



भारत सरकार — रेल मंत्रालय
अनुसंधान अभिकल्प और मानक संगठन
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Government of India - Ministry of Railways
Research Designs & Standards Organisation
Lucknow – 226011
DID (0522) 2450115
DID (0522) 2465310



No. : MW/BVCM

Date : 23/05/2025

**PCMEs
All Zonal Railways**

Sub: Improvements in Brake Van (Improved chairs, panelling, solar lighting system, improved door locking and other amenities)

Ref: 1) RDSO's letter no. MW/BVCM dated 12.08.2024
2) Railway Board letter no. 2019/M(N)/60/7 (E-3317908) dated 26.02.2025
3) Railway Board letter No. 2013/M (N)/60/10 (E-3320409) dated 15.07.2024

As per Railway Board directions, RDSO has issued detailed guidelines for improving Brake Vans (BVCM) vide ref 1) above. Besides new manufacturing, Railway board vide ref 2) above has also sanctioned RSP works and has advised Zonal railways for upgradation of BVZI/BVCM Brake van.

- 1) Provision of adjustable guard chairs and other essential amenities in brake vans (PB item no. 769/24-25) during ROH, POH and sick repair.
- 2) Upgradation of 8000 brake vans during periodical overhauling in workshops (PB item no. 770/24-25).

In line with Railway Board's directions, it is reiterated that all items required for upgradation work shall be procured strictly as per RDSO drawings, only from reputed/approved sources as applicable. The drawings of BVCM and BVZI (32 nos. for BVCM and 30 nos. for BVZI respectively) for the above upgradation works are attached herewith.

Enclosure: As above

Digitally Signed by Sanjay
Kumar

Date: 24-05-2025 15:36:57

Reason: Approved

(Sanjay Kumar)

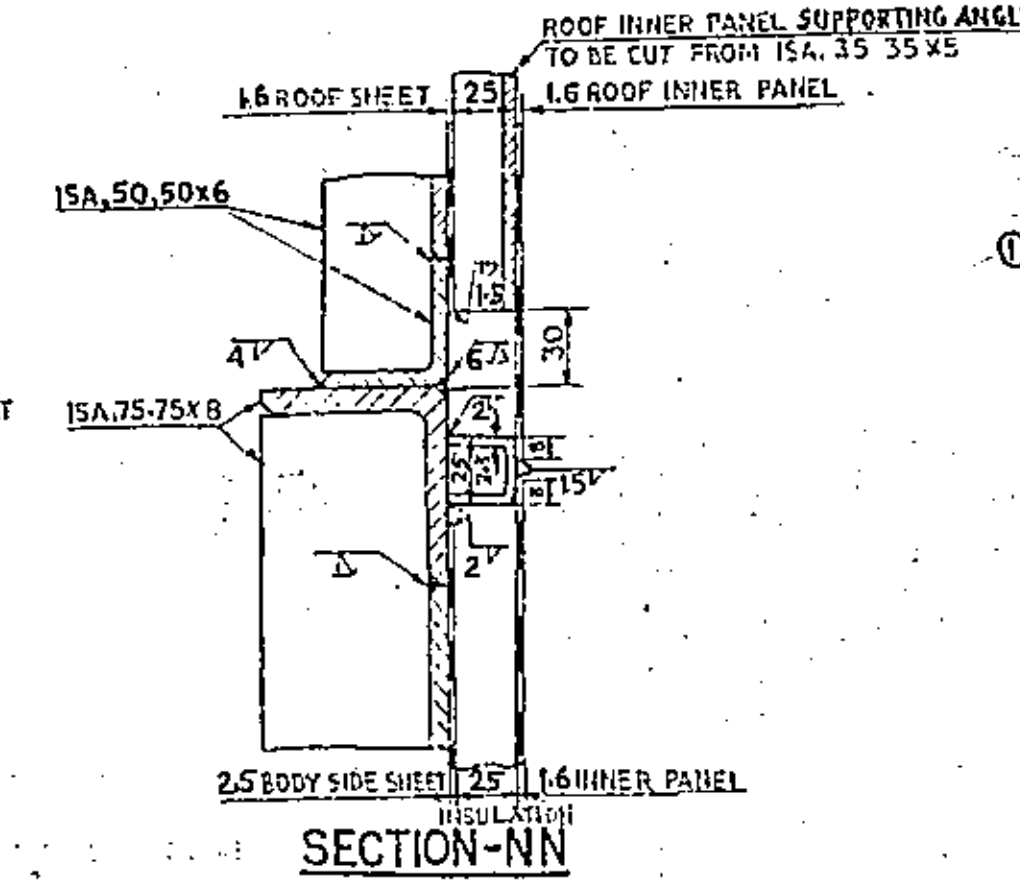
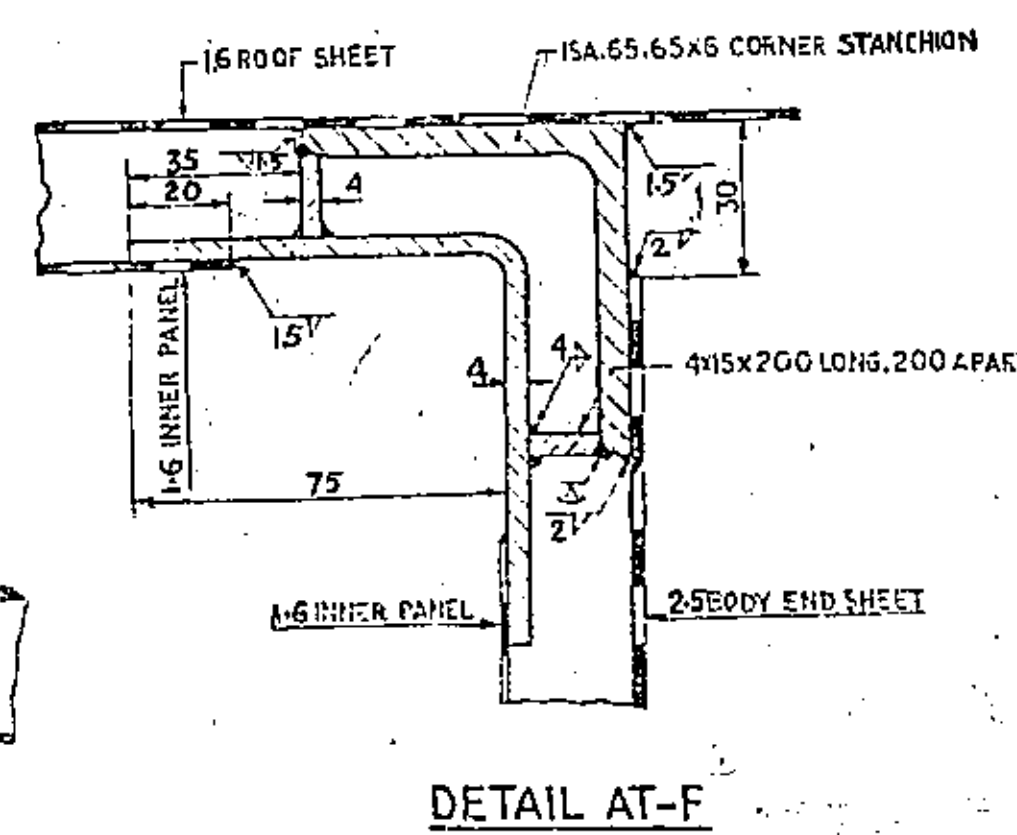
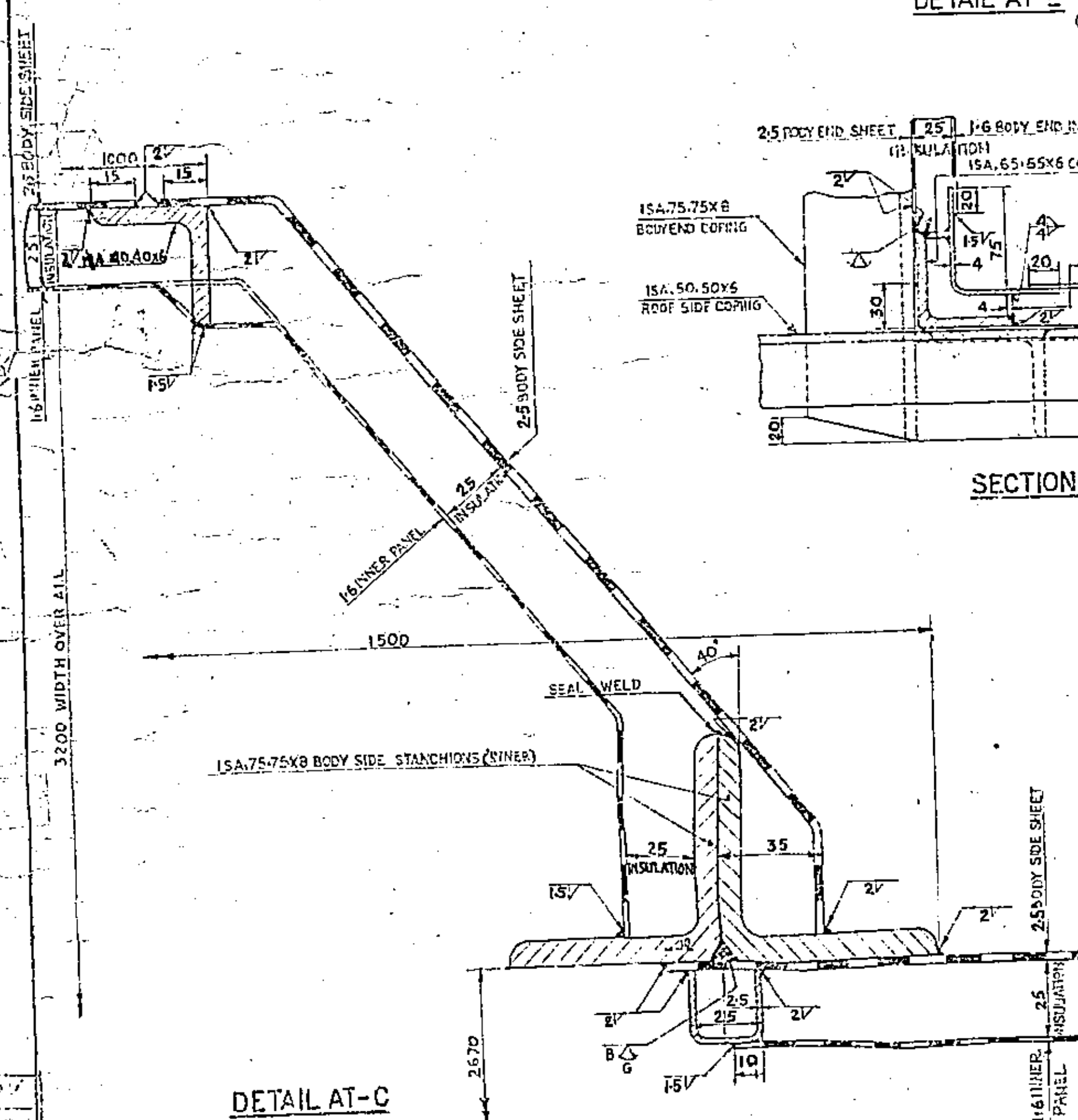
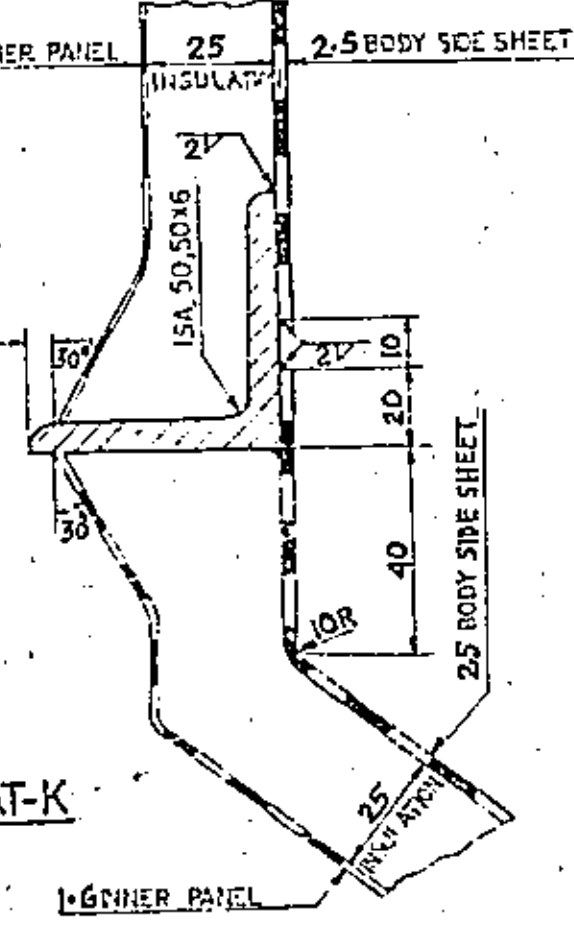
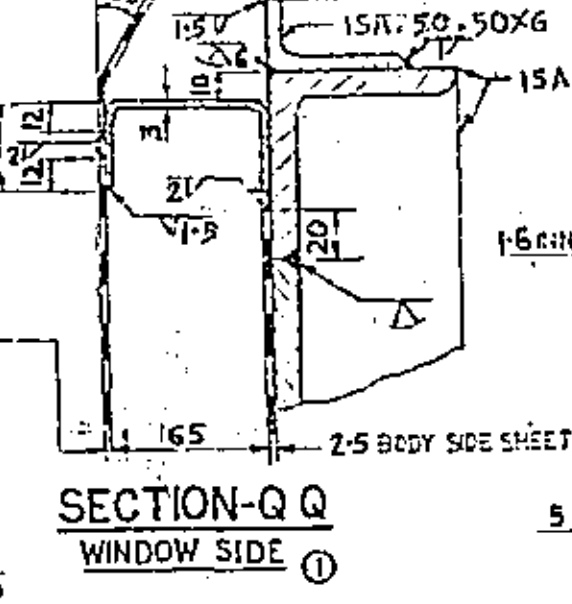
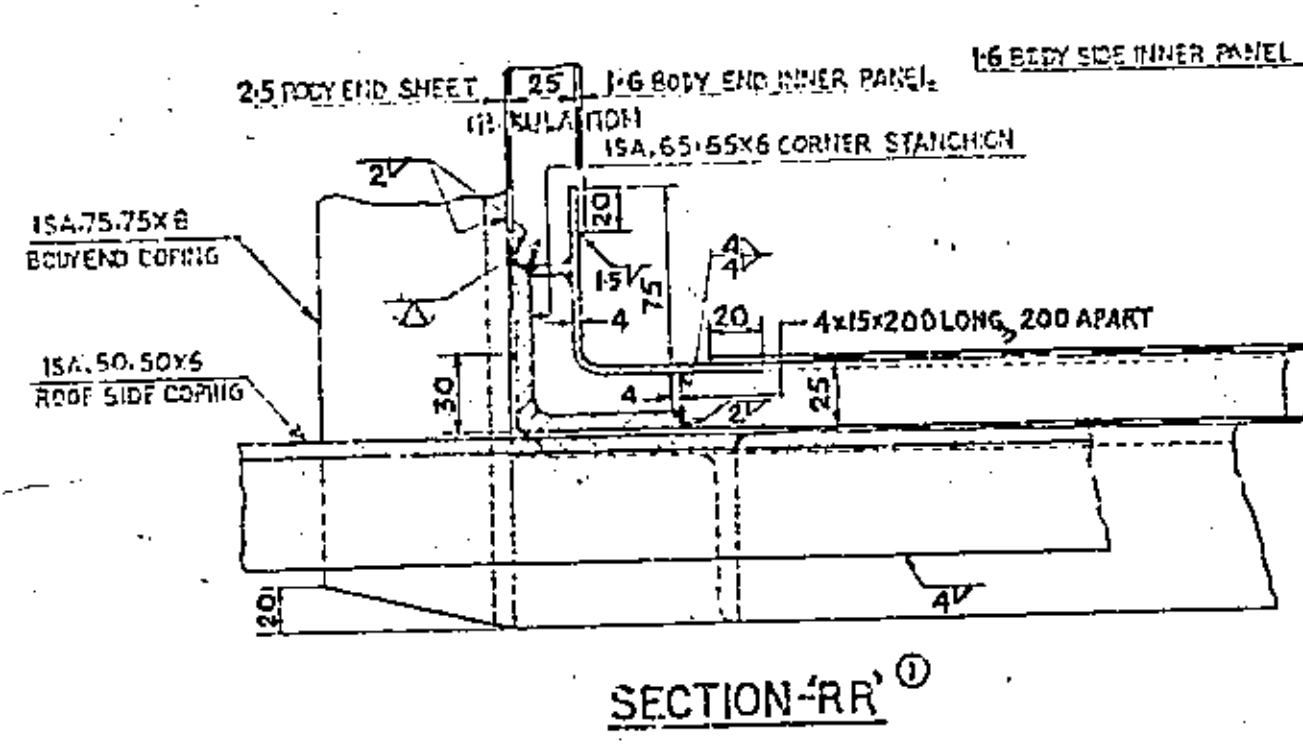
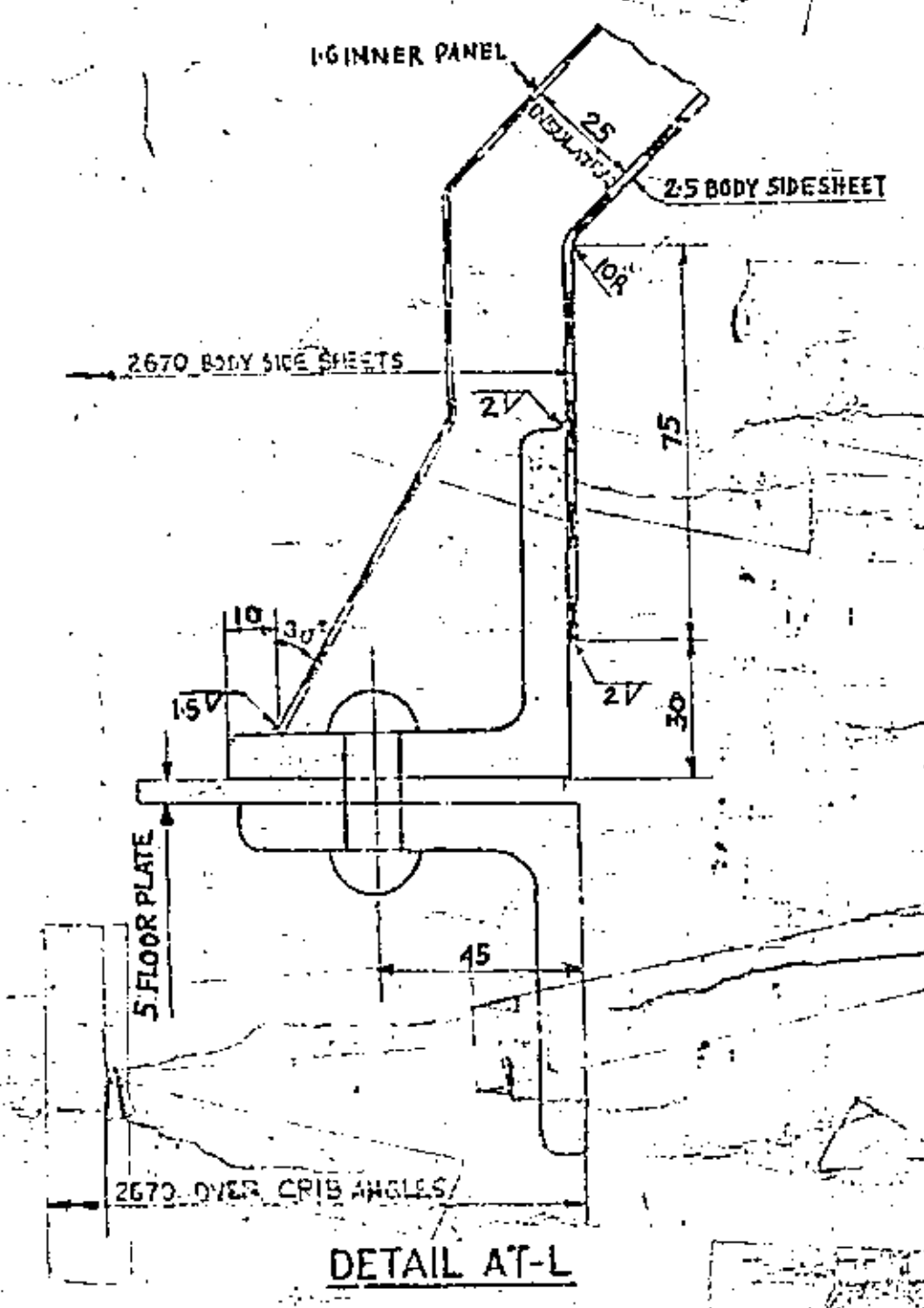
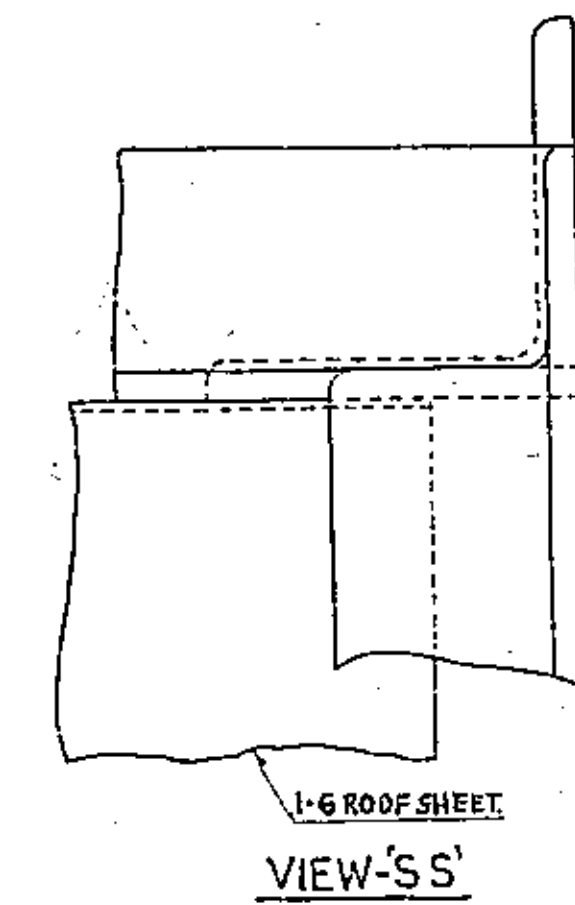
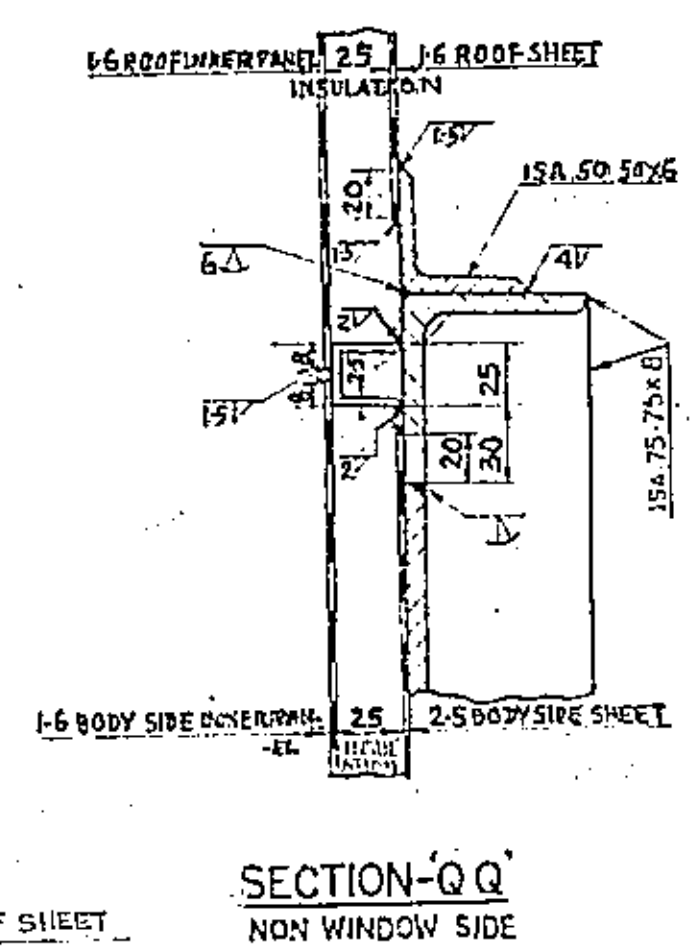
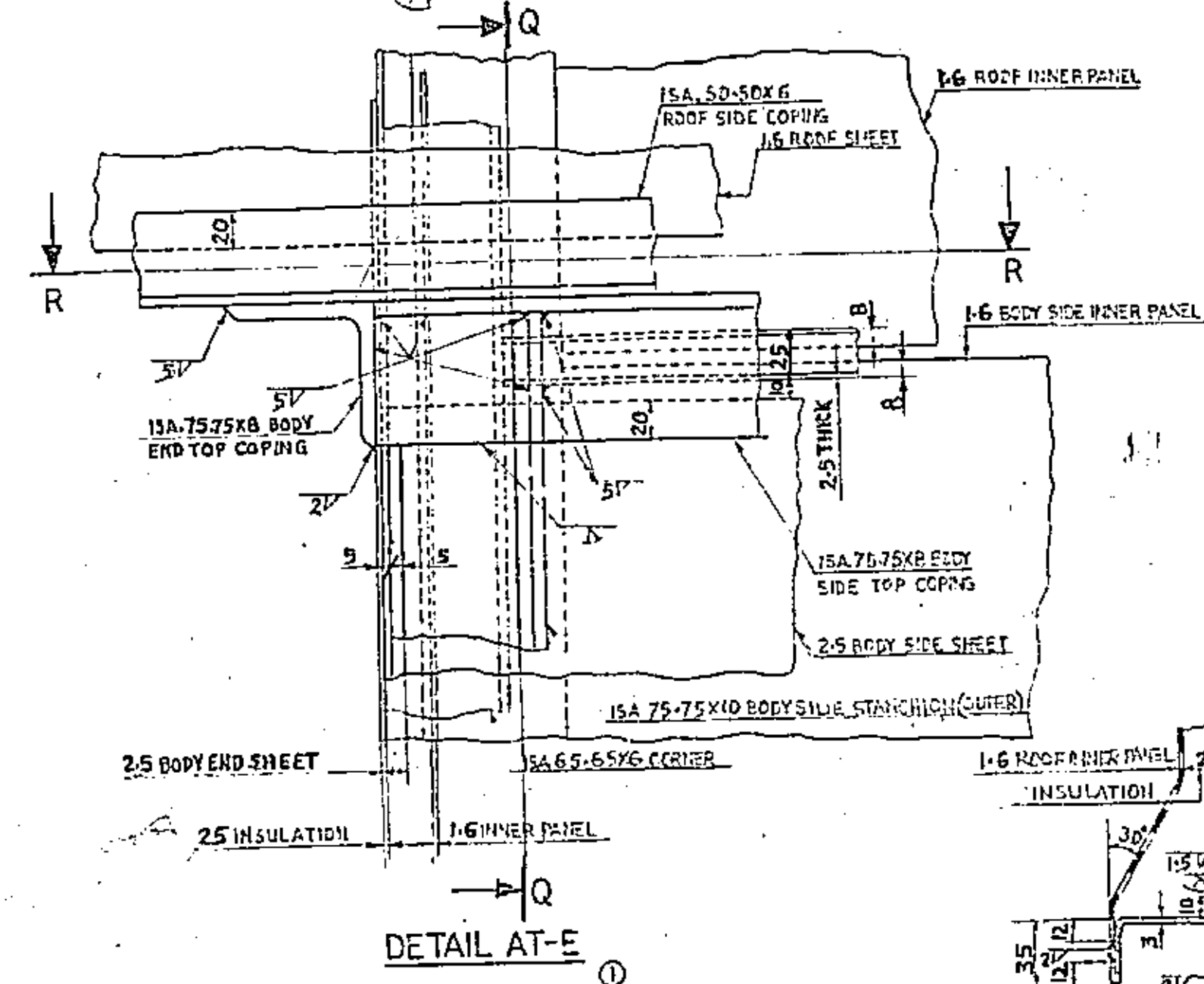
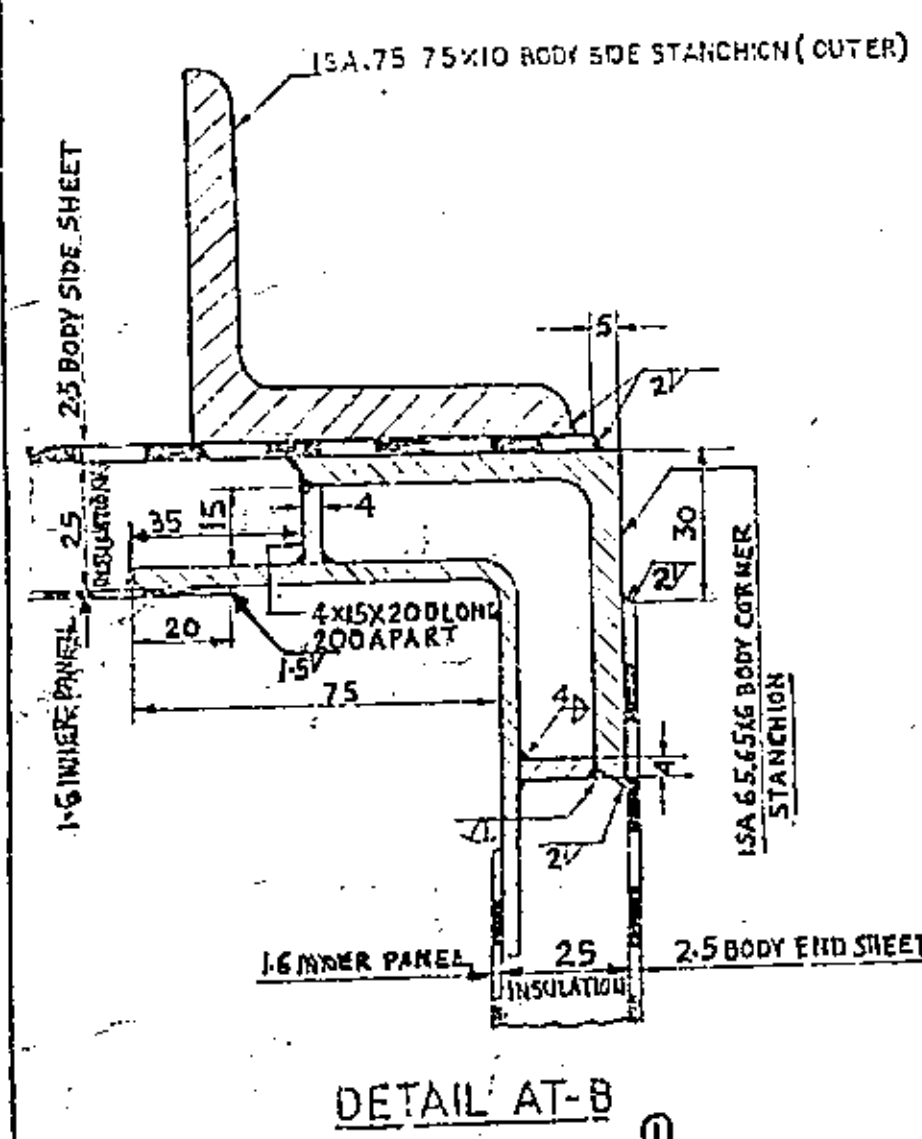
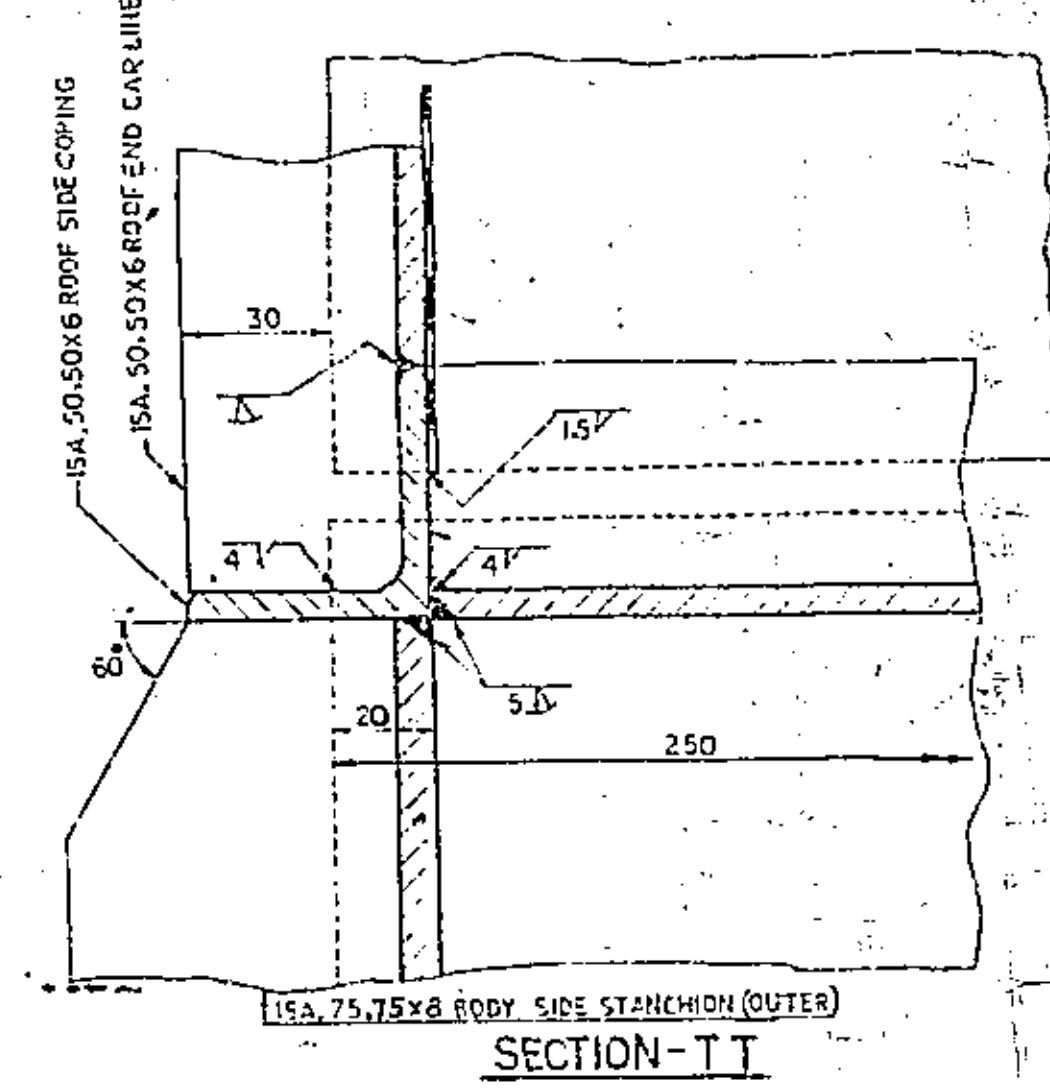
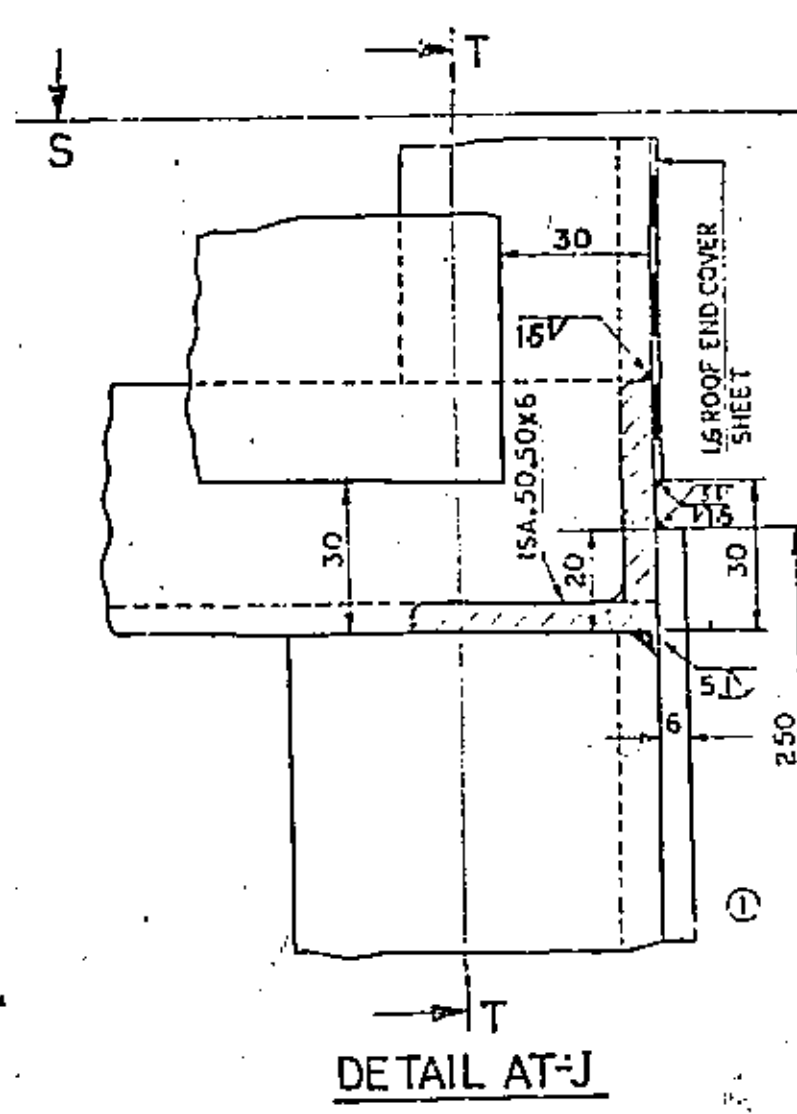
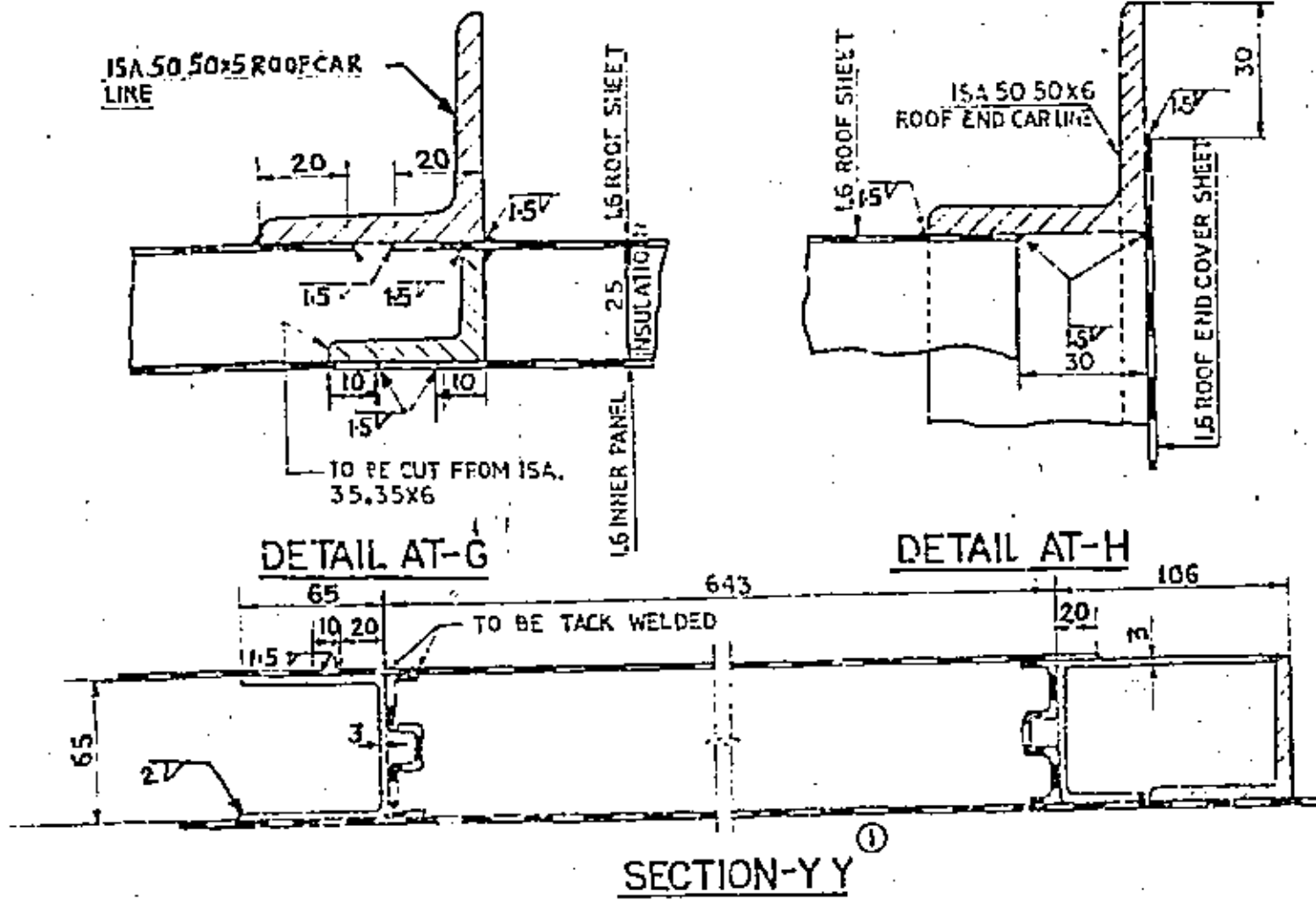
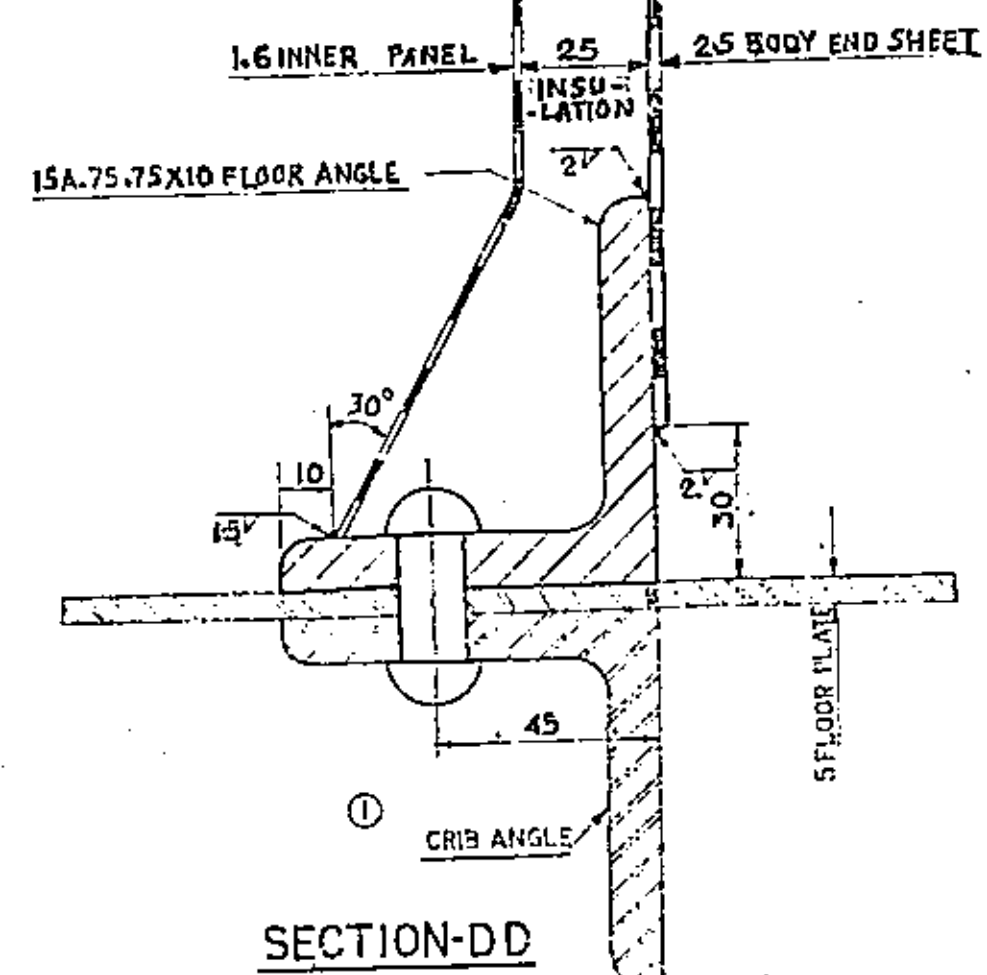
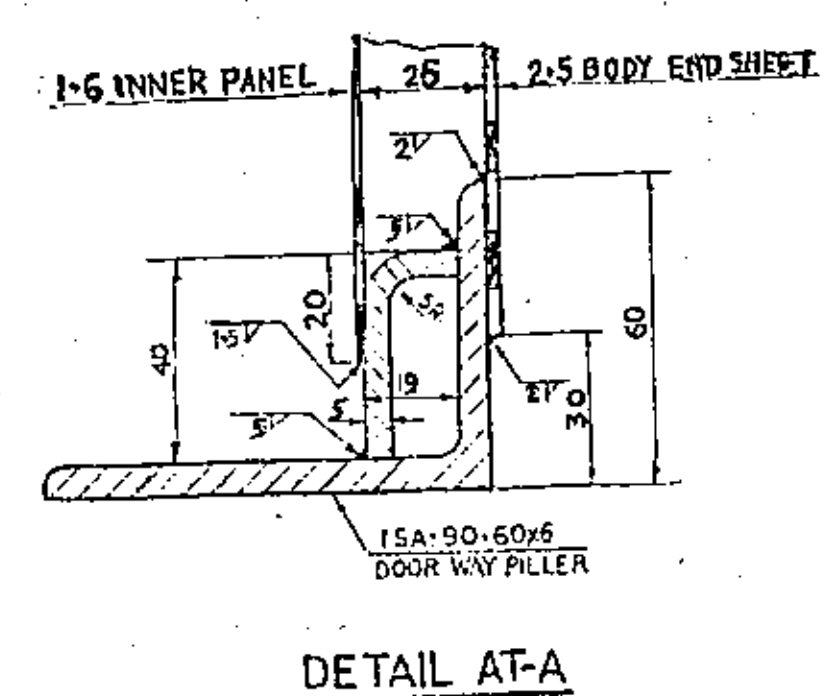
Director stds Wagon

For Executive Director Stds wagon

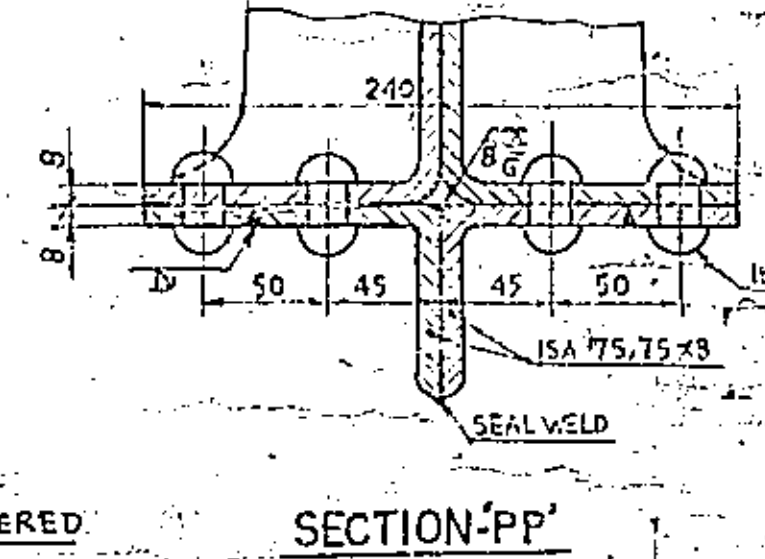
Copy to: ED/QAM/Delhi, Mumbai & kolkata for information and ensuring strict compliance of instructions given vide ref.(1) above during BVCM manufacturing by wagon manufacturers.

