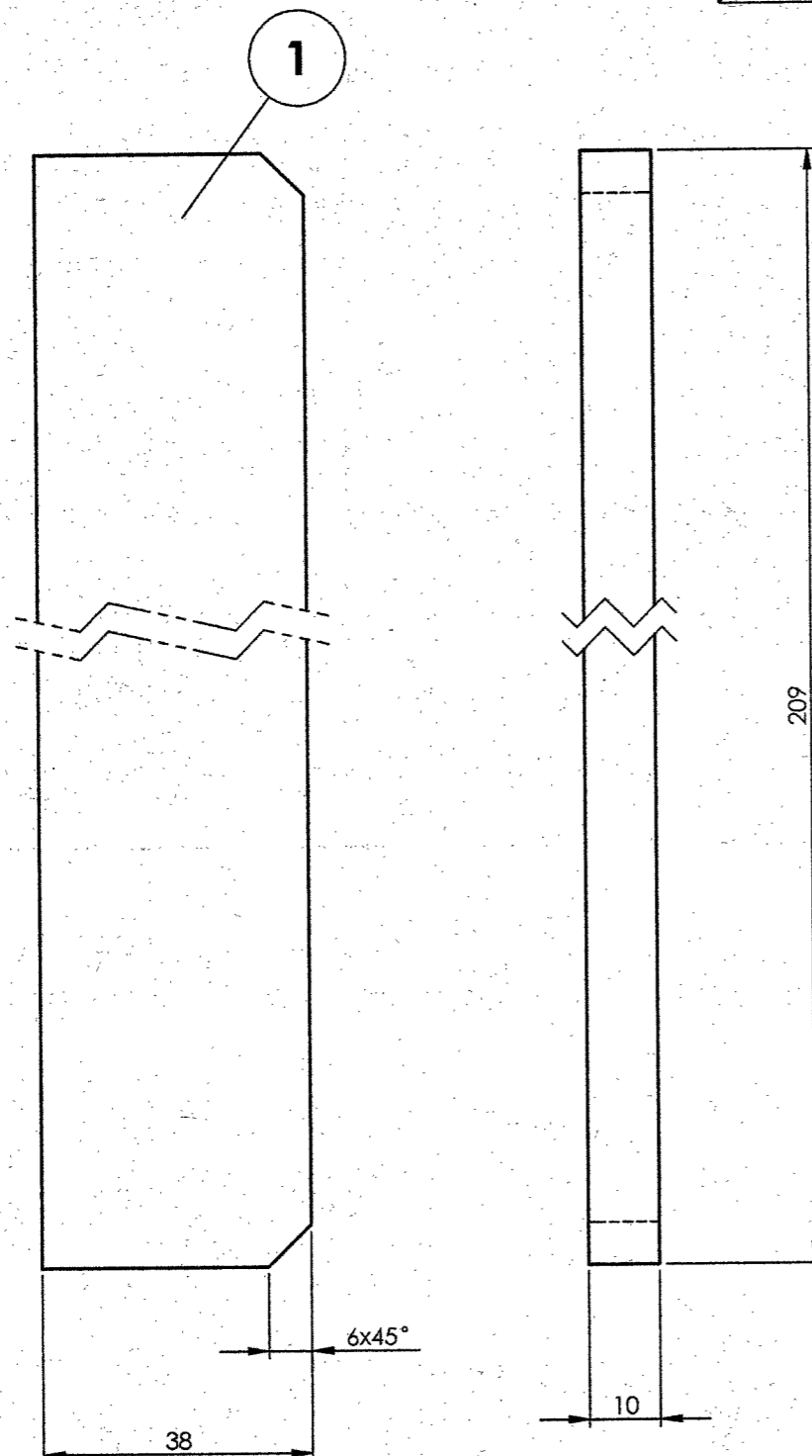
20/4/18 16-03-2018
DATE OF LATEST ALT. DATE OF FIRST ISSUE

AME/SME

ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE SPECIFIED. FOR UNTOLERANCED DIMENSIONS AND ROUGHNESS VALUES, REFER DRAWING NO ICF/STD-9-0001.
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WEIGHT GIVEN IN DRAWING IS FOR INDICATIVE PURPOSE ONLY

▽ ROUGH MACHINED	① ROUGH CLEANED
▽▽ FINISH MACHINED	①b BURRS REMOVED
▽▽▽ FINE FINISH MACHINED	⑱ CHAMFERED

REVISIONS			
ALT.	ZONE	DESCRIPTION	APPROVED & DATE
a		R.M SIZE ALTD FROM 10x38x215 TO 10x38x209.	




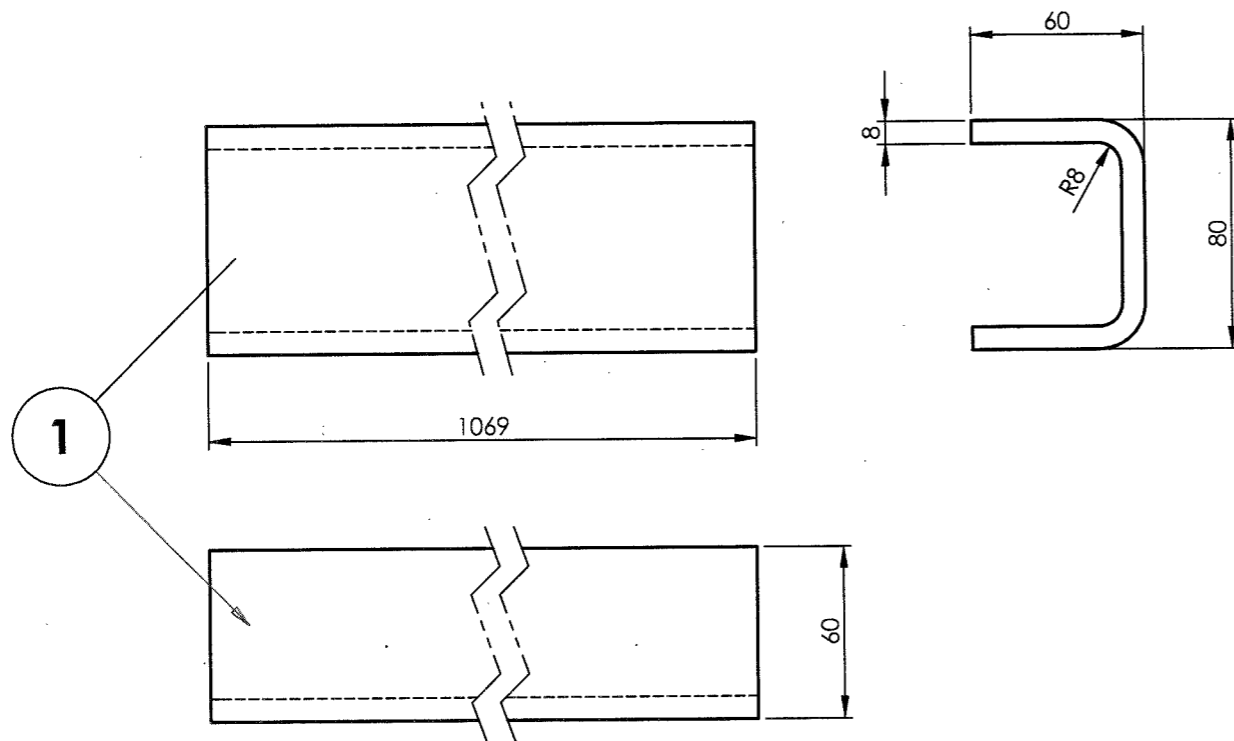
ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE SPECIFIED. FOR UNTOLERANCED DIMENSIONS AND ROUGHNESS VALUES, REFER DRAWING NO. ICF/STD-9-0-001.
ANY MANUAL ALTERATION SHALL AUTOMATICALLY RENDER THIS DRAWING INVALID. WELDING SYMBOLS ARE AS PER IS: 813-1986.
WEIGHT GIVEN IN DRAWING IS FOR INDICATIVE PURPOSE ONLY.

1	RIB	10x38x209	1		IRS M-41-1997	0.62		
QTY.	DESCRIPTION	DIMENSIONS	ITEM NO.	REF. DRGS	MATL.SPEC.	WT/UNIT IN KGS	REMARKS	
GROUP: 1-0		SURFACE AREA IN Sq.m.:			WT/ASSY IN Kgs:			
RIB					SCALE	SSE/D		
					1:2	CHD		
					ALT. a	ALTD	P.MURUGAN	
						DRN	3D: P.MURUGAN 3D: SATISH KUMAR	
INDIAN RAILWAY STANDARDS INTEGRAL COACH FACTORY, CHENNAI - 600038				SHEET 1 OF 1				
					AAE11726		AS	

AAE11738

▽ ROUGH MACHINED	① ROUGH CLEANED
▽▽ FINISH MACHINED	①b BURRS REMOVED
▽▽▽ FINE FINISH MACHINED	①B CHAMFERED

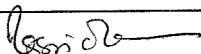
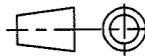
REVISIONS			
ALT.	ZONE	DESCRIPTION	APPROVED & DATE
a		R.M. SIZE OF ITEM-1 ALTERED FROM 2748 TO 1069.	



ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE SPECIFIED. FOR UNTOLERANCED DIMENSIONS AND ROUGHNESS VALUES, REFER DRAWING NO ICF/STD-9-0-001.
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WEIGHT GIVEN IN DRAWING IS FOR INDICATIVE PURPOSE ONLY


REF.DRG.NO.ICF/MRVC/M/SS-1-1-008/ITEM-3

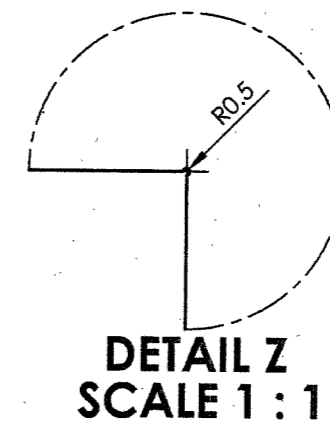
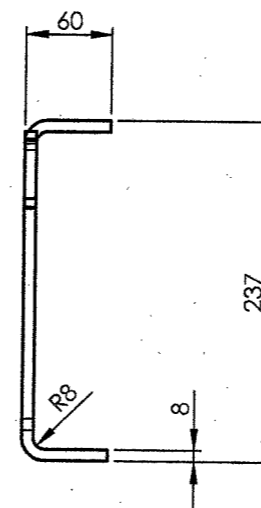
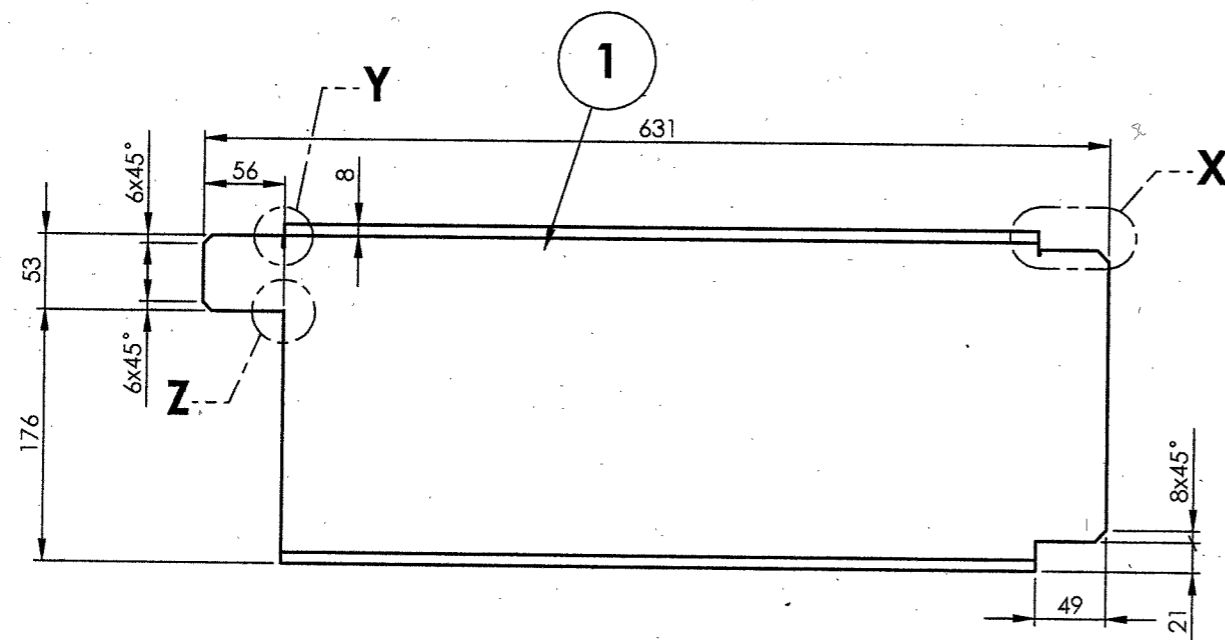
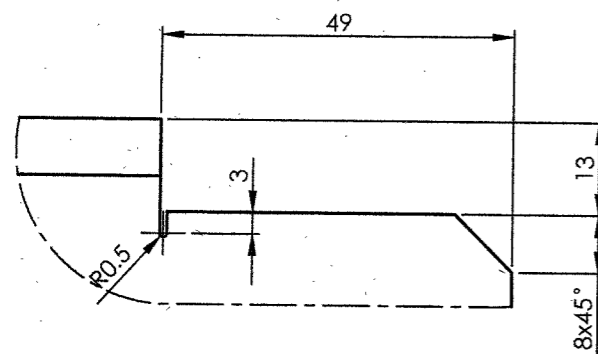
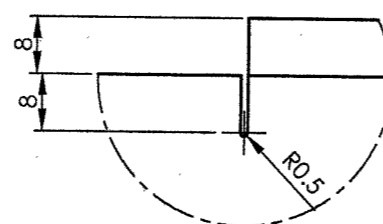
17-07-2018	16-03-2018	
DATE OF LATEST ALT.	DATE OF FIRST ISSUE	AME/SME

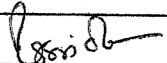
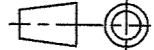
1	CROSS BEARER	8x180x1069	1		IRS M-41-1997	11.66	
QTY.	DESCRIPTION	DIMENSIONS	ITEM NO.	REF. DRGS	MATL.SPEC.	WT/UNIT IN KGS	REMARKS
GROUP: 1-1		SURFACE AREA IN Sq.m.:			WT/ASSY IN Kgs:		
CROSS BEARER					SCALE	SSE/D	
					1:20	CHD	
					ALT.	ALTD	SATISH KUMAR
					a	DRN	V.S.SRIDHARAN
INDIAN RAILWAY STANDARDS INTEGRAL COACH FACTORY, CHENNAI - 600038							
					SHEET 1 OF 1	AAE11738	A3

AAE11739

▽ ROUGH MACHINED	① ROUGH CLEANED
▽▽ FINISH MACHINED	①b BURRS REMOVED
▽▽▽ FINE FINISH MACHINED	①8 CHAMFERED

REVISIONS			
ALT.	ZONE	DESCRIPTION	APPROVED & DATE
a		HEIGHT OF CHANNEL REDUCED FROM 247 TO 237. R.M SIZE ALTD ACCORDINGLY.	

DETAIL Z
SCALE 1 : 1DETAIL X
SCALE 1 : 1DETAIL Y
SCALE 1 : 1

1	STIFFENING CHANNEL	8x325x631	1		IRS M-41-1997	11.73	
QTY.	DESCRIPTION	DIMENSIONS	ITEM NO.	REF. DRGS	MATL.SPEC.	WT/UNIT IN KGS	REMARKS
GROUP: 1-1		SURFACE AREA IN Sq.m.:			WT/ASSY IN Kgs:		
STIFFENING CHANNEL					SCALE	SSE/D	
					1:5	CHD	
					ALT.	ALTD	P.MURUGAN
					a	DRN	3D: V.S.SRIDHARAN, 2D: SATISH KUMAR
INDIAN RAILWAY STANDARDS				SHEET 1 OF 1			A3
INTEGRAL COACH FACTORY, CHENNAI - 600038							
					AAE11739		

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REF.DRG.NO.ICF/MRVC/M-T-1-020/ITEM-8

AAE11740

▽ ROUGH MACHINED

▽▽ FINISH MACHINED

▽▽▽ FINE FINISH MACHINED

① ROUGH CLEANED

①b BURRS REMOVED

①8 CHAMFERED

REVISIONS

ALT.

ZONE

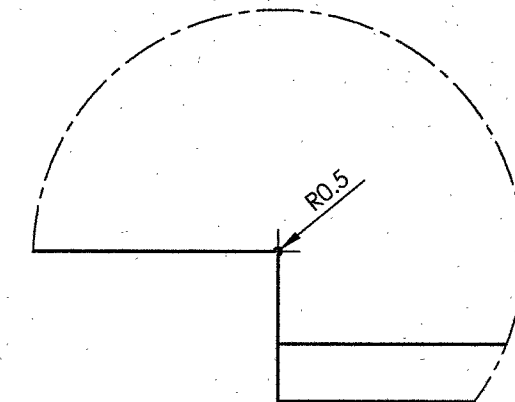
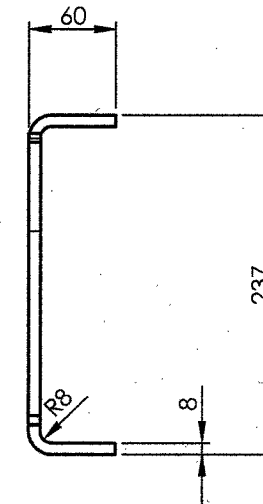
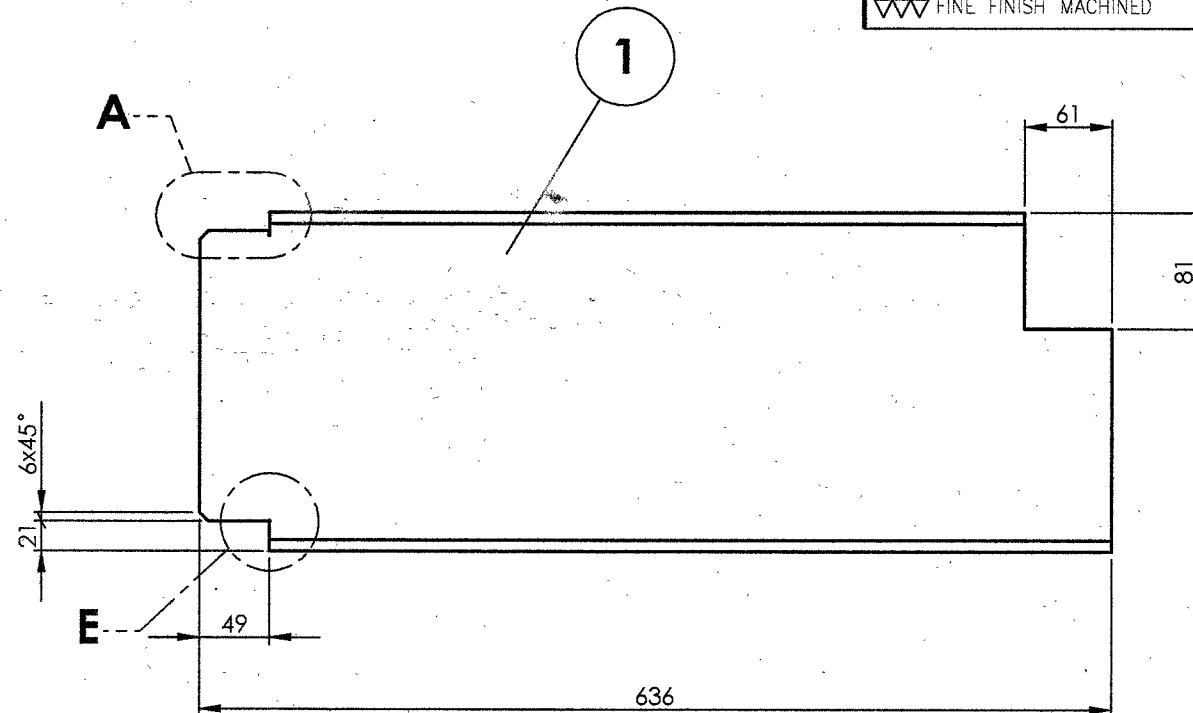
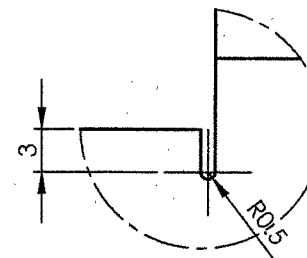
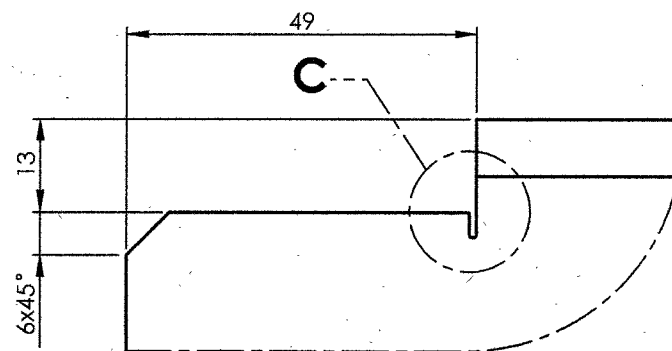
DESCRIPTION

APPROVED &
DATE

a

HEIGHT OF CHANNEL REDUCED FROM 247 TO 237. R.M SIZE
ALTD ACCORDINGLY.

[Signature]

DETAIL E
SCALE 1 : 1DETAIL C
SCALE 2 : 1DETAIL A
SCALE 1 : 1

1	STIFFENING CHANNEL	8x325x636	1		IRS M-41-1997	12.32	
QTY.	DESCRIPTION	DIMENSIONS	ITEM NO.	REF. DRGS	MATL.SPEC.	WT/UNIT IN KGS	REMARKS
GROUP: 1-1				SURFACE AREA IN Sq.m.:		WT/ASSY IN Kgs:	
STIFFENING CHANNEL					SCALE 1:5	SSE/D CHD	[Signature]
					ALT. a	ALTD DRN	P.MURUGAN
							3D: V.S.SRIDHARAN, 2D: SATISH KUMAR
INDIAN RAILWAY STANDARDS				SHEET 1 OF 1		AAE11740	
INTEGRAL COACH FACTORY, CHENNAI - 600038						A3	

REF.DRG.NO.ICF/MRVC/M-1-1-020/ITEM-9

19-04-2018

DATE OF LATEST ALT.