② DESIGN-A		②DESIGN-B		⑤ DESIGN-C	
DRG.NOS.	DESCRIPTION	DRG.NOS.	DESCRIPTION	DRG.NOS.	DESCRIPTION
WD-09107-S-01	INDEX	WD-09107-S-01	INDEX	WD-09107-S-01	INDEX
WD-09107-S-02	DIAGRAM	WD-15009-S-02	DIAGRAM	WD-15009-S-02	DIAGRAM
WD-09107-S-03	GENERAL ARRANGEMENT	WD-15009-S-03	GENERAL ARRANGEMENT	WD-17039-S-03	GENERAL ARRANGEMENT
WD-09107-S-04	UNDERFRAME ARRANGEMENT (MODIFIED)	WD-15009-S-04	UNDERFRAME ARRANGEMENT	WD-17039-S-04	UNDERFRAME ARRANGEMENT
WD-09107-S-05	UNDERFRAME DETAILS (MODIFIED)	WD-15009-S-05	UNDERFRAME DETAILS (SHEET-1)	WD-15009-S-05	UNDERFRAME DETAILS (SHEET-1)
WD-09107-S-06	ARRANGEMENT OF SUPER STRUCTURE	WD-15009-S-06	UNDERFRAME DETAILS (SHEET-2)	WD-17039-S-05	UNDERFRAME DETAILS (SHEET-2)
WD-09107-S-07	JOINTS OF BODY WITH UNDER FRAME	WD-15009-S-07	UNDERFRAME DETAILS (SHEET-3)	WD-15009-S-07	UNDERFRAME DETAILS (SHEET-3)
WD-09107-S-08	BRAKE DIAGRAM	WD-15009-S-08	ARRANGEMENT OF SUPER STRUCTURE	WD-17039-S-06	ARRANGEMENT OF SUPER STRUCTURE
WD-09107-S-09	UNDERFRAME BRAKE GEAR ARRANGEMENT	WD-15009-S-09	UNCOUPLING GEAR ARRANGEMENT	WD-15009-S-09	UNCOUPLING GEAR ARRANGEMENT
WD-09107-S-10	UNDERFRAME BRAKE GEAR DETAILS	WD-15009-S-10	ARRANGEMENT OF FOOT STEP AND DETAILS	WD-15009-S-10	ARRANGEMENT OF FOOT STEP AND DETAILS
WD-09107-S-11	MARKING DIAGRAM	WD-09107-S-08	BRAKE DIAGRAM	WD-09107-S-08	BRAKE DIAGRAM
WD-09107-S-12	FITMENT OF AIR BRAKE EQUIPMENT AND PIPE LAYOUT	WD-15009-S-11	UNDERFRAME BRAKE GEAR ARRANGEMENT	WD-15009-S-11	UNDERFRAME BRAKE GEAR ARRANGEMENT
WD-09107-S-13	DETAILS OF PIPES FOR FITMENT OF AIR BRAKE EQUIPMENT	WD-09107-S-10	UNDERFRAME BRAKE GEAR DETAILS	WD-09107-S-10	UNDERFRAME BRAKE GEAR DETAILS
WD-09107-S-14	DETAILS FOR FITMENT OF AIR BRAKE EQUIPMENT	WD-15009-S-12	MARKING DIAGRAM	WD-15009-S-12	MARKING DIAGRAM
① WD-14008-S-01	CASNUB 22HS (MODIFIED)	WD-15009-S-13	BODY DETAILS AND FITTINGS	WD-15009-S-13	BODY DETAILS AND FITTINGS
① WD-14027-S-01	CENTER PIVOT AND SIDE BEARER ARRANGEMENT	WD-15009-S-14	FITMENT OF AIR BRAKE EQUIPMENT AND PIPE LAYOUT	WD-15009-S-14	FITMENT OF AIR BRAKE EQUIPMENT AND PIPE LAYOUT
		WD-15009-S-15	DETAILS OF PIPES FOR FITMENT OF AIR BRAKE EQUIPMENT	WD-15009-S-15	DETAILS OF PIPES FOR FITMENT OF AIR BRAKE EQUIPMENT
		WD-15009-S-16	DETAILS FOR FITMENT OF AIR BRAKE EQUIPMENT	WD-15009-S-16	DETAILS FOR FITMENT OF AIR BRAKE EQUIPMENT
		④ WD-14008-S-01	CASNUB 22HS (MODIFIED) —		
		WD-14027-S-01	CENTER PIVOT AND SIDE BEARER ARRANGEMENT	WD-14027-S-01	CENTER PIVOT AND SIDE BEARER ARRANGEMENT
		SK-75528	BODY AND ROOF JOINT DETAILS	SK-75528	BODY AND ROOF JOINT DETAILS
		SK-63720	PRO/PR STENCIL	SK-63720	PRO/PR STENCIL
		SK-66511	RAILWAYS INITIALS IN HINDI	SK-66511	RAILWAYS INITIALS IN HINDI
		SK-73552	AIR BRAKE HOSE COUPLING SUPPORT VENTILATOR	SK-73552	AIR BRAKE HOSE COUPLING SUPPORT VENTILATOR
		SK-75535	FIXING ARRANGEMENT AND DETAILS OF LV BOARD	SK-75535	FIXING ARRANGEMENT AND DETAILS OF LV BOARD — ⑥
		WD-81010-S-03	ARRANGEMENT OF HIGH TENSILE CENTRE BUFFER COUPLER	WD-81010-S-03	ARRANGEMENT OF HIGH TENSILE CENTRE BUFFER COUPLER
		CSC-1015	VENTILATOR	CSC-1015	VENTILATOR
		③ WD-17016-S-01	MOUNTING ARRANGEMENT OF BIO-DIGESTOR	WD-24025-S-01 (SHEET-1 OF 2)	GUARD'S SEAT FOR GOODS BRAKE VAN ⑦
		③ WD-17016-S-02	ARRANGEMENT OF FITMENT OF WATER TANK	WD-24025-S-01 (SHEET-2 OF 2)	GUARD'S SEAT FOR GOODS BRAKE VAN ⑦
		④ WD-17013-S-01	INDEX (BOGIE)	WD-24077-S-01	UNIVERSAL LOCK⑦
				WD-17013-S-01	INDEX (BOGIE)
				WD-24050-S-07 (SHEET-I)	FITMENT OF SOLAR SYSTEM WITH LIGHT & FAN ⑦
				WD-24050-S-07 (SHEET-II)	FITMENT OF SOLAR SYSTEM WITH LIGHT & FAN ⑦

				PRELIMINARY SKETCH		ONLY FOR PROTOTYPE APPLICATION UNDER GUIDANCE OF R.D.S.O. (WAGON)	
⑦	—	WD-24050	REFERENCE DRAWING OF GAURO CHAIR,UNIVERSAL LOCK AND FITMENT OF SOLAR SYSTEM WITH LIGHT & FAN ADDED IN DESIGN -C.	08/24		BOGIE BRAKE VAN TYPE 'BVCM'	
⑥	—	WD-21047	IN DESIGN-C DRG. NO.SK-75535 DELETED	06/21			
⑤	—	WD-17039	INDEX DRG. ALTERED BY ADDING DESIGN-C	06/17	—	INDEX	
④	—	WD-17022	IN DESIGN-B DRG.No.WD-14008-S-01 DELETED & BOGE INDEX DRG. ADDED	04/17	—		
③	—	WD-17016	IN DESIGN-B TWO NOS. DRAWING ADDED	02/17	—		
②	—	WD-15009	NOTE: REMOVED,NAMED AS DESIGN-A NEW DESIGN-B DRAWINGS ADDED	01/15	—		
①	—	WD-14027	BOGIE, CP TOP & SIDE BEARER DRG. ADDED	10/14	—	WD-09107-S-01	
ALT.	ITEM	AUTHY.	DESCRIPTION	DATE	ASSLY. DRGS.		
				B.G.		R.D.S.O. [W]	GROUP



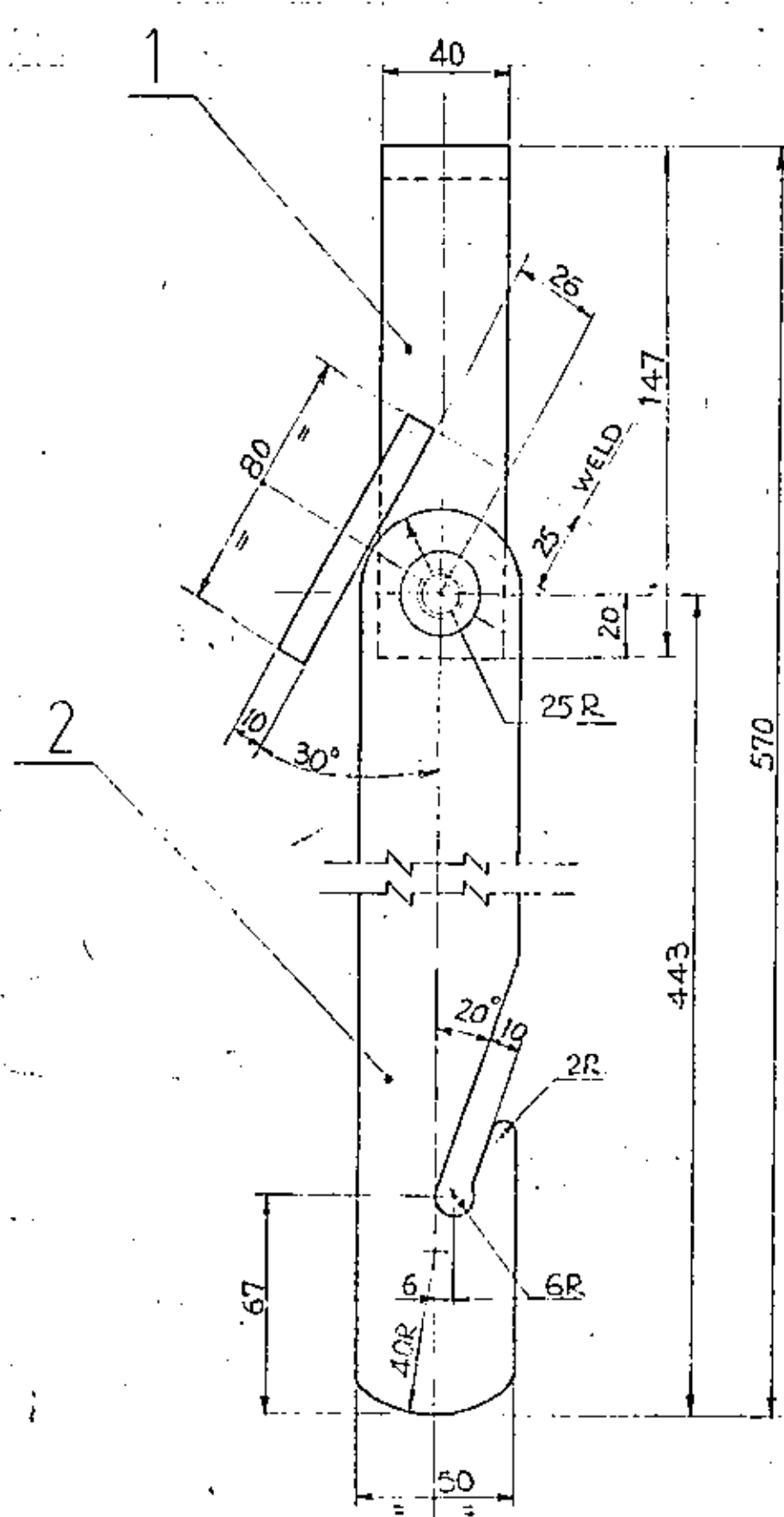
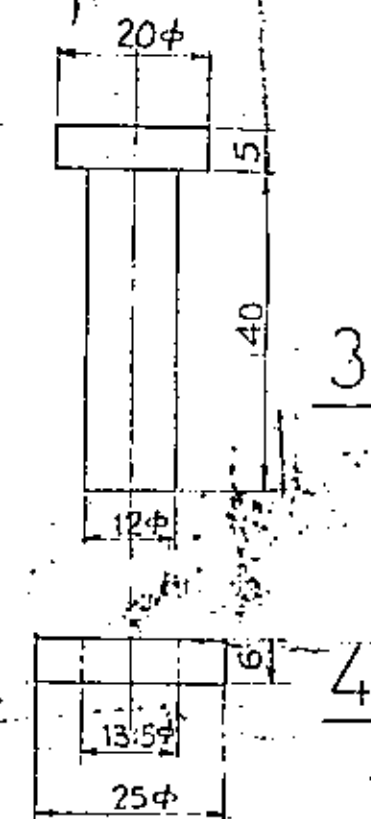
DRG. NO. WD.2.7341-S/8 RE-NUMBERED
① AS 75528.



PRELIMINARY SKETCH		ONLY FOR PH	
SUPERSEDED BY		4-WHEELED GOODS BRAKE VAN TYPE BVT	
SUPERSEDED BY		B.G. R.P.S.O. GROUP	
SUPERSEDED BY		SK.75528	
SUPERSEDED BY		ASSEMBLY DRGS.	
SUPERSEDED BY		SK.75528	

A006/197 01 84

BODY & ROOF
JOINT DETAILS

13.5 ϕ HOLE
ON ITEM 1 & 22
GAP

⑤	-	WD-04089	REVISED	3/06	
⑤	-	WD-03037	MATERIAL UPDATE	7/03	
④	-	WD-91027	REVISED & REDRAWN	4/91	
ALT.	ITEM	AUTHY.	DESCRIPTION	DATE	ASSY. DRG.

4.	WASHER	1			IS:2152 FE-PLA	
3.	PIN	1			" "	
2.	COUPLING SUPPORT	1			" "	
1.	COUPLING BRACKET	1			" "	
S.No	DESCRIPTION	No. OFF.	REF. DRG.	WT. OF ONE Kg.	MAT. & SPEC.	REMARKS
SUPERSEDED BY						
SUPERSEDES		DATE				
SCALE	PASSED	1:2	CHECKED	1:1	1:1	
	DRAIN		TRACED			
	SHEET					
B.G.	P.D.S.O.	GROUP	FOR AIR BRAKE ON WAGON			
[W]			AIR BRAKE HOSE COUPLING SUPPORT			
			SK-73552			

मध्य पूर्वी दक्षिण पूर्व

दक्षिण पूर्व उत्तर पूर्व दक्षिण

पूर्व पूर्व उत्तर पूर्व पूर्व

उत्तर पूर्व दक्षिण पूर्व दक्षिण

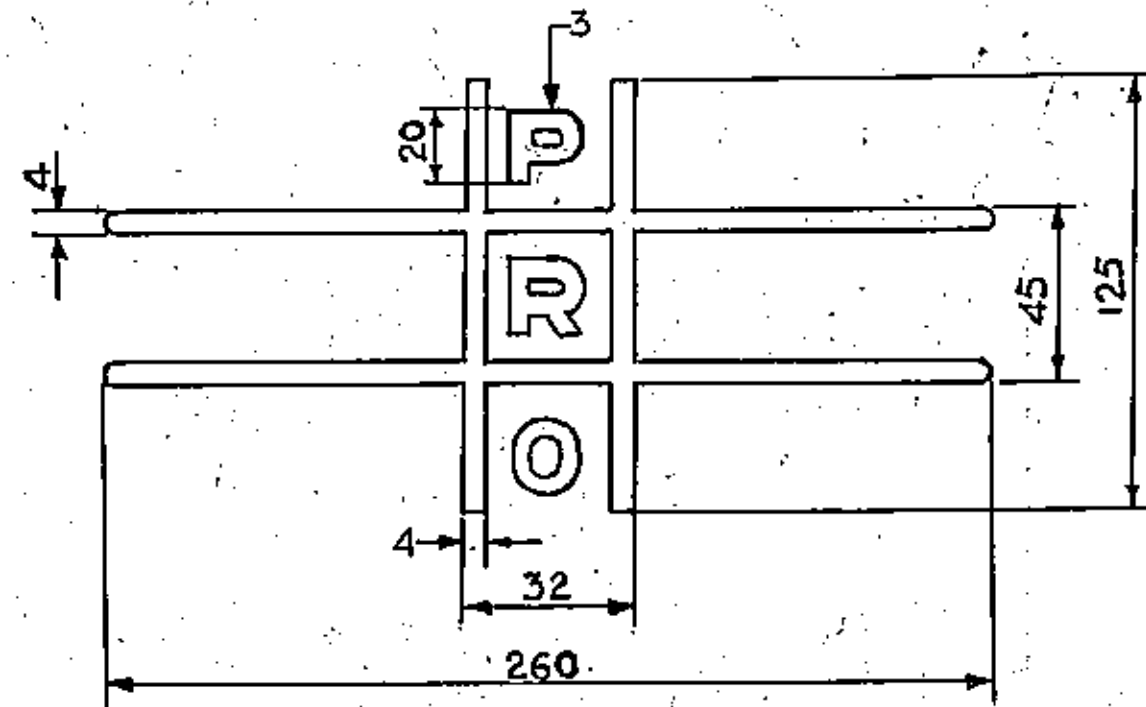
RAILWAY	INITIALS	रेलवे	प्रथमाक्षर
CENTRAL	CR	मध्य	मध्य
NORTH EAST FRONTIER	NFR	पूर्वोत्तर सीमा	पू सी
SOUTH EASTERN	SER	दक्षिण पूर्व	द पू
EASTERN	ER	पूर्व	पूर्व
SOUTHERN	SR	दक्षिण	द रे
WESTERN	WR	पश्चिम	प रे
NORTHERN	NR	उत्तर	उ रे
NORTH EASTERN	NER	पूर्वोत्तर	पू उ
SOUTH CENTRAL	SCR	दक्षिण मध्य	द म
EAST CENTRAL	ECR	पूर्व मध्य	पू म
EAST COAST	ECOR	पूर्व तटीय	पू त
NORTH CENTRAL	NCR	उत्तर मध्य	उ म
NORTH WESTERN	NWR	उत्तर पश्चिम	उ प
SOUTH EAST CENTRAL	SECR	दक्षिण पूर्व मध्य	द पू म
SOUTH WESTERN	SWR	दक्षिण पश्चिम	द प
WEST CENTRAL	WCR	पश्चिम मध्य	प म

NOTE:-

- THIS SKETCH SHOULD BE FOLLOWED ONLY FOR THE SHAPE AND PROPORTION OF THE LETTERS.
- THE ACTUAL MARKING & SIZE SHOULD BE AS PER THE RELEVANT PLATES OF IRCA RULES BOOK PART III OF LATEST REVISION.

①	-	WD-17024	NEW RLY ZONES, INITIALS ADDED & REVISED	04/17	
-	-	-	RETRACED	6/97	
ALT	ITEM	AUTHY	DESCRIPTION	DATE	ASSLY. DRG

SUPERSEDED BY	DATE
SUPERSEDES	
SCALE	PASSED
CHECKED	Sd/YAGASIA 6/66
DRAWN	Sd/JP SINGH 5/66
TRACED	Sd/SUKHADEV 5/66
J.S.NO.	R.JAIN 6/97
WG66031	5/66
B.G.	R.D.S.O. [W]
GROUP	SK.66511

**NOTE:**

1. TO BE STENCILLED WITH WHITE PAINT
2. FOR WAGONS FITTED WITH ROLLER BEARING
AXLE BOXES LETTERS P & R ONLY TO BE
STENCILLED.
3. ALL DIMENSIONS IN MILLIMETRES.

COMP BY	SIG.	DATE
M.L. BAHL	<i>[Signature]</i>	19/5/97

ALT.	LETT	AUTHY	DESCRIPTION	DATE
-	-	-	RETRACED	2/97
①	-	CW-978	REVISED	9/63

MF AQU/393 MICROFILMED 7/89

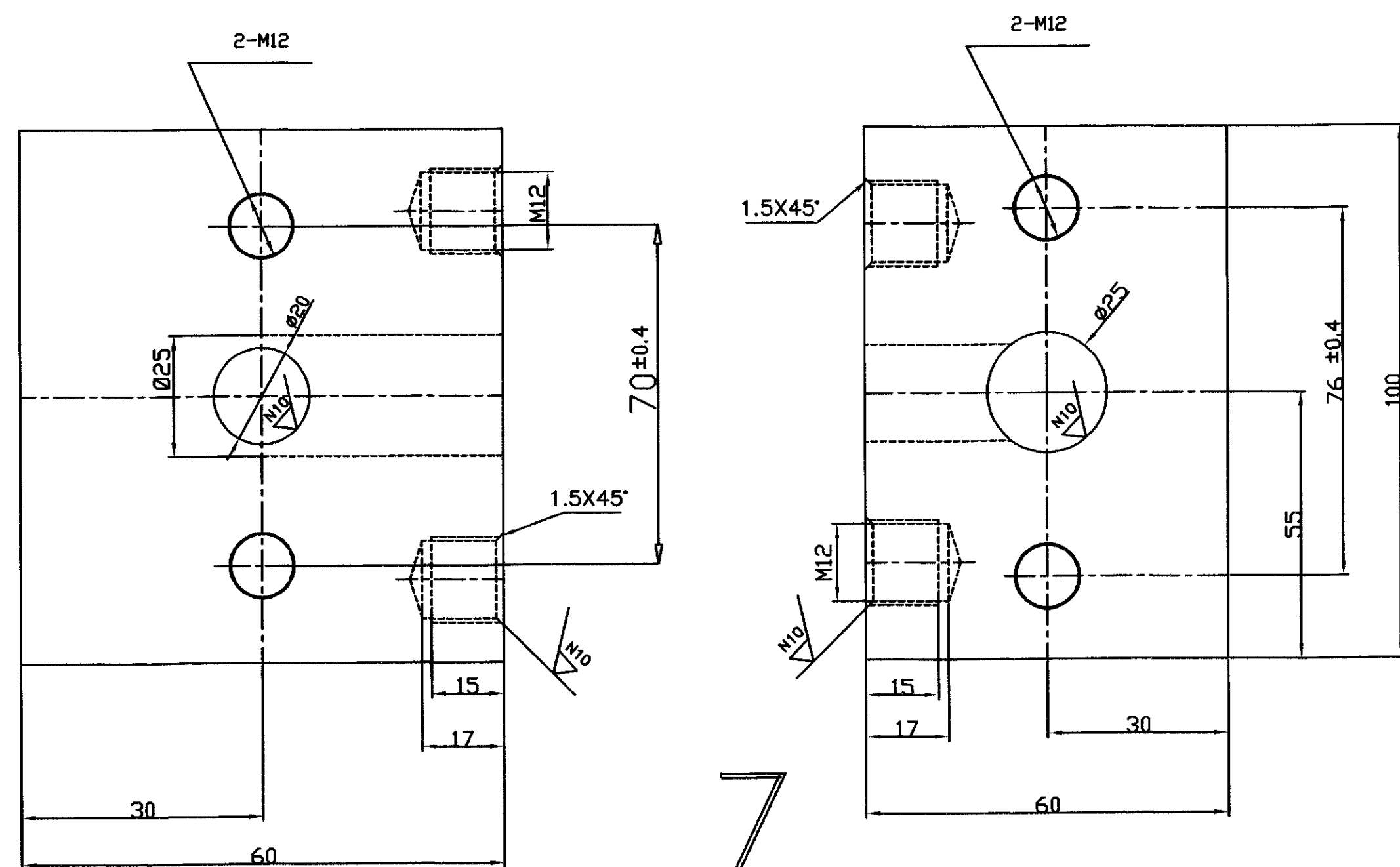
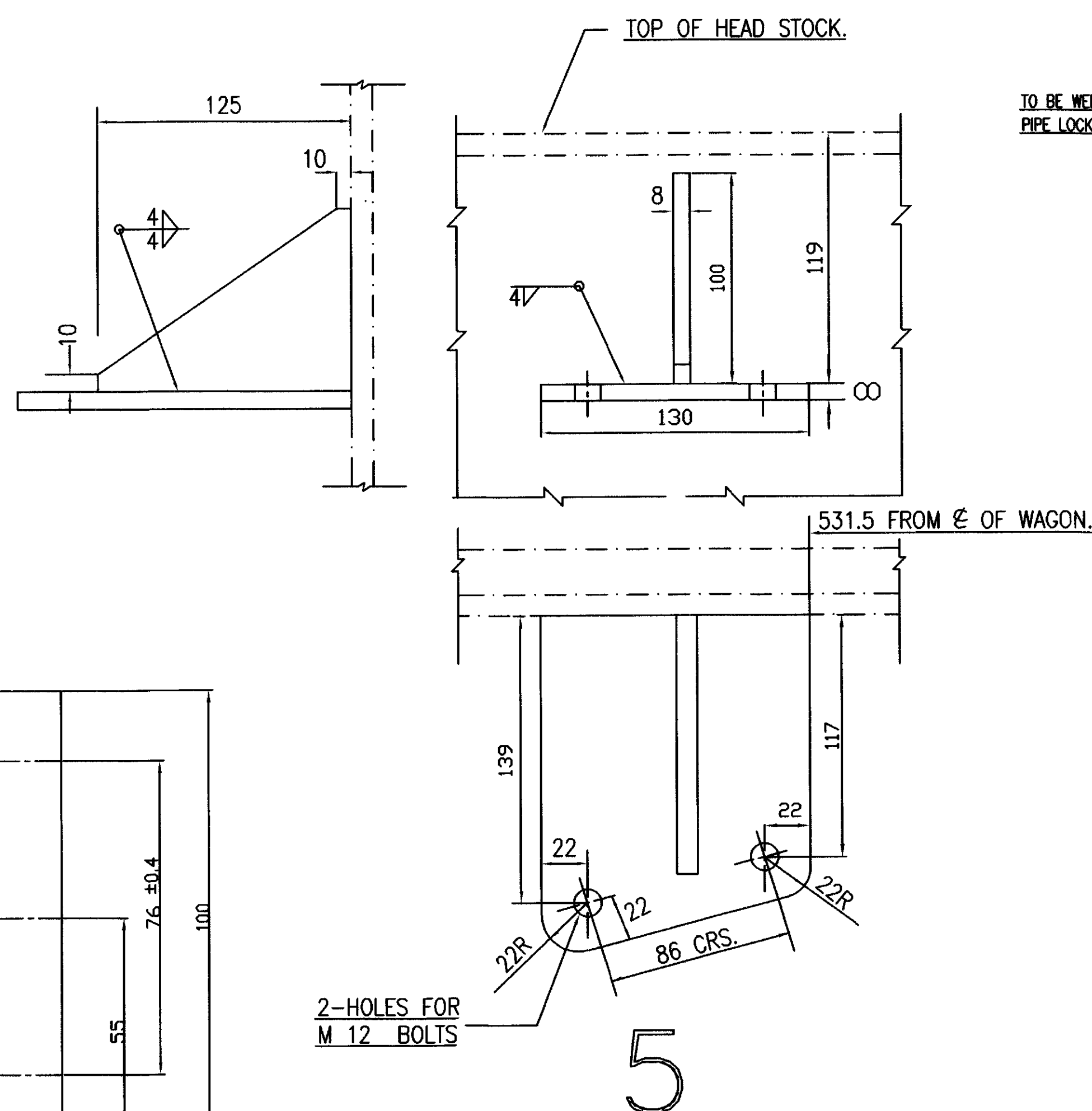
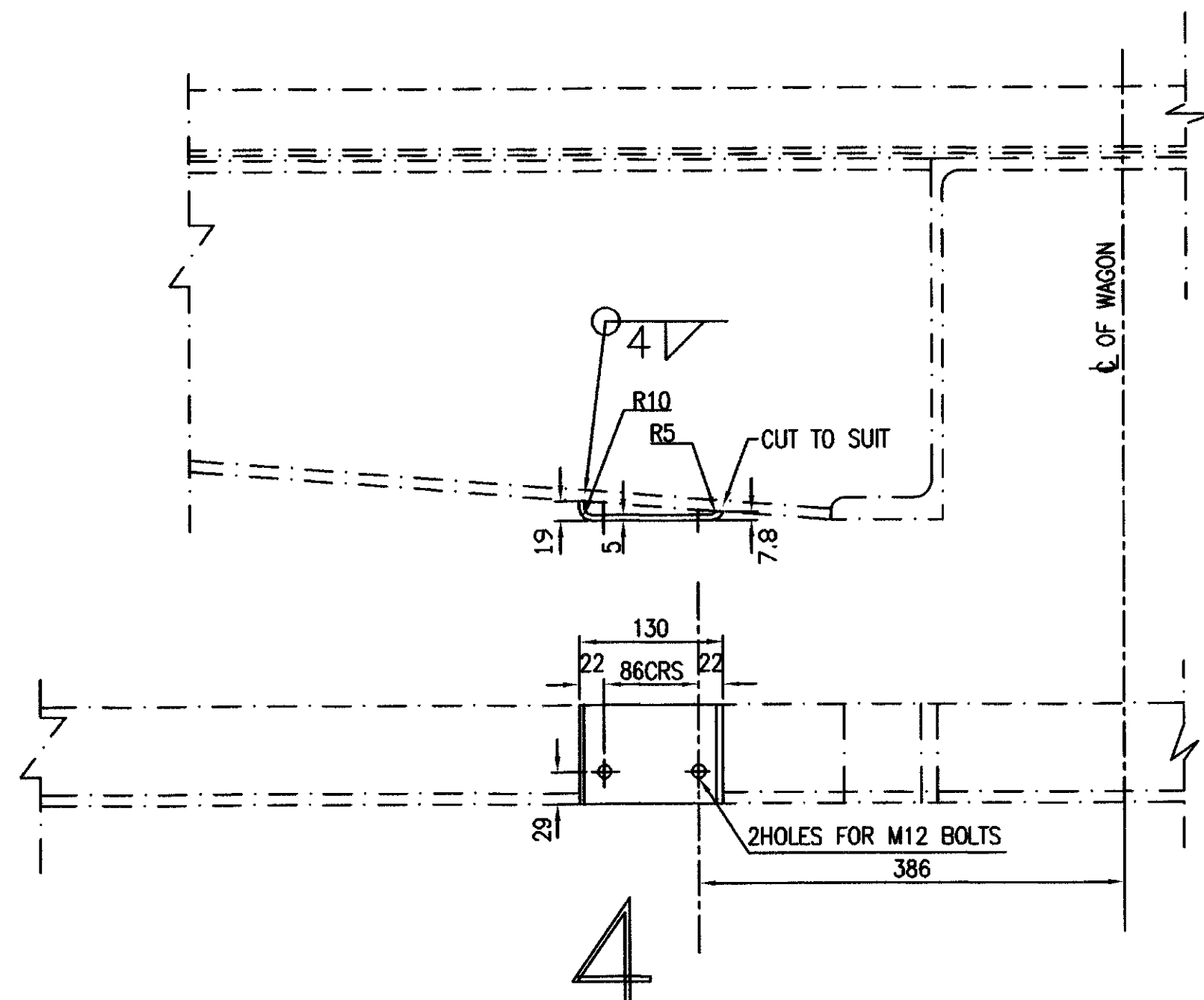
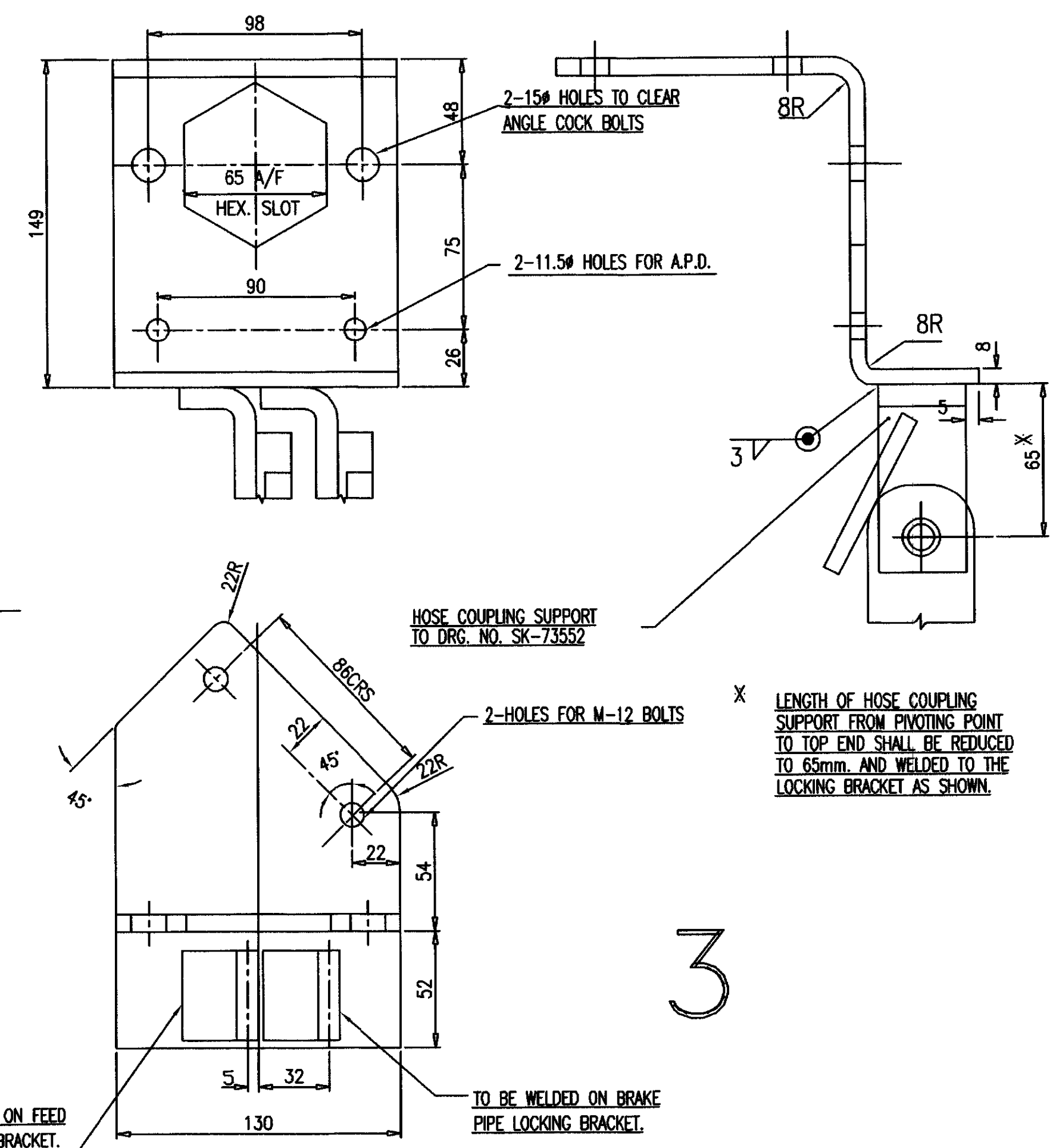
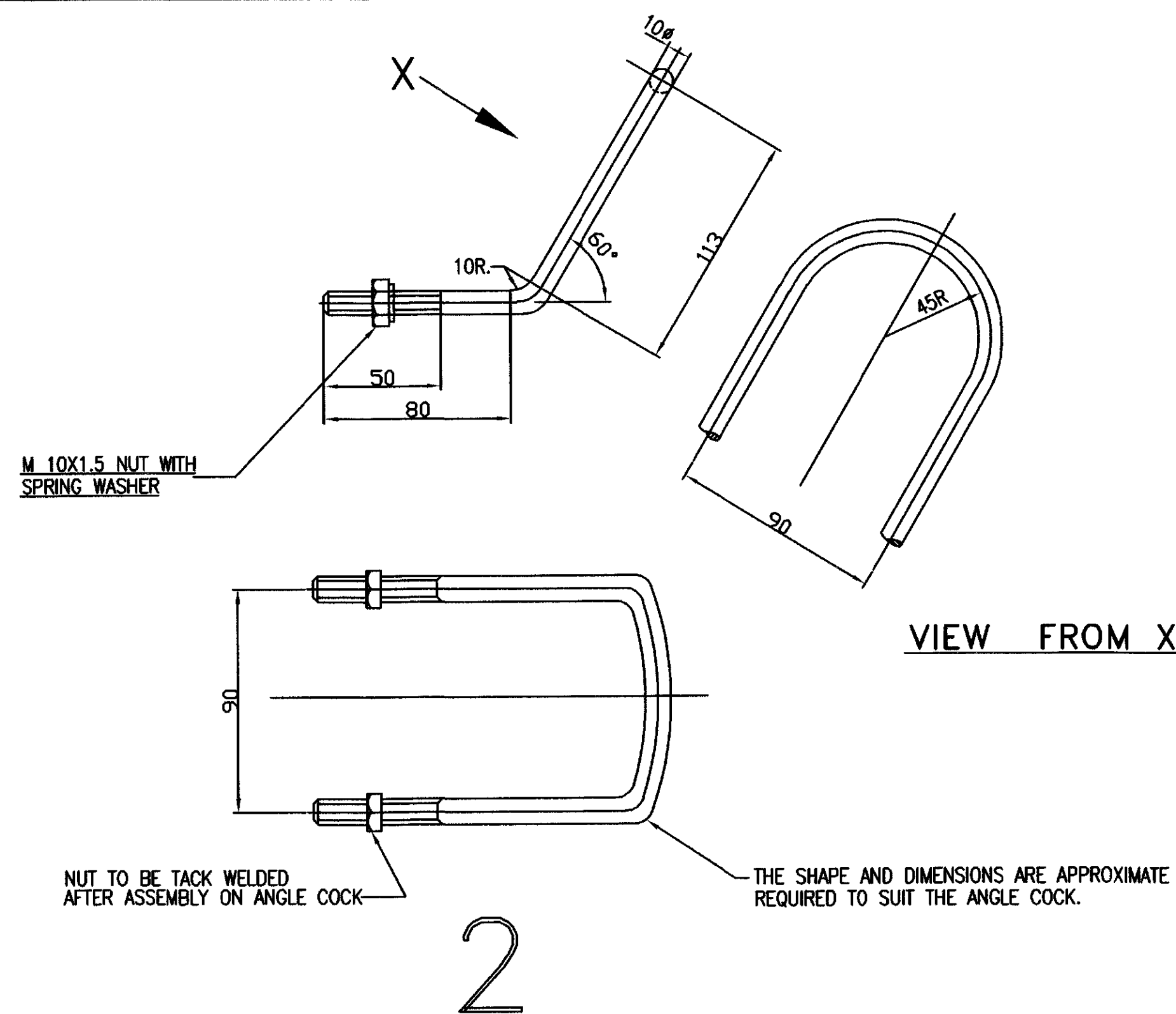
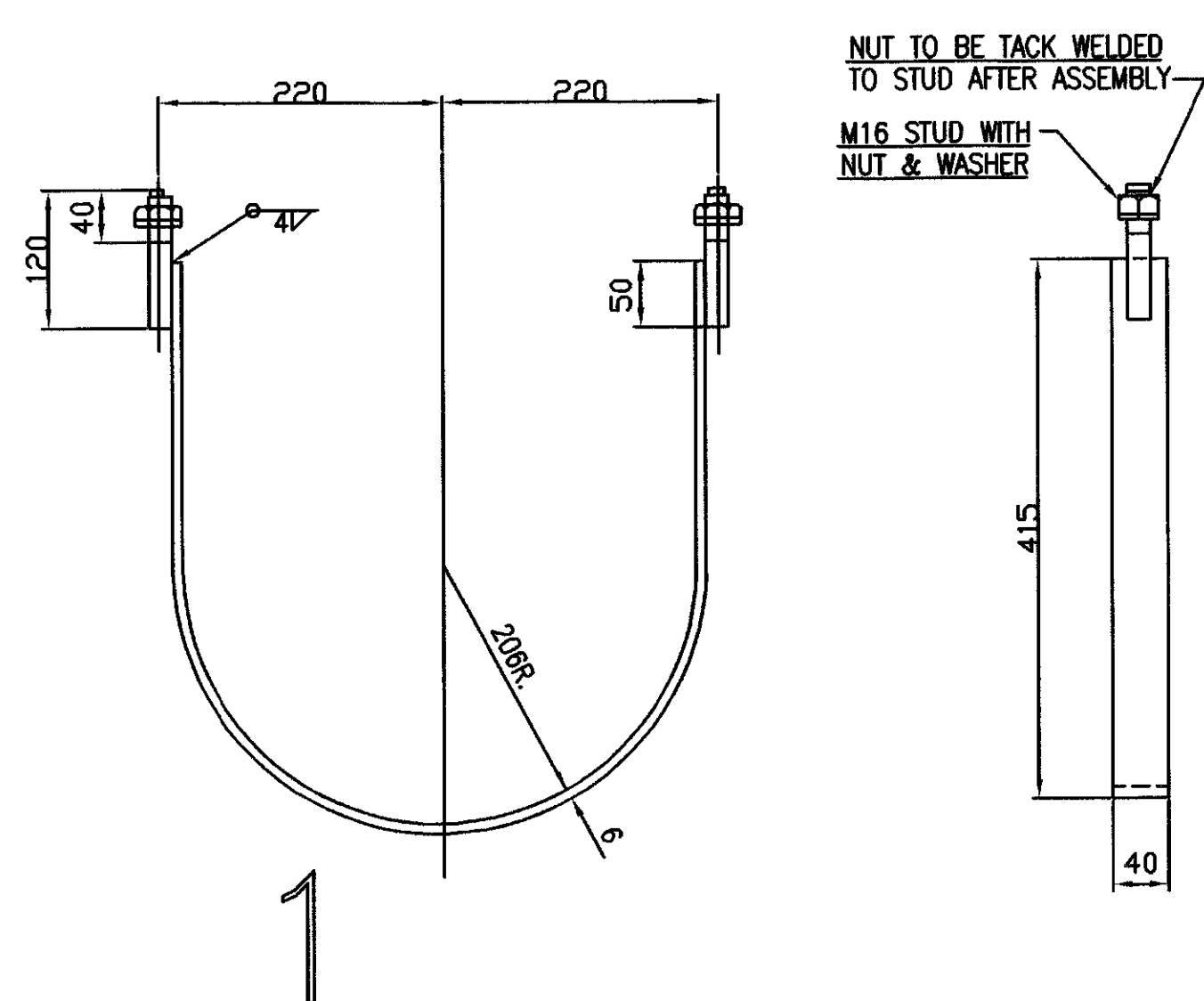
SUPERSEDED BY	
SUPERSEDES	DATE
ENT/PASSED Sd	-
CHECKED Sd	-
DRAWN Sd	-
TRACED S.P.M.	2/97
J-SHEET CW-978	9/63

B.G.
MGR.D.S.O.
(W)

GROUP

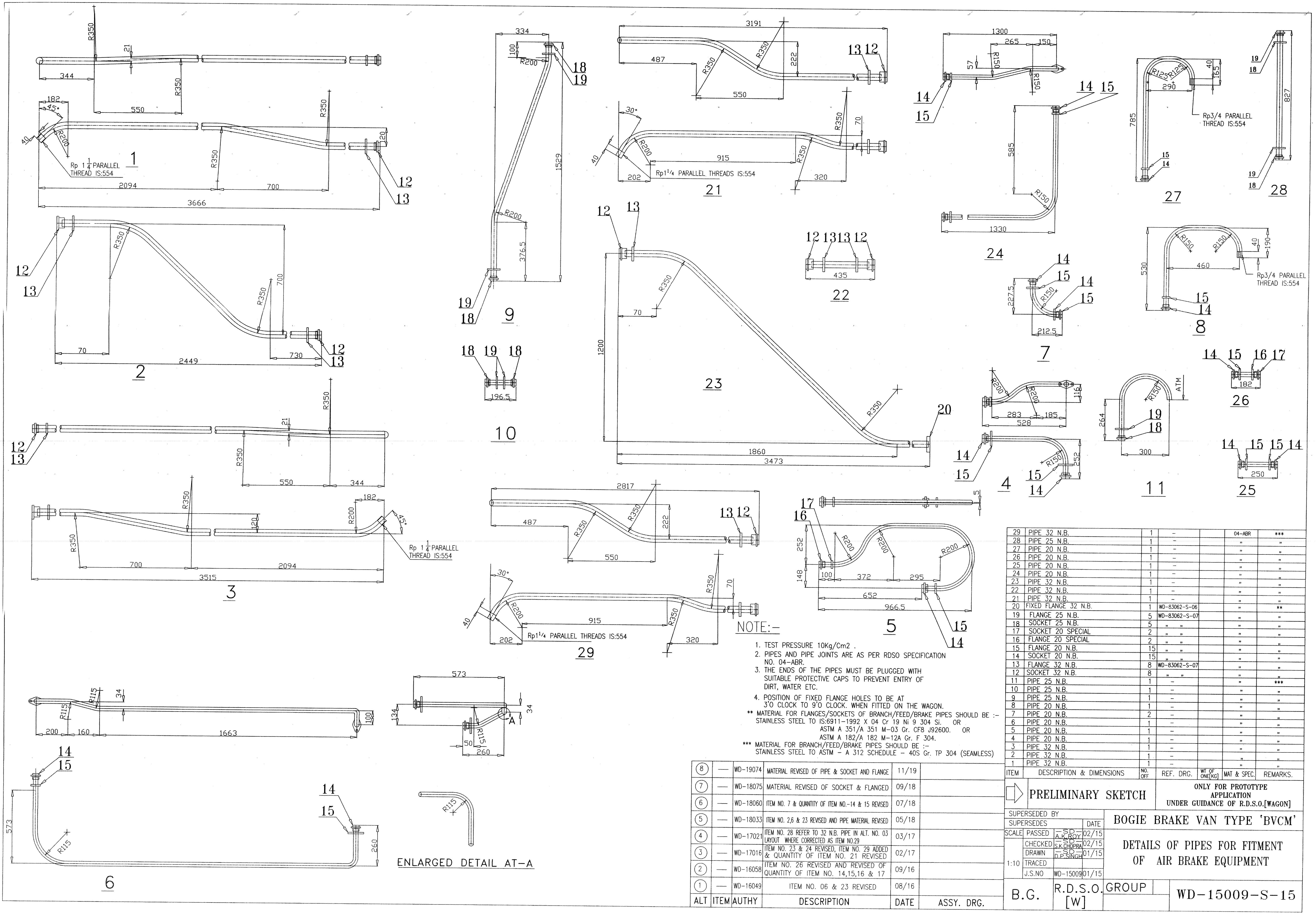
**PRO/PR
STENCIL****SK-63720**

A3



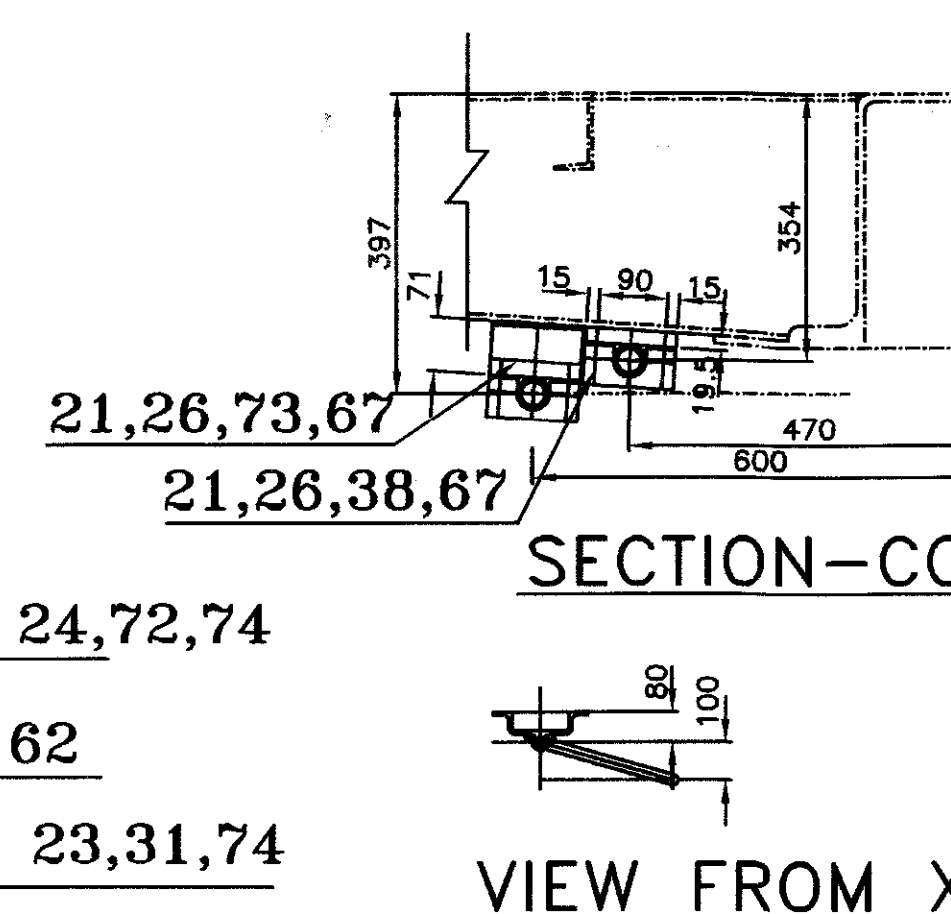
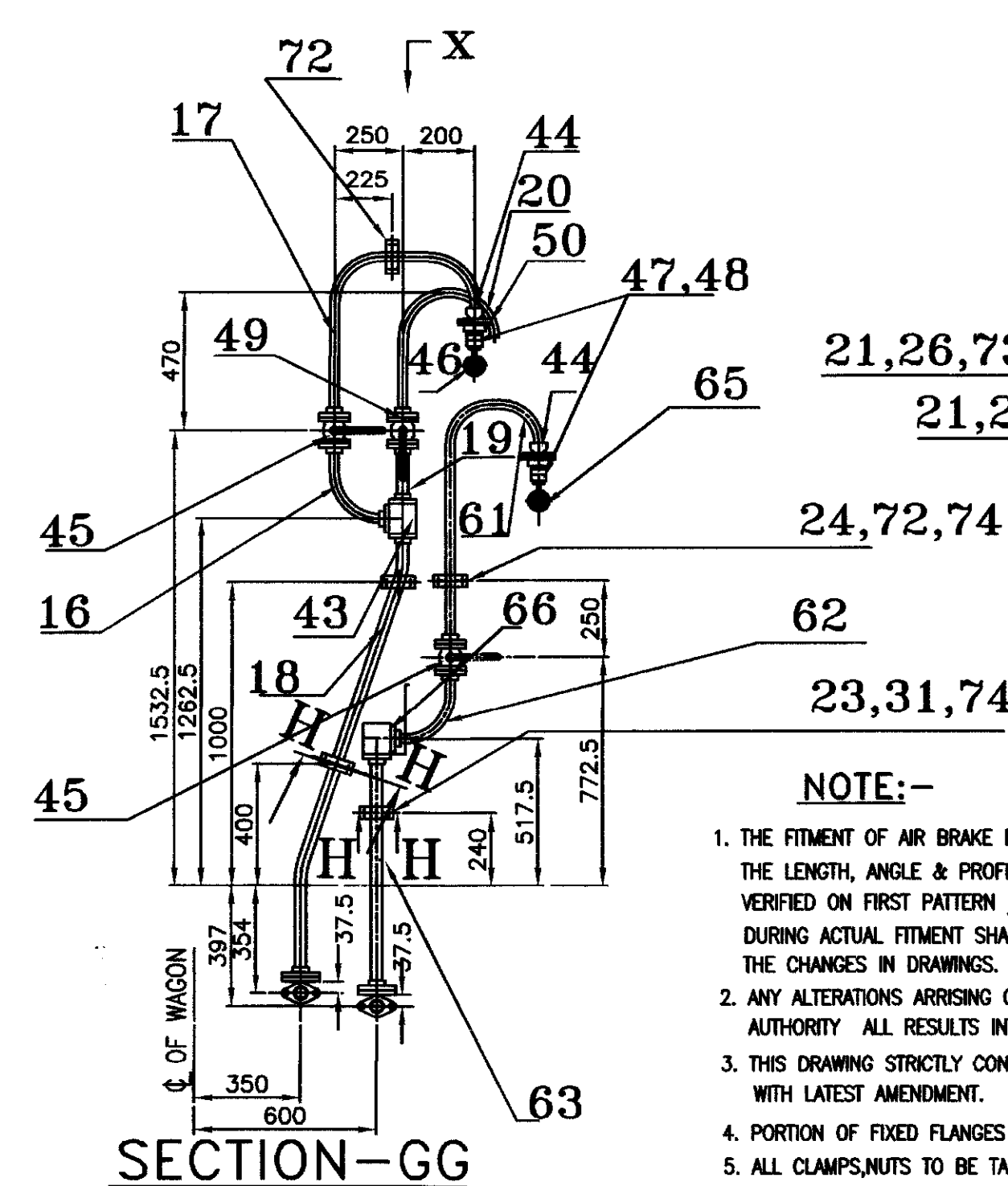
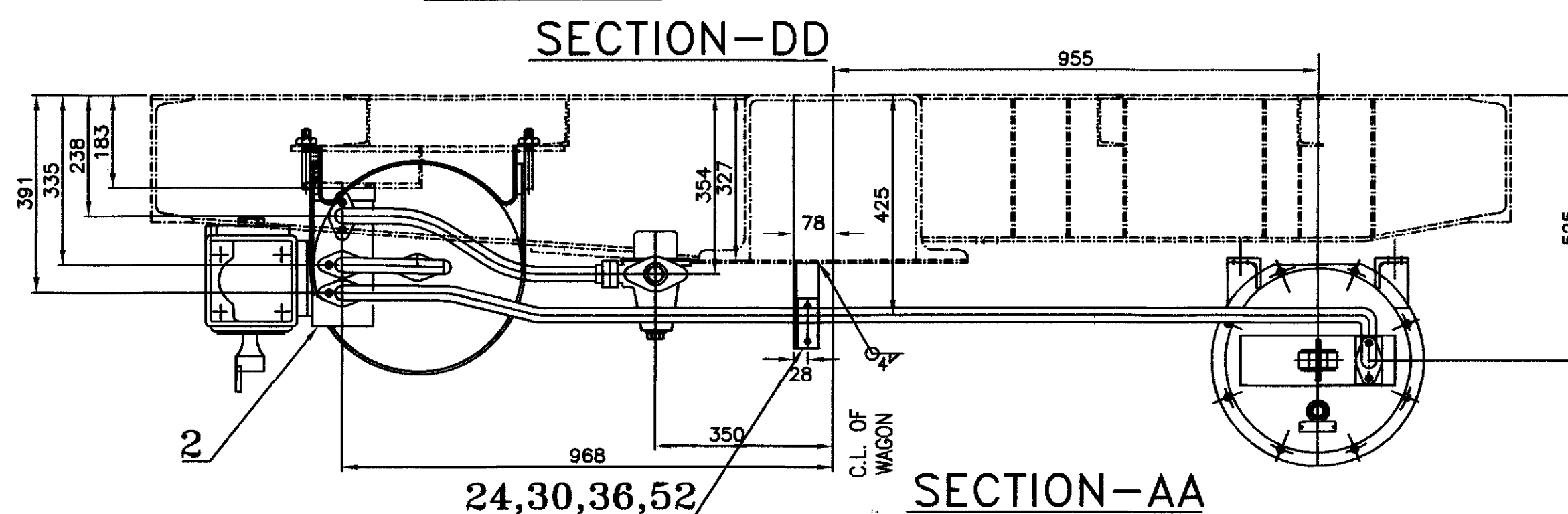
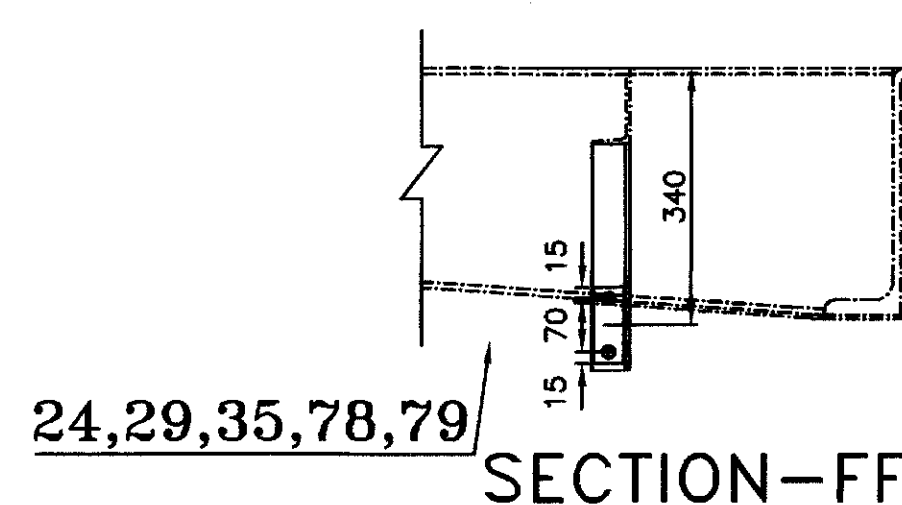
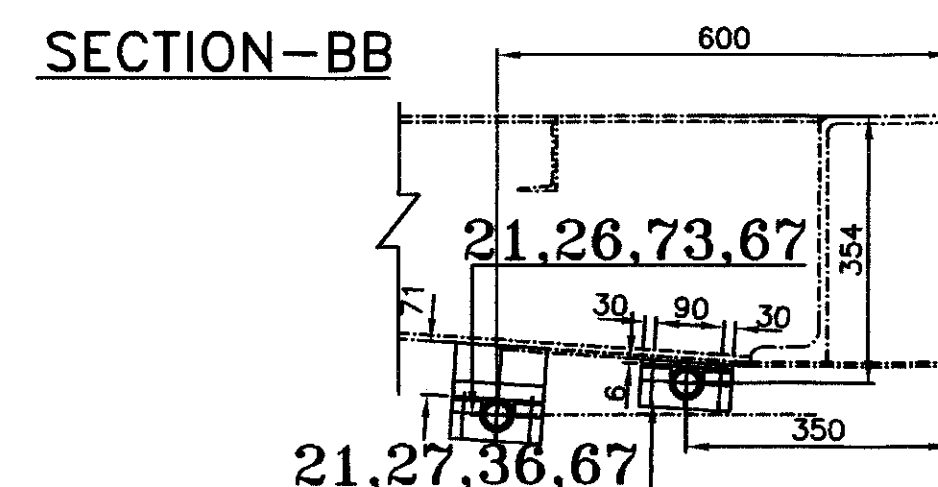
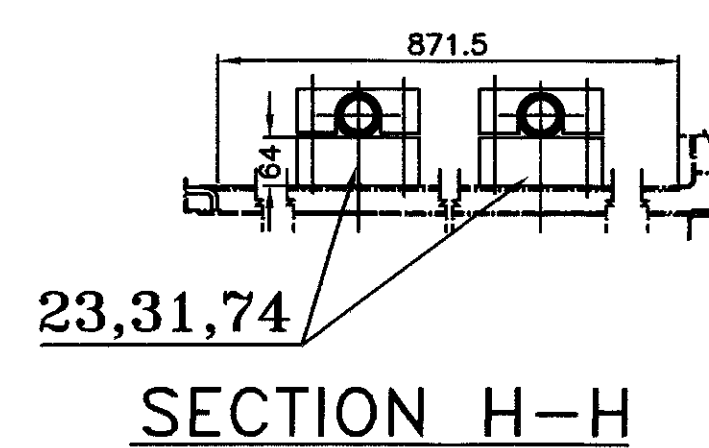
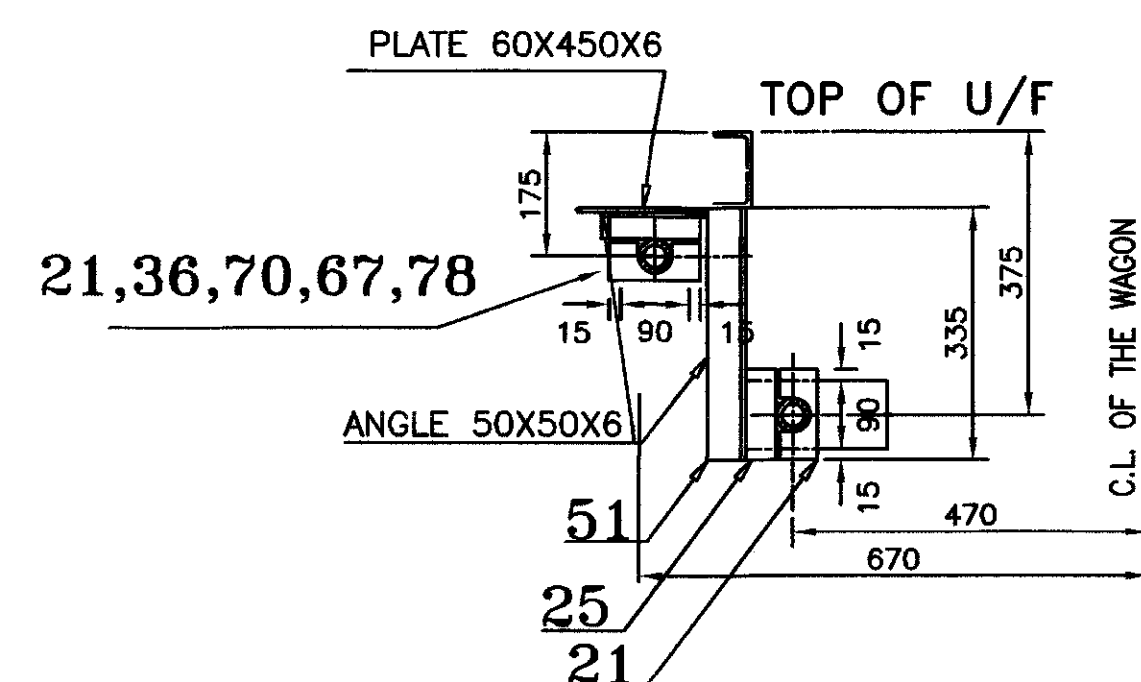
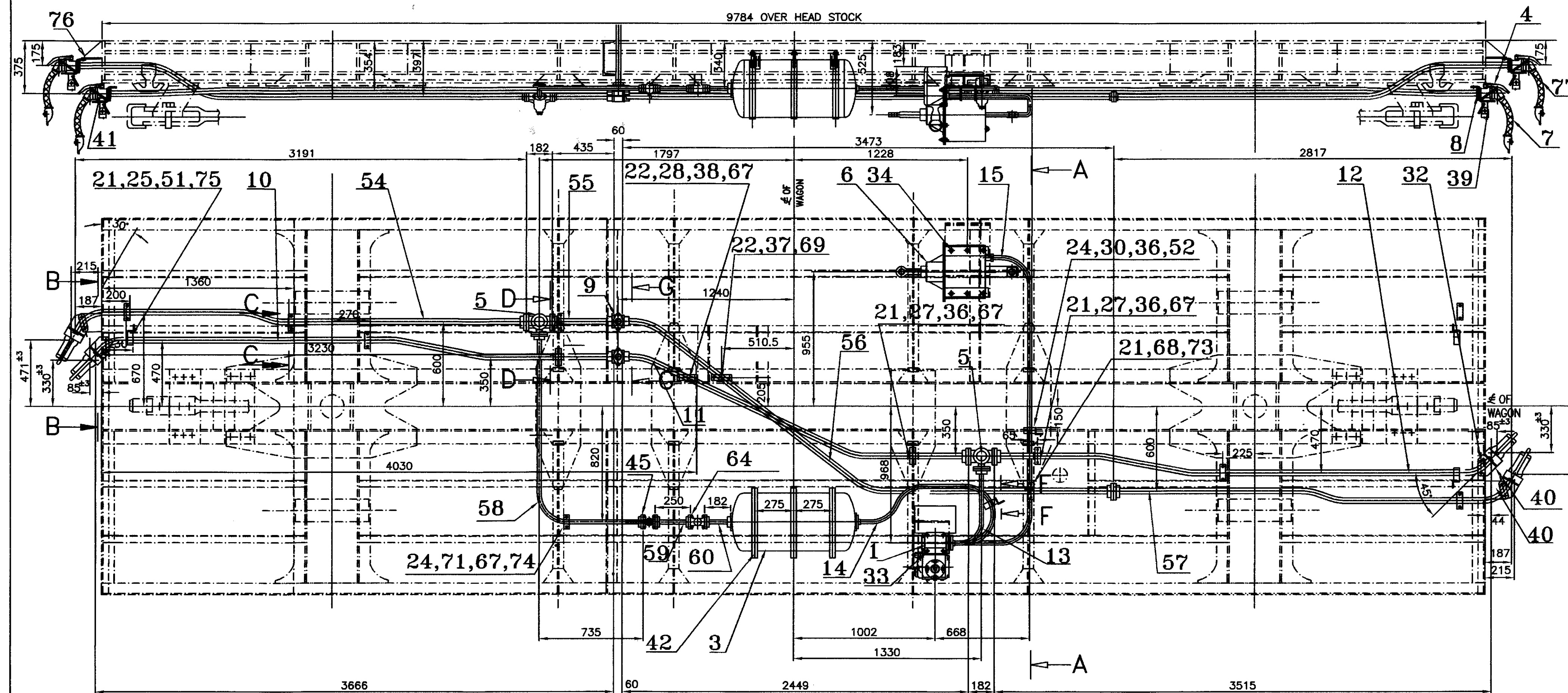
3	NO-220	QUANTITY OF ITEM NO.-01 REISED	05/22	
2	NO-1007	ITEM NO.-06 REISED & 07 REISED	08/18	
1	NO-1000	ITEM NO.-06 & 07 ADDED	07/18	
ALT	ITEM	AUTHY	DESCRIPTION	DATE
			ASSLY. DRG.	

7	ELBOW FLANGE 25*20	1			CI-151875 & 152004	
6						
5	BRACKET SUPPORTING PLATE(F.P.)	2		0.49	IS:2082-2006 E-250-Cu	
4	BRACKET SUPPORTING PLATE(B.P.)	2		0.811	IS:2082-2006 E-250-Cu	
3	LOCKING BRACKET	4		1.80	" "	
2	APD FOR ANGLE COCK	4		0.23	" "	
1	AUXILIARY RESERVOIR SUSPENSION STRAP	3		1.79	" "	
ITEM	DESCRIPTION	NO. OFF.	REF.DRG.	WT.OF ONE(Kg)	MATL&SPEC	REMARKS
PRELIMINARY SKETCH						
ONLY FOR PROTOTYPE APPLICATION UNDER GUIDANCE OF RDSO(WAGON)						
SUPERSEDED BY						
SCALE PASSED						
CHECKED						
DRAWN						
TRACED						
J.S.NO.						
B.G.						
R.D.S.O.						
GROUP						
WD-15009-S-16						



29	PIPE 32 N.B.	1	-	-	04-ABR	***
28	PIPE 25 N.B.	1	-	-	"	"
27	PIPE 20 N.B.	1	-	-	"	"
26	PIPE 20 N.B.	1	-	-	"	"
25	PIPE 20 N.B.	1	-	-	"	"
24	PIPE 20 N.B.	1	-	-	"	"
23	PIPE 32 N.B.	1	-	-	"	"
22	PIPE 32 N.B.	1	-	-	"	"
21	PIPE 32 N.B.	1	-	-	"	"
20	FIXED FLANGE 32 N.B.	1	WD-83062-S-06	-	"	**
19	FLANGE 25 N.B.	5	WD-83062-S-07	-	"	"
18	SOCKET 25 N.B.	5	"	-	"	"
17	SOCKET 20 SPECIAL	2	"	-	"	"
16	FLANGE 20 SPECIAL	2	"	-	"	"
15	FLANGE 20 N.B.	15	"	-	"	"
14	SOCKET 20 N.B.	15	"	-	"	"
13	FLANGE 32 N.B.	8	WD-83062-S-07	-	"	"
12	SOCKET 32 N.B.	8	"	-	"	"
11	PIPE 25 N.B.	1	-	-	"	***
10	PIPE 25 N.B.	1	-	-	"	"
9	PIPE 25 N.B.	1	-	-	"	"
8	PIPE 20 N.B.	1	-	-	"	"
7	PIPE 20 N.B.	2	-	-	"	"
6	PIPE 20 N.B.	1	-	-	"	"
5	PIPE 20 N.B.	1	-	-	"	"
4	PIPE 20 N.B.	1	-	-	"	"
3	PIPE 32 N.B.	1	-	-	"	"
2	PIPE 32 N.B.	1	-	-	"	"
1	PIPE 32 N.B.	1	-	-	"	"

ITEM	DESCRIPTION & DIMENSIONS	NO. OF	REF. DRG.	WT. OF ONE(KG)	MAT & SPEC.	REMARKS.
PRELIMINARY SKETCH						
SUPERSEDED BY		DATE		ONLY FOR PROTOTYPE APPLICATION UNDER GUIDANCE OF R.D.S.O.[WAGON]		
SCALE PASSED		DATE		BOGIE BRAKE VAN TYPE 'BVCM'		
CHECKED		DATE		DETAILS OF PIPES FOR FITMENT OF AIR BRAKE EQUIPMENT		
DRAWN		DATE				
1:10 TRACED		DATE				
J.S.NO		DATE				
B.G.	R.D.S.O.	GROUP	WD-15009-S-15			
[W]						



NOTE:-

1. THE FITMENT OF AIR BRAKE EQUIPMENT SHOULD BE TRIED FIRST ON PATTERN WAGON. THE LENGTH, ANGLE & PROFILE OF PIPE LOCATION OF CLAMPS AND BRACKETS TO BE VERIFIED ON FIRST PATTERN / PROTOTYPE WAGON, ANY ALTERATIONS / CHANGES REQUIRED DURING ACTUAL FITMENT SHALL BE ADVISED TO RDSO/LKO FOR REVIEW & INCORPORATE THE CHANGES IN DRAWINGS.
2. ANY ALTERATIONS ARISING OUT OF PARA 1 SHALL BE VERIFIED BY RDSO / INSPECTING AUTHORITY ALL RESULTS INTIMATED TO RDSO / LKO.
3. THIS DRAWING STRICTLY CONFORMS TO LATEST AIR BRAKE SPECIFICATION 02-ABR & 04-ABR WITH LATEST AMENDMENT.
4. PORTION OF FIXED FLANGES HOLES ARE AT 3 O'CLOCK TO 9 O' CLOCK.
5. ALL CLAMPS,NUTS TO BE TACK WELDED TO BOLTS.

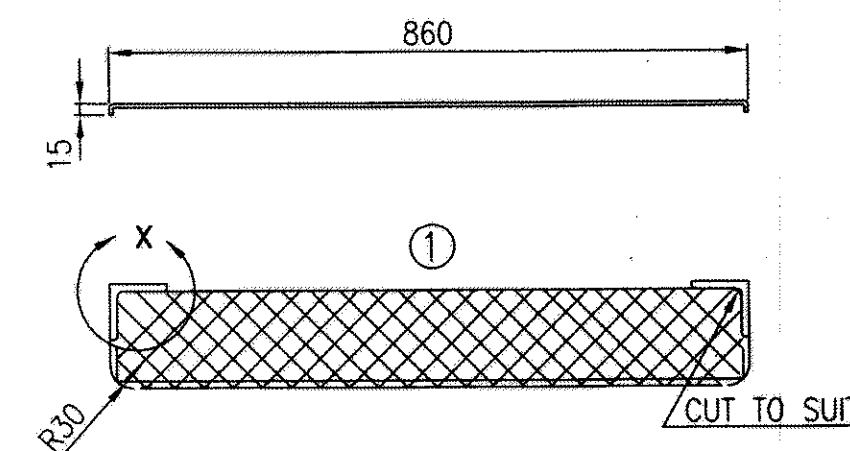
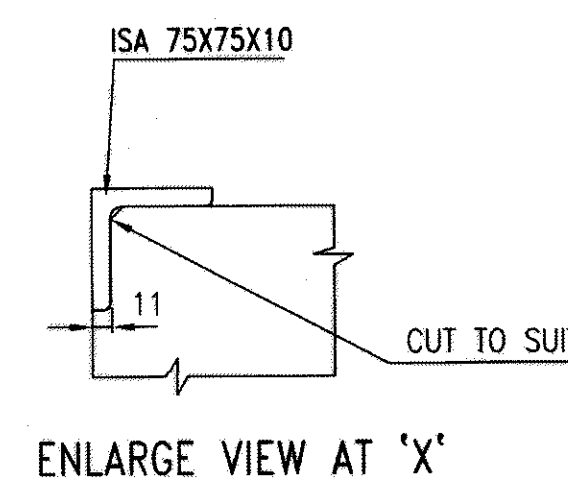
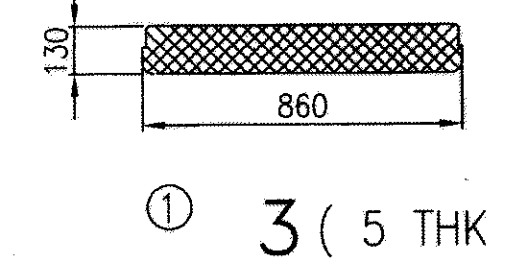
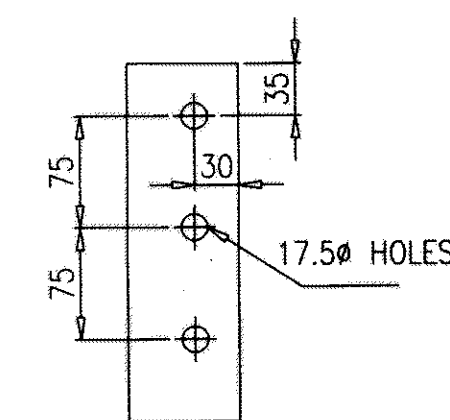
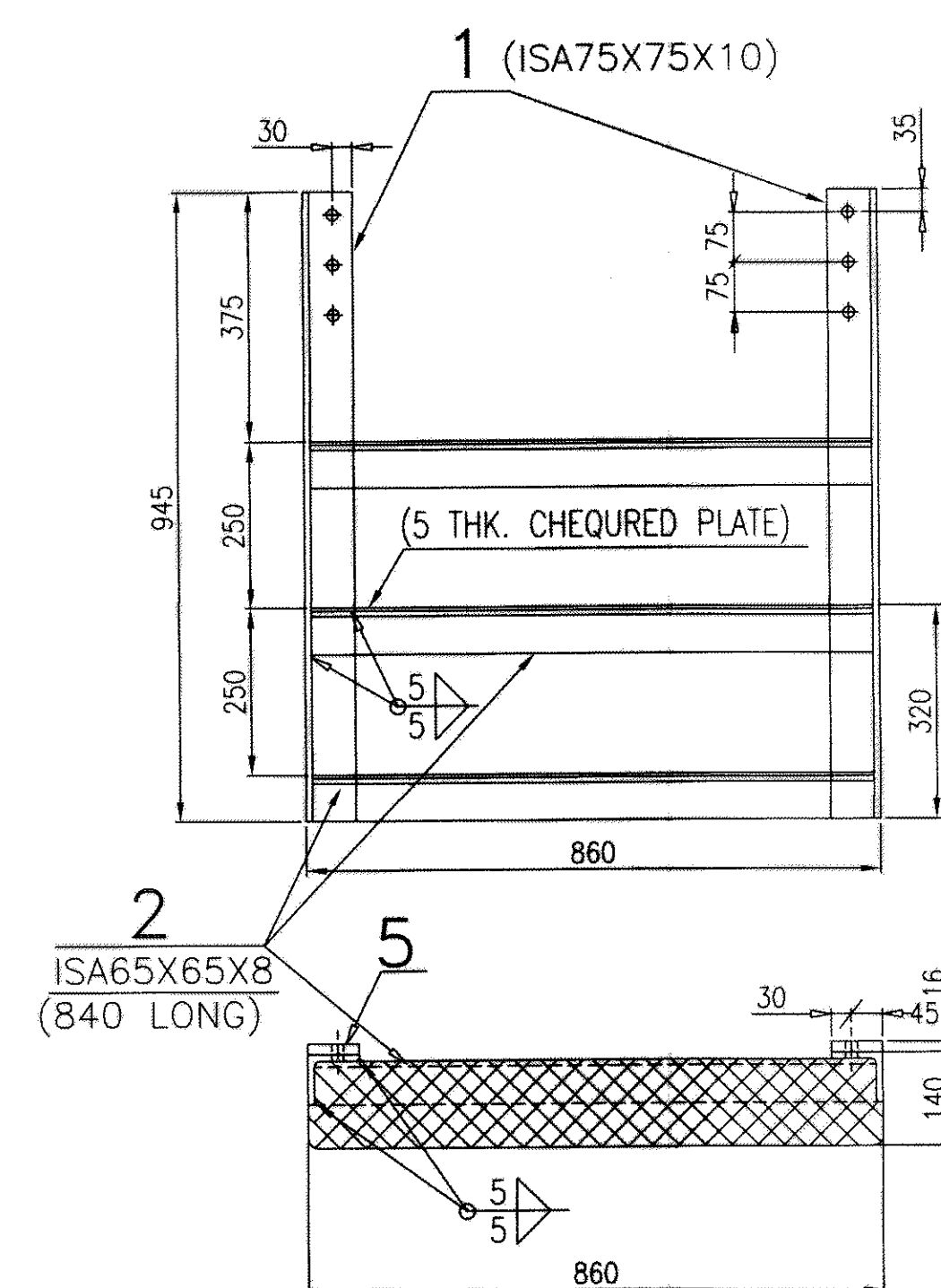
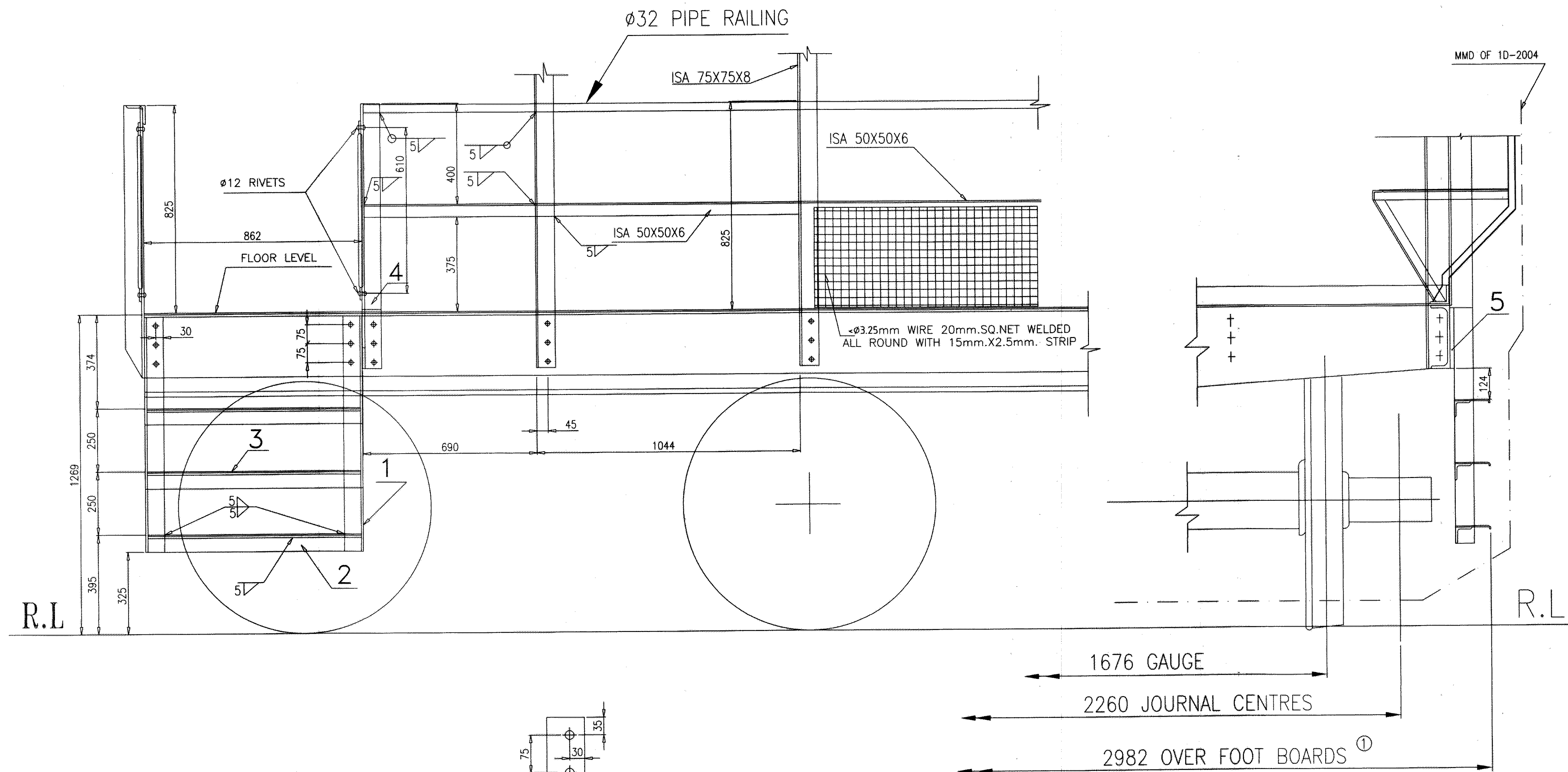
9	-	WD-22041	QUANTITY OF ITEM NO. 42 REVISED	05/22
8	-	WD-21083	ITEM NO. 70-79 ADDED, QTY OF ITEM 67 REVISED	10/21
7	-	WD-18075	ITEM NO. 51 & 52 REVISED	
6	-	WD-18075	ITEM NO. 43 & 66 REVISED	08/18
6	-	WD-18060	ITEM NO. 10,43,44,62 & 66 REVISED	07/18
5	11,15 45 & 66	WD-18033	ITEM NO. 11,15 & 56 REVISED	05/18
4	-	WD-18002	ITEM 43 & 66 REFERENCE SPECIFICATION ADDED	01/18
3	-	WD-17016	CHANGE OF PIPE LAYOUT OF ITEM 56 & 57 & NOTE, (A) REVISED	02/17
2	-	WD-18058	CURRENT THE DIMENSION OF WORKMAN IN PLACE OF WORKMAN CHANGE OF PIPE LAYOUT OF ITEM 56 & 57, REVISED	08/16
1	-	WD-16048	ITEM NO. 43 & 66 REFERENCE SPECIFICATION ADDED AND ALSO CHANGE THE LOCATION OF WORKMAN IN PLACE OF WORKMAN	08/16
ALT.	ITEM	AUTHY.	DESCRIPTION	DATE
				ASSLY. DRGS

79	ANGLE 50X50X6X300 LONG	1			IS-2062-2006 E-250A WITHIN
ITEMS	DESCRIPTION & DIMENSIONS	QTY	REF. DRG.	WT. OF TIME IN	MAT. & SPEC. REMARKS