20-03-2018

DATE OF FIRST ISSUE

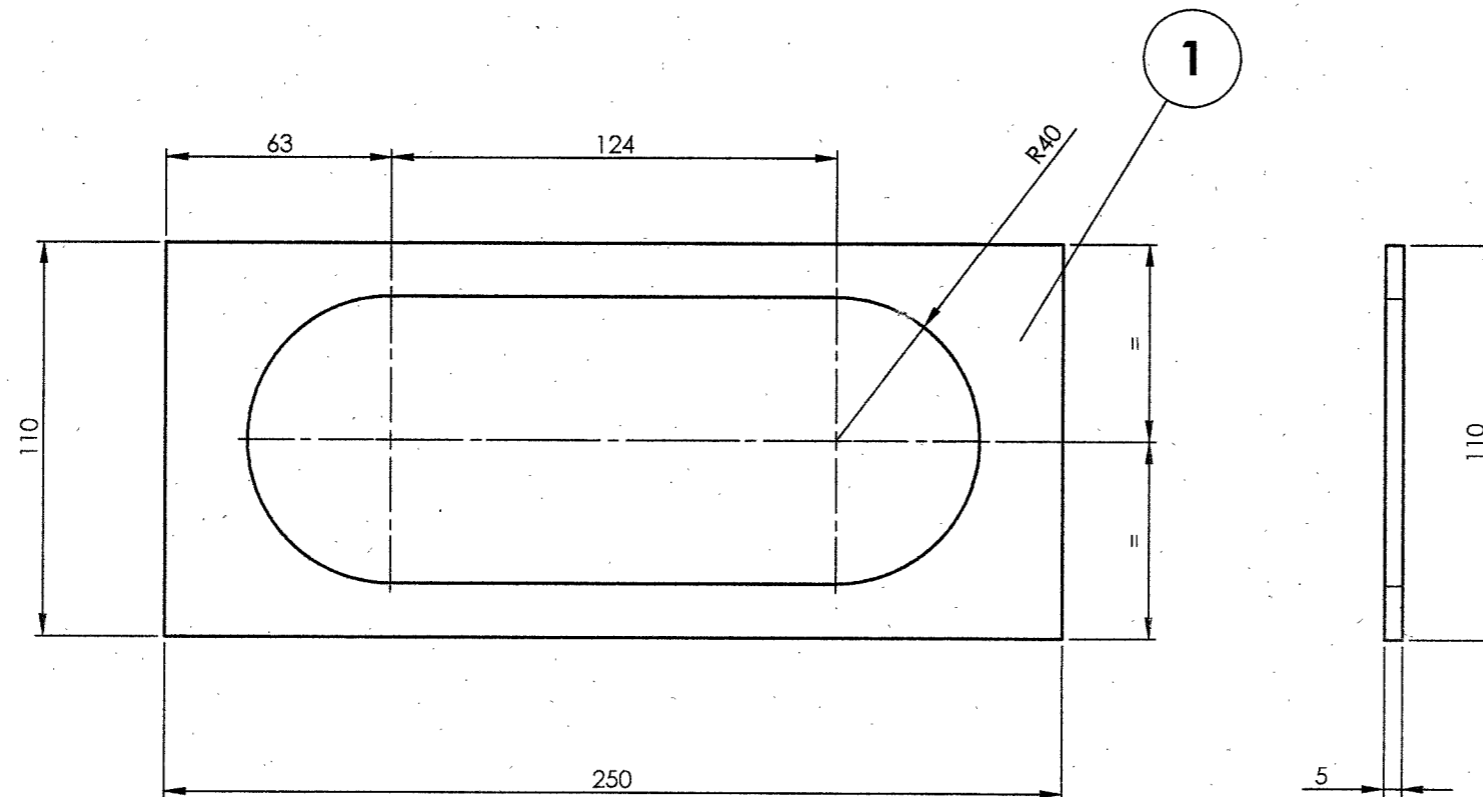
AME/SME

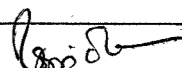
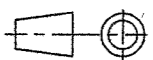
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AAE11800

▽ ROUGH MACHINED	① ROUGH CLEANED
▽▽ FINISH MACHINED	①b BURRS REMOVED
▽▽▽ FINE FINISH MACHINED	⑱ CHAMFERED

REVISIONS			
ALT.	ZONE	DESCRIPTION	APPROVED & DATE



1	PLATE	5x110x250	1		IRS M-41-1997	0.49	
QTY.	DESCRIPTION	DIMENSIONS	ITEM NO.	REF. DRGS	MATL.SPEC.	WT/UNIT IN KGS	REMARKS
GROUP: 1-1		SURFACE AREA IN Sq.m.:			WT/ASSY IN Kgs:		
PLATE					SCALE	SSE/D	
					1:2	CHD	
					ALT.	ALTD	
						DRN	P.MURUGAN
INDIAN RAILWAY STANDARDS INTEGRAL COACH FACTORY, CHENNAI - 600038							
					SHEET 1 OF 1		AAE11800

ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE SPECIFIED. FOR UNTOLERANCED DIMENSIONS AND ROUGHNESS VALUES, REFER DRAWING NO ICF/STD-9-0-001.
ANY MANUAL ALTERATION SHALL AUTOMATICALLY RENDER THIS DRAWING INVALID. WELDING SYMBOLS ARE AS PER IS: 813-1986.
WEIGHT GIVEN IN DRAWING IS FOR INDICATIVE PURPOSE ONLY

REF.DRG.NO.ICF/MRVC/M/BT-1-1-010, ITEM-12

	19-04-2018	
DATE OF LATEST ALT.	DATE OF FIRST ISSUE	AME/SME

AAE11805

▽ ROUGH MACHINED
▽▽ FINISH MACHINED
▽▽▽ FINE FINISH MACHINED

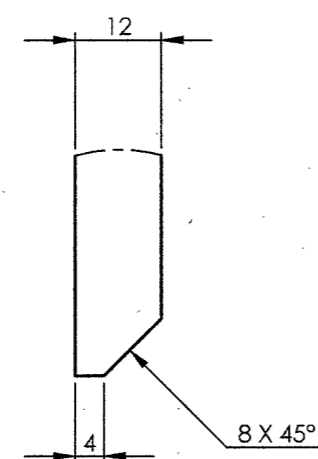
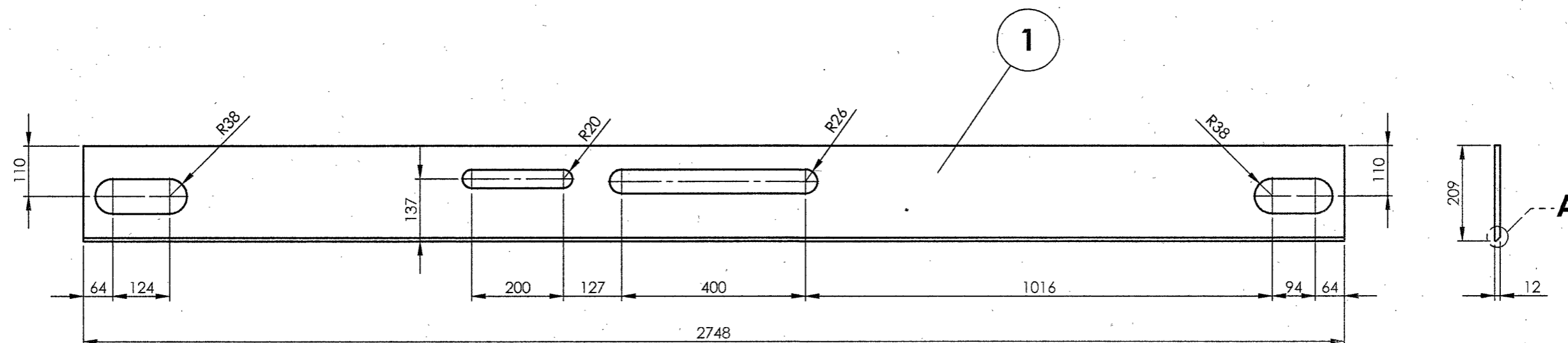
① ROUGH CLEANED
①b BURRS REMOVED
⑱ CHAMFERED

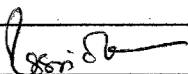
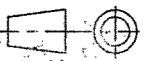
REVISIONS

ALT.

ZONE

DESCRIPTION

APPROVED &
DATEDETAIL A
SCALE 1 : 1

1	WEB	12x209x2748	1		IS:2062-2011 E 250 Cu-C	47.97	
QTY.	DESCRIPTION	DIMENSIONS	ITEM NO.	REF. DRGS	MATL.SPEC.	WT/UNIT IN KGS	REMARKS
GROUP: 1-1		SURFACE AREA IN Sq.m.:			WT/ASSY IN Kgs:		
WEB					SCALE	SSE/D	
					1:10	CHD	
					ALT.	ALTD	
						DRN	P.MURUGAN
INDIAN RAILWAY STANDARDS INTEGRAL COACH FACTORY, CHENNAI - 600038							
					SHEET 1 OF 1		AAE11805

ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE SPECIFIED. FOR UNTOLERANCED DIMENSIONS AND ROUGHNESS VALUES, REFER DRAWING NO ICF/STD-9-0-001.
ANY MANUAL ALTERATION SHALL AUTOMATICALLY RENDER THIS DRAWING INVALID. WELDING SYMBOLS ARE AS PER IS: 813-1986.
WEIGHT GIVEN IN DRAWING IS FOR INDICATIVE PURPOSE ONLY

REF.DRG.NO.ICF/MRVC/M/B-1-1-010, ITEM-8

DATE OF LATEST ALT.

19 -04-2018

DATE OF FIRST ISSUE

AME/SME

INDIAN RAILWAY STANDARDS

INTEGRAL COACH FACTORY, CHENNAI - 600038

SHEET
1 OF 1

AAE11805

A3

1		2		3		4		5		6		7		8																																																											
AAF11159				▽ ROUGH MACHINED		① ROUGH CLEANED		REVISIONS																																																																	
				▽▽ FINISH MACHINED		①b BURRS REMOVED		ALT.		ZONE		DESCRIPTION																																																													
				▽▽▽ FINE FINISH MACHINED		①8 CHAMFERED		APPROVED & DATE																																																																	
<div>ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE SPECIFIED. FOR UNTOLERANCED DIMENSIONS AND ROUGHNESS VALUES, REFER DRAWING NO ICF/STD-9-0-001. ANY MANUAL ALTERATION SHALL AUTOMATICALLY RENDER THIS DRAWING INVALID. WELDING SYMBOLS ARE AS PER IS: 813-1986. WEIGHT GIVEN IN DRAWING IS FOR INDICATIVE PURPOSE ONLY</div> <div><div><div>1</div><div>747</div></div><div><div>80</div><div>60</div><div>8</div><div>R8</div><div>R8</div></div><div>ISOMETRIC VIEW</div></div> <table><tr><td>1</td><td>CROSS BEARER</td><td>8x174x747</td><td>1</td><td></td><td>IRS M-41-1997</td><td>8.15</td><td></td></tr><tr><td>QTY.</td><td>DESCRIPTION</td><td>DIMENSIONS</td><td>ITEM NO.</td><td>REF. DRGS</td><td>MATL.SPEC.</td><td>WT/UNIT IN KGS</td><td>REMARKS</td></tr><tr><td colspan="2">GROUP: 1-1</td><td colspan="2">SURFACE AREA IN Sq.m.:</td><td colspan="4">WT/ASSY IN Kgs:</td></tr><tr><td colspan="4" rowspan="4">CROSS BEARER</td><td>SCALE</td><td>SSE/D</td><td colspan="2">①</td></tr><tr><td>1:2</td><td>CHD</td><td colspan="2"></td></tr><tr><td>ALT.</td><td>ALTD</td><td colspan="2"></td></tr><tr><td>DRN</td><td colspan="2">3D: V.S.SRIDHARAN 2D: SATISH KUMAR</td></tr><tr><td colspan="4">INDIAN RAILWAY STANDARDS</td><td colspan="2">SHEET 1 OF 1</td><td colspan="2">AAF11159</td></tr><tr><td colspan="4">INTEGRAL COACH FACTORY, CHENNAI - 600038</td><td colspan="2"></td><td colspan="2">A3</td></tr></table> <div><div>REF.DRG.NO.ICF/MRVC/M/SS-1-1-008/ITEM-3</div><div><div>①-07-2018</div><div>DATE OF LATEST ALT.</div><div>DATE OF FIRST ISSUE</div><div>AME/SME</div></div></div>															1	CROSS BEARER	8x174x747	1		IRS M-41-1997	8.15		QTY.	DESCRIPTION	DIMENSIONS	ITEM NO.	REF. DRGS	MATL.SPEC.	WT/UNIT IN KGS	REMARKS	GROUP: 1-1		SURFACE AREA IN Sq.m.:		WT/ASSY IN Kgs:				CROSS BEARER				SCALE	SSE/D	①		1:2	CHD			ALT.	ALTD			DRN	3D: V.S.SRIDHARAN 2D: SATISH KUMAR		INDIAN RAILWAY STANDARDS				SHEET 1 OF 1		AAF11159		INTEGRAL COACH FACTORY, CHENNAI - 600038						A3	
1	CROSS BEARER	8x174x747	1		IRS M-41-1997	8.15																																																																			
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INTEGRAL COACH FACTORY, CHENNAI - 600038						A3																																																																			

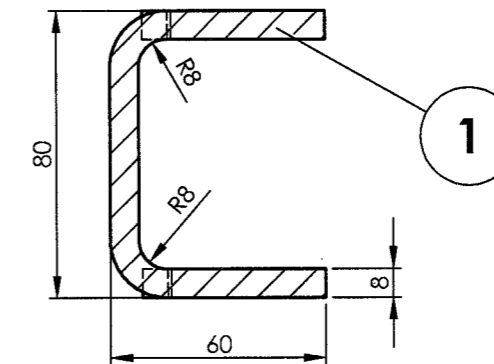
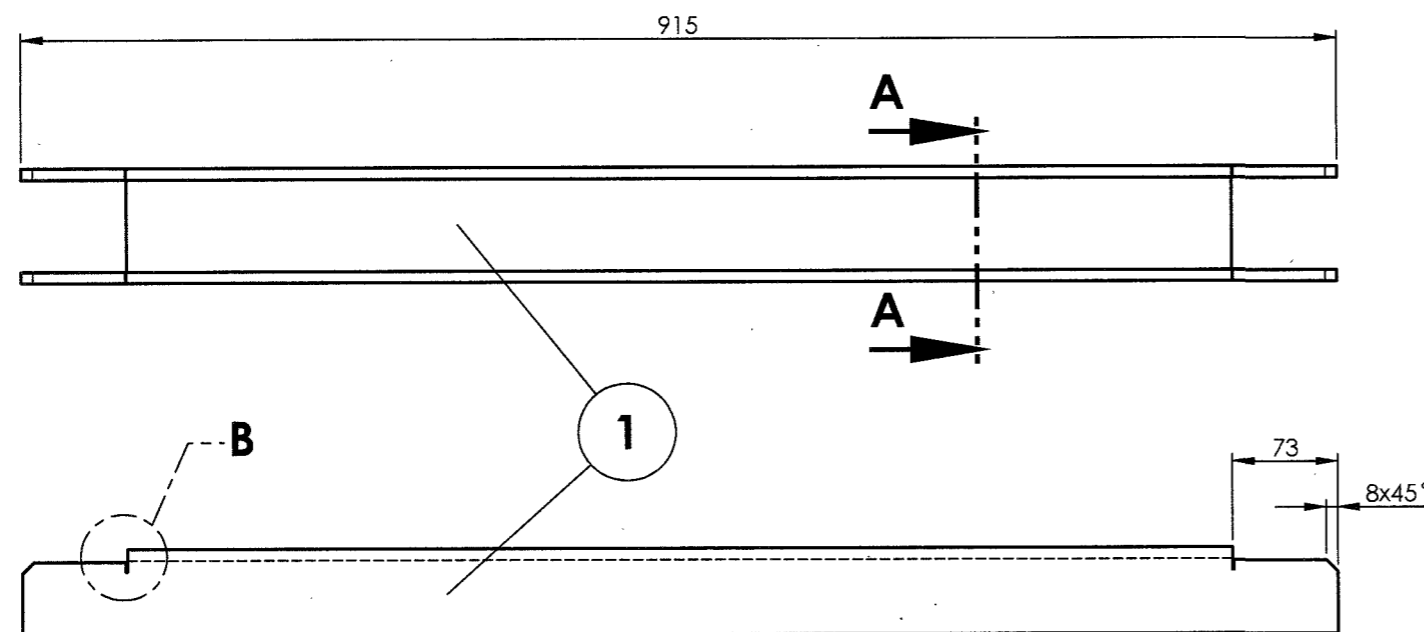
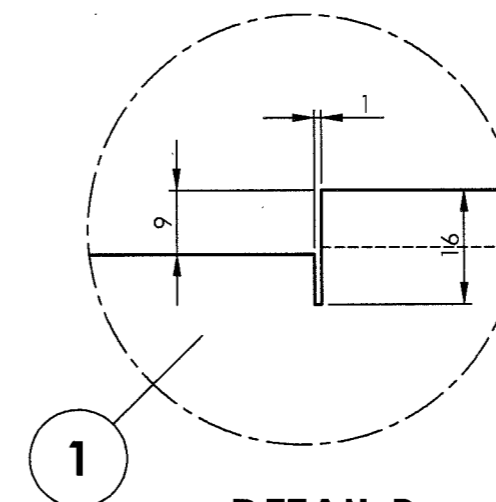
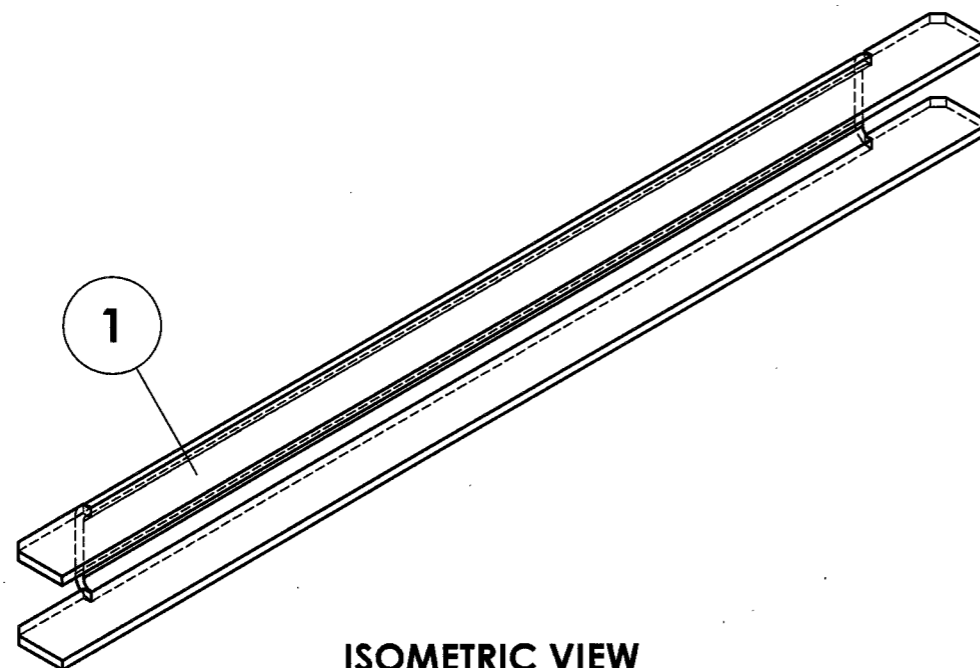
A														
B														
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D														
E														
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AA11160

▽ ROUGH MACHINED	① ROUGH CLEANED
▽▽ FINISH MACHINED	①b BURRS REMOVED
▽▽▽ FINE FINISH MACHINED	①8 CHAMFERED

REVISIONS

ALT.	ZONE	DESCRIPTION	APPROVED & DATE
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SECTION A-A
SCALE 1 : 2DETAIL B
SCALE 1 : 1

ISOMETRIC VIEW

1	CROSS BEARER	8x174x915	1		IRS M-41-1997	9.31		
QTY.	DESCRIPTION	DIMENSIONS	ITEM NO.	REF. DRGS	MATL.SPEC.	WT/UNIT IN KGS	REMARKS	
GROUP: 1-1		SURFACE AREA IN Sq.m.:			WT/ASSY IN Kgs:			
CROSS BEARER					SCALE 1:5	SSE/D		
						CHD		
					ALT.	ALTD		
						DRN	3D: V.S.SRIDHARAN 2D:SATISH KUMAR	
					INDIAN RAILWAY STANDARDS INTEGRAL COACH FACTORY, CHENNAI - 600038			
SHEET 1 OF 1		AAF11160	A3					

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REF.DRG.NO.ICF/MRVC/M/SS-1-1-008/ITEM-3

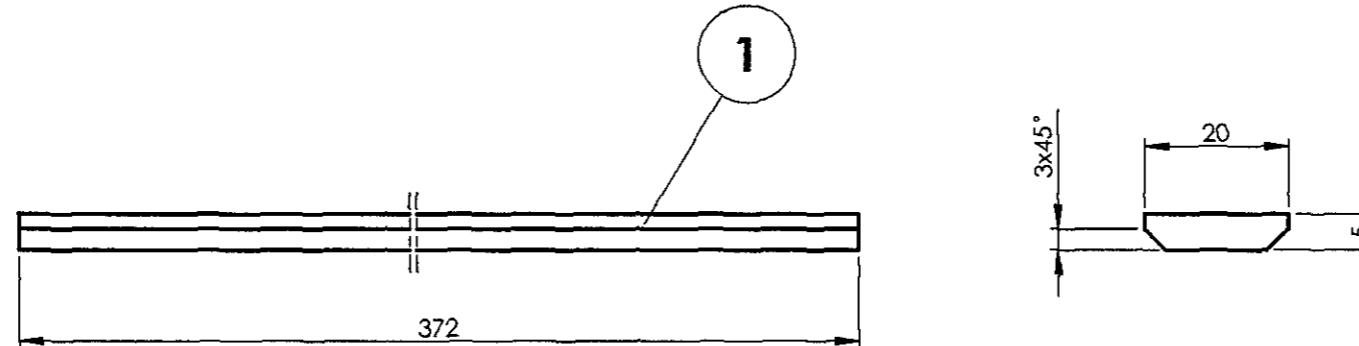
	17-07-2018	
DATE OF LATEST ALT.	DATE OF FIRST ISSUE	AME/SME

AAG11085

▽ ROUGH MACHINED	① ROUGH CLEANED
▽▽ FINISH MACHINED	①b BURRS REMOVED
▽▽▽ FINE FINISH MACHINED	①B CHAMFERED

REVISIONS

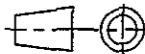
ALT.	ZONE	DESCRIPTION	APPROVED & DATE
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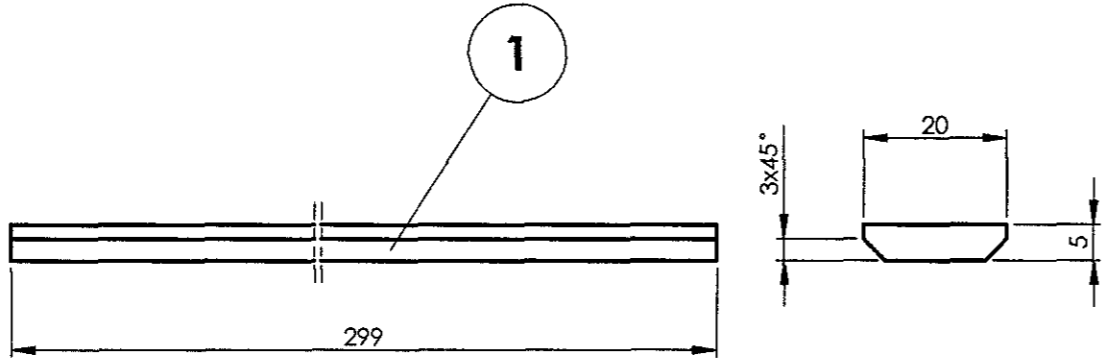


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WEIGHT GIVEN IN DRAWING IS FOR INDICATIVE PURPOSE ONLY

REF.DRG.NO.

DATE OF LATEST ALT.	17-08-2019	AME/SME
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1	FLAT	5x20x372	1		RDSO/SPEC C-K201 X2CrNi12	0.27	
QTY	DESCRIPTION	DIMENSIONS	ITEM NO.	REF. DRGS	MATL.SPEC.	WT/UNIT IN KGS	REMARKS
GROUP: 1-1		SURFACE AREA IN Sq.m.:			WT/ASSY IN Kgs:		
FLAT					SCALE	SSE/D	P. Sengupta
					1:1	CHD	elangop
					ALT.	ALTD	-
						DRN	SARAVANAN B
INDIAN RAILWAY STANDARDS				SHEET 1 OF 1			
INTEGRAL COACH FACTORY, CHENNAI - 600038					AAG11085		A3

1		2		3		4		5		6		7		8																																																																										
AAG11086				▽ ROUGH MACHINED		① ROUGH CLEANED		REVISIONS																																																																																
				▽▽ FINISH MACHINED		①B BURRS REMOVED		ALT.		ZONE		DESCRIPTION		APPROVED & DATE																																																																										
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<table><tr><td>1</td><td>FLAT</td><td>5x20x299</td><td>1</td><td></td><td>RDSO/SPEC C-K201 X2CrNi12</td><td>0.22</td><td></td></tr><tr><td>QTY</td><td>DESCRIPTION</td><td>DIMENSIONS</td><td>ITEM NO.</td><td>REF. DRGS</td><td>MATL.SPEC.</td><td>WT/UNIT IN KGS</td><td>REMARKS</td></tr><tr><td colspan="5">GROUP: 1-1</td><td colspan="2">SURFACE AREA IN Sq.m.:</td><td>WT/ASSY IN Kgs:</td></tr><tr><td colspan="5" rowspan="4">FLAT</td><td>SCALE</td><td>SSE/D</td><td rowspan="2">P. Chango elangap</td></tr><tr><td>1:1</td><td>CHD</td></tr><tr><td>ALT.</td><td>ALTD</td><td>-</td></tr><tr><td></td><td>DRN</td><td>SARAVANAN B</td></tr><tr><td colspan="5">INDIAN RAILWAY STANDARDS</td><td colspan="2">SHEET 1 OF 1</td><td></td></tr><tr><td colspan="5">INTEGRAL COACH FACTORY, CHENNAI - 600088</td><td colspan="2"></td><td></td></tr><tr><td colspan="2">REF.DRG.NO.</td><td>DATE OF LATEST ALT.</td><td>DATE OF FIRST ISSUE</td><td>AME/SME</td><td colspan="3">AAG11086</td><td>A3</td></tr><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td></tr></table>																1	FLAT	5x20x299	1		RDSO/SPEC C-K201 X2CrNi12	0.22		QTY	DESCRIPTION	DIMENSIONS	ITEM NO.	REF. DRGS	MATL.SPEC.	WT/UNIT IN KGS	REMARKS	GROUP: 1-1					SURFACE AREA IN Sq.m.:		WT/ASSY IN Kgs:	FLAT					SCALE	SSE/D	P. Chango elangap	1:1	CHD	ALT.	ALTD	-		DRN	SARAVANAN B	INDIAN RAILWAY STANDARDS					SHEET 1 OF 1			INTEGRAL COACH FACTORY, CHENNAI - 600088								REF.DRG.NO.		DATE OF LATEST ALT.	DATE OF FIRST ISSUE	AME/SME	AAG11086			A3	1	2	3	4	5	6	7	8
1	FLAT	5x20x299	1		RDSO/SPEC C-K201 X2CrNi12	0.22																																																																																		
QTY	DESCRIPTION	DIMENSIONS	ITEM NO.	REF. DRGS	MATL.SPEC.	WT/UNIT IN KGS	REMARKS																																																																																	
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AAG11088		▽ ROUGH MACHINED		① ROUGH CLEANED	REVISIONS				
		▽▽ FINISH MACHINED		①b BURRS REMOVED	ALT.	ZONE	DESCRIPTION	APPROVED & DATE	
		▽▽▽ FINE FINISH MACHINED		⑱ CHAMFERED					

1

235

20

5

3x45°

ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE SPECIFIED. FOR UNTOLERANCED DIMENSIONS AND ROUGHNESS VALUES, REFER DRAWING NO ICF/STD-9-0-001. ANY MANUAL ALTERATION SHALL AUTOMATICALLY RENDER THIS DRAWING INVALID. WELDING SYMBOLS ARE AS PER IS: 813-1986. WEIGHT GIVEN IN DRAWING IS FOR INDICATIVE PURPOSE ONLY

1	FLAT	5x20x235	1		RDSO/SPEC C-K201 X2CrNi12	0.17	
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GROUP: 1-1		SURFACE AREA IN Sq.m.:			WT/ASSY IN Kgs:		
FLAT					SCALE	SSE/D	P. Sango
					1:1	CHD	elangop
					ALT.	ALTD	-
					DRN	SARAVANAN B	
INDIAN RAILWAY STANDARDS					SHEET 1 OF 1		
INTEGRAL COACH FACTORY, CHENNAI - 600038							
REF.DRG.NO.		17-08-2019	For		AAG11088		A3
DATE OF LATEST ALT.	DATE OF FIRST ISSUE	AME/SME					

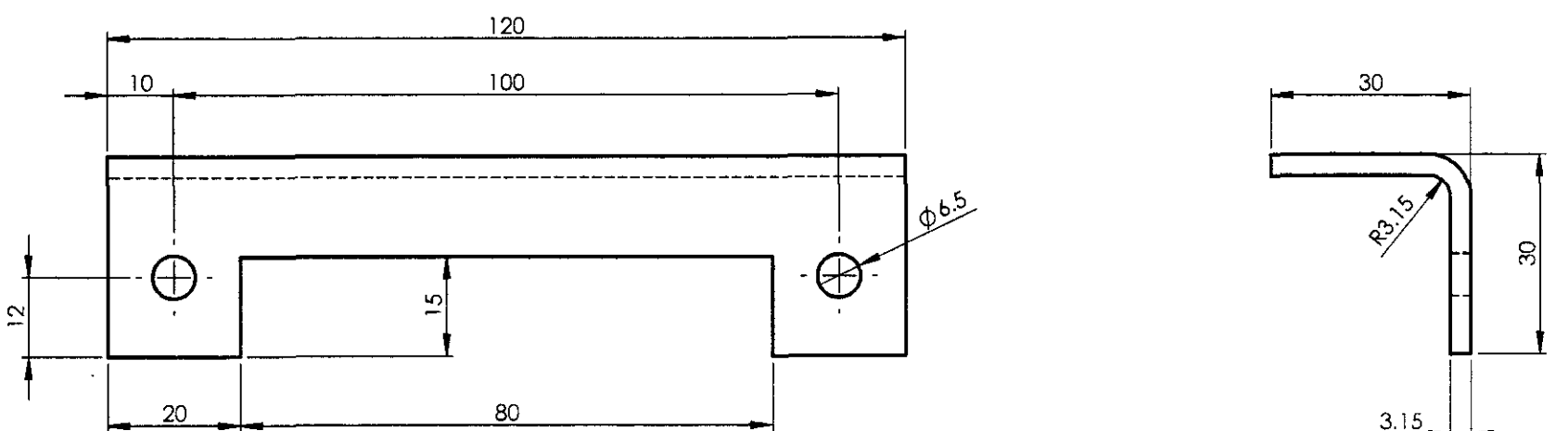
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AAG11089				▽ ROUGH MACHINED		① ROUGH CLEANED		REVISIONS																							
				▽▽ FINISH MACHINED		①b BURRS REMOVED		ALT.		ZONE		DESCRIPTION			APPROVED & DATE																
				▽▽▽ FINE FINISH MACHINED		①8 CHAMFERED																									
<div><p>ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE SPECIFIED. FOR UNTOLERANCED DIMENSIONS AND ROUGHNESS VALUES, REFER DRAWING NO ICF/STD-9-Q-001. ANY MANUAL ALTERATION SHALL AUTOMATICALLY RENDER THIS DRAWING INVALID. WELDING SYMBOLS ARE AS PER IS: 813-1986. WEIGHT GIVEN IN DRAWING IS FOR INDICATIVE PURPOSE ONLY</p><p>Ø7.8 HOLES</p><p>1</p></div>																															
1		CLOSING SHEET		2x339x372		1				RDSO/SPEC C-K201 X2CrNi12		2.01																			
QTY		DESCRIPTION		DIMENSIONS		ITEM NO.		REF. DRGS		MATL.SPEC.		WT/UNIT IN KGS		REMARKS																	
GROUP: 1-1				SURFACE AREA IN Sq.m.:				WT/ASSY IN Kgs:																							
CLOSING SHEET										SCALE		SSE/D		P. elangop																	
										1:5		CHD																			
										ALT.		ALTD		-																	
										DRN		SARAVANAN B																			
INDIAN RAILWAY STANDARDS										SHEET 1 OF 1		AAG11089				A3															
INTEGRAL COACH FACTORY, CHENNAI - 600038																															
REF.DRG.NO.		DATE OF LATEST ALT.		DATE OF FIRST ISSUE		AME/SME																									
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AAG11090				▽ ROUGH MACHINED		① ROUGH CLEANED		REVISIONS																																																															
				▽▽ FINISH MACHINED		①b BURRS REMOVED		ALT.		ZONE		DESCRIPTION			APPROVED & DATE																																																								
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<table><tr><td>1</td><td>CLOSING SHEET</td><td>2x339x372</td><td>1</td><td></td><td>RDSO/SPEC C-K201 X2CrNi12</td><td>1.69</td><td></td></tr><tr><td>QTY</td><td>DESCRIPTION</td><td>DIMENSIONS</td><td>ITEM NO.</td><td>REF. DRGS</td><td>MATL.SPEC.</td><td>WT/UNIT IN KGS</td><td>REMARKS</td></tr><tr><td colspan="5">GROUP: 1-1</td><td colspan="2">SURFACE AREA IN Sq.m.:</td><td>WT/ASSY IN Kgs:</td></tr><tr><td colspan="5" rowspan="4">CLOSING SHEET</td><td>SCALE</td><td>SSE/D</td><td><i>H. elangop</i></td></tr><tr><td>1:5</td><td>CHD</td><td>elangop</td></tr><tr><td>ALT.</td><td>ALTD</td><td>-</td></tr><tr><td>DRN</td><td>SARAVANAN B</td></tr><tr><td colspan="5">INDIAN RAILWAY STANDARDS</td><td colspan="2">SHEET 1 OF 1</td><td></td></tr><tr><td colspan="5">INTEGRAL COACH FACTORY, CHENNAI - 600038</td><td colspan="2">AAG11090</td><td>A3</td></tr></table>																1	CLOSING SHEET	2x339x372	1		RDSO/SPEC C-K201 X2CrNi12	1.69		QTY	DESCRIPTION	DIMENSIONS	ITEM NO.	REF. DRGS	MATL.SPEC.	WT/UNIT IN KGS	REMARKS	GROUP: 1-1					SURFACE AREA IN Sq.m.:		WT/ASSY IN Kgs:	CLOSING SHEET					SCALE	SSE/D	<i>H. elangop</i>	1:5	CHD	elangop	ALT.	ALTD	-	DRN	SARAVANAN B	INDIAN RAILWAY STANDARDS					SHEET 1 OF 1			INTEGRAL COACH FACTORY, CHENNAI - 600038					AAG11090		A3
1	CLOSING SHEET	2x339x372	1		RDSO/SPEC C-K201 X2CrNi12	1.69																																																																	
QTY	DESCRIPTION	DIMENSIONS	ITEM NO.	REF. DRGS	MATL.SPEC.	WT/UNIT IN KGS	REMARKS																																																																
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INDIAN RAILWAY STANDARDS					SHEET 1 OF 1																																																																		
INTEGRAL COACH FACTORY, CHENNAI - 600038					AAG11090		A3																																																																
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DATE OF LATEST ALT.		DATE OF FIRST ISSUE		AME/SME																																																																			
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A		B		C		D		E		F																																																													

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AAG11091				▽ ROUGH MACHINED		① ROUGH CLEANED		REVISIONS							
				▽▽ FINISH MACHINED		①b BURRS REMOVED		ALT.		ZONE		DESCRIPTION		APPROVED & DATE	
				▽▽▽ FINE FINISH MACHINED		⑱ CHAMFERED									
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INTEGRAL COACH FACTORY, CHENNAI - 600038															
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AAG11151				▽ ROUGH MACHINED		① ROUGH CLEANED		REVISIONS								
				▽▽ FINISH MACHINED		② BURRS REMOVED		ALT.		ZONE		DESCRIPTION			APPROVED & DATE	
				▽▽▽ FINE FINISH MACHINED		③ CHAMFERED										
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AAG11543				▽ ROUGH MACHINED		① ROUGH CLEANED		REVISIONS							
				▽▽ FINISH MACHINED		①b BURRS REMOVED		ALT.		ZONE		DESCRIPTION		APPROVED & DATE	
				▽▽▽ FINE FINISH MACHINED		①8 CHAMFERED		a				CUTAWAY REVISED.		ghe	
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DATE OF LATEST ALT. DATE OF FIRST ISSUE A/E/SME															
1 SS FLOOR SHEET2.5x440x27201RDSO SPEC C-K201 X2 Cr Ni 1217.58															
QTY DESCRIPTION DIMENSIONS ITEM NO. REF. DRGS MATL.SPEC. WT/UNIT IN KGS REMARKS															
GROUP: 1-1 Under Frame SURFACE AREA IN Sq.m.: WT/ASSY IN Kgs:															
SS FLOOR SHEET															
SCALE 1:10 SSE/D C-ID P. Vargo															
ALT. a ALT D M.SIVAKUMAR															
DRN B.SARAVANAN															
INDIAN RAILWAY STANDARDS															
INTEGRAL COACH FACTORY, CHENNAI - 600038															
SHEET 1 OF 1															
AAG11543 A3															
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AAH11887				▽ ROUGH MACHINED		⊖ ROUGH CLEANED		REVISIONS																							
				▽▽ FINISH MACHINED		⊖⊖ BURRS REMOVED		ALT.		ZONE		DESCRIPTION		APPROVED & DATE																	
				▽▽▽ FINE FINISH MACHINED		⊖⊖⊖ CHAMFERED																									
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REF.DRG.NO.-		DATE OF LATEST ALT.		DATE OF FIRST ISSUE		AME/SME		INDIAN RAILWAY STANDARDS INTEGRAL COACH FACTORY, CHENNAI - 600038								SHEET 1 OF 1		AAH11887		A3											

AAJ11599

▽ ROUGH MACHINED

▽▽ FINISH MACHINED

▽▽▽ FINE FINISH MACHINED

⊖1 ROUGH CLEANED

⊖10 BURRS REMOVED

⊖15 CHAMFERED

ALT.

ZONE

DESCRIPTION

APPROVED & DATE

45°

6

2

45°

2

40

170

1

1

FLAT

6x40x170

1

RDSO SPEC C-K201 X2 Cr Ni 12

0.32

QTY.

DESCRIPTION

DIMENSIONS

ITEM NO.

REF. DRGS

MATL.SPEC.

WT/UNIT IN KGS

REMARKS

GROUP: 1-1 Under Frame

SURFACE AREA IN Sq.m.:

WT/ASSY IN Kgs:

FLAT

SCALE 1:1

SSE/D CHD

ALT. ALTD

DRN

M.SIVAKUMAR

INDIAN RAILWAY STANDARDS

INTEGRAL COACH FACTORY, CHENNAI - 600038

SHEET 1 OF 1

AAJ11599

A3

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03-2025

DATE OF LATEST ALT

DATE OF FIRST ISSUE

AME/SME

REF.DRG.NO.-

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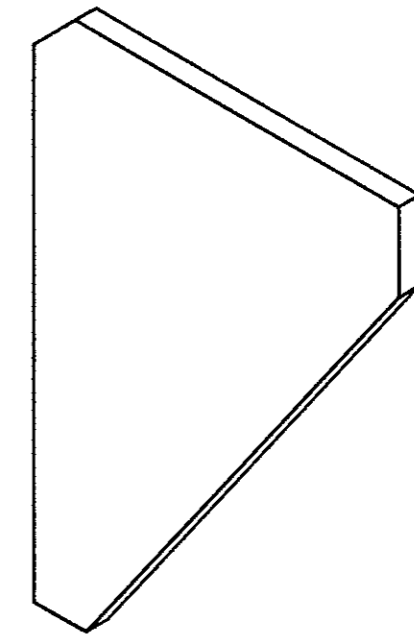
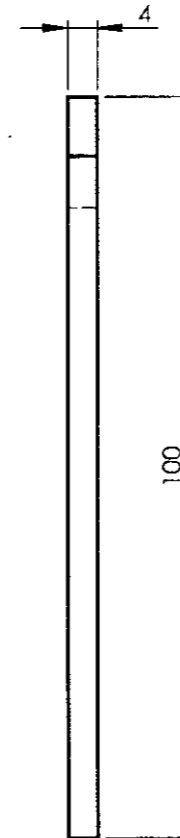
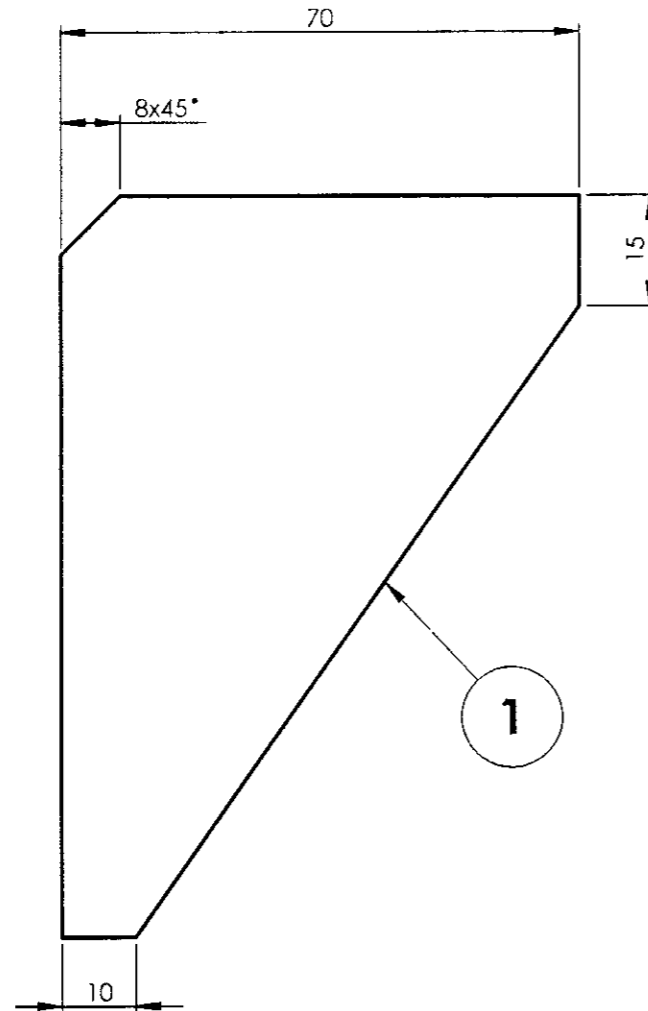
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AAJ11600				▽ ROUGH MACHINED		① ROUGH CLEANED		REVISIONS																																																																																																							
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<div><div>247.5</div><div>1</div><div>R2.5</div><div>2.5</div><div>25</div><div>350</div></div>																																																																																																															
<table><tr><td>1</td><td>ANGLE</td><td>2.5x25x592</td><td>1</td><td></td><td>RDSO SPEC C-K201 X2 Cr Ni 12</td><td>0.30</td><td></td></tr><tr><td>QTY.</td><td>DESCRIPTION</td><td>DIMENSIONS</td><td>ITEM NO.</td><td>REF. DRGS</td><td>MATL.SPEC.</td><td>WT/UNIT IN KGS</td><td>REMARKS</td></tr><tr><td colspan="4">GROUP: 1-1 Under Frame</td><td colspan="2">SURFACE AREA IN Sq.m.:</td><td colspan="2">WT/ASSY IN Kgs:</td></tr><tr><td colspan="6" rowspan="4">ANGLE</td><td>SCALE</td><td>SSE/D</td><td rowspan="2">P. Sange</td></tr><tr><td>1:2</td><td>CHD</td></tr><tr><td>ALT.</td><td>ALTD</td><td rowspan="2">M.SIVAKUMAR</td></tr><tr><td></td><td>DRN</td></tr><tr><td colspan="6">INDIAN RAILWAY STANDARDS</td><td colspan="2">SHEET 1 OF 1</td><td colspan="2">AAJ11600</td><td colspan="2">A3</td></tr><tr><td colspan="6">INTEGRAL COACH FACTORY, CHENNAI - 600038</td><td colspan="6"></td></tr><tr><td colspan="2">REF.DRG.NO.-</td><td colspan="2">08-03-2025</td><td colspan="2">AME/SME</td><td colspan="10"></td></tr><tr><td colspan="2">DATE OF LATEST ALT.</td><td colspan="2">DATE OF FIRST ISSUE</td><td colspan="2">AME/SME</td><td colspan="10"></td></tr></table>																1	ANGLE	2.5x25x592	1		RDSO SPEC C-K201 X2 Cr Ni 12	0.30		QTY.	DESCRIPTION	DIMENSIONS	ITEM NO.	REF. DRGS	MATL.SPEC.	WT/UNIT IN KGS	REMARKS	GROUP: 1-1 Under Frame				SURFACE AREA IN Sq.m.:		WT/ASSY IN Kgs:		ANGLE						SCALE	SSE/D	P. Sange	1:2	CHD	ALT.	ALTD	M.SIVAKUMAR		DRN	INDIAN RAILWAY STANDARDS						SHEET 1 OF 1		AAJ11600		A3		INTEGRAL COACH FACTORY, CHENNAI - 600038												REF.DRG.NO.-		08-03-2025		AME/SME												DATE OF LATEST ALT.		DATE OF FIRST ISSUE		AME/SME											
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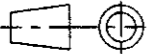
AAJ11618

▽ ROUGH MACHINED	⊖ ROUGH CLEANED
▽▽ FINISH MACHINED	⊖⊖ BURRS REMOVED
▽▽▽ FINE FINISH MACHINED	⊖⊖⊖ CHAMFERED

REVISIONS			
ALT.	ZONE	DESCRIPTION	APPROVED & DATE



ISOMETRIC VIEW

1	GUSSET	4x70x100	1		IRS M-41-97	0.14	
QTY	DESCRIPTION	DIMENSIONS	ITEM NO.	REF. DRGS	MATL.SPEC.	WT/UNIT IN KGS	REMARKS
GROUP: 1-1 Under Frame		SURFACE AREA IN Sq.m.:			WT/ASSY IN Kgs:		
GUSSET					SCALE	SS-1/1	
					1:1	CHD	
					ALT.	ALTD	
						DRN	K.Sethuraman
INDIAN RAILWAY STANDARDS INTEGRAL COACH FACTORY, CHENNAI - 600038							
						SHEET 1 OF 1	
					AAJ11618		A3

ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE SPECIFIED. FOR UNTOLERANCED DIMENSIONS AND ROUGHNESS VALUES, REFER DRAWING NO ICF/STD-9-0-001.
ANY MANUAL ALTERATION SHALL AUTOMATICALLY RENDER THIS DRAWING INVALID. WELDING SYMBOLS ARE AS PER EN ISO 2553
WEIGHT GIVEN IN DRAWING IS FOR INDICATIVE PURPOSE ONLY