78	PLATE 60X450X6	3			"	
77	AIR BRAKE HOSE COUPLING (F P)	02	W-10027-S-01			WD-02-AER-02
76	BRACKET SUPPORTING PLATE (FP)	02	W-15009-S-18 ITEM-4			
75	BOLT M10X120 LONG WITH NUT AND SPRING WASHER	4		IS:1364 & S-303		
74	BOLT M10X140 LONG WITH NUT AND SPRING WASHER	12		IS:1364 & S-303		
73	BOLT M10X150 LONG WITH NUT AND SPRING WASHER	4		IS:1364 & S-303		
72	PACKING 100X40X64	2	*			SEE NOTE NO.8
71	PACKING 100X40X55.5	1	*		"	
70	PACKING 120X40X30	2	*		"	
69	PACKING 140X40X48	2	*		"	
68	PACKING 120X40X71	2	*		"	
67	ANGLE 50X50X5X140	10		S2062-2008 E-250A WITHIN C-738.076 & IS:2004		
66	ELBOW FLANGE 25*20	1	W-15009-S-18 ITEM-07			
65	PRESSURE GAUGE (63mm) FOR F.P.	1	W-92047-S-02			WD-02-AER-02
64	CHECK VALVE	1	W-93002-S-03			WD-02-AER-02
63	PIPE 25 N.B.	1	W-15009-S-15 ITEM-28			WD-04-AER-02
62	PIPE 20 N.B.	1	W-15009-S-15 ITEM-7			
61	PIPE 20 N.B.	1	W-15009-S-15 ITEM-27			"
60	PIPE 20 N.B.	1	W-15009-S-15 ITEM-26			"
59	PIPE 20 N.B.	1	W-15009-S-15 ITEM-25			"
58	PIPE 20 N.B.	1	W-15009-S-15 ITEM-24			"
57	PIPE 32 N.B.	1	W-15009-S-15 ITEM-23			"
56	PIPE 32 N.B.	1	W-15009-S-15 ITEM-22			"
55	PIPE 32 N.B.	1	W-15009-S-15 ITEM-21			"
54	PIPE 32 N.B.	1	W-15009-S-15 ITEM-20			"
53	PLATE 130X105X5	1		S2062-2008 E-250A WITHIN C-738.076 & IS:2004		
52	ANGLE 50X50X6X200 LONG	1		"		
51	ANGLE 50X50X6X 350 LONG	2		S2062-2008 E-250A WITHIN C-738.076 & IS:2004		
50	APD FOR QUICK COUPLING	2	W-99021-S-01			
49	GUARD EMERGENCY BRAKE VALVE	1	SK-73549			WD-02-AER-02
48	QUICK COUPLING PLUG	2	W-91101-S-05			"
47	QUICK COUPLING SOCKET	2	W-91101-S-05			"
46	PRESSURE GAUGE (63mm) FOR B.P	1	W-92047-S-01			"
45	ISOLATING COCK	3	W-93002-S-04			"
44	SOCKET REDUCING 20X10mm	2	---	IS:17339 PART-2		
43	TEE FLANGE 25*25*20	1	SK-98074 ITEM-01	G-238.1875 & IS:2004		
42	AUXILIARY RESERVOIR SUSPENSION STRAP.	3	W-15009-S-18 ITEM-3			
41	A.P.D. FOR CUT OFF ANGLE COCK	4	W-15009-S-18 ITEM-2			
40	LOCKING BRACKET	4	W-15009-S-18 ITEM-1			
39	COUPLING SUPPORT	4	SK-73552			
38	BOLT M10X95 LONG WITH NUT AND SPRING WASHER	8		IS:1364 & S-303		
37	BOLT M10X115 LONG WITH NUT AND SPRING WASHER	6		"		
36	BOLT M10X100 LONG WITH NUT AND SPRING WASHER	10		"		
35	BOLT M10X90 LONG WITH NUT AND SPRING WASHER	2		"		
34	BOLT M10X70 LONG WITH NUT AND SPRING WASHER	6		"		
33	BOLT M16X70 LONG WITH NUT AND SPRING WASHER	4		"		
32	BOLT M12X40 LONG WITH NUT AND SPRING WASHER	8		"		
31	PACKING 110X40X64	3	*			SEE NOTE NO.8
30	PACKING 100X40X40	1	*		"	
29	PACKING 100X40X21.5	1	*		"	
28	PACKING 140X40X5.5	2	*		"	
27	PACKING 120X40X6	2	*		"	
26	PACKING 120X40X19.5	2	*		"	
25	PACKING 120X40X40	2	*		"	
24	CLAMP FOR PIPE 20 N. B	5	W-04050-S-01 ITEM-1			
23	CLAMP FOR PIPE 25 N. B	3	W-04050-S-01 ITEM-2			
22	CLAMP FOR PIPE 32 N. B	4	W-04050-S-01 ITEM-3			
21	CLAMP FOR PIPE 32 N. B	11	W-04050-S-01 ITEM-4			
20	PIPE 25N.B.	1	W-15009-S-15 ITEM-11			WD-04-AER-02
19	PIPE 25N.B.	1	W-15009-S-15 ITEM-10			"
18	PIPE 25N.B.	1	W-15009-S-15 ITEM-9			"
17	PIPE 20N.B.	1	W-15009-S-15 ITEM-8			"
16	PIPE 20N.B.	1	W-15009-S-15 ITEM-7			"
15	PIPE 20N.B.	1	W-15009-S-15 ITEM-6			"
14	PIPE 20N.B.	1	W-15009-S-15 ITEM-5			"
13	PIPE 20N.B.	1	W-15009-S-15 ITEM-4			"
12	PIPE 32 N.B.	1	W-15009-S-15 ITEM-3			"
11	PIPE 32 N.B.	1	W-15009-S-15 ITEM-2			"
10	PIPE 32 N.B.	1	W-15009-S-15 ITEM-1			"
9	TEE FLANGE	2	W-94020-S-01 ITEM-1			
8	LOCK NUT Rp 1 1/4	4		IS:3468		"
7	AIR BRAKE HOSE COUPLING	2	SK-73547			WD-02-AER-02
6	BRAKE CYLINDER (355) mm	1	W-92051-S-06			
5	DIRT COLLECTOR	2	W-92051-S-03			"
4	CUT-OFF ANGLE COCK	4	W-98123-S-01			"
3	AUXILIARY RESERVOIR (100 lts.)	1	W-92051-S-01			"
2	PIPE BRACKET WITH CONTROL RESERVOIR	1	W-7651-S-10			"
1	DISTRIBUTOR VALVE	1	---			"
ITEMS DESCRIPTION & DIMENSIONS		NO. OF PARTS	REF. DRG.	WT. OF ONE KG.	MAT. & SPEC.	REMARKS
PRELIMINARY SKETCH			ONLY FOR PROTOTYPE APPLICATION UNDER GUIDANCE OF R.D.S.O.(WAGON)			
SUPERSEDED BY		DATE	BOGIE BRAKE VAN TYPE 'BVCV'			
SCALE PASSED		1:50	FITMENT OF AIR BRAKE EQUIPMENT AND PIPE LAYOUT			
CHECKED		1:10				
DRAWN		1:20				
TRACED						
COMPILED						
J.S.NO.		W-15009-01/15				
B.G.		R.D.S.O. [WT]	GROUP	WD-15009-S-14		

A
18/05/22

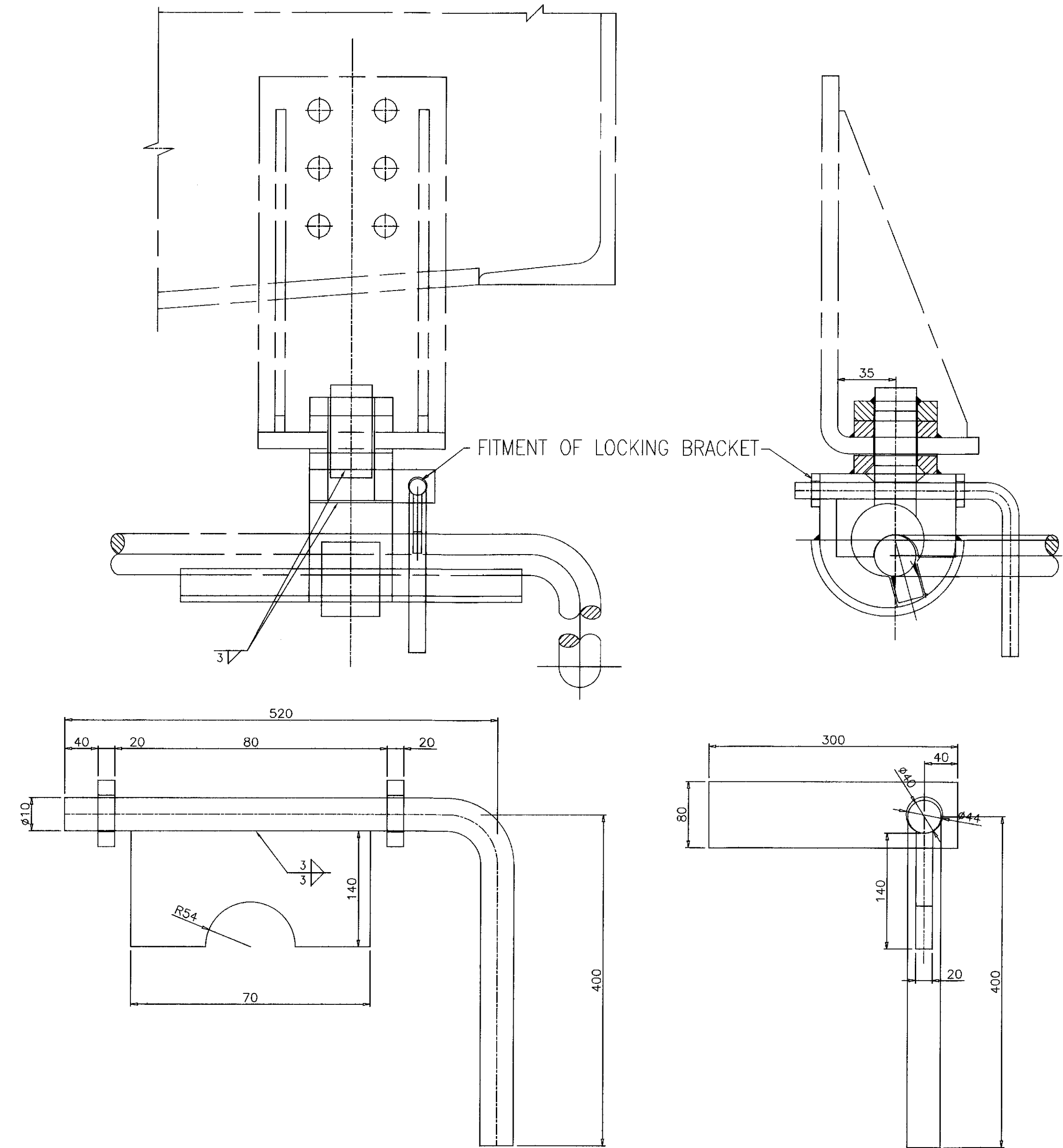
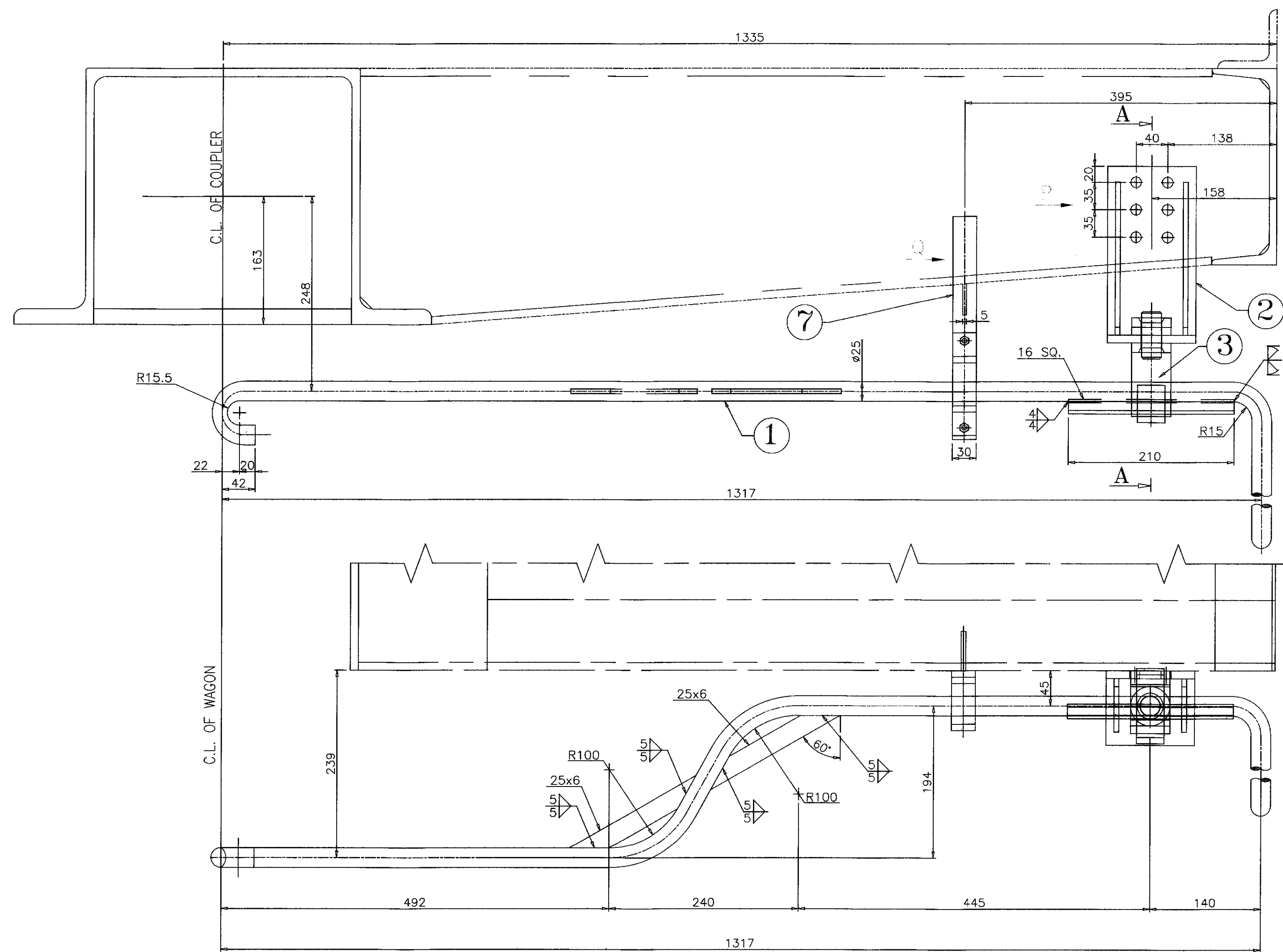


NOTE: 16mm RIVETS SHOWN THUS $\oplus$

② REMARK: WHEREVER RIVETS ARE USED, ALTERNATIVELY SUITABLE SIZE WITH ACTUAL GRIP LENGTH LOCK BOLTS MAY BE USED IN LIEU OF RIVETS.

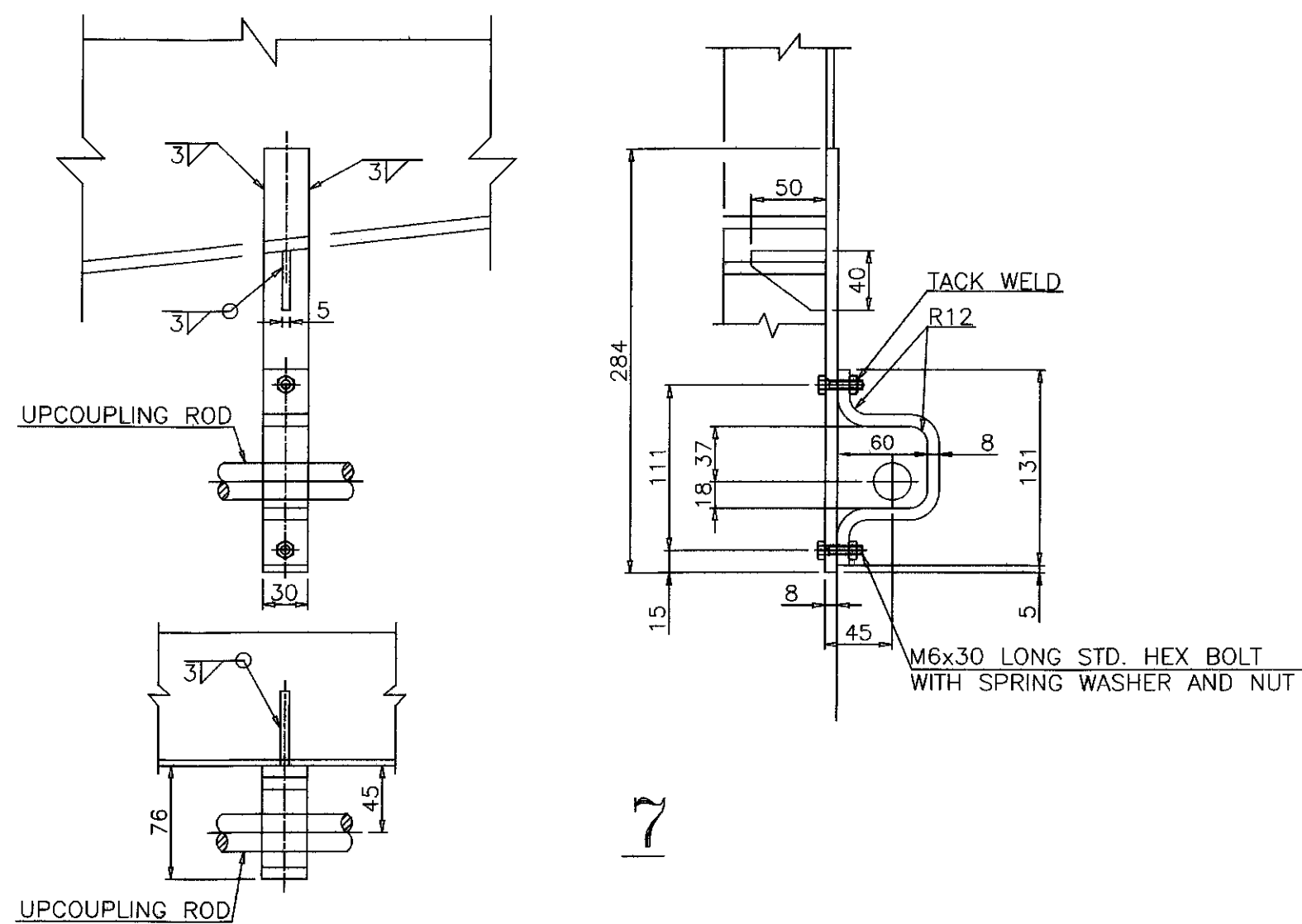
②	-	WD-20061	REMARK ADDED FOR LOCK BOLTS	12/20	
①	3,5	WD-17016	IT. 5 ADDED & IT. 3 MODIFIED	2/17	
ALT.	ITEM	AUTHY.	DESCRIPTION	DATE	ASSLY. DRGS.

①	5	PACKING PLATE (240X75X16)	8			IS-2062-2011 E250 A WITH Cu	
	4	CLEAT (ISA 75X75X10, L=75)	4			IS-2062-2011 E250 A WITH Cu	
	3	FOOT STEP PLATE	12			IS-3502 TYPE-1A	
	2	FOOT STEP SUPPORT ANGLE	12			IS-2062-2011 E250 A WITH Cu	
	1	FOOT STEP BRACKET ANGLE	8			IS-2062-2011 E250 A WITH Cu	
ITEM	DESCRIPTION	NO. OF PER WAGON	REF. DRGS.	WT. OF ONE (Kg)	MATL & SPEC	REMARKS	
PRELIMINARY SKETCH							ONLY FOR PROTOTYPE APPLICATION UNDER GUIDANCE OF R.D.S.O. (WAGON)
SUPERSEDED BY			BOGIE BRAKE VAN TYPE 'BVCM'				
SCALE/PASSED			DATE				
CHECKED			sd/A.K.ROY	03/15	ARRANGEMENT OF FOOT STEPS AND DETAILS		
DRAWN			sd/JAHMAD	03/15			
TRACED			JAHMAD	01/15			
COMPARED							
J.S.NO.			WD-15009	01/15	WD-15009-S-10		
B.G.			R.D.S.O. [W]	GROUP			

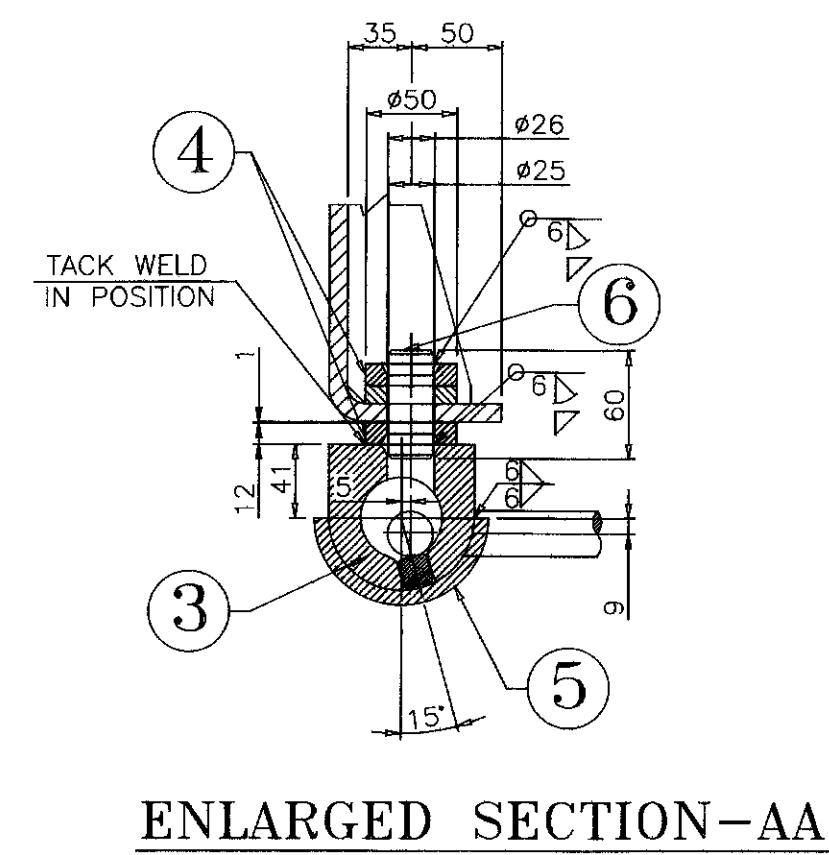


NOTE: SAFETY LOCK SHALL BE WELDED ON BEARING PIECE IN SUCH A MANNER THAT SEMI CIRCLE SLOT IN SAFETY LOCK PLATE REST FULLY OVER UNCOUPLING ROD HANDLE.

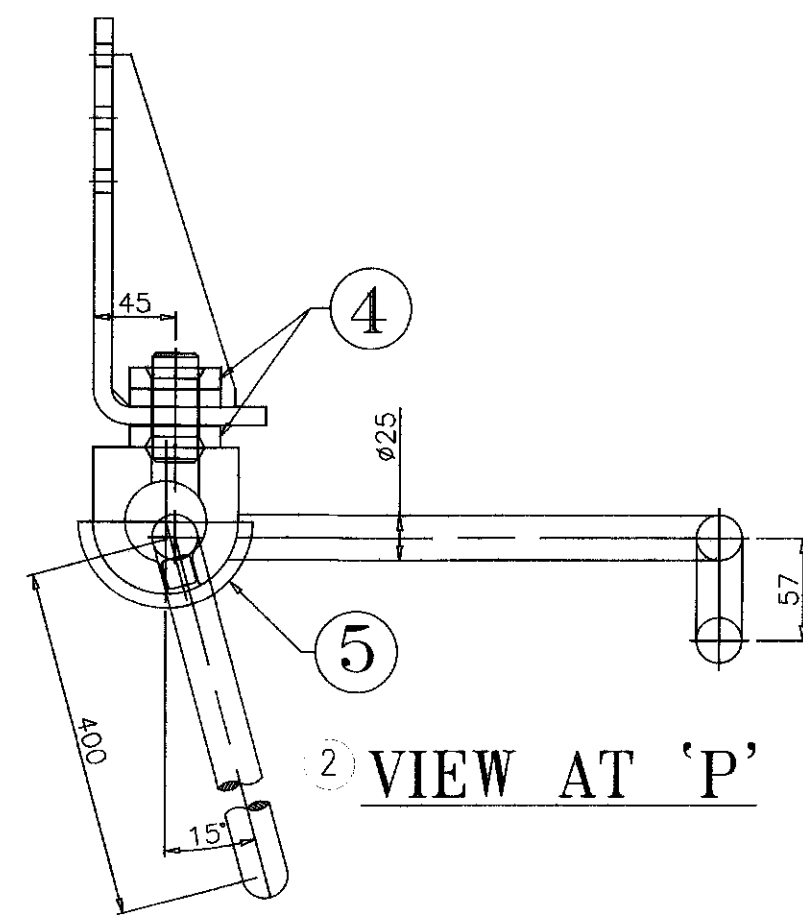
8



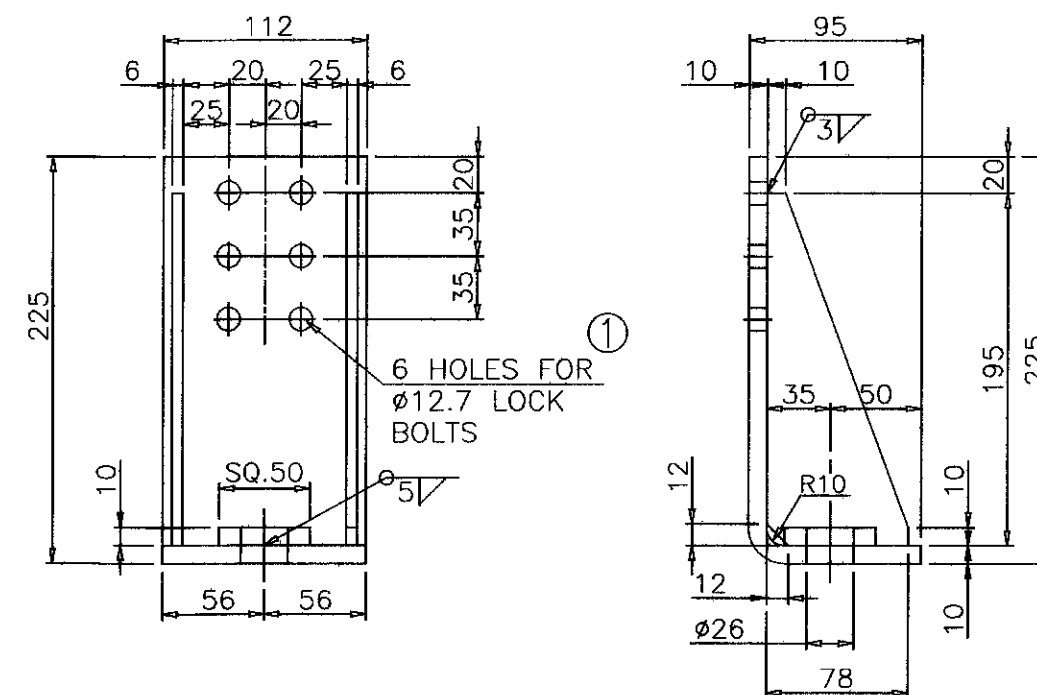
VIEW AT 'Q'



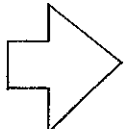
ENLARGED SECTION-AA



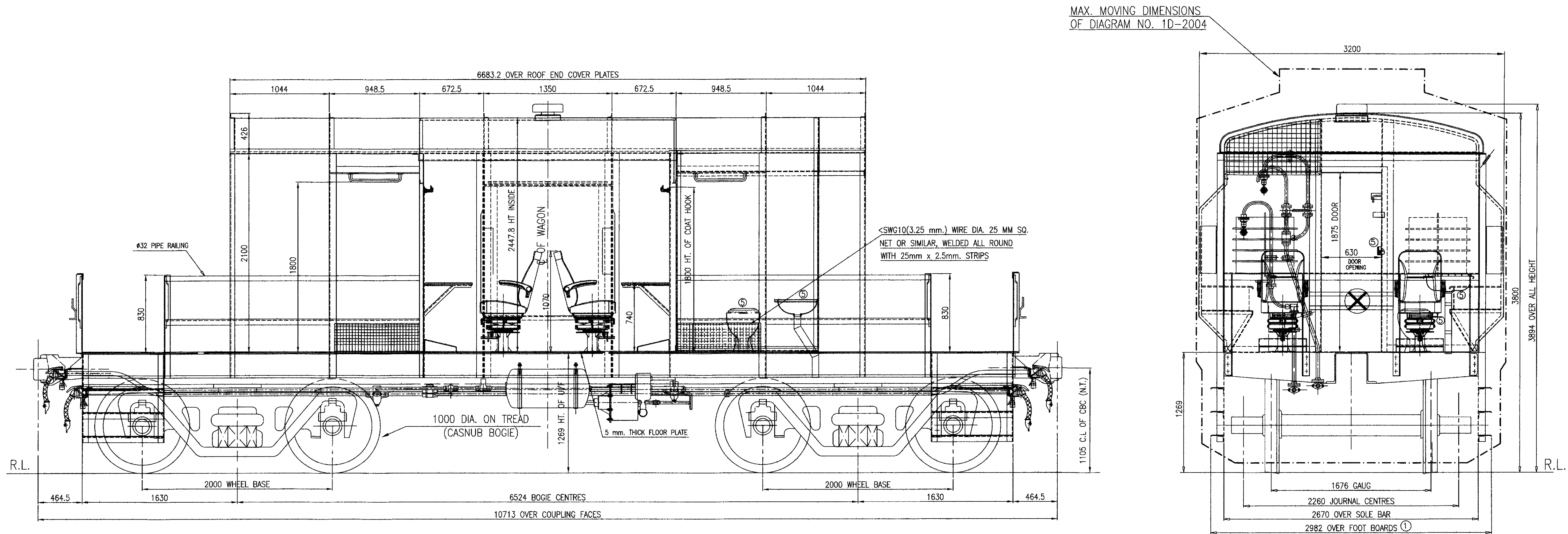
VIEW AT 'P'



2

②	8	SAFETY LOCKING ARRANGEMENT OF UNCOUPLING ROD	2			IS:2062-2011 E250 A		
	7	SAFETY BRACKET	2			IS:2062-2011 E250 A WITH Cu		
	6	PIN 25 DIA X 60 LONG	2			IS:2062-2011 E250 A WITH Cu		
	5	SAFETY STRAP FOR BEARING PIECE	2	W/BD-6318				
	4	WASHER (50 DIA X 12 THICK)	4	W/BD-6285				
	3	BEARING PIECE	2	W/BD-6284				
	2	HANGER BRACKET	2			IS:2062-2011 E250 A WITH Cu		
	1	COUPLER ROD	2			IS:2062-2011 E250 A WITH Cu		
ITEM	DESCRIPTION		NO. OFF PER WAGON	REF. DRGS.	WT. OF ONE (Kg)	MATL.&SPEC.REMARKS		
		PRELIMINARY SKETCH		ONLY FOR PROTOTYPE APPLICATION UNDER GUIDANCE OF R.D.S.O.(WAGON)				
SUPERSEDED BY			BOGIE BRAKE VAN TYPE 'BVCM'					
SUPERSEDES								
SCALE	PASSED	sd/A.K.Roy	03/15	UNCOUPLING GEAR ARRANGEMENT				
	CHECKED	sd/J.Ahmad	03/15					
	DRAWN	J.AHMAD	01/15					
	TRACED	—	—					
	COMPARED	—	—					
	J.S.NO.	WD-15009	01/15					
B.G.		R.D.S.O. [W]		GROUP	WD-15009-S-09			
RGS.								

②	-	WD-23096	LOCKING ARRANGEMENT UNCOUPLING ADDED	10/23	JA 10/23
①	2	WD-20061	HUCK BOLT CHANGE TO LOCK BOLT	12/20	JA 12/20
ALT.	ITEM	AUTHY.	DESCRIPTION	DATE	ASSLY. DRGS.



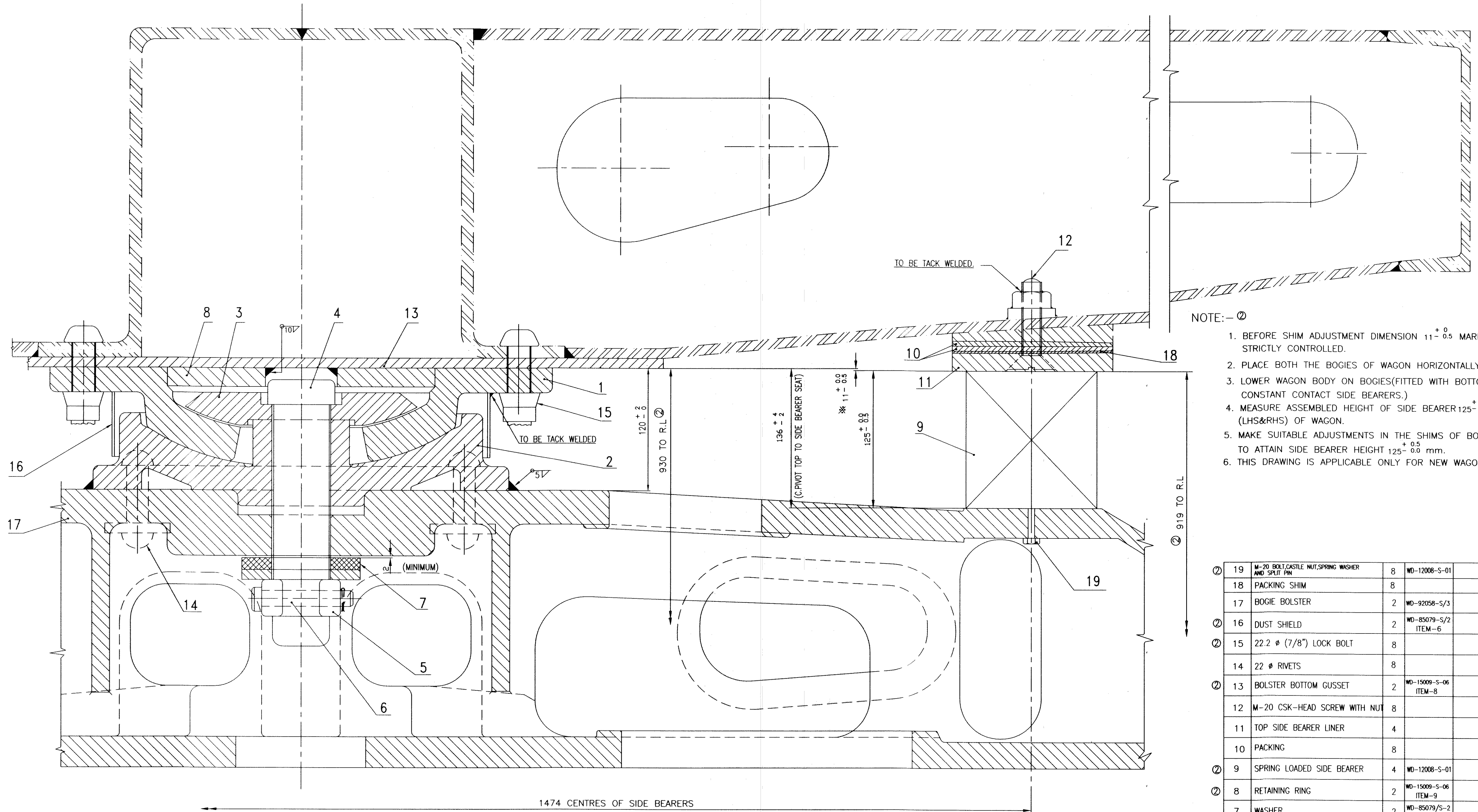
SUMMARY OF WEIGHTS (ESTIMATED)	MEASURES
UNDERFRAME	3.763 t
BODY COMPLETE INCLUDING FOOT BOARD,SIDE& END RAILING FLOOR PLATES.	3.425 t
UNDERFRAME BRAKE GEAR, AIR BRAKE EQUIPMENT INCLUDING PIPING.	1.075 t
TWO CBC.COMPLETE (NON TRANSITION) WITH YOKE AND DRAFT GEAR.	0.65 t
BOGIES COMPLETE EXCEPT SPRINGS,WHEELS & AXLES, CARTRIDGE BEARINGS WITH ADAPTERS AND CENTRE PIVOTS	1.320 t
FOUR PAIRS OF WHEELS AND AXLES	3.636 t
EIGHT CATRIDGE BEARING UNITS AND ADAPTERS.	5.750 t
BOLSTER SPRINGS AND SNUBER SPRINGS	0.372 t
CENTRE PIVOT ASSEMBLIES	0.368 t
BOGIE BRAKE GEAR COMPLETE	0.224 t
ESTIMATED TARE (APPROX.)	0.500 t
TARE WEIGHT PER METRE RUN OVER COUPLING FACES	21.1 t
AXLE LOAD	1.97 t/m
C.G. FROM R.L.(EMPTY)	20.32 t
	986 mm

DATA (BOGIE)	WAGON UNDER TARE (m.m)
HEIGHT OF BOTTOM OF BOGIE FROM R.L. AT CENTRE	165
DISTANCE FROM R.L. TO TOP OF TOP PIVOT	930
DISTANCE FROM R.L. TO TOP OF BOGIE SIDE BEARER	919
HEIGHT OF SPRINGS	249
WHEEL DIA ON TREAD	1000
WHEEL DIA ON TREAD CONDEMNING SIZE	906
DIA OF WHEEL SEAT	210
JOURNAL CENTRES	2260
JOURNAL SIZE	144X278

DATA (WAGON)	WAGON UNDER TARE (m.m)
HEIGHT OF CENTRE BUFFER COUPLER	1105
DISTANCE BETWEEN WHEEL FLANGES & FLOOR	240.5
DISTANCE BETWEEN TOP & BOTTOM SIDE BEARERS	NIL

⑤	-	WD-24050	UNIVERSAL LOCK,COUPLER NEW MODIFIED & WASH BASIN VIEW ADDED	08/24	
④	-	WD-24056	CHAR,ANCHOLD,COAT HOOK CHANGED AND FOOTREST ADDED	06/24	
③	-	WD-17032	NOTE & VENTILATOR REF. DRG. REMOVED	5/17	
②	-	WD-17022	BOGIE DATA, NOTE 2.1 MODIFIED ADDING BOGIE INDEX DRG.	4/17	
①	-	WD-17016	DIMENSION 2950 CHANGED TO 2982	2/17	
ALT	ITEM	AUTHY	DESCRIPTION	DATE	ASSEMBLY DRAWING

PRELIMINARY SKETCH		ONLY FOR PROTOTYPE APPLICATION UNDER GUIDANCE OF R.D.S.O. (WAGON)	
SUPERSEDED BY		BOGIE BRAKE VAN TYPE 'BVCN'	
SCALE PASSED		DATE	
N.S. CHECKED		J.SHEET	
DRAWN		J.SHEET	
B.G.		R.D.S.O. [W]	
GROUP		WD-15009-S-02	



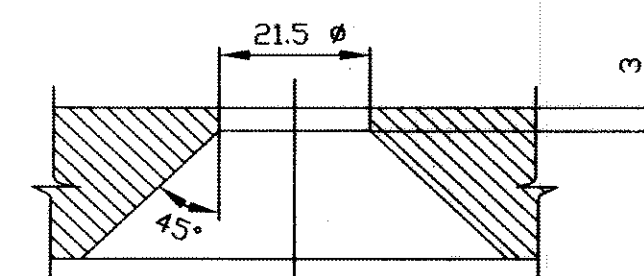
NOTE:- ②

1. BEFORE SHIM ADJUSTMENT DIMENSION 11 ± 0.5 MARKED AS $\times$ IS TO BE STRICTLY CONTROLLED.
2. PLACE BOTH THE BOGIES OF WAGON HORIZONTALLY ON LEVEL TRACK.
3. LOWER WAGON BODY ON BOGIES(FITTED WITH BOTTOM CENTER PIVOT & CONSTANT CONTACT SIDE BEARERS.)
4. MEASURE ASSEMBLED HEIGHT OF SIDE BEARER 125 ± 0.5 mm ON BOTH SIDES (LHS&RHS) OF WAGON.
5. MAKE SUITABLE ADJUSTMENTS IN THE SHIMS OF BODY SIDE BEARERS TO TO ATTAIN SIDE BEARER HEIGHT 125 ± 0.5 mm.
6. THIS DRAWING IS APPLICABLE ONLY FOR NEW WAGONS.