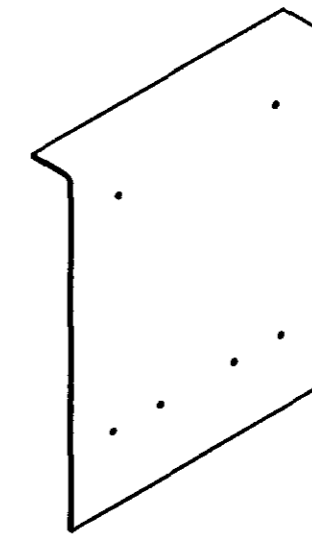
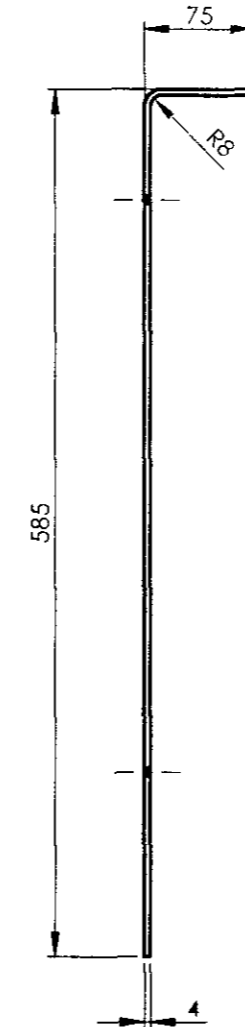
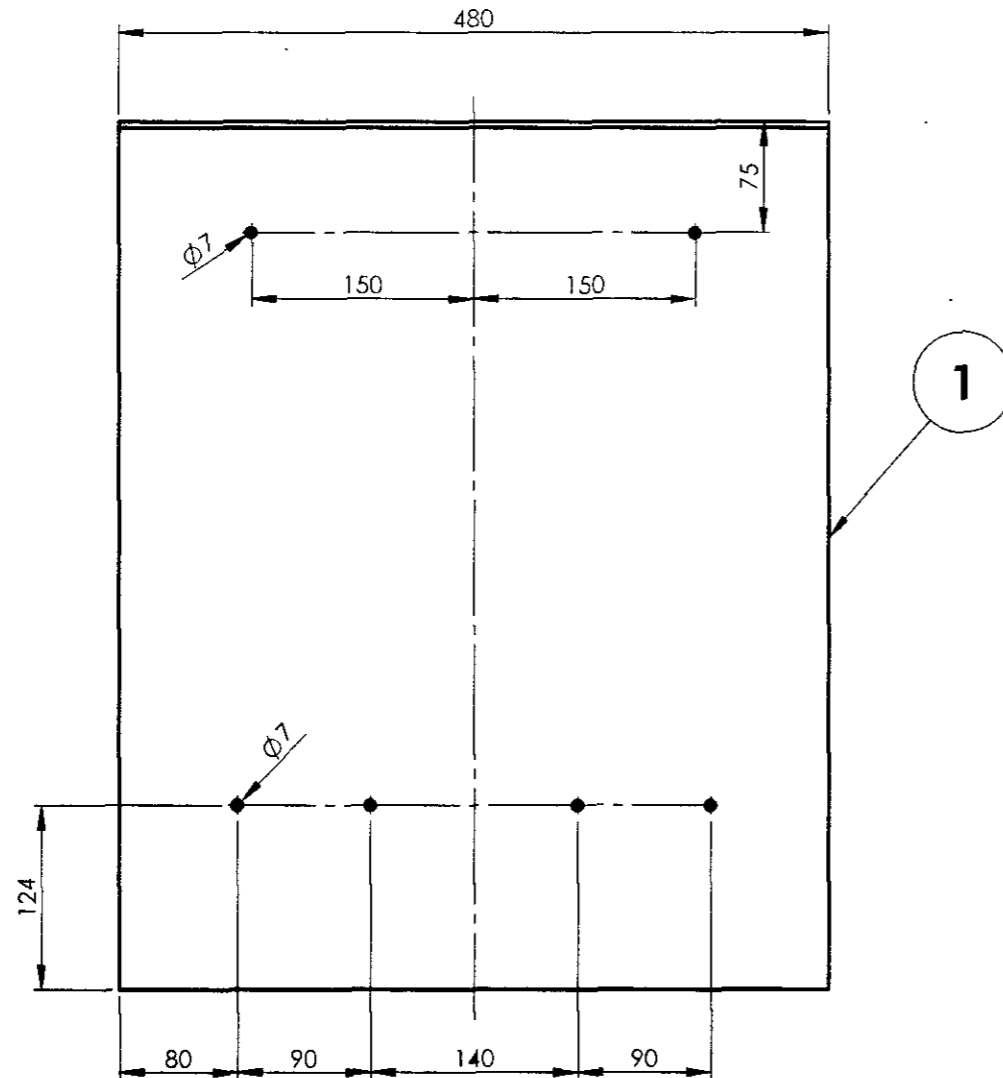
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	18-04-2025	<i>Alloy Co</i>
DATE OF LATEST ALT.	DATE OF FIRST ISSUE	AME/SME


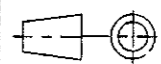
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▽ ROUGH MACHINED	⑪ ROUGH CLEANED
▽▽ FINISH MACHINED	⑪b BURRS REMOVED
▽▽▽ FINE FINISH MACHINED	⑪c CHAMFERED

REVISIONS			
ALT.	ZONE	DESCRIPTION	APPROVED & DATE



ISOMETRIC VIEW

1	SUPPORT	4x480x652	1		IRS M-41-97	9.82	
QTY	DESCRIPTION	DIMENSIONS	ITEM NO.	REF. DRGS	MATL.SPEC.	WT/UNIT IN KGS	REMARKS
GROUP: 1-1 Under Frame		SURFACE AREA IN Sq.m.:			WT/ASSY IN Kgs:		
SUPPORT					SCALE	SSE/D	
					1:5	CHD	
					ALT.	ALTD	K.Sethuraman
						DRN	
INDIAN RAILWAY STANDARDS INTEGRAL COACH FACTORY, CHENNAI - 600038				SHEET 1 OF 1			A3
					AAJ11622		

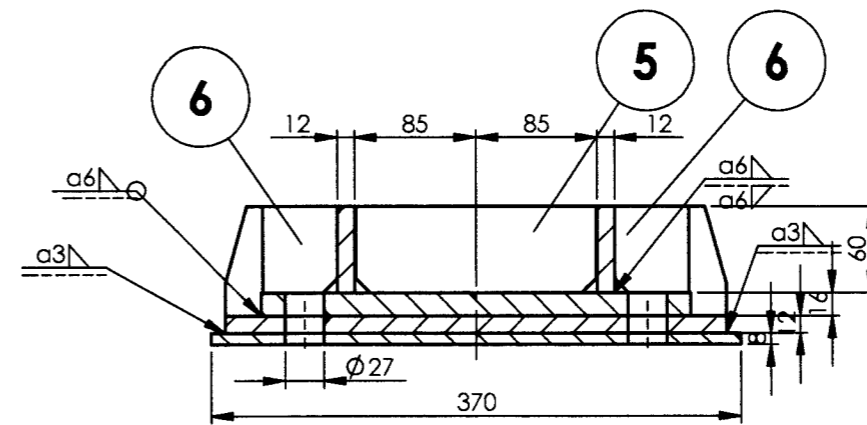
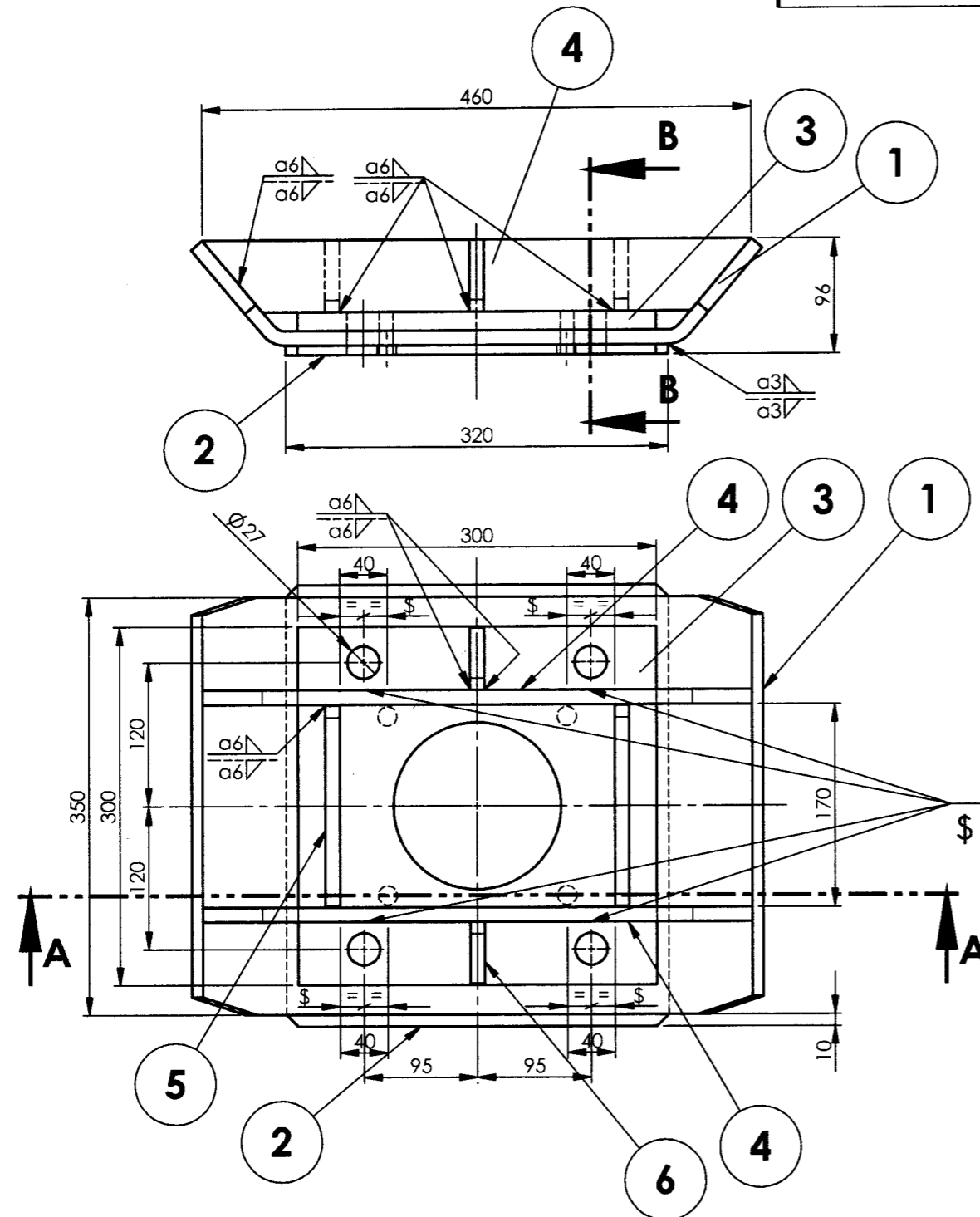
1		2		3		4		5		6		7		8																																																																							
AAJ11623				▽ ROUGH MACHINED		① ROUGH CLEANED		REVISIONS																																																																													
				▽▽ FINISH MACHINED		①b BURRS REMOVED		ALT.		ZONE		DESCRIPTION			APPROVED & DATE																																																																						
				▽▽▽ FINE FINISH MACHINED		①b CHAMFERED																																																																															
<div><div><p>ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE SPECIFIED. FOR UNTOLERANCED DIMENSIONS AND ROUGHNESS VALUES, REFER DRAWING NO ICF/STD-9-0-001. ANY MANUAL ALTERATION SHALL AUTOMATICALLY RENDER THIS DRAWING INVALID. WELDING SYMBOLS ARE AS PER EN ISO 2553. WEIGHT GIVEN IN DRAWING IS FOR INDICATIVE PURPOSE ONLY</p></div><div><p>ISOMETRIC VIEW</p></div></div>																																																																																					
<table><tr><td>1</td><td>RIB</td><td>4x150x585</td><td>1</td><td></td><td>IRS M-41-97</td><td>2.11</td><td></td></tr><tr><td>QTY</td><td>DESCRIPTION</td><td>DIMENSIONS</td><td>ITEM NO.</td><td>REF. DRGS</td><td>MATL.SPEC.</td><td>WT/UNIT IN KGS</td><td>REMARKS</td></tr><tr><td colspan="4">GROUP: 1-1 Under Frame</td><td colspan="2">SURFACE AREA IN Sq.m.:</td><td colspan="2">WT/ASSY IN Kgs:</td></tr><tr><td colspan="5" rowspan="4">RIB</td><td>SCALE</td><td>SSE/D</td><td rowspan="2"><i>Slango</i></td></tr><tr><td>1:5</td><td>CHD</td></tr><tr><td>ALT.</td><td>ALTD</td><td rowspan="2">K.Sethuraman</td></tr><tr><td></td><td>DRN</td></tr><tr><td colspan="4">INDIAN RAILWAY STANDARDS</td><td colspan="2">SHEET 1 OF 1</td><td colspan="2">AAJ11623 A3</td></tr><tr><td colspan="4">INTEGRAL COACH FACTORY, CHENNAI - 600038</td><td colspan="2"></td><td colspan="2"></td></tr><tr><td colspan="2">REF.DRG.NO.</td><td>18-04-2025</td><td><i>Alkayla</i></td><td colspan="4"></td></tr><tr><td>DATE OF LATEST ALT.</td><td>DATE OF FIRST ISSUE</td><td>AME/SME</td><td colspan="4"></td></tr></table>																1	RIB	4x150x585	1		IRS M-41-97	2.11		QTY	DESCRIPTION	DIMENSIONS	ITEM NO.	REF. DRGS	MATL.SPEC.	WT/UNIT IN KGS	REMARKS	GROUP: 1-1 Under Frame				SURFACE AREA IN Sq.m.:		WT/ASSY IN Kgs:		RIB					SCALE	SSE/D	<i>Slango</i>	1:5	CHD	ALT.	ALTD	K.Sethuraman		DRN	INDIAN RAILWAY STANDARDS				SHEET 1 OF 1		AAJ11623 A3		INTEGRAL COACH FACTORY, CHENNAI - 600038								REF.DRG.NO.		18-04-2025	<i>Alkayla</i>					DATE OF LATEST ALT.	DATE OF FIRST ISSUE	AME/SME				
1	RIB	4x150x585	1		IRS M-41-97	2.11																																																																															
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SSA11033

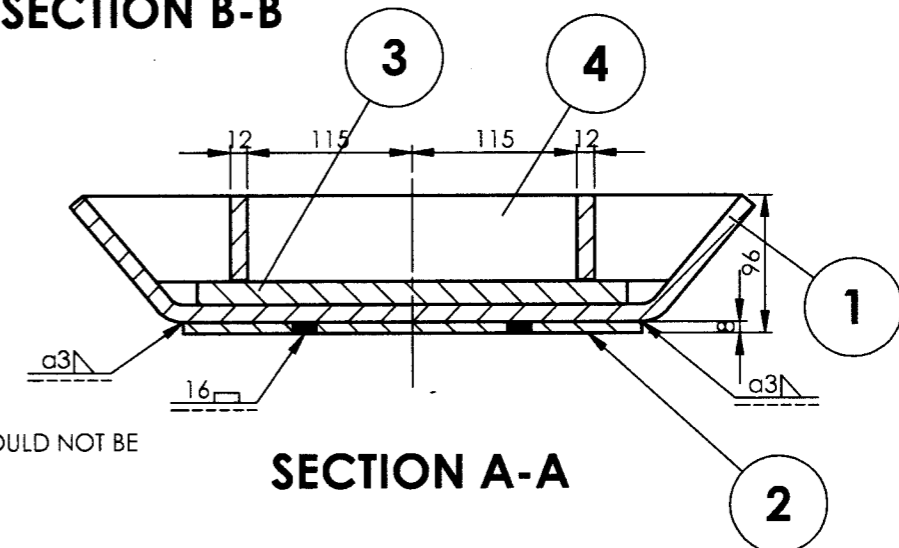
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▽▽ FINISH MACHINED	② BURRS REMOVED
▽▽▽ FINE FINISH MACHINED	③ CHAMFERED

REVISIONS

ALT.	ZONE	DESCRIPTION	APPROVED & DATE
a		MATL. SPEC. UPDATED FOR ITEMS-1 TO 4.	<i>Sh</i>



SECTION B-B



SECTION A-A

2	RIB		6	AAB11796		0.29	
2	RIB		5	AAB11795		0.94	
2	CLOSING PIECE		4	AAA11026		2.317	
1	THICKENER		3	AAA11025		9.371	
1	BEARING PIECE		2	AAA11024		6.41	
1	BASE PLATE		1	AAA11027		16.14	
Default	DESCRIPTION	DIMENSIONS	ITEM NO.	REF.DRGS.	MATL	WT/UNIT IN KGS	REMARKS

GROUP: 1-1 Under Frame

SURFACE AREA IN Sq.m.:0.95

WT/ASSY IN Kgs:35.89

BASE PLATE COMPLETE

SCALE	SSE/D	<i>Sh</i>
1:5	CHD	
ALT.	ALTD	S.GANESH KUMAR
a	DRN	S.GANESH KUMAR

INDIAN RAILWAY STANDARDS

INTEGRAL COACH FACTORY, CHENNAI - 600038

SHEET
1 OF 1

DMU/DPC/SS/JK

SSA11033

A3

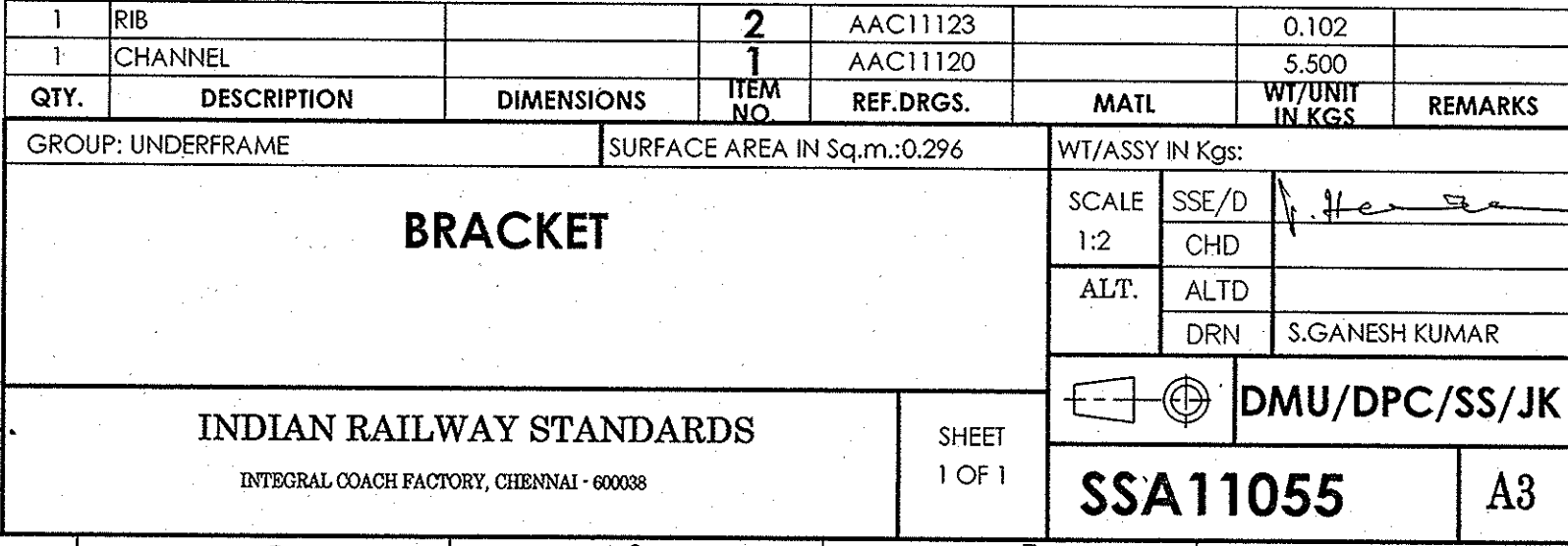
26-07-2021	22-04-2016	<i>Sh</i>
DATE OF LATEST ALT.	DATE OF FIRST ISSUE	AME/SME

REF.DRG.NO.32911021

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▽ ROUGH MACHINED	① ROUGH CLEANED
▽▽ FINISH MACHINED	② BURRS REMOVED
▽▽▽ FINE FINISH MACHINED	③ CHAMFERED

REVISIONS			
ALT.	ZONE	DESCRIPTION	APPROVED & DATE



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SSA12005

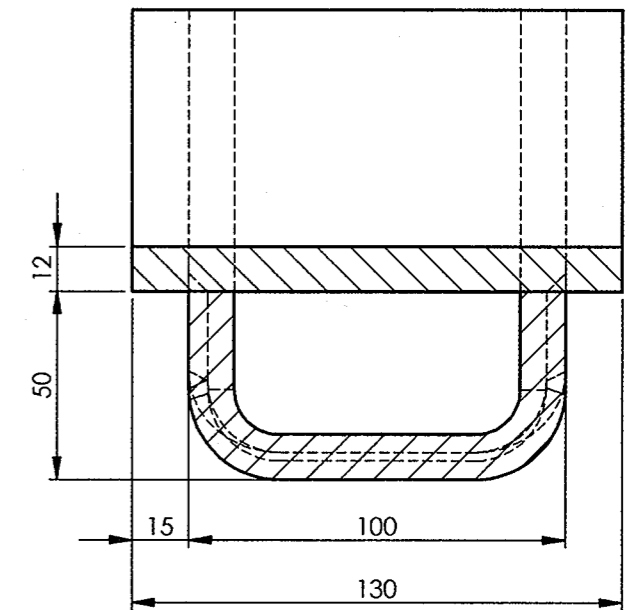
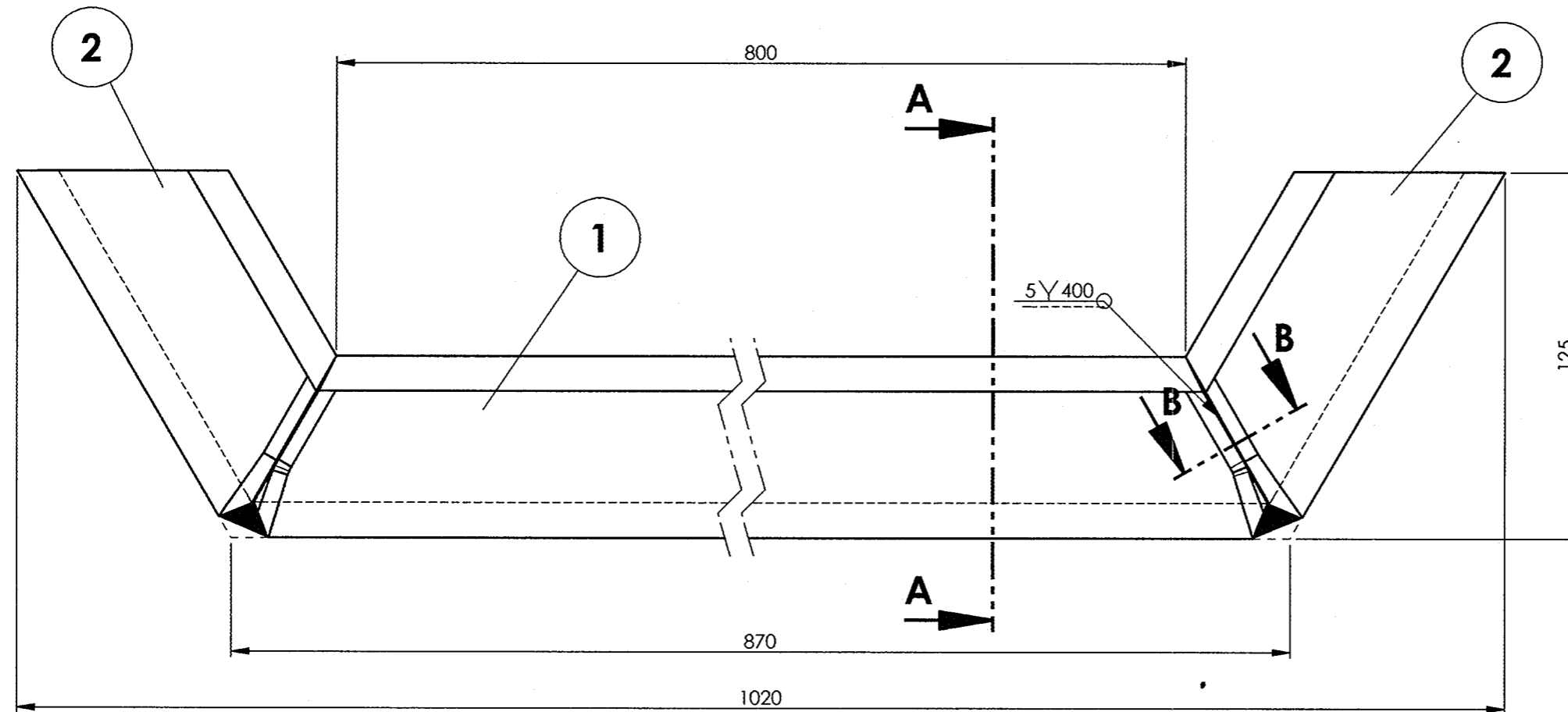
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▽▽ FINISH MACHINED	①b BURRS REMOVED
▽▽▽ FINE FINISH MACHINED	⑱ CHAMFERED