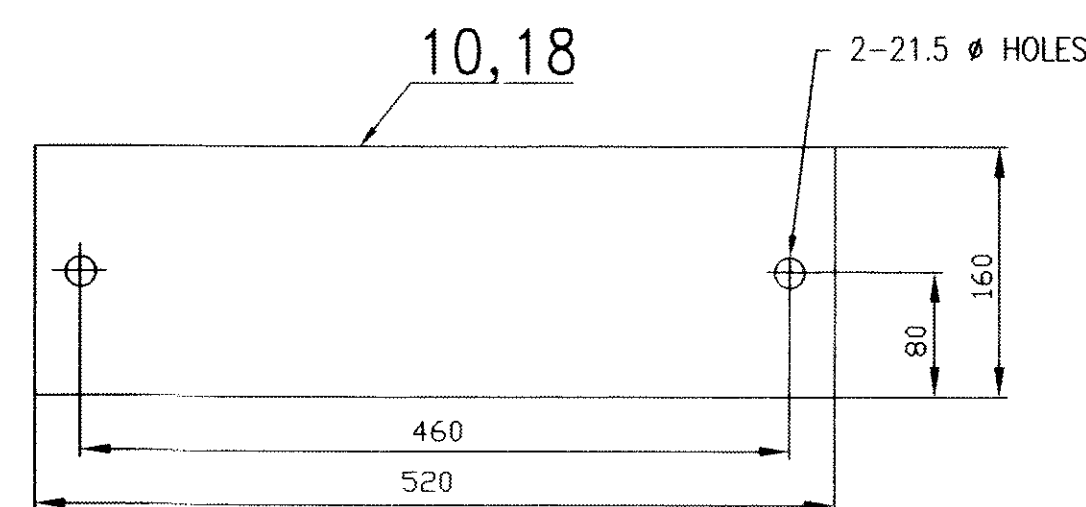
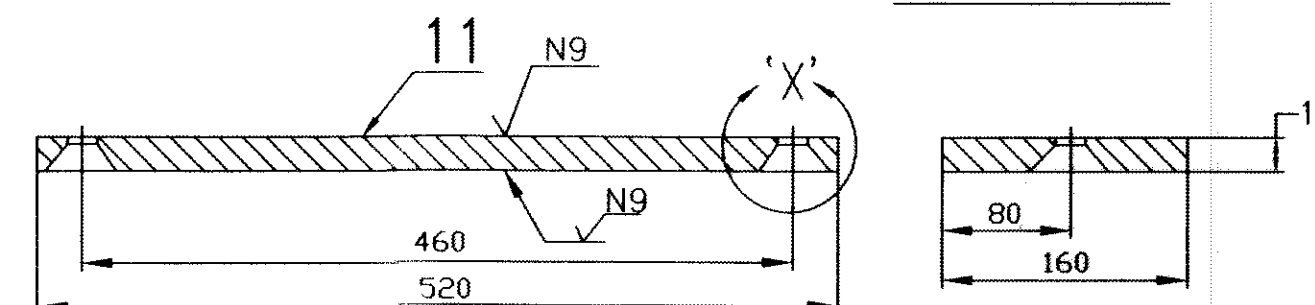
②	19	M-20 BOLT, CASTLE NUT, SPRING WASHER AND SPLIT PIN	8	WD-12008-S-01			
	18	PACKING SHIM	8			IS:1079	
	17	BOGIE BOLSTER	2	WD-92058-S/3			
②	16	DUST SHIELD	2	WD-85079-S/2 ITEM-6			
②	15	22.2 ϕ (7/8") LOCK BOLT	8			CARBON STEEL	
	14	22 ϕ RIVETS	8			IS:1929 IS:1148	
②	13	BOLSTER BOTTOM GUSSET	2	WD-15009-S-06 ITEM-8			
	12	M-20 CSK-HEAD SCREW WITH NUT	8			IS:1367 PT III-79 PROPERTY CLASS-4 & IS:1365	
	11	TOP SIDE BEARER LINER	4			IS:2062 Fe 410 CU WA	
	10	PACKING	8			IS:1079 "O" CU BEARING	
②	9	SPRING LOADED SIDE BEARER	4	WD-12008-S-01			
②	8	RETAINING RING	2	WD-15009-S-06 ITEM-9			
	7	WASHER	2	WD-85079/S-2 ITEM-4			
	6	LOCK PIN WITH 3.5 ϕ SPLIT PIN	2	WD-85079/S-2 ITEM-8		IS:549 FOR SPLIT PIN	
	5	SHACKLE LOCK	2	WD-85079/S-2 ITEM-7			
	4	BOGIE CENTRE PIVOT PIN	2	WD-85079/S-2 ITEM-5			
	3	CENTRE PIVOT RETAINER	2	WD-85079/S-2 ITEM-3			
	2	BOGIE CENTRE PIVOT (BOTTOM)	2	WD-85079/S-2 ITEM-1			
	1	BOGIE CENTRE PIVOT (TOP)	2	WD-85079/S-2 ITEM-2			

ITEM	DESCRIPTION	NO. OFF PER WAGON	REF. DRG.	WT. OF ONE(Kg)	MATL. & SPEC.	REMARKS
SUPERSEDED BY						
SUPERSEDES			DATE			
SCALE	PASSED	Sd/A.K.ROY	11/14	Bogie Brake Van Type 'BVCN' CENTRE PIVOT & SIDE BEARER ARRANGEMENT		
	CHECKED	Sd/JAHMAD	11/14			
1:2	DRAWN	J.AHMAD	10/14			
1:5	TRACED	—	—			
	J.SHEET	WD-14027	10/14			
B.G.			R.D.S.O.			
[W]			GROUP	WD-14027-S-01		

ITEM	THICKNESS
10	3.15 mm
18	1 mm

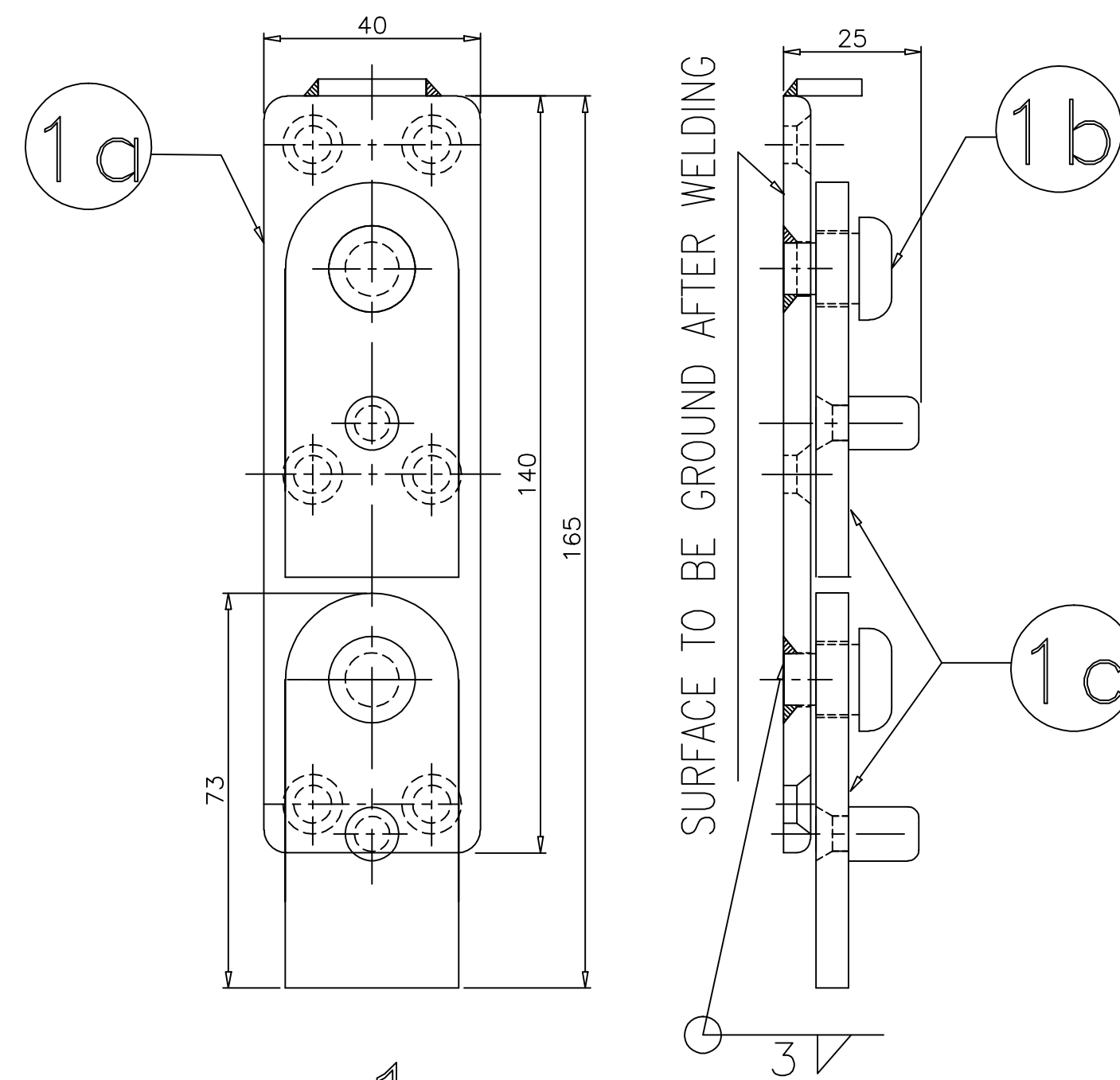


DETAIL AT 'X'

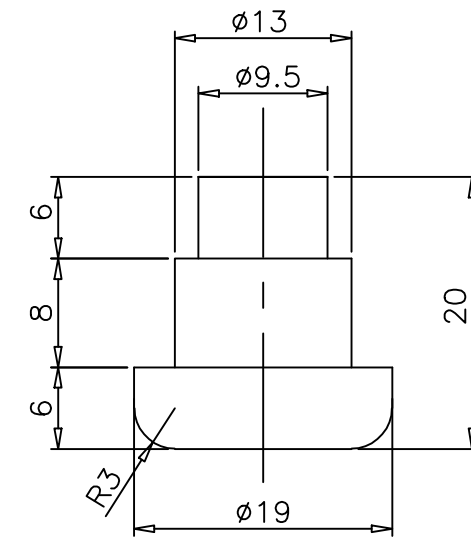


②	--	WD-17022	NOTE & IT.8,9,13,15,16 MODIFIED,IT.19 ADDED	4/17	
①	--	WD-16034	CENTER SILL SECTION CHANGED	6/16	
ALT	ITEM	AUTHY	DESCRIPTION	DATE	ASMBLY DRG

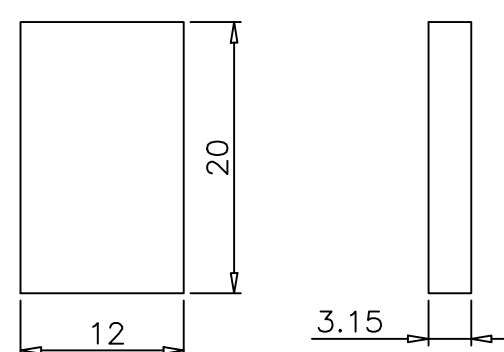
③	7	WD-18043	BUSH W/BU-2368 CHANGED TO W/BU-2364	05/18	
②	-	WD-18002	ITEM-3 MODIFIED& ITEM-11 CORRECTED	01/18	
①	-	WD-16049	DRAWING REVISED,ITEM-5&6 DELETED & ITEM-8,9,10 &11 ADDED.	8/16	
ALT.	ITEM	AUTHY.	DESCRIPTION	DATE	ASSLY. DRGS



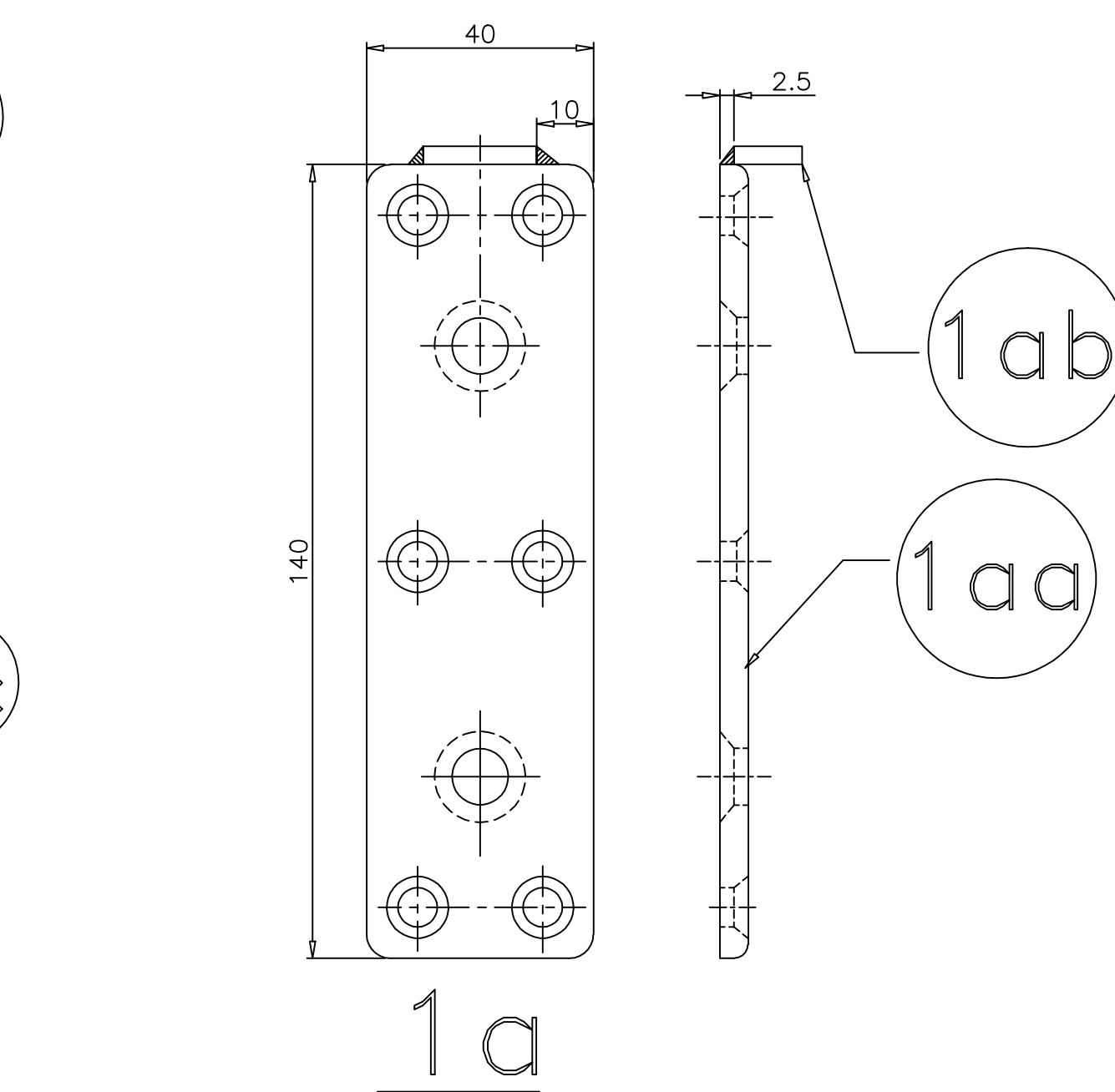
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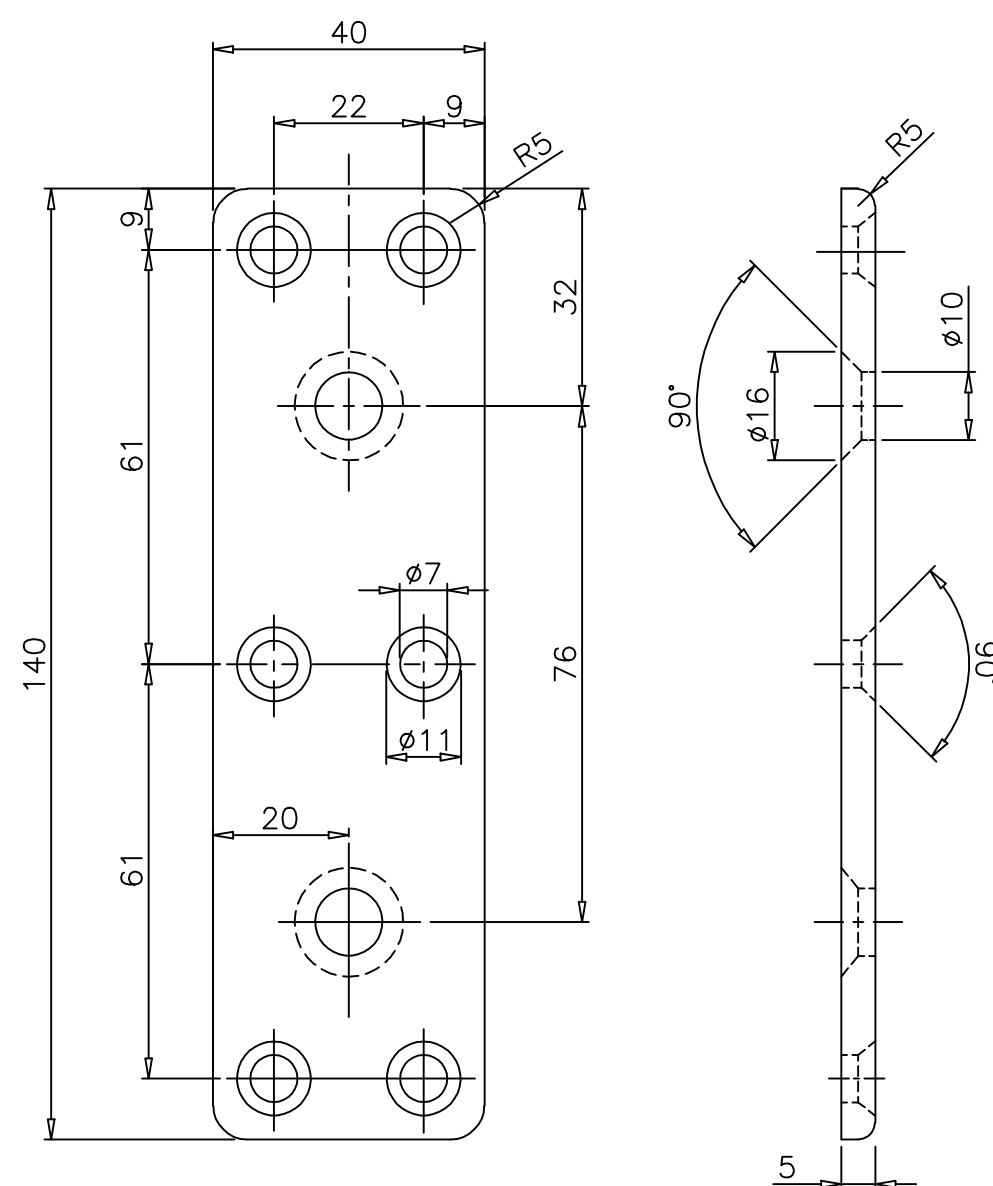
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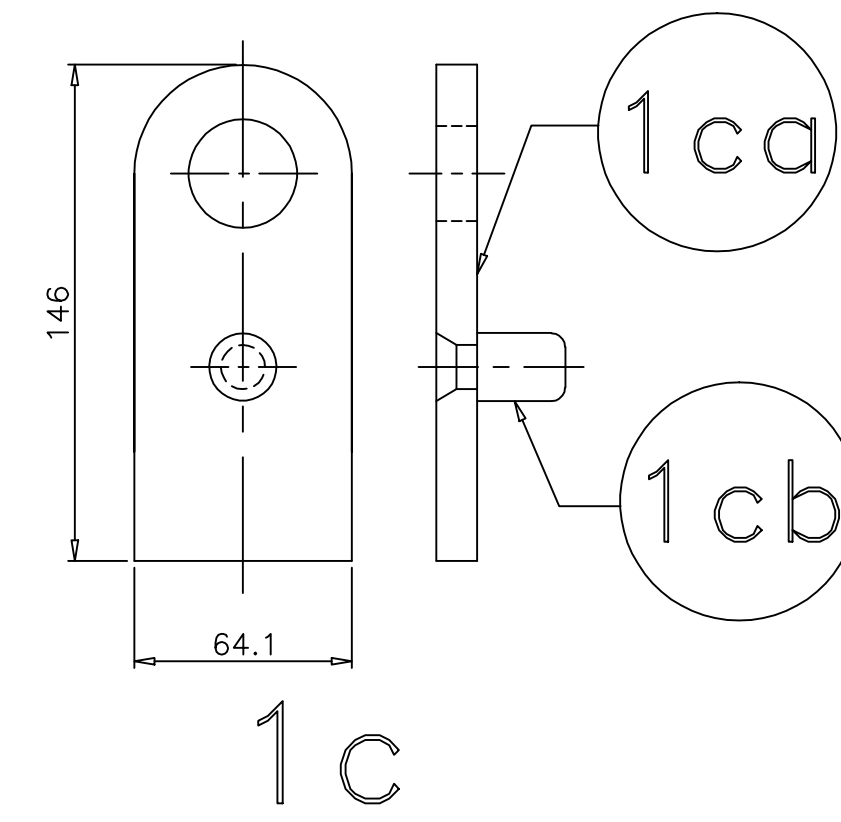
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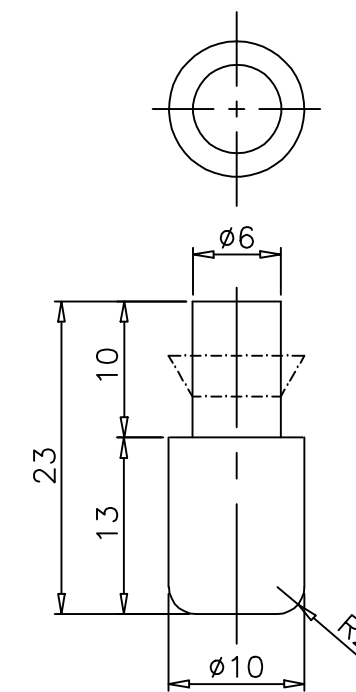
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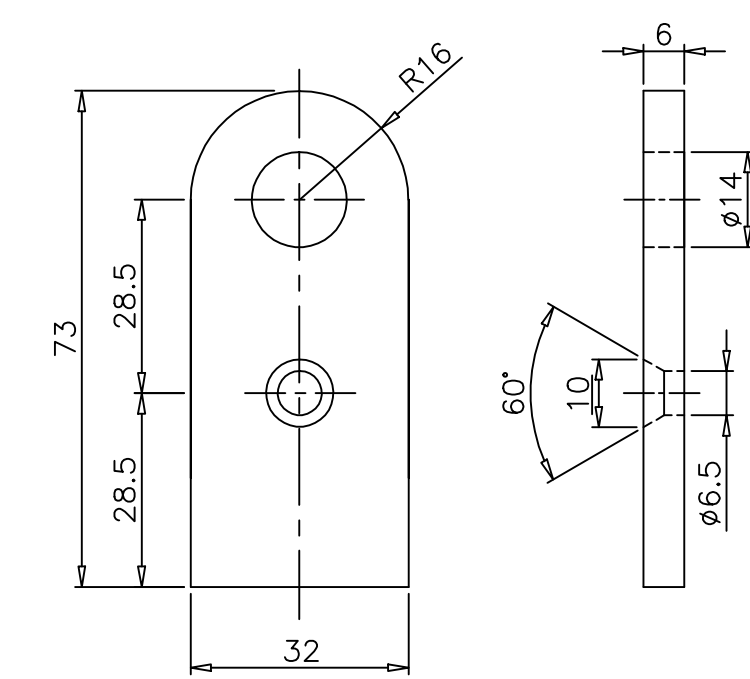
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1cb

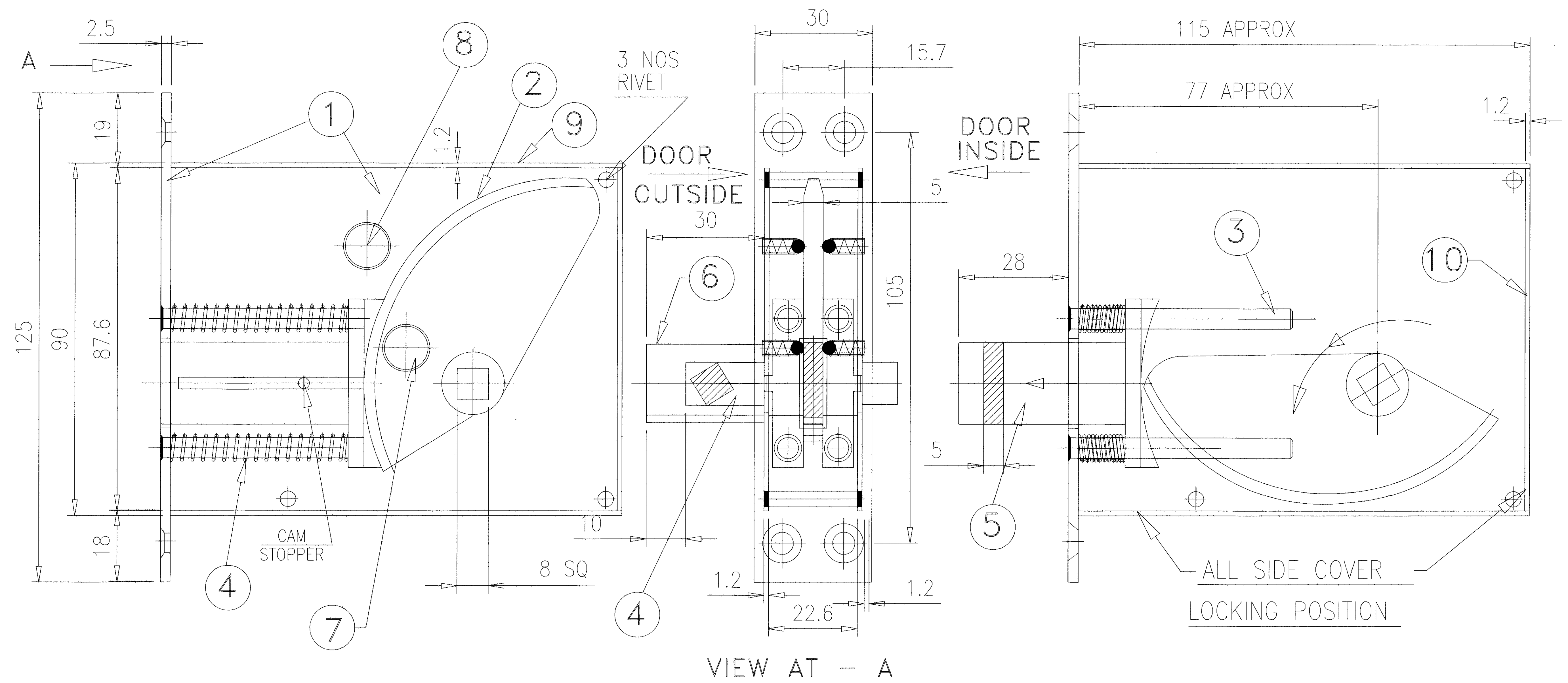


1ca

NOTE:—

1. ALL DIMENSION IN MM.
2. REFERENCE DRAWING: T-5-1-648 (SAFETY CATCH FOR OUTER DOOR)
3. ONE COAT OF RED OXIDE ZINC CHROMATE PRIMER TO BE APPLIED BY THE SUPPLIER.
4. NAME OF MANUFACTURE, DATE & YEAR OF MANUFACTURING SHULD BE LEGIBLE PUNCHED MARK AT SUITABLE AND VISIBLE LOCATION.

1cb	KNOB	2							
1ca	LATCH	2							
1c	LATCH COMPLETE	2							
1b	SHOULDERED RIVET	2						IS:2062 E250 A	
1ab	STOP PLATE	1							
1aa	BASE PLATE	1							
1a	BASE PLATE COMPLETE	1							
1	SAFETY CATCH	1							
ITEM	DESCRIPTION	NO. OFF.	REF. DRG.	WT. OF ONE(Kg)	MTL & SPEC	REMARKS			
	PRELIMINARY SKETCH		ONLY FOR PROTOTYPE APPLICATION						
			UNDER GUIDANCE OF R.D.S.O. (WAGON)						
			BOGIE BRAKE VAN TYPE 'BVZI, BVZC & BVCM'						
SUPERSEDED BY		DATE							
SUPERSEDES		DATE							
SCALE	PASSED	sd/A.K Roy	03/15	SAFETY CATCH FOR OUTER DOOR					
	CHECKED	sd/J.AHMAD	03/15						
	DRAWN	J.AHMAD	01/15						
	TRACED	---	---						
	COMPARED	---	---						
J.S.NO.		WD-15009	01/15						
B.G.		R.D.S.O. [W]	GROUP	WD-25032-S-1					



10	SIDE COVER	1	WD-24077-S-01 (SH-2 IT.10)			
9	TOP & BOTTOM COVER	2	WD-24077-S-01 (SH-2 IT.9)			
8	PROVISIONAL CAM LOCK ASSLY	2	WD-24077-S-01 (SH-2 IT.8)			
7	CAM END LOCK ASSLY	1	WD-24077-S-01 (SH-2 IT.7)			
6	Ø20 PIPE	1	WD-24077-S-01 (SH-2 IT.6)			
5	LOCKING DEVICE	1	WD-24077-S-01 (SH-2 IT.5)			
4	SPRING	4	WD-24077-S-01 (SH-2 IT.4)			
3	SPRING GUIDE	4	WD-24077-S-01 (SH-2 IT.3)			
2	CAM PROFILE	1	WD-24077-S-01 (SH-2 IT.2)			
1	FRAME	1	WD-24077-S-01 (SH-2 IT.1)			

ITEM	DESCRIPTION & DIMENSION	NO. OFF PER SEAT	REFERENCE DRG.	Wt. OFF	MTL. & SPEC.	REMARKS
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SUPERSEDED BY
SUPERSEDES
SCALE PASSED 15/08/24
CHECKED 08/24
DRAWN J.AHMAD 8/24
TRACED
COMPARED
J.S.NO. WD-24077 8/24

GOODS BRAKE VAN TYPE 'BVZC'/'BVZI'/BVCM

UNIVERSAL LOCK
(SHEET- 1 OF 2)

B.G. R.D.S.O. [W] GROUP WD-24077-S-01

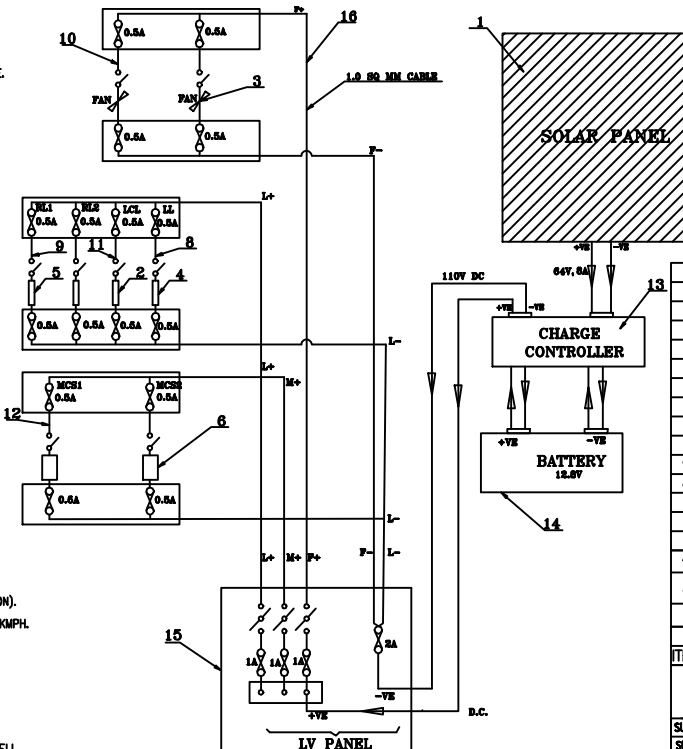
REMARKS: ALL DIMENSIONS ARE IN MM.

ALT.	ITEM	AUTHY.	DESCRIPTION	DATE
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NOTE:-

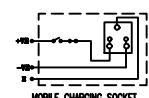
1. FLEXIBLE SOLAR PHOTO VOLTAGE (SPV) MODULE SHALL BE OF POLYCRYSTALLINE CELL WITH ETHYLENE TETRA FLOURO ETHYLENE AS TOP LAYER WITH MINIMUM PEAK WATTAGE W_p OF 500W AND ATLEAST 9 BYPASS DIODES.
2. FLEXIBLE PV MODULE SHALL BE HIGHLY RELIABLE, FLEXIBLE AND LIGHT WEIGHT AND HAVE SERVICE LIFE OF MORE THAN 25 YEARS.
3. FLEXIBLE SPV MODULE SHALL BE POTENTIAL INDUCED DEGRADATION (PID) RESISTANT AND TESTED FOR PID AS PER IEC 62804.
4. FLEXIBLE SPV MODULE MUST QUALIFY SALT MIST CORROSION TESTING AS PER IEC 61701.
5. CONVERSION EFFICIENCY OF SPV MODULE SHALL NOT LESS THAN 15% AND FILL FACTOR SHALL NOT BE LESS THAN 72%.
6. FLEXIBLE SPV SHALL BE FIXED WITHOUT PIERCING ROOF AND CAPABLE OF WITHSTANDING BODY VIBRATION THERMAL VARIATION OF WAGON.
7. SPV ENCAPSULATION SHALL BE COMPATIBLE WITH THERMAL EXPANSION OF SILICON CELLS AND MOISTURE PROOF.
8. SPV TERMINAL BLOCK SHALL BE IEC 61215 CERTIFIED AND HAVE WATER PROOF DESIGN (MIN. IP65) AND HAVE PROVISION FOR OPENING/REPLACING CABLES.
9. MARKINGS:
 - (i) NAME, MONOGRAM OR SYMBOL OF MANUFACTURER OF SOLAR MODULE
 - (ii) NAME OF THE MANUFACTURER OF SOLAR CELLS
 - (iii) TYPE OR MODEL NUMBER
 - (iv) SERIAL NUMBER
 - (v) POLARITY OF TERMINALS OR LEADS (COLOR CODING IS PERMISSIBLE)
 - (vi) OPEN CIRCUIT VOLTAGE AND OPERATING VOLTAGE
 - (vii) MAXIMUM SYSTEM VOLTAGE FOR WHICH THE MODULE IS SUITABLE.
 - (viii) OPERATING CURRENT AND SHORT CIRCUIT CURRENT
 - (ix) DATE AND PLACE OF MANUFACTURE
 - (x) WEIGHT OF THE MODULE
 - (xi) MODULE W_p AND TOLERANCE
10. FOR BATTERY BANK LITHIUM FERRO PHOSPHATE BATTERY SHALL BE USED WITH MINIMUM CAPACITY OF 12.8V/110Ah
11. BATTERY SHOULD BE FREE FROM FIRE HAZARD AND SEALED IN SUITABLE CASING.
12. OPERATING CONDITION OF BATTERY BANK AS PER IEC 62133-2:2017/IS 16046 AND SHALL WITHSTAND VIBRATION AND SHOCKS AS PER IEC 61373.
13. BATTERY BANK MUST HAVE MORE THAN 3000 CHARGE CYCLES AT 90% DEPTH OF DISCHARGE.
14. BATTERY MANAGEMENT SYSTEM (BMS):
 - (i) BMS SHOULD BE ABLE TO MONITOR PARAMETER LIKE VOLTAGE, CURRENT, TEMPERATURE, ETC. OF BATTERY BANK
 - (ii) BMS SHOULD HAVE PROTECTION LIKE OVER VOLTAGE, UNDER VOLTAGE, SHORT CIRCUIT, REVERSE POLARITY AND OVER TEMPERATURE.
 - (iii) BMS SHOULD BE SYNCRONIZED WITH CHARGE CONTROLLER UNIT AND SHOULD BE CAPABLE OF CELL BALANCING.
15. BATTERY PACK ALONG WITH OTHER ACCESSORIES SHOULD BE KEPT IN ANTI PIRFERAGE DEVICE WITH LOCKING MECHANISM
16. MAXIMUM POWER POINT TRACKING (MPPT) SOLAR CHARGE CONTROLLER UNIT (CCU) SHALL BE PROVIDED BETWEEN SOLAR ARRAY, DC LOADS AND LITHIUM FERRO PHOSPHATE BATTERY.
17. CCU SHOULD HAVE INTEGRATED ENERGY METER, VOLT METER, AMPS METER, DATA LOGGER, GPS TRACKER, GPRS BASED REMOTE MONITORING SYSTEM AND GRAPHICAL USER INTERFACE PROVIDED WITH ADEQUATE PROTECTION.
18. CCU SHALL HAVE 'TEMPERATURE COMPENSATION' FEATURE AND RESET BUTTON TO RESET/REFRESH THE SYSTEM AND OTHER OPTIONS TO OPERATE LED DISPLAY.
19. CCU SHOULD HAVE FOLLOWING LIST OF INDICATIONS THROUGH LED/LCD DISPLAYS:
 - (i) CHARGE CONTROLLER ON/OFF
 - (ii) CHARGE CONTROLLER OVER VOLTAGE/UNDER VOLTAGE.
 - (iii) CHARGE CONTROLLER OVER TEMPERATURE.
 - (iv) DISPLAY ON SCREEN AS PV VOLTAGE, PV CURRENT, BATTERY VOLTAGE, BATTERY CURRENT, LOAD VOLTAGE, LOAD CURRENT.
 - (v) SOLAR GENERATION ON-DAILY BASIS AND CUMULATIVE.
20. CCU SHOULD HAVE GROUND FAULT DETECTION DEVICE (FOR AC SYSTEM ONLY).
21. COMBINED UNIT BOX WITH SHELS SHOULD BE MADE OF 3.15 MM THICK SHEET AND SHOULD ENCLOSE ITEM-13,14,15 AND 17 ETC. THE BOX SHALL BE FIXED WITH SUPPORTING ANGLES WITH WELDING ALL AROUND TO PREVENT VANDALISM AND PIRFERAGE. HINGE DOOR OF COMBINED UNIT BOX SHOULD BE FITTED WITH UNIVERSAL LOCK TO RDSO DRAWING NO. WD-24077-S-01 AND "DANGER" SHALL BE MARKED OUTSIDE OF HINGE DOOR BY RED PAINT OR STICKER.
22. ELECTRICAL WIRING SHALL BE PROTECTED BY METALLIC CONDUITS WELDED TO THE STRUCTURE.
23. 110V BLDG FANS AND 110V LED LIGHTS WITH TAMPER PROOF FITTINGS TO BE PROCURED BY RDSO APPROVED SOURCES.
24. COMPONENTS AND HARDWARE SHALL BE VANDAL AND THEFT RESISTANT. ALL PARTS SHALL BE CORROSION-RESISTANT AND HARDWARE SHOULD BE STAINLESS STEEL.
25. METHOD OF FIXING SPV ON BVZ1/BVCM WAGON ROOFTOP:
 - (A) MODULE MOUNTING STRUCTURE:
 - (i) MODULE MOUNTING STRUCTURE SHOULD BE MADE OF HOT DIPPED GALVANIZED MS ANGLE OF SUITABLE SIZE. WELDING ELECTRODES IF REQUIRED, SHALL BE COMPATIBLE WITH ROOF MATERIAL AND SHOULD NOT DAMAGE THE ROOF.
 - (ii) BOLTS, NUTS, SHIMS ETC. SHALL BE ZINC PLATED AND FASTENERS SHALL BE OF STAINLESS STEEL SS-304.
 - (iii) MODULE MOUNTING STRUCTURE SHALL BE DESIGNED THAT IT SHALL OCCUPY MINIMUM SPACE WITHOUT SACRIFICING OUTPUT FROM SPV PANELS AND SHALL ALLOW EASY REPLACEMENT OF SPV PANELS IF REQUIRED.
 - (iv) OVERALL MOUNTING ARRANGEMENT FOR BVZ1/BVCM WAGON SHALL BE WITHIN IRSDO (INDIAN RAILWAYS SCHEDULE OF DIMENSION).
 - (v) THE SUPPORT STRUCTURE, DESIGN AND FOUNDATION SHALL NORMALLY BE DESIGNED TO WITHSTAND WIND SPEED UP TO 200 KMPH OR
 - (B) FLEXI SOLAR PANEL PASTING ARRANGEMENT:
 - (i) FIXING SCHEME SHOULD WITHSTAND THE VIBRATIONS IN WAGON BODY FOR LIFE TIME OF PANELS
 - (ii) MATERIAL USED FOR PASTING SHOULD BE ANTI-CORROSIVE.
 - (iii) DOUBLE SIDED ACRYLIC FOAM TAPE OR ELASTIC ADHESIVE SEALANT SHALL BE USED IF REQUIRED.
 - (iv) ACRYLIC FOAM TAPE SHALL BE MINIMUM 1 INCH WIDE AND THICKNESS RANGE OF 2-2.5 MM. HAVING CLOSED CELL CONSTRUCTION TO AVOID INGRESS OF WATER/AIR.
 - (v) ACRYLIC FOAM TAPE SHALL HAVE MINIMUM FOAM DENSITY OF 700 KG/M³ AND SURFACE RESISTIVITY OF 10¹⁴ OHM/M
 - (vi) ACRYLIC FOAM TAPE SHALL CONFORM TO ASTM D 3330 FOR PEEL ADHESION (300N/100MM) AND HAVE AT LEAST 10,000 MINUTES OF STATIC SHEAR RESISTANCE AS PER ASTM D3854.
 - (vii) ACRYLIC FOAM TAPE SHOULD HAVE BEEN TESTED AGAINST SUSTAINED WIND SPEED OF MINIMUM 200 KMPH AS PER ASTM E330 WITH TEST REPORT CORROBORATED WITH NABL ACCREDITED LAB OR INTERNATIONAL LAB OF REPUTE.
 - (viii) ACRYLIC FOAM TAPE SHALL HAVE BEEN TESTED FOR ITS STRENGTH RETENTION, UNDERWATER SUBMERSION FOR MINIMUM 5 YEARS AND HAVE 25 YEARS OF SERVICE LIFE MODELING.

- (ix) ACRYLIC FOAM TAPE SHALL DISPLAY THE MANUFACTURER LOGO WITH CLEAR MENTION OF LOT/BATCH NUMBER AND YEAR OF PRODUCTION
- (x) ELASTIC ADHESIVE SEALANT SHALL BE A SINGLE COMPONENT MOISTURE CURING POLYURETHANE SEALANT WITH NORMAL CURING UNDER ATMOSPHERIC CONDITIONS.
- (xi) ADHESIVE SHALL HAVE SHORE A HARDNESS BETWEEN 55 AND 60 AS PER ASTM C661 AND ELONGATION AT BREAK MORE THAN 300% (AS PER ASTM D412).
- (xii) EDGE SEALING TAPE OF MINIMUM 2 INCH WIDE AND 2 MM THICK TRANSLUCENT, SINGLE SIDE COATED PRESSURE SENSITIVE ACRYLIC ADHESIVE TAPE WITH IONOMER BACKING, HAVING ELONGATION OF 530% AT BREAK WHEN TESTED AS PER ASTM D3759.
- (xiii) UV STABLE ADHESIVE PROMOTER/PRIMER CONTAINING ACRYLATE POLYMER SHALL BE APPLIED BEFORE APPLICATION OF ACRYLIC TAPE.
- (xiv) UV STABLE ADHESIVE PROMOTER/PRIMER SHALL HAVE VISCOSITY LESS THAN 25CPS AND FAST DRYING PROPERTIES, THAT IS COMPATIBLE WITH ACRYLIC BASED ADHESIVE.
26. BRANCH WIRING FOR CONNECTION OF ELECTRICAL EQUIPMENTS TO ROUTED THROUGH FLEXIBLE POLYAMIDE CONDUIT AS PER RDSO SPECIFICATION NO. RDSO/PE/SPEC/AC/0138-2009 (REV.1)
27. ROTARY SWITCH PANELS/LV PANEL TO BE PROVIDED AS PER ICF DRAWING NO. GS6-7-2-802.
28. AEROSOL BASED FIRE SUPPRESSION SYSTEM TO BE PROVIDED IN THE LV PANEL AS PER RDSO LETTER NO. EL/7.1.108/MSSBC/MAIN DATED 17.07.2023
29. CODE OF PRACTICE FOR WIRING FOR 110V DC SELF GENERATION TRAIN LIGHTING SYSTEM AS PER RDSO SPECIFICATION NO. EL/TL/48 REV.1-2005 NEEDS TO BE FOLLOWED.
30. CODE OF PRACTICE FOR TRAIN LIGHTING MAINTENANCE ON PREVENTION OF FIRES ON 110V DC SELF GENERATING COACHES AS PER RDSO SPECIFICATION NO. EL/TL/56-1992 NEEDS TO BE FOLLOWED.
31. THE FITMENT AND MOUNTING OF ELECTRICAL EQUIPMENTS INSTALLED IN THE BOGIE BRAKE VAN MAY BE ENSURED AT ZONAL RAILWAY LEVEL.



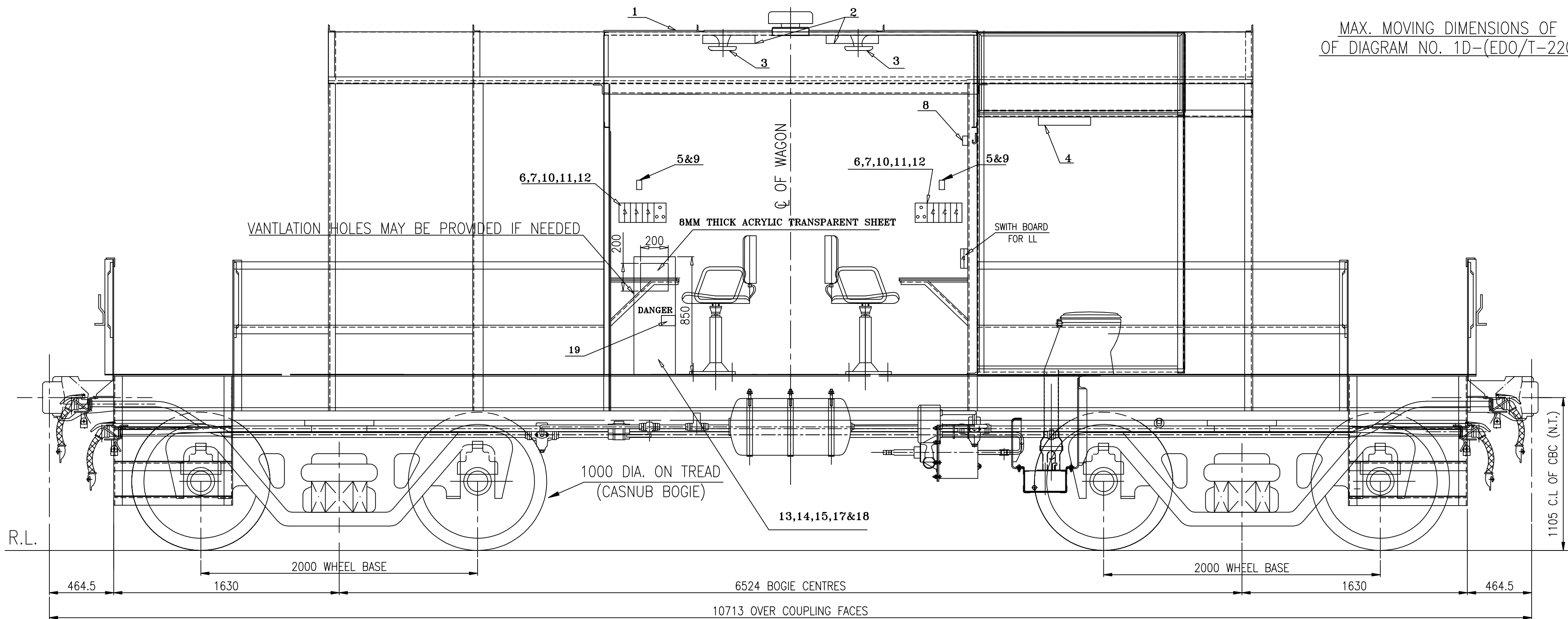
SCHEMATIC DIAGRAM FOR WIRING

CIRCUIT	DESCRIPTION	WATTAGE	QUANTITY	TOTAL LOAD
LCL	LED COMPARTMENT LIGHT	9W	1	9W
LL	LAVATORY LIGHT	9W	1	9W
TL/LT/L	TABLE LAMP	2W	2	4W
F	FAN (FIXED 400mm SWEEP)	32W	2	64W
MCS	MOBILE CHARGING SOCKET	5W	2	10W
TOTAL				110W

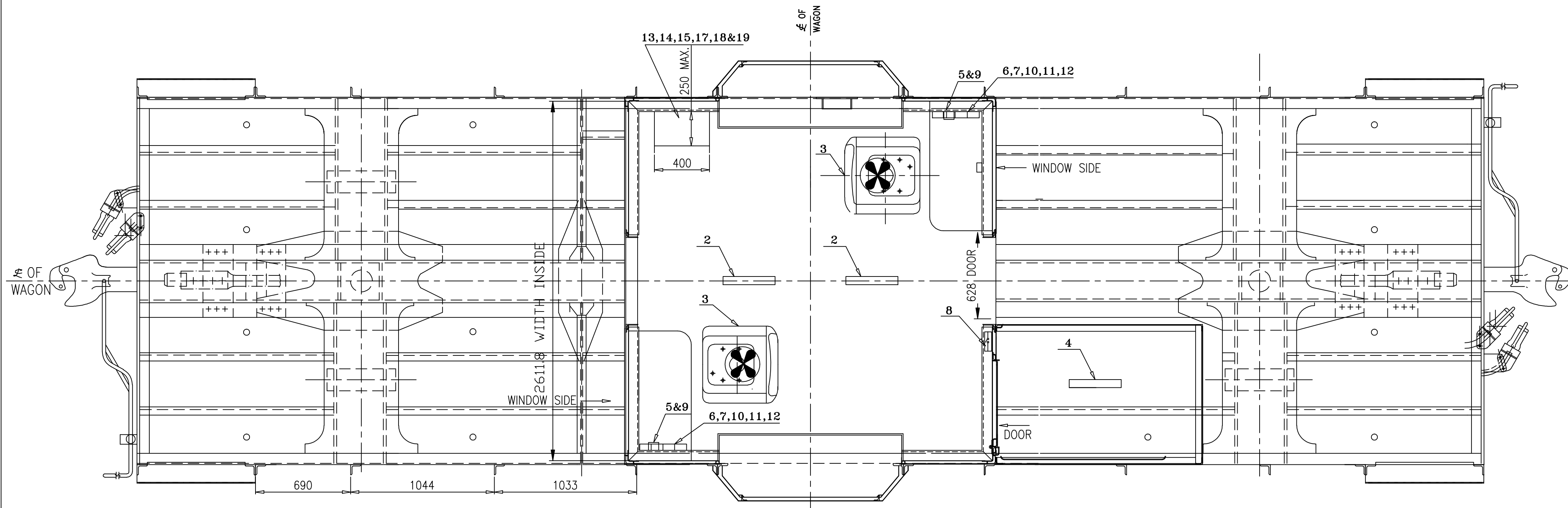
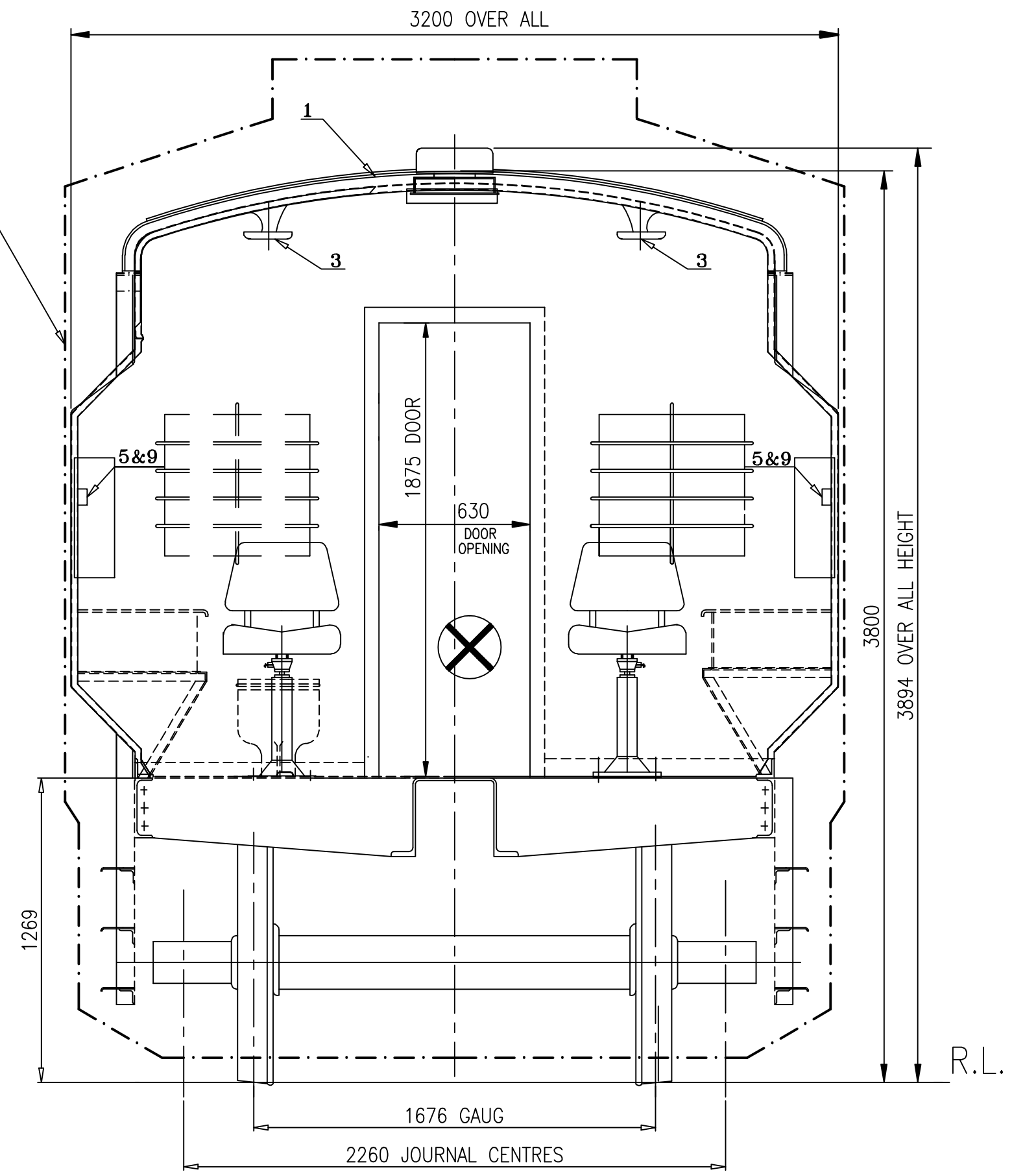


19	UNIVERSAL LOCK	1	WD-24077-S-01		SEE NOTE-21
18	COMBINED UNIT BOX	1	REFER SHEET-1	IS:2082 E250 A	SEE NOTE-21
17	AEROSOL BASED FIRE SUPPRESSION SYSTEM	1		RDSO LETTER NO. EL/7.1.108/MSSBC/MAIN DATED 17.07.2023. SEE NOTE-28	
16	2.5 SQ. MM. CABLE	1		RDSO SPEC. NO. EL/TL/48 REV.1-2005	
15	LV PANEL	1		EN 61439-1	
14	BATTERY	1		IS: 3854-1997	
13	CHARGING CONTROLLER	1		IS: 3854-1997	
12	SWITCH FOR MOBILE CHARGING	2		IS: 3854-1997	
11	SWITCH FOR LED COMPARTMENT LIGHT	2		IS: 3854-1997	
10	SWITCH FOR FAN	2		IS: 3854-1997	
9	SWITCH FOR TABLE LAMP	2		IS: 3854-1997	
8	SWITCH FOR LAVATORY LIGHT	1		IS: 3854-1997	
7	SWITCH MAIN BOARD	2		-	
6	MOBILE CHARGING SOCKET	2		IS: 1293-2019	
5	TABLE LAMP	2		IS: 3854-1997	
4	LAVATORY LIGHT	1		IS: 3854-1997	
3	FAN (FIXED 400mm SWEEP)	2		RDSO SPEC. NO. EL/TL/48 REV.1-2005	
2	LED COMPARTMENT LIGHT	2		RDSO SPEC. NO. EL/TL/48 REV.1-2005	
1	SOLAR PANEL	1		IEC: 61215 Ed 2/IS: 14286	
ITEM	DESCRIPTION	QTY	REF. DRGS.	IS: 14286	REMARKS
PRELIMINARY SKETCH ONLY FOR PROTOTYPE APPLICATION UNDER GUIDANCE OF R.D.S.O. (WAGON)					
BOGIE BRAKE VAN TYPE 'BVCN' FITMENT OF SOLAR SYSTEM WITH LIGHT & FAN					
SUPERSEDED BY: [] DATE: [] SCALE: PASSED: [] DATE: [] CHECKED: [] DATE: [] DRAWN: [] DATE: [] TRACED: [] DATE: [] J.SHEET: WD-24050/05/24		R.D.S.O. GROUP: [] WD-24050-S-07 (SHEET-II)			

17.10	WD-22032	ITEM NO. 17,18 AND 19 INDICATED IN BOM. NOTE-3&4 DELETED. NOTE-17,18,19 AND 21 MODIFIED.	05/25
ALT/ITEM	AUTHY	DESCRIPTION	DATE ASSEMBLY DRAWING



MAX. MOVING DIMENSIONS OF
OF DIAGRAM NO. 1D--(EDO/T-2202



19	UNIVERSAL LOCK	1	WD-24050-S-07 (SHEET-II) ITEM-19			
18	COMBINED UNIT BOX	1	WD-24050-S-07 (SHEET-II) ITEM-18			
17	AEROSOL BASED FIRE SUPPRESSION SYSTEM		WD-24050-S-07 (SHEET-II) ITEM-17			
16	2.5 SQ. MM CABLE		WD-24050-S-07 (SHEET-II) ITEM-16			
15	LV PANEL		WD-24050-S-07 (SHEET-II) ITEM-15			
14	BATTERY		WD-24050-S-07 (SHEET-II) ITEM-14			
13	CHARGING CONTROLLER		WD-24050-S-07 (SHEET-II) ITEM-13			
12	SWITCH FOR MOBILE CHARGING	2	WD-24050-S-07 (SHEET-II) ITEM-12			
11	SWITCH FOR LED COMPARTMENT LIGHT	2	WD-24050-S-07 (SHEET-II) ITEM-11			
10	SWITCH FOR FAN	2	WD-24050-S-07 (SHEET-II) ITEM-10			
9	SWITCH FOR TABLE LAMP	2	WD-24050-S-07 (SHEET-II) ITEM-9			
8	SWITCH FOR LAVATORY LIGHT	1	WD-24050-S-07 (SHEET-II) ITEM-8			
7	SWITCH MAIN BOARD	2	WD-24050-S-07 (SHEET-II) ITEM-7			
6	MOBILE CHARGING SOCKET	2	WD-24050-S-07 (SHEET-II) ITEM-6			
5	TABLE LAMP	2	WD-24050-S-07 (SHEET-II) ITEM-5			
4	LAVATORY LIGHT	1	WD-24050-S-07 (SHEET-II) ITEM-4			
3	FAN (FIXED 400mm SWEEP)	2	WD-24050-S-07 (SHEET-II) ITEM-3			
2	LED COMPARTMENT LIGHT	2	WD-24050-S-07 (SHEET-II) ITEM-2			
1	SOLAR PANEL	1	WD-24050-S-07 (SHEET-II) ITEM-1			

ITEM	DESCRIPTION	NO. OF WAGON	REF. DRGS.	WT. OF ONE (Kg)	MATL.&SPEC	REMARKS
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PRELIMINARY SKETCH

ONLY FOR PROTOTYPE APPLICATION
UNDER GUIDANCE OF R.D.S.O. (WAGON)

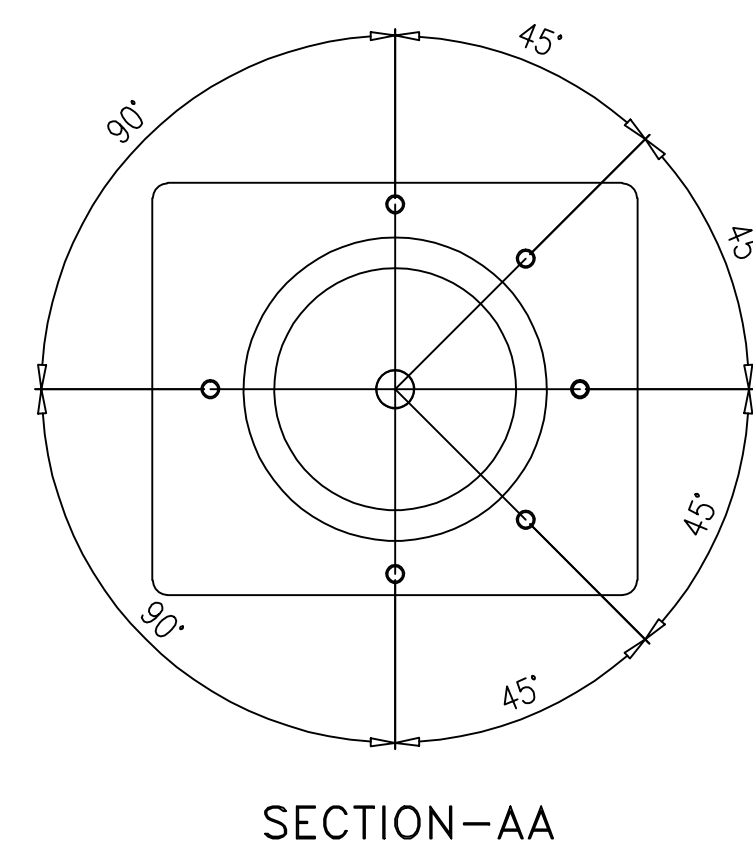
SUPERSEDED BY		
SUPERSEDES	DATE	
SCALE PASSED	05/24	
CHECKED	05/24	
DRAWN	05/24	
TRACED		
J.SHEET	WD-24050	05/24

BOGIE BRAKE VAN TYPE 'BVCM'

FITMENT OF SOLAR SYSTEM
WITH LIGHT & FAN

B.G.	R.D.S.O.	GROUP	WD-24050-S-07 (SHEET-I)
	[W]		

①	17	WD-25032	ITEM NO. 13 TO 19 INDICATED IN BOM.	05/25	
ALT	ITEM	AUTHY	DESCRIPTION	DATE	ASSEMBLY DRAWING

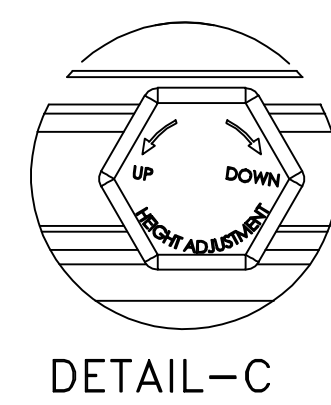
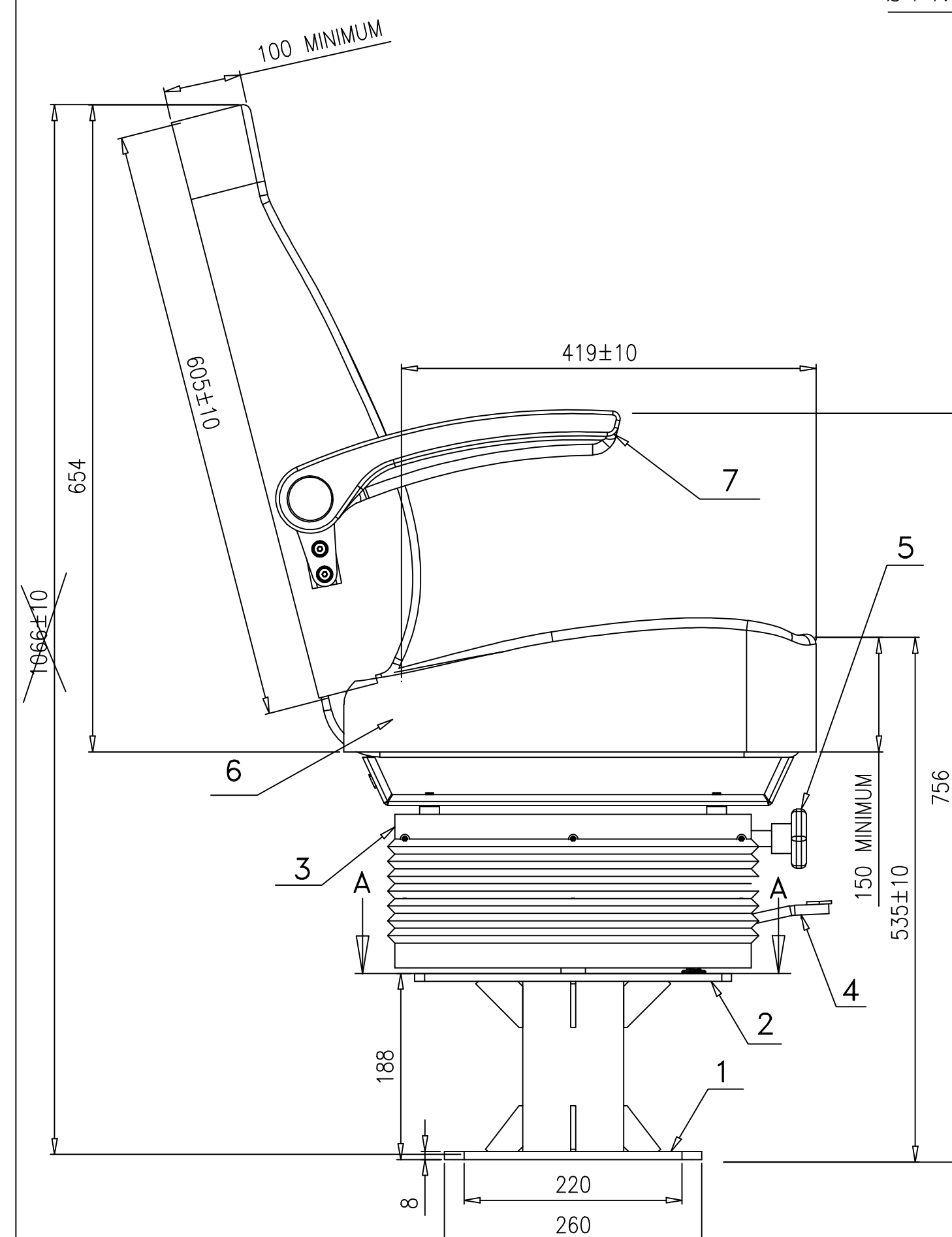


POWDER COATING DETAILS:
COLOUR : RAL 9005 (Matt black)
THICKNESS : 60 – 100 μm
GLOSS : 30 $\pm$ 15 GU AT 60°

TOLERANCE TO BE FOLLOWED AS PER IS: 2102 C COARSE CLASS

NOTE:-

1. SEAT VERTICAL DISPLACEMENT TO BE MET AS PER DRAWING.
2. SEAT ROTATIONAL MOVEMENT 360° , LOCKED AT INDEXED POSITION i.e. 45°,45°,90°,90°, 45° & 45° AS SHOWN IN SECTION-AA IN DRAWING.
3. CUSHIONING MATERIAL FOR BACK AND SEAT TO BE PROVIDED WITH MOULDED PU TO THE FOLLOWING DENSITY (AS PER SPECIFICATION No. IS:8255 & IS:7888)
SEAT: 50±10 KG/CUM BACK: 40±10 KG/CUM OR SUPERIOR
4. SUPERIOR QUALITY UPHOLSTERY FABRIC (MAROON COLOUR) TO BE USED WHICH CONFORM RDSO SPEC. RDSO/2008/CG-07 Rev.1 OR LATEST.
5. MATERIAL OF BELLOW UK-110 D AS PER FMVSS 302, CUSHION SUPPORT STRIP IS:1079-1994 OR LATEST.
6. OPERATING KNOB ARE PP MOULDED.
7. ALL STRUCTURE PART CONSIDERING CARBON STEEL OF IS:2062 E250 Gr-A.
8. WELDING OF SEAT AS PER IS:15326-3 OR EQUIVALENT EN 15085-2, CL2.
9. POWDER COATING - COLOR RAL 9005 MATT BLACK.
10. GENERAL TOLERANCE ON FOAM ±10MM.
- Ø 11. OPERATING FORCE FOR ALL LEVER SHOULD REMAIN BETWEEN 5 TO 50 N.m
- Ø 12. OPERATING FORCE FOR HEIGHT ADJUSTMENT KNOB SHOULD REMAIN BETWEEN 5 TO 50 N.m WITHOUT DRIVER MASS .
13. SHAFT MATERIAL EN8 WHITE ZINC PLATED.
14. EVERY INTERVAL OF EIGHTEEN MONTHS PREVENTIVE MAINTENANCE TO BE DONE OF HEIGHT ADJUSTER i.e. GREASING Etc.
15. THERE SHOULD NOT BE SHARP CORNER OR BURRS.
16. CHAIR ARM SHOULD BE FOLDABLE & SUITABLY FASTENED LIKE ALLEN BOLT.
17. CHAIR SHOULD BE PROVIDED WITH SHOCK ABSORBING MECHANISM.
18. THE DESIGN SHALL CONFORM TO SAFETY REQUIREMENT AS PER STANDARD UIC-651/612
19. THE CUSHIONED MATERIAL TO BE MET AS PER EN-45545-HL3 R21.
20. THE GUARD SEAT SHALL UNDER GO STATIC TEST AS PER DIN 5566 & SHOCK VIBRATION TEST AS PER IEC 61373 CAT.1 CLASS A.
21. EACH PART OF THE CHAIR SHOULD BE REPLACEABLE AND CAN BE STOCKED FOR REPLACEMENT.



0.0 mm	+80 mm
HT. ADJ.	HT. ADJ.

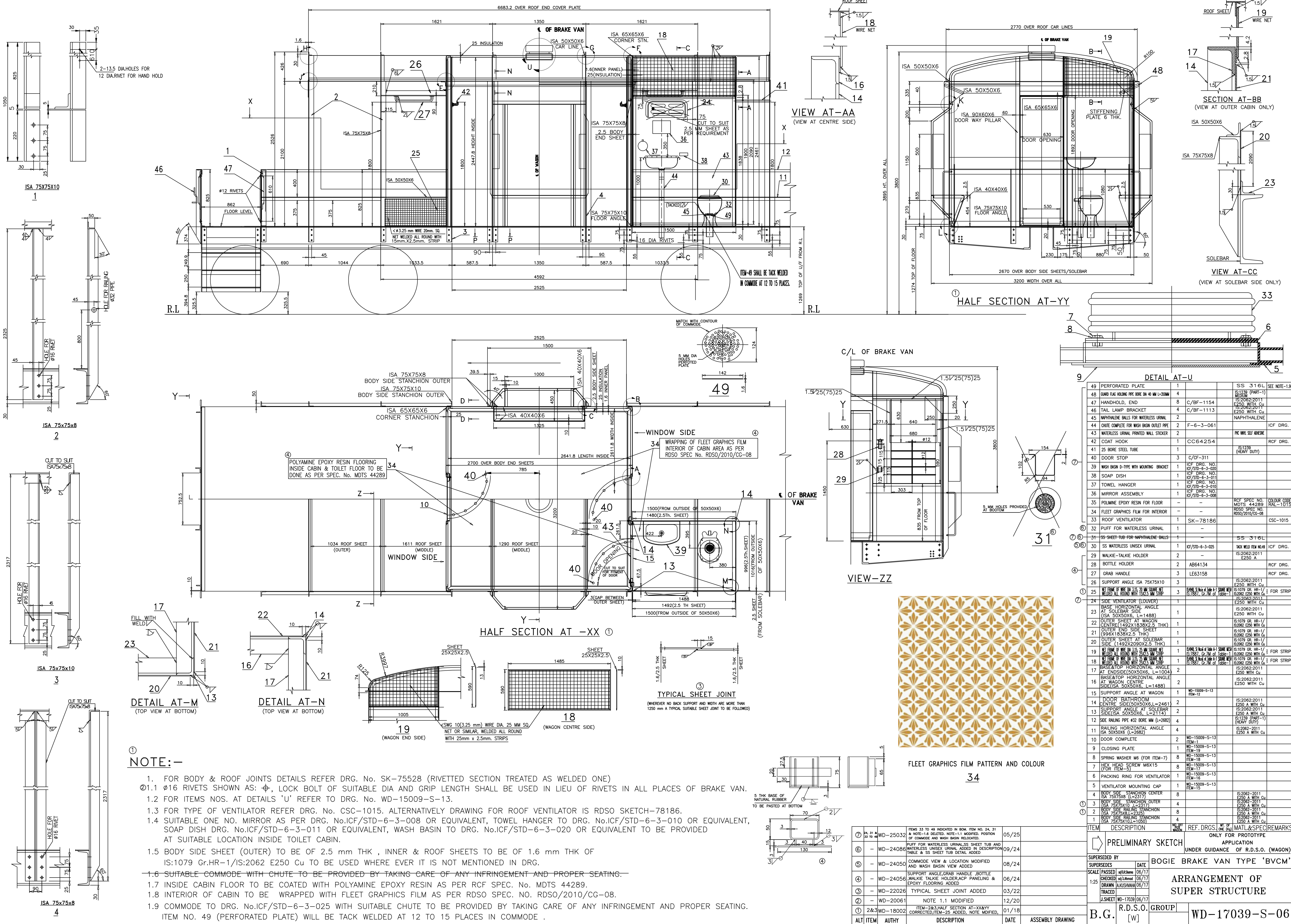
TURN 7±2 ROUNDS AND
HEIGHT ADJUSTMENT 80 MM

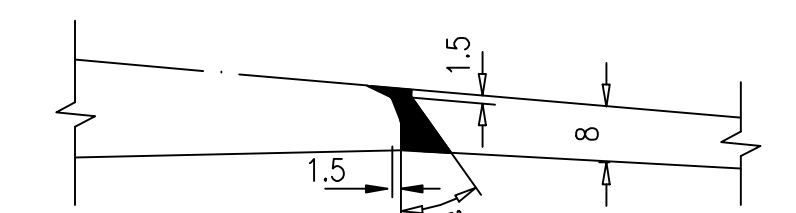
⊗: CRITICAL CHARACTERISTIC

REMARKS: ONLY PROFILE AND CONTROLLING DIMENSIONS ARE SHOWN. ALL DIMENSIONS ARE IN MM.

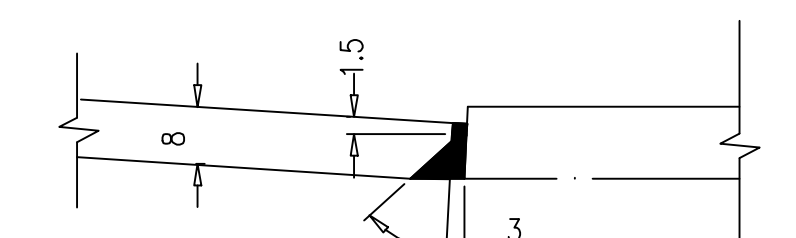
①	WD-25032	OVERALL HEIGHT OF CHAIR DIMENSION 1066 DELETED. THICKNESS OF CUSHION OF SEAT AND BACK REST OF CHAIR ADDED	05/25		
ALT.	ITEM	AUTHY.	DESCRIPTION	DATE	ASSEMBLY DRAWING

7	ARM REST	2	WD-24025-S-1A (SH-2 ft.3)			
6	SEAT WITH BACKREST	1	WD-24025-S-1A (SH-2 ft.2)			
5	HEIGHT ADJUSTMENT KNOB	1	-			
4	LEVER FOR ROTATION	1	-			
3	BEARING PLATE UPPER	1	WD-24025-S-1A (SH-2 ft.1)			
2	BEARING PLATE LOWER	1	-			
1	BASE PLATE (8 THK)	1	-		IS:2062 E250 Gr-A	
ITEM	DESCRIPTION & DIMENSION	NO. OFF PER SEAT	REFERENCE DRG.	Wt. OFF	MTL. & SPEC.	REMARKS
SUPERSEDED BY		GOODS BRAKE VAN TYPE 'BVZC'/'BVZI'/BVCM				
SUPERSEDES						
SCALE	PASSED		GUARD'S SEAT FOR GOODS BRAKE VAN (SHEET- 1 OF 2)			
	CHECKED					
	DRAWN	J.AHMAD 3/24				
	TRACED	— —				
	COMPARED	— —				
	J.S.NO.	WD-24025	3/24			
B.G.		R.D.S.O. [W]	GROUP	WD-24025-S-01		



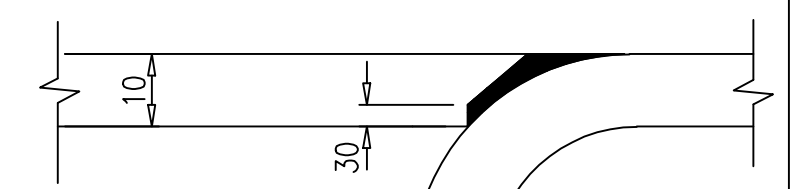


DETAIL-AT 'V'

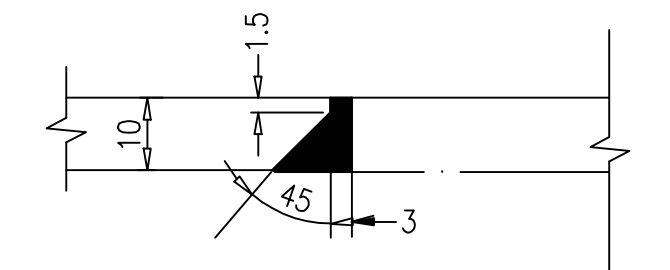


45.4

DETAIL-AT 'X'



DETAIL-AT 'R'

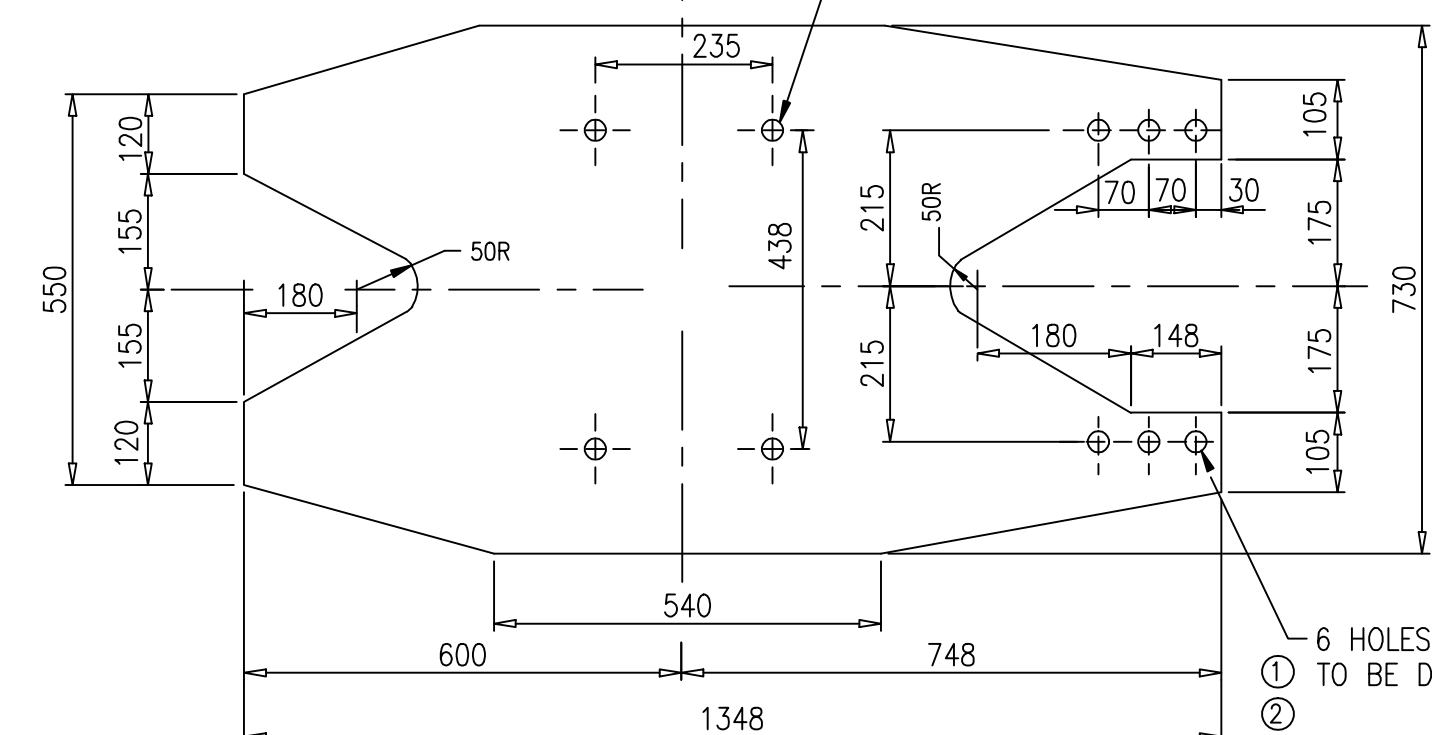


DETAIL-AT 'S'

DETAIL-AT 'N'



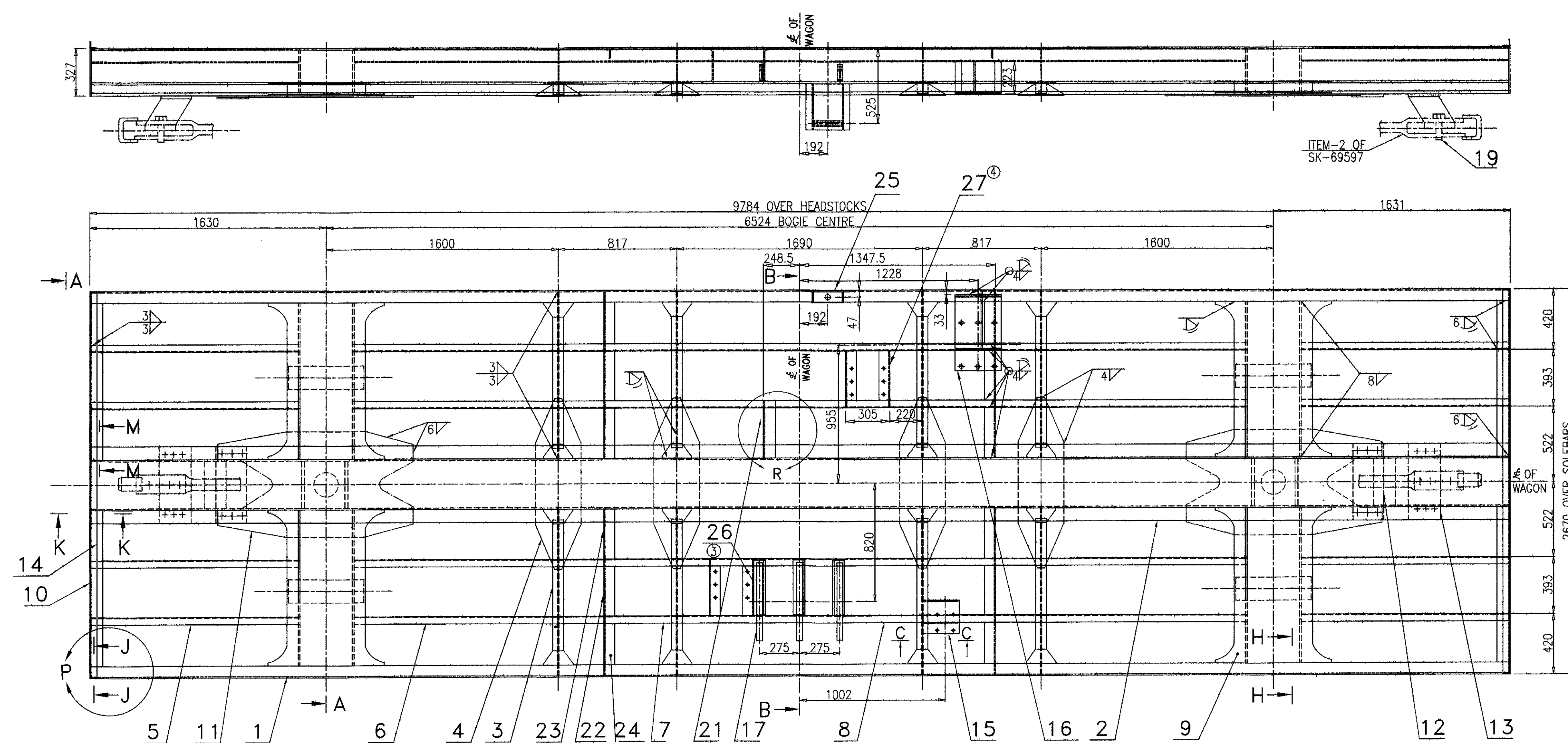
10 (8 THICK) ①



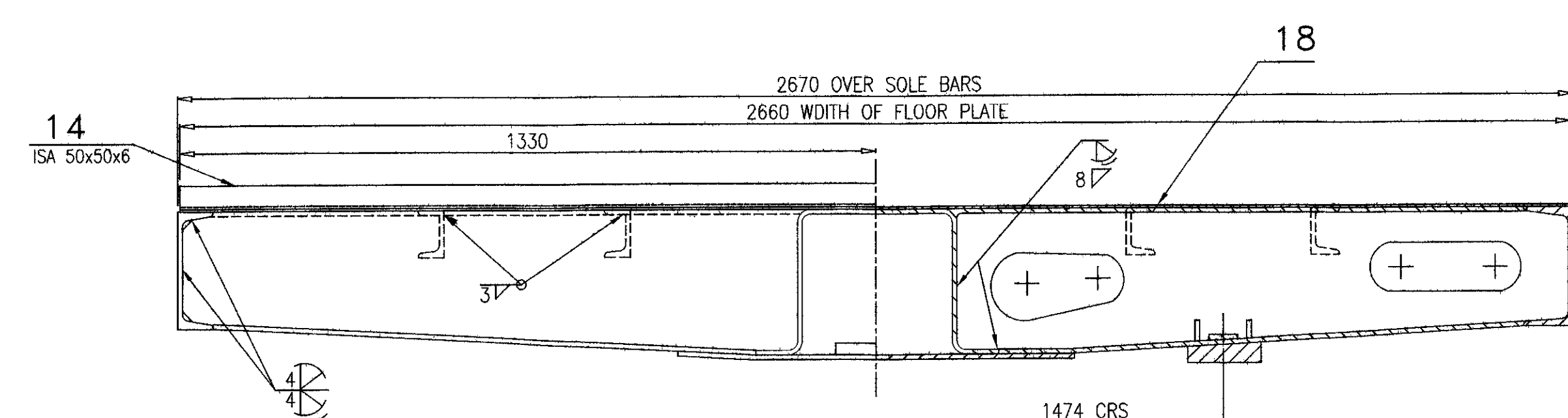
8 (10 THICK)

②	5&10	WD-25032	FITMENT OF ITEM NO.10 IN ITEM NO.5 HAS BEEN SHOWN. DIA OF HOLES OF ITEM NO.8 SHOWN	05/25	
①	5&8	WD-18002	IT.5 DIM CORRECTED, IT.10 ADDED IT.8 BOLTS DELETED	01/18	
ALT	ITEM.	AUTHY	DESCRIPTION	DATE	ASSEMBLY DRGS.