REVISIONS

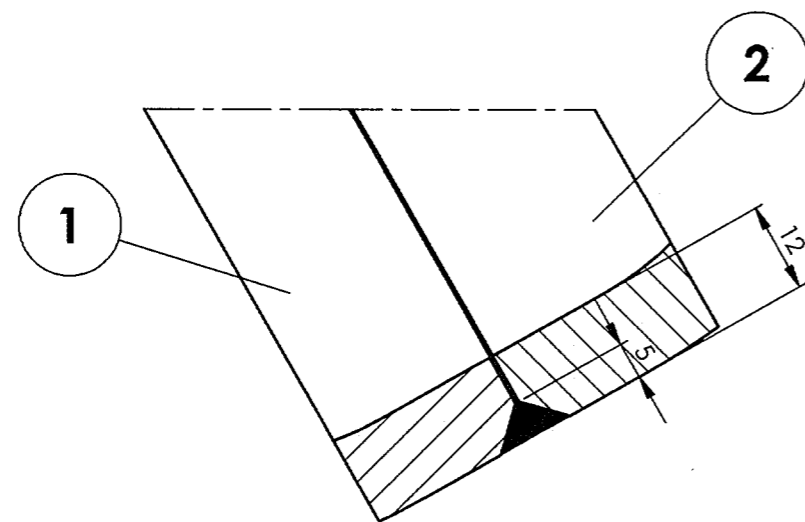
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ZONE

DESCRIPTION

APPROVED &
DATE

SECTION A-A

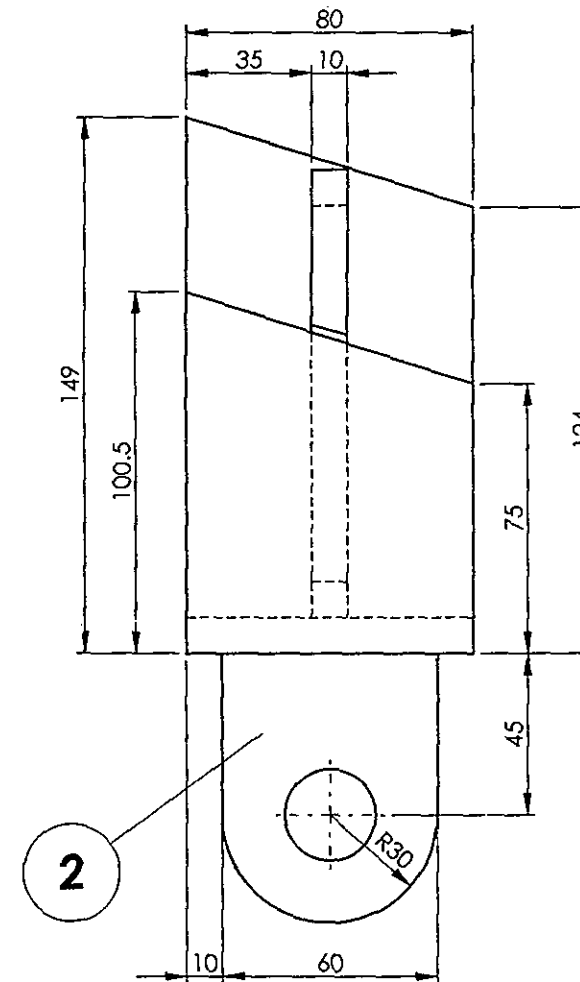
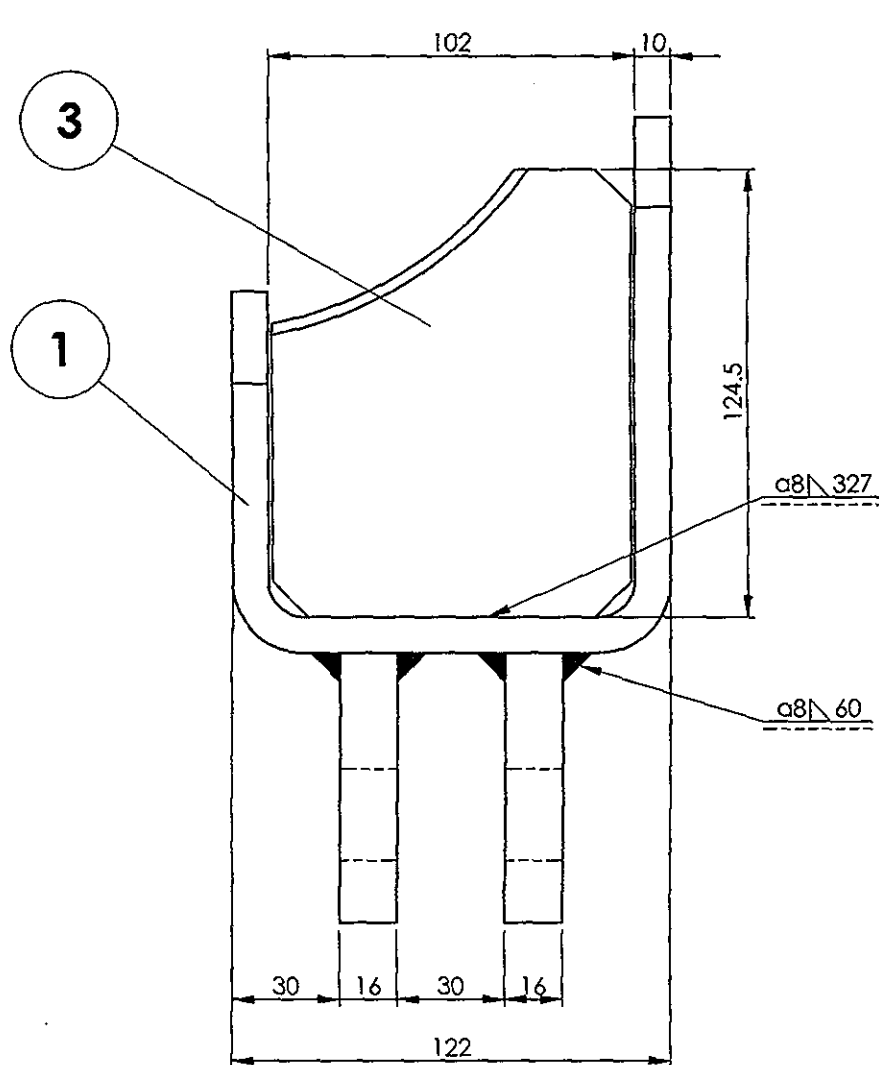
SECTION B-B
SCALE 1 : 1

2	BEAM		2	SSA12013		2.820	
1	HEAD STOCK BEAM		1	SSA12012		22.612	
QTY.	DESCRIPTION	DIMENSIONS	ITEM NO.	REF.DRGS	MATL. SPEC	WT/UNIT IN KGS	REMARKS
GROUP: HEAD STOCK		SURFACE AREA IN Sq.m.: 0.669			WT/ASSY IN Kgs: 28.252		
SUPPORTING BEAM					SCALE 1:2	SSE/D	

SSA12006

▽ ROUGH MACHINED	③ ROUGH CLEANED
▽▽ FINISH MACHINED	③b BURRS REMOVED
▽▽▽ FINE FINISH MACHINED	③ CHAMFERED

REVISIONS			
ALT.	ZONE	DESCRIPTION	APPROVED & DATE
a		DRG. REVISED.	



1	RIB		3	AAA12060		0.809	
2	LUG		2	AAA12059		0.453	
1	CHANNEL		1	AAA12058		1.968	
QTY.	DESCRIPTION	DIMENSIONS	ITEM NO.	REF.DRGS.	MATL	WT/UNIT IN KGS	REMARKS
GROUP: HEAD STOCK				SURFACE AREA IN Sq.m.:0.108		WT/ASSY IN Kgs:3.683	
BRACKET FOR CENTERING DEVICE					SCALE	SSE/D	
					1:2	CHD	
					ALT. a	ALTD	K.SETHURAMAN
INDIAN RAILWAY STANDARDS						DRN	K.Sethuraman
INTEGRAL COACH FACTORY, CHENNAI - 600038					SHEET 1 OF 1	SSA12006	
						A3	

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24.12.2011

DATE OF LATEST ALT.

DATE OF FIRST ISSUE

AME/SME

INDIAN RAILWAY STANDARDS

INTEGRAL COACH FACTORY, CHENNAI - 600038

SHEET
1 OF 1

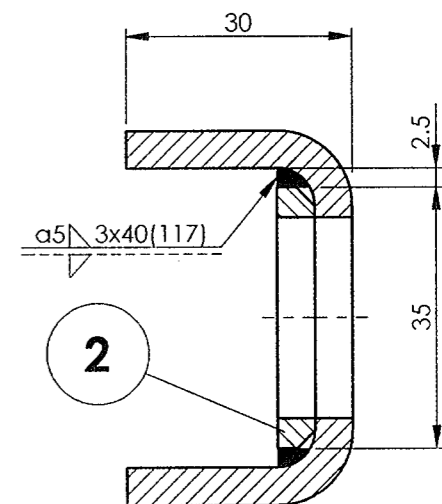
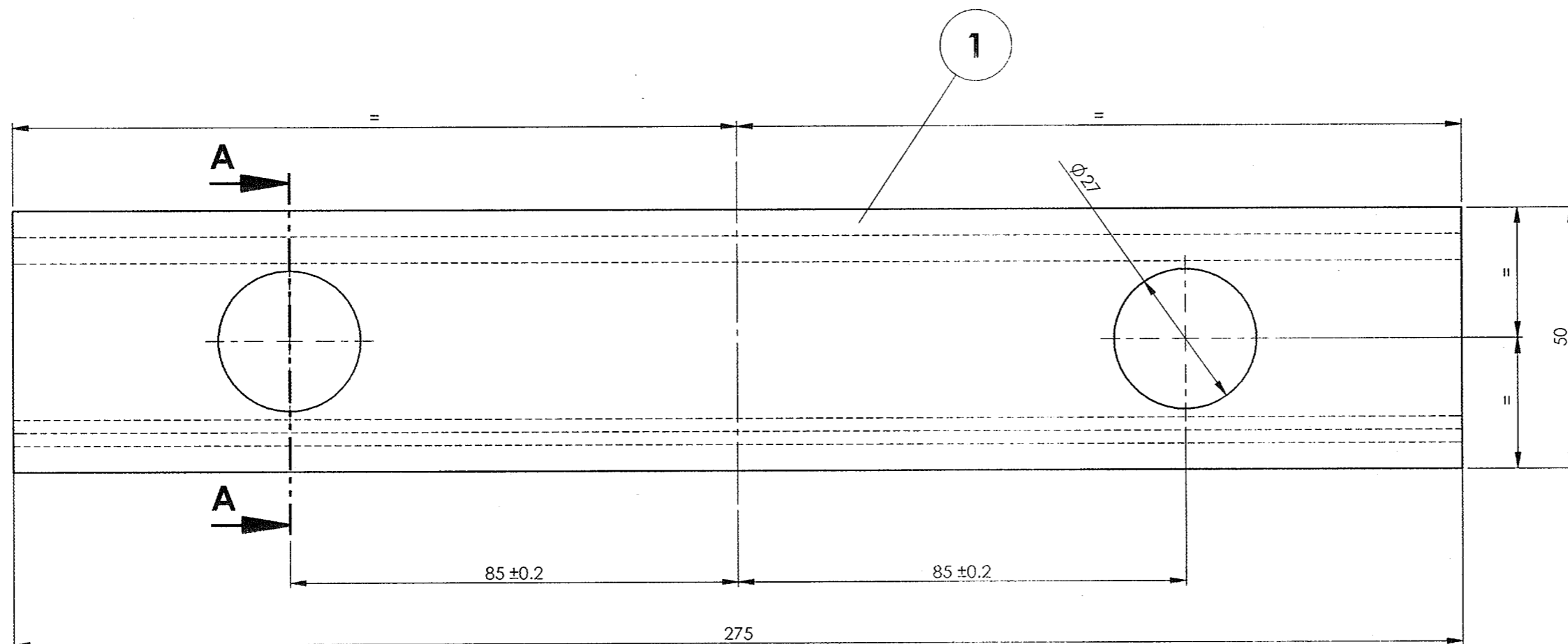
SSA12006

A3

SSA12007

▽ ROUGH MACHINED	⊙ ROUGH CLEANED
▽▽ FINISH MACHINED	⊙ BURRS REMOVED
▽▽▽ FINE FINISH MACHINED	⊙ CHAMFERED

REVISIONS				APPROVED & DATE
ALT.	ZONE	DESCRIPTION		



SECTION A-A

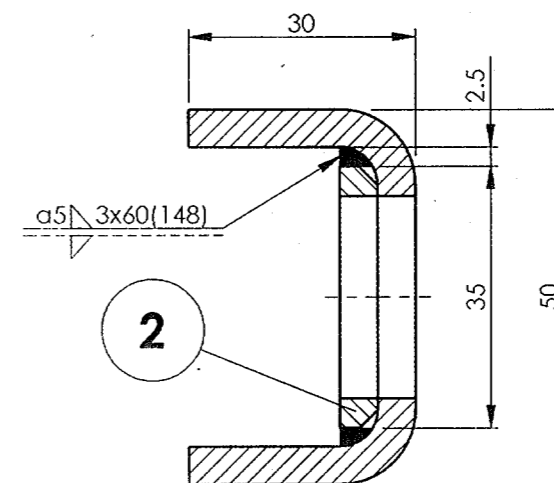
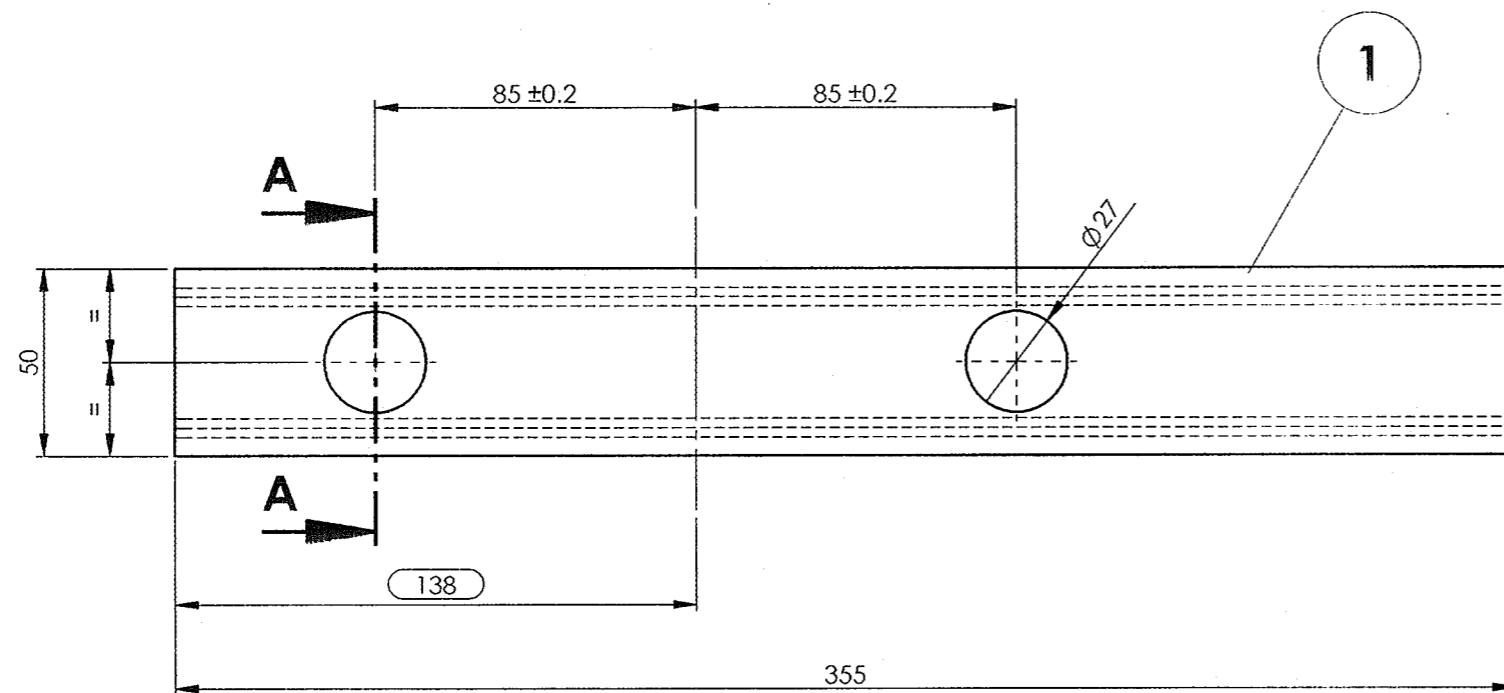
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1	INSERT		2	AAA12011	IRS M-41-1997	0.36	
1	STIFFENER		1	AAA12010	IRS M-41-1997	1.01	
QTY.	DESCRIPTION	DIMENSIONS	ITEM NO.	REF.DRGS	MATL. SPEC	WT/UNIT IN KGS	REMARKS
GROUP: HEAD STOCK				SURFACE AREA IN Sq.m.: 0.075		WT/ASSY IN Kgs: 1.329	
STIFFENER					SCALE 1:1	SSE/D	
						CHD	
					ALT.	ALTD	
						DRN	K.Sethuraman
INDIAN RAILWAY STANDARDS				SHEET 1 OF 1			
INTEGRAL COACH FACTORY, CHENNAI - 600038						SSA12007	A3
DATE OF LATEST ISSUE		DATE OF FIRST ISSUE	DY.CME/D	SME			

SSA12008

▽ ROUGH MACHINED	⊖ ROUGH CLEANED
▽▽ FINISH MACHINED	⊖ BURRS REMOVED
▽▽▽ FINE FINISH MACHINED	⊖ CHAMFERED

REVISIONS			
ALT.	ZONE	DESCRIPTION	APPROVED & DATE



SECTION A-A
SCALE 1 : 1

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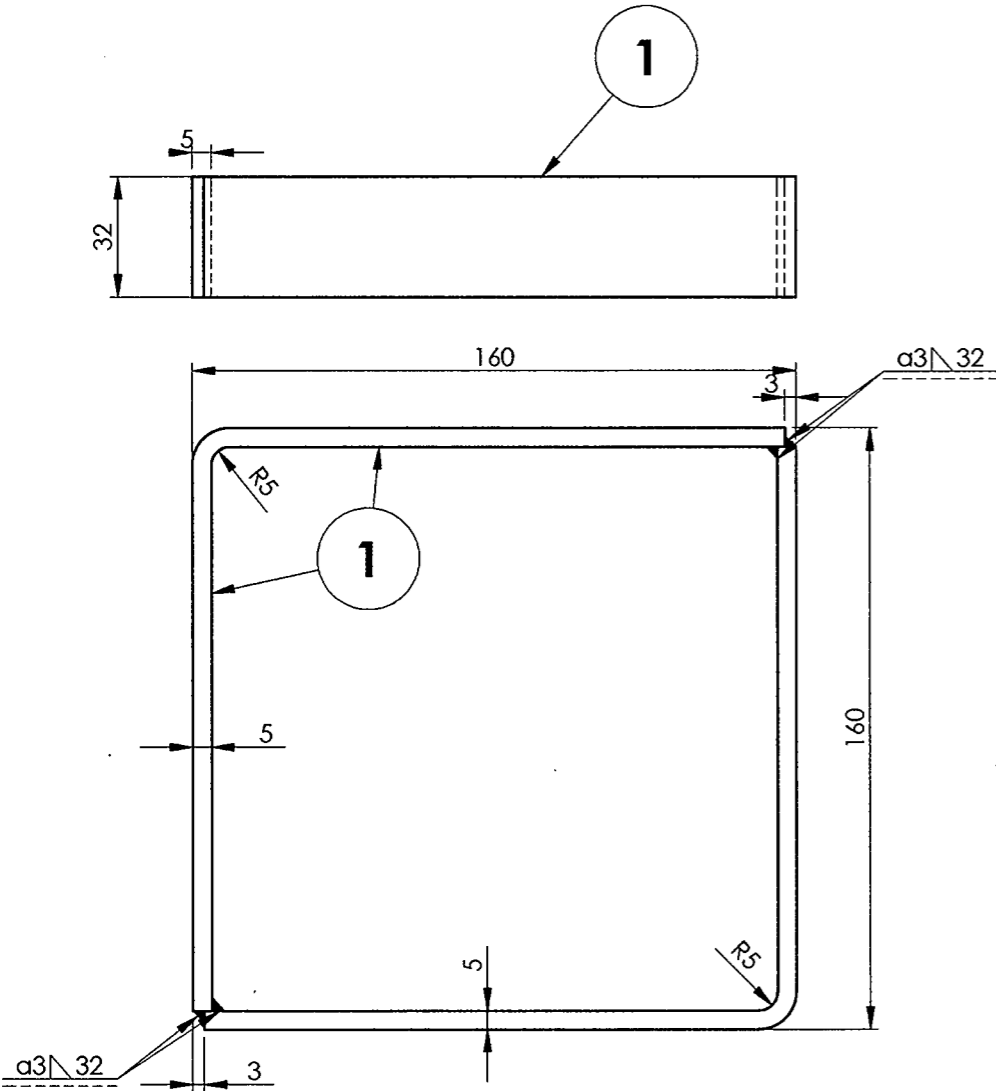
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1	STIFFENER		1	AAA12061	IRS M-41-1997	1.304	
QTY.	DESCRIPTION	DIMENSIONS	ITEM NO.	REF.DRGS	MATL. SPEC	WT/UNIT IN KGS	REMARKS
GROUP: HEAD STOCK				SURFACE AREA IN Sq.m.: 0.096		WT/ASSY IN Kgs: 1.684	
STIFFENER					SCALE 1:2	SSE/D	<i>K. Sathuraman</i>
						CHD	
					ALT.	ALTD	
						DRN	K.Sethuraman
INDIAN RAILWAY STANDARDS INTEGRAL COACH FACTORY, CHENNAI - 600038					SHEET 1 OF 1		
					SSA12008		A3

DATE OF LATEST ISSUE	DATE OF FIRST ISSUE	DY.CME/D	SME

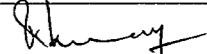
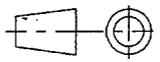
SSA13006

▽ ROUGH MACHINED	① ROUGH CLEANED
▽▽ FINISH MACHINED	①b BURRS REMOVED
▽▽▽ FINE FINISH MACHINED	⑱ CHAMFERED

REVISIONS			
ALT.	ZONE	DESCRIPTION	APPROVED & DATE



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2	ANGLE FOR HOUSING		1	AAA13033	ISI-301	0.389	
QTY.	DESCRIPTION	DIMENSIONS	ITEM NO.	REF.DRGS	MATL. SPEC	WT/UNIT IN KGS	REMARKS
GROUP: TROUGHFLOOR		SURFACE AREA IN Sq.m.: 0.046			WT/ASSY IN Kgs: 0.778		
HOUSING					SCALE 1:2	SSE/D	
						CHD	G. M. Lakshminarayana
					ALT.	ALTD	
						DRN	G.M.Lakshminarayana
INDIAN RAILWAY STANDARDS							
INTEGRAL COACH FACTORY, CHENNAI - 600038				SHEET 1 OF 1		SSA13006	
						A3	