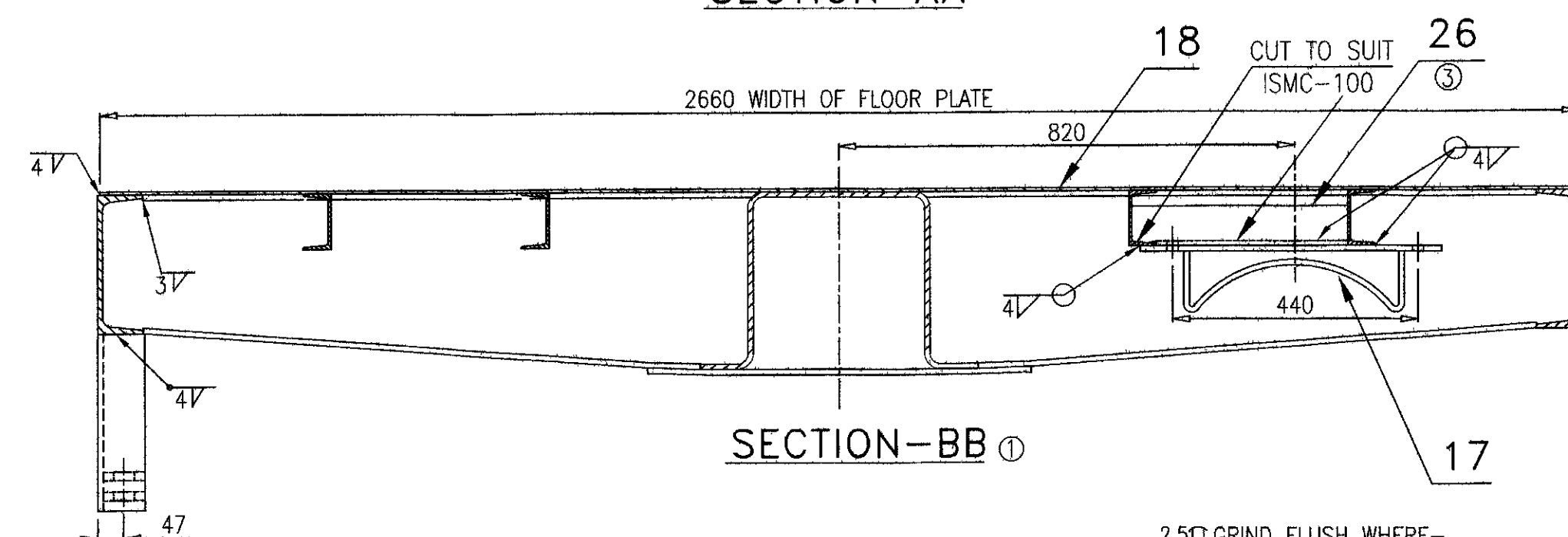
N.	10	BOLSTER WEB STIFFENER	8			IS: 2062:2011 E250 A With Cu		
	9	RETAINING RING	2			IS: 2062:2011 E250 A With Cu		
	8	BOLSTER BOTTOM GUSSET	2			" "		
	7	CROSSBAR BOTTOM GUSSET	4			" "		
	6	CROSSBAR	8			" "		
	5	BOLSTER	4			" "		
	4	STRINGER (CENTRE)	8			" "		
	3	STRINGER (INNER)	8			" "		
	2	STRINGER (OUTER)	4R,4L			" "		
	1	STRINGER (END)	4R,4L			IS: 2062:2011 E250 A With Cu		
ITEM		DESCRIPTION		NO OFF	REF. DRG.	WT OF ONE(Kg)	MATL & SPEC	REMARKS
SUPERSEDED BY			BOGIE BRAKE VAN TYPE 'BVCN'					
SUPERSEDES		DATE						
SCALE		PASSED	sd/G.R.Sharma	06/17	UNDERFRAME DETAILS (SHEET-2)			
1:10	CHECKED	sd/J.Ahmad	06/17					
1:5	DRAWN	J.AHMAD	06/17					
1:1	TRACED							
	J.S.NO.	WD-17039	06/17					
B.G.		R.D.S.O.		GROUP	WD-17039-S-05			
		[W]						



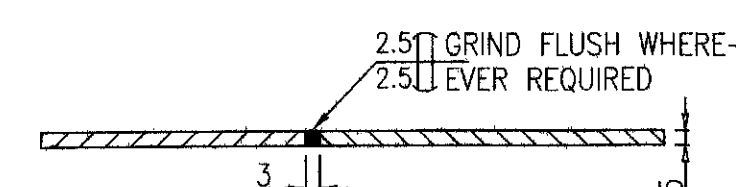
(VIEW SHOWN WITHOUT FLOOR PLATE)



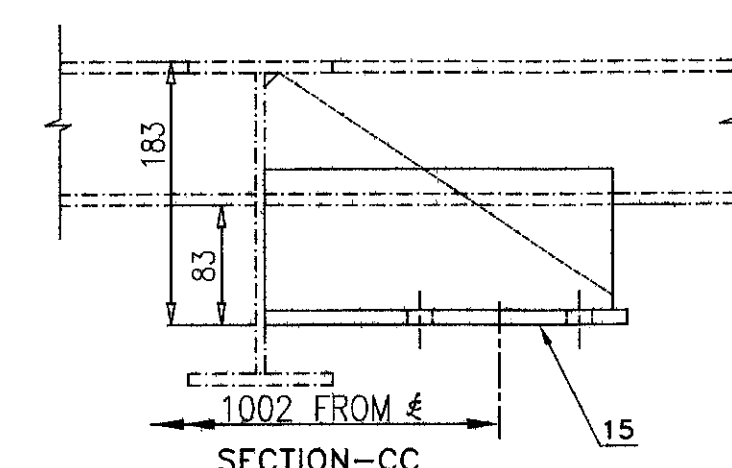
SECTION-AA



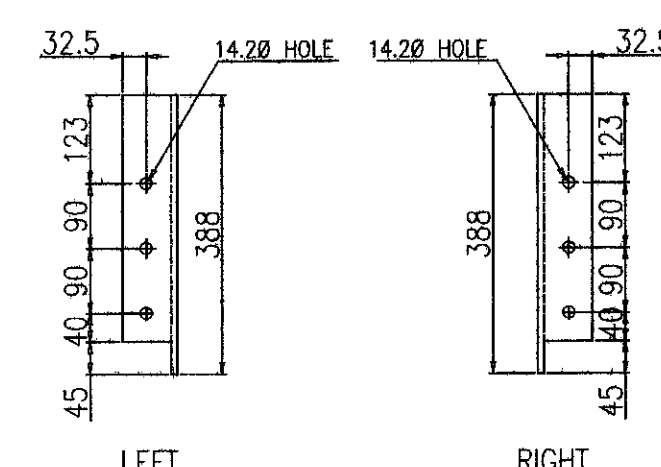
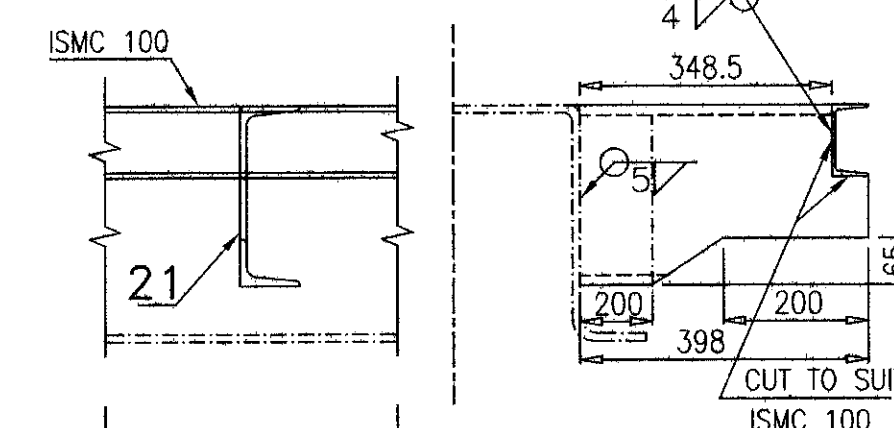
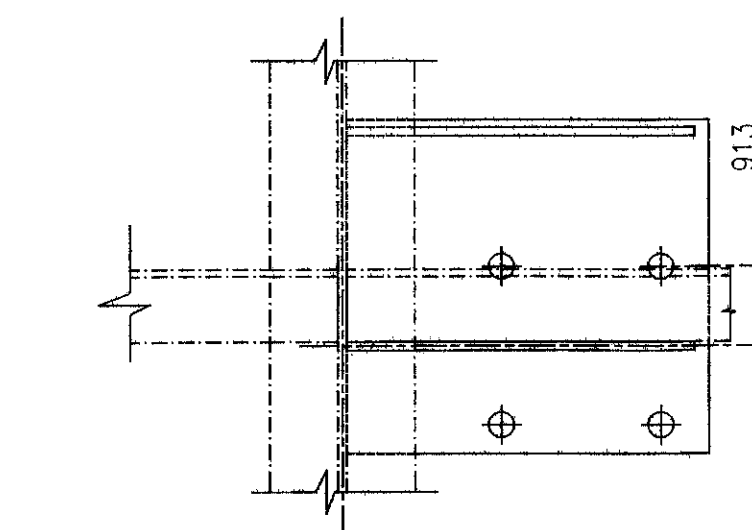
SECTION-BB ①



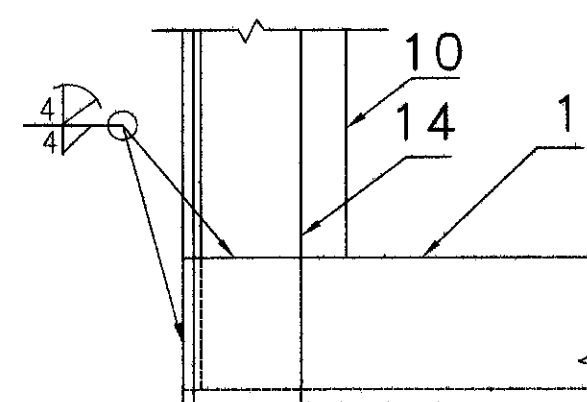
TYPICAL FLOOR PLATE JOINT



SECTION-CC

27^④

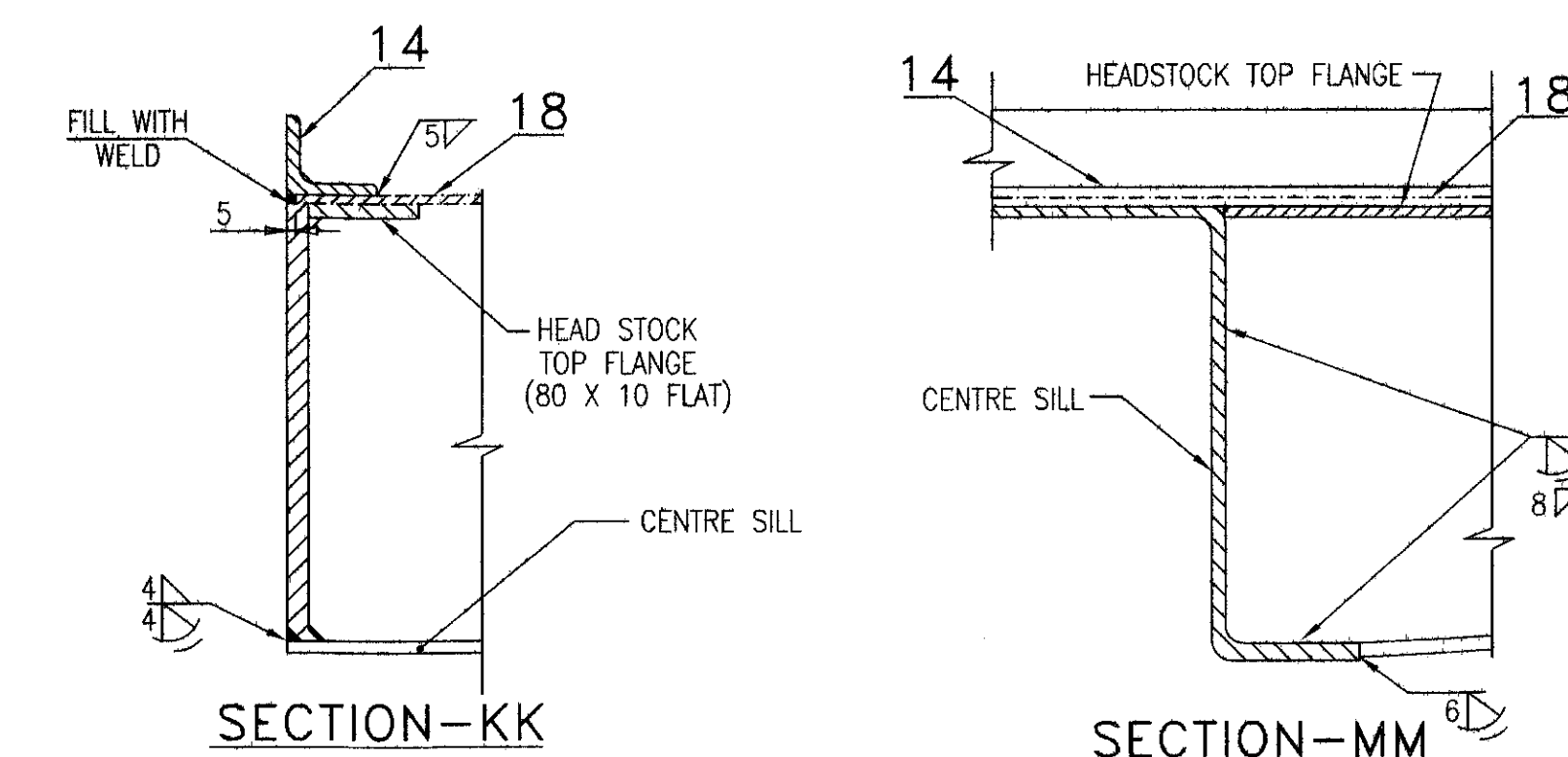
ENLARGE VIEW AT 'R'



ENLARGED DETAIL AT-P

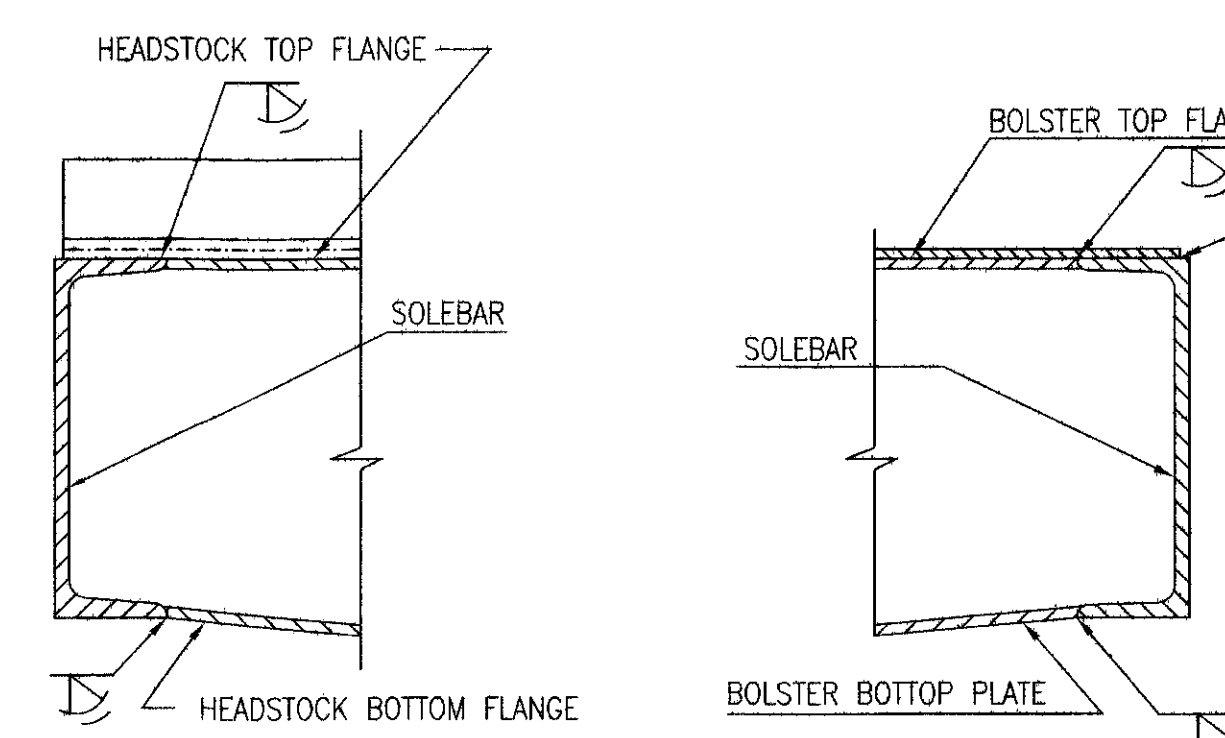
NOTE:-

1. 3mm STAGGERED INTERMITTENT FILLET WELDS 50(200)50 OF FLOOR PLATE WITH UNDERFRAME MEMBERS.
- ⑤ 2. BUILT IN CAMBER IN UNDERFRAME MEASURED FROM HEAD STOCK TO HEAD STOCK 6 ± 2 mm.



SECTION-KK

SECTION-MM



SECTION-JJ

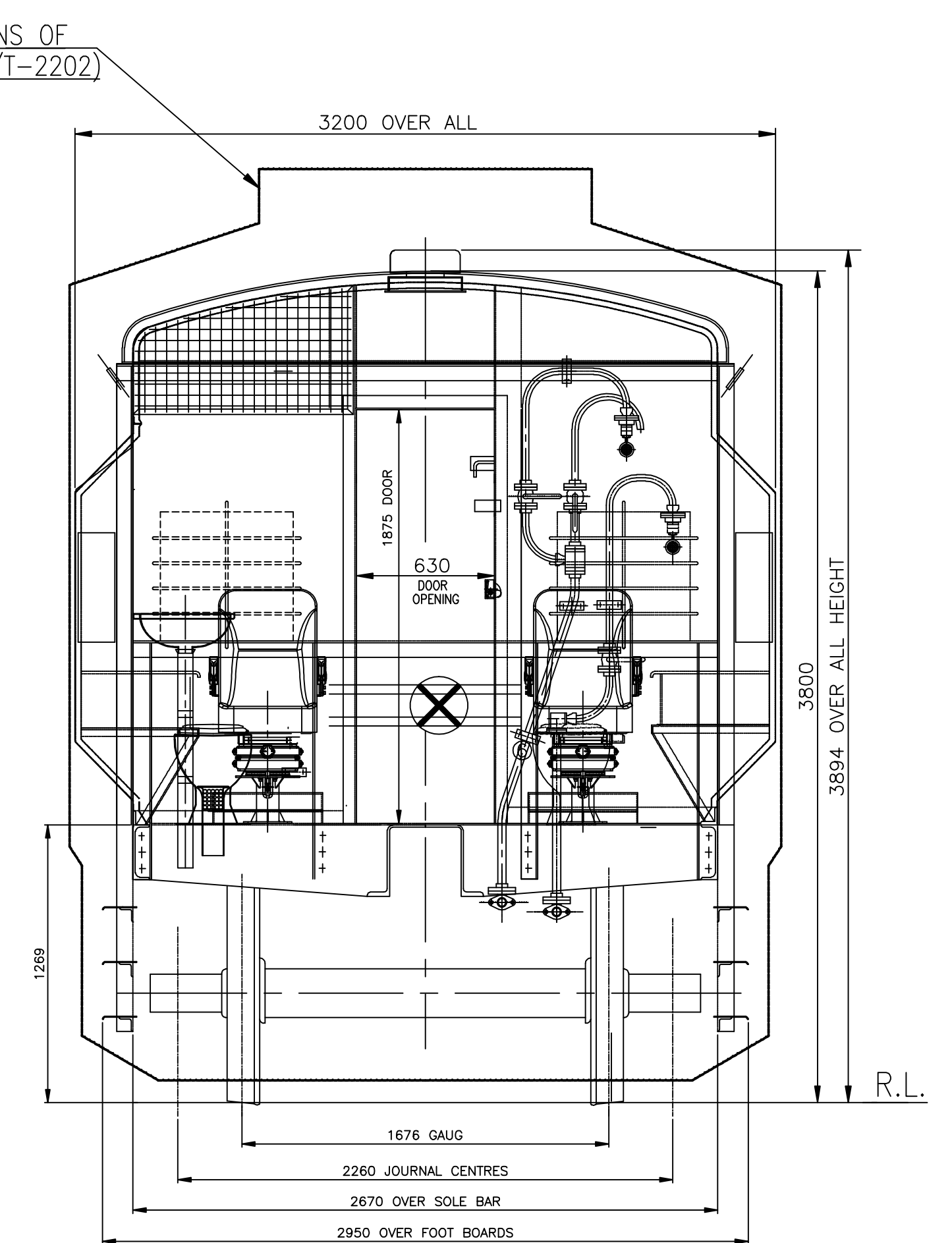
SECTION-HH

④	27	SUPPORTING ANGLE FOR CHAIR (ISA 75X75X8 L=388)	2R2L	—		
	26	SUPPORT ANGLE FOR AR SUPPORT BRACKET (ISA 75X75X8 L=385)	3	WD-15009-S-07 ITEM=3		
	25	HAND BRAKE HORIZONTAL LEVER BKT.	1	WD-15009-S-07 ITEM=4		
	24	SUPPORTING ANGLE(INNER) FOR BODY STRUCTURE(ISA 75X75X10, L=406)	4	—	IS:2062:2011 E250A With Cu	
	23	SUPPORTING ANGLE(MIDDLE) FOR BODY STRUCTURE(ISA 75X75X10, L=348.5)	4	—	IS:2062:2011 E250A With Cu	
	22	SUPPORTING ANGLE FOR BODY STRUCTURE(ISA 75X75X10, L=388)	4	—	IS:2062:2011 E250A With Cu	
	21	SUPPORTING BRACKET FOR HAND BRAKE BELL CRANK BKT(SMC 250,L=398)	1	—	IS:2062:2011 E250A With Cu	
	20	—			—	
	19	APD FOR BOGIE END PULL ROD	2	WD-91030-S-1		
	18	FLOOR PLATE (5 TH.)	1	—	IS:3502 TYPE-1A	
③	17	AUXILIARY RESERVOIR SUPPORTING BRACKET	23	WD-15009-S-07 ITEM-2		—
	16	BRACKET FOR BRAKE CYLINDER	1	WD-15009-S-07 ITEM-1		—
	15	BRACKET FOR DISTRIBUTOR VALVE	1	WD-15006-S-07 ITEM-3		—
	14	END ANGLE	2	WD-15009-S-05 ITEM-4		—
	13	SAFETY PLATE WITH ANCHOR PLATE	2	WD-15009-S-05 ITEM-5		—
	12	YOKE SUPPORT PLATE	2	WD-15009-S-05 ITEM-6		—
	11	BOLSTER BOTTOM GUSSET.	2	WD-17039-S-05 ITEM-8		—
	10	HEADSTOCK (10 THICK)	2R2L	WD-15009-S-05 ITEM-3		—
	9	BOLSTER	4	WD-17039-S-05 ITEM-5		—
	8	STRINGER (CENTER) [SMC 100]	4	WD-17039-S-05 ITEM-4		—
②	7	STRINGER (INNER) [SMC 100]	8	WD-17039-S-05 ITEM-3		—
	6	STRINGER (OUTER) [SMC 100]	4R4L	WD-17039-S-05 ITEM-2		—
	5	STRINGER (END) [SMC 100]	4R4L	WD-17039-S-05 ITEM-1		—
	4	CROSSBAR BOTTOM GUSSET	4	WD-17039-S-05 ITEM-7		—
	3	CROSSBAR	8	WD-17039-S-05 ITEM-6		—
	2	CENTRE SILL (CRF SECTION)	1	WD-15009-S-05 ITEM-2		—
	1	SOLEBAR(SMC 250 WITH 9 WEB)	1R1L	WD-15009-S-05		—

ITEM	DESCRIPTION	NO. OFF.	REF.DRG.	WT.OF ONE [Kg]	MATL.&SPEC	REMARK
	PRELIMINARY SKETCH			ONLY FOR PROTOTYPE APPLICATION UNDER GUIDANCE OF R.D.S.O. (WAGON)		

SUPERSEDED BY		DATE	BOGIE BRAKE VAN TYPE 'BVCN
SUPERSEDES			
SCALE	PASSED	06/17	अन्डरफ्रेम व्यवस्था UNDERFRAME ARRANGEMENT
	CHECKED	06/17	
	DRAWN	06/17	
	TRACED		
J.S.NO.	WD-17039	06/17	

5	WD-24086	NOTE NO 2 ADDED	09/24		
27	WD-24056	SUPPORTING LETTER FOR CHAIR ADDED	06/24		
3-9-81	WD-23096	AR SUPPORTING BKT INCREASED FROM 2 TO 3 & 303 SUPPORT ANGLE FOR AR BKT ADDED	10/23		
3-9-81	WD-18043	REFERENCE DRAWING NO. CORRECTED	05/18		
3-9-81	WD-18002	REF.DRG. IN BOW & SECTION BB CORRECTED	01/18		
ALT	ITEM	AUTHY	DESCRIPTION	DATE	ASSLY.



- | | | | | | |
|-----|------|----------|--|-------|------------------|
| ⑧ | — | WD-25032 | ITEM-1 TO15 INDICATED IN BOM SHOWN. NOTE NO.3 MODIFIED.
INTERIOR FITTING DROPS NO. SHIFTED TO CONCERNED DRAWINGS. | 05/25 | |
| ⑦ | — | WD-24086 | REFERENCE DRAWING NO. OF CHUTE COMPLETE FOR WASH
BASIN OUTLET PIPE ADDED. | 09/24 | |
| ⑥ | — | WD-24050 | CHAR,CAMMODE REFERENCE DRAWING MODIFIED.UNIVERSAL LOCK
REF. ADDED & VIEW MODIFIED.VIEW OF WASH BASIN ADDED. | 08/24 | |
| ⑤ | — | WD-24056 | CHAR,HANDHOLD,COAT HOOK CHANGED AND FOOTREST ADDED | 06/24 | |
| ④ | — | WD-20061 | NOTE- 3 ADDED | 12/20 | |
| ③ | — | WD-18038 | NOTE- 1.1, 1.2 &1.3 MODIFIED | 05/18 | |
| ② | — | WD-17060 | NOTE 1.2 MODIFIED | 10/17 | |
| ① | — | WD-17059 | NOTE 1.2 MODIFIED | 10/17 | |
| ALT | ITEM | AUTHY | DESCRIPTION | DATE | ASSEMBLY DRAWING |

15	SOLAR SYSTEM WITH LIGHT AND FAN		WD-24050-S-07			
14	ARRGT. OF HIGH TENSILE CENTRE BUFFER COUPLER	1	WD-81010-S-03			
13	CENTRE PIVOT AND SIDE BEARER ARRG.	2	WD-14027-S-01			
12	DETAILS OF PIPES FOR FITMENT OF AIR BRAKE EQUIPMENT	2	WD-15009-S-15			
11	FITMENT OF AIR BRAKE EQUIPMENTS AND PIPE LAYOUT	1 SET	WD-15009-S-14			
10	BODY DETAILS AND FITTING	1	WD-15009-S-13			
9	MARKING DIAGRAM	1	WD-15009-S-12			
8	UNDER FRAME BRAKE GEAR ARRG.	1	WD-15009-S-11			
7	BRAKE DIAGRAM	1	WD-09107-S-08			
6	ARRANGE OF FOOT STEPS AND DETAILS	4	WD-15009-S-10			
5	UNCOUPLING GEAR ARRG	2	WD-15009-S-09			
4	ARRANGEMENT OF SUPER STRUCTURE	1	WD-17039-S-06			
3	UNDER FRAME DETAILS (SHEET-2)	2	WD-15009-S-05			
2	UNDER FRAME ARRANGEMENT	1	WD-17039-S-04			
1	BOGIE GENERAL ARRANGEMENT	2	WD-17013-S-02		WD-17013-S-01 INDEX (BOGIE)	
ITEM	DESCRIPTION	NO. OF PIPS WAGON	REF. DRGS.	WT. OF ONE (Kg)	MATL.&SPEC.	REMARKS
 PRELIMINARY SKETCH			ONLY FOR PROTOTYPE APPLICATION UNDER GUIDANCE OF R.D.S.O. (WAGON)			
SUPERSEDED BY SUPERSEDES DATE SCALE PASSED Sd/G.R.Sharma 06/17 1:1 CHECKED Sd/JAHMAD 06/17 DRAWN J.AHMAD 06/17 TRACED J.SHEET WD-17039 06/17			BOGIE BRAKE VAN TYPE 'BVCM' GENERAL ARRANGEMENT			
B.G. R.D.S.O. GROUP [W]			WD-17039-S-03			

WX-17003

DRG. NO.	DESCRIPTION
WD-17013-S/1	INDEX
WD-17013-S/2	BOGIE GENERAL ARRANGEMENT WITH SPRING LOADED SIDE BEARER
WD-89067-S/3	CAST STEEL SIDE FRAME
WD-17013-S/3	BOGIE DETAILS
WD-89067-S/5	BOGIE BRAKE GEAR ARRANGEMENT
WD-89033-S/1	BRAKE BEAM
SK-69597	BOGIE BRAKE GEAR DETAIL
WD-92058-S/5	SPRING DETAILS
SK-77579	WEDGE
WD-92058-S/7	LEADING DIMENSIONS AND TOLERANCES
WD-85054-S/7	ASSEMBLY PROCEDURE
WD-17013-S/4	CAST STEEL BOLSTER
WD-89025-S/1	WHEEL & AXLE
STR. No. AB/RB-39-2002(REV. 2)	STD.A.A.R.CLASS 'E' CARTRIDGE R.B. ASSEMBLY
WD-17013-S/3 (ITEM-2)	SIDE FRAME KEY
WD-89067-S/9	NARROW JAW ADAPTER
WD-17013-S/3 (ITEM-4)	KEY BOLT,NUT,SPRING WASHER & SPLIT PIN
WD-95005-S/1	MODIFIED ELASTOMERIC PAD
WD-85079-S/2	CENTRE PIVOT ASSEMBLY & DETAILS
WD-12008-S/1	SPRING LOADED SIDE BEARER
WD-14027-S/1	CENTRE PIVOT & SIDE BEARER ARRANGEMENT
WD-89006-S/1	B.G.,M.G. & N.G. COIL SPRING DRAWING CODE
WD-86038-S/1	MARKING SCHEME OF SIDE FRAMES AND BOLSTERS

ALT.	ITEM	AUTHY.	DESCRIPTION	DATE	ASSEMBLY DRAWING
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SUPERSEDED BY			
SUPERSEDES	DATE		
SCALE	PASSED	DATE	
CHECKED	DATE	DATE	
DRAWN	DATE	DATE	
TRACED	DATE	DATE	
J.SHEET	WD-17013	2/17	

MODIFIED CASNUB 22HS BOGIE FOR BVCM

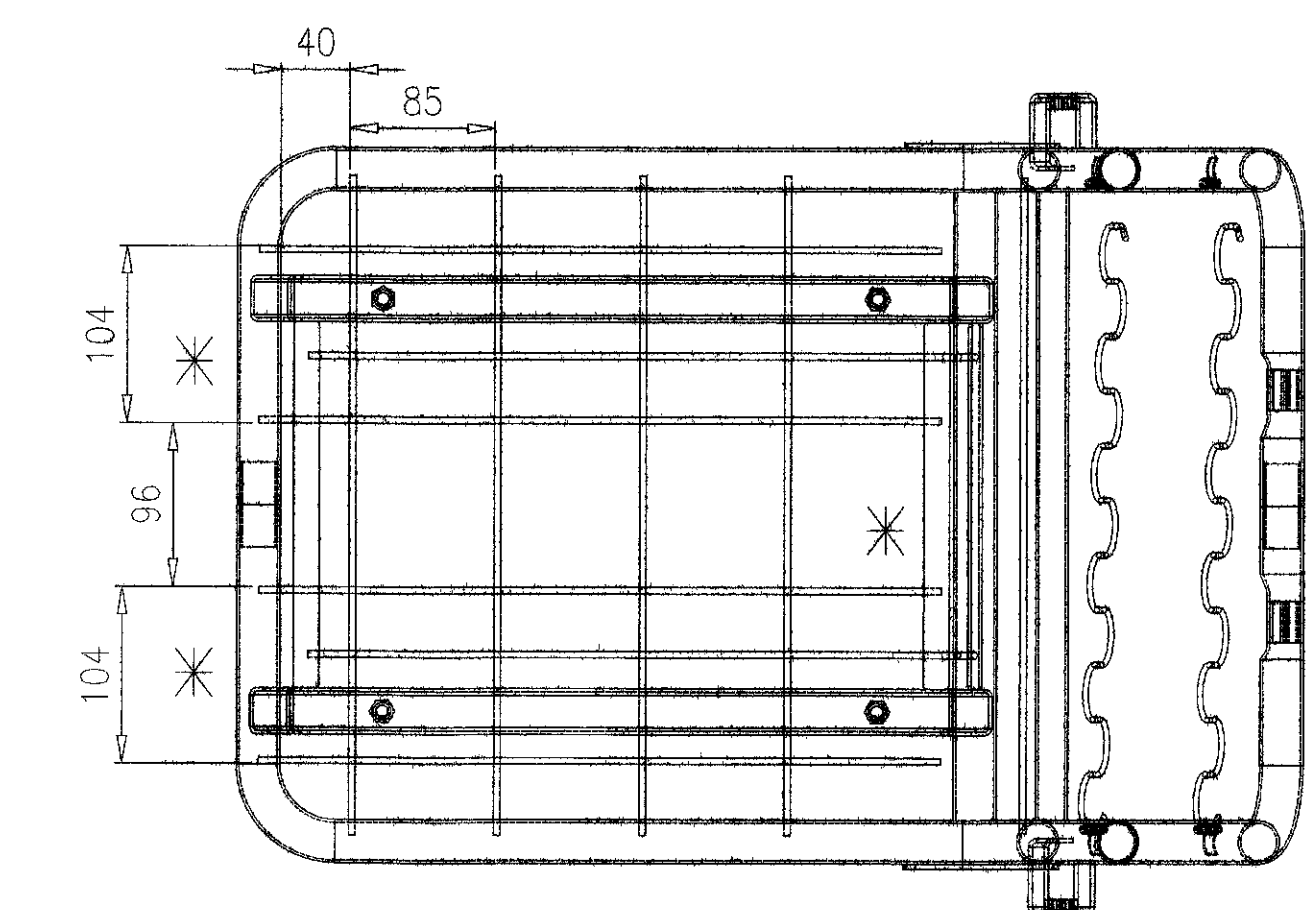
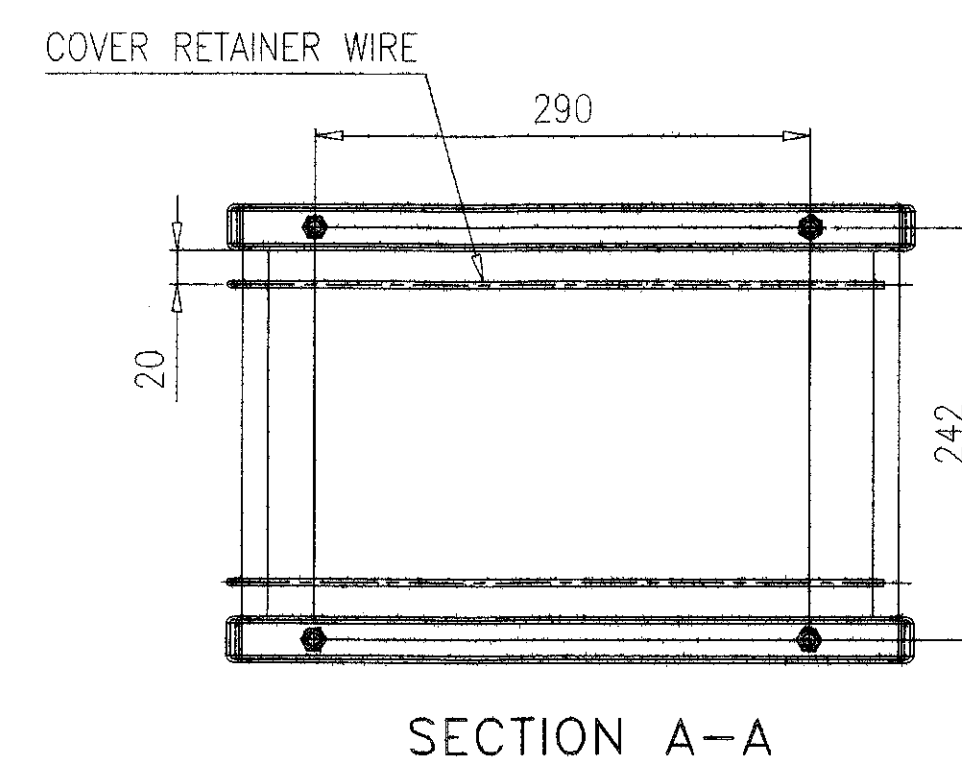
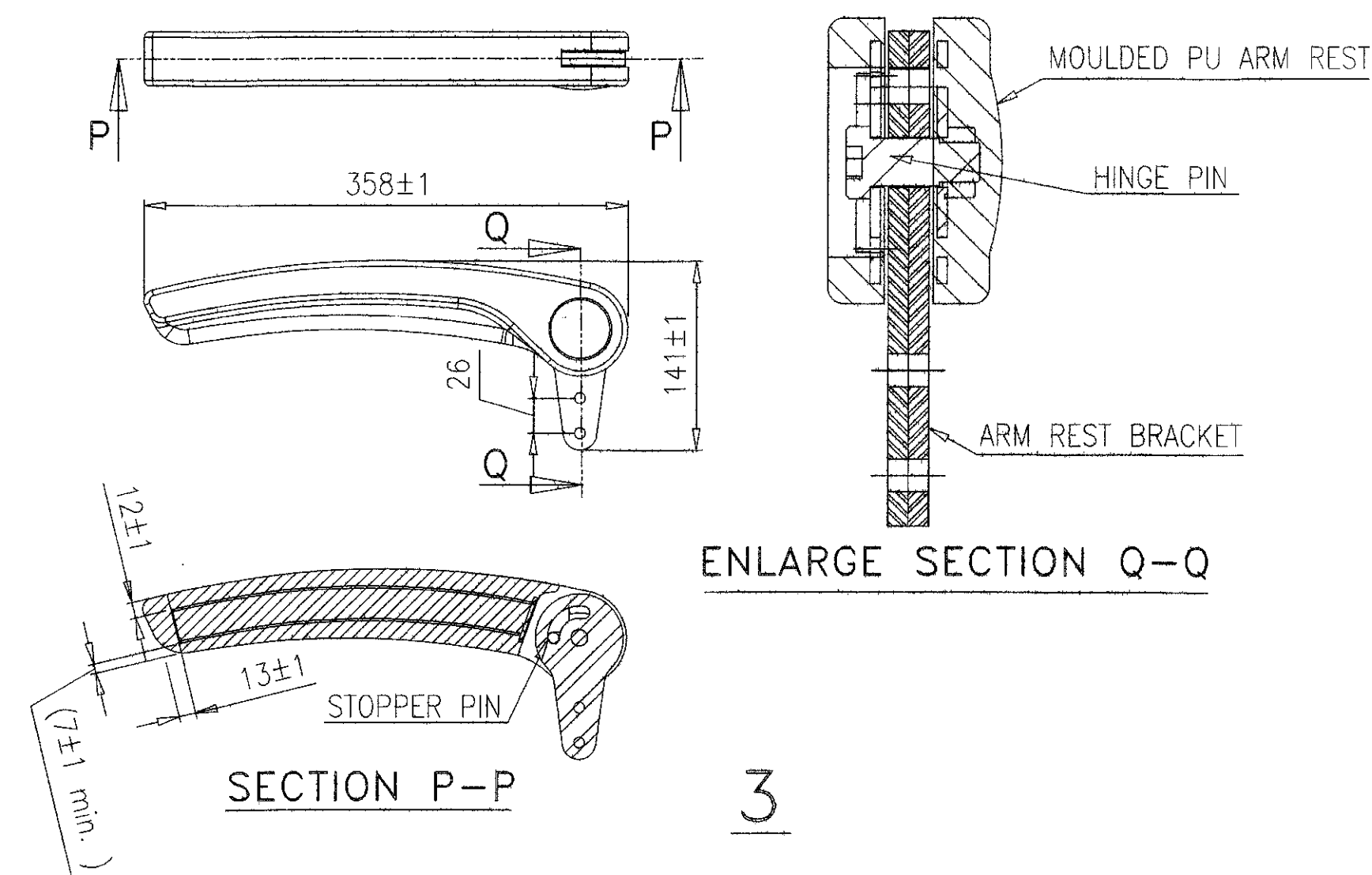
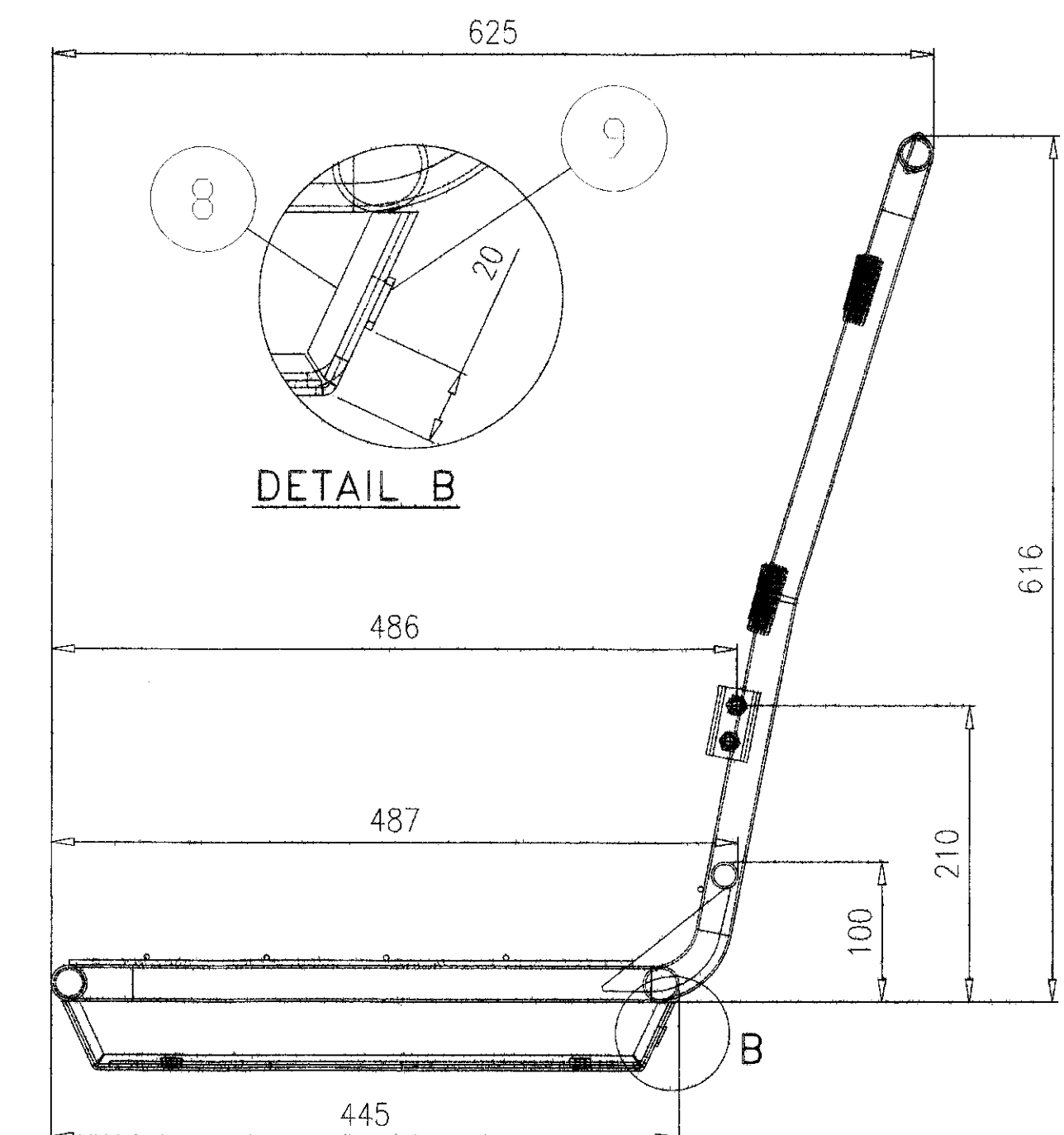
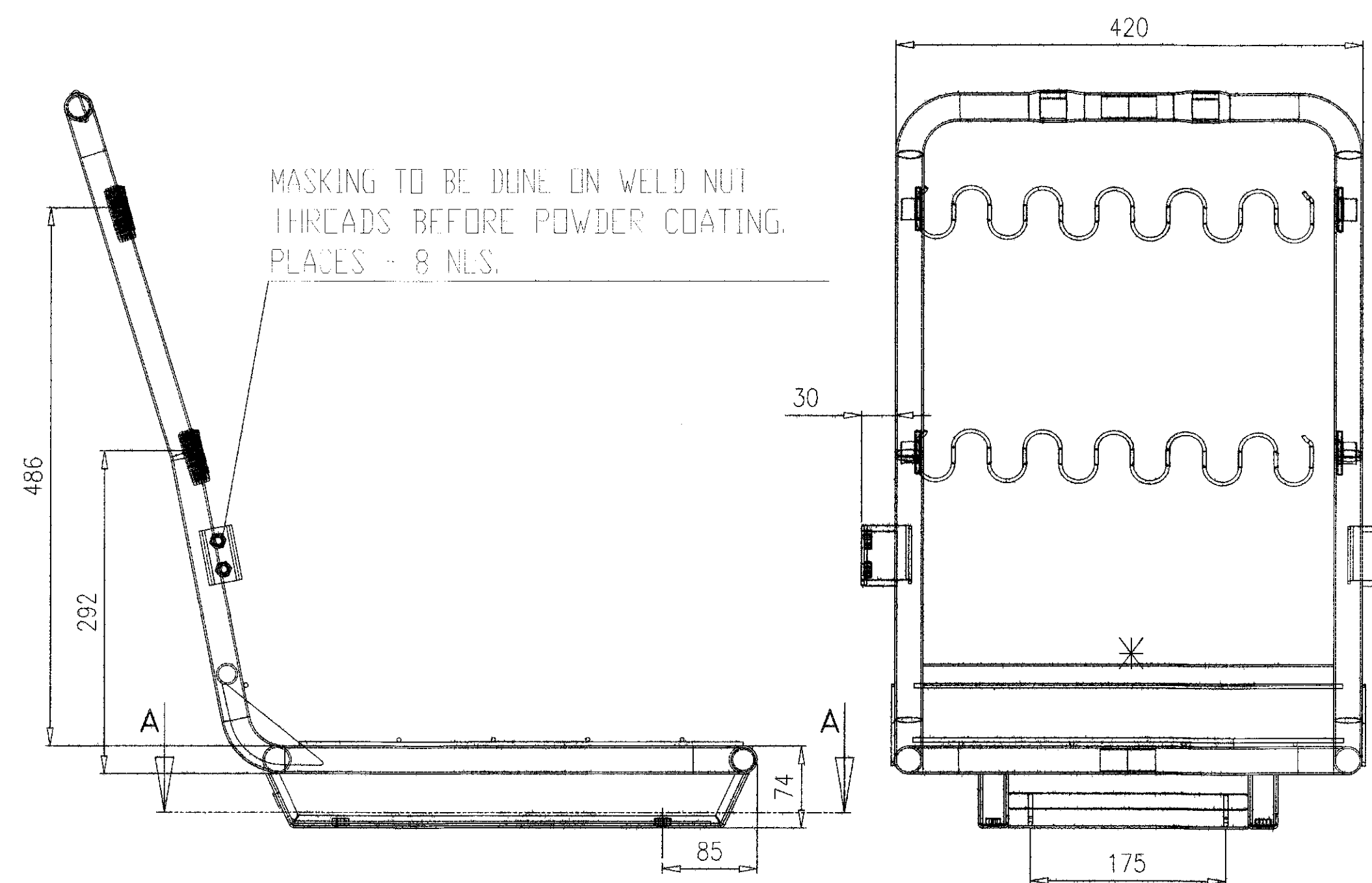
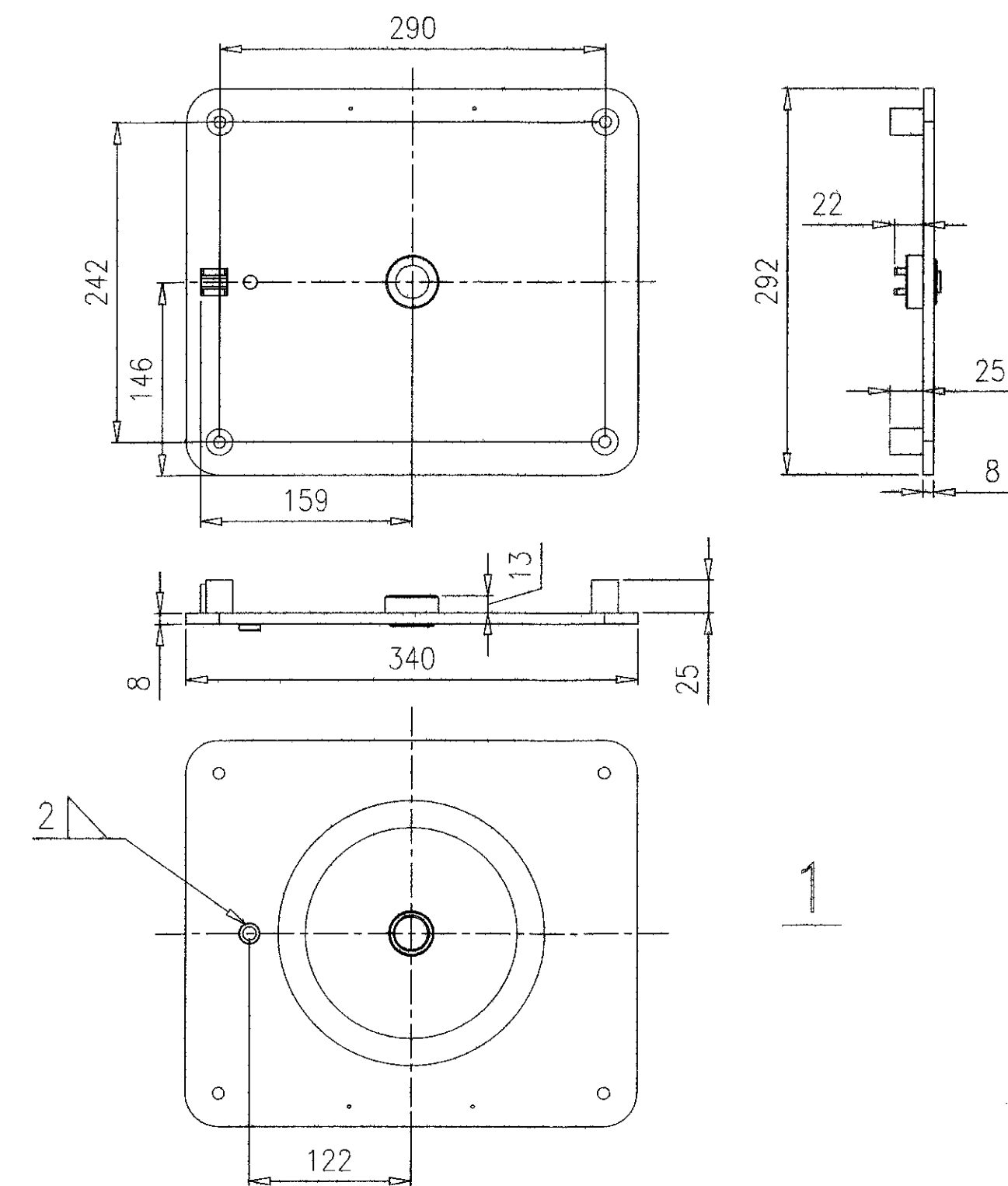
INDEX