PART LIST FOR CLASSIFICATION LEVELS (CL) AS PER EN 15085-2

CL1 PARTS	CL2 PARTS	CL3 PARTS
<u>Bogies</u> Bogie frames, Bogie bolsters, headstock, transoms, nose suspension brackets) Wheel set mountings, axle boxes, spring supports, shock absorbers, vibration dampers. Brake equipment (eg.magnetic track brake, brake rods, brake triangles, brake cylinders, brake cross beams, levers)	Payload container for non-dangerous materials	Cranks and levers for various operations
	other transport containers	striking plates
	Internal parts of passenger coaches(partitions, walls, doors, panelling)	Equipment boxes and switch cabinets in rail vehicles(including gear boxes and consoles for hand brake operation, without supporting frame)
	supporting frame for internal parts (electrical, air-conditioning and compressed air installations)	holders for index plates
<u>Bodyshell components(eg. underframes, structures)</u> underframes(solebars, cross bearers, modular frames, Body Bolster, headstock) vehicle body (front walls/Nose cone, side walls, roof, end walls) Buffers & drawgear	Driving cab equipment	wheel scotches
	Lavatory parts and water containers with installations	covers for freight wagons(heat protection on tank wagons)
	Sliding doors in vehicles including runways	steps, handrails, railings on rail vehicles (Inside the Coach)
	Fastenings for brake pipes	seating frames
Supporting frames for heavy components (eg. traction units, pantographs) Supporting frames for external equipment parts (eg. tanks, electrical, air-conditioning and air containers) Supporting frames for heavy duty vehicles including road/rail vehicles Welded components for drag transmission from bogie to vehicle (bolster)	Non-self supporting equipment boxes underneath the base frame(without supporting frame)	window frames
	Gear boxes and consoles for hand brake operation	ventilation grills
	Steps, hand rails (including handrails in entry areas) and railings external to the vehicle	
	Machine room equipment(transformer casing, transformer suspension, engine suspension, transmission suspension, attachment for traction motor, instrument racks); if they are assembled outside of the carbody	
finishing welding of castings within components indicated above external fuel tanks pressure gas tanks, tanks and containers of rail vehicles with test pressure containers for dangerous materials	Exhaust pipes	
	Entrance doors, end doors, foot step	
	self-supporing equipment boxes and underfloor containers(fresh water and waste-water containers)	
	External machine equipement parts(transformer, engine, transmission suspension)	
	Roof construction(pantograph, panelling)	
	Power transmission parts (traction coupling, cardan shafts)	
	Traversers(ie. car wagon)	
	Turning and tipping equipment	
	Obstacle deflectors	
	Stanchions and lashing rings	
	Compressed-air reservoirs for rail vehicles	
	Pressurised pipes	
	Seat frame, hand holds and luggage racks	

GENERAL GUIDELINES FOR WELDING ELECTRODES/FILLER WIRES AND SHIELDING GASES
IN COACH FABRICATION (SEE NOTE-5)

Sl. No	Parent Material Used for fabrication	Welding Process	Electrode / Filler wire (Specification & Grade)	Shielding Gas designation & Composition	Fabrication component description
1	Mild steel (IS:2062 grade E250A, E250B0 & E250BR, E250C) with Mild steel	MMAW (111)	IRS M 28 – ‘A2’ Class (Eq – ER4211X of IS:814)	N.A.	Non critical mild steel components. Also for tack welding
2	Mild steel (IS:2062 grade E250C) with Mild steel		IRS M 28 – ‘A3 or A4’ Class (Eq – EB5326H2JX of IS:814)	N.A.	Bogie frames & bolsters
3	HSLA Steels & weathering steels like Corten steel (IRS M41) & EN 10025-5 steels with same material and with mild steels (IS: 2062)		IRS M 28 – ‘D’ Class (Eq – E8018 of AWS A 5.5)	N.A.	Sub-assembly parts of underframe, Bogie frame components
4	Stainless steel (SS 301, SS 301L, SS304, SS409M) with stainless steel (similar welding)		IRS M 28 – ‘M2’ Class (Eq – E308L of AWS A 5.4)	N.A.	SS partition frames,
5	Stainless steel (SS 316/SS 316L) with similar steel		IRS M 28 – ‘M3’ Class (Eq – E316 of AWS A 5.4)	N.A.	Water tank, Bio toilet parts and lavatory parts
6	Stainless steel (all grades) with stainless steel. Also dissimilar welding of SS with Mild Steel / Corten steel & EN10025-5 steel		IRS M 28 – ‘M4’ Class (Eq – E309L of AWS A 5.4)	N.A	Body jig assembly fabrication of side wall, End wall with roof and door corner sheets
7	Manganese steel liner with mild steel / corten steel		IRS M 28 – ‘M5’ Class (Eq – E18.8MnR26 of IS:5206)	N.A	Wear plate (Rubbing pad) fabrication in bogie frames.
8	Mild steel (Grade E250C of IS 2062) with mild steel	GMAW (135)	IRS M 46 – Class I (Eq – ER70S6 of AWS A 5.18)	ISO: 14175 C1 100% CO ₂ (Or) M21 80%Ar + 20%CO ₂ (ACM)	Bogie frames, Bolsters & Under Frame assembly.
9	Corten steel to IRSM – 41& Weathering Steel to EN10025-5 with same material and with mild steel (IS: 2062)		IRS M 46 – Class IV (Eq – ER80SG of AWS A 5.28)		Subassembly Components of bogie & under frame
10	Stainless Steel (SS 301, SS 301L, SS304, SS409M) with same grade of stainless steels		IRS M 46 – Class VI (Eq – ER308L of AWS A 5.9)	ISO: 14175 M13 98% Ar + 2% O ₂ (Or) M12 98% Ar + 2% CO ₂	Side Wall Assembly & endwall assembly
11	SS grades (SS 301, SS 301L, SS304, SS409M) with SS and dissimilar welding of SS with Mild Steel / Corten steel		IRS M 46 – Class VII (Eq – ER309L of AWS A 5.9)		Trough floor sheet with underframe assembly, body shell assembly and side wall with sole bar(u/f)

NOTE:

- THE CLASSIFICATION LEVEL TABLE PREPARED BASED ON EN15085-2 AND IS NOT EXHAUSTIVE AND INDICATIVE ONLY.
- FOR ITEMS WHICH ARE NOT CATEGORIZED IN THE LIST, ICF SHALL ALLOT SUITABLE CLASSIFICATION LEVELS.
- ICF RESERVES THE RIGHT TO CHANGE CLASSIFICATION LEVEL BASED ON CUSTOMER FEEDBACK/DESIGN CHANGE/FEEDBACK FROM PRODUCTION SHOPS ETC.
- CLASSIFICATION LEVEL FOR EACH COMPONENT SHALL BE INDICATED IN LIST OF PARTS (LOP)/BILL OF MATERIALS (BOM) BY PLANNING DEPT.
- THIS IS FOR REFERENCE ONLY. SHIELDING GASES SHALL BE USED AS PER RELEVANT WPS OF PARTICULAR WELD JOINT AND AS RECOMMENDED BY THE ELECTRODE MANUFACTURERS. FOR FURTHER INFORMATION, REFER IRS M28 & IRS M46.

12	Aluminium alloys IS: 737:2008 Grade 31000-H2 and similar	GMAW (131)	ER 4043 of AWS A 5.10	ISO: 14175 I1 100% Argon	AC duct fabrication
13	Mild steel (Grade E250C of IS 2062) with mild steel	FCAW (136)	IRS M 46 – Class I (Eq – E71T12 of AWS A 5.20)	ISO: 14175 C1 100% CO ₂	Bogie frames, Bolsters & Under Frame assembly.
14	Corten steel to IRSM – 41& Weathering Steel to EN10025-5 with same material and with mild steel (IS: 2062)		IRS M 46 – Class IV (Eq – E81T1W2C of AWS A 5.29)		Subassembly Components of bogie & under frame
15	Stainless Steel (SS 301, SS 301L, SS304, SS409M) with same grade of stainless steels		IRS M 46 – Class VI (Eq – E308LT1-1 of AWS A 5.22)		SS+SS in Side wall Assembly & endwall assembly
16	SS grades (SS 301, SS 301L, SS304, SS409M) with SS and dissimilar welding of SS with Mild Steel / Corten steel		IRS M 46 – Class VII (Eq - E309LT1-1 of AWS A 5.22)		Trough floor sheet with underframe assembly, body shell assembly and side wall with sole bar(u/f)
17	SS 316 with SS 316 and SS 316 with corten steel / Mild steel	GTAW/ TIG (141)	E309LMoT1-1 of AWS A 5.22	ISO: 14175 I1 100% Argon	Bio toilet , Biotoilet J bracket with underframe
18	Stainless Steel (SS 301, SS 301L, SS304, SS409M) with same grade of stainless steels		Electrode: EWLa2 / EWTh2 (AWS A 5.12) Filler wire: ER308L of AWS A 5.9		Roof & Side wall Assembly & Body Shell Assembly
19	SS grades (SS 301, SS 301L, SS304, SS409M) with SS and dissimilar welding of SS with Mild Steel / Corten steel		Electrode: EWLa2 / EWTh2 (AWS A 5.12) Filler wire : ER309L of AWS A 5.9		Side wall with sole bar dissimilar joints
20	Stainless Steel (SS 409M, SS304)	MIG brazing (983)	DIN 1733-SG-Cu A18	ISO: 14175 I1 100% Argon	Side Wall Assembly

DESCRIPTION & DIMENSION		ITEM	REF.DRGS	MAT.SPEC	WEIGHT/UNIT	REMARKS
GROUP: 9-0		SUPERSEDED BY:				
SCALE		SUPERSEDES: ICF/STD-9-0-998 ALT 1/-				
NTS		SSE/D	SABAPATHY NATHAN M			
		CHD	J. RAMESH			
		ALTD	J. RAMESH			
		DRN	J. RAMESH			
Alpha Alt:- 9						
DATA CODE NO.		INDIAN RAILWAY STANDARDS			SHEET	INTEGRAL COACH FACTORY CHENNAI-38
140					1 OF 2	ICF/STD-9-0-998

TABLE-1 FOR BOGIE & ITS COMPONENTS

WELD TESTING PREFERENCES AS PER EN 15085-3: 2022 (FUSION WELDING)

WELD PERFORMANCE CLASS	QUALITY LEVEL FOR IMPERFECTIONS EN ISO 5817	INSPECTION CLASS	VOLUMETRIC TEST RT	SURFACE TEST MPT or DPT	VISUAL EXAMINATION VT
CP B1	B	CT2	100 %	10 %	100 %
CP C2	B	CT2	NOT REQUIRED	10 %	100 %
CP C2	C	CT3	NOT REQUIRED	NOT REQUIRED	100 %

CONTENTS OF THE TABLE IS SIMILAR TO TABLE-3 OF EN 15085-3, BUT CUSTOMIZED TO ICF REQUIREMENTS.

TABLE-2 FOR SHELL & ITS COMPONENTS

WELD TESTING PREFERENCES AS PER EN 15085-3: 2022 (FUSION WELDING)

WELD PERFORMANCE CLASS	QUALITY LEVEL FOR IMPERFECTIONS EN ISO 5817	INSPECTION CLASS	VOLUMETRIC TEST RT	SURFACE TEST MPT or DPT	VISUAL EXAMINATION VT
CP C2	C	CT3	NOT REQUIRED	NOT REQUIRED	100 %

CONTENTS OF THE TABLE IS SIMILAR TO TABLE-3 OF EN 15085-3, BUT CUSTOMIZED TO ICF REQUIREMENTS.

NOTE: (FOR FUSION WELDING)

- THE VENDOR/SUPPLIER SHOULD POSSESS VALID ISO:3834-2 OR EN 15085-2 CERTIFICATION AND SHALL FULLY COMPLY WITH THE REQUIREMENTS OF THE SPECIFICATION.
- 'UT' IS NOT PERMITTED IN VOLUMETRIC TEST OF BUTT WELDS.
- ISO: 5817 SHALL BE FOLLOWED FOR QUALITY LEVELS FOR IMPERFECTIONS OF FUSION WELDED JOINT. ISO-13919-1 FOR LASER WELD TABLE AND EN15085-3 FOR SPOT WELDING TABLE.
- ISO: 17636 SHALL BE FOLLOWED FOR 'RT' AND SHALL ENSURE UNAMBIGUOUS IDENTIFICATION OF EACH SECTION AND EACH ITEM.
- ACCEPTANCE LEVEL FOR 'RT' SHALL BE AS PER ISO: 10675-1, LEVEL-1.
- ISO: 17637 SHALL BE FOLLOWED FOR VISUAL TESTING OF FUSION WELDED JOINTS.
- ACCEPTANCE LEVEL FOR 'VT' SHALL BE AS PER COL-2 OF ABOVE TABLE.
- ISO: 17638 SHALL BE FOLLOWED FOR MAGNETIC PARTICLE TEST OF FUSION WELDED JOINTS.
- ACCEPTANCE LEVEL FOR 'MPT' SHALL BE AS PER ISO: 23278, LEVEL-2X.
- ISO: 3452-1 SHALL BE FOLLOWED FOR PENETRANT TESTING OF FUSION WELDED JOINTS.
- ACCEPTANCE LEVEL FOR 'DPT' SHALL BE AS PER ISO: 23277, LEVEL-2X.
- ALL NDT (RT/MPT/DPT) SHALL BE PERFORMED BY PERSONNEL CERTIFIED ACCORDING TO ISO 9712 LEVEL-II AND SHALL BE DOCUMENTED.
- FOR INSPECTION CLASS CT2, THE VISUAL EXAMINATION SHALL BE PERFORMED BY PERSONNEL CERTIFIED ACCORDING TO ISO 9712 LEVEL-II AND SHALL BE DOCUMENTED. FOR CT3 SUITABLY TRAINED PERSONNEL BY RESPONSIBLE WELDING COORINATOR.
- THE TEST METHODS INDICATED SHALL BE THE MINIMUM CAPABLE OF ENSURING COMPLIANCE OF THE WELDED JOINTS. ADDITIONAL TESTS DEPENDING ON THE MATERIAL AND DESIGN MAY BE INSISTED BY THE PURCHASER.
- THE PERCENTAGES EXPRESSED, REFER TO THE TOTAL LENGTH TO BE EXAMINED FOR ONE GIVEN WELD.
 - 10% MEANS: TESTING OF 10% OF THE ENTIRE LENGTH OF THE WELD ON ALL THE PIECES BUILT OR 100% TESTING ON 1 OF EVERY 10 ITEMS BUILT.
 - 100% MEANS: TESTING OF THE ENTIRE LENGTH OF THE WELD AND ON ALL THE PIECES BUILT.
- MACRO EXAMINATION SHALL BE CARRIED OUT AS PER ISO: 17639 ON ATLEAST ONE REPRESENTATIVE TEST PIECE FOR EACH WPS USED IN THE WELDED COMPONENT. THE TEST PIECE SHOULD MEET THE REQUIREMENTS OF COL-2 OF ABOVE TABLE FOR ALL INTERNAL IMPERFECTIONS.
- PRODUCTION WELD TESTS SHALL BE CONDUCTED AS PER CLAUSE 4.2 OF EN 15085-4.
- PRODUCTION WELD TESTS SHOULD BE CHECKED IN ACCORDANCE WITH EN ISO 15613 AND TESTS SHALL BE DOCUMENTED.
- IN ADDITION TO THE ABOVE REQUIREMENTS, ANY SPECIFIC REQUIREMENTS MENTIONED IN RESPECTIVE DRAWINGS SHALL BE ADHERED TO.

TABLE-3 FOR SPOT AND SEAM WELDING

WELD TESTING PREFERENCES AS PER EN 15085-3: 2022

WELD PERFORMANCE CLASS	QUALITY LEVEL FOR IMPERFECTIONS EN-15085-3	INSPECTION CLASS	VOLUMETRIC TEST RT	SURFACE TEST MPT or DPT	VISUAL EXAMINATION VT
CP C2	TABLE-F2 OF EN15085-3	CT3	NOT REQUIRED	NOT REQUIRED	100 %

CONTENTS OF THE TABLE IS SIMILAR TO TABLE-3 OF EN 15085-3, BUT CUSTOMIZED TO ICF REQUIREMENTS.

NOTE: (FOR SPOT & SEAM WELDING)

- FOR WELD QUALITY, SURFACE QUALITY AND SHEAR STRENGTH REQUIREMENTS EN15085-3 TABLE F-2, F-3 AND TABLE F-4 SHALL BE FOLLOWED.
- WELDING OPERATORS NEED TO BE QUALIFIED AS PER ISO: 14732.
- WELDING PROCEDURE SPECIFICATION SHALL BE QUALIFIED AS PER ISO 15609-5/ISO, 15614-12/ISO & 15613.
- FOR INSPECTION CLASS CT3, SUITABLY TRAINED PERSONNEL BY RESPONSIBLE WELDING COORDINATOR/COMPETENT PERSON OF MANUFACTURER SHALL BE DEPLOYED AND SHOULD BE DOCUMENTED.
- SWPT (SIMPLIFIED WELD PRODUCTION TEST) TO BE DONE DAILY AND NWPT(NORMAL WELD PRODUCTION TEST) TO BE DONE ONCE IN SIX MONTHS AS PER EN15085-3 TABLE F-2 REQUIREMENTS AND SHALL BE DOCUMENTED.

TABLE-4 FOR SURFACE QUALITY OF SPOT WELDS (REF. EN15085-3 TABLE F-3)

SURFACE QUALITY AS PER EN15085-3	REQUIREMENTS	APPLICATION
2	SURFACES WHERE WELDING MARKS (ELECTRODE IMPRESSIONS,RING SHAPED REINFORCEMENT-FORMATION,IMPERFECTIONS, THROUGH HEAT DISTORTION ETC.) DO NOT AMOUNT TO MORE THAN 10% OF THE PARTICULAR SINGLE SHEET METAL THICKNESS. NOTE: IF REQUIRED THE INDENTATION CAN BE FILLED IN.	AESTHETIC SIDE OF PASSENGER COACH SIDE WALLS, NOSE CONE AND ROOFS.
3	SURFACES WHERE WELDING MARKS DO NOT AMOUNT TO MORE THAN 25% OF THE PARTICULAR METAL THICKNESS. IN THIS AREA ARE ALSO FIRMLY ADHERING WELDING SPATTER PERMITTED AS LONG AS THE DRAWING DOES NOT DEMAND THAT IT SHALL BE FREE OF BURRS AND SPATTERS.	SURFACES FOR NON-AESTHETIC REQUIREMENT.

TABLE-5 FOR LASER WELDING

WELD TESTING PREFERENCES AS PER EN 15085-3: 2022

WELD PERFORMANCE CLASS	QUALITY LEVEL FOR IMPERFECTIONS ISO-13919-1	INSPECTION CLASS	VOLUMETRIC TEST RT	SURFACE TEST MPT or DPT	VISUAL EXAMINATION VT
CP C2	C	CT3	NOT REQUIRED	NOT REQUIRED	100 %

CONTENTS OF THE TABLE IS SIMILAR TO TABLE-3 OF EN 15085-3, BUT CUSTOMIZED TO ICF REQUIREMENTS.

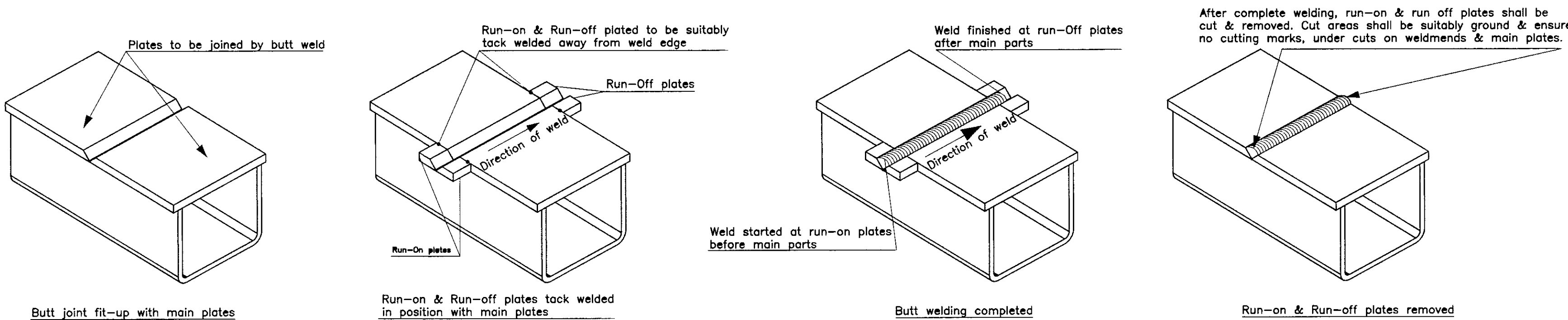
NOTE: (FOR LASER WELDING)

- FOR VISUAL EXAMINATION (VT) AND OTHER ROUTINE TESTS ISO 13919-1 SHALL BE USED. .
- WELDING OPERATORS NEED TO BE QUALIFIED AS PER ISO 14732.
- WELDING PROCEDURE SPECIFICATION SHALL BE QUALIFIED AS PER ISO 15609-4/ISO, 15614-11/ISO & 15613.
- FOR INSPECTION CLASS CT3 SUITABLY TRAINED PERSONNEL BY RESPONSIBLE WELDING COORDINATOR/COMPENT PERSON/MANUFACTURER SHALL BE DEPLOYED AND SHOULD BE DOCUMENTED.
- LASER WELDING TESTING REQUIREMENTS AS PER TABLE GIVEN BELOW SHALL BE FOLLOWED.
- SWPT (SIMPLIFIED WELD PRODUCTION TEST) TO BE DONE IN ONCE IN EVERY WEEK AND NWPT(NORMAL WELD PRODUCTION TEST) TO BE DONE ONCE IN SIX MONTHS AS PER ISO 15614-11 & ISO 13919-1 AND SHALL BE DOCUMENTED.

TABLE-6 LASER WELDING TESTING STANDARDS - FOR INFORMATION

TEST METHOD	TESTING STANDARD	ACCEPTANCE CRITERIA STANDARD
VISUAL TESTING (VT)	ISO 17637	ISO 13919-1
MAGNETIC PARTICLE TESTING (MPT)	ISO 17638	ISO 23278 LEVEL-2X
DYE PENETRANT TESTING (DPT)	ISO 3452-1	ISO 23277, LEVEL-2X
RADIO GRAPHIC TESTING	ISO 17636	ISO 10675-1, LEVEL-1

TABLE-7 Use of Run-on & Run-off plates in butt joints with CP B1 weld performance class



Note:

- Thickness, material & edge preparation of Run-on & Run-off plates shall be the same as of parent materials.
- After welding, 1% of the removed run-on & run-off plates may be used for sample testing (macro etch testing).

GENERAL INSTRUCTIONS:

- TRIAXIAL WELDS AND USE OF BACKINGS OR BACK STRIPS SHALL BE AVOIDED.
- WELDING GAPS SHALL BE SEALED WITH APPROVED QUALITY OF SEALING COMPOUND TO IS:1580 TO AVOID MOISTURE CREEP.
- CREVICE IN WELDMENT TIP IF ANY, SHALL BE WELDED AND GROUND SMOOTHLY.
- STAGE INSPECTION SHOULD BE DONE AND DOCUMENTED AS PER CLAUSE-6 OF EN 15085-5 AND REPORTS SHOULD BE SUBMITTED TO INSPECTION AGENCY.
- INSPECTION AND TESTING BEFORE/DURING/AFTER WELDING SHALL BE DONE AS PER CLAUSE-14 OF ISO 3834-2 AND REPORTS SHALL BE SUBMITTED TO THE INSPECTION AGENCY.
- THIRD PARTY INSPECTION AGENCY LIKE RITES/RDSO SHALL COLLECT ALL THE WELD TEST REPORTS FROM THE VENDORS AND SUBMIT THE SAME TO ICF.
- WELDING OF REPLACED MATERIAL AFTER SAMPLE COLLECTION AND SUBSEQUENT WELD TEST(DPT) BY INSPECTION AGENCIES ALSO TO BE CARRIED OUT AS PER THIS DRAWING. FOR WPS DETAILS, REFER DRAWING No.140-9-0-999 (LATEST ALTERATION).

ALTERATION	
09/2018	NOTES-4 TO 7 MODIFIED. AND NOTE-12 ADDED.
-Sd/-SSE/D	-Sd/-SME/BD
11/2020	WELDING TABLE, NOTES & TITLE BLOCK REVISED. SHEET-2 ADDED.
-Sd/-SSE/D	3.11.20 SME/AME
12/2020	'GENERAL INSTRUCTIONS' ADDED IN SHEET-2.
-Sd/-SSE/D	-Sd/-SME
02/2021	TITLE REVISED. CLASSIFICATION TABLE REVISED AS PER EN 15085-2.
-Sd/-SSE/D	6.2.21 SME
10/2022	GENERAL GUIDELINES FOR WELDING ELECTRODES/FILLER WIRES AND SHIELDING GASES ADDED IN SHEET-1.
-Sd/-SSE/D	31.10.22 AME
9/2023	ALL DATA UPDATED BASED ON EN15085-3:2022 AND AWTI LR.No.AWTI/79 DT.31-8-2023.
-Sd/-SSE/D	8.9.23 AME
12/2024	GENERAL INSTRUCTION No. 7 ADDED AS PER WQMS EXTERNAL AUDIT INSTRUCTIONS.
SSE/D	AME

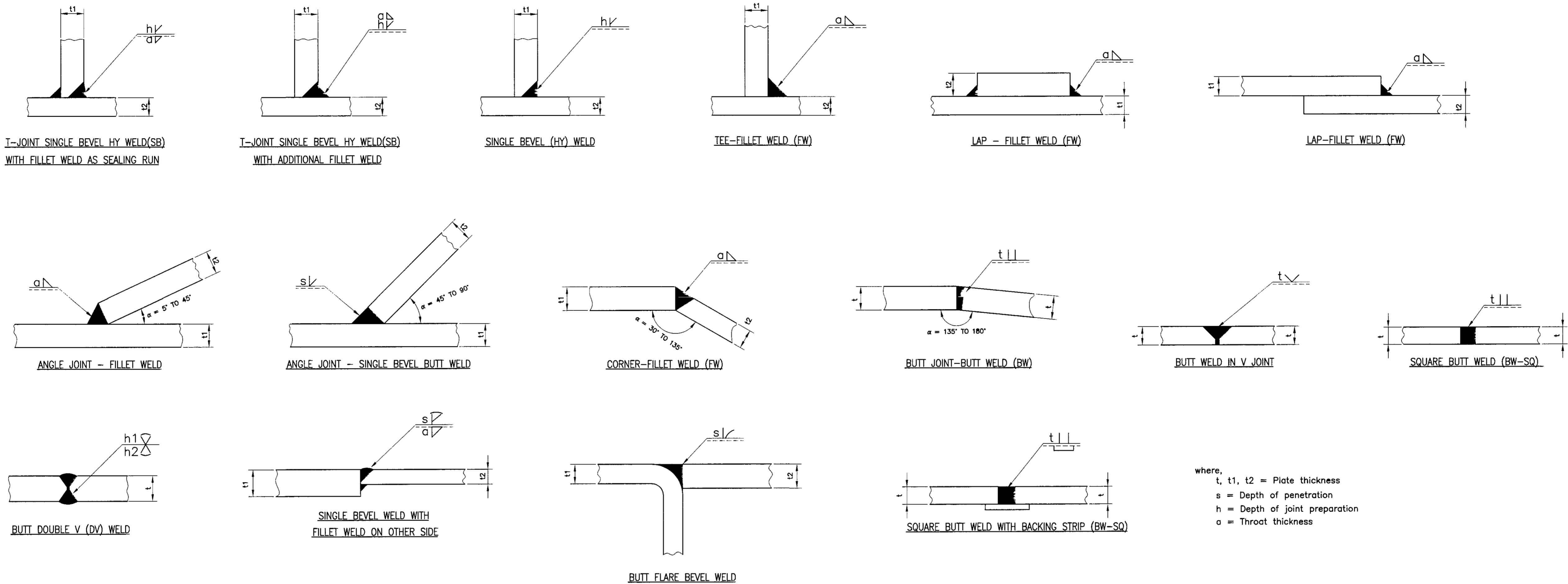
QTY	DESCRIPTION & DIMENSION	ITEM	REF.DRGS	MAT.SPEC	WEIGHT/UNIT	REMARKS
1	GROUP: 9-0					SUPERSEDED BY:
						SUPERSEDES: ICF/STD-9-0-998 ALT 1/-
						SCALE SSE/D SABAPATHY NATHAN M
						NTS CHD
						ALTD J. RAMESH
						DRN J. RAMESH
						Alpha Alt:- g
						INTEGRAL COACH FACTORY CHENNAI-38
						ICF/STD-9-0-998

S.No.	MATERIAL	THICKNESS	JOINT	TYPE OF WELD	POSITION	GAS	PROCESS	WPS No.	REMARKS
GMAW									
1	IRS M41 + IRS M41	6 mm + 8 mm	T	FW	PB	CO ₂	GMAW	ICF/WPS/GMAW/CS/6N8/FW/PB/315	
2	IRS M41 + IS 2062	6 mm + 16 mm	T	FW	PB	CO ₂	GMAW	ICF/WPS/GMAW/CS/6N16/FW/PB/317	
3	IRS M41 + IS 2062	6 mm + 12 mm	T	FW	PB	CO ₂	GMAW	ICF/WPS/GMAW/CS/6N12/FW/PB/316	
4	IRS M41 + IRS M41	10 mm + 10 mm	T	FW	PB	CO ₂	GMAW	ICF/WPS/GMAW/CS/10N10/FW/PB/325	
5	IRS M41 + IS 2062	10 mm + 16 mm	T	FW	PB	CO ₂	GMAW	ICF/WPS/GMAW/CS/10N16/FW/PB/324	
6	IRS M41 + IRS M41	5 mm + 10 mm	T	FW	PB	CO ₂	GMAW	ICF/WPS/GMAW/CS/5N10/FW/PB/318	
7	IS 2062 + IS 2062	12 mm + 16 mm	T	FW	PB	CO ₂	GMAW	ICF/WPS/GMAW/CS/12N16/FW/PB/326	
8	IRS M41 + IRS M41	8 mm + 8 mm	T	FW	PA	CO ₂	GMAW	ICF/WPS/GMAW/CS/8N8/FW/PA/012	
9	IRS M41 + IS 2062	8 mm + 16 mm	T	FW	PA	CO ₂	GMAW	ICF/WPS/GMAW/CS/8N16/FW/PA/004	
10	IS 2062 + IS 2062	12 mm + 10 mm	T	FW	PA	CO ₂	GMAW	ICF/WPS/GMAW/CS/12N10/FW/PA/002	
11	IRS M41 + IRS M41	10 mm + 10 mm	T	FW	PA	CO ₂	GMAW	ICF/WPS/GMAW/CS/10N10/FW/PA/001	
12	DIN1630(st 52.4) + DIN17182(GS20Mn5V)	14 mm + 10 mm	T-PIPE	FW	PB	ACM	GMAW	ICF/WPS/GMAW/DIS/14N10/FW/PB/701-PIPE	
13	IRS M41 + IRS M41	10 mm + 8 mm	T	FW	PB	CO ₂	GMAW	ICF/WPS/GMAW/CS/10N8/FW/PB/502	
14	IRS M41 + IRS M41	8 mm + 5 mm	LAP	FW	PB	CO ₂	GMAW	ICF/WPS/GMAW/CS/8N5/LAP/PB/503	
15	IRS M41 + IRS M41	10 mm + 5 mm	T	FW	PG	CO ₂	GMAW	ICF/WPS/GMAW/CS/10N5/FW/PG/505	
16	IRS M41 + IRS M41	1.6 mm + 1.6 mm	LAP	FW	PB	CO ₂	GMAW	ICF/WPS/GMAW/CS/1.6N1.6/LAP/PB/510	
17	IRS M41 + IRS M41	2 mm + 2 mm	T	FW	PG	CO ₂	GMAW	ICF/WPS/GMAW/CS/2N2/FW/PG/511	
18	IRS M41 + IRS M41	2 mm + 3.15 mm	T	FW	PG	CO ₂	GMAW	ICF/WPS/GMAW/CS/2N3.15/FW/PG/512	
19	IRS M41 + IRS M41	10 mm + 10 mm	T	FW	PG	CO ₂	GMAW	ICF/WPS/GMAW/CS/10N10/FW/PG/301	
20	IRS M41 + IS 2062	8 mm + 12 mm	T	FW	PB	CO ₂	GMAW	ICF/WPS/GMAW/CS/8N12/FW/PB/287	
21	IRS M41 + IS 2062	8 mm + 16 mm	T	FW	PB	CO ₂	GMAW	ICF/WPS/GMAW/CS/8N16/FW/PB/286	
22	IRS M41 + IS 2062	10 mm + 12 mm	T	FW	PB	CO ₂	GMAW	ICF/WPS/GMAW/CS/10N12/FW/PB/285	
23	IS 2062 + IRS M41	8 mm + 10 mm	T	FW	PG	CO ₂	GMAW	ICF/WPS/GMAW/CS/8N10/FW/PG/302	
24	IRS M41 + IRS M41	5 mm + 5 mm	T	FW	PG	CO ₂	GMAW	ICF/WPS/GMAW/CS/5N5/FW/PG/342	
25	IRS M41 + IRS M41	2 mm + 2 mm	T	FW	PG	CO ₂	GMAW	ICF/WPS/GMAW/CS/2N2/FW/PG/341	
26	IRS M41 + IRS M41	2 mm + 5 mm	LAP	FW	PB	CO ₂	GMAW	ICF/WPS/GMAW/CS/2N5/LAP/PB/321	
27	IRS M41 + IRS M41	2 mm + 2 mm	T	FW	PB	CO ₂	GMAW	ICF/WPS/GMAW/CS/2N2/FW/PB/323	
28	IRS M41 + IRS M41	4 mm + 8 mm	T	FW	PF	CO ₂	GMAW	ICF/WPS/GMAW/CS/4N8/FW/PF/010	
29	IRS M41 + IRS M41	4 mm + 6 mm	T	FW	PF	CO ₂	GMAW	ICF/WPS/GMAW/CS/4N6/FW/PF/09	
30	IRS M41 + EN 10025	8 mm + 15 mm	LAP	FW	PB	CO ₂	GMAW	ICF/WPS/GMAW/DIS/8N15/LAP/PB/06	
31	EN 10393 + IRS M41	10 mm + 6 mm	T	FW	PB	CO ₂	GMAW	ICF/WPS/GMAW/DIS/10N6/FW/PB/01	
32	IS 2062 + IS 2062	22 mm + 22 mm	BUTT	BW-DV	PA	CO ₂	GMAW	ICF/WPS/GMAW/CS/22N22/BW/PA/309	
33	IS 2062 + IS 2062	16 mm + 20 mm	T	BW-HV	PA	CO ₂	GMAW	ICF/WPS/GMAW/CS/16N20/BW/PA/006	
34	IS 2062 + IS 2062	16 mm + 16 mm	BUTT	BW-HV	PA	CO ₂	GMAW	ICF/WPS/GMAW/CS/16N16/BW/PA/001	
35	EN 10025:2004 S355 J2 + EN 10025:2004 S355 J2	10 mm + 10 mm	T	BW-HV	PA	ACM	GMAW	ICF/WPS/GMAW/CS/10N10/BW/PA/705	
36	EN 10025:2004 S355 J2 + EN 10025:2004 S355 J2	18 mm + 12 mm	T	BW-HV	PA	ACM	GMAW	ICF/WPS/GMAW/CS/18N12/BW/PA/704	
37	EN 10025:2004 S355 J2 + EN 10025:2004 S355 J2	12 mm + 12 mm	T	BW-HV	PA	ACM	GMAW	ICF/WPS/GMAW/CS/12N12/BW/PA/703	
38	EN 10025:2004 S355 J2 + EN 10025:2004 S355 J2	8 mm + 10 mm	T	BW-HV	PA	ACM	GMAW	ICF/WPS/GMAW/CS/8N10/BW/PA/702	
39	DIN 1630(st.52.4) + EN 10025:2004 S355 J2	10 mm + 12 mm	T-PIPE	BW-HV	PA	ACM	GMAW	ICF/WPS/GMAW/DIS/10N12/BW/PA/706 PIPE	
40	IS 2062 + IS 2062	16 mm + 16 mm	BUTT	BW-HV	PE	CO ₂	GMAW	ICF/WPS/GMAW/CS/16N16/BW/PE/508	
41	IRS M41 + IRS M41	2 mm + 2 mm	BUTT	BW-SQ	PA	CO ₂	GMAW	ICF/WPS/GMAW/CS/2N2/BW/PA/322	
42	IRS M41 + IRS M41	8 mm + 8 mm	BUTT	BW-HV	PF	CO ₂	GMAW	ICF/WPS/GMAW/CS/8N8/BW/PF/08	
43	IRS M41 + EN 10293	6 mm + 15 mm	T	BW-HV	PB	CO ₂	GMAW	ICF/WPS/GMAW/DIS/6N15/BW/PB/07	
44	IRS M41 + EN 10293	8 mm + 10 mm	T	BW-HV	PB	CO ₂	GMAW	ICF/WPS/GMAW/DIS/8N10/BW/PB/03	
45	IRS M41 + IRS M41	5 mm + 5 mm	TEE	FW	PB	CO ₂	GMAW	ICF/WPS/GMAW/CS/5N5/FW/PB/526	
46	IRS M41 + IRS M41	8 mm + 8 mm	TEE	FW	PB	CO ₂	GMAW	ICF/WPS/GMAW/CS/8N8/FW/PB/531	
47	IRS M41 + IRS M41	6 mm + 6 mm	TEE	FW	PB	CO ₂	GMAW	ICF/WPS/GMAW/CS/6N6/FW/PB/530 Rev 01	
48	IRS M41 + IRS M41	5 mm + 5 mm	TEE	FW	PB	ACM	GMAW	ICF/WPS/GMAW/CS/5N5/FW/PB/550	
49	IRS M41 + IRS M41	5 mm + 5 mm	BUTT	BW-SV	PA	ACM	GMAW	ICF/WPS/GMAW/CS/5N5/FW/PA/551	
50	IRS M41 + IRS M41	4 mm + 6 mm	TEE	FW	PB	ACM	GMAW	ICF/WPS/GMAW/CS/4N6/FW/PB/552	
51	DIN EN 10293 G20Mn+QT + IRS M41	15 mm + 6 mm	SPL	BW	PB	ACM	GMAW	ICF/WPS/GMAW/CS/15N6/BW/PB/553	
52	DIN EN 10025 355J10 + IRS M41	12 mm + 6 mm	LAP	FW	PB	ACM	GMAW	ICF/WPS/GMAW/CS/12N6/LAP/PB/554	
53	IRS M41 + IRS M41	5 mm + 5 mm	TEE	FW	PF	CO ₂	GMAW	ICF/WPS/GMAW/CS/5N5/FW/PF/538	
54	IRS M41 + IRS M41	8 mm + 8 mm	TEE	FW	PG	ACM	GMAW	ICF/WPS/GMAW/CS/8N8/FW/PG/557	
55	IRS M41 + IS 2062	8 mm + 12 mm	TEE	FW	PB	ACM	GMAW	ICF/WPS/GMAW/CS/8N12/FW/PB/558	
56	IRS M41 + IS 2062	8 mm + 20 mm	TEE	FW	PB	ACM	GMAW	ICF/WPS/GMAW/CS/8N20/FW/PB/559	
57	IRS M41 + IS 2062	8 mm + 16 mm	TEE	FW	PB	ACM	GMAW	ICF/WPS/GMAW/CS/8N16/FW/PB/561	
58	IRS M41 + IRS M41	5 mm + 5 mm	TEE	FW	PF	ACM	GMAW	ICF/WPS/GMAW/CS/5N5/FW/PF/564	
59	IRS M41 + IRS M41	6 mm + 6 mm	BUTT	BW-SQ	PF	CO ₂	GMAW	ICF/WPS/GMAW/CS/6N6/BW/PF/566	
60	IRS M41 + IRS M41	5 mm + 5 mm	BUTT	BW-SQ	PF+PG	CO ₂	GMAW	ICF/WPS/GMAW/CS/5N5/BW/PF+PG/567	
61	EN10025-5 S355 J2 W+N + EN10025-5 S355 J2 W+N	10 mm + 10 mm	TEE	BW-FW	PA	ACM	GMAW	ICF/WPS/GMAW/CS/10N10/BW+FW/PA/574	
62	DIN 1630 st52.4 + DIN 17182(GSMn5V)	14 mm + 10 mm	TEE-PIPE	FW	PB	ACM	GMAW	ICF/WPS/GMAW/CS/14N10/FW/PB/570	
63	IS 2062 + IS 2062	16 mm + 16 mm	BUTT	BW-SV	PA	ACM	GMAW	ICF/WPS/GMAW/CS/16N16/BW/PA/562	
64	EN10025-5 S355 J2 W+N + EN10025-5 S355 J2 W+N	8 mm + 10 mm	TEE	BW	PA	ACM	GMAW	ICF/WPS/GMAW/CS/BW/8N10/PA/571	
65	DIN 1630 st52.4 + EN10025-5 S355 J2 W+N	10 mm + 12 mm	TEE	BW-FW	PB	ACM	GMAW	ICF/WPS/GMAW/CS/10N12/BW+FW/PB/575	
66	EN10025-5 S355 J2 W+N + EN10025-5 S355 J2 W+N	12 mm + 12 mm	TEE	BW-FW	PA	ACM	GMAW	ICF/WPS/GMAW/CS/12N12/BW+FW/PB/572	
67	EN10025-5 S355 J2 W+N + EN10025-5 S355 J2 W+N	18 mm + 12 mm	TEE	BW	PA	ACM	GMAW	ICF/WPS/GMAW/CS/18N12/BW/PA/573	
68	IS 2062 + IS 1875	16 mm + 12 mm	LAP	FW	PB	ACM	GMAW	ICF/WPS/GMAW/CS/16N12/FW/PB/587	
69	IRS M41 + IRS M41	6 mm + 6 mm	TEE	FW	PG	CO ₂	GMAW	ICF/WPS/GMAW/CS/6N6/FW/PG/632	
70	IRS M41 + IRS M41	2 mm + 2 mm	LAP	FW	PD	CO ₂	GMAW	ICF/WPS/GMAW/CS/2N2/LAP/PD/612	
71	IRS M41 + IRS M41	3.15 mm + 3.15 mm	BUTT	BW-SQ	PA	CO ₂	GMAW	ICF/WPS/GMAW/CS/3.15N3.15/BW/PA/619	
72	IS737:2008Gr.31000-H2 + IS737:2008Gr.31000-H2	2.5 mm +2.5 mm	TEE	FW	PB	Ar	GMAW	ICF/WPS/GMAW/ALU/2.5N2.5/FW/PB/583	
73	EN10025-5 S355 J2 W+N + DIN 17182(GSMn5V)	10 mm + 16 mm	TEE	FW	PB	ACM	GMAW	ICF/WPS/GMAW/CS/10N16/FW/PB/636	
74	EN10025+DIN 1630	14mm+12 mm	T	BW+FW	PB	ACM	GMAW	ICF-WPS-GMAW-CS-12N12-BW+FW-PB-634	
75	EN10025+EN 10025	10mm+10 mm	T	FW	PB	ACM	GMAW	AWTI-WPS-GMAW-CS-10N10-FW-PB-592	
76	EN10025+EN 10025	12mm+22 mm	T	FW	PA	ACM	GMAW	AWTI-WPS-GMAW-CS-12N22-FW-PA-594	
77	IS 2062+ IS 2062	16mm+16 mm	T	FW	PA	ACM	GMAW	AWTI-WPS-GMAW-CS-16N16-FW-PA-588	
78	EN10025+EN 10025	22mm+22 mm	BUTT	BW	PA	ACM	GMAW	AWTI-WPS-GMAW-CS-22N22-BW-PA-602	
79	EN10025+EN 10025	10mm+10mm	T	FW	PA	ACM	GMAW	AWTI-WPS-GMAW-CS-10N10-BW+FW-PA-584	
80	EN10025+EN 10025	10mm+12 mm	T	FW	PB	ACM	GMAW	AWTI-WPS-GMAW-CS-10N12-FW-PB-593	
81	IRSM 41+DIN EN 10293	8mm+15 mm	SINGLE BEVEL TEE	BW	PB	CO2	GMAW	ICF-WPS-GMAW-CS-15N8-BW-PB-03	CONSOLE WITH SOLE BAR
82	SS409M+SS 409M	2mm+3 mm	BUTT	BW	PA	ARGON	GMAW	ICF-WPS-GMAW-BRAZING-SS-2n3-BW-PA-306	MIG BRAZING
83	EN10025+EN 10025	12mm+12 mm	BUTT	BW	PA	ACM	GMAW	ICF-WPS-GMAW-CS-12+12-BW-PA-607	
84	IRS M41 + IRS M41	3.15 mm +3.15 mm	BUTT	SQ BUTT	PG	CO ₂	GMAW	ICF/WPS/GMAW/CS/3.15N3.15/BW/PG/616	
85	IRS M41 + IRS M41	3.15 mm +3.15 mm	BUTT	SQ BUTT	PA	CO ₂	GMAW	AWTI-WPS-GMAW-CS-3.15N3.15-BW-PA-622	

S.No.	MATERIAL	THICKNESS	JOINT	TYPE OF WELD	POSITION	GAS	PROCESS	WPS No.	REMARKS
FCAW									
1	IRS M41 + AISI301	10 mm + 1.7 mm	LAP	FW	PB	CO ₂	FCAW	ICF/WPS/FCAW/DIS/10N1.7/LAP/PB/504	
2	IRS M41 + AISI 304	6 mm + 2 mm	CORNER	FW	PB	CO ₂	FCAW	ICF/WPS/FCAW/DIS/6N2/CORNER/PB/05	
3	AISI 304 + AISI 304	2 mm + 1.25 mm	LAP	FW	PB	CO ₂	FCAW	ICF/WPS/FCAW/AISI304/2N1.25/LAP/PB/02	
4	SS 409M + SS 409M	2.5 mm + 3 mm	T	FW	PA	CO ₂	FCAW	ICF/WPS/FCAW/SS409M/2.5N3/FW/PA/003	
5	SS 409M + SS 409M	2.5 mm + 2 mm	FLARE	FW	PB	CO ₂	FCAW	ICF/WPS/FCAW/SS409M/2.5N2/FW/PB/002	
6	SS 409M + SS 409M	2.5 mm + 4 mm	T	FW	PB	CO ₂	FCAW	ICF/WPS/FCAW/SS409M/2.5N4/FW/PB/001	
7	AISI 304 + AISI 304	1.25 mm + 1.25 mm	LAP	FW	PB	CO ₂	FCAW	ICF/WPS/FCAW/AISI304/1.25N1.25/LAP/PB/04	
8	SS 409M + SS 409M	3 mm + 3 mm	TEE	FW	PB	CO ₂	FCAW	ICF/WPS/FCAW/SS409M/3N3/FW/PB/519	
9	SS 409M + SS 409M	2 mm + 2 mm	TEE	FW	PB	CO ₂	FCAW	ICF/WPS/FCAW/SS409M/2N2/FW/PB/598	
10	SS 409M + SS 409M	3 mm + 3 mm	TEE	FW	PB	ACM	FCAW	ICF/WPS/FCAW/SS409M/3N3/FW/PB/585	
11	AISI 316 + AISI 316	6 mm + 6 mm	TEE	FW	PB	CO ₂	FCAW	ICF/WPS/FCAW/AISI316/6N6/FW/PB/581	
12	AISI 304 + AISI 304	2 mm + 2 mm	TEE	FW	PB	CO ₂	FCAW	ICF/WPS/FCAW/SS/2N2/FW/PB/579	
13	AISI 304 + AISI 304	1.25 mm + 1.25 mm	LAP	FW	PB	ACM	FCAW	ICF/WPS/FCAW/SS/1.25N1.25/PB/611	
14	AISI 304 + SS 409M	1.7 mm + 2 mm	TEE	FW	PB	CO ₂	FCAW	ICF/WPS/FCAW/SS/1.7N2/FW/PB/578	
15	AISI 304 + SS 409M	2 mm + 2 mm	TEE	FW	PB	CO ₂	FCAW	ICF/WPS/FCAW/SS/2N2/FW/PB/576	
16	AISI 304 + SS 409M	1.2 mm + 2 mm	TEE	FW	PB	CO ₂	FCAW	ICF/WPS/FCAW/SS/1.2N2/FW/PB/580	
17	IRS M41 + SS 409M	2 mm + 2 mm	TEE	FW	PB	CO ₂	FCAW	ICF/WPS/FCAW/SS/2N2/FW/PB/599	
18	AISI 316 + IRS M41	6 mm + 5 mm	TEE	FW	PB	CO ₂	FCAW	ICF/WPS/FCAW/DIS/6N5/FW/PB/582	

GTAW									
1	AISI 304 + SS 409M	Ø12 mm + 2 mm	Spl	FW	PJ	Ar	GTAW	ICF/WPS/GTAW/DIS/DIA12N2/FW/PJ/001-PIPE	Window bar+Sheet
2	AISI 304 + AISI 304	1.25 mm + 1.25 mm	LAP	FW	PB	Ar	GTAW	ICF/WPS/GTAW/AISI304/1.25N1.25/LAP/PB/619	
3	SS 409M + SS 409M	3 mm + 2.5 mm	LAP	FW	PB	Ar	GTAW	ICF/WPS/GTAW/SS409M/3N2.5/LAP/PB/311	
4	SS 409M + SS 409M	2.5 mm + 8 mm	LAP	FW	PB	Ar	GTAW	ICF/WPS/GTAW/SS409M/2.5N8/LAP/PB/308	
5	SS 409M + SS 409M	2.5 mm + 3 mm	T	FW	PB	Ar	GTAW	ICF/WPS/GTAW/SS409M/2.5N3/FW/PB/305	
6	SS 409M + SS 409M	2.5 mm + 2 mm	LAP	FW	PB	Ar	GTAW	ICF/WPS/GTAW/SS409M/2.5N2/LAP/PB/304	
7	SS 409M + SS 409M	4 mm + 2.5 mm	LAP	FW	PB	Ar	GTAW	ICF/WPS/GTAW/SS409M/4N2.5/LAP/PB/302	
8	SS 409M + SS 409M	5 mm + 2.5 mm	LAP	FW	PB	Ar	GTAW	ICF/WPS/GTAW/SS409M/5N2.5/LAP/PB/301	
9	SS 409M + SS 409M	2 mm + 4 mm	T	FW	PB	Ar	GTAW	ICF/WPS/GTAW/SS409M/2N4/FW/PB/611	
10	SS 409M + SS 409M	2 mm + 4 mm	T	FW	PD	Ar	GTAW	ICF/WPS/GTAW/SS409M/2N4/FW/PD/607	
11	AISI 304 + SS 409M	1.25 mm + 2 mm	LAP	FW	PB	Ar	GTAW	ICF/WPS/GTAW/DIS/1.25N2/LAP/PB/606	
12	SS 409M + AISI 304	2 mm + 1.7 mm	LAP	FW	PB	Ar	GTAW	ICF/WPS/GTAW/DIS/2N1.7/LAP/PB/605	
13	SS 409M + SS 409M	2 mm + 2.5 mm	T	FW	PG	Ar	GTAW	ICF/WPS/GTAW/SS409M/2N2.5/FW/PG/604	
14	AISI 304 + AISI 304	1.7 mm + 1.7 mm	LAP	FW	PB	Ar	GTAW	ICF/WPS/GTAW/AISI304/1.7N1.7/LAP/PB/603	
15	AISI 304 + AISI 304	1.25 mm + 1.7 mm	LAP	FW	PB	Ar	GTAW	ICF/WPS/GTAW/AISI304/1.25N1.7/LAP/PB/602	
16	IRS M41 + SS 409M	6 mm + 2 mm	LAP	FW	PB	Ar	GTAW	ICF/WPS/GTAW/DIS/6N2/LAP/PB/200	
17	SS 409M + SS 409M	2 mm + 2 mm	LAP	FW	PG	Ar	GTAW	ICF/WPS/GTAW/SS409M/2N2/LAP/PG/196	
18	SS 409M + SS 409M	8 mm + 2.5 mm	Sq. BUTT	BW	PA	Ar	GTAW	ICF/WPS/GTAW/SS409M/8N2.5/BW/PA/312	Sidewall+Backpieces
19	SS 409M + SS 409M	4 mm + 2.5 mm	Single V	BW	PA	Ar	GTAW	ICF/WPS/GTAW/SS409M/4N2.5/BW/PA/303	
20	SS 409M + SS 409M	3 mm + 2.5 mm	FLARE	FW	PA	Ar	GTAW	ICF/WPS/GTAW/SS409M/3N2.5/FLARE/PA/310	Sidewall+Backpieces
21	SS 409M + SS 409M	2.5 mm + 2.5 mm	FLARE	FW	PA	Ar	GTAW	ICF/WPS/GTAW/SS409M/2.5N2.5/FLARE/PA/309	
22	SS 409M + SS 409M	3 mm + 3 mm	TEE	FW	PB	Ar	GTAW	ICF/WPS/GTAW/SS409M/3N3/FW/PB/524	
23	SS 409M + SS 409M	3 mm + 3 mm	TEE	FW	PD	Ar	GTAW	ICF/WPS/GTAW/SS409M/3N3/FW/PD/543*Wla	Lanthanum electrode
24	Duplex 2101 + Duplex 2101	2 mm + 2 mm	TEE	FW	PD	Ar	GTAW	ICF/WPS/GTAW/DUP2101/2N2/FW/PD/539*Duplex	Duplex stainless steel
25	SS 409M + SS 409M	3 mm + 3 mm	TEE	FW	PD	Ar	GTAW	ICF/WPS/GTAW/SS409M/3N3/FW/PD/536	
26	SS 409M + SS 409M	3 mm + 3 mm	Sq.BUTT	BW	PA	Ar	GTAW	ICF/WPS/GTAW/SS409M/3N3/BW/PA/590	Two passes
27	AISI 304 + AISI 304	1.7 mm + 2 mm	TEE	FW	PB	Ar	GTAW	ICF/WPS/GTAW/SS/1.7N2/FW/PB/621	08.07.2021
28	IRS M41 + SS 409M	8 mm + 3 mm	LAP	FW	PB	Ar	GTAW	ICF/WPS/GTAW/DIS/8N3/LAP/PB/517	
29	SS409M + AISI 304	1.7 mm + 1.25 mm	LAP	FW	PB	Ar	GTAW	ICF/WPS/GTAW/SS/1.7N1.25/FW/LAP/PB/620	08.07.2021
30	AISI 304 + AISI 304	1.2 mm + 1.2 mm	LAP	FW	PB	Ar	GTAW	ICF/WPS/GTAW/SS/1.2N1.2/FW/LAP/PB/644	
31	SS 409M + SS 409M	3 mm + 3 mm	LAP	FW	PG	Ar	GTAW	ICF/WPS/GTAW/SS/3N3/FW/LAP/PG/640	
32	IRS M41 + SS 409M	5 mm + 3 mm	LAP	FW	PD	Ar	GTAW	ICF/WPS/GTAW/DIS/5N3/FW/LAP/PD/646	
33	SS409M+SS304	3mm+1.2mm	LAP	FW	PB	Ar	GTAW	ICF-WPS-GTAW-SS-3N1.2-FW-PB-642	
34	SS409M+SS409M	2.5mm+8mm	LAP	FW	PB	Ar	GTAW	ICF-WPS-GTAW-SS-2.5N8-LAP-PB-308	

ALTERATIONS	
①	9/2023
ALL DATA UPDATED BASED ON EN15085-3:2022 AND AWTI LR.No.AWTI/79 DT.31-8-2023.	
-Sd-	8.9.23
SSE/D	AME
②	12/2024
NOTE-4 ADDED W.R.T AWTI LR.AWTI/79 DT.19-11-2024	
③	
SSE/D	AME



where,
t, t1, t2 = Plate thickness
s = Depth of penetration
h = Depth of joint preparation
a = Throat thickness

TABLE-1

RANGE OF QUALIFICATION FOR BUTT WELDS MATERIAL THICKNESS AND DEPOSITED METAL THICKNESS AS PER EN ISO 15614-1:2017 TABLE-7				
THICKNESS OF TEST PIECE 't' IN mm	RANGE OF QUALIFICATION			DEPOSITED WELD METAL THICKNESS FOR EACH PROCESS 's' IN mm
	PARENT MATERIAL THICKNESS			
	LEVEL 1	LEVEL 2		
		SINGLE RUN	MULTI-RUN	
t≤3		0.5t to 2t		MAX 2 s
3<t≤12	1.5 to 2t	0.5t(3MIN) to 1.3t	3 to 2t °	MAX 2 s °
12<t≤20	5 to 2t	0.5t to 1.1t	0.5t to 2t	MAX 2 s
20<t≤40	5 to 2t	0.5t to 1.1t	0.5t to 2t	MAX 2 s when s < 20 MAX 2 t when s ≥ 20
40<t≤100	5 to 200t	–	0.5t to 2t	MAX 2 s when s < 20 MAX 200 t when s ≥ 20
100<t≤150	5 to 200t	–	50 to 2t	MAX 2 s when s < 20 MAX 300 t when s ≥ 20
t>150	5 to 1.33t	–	50 to 2t	MAX 2 s when s < 20 MAX 1.33 t when s ≥ 20

° FOR LEVEL-1, WHEN IMPACT REQUIREMENTS ARE SPECIFIED BUT IMPACT TESTS HAVE NOT BEEN PERFORMED, THE MAXIMUM THICKNESS OF QUALIFICATION IS LIMITED TO 12mm.

TABLE-2

FOR LEVEL-2: RANGE OF QUALIFICATION FOR MATERIAL THICKNESS AND THROAT THICKNESS OF FILLET WELDS AS PER EN ISO 15614-1:2017 TABLE-8				
THICKNESS OF TEST		RANGE OF QUALIFICATION		
PIECE 't' IN mm	MATERIAL THICKNESS IN mm	THROAT THICKNESS		
		SINGLE RUN	MULTI-RUN	
t ≤ 3	0.7t TO 2t	0.75a TO 1.5a	NO RESTRICTION	
3 < t ≤ 30	3t TO 2t			
t ≥ 30	≥ 5			

WHERE A FILLET WELD IS QUALIFIED BY MEANS OF A BUTT WELD TEST, THE THROAT THICKNESS RANGE SHALL BE BASED ON THE THICKNESS OF THE DEPOSITED WELD METAL.
NOTE: 'a' IS THE NOMINAL THROAT THICKNESS AS SPECIFIED IN PWPS FOR THE TEST PIECE.

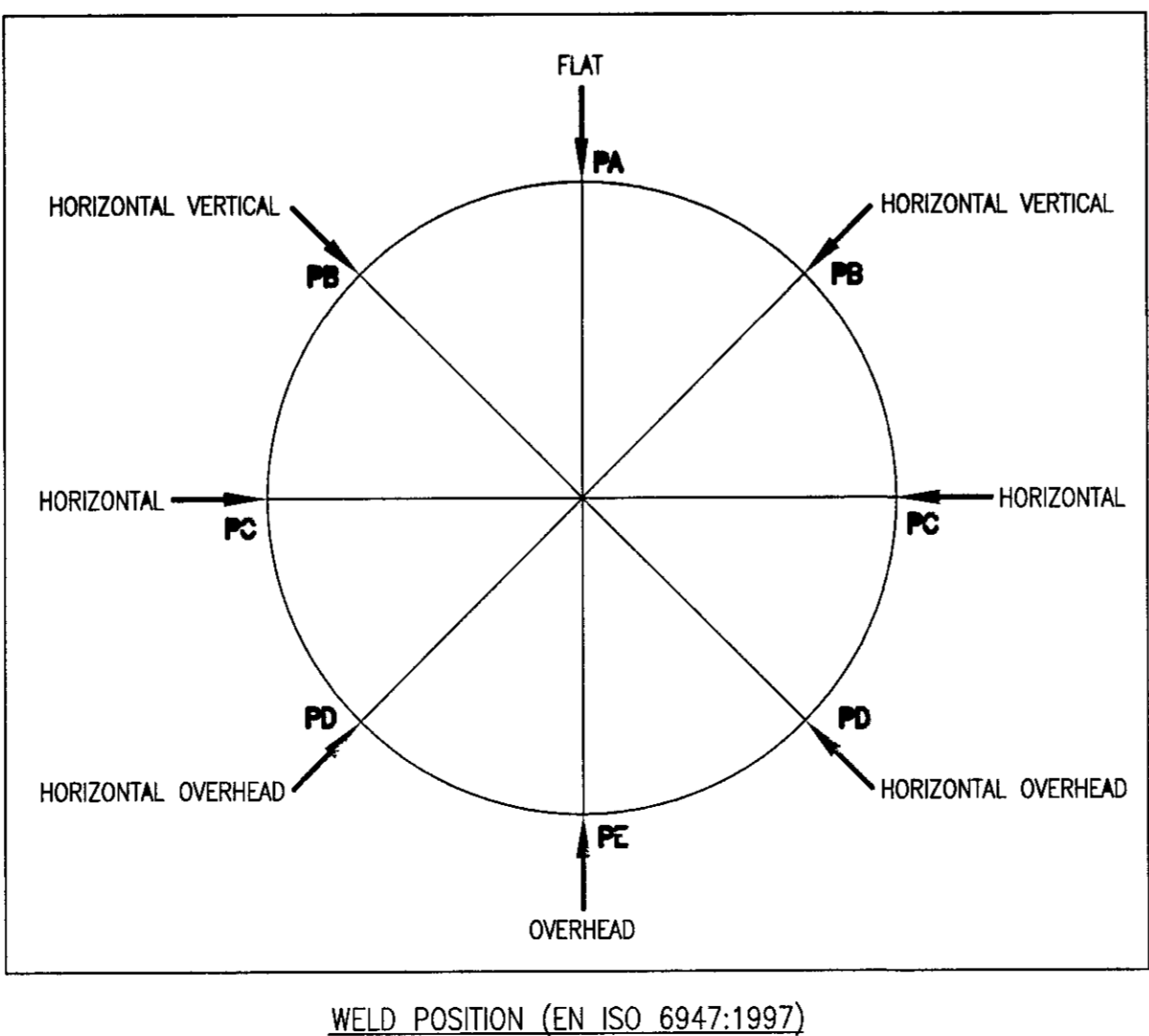
't' - IN CASE OF DIFFERENT MATERIAL THICKNESSES, THE RANGE OF QUALIFICATION OF BOTH THICKNESSES OF THE TEST PIECES SHALL BE CALCULATED SEPARATELY.

TABLE-3

TERMS	DESCRIPTION	SYMBOL
FLAT POSITION	HORIZONTAL WORKING, CENTERLINE OF WELD VERTICAL, CAPPING LAYER ON CAPPING	PA
HORIZONTAL VERTICAL POSITION	HORIZONTAL WORKING, CAPPING LAYER TOWARDS THE CAPPING	PB
HORIZONTAL POSITION	HORIZONTAL WORKING, CENTERLINE OF WELD HORIZONTAL	PC
HORIZONTAL OVERHEAD POSITION	HORIZONTAL WORKING, OVERHEAD CAPPING LAYER TOWARDS THE BOTTOM	PD
OVERHEAD POSITION	HORIZONTAL WORKING, OVERHEAD CENTERLINE OF WELD VERTICAL, CAPPING LAYER UNDERNEATH	PE
VERTICAL UP POSITION	WORKING UPWARDS	PF
VERTICAL DOWN POSITION	WORKING DOWNWARDS	PG

TABLE-4

WELD PROCESS (EN ISO 4063)	CODE
MAW - MANUAL METAL ARC WELDING	111
MAW - METAL ACTIVE GAS ARC WELDING (MAG)	135
MAW - METAL ARC WELDING (ACTIVE GAS SHIELD)	136
TIG - TUNGSTEN INERT GAS ARC WELDING (TIG)	141
SELF SHIELDED ARC WELDING	114
SUBMERGED ARC WELDING	12
MIG - METAL INERT GAS WELDING (MIG)	131
MIG - METAL ARC WELDING (INERT GAS SHIELD)	137
PLASMA ARC WELDING	15
OXY-ACETYLENE WELDING	311
LBM - LASER BEAM WELDING WITH GAS	522
RSW - RESISTANCE SPOT WELDING (DIRECT)	212
RSW - RESISTANCE SPOT WELDING (INDIRECT)	211



WELD POSITION (EN ISO 6947:1997)

- NOTE:**
- 1.1 RANGE OF QUALIFICATION FOR INFORMATION ONLY.
 - 1.2 FOR RANGE OF QUALIFICATION REFER EN ISO: 15614-1(LATEST REVISION)
 2. FOR DETAIL SPECIFICATIONS REFER THE APPLICABLE WELD PROCEDURE SPECIFICATION (WPS).
 3. IF ANY JOINT IS NOT COVERED IN THIS DRAWING, THE ASSEMBLY SHOP/VENDOR MAY DEVELOP WPS FOR THE SAME AND SUBMIT TO AWTI/ICF AND GET IT APPROVED.
 4. FOR LATEST WPS, ICF WORKSHOPS MAY REFER ICF WEBSITE LINK AS FOLLOWS: DEPARTMENT/MECHANICAL/DEPT.SUB SECTIONS/IMS/WQMS/WPS

QTY	DESCRIPTION & DIMENSION	ITEM	REF.DRGS	MAT.SPEC	WEIGHT/UNIT	REMARKS
	GROUP: 9-0					
WELD PROCEDURE SPECIFICATION DETAILS						SUPERSEDED BY:
						SUPERSEDES:
						SCALE: SSE/D 12/24
						NTS: CHD J.RAMESH, DRN UKKAPANDIAN T/NAZARUL HAQUE
Alpha Alt:- b						INTEGRAL COACH FACTORY CHENNAI-38
DATA CODE NO. 140						SHEET 2 OF 2
INDIAN RAILWAY STANDARDS						ICF/STD-9-0-999

2-12-2024 16-09-2017 ASSEMBLY DRAWINGS

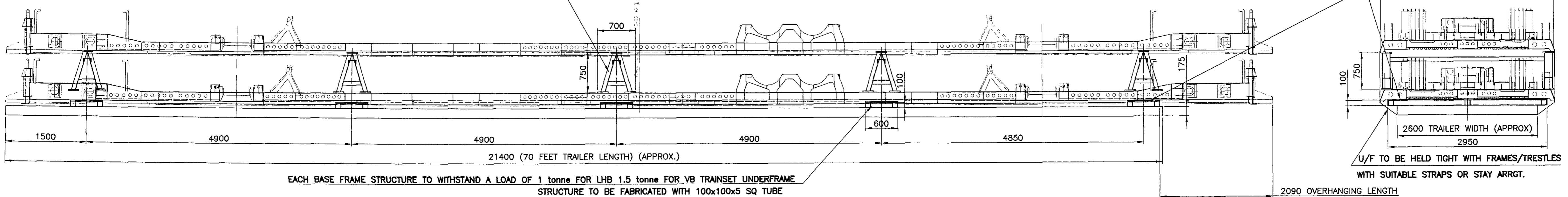
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ICF/J&T/MISC-2487

▽ ROUGH MACHINED		ALTERATIONS
▽▽ FINISH MACHINED		③ DATE:-09/03/2020
▽▽▽ FINE FINISH MACHINED		JOBNO:1134/19-20

EACH MIDDLE FRAME STRUCTURE TO WITHSTAND A LOAD OF 1 Tonne FOR LHB 1.5 TONNE FOR VB TRAINSET UNDERFRAME
STRUCTURE TO BE FABRICATED WITH 125x65 CHANNEL


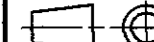

CONTACT POINT WITH TROUGH FLOOR TO BE PROVIDED WITH RUBBER PAD.



NOTE:

1. BOTTOM FRAMES TO BE SUITABLY FASTENED OR WELDED WITH THE TRAILER FLOOR DURING TRANSPORTATION.
2. MIDDLE FRAMES TO BE SUITABLY STRAPPED WITH TRAILER USING CHAIN OR POLYESTER WEBBING SLINGS.
3. DIMENSIONS SHOWN ARE INDICATIVE ONLY.
4. FRAME SHOULD BE OF ADEQUATE STRENGTH FOR TRANSPORTING.
5. WEIGHT OF EACH LHB UNDER FRAME IS 5.5 T (APPROX.)
6. ONLY TWO UNDERFRAMES TO BE PLACED AS SHOWN IN THE SKETCH (BOTH INVERTED) FOR TRANSPORTING.
7. PACKING CONDITION SHOWN IS FOR TRANSPORTING ONLY.
8. U/F TO BE HELD TIGHT WITH FRAMES/TRESTLES WITH SUITABLE STRAPS OR STAY ARRGT.
9. WEIGHT OF EACH BASE FRAME – 100 kg. (TOTAL WEIGHT $5 \times 100 = 500$ kg.) APPROX.
10. WEIGHT OF EACH MIDDLE FRAME – 100 kg. (TOTAL WEIGHT $5 \times 100 = 500$ kg.) APPROX.
11. THE SAME PACKING CONDITION TO BE ADAPTED FOR VB TRAINSET UNDERFRAME WITH NECESSARY SAFETY ARRANGEMENTS.
12. WEIGHT OF EACH VB TRAINSET UNDER FRAME IS 7.5 T (APPROX.)

THE PACKING FRAMES/STRUCTURES ARE TO BE TAKEN
BACK BY THE SUPPLIER FROM ICF PREMISES AFTER THE
COMPONENTS ARE TAKEN FOR PRODUCTION

		NO. OFF		DESCRIPTION & DIMENSIONS		ITEM	REF. DRGS.	MAT.& SPEC		REMARKS			
				CADFILE:-\\10.53.12.205\JIG&TOOL\J&T-CAD\MIS\MIS_2487_b.DWG				SUPERSEDED BY:					
				TRANSPORTING ARRANGEMENT FOR VB AND LHB UNDERFRAME				SUPERSEDES:					
						SCALE 1:40	SSE/D	 B. Bannugoban					
							CHD						
							DRN						
				CAD									
						ALT	a	b					
		ASSEMBLY DRAWINGS							INTEGRAL COACH FACTORY CHENNAI-38				
18-11-2023	11-03-2014	 19/11/23								ICF/J&T/MISC-2487			
DATE OF LATEST ALT.	DATE OF FIRST ISSUE	SME/AME											

JOB NO.: 228/14-15