B.G.	R.D.S.O.	GROUP
[W]		

WD-17013-S/1

POWDER COATING DETAILS:
COLOUR : RAL 9005 (Matt black)
THICKNESS : 60 – 100 μm
GLOSS : 30 ± 15 GU AT 60°

TOLERANCE TO BE FOLLOWED AS PER IS: 2102 C COARSE CLASS

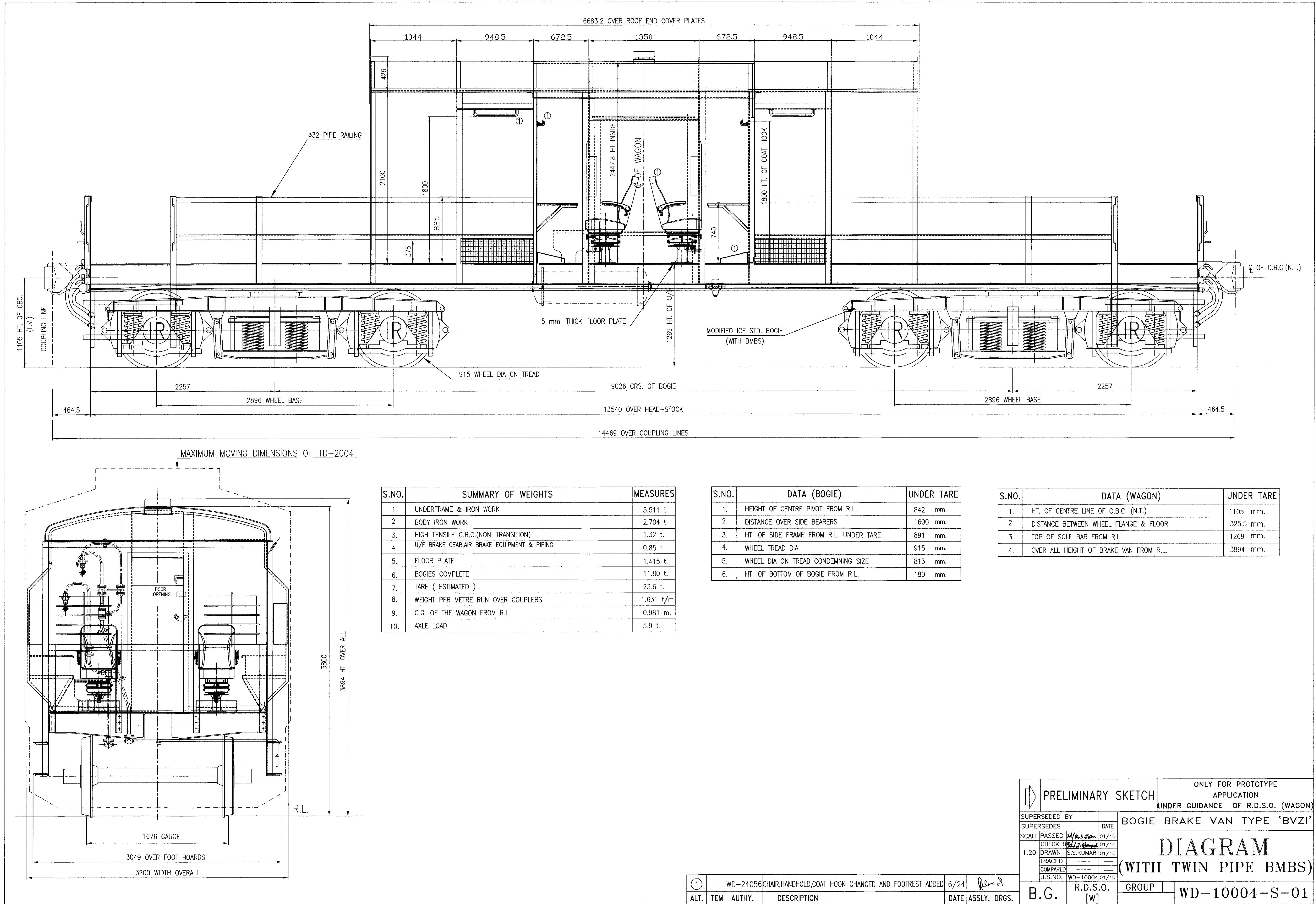


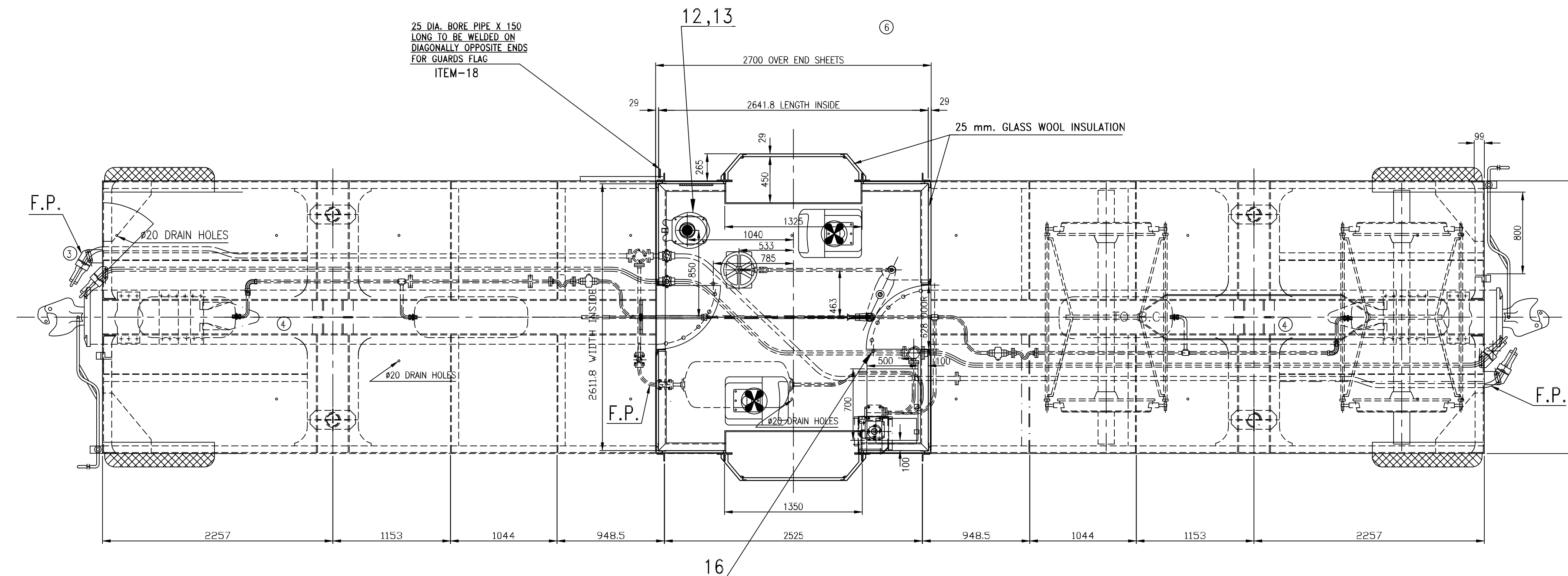
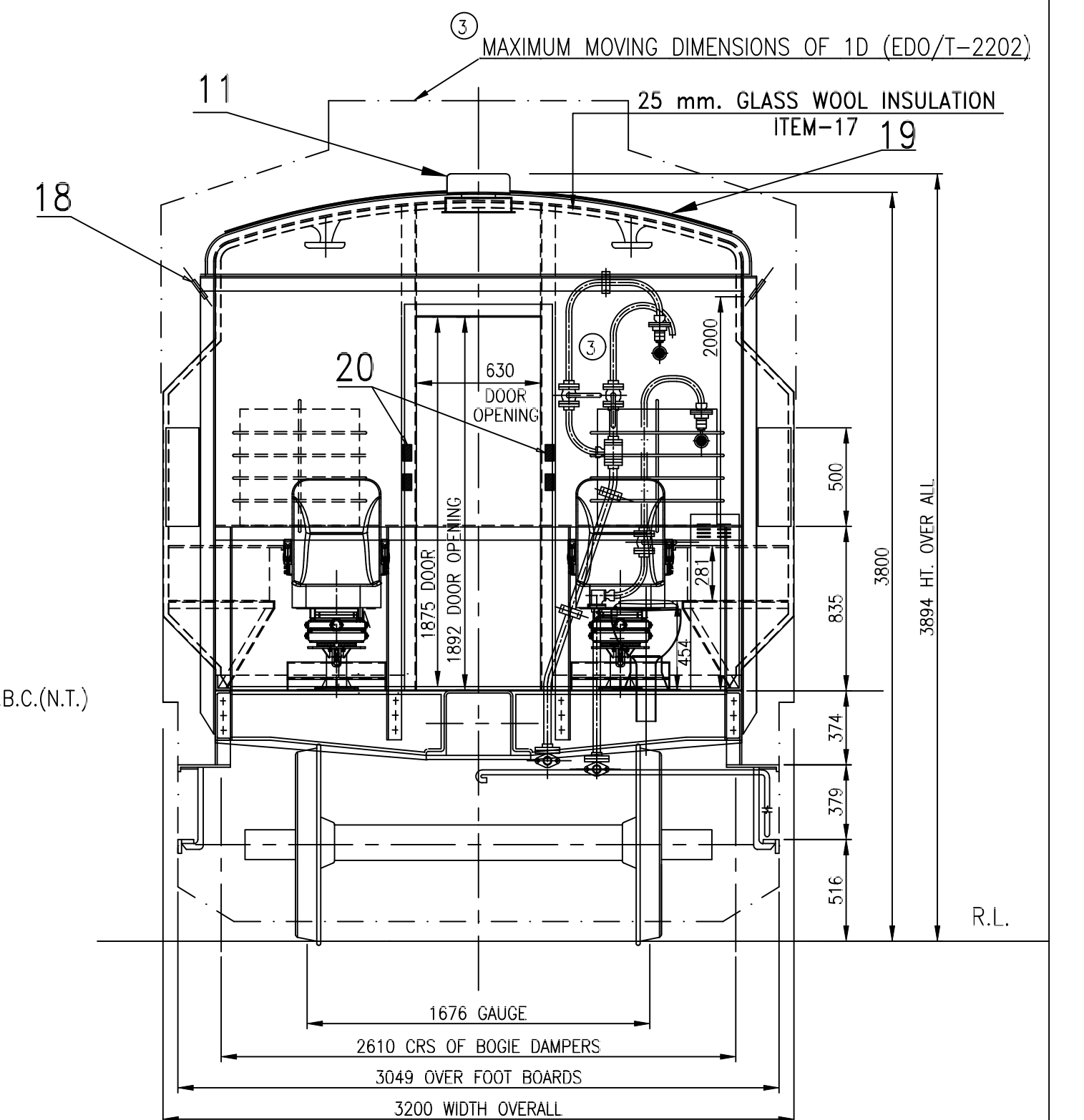
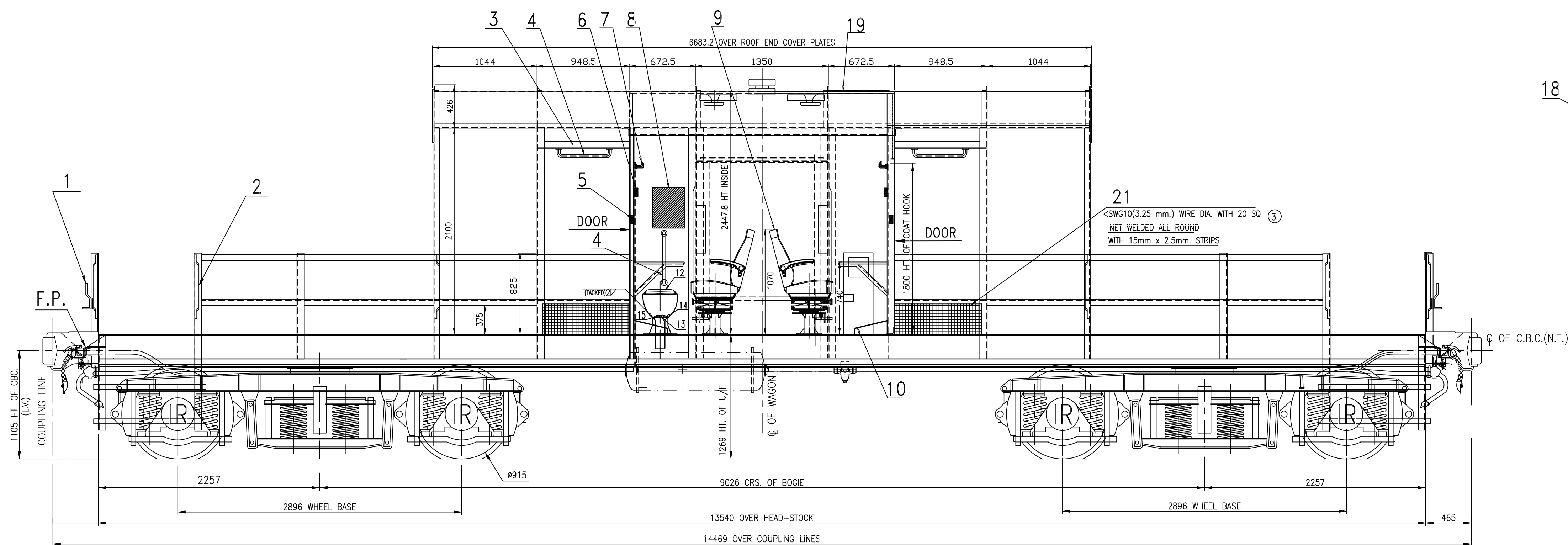
REMARKS: ONLY PROFILE & CONTROLLING DIMENSIONS ARE SHOWN. ALL DIMENSIONS ARE IN MM.

3	ARM REST	2				
2	SEAT WITH BACKREST	1				
1	BEARING PLATE UPPER	1				
ITEM	DESCRIPTION & DIMENSION	NO. OFF PER SEAT	REFERENCE DRG.	Wt. OFF	MTL. & SPEC	REMARKS
SUPERSEDED BY			GOODS BRAKE VAN TYPE 'BVZC'/'BVZI'/BVCM			
SUPERSEDES		DATE				
SCALE	PASSED	08/24	GUARD'S SEAT FOR GOODS BRAKE VAN (SHEET- 2 OF 2)			
	CHECKED	08/24				
	DRAWN	J.AHMAD 3/24				
	TRACED	— —				
	COMPARED	— —				
	J.S.NO.	WD-24025 3/24				
B.G.	R.D.S.O. [W]	GROUP		WD-24025-S-01		

ALT.	ITEM	AUTHY.	DESCRIPTION	DATE
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DESIGN-‘A’			DESIGN-‘B’			DESIGN-‘C’		
SINGLE PIPE ARRANGEMENT WITH CONVENTIONAL BRAKE SYSTEM			SINGLE PIPE ARRANGEMENT WITH BMBS			TWIN PIPE ARRANGEMENT WITH BMBS		
DRG. NO.	DESCRIPTION		DRG. NO.	DESCRIPTION		DRG. NO.	DESCRIPTION	
WD-00039-S-01	INDEX		WD-00039-S-01	INDEX		WD-00039-S-01	INDEX	
WD-00039-S-02	DIAGRAM		WD-00039-S-02	DIAGRAM		WD-10004-S-01	DIAGRAM	
WD-00039-S-03	GENERAL ARRANGEMENT		WD-00039-S-03	GENERAL ARRANGEMENT		WD-00039-S-03	GENERAL ARRANGEMENT	
WD-00039-S-04	UNDERFRAME ARRANGEMENT		WD-00039-S-04	UNDERFRAME ARRANGEMENT		WD-00039-S-04	UNDERFRAME ARRANGEMENT	
WD-00039-S-05	UNDERFRAME DETAILS		WD-00039-S-05	UNDERFRAME DETAILS		WD-00039-S-05	UNDERFRAME DETAILS	
WD-00039-S-06	CENTRE PIVOT & SIDE BEARER ARRANGEMENT		WD-00039-S-06	CENTRE PIVOT & SIDE BEARER ARRANGEMENT		WD-00039-S-06	CENTRE PIVOT & SIDE BEARER ARRANGEMENT	
WD-00039-S-07	BRAKE GEAR ARRANGEMENT		WD-81035-S-16	ARRANGEMENT OF PRESURE GAUGE FOR BRAKE PIPE		WD-81035-S-16	ARRANGEMENT OF PRESURE GAUGE FOR BRAKE PIPE	
WD-00039-S-08	BRAKE GEAR DETAILS		WD-81035-S-17	UNCOUPLING GEAR ARRANGEMENT ON GAURD ARM SIDE		WD-81035-S-17	UNCOUPLING GEAR ARRANGEMENT ON GAURD ARM SIDE	
WD-00039-S-09	BRAKE DIAGRAM		WD-81035-S-19	ARRANGEMENT OF FOOT STEPS AND DETAILS		WD-81035-S-19	ARRANGEMENT OF FOOT STEPS AND DETAILS (SHEET-2) ②	
WD-00039-S-10	BRAKE EQUIPMENT & PIPE LAYOUT		WD-01064-S-01	ARRANGEMENT FOR REFLECTOR INDICATOR BOARD		WD-01064-S-01	ARRANGEMENT FOR REFLECTOR INDICATOR BOARD	
WD-00039-S-11	MODIFICATION IN ICF BOGIE FOR USE ON BRAKE VANS		WD-04050-S-01	MARKING DIAGRAM		WD-04050-S-01	MARKING DIAGRAM	
WD-81035-S-11	ANTI PILFERAGE DEVICE FOR BRAKE GEAR COMPONENTS		WD-04050-S-02	MODIFICATION IN ICF BOGIE FOR USE ON BRAKE VANS		WD-04050-S-02	MODIFICATION IN ICF BOGIE FOR USE ON BRAKE VANS	
WD-81035-S-16	ARRANGEMENT OF PRESURE GAUGE FOR BRAKE PIPE		WD-04050-S-03	HAND BRAKE GEAR ARRANGEMENT		WD-04050-S-03	HAND BRAKE GEAR ARRANGEMENT	
WD-81035-S-17	UNCOUPLING GEAR ARRANGEMENT ON GAURD ARM SIDE		WD-04050-S-04	HAND BRAKE GEAR DETAILS		WD-04050-S-04	HAND BRAKE GEAR DETAILS	
WD-81035-S-18	MARKING DIAGRAM		WD-04050-S-05	BRAKE DIAGRAM		WD-04050-S-05	BRAKE DIAGRAM	
WD-81035-S-19	ARRANGEMENT OF FOOT STEPS AND DETAILS		WD-04050-S-06	FITMENT OF AIR BRAKE EQUIPMENT AND PIPE LAYOUT		WD-10004-S-02	FITMENT OF AIR BRAKE EQUIPMENT AND TWIN PIPE LAYOUT	
WD-81035-S-21	FITMENT OF GRADUATED RELEASE AIR BRAKE EQUIPMENT & TWIN PIPE LAYOUT		WD-04050-S-07	DETAILS OF PIPE FOR FITMENT OF AIR BRAKE EQUIPMENT		WD-10004-S-03	DETAIL OF PIPES FOR FITMENT OF TWIN PIPE AIR BRAKE EQUIPMENT	
WD-81035-S-22	DETAILS OF PIPE CLAMPS AND PACKINGS		WD-04050-S-08	DETAILS OF FITMENT OF AIR BRAKE EQUIPMENT		WD-10004-S-04	DETAILS OF FITMENT OF TWIN PIPE AIR BRAKE EQUIPMENT	
WD-81035-S-23	DETAILS OF PIPES FOR FITMENT OF GRADUATED RELEASE AIR BRAKE EQUIPMENT	T-0-0-801 (ICF DRG.)	BOGIE GENERAL ARRANGEMENT		T-0-0-801 (ICF DRG.)	BOGIE GENERAL ARRANGEMENT		
		SK-63720	PRO/PR STENCIL		SK-63720	PRO/PR STENCIL		
WD-81094-S-04	ADDITIONAL MARKING FOR BRAKE VAN FITTED WITH AIR BRAKES		SK-66511	RAILWAYS INITIALS IN HINDI		SK-66511	RAILWAYS INITIALS IN HINDI	
WD-01064-S-01	ARRANGEMENT FOR REFLECTOR INDICATOR BOARD		SK-73552	AIR BRAKE HOSE COUPLING SUPPORT VENTILATOR		SK-73552	AIR BRAKE HOSE COUPLING SUPPORT VENTILATOR	
SK-63720	PRO/PR STENCIL		SK-75524	ARRANGEMENT OF SUPPER STRUCTURE		SK-75524	ARRANGEMENT OF SUPPER STRUCTURE	
SK-66511	RAILWAYS INITIALS IN HINDI		SK-75527	BODY DETAILS AND FITTINGS		SK-75527	BODY DETAILS AND FITTINGS	
SK-73552	AIR BRAKE HOSE COUPLING SUPPORT VENTILATOR		SK-75528	BODY AND ROOF JOINT DETAILS		SK-75528	BODY AND ROOF JOINT DETAILS	
SK-74540	DETAILS OF MODIFICATIONS TO BRAKE ARRANGEMENT FOR FITMENT OF AIR BRAKE		SK-75535	FIXING ARRANGEMENT AND DETAILS OF LV BOARD		SK-75535	FIXING ARRANGEMENT AND DETAILS OF LV BOARD	
SK-75524	ARRANGEMENT OF SUPPER STRUCTURE		CSC-1015	VENTILATOR		CSC-1015	VENTILATOR	
SK-75527	BODY DETAILS AND FITTINGS		WD-81010-S-03	ARRANGEMENT OF HIGH TENSILE CENTRE BUFFER COUPLER		WD-81010-S-03	ARRANGEMENT OF HIGH TENSILE CENTRE BUFFER COUPLER	
SK-75528	BODY AND ROOF JOINT DETAILS					⑥ WD-14031-S-01	SPLICE JOINTS FOR SOLE BAR & CENTER SILL	
SK-75535	FIXING ARRANGEMENT AND DETAILS OF LV BOARD					⑧ WD-16056-S-01	DETAILS OF CRF CENTER SILL AND ASSOCIATED JOINTS	
CSC-1015	VENTILATOR							
WD-81010-S-03	ARRANGEMENT OF HIGH TENSILE CENTRE BUFFER COUPLER		➤ PRELIMINARY SKETCH ONLY FOR PROTOTYPE APPLICATION UNDER GUIDANCE OF R.D.S.O. (WAGON) ⑧ — WD-16056 NEW DRG. ADDED IN DESIGN'C' 09/16 ⑦ — WD-15047 DRG. REVISED IN DESIGN'C' CORRECTING WD-81035-S-19 (SHEET-2) 08/15 ⑥ — WD-14031 DRG. REVISED BY ADDING IN DESIGN'C' ONE MORE DRG. FOR SPLICE JOINT 11/14 ⑤ — WD-11020 DRAWING REVISED FOR ADDING ALL TYPE BVZI WAGON 03/11 ④ — WD-10004 DRAWING ADDED FOR TWIN PIPE ARRANGEMENT 01/10 ③ — WD-04050 DRAWING REVISED & REDRAWN 11/08 ALT ITEM AUTHY DESCRIPTION DATE ASSLY.DRG. SUPERSEDED BY SUPERSEDES SCALE PASSED Sd/A.N.MENHA 09/00 CHECKED Sd/J.AHMAD 08/00 DRAWN J.AHMAD 08/00 TRACED S.S.KUMAR 10/03 J.S.NO. WD-00039 DB/00 B.G. R.D.S.O. [W] GROUP WD-00039-S-01 INDEX					





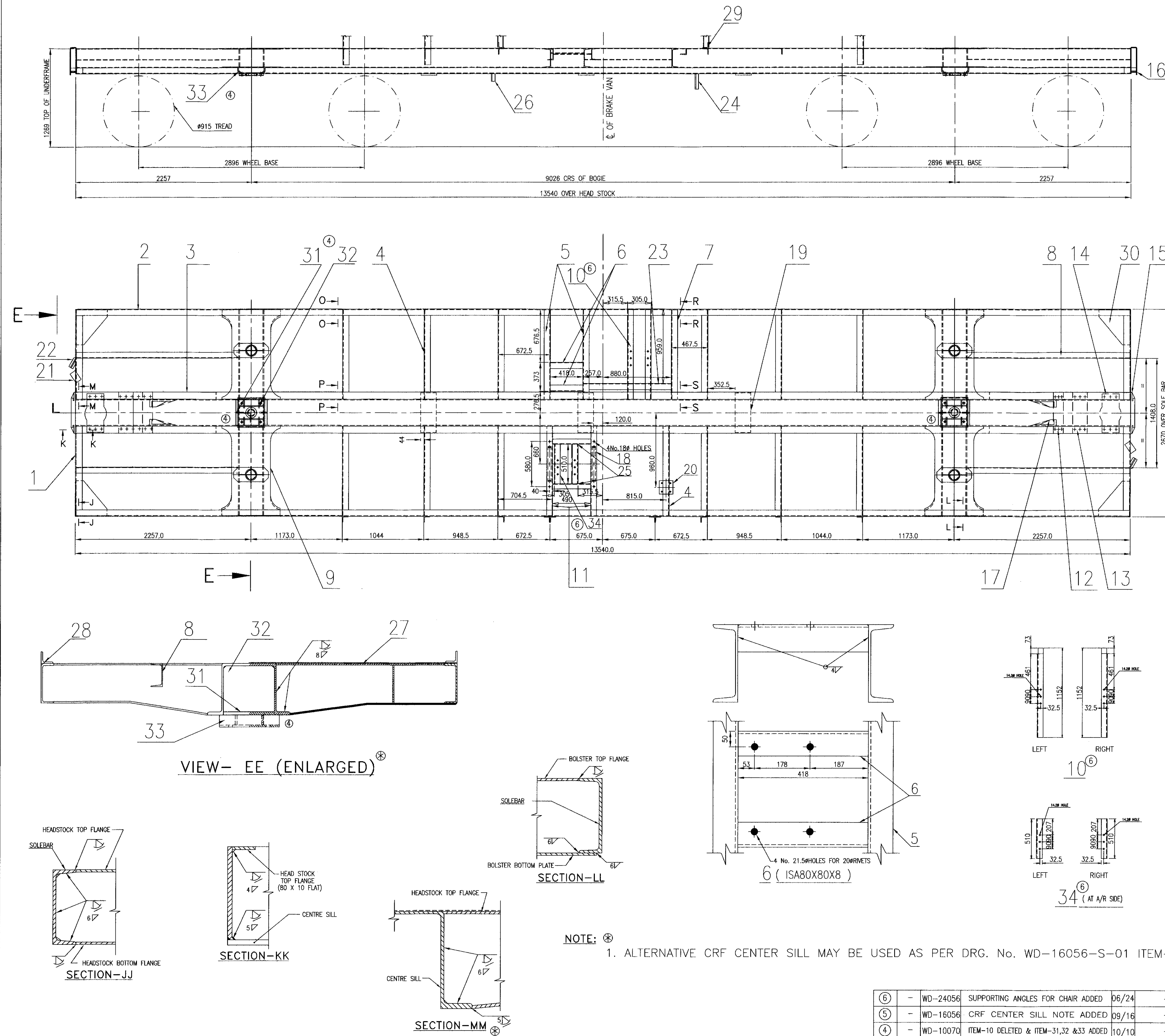
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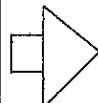
1. FOR INTERIOR FITTINGS REFER DRG. NO. SK-75527 & SK-75524.
2. FOR FOOT STEPS SIMILAR ARRANGEMENT AS SHOWN IN
 DRG. NO. WD-81035-S-19 SHOULD BE FOLLOWED.
3. THE BOGIE SHALL BE AS PER DRG. NO. WD-04050-S-02 OF MODIFIED ICF BOGIE T-0-0-801.
4. F.P. SHOWN FOR TWIN PIPE ARRANGEMENT ONLY. FOR OTHER DETAILS OF TWIN PIPE ARRANGEMENT
 REFER DRG. NO. WD-10004-S-02, 03 & 04.
5. THE BRAKE VAN SHALL BE EQUIPPED WITH AUTOMATIC HIGH TENSILE CENTER BUFFER COUPLER OF
 KNUCKLE TYPE TO RDSO STR No.48-BD-2008 OR LATEST AND DRAFT GEAR TO RDSO STR No.49-BD-2008 OR LATEST.

⑥	-	WD-25036	ITEM-1 TO 21 ARE ITEMIZED IN BOM	5/25	
⑦	-	WD-24056	CHAR,HANDHOLD,COAT HOOK CHANGED AND FOOTSTEP ADDED	6/24	
⑥	-	WD-16056	COMMODE DRG. CA/LF-1817 CHANGED TO 10/STD-6-3-099	9/16	
⑤	-	WD-11020	CBC & DRAFT GEAR NOTE ADDED.	3/11	-
④	-	WD-10070	BOLSTER BOTTOM GUSSET REMOVED & FILLER PLATE,STIFFENER ADDED	10/10	-
③	-	WD-10004	FEED PIPE ADDED FOR TWIN PIPE BRAKE ARRANGEMENT WIRE MESH SIZE & MMOD. MODIFIED.	01/10	-
②	-	WD-04050	DRG. REVISED	7/04	-
①	-	WD-03006	DRG. CORRECTED & FOOT STEP REDUCED	2/03	-
ALT.	ITEM	AUTHY.	DESCRIPTION	DATE	ASSLY. DRGS.

26/0 OVER SHEET PAGE

21	NET FRAME OF WIRE DIA 3.15, 20 MM SQUARE NET WELDED ALL ROUND WITH 15X2.5 MM STRIP	4	SK-75524 ITEM-13			
20	BOTTLE HOLDER	2	SK-75524 ITEM-3			PL No. 01160254
19	FITMENT OF SOLAR SYSTEM WITH LIGHT FAN & COMBINED UNIT BOX	—	WD-25036-S-01 WD-25036-S-02			
18	25 DIA BORE PIPE (L-150)	—	SK-75524 ITEM-12			
17	GLASS WOOL 25 mm	—	—			
16	DOOR STOP	2	SK-75524 ITEM-11			
15	NAPHTHALENE BALLS FOR WATERLESS URINAL	12	SK-75524 ITEM-10			
14	PUFF FOR WATERLESS URINAL	1	SK-75524 ITEM-9			
13	PERFORATED PLATE	1	SK-75524 ITEM-8			
12	SS WATERLESS UNISEX URINAL	1	SK-75524 ITEM-7			
11	ROOF VENTILATOR	1	SK-75524 ITEM-21			
10	FOOT REST	2	SK-75527 ITEM-27			
9	GAURD'S CHAIR	2	SK-75527 ITEM-25			
8	MIRROR ASSEMBLY	1	SK-75524 ITEM-6			
7	COAT HOOK	2	SK-75524 ITEM-5			
6	WALKIE-TALKIE HOLDER	2	SK-75524 ITEM-4			
5	UNIVERSAL LOCK	2	SK-75527 ITEM-28			
4	GRAB HANDLE	5	SK-75524 ITEM-2			
3	SUPPORT ANGLE ISA 75X75X10	4	SK-75524 ITEM-1			
2	HANDHOLD, END	8	C/BF-1154		IS:2062:2011 E250 WITH Cu	
1	TAIL LAMP BRACKET	4	C/BF-1113		IS:2062:2011 E250 WITH Cu	
ITEM DESCRIPTION		NO. OFF PER WAGON	REF. DRGS.	WT. OF ONE (Kg)	MATL & SPEC REMARKS	
PRELIMINARY SKETCH ONLY FOR PROTOTYPE APPLICATION UNDER GUIDANCE OF R.D.S.O. (WAGON)						
SUPERSEDED BY			BOGIE BRAKE VAN TYPE 'BVZI' GENERAL ARRANGEMENT			
SUPERSEDES		DATE				
SCALE	PASSED	A.N.MEHIA 08/2000				
	CHECKED	J.AHMAD 08/2000				
	DRAWN	S.S.PARVAN 08/2000				
	TRACED	—				
	COMPARED	—				
J.S.NO.		WD-00039 08/2000				
B.G. R.D.S.O. [W]		GROUP		WD-00039-S-03		

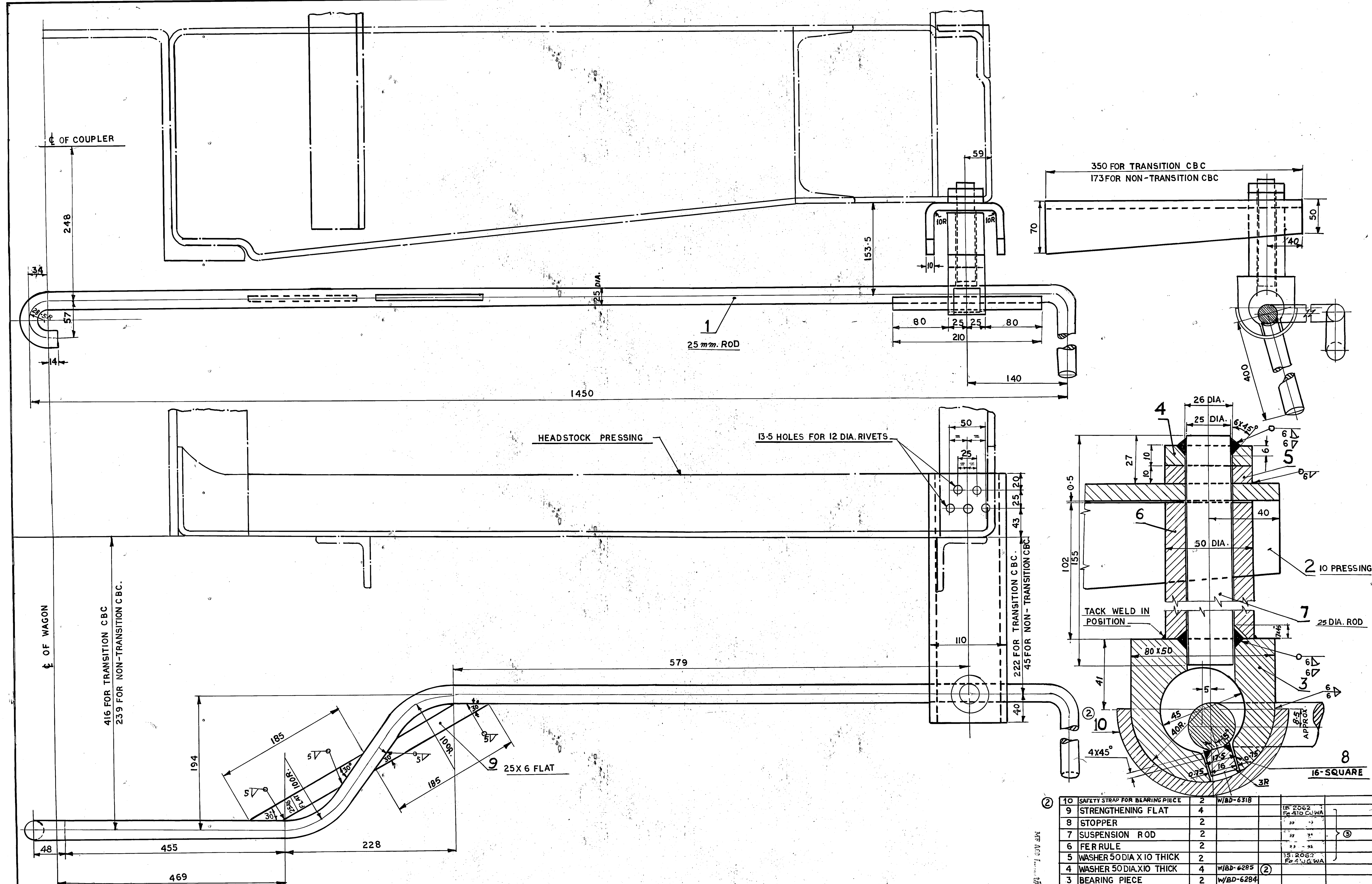


	34	SUPPORTING ANGLE FOR CHAIR 'SHORT' (ISA 75X75X8 L-510)	1R&1L	-----			
④	33	PIVOT BRACKET	2	WD-00039/S-6 ITEM-1			
④	32	FILLER PLATE STIFFENERS	4	WD-00039/S-5 ITEM-8&10			
④	31	FILLER PLATE	2	WD-00039/S-05 ITEM-8			
	30	SOLEBAR HEAD STOCK BOTTOM GUSSET	4	WD-00039/S-5 ITEM-4			
	29	FLOOR PLATE ANGLE (END WALL)	2	WD-81035/S-6 ITEM-7			
	28	FLOOR PLATE ANGLE (OVER CRIB ANGLE/SIDE WALL)	2	WD-81035/S-6 ITEM-7			
	27	FLOOR PLATES (13530x2660x5)	1	WD-81035/S-8			
	26	BRACKET FOR 20 mm. PIPE	2	WD-81035/S-12,13 ITEM-53			
	25	AUXILIARY RESERVOIR SUPPORT ANGLE ISA 65X65X6 (L=794)	2	-----		IS:2062 Fe 410 CUMA	
	24	BRACKET FOR 20 mm. PIPE	2	WD-81035/S-12,13 ITEM-54			
	23	BELL CRANK SUPPORT CHANNEL (L=1129.9)	1	WD-81035/S-7 ITEM-3			
	22	LOCKING BKT SUPPORT PLATE	2	WD-81035/S-15A ITEM-2			
	21	LOCKING BKT SUPPORT BKT	2	WD-81035/S-15A ITEM-1			
	20	BRACKET FOR DISTRIBUTOR VALVE	1	WD-00039/S-5 ITEM-9			
	19	CENTRE SILL STIFFING PLATE(210X510X20 TH)	3	-----		IS:2062 Fe 410 CUMA	
	18	AUXILIARY RESERVOIR SUPPORTING BRACKET	2	WD-00039/S-5 ITEM-7			
	17	BACK STOP	4	W/BD-699			
	16	STRIKER CASTING WEAR PLATE	2	WD-87056/S-1			
	15	STRIKER CASTING	2	WA/BD-4460			
	14	YOKE PIN SUPPORT	2	WA/BD-4462			
	13	COUPLER SAFETY PLATE	2	WD-81035/S-5 ITEM-12			
	12	YOKE SUPPORT PLATE	2	WD-81035/S-5 ITEM-11			
	11	AUXILIARY RESERVOIR SUSPENSION CHANNEL (L=1152)	2	WD-81035/S-7 ITEM-5			
⑥	10	SUPPORTING ANGLE FOR CHAIR 'LONG' (ISA 75X75X8 L-1152)	1R&1L	-----			
	9	BODY BOLSTER	2R&2L	WD-00039/S-5 ITEM-1			
	8	BUFFING STRUT	2R&2L	WD-00039/S-5 ITEM-2			
	7	FLOOR PLATE SUPPORT CHANNEL (ISMC 250X80X7.1, L=1152)	1	-----		IS:2062 Fe 410 CUMA	
	6	HAND BRAKE SUPPORT ANGLE (L=418)	2	-----		IS:2062 Fe 410 CUMA	
	5	HAND BRAKE SUPPORT CHANNEL (L=1152)	2	WD-81035/S-7 ITEM-2			
	4	FLOOR PLATE SUPPORT ANGLE ISA 80X80X8 (L=1152)	13	-----		IS:2062 Fe 410 CUMA	
⑤	3	CENTRE SILL (L=13540)	1	WD-81035/S-6 ITEM-1			SEE NOTE-1
	2	SOLE BAR (L = 13540)	1R&1L	WD-81035/S-6 ITEM-2			
	1	HEAD STOCK	2R&2L	WD-00039/S-5 ITEM-5			
ITEM		DESCRIPTION	NO. OF PARTS WAGON	REF. DRGS.	WT. OF ONE (Kg)	MAT'L & SPEC. REMARKS	
		PRELIMINARY SKETCH		ONLY FOR PROTOTYPE APPLICATION UNDER GUIDANCE OF R.D.S.O.(WAGON)			

SUPERSEDED BY		DATE	
SUPERSEDES		DATE	
SCALE	PASSED	A.N.MEHTA	9/00
1:25	CHECKED	JAHMAD	9/00
	DRAWN	P.TIWARI	7/00
	TRACED		
	COMPARED		
J.S.NO.	WD-00039	8/00	
B.G.	R.D.S.O.	GROUP	WD-00039-S-04
	[W]		

⑥	-	WD-24056	SUPPORTING ANGLES FOR CHAIR ADDED	06/24	-
⑤	-	WD-16056	CRF CENTER SILL NOTE ADDED	09/16	-
④	-	WD-10070	ITEM-10 DELETED & ITEM-31,32 &33 ADDED	10/10	-
③	-	WD-04050	DRG. REVISED AND REDRAWN BY ELIMINATING BODY BKTS. & CRIB ANGLE	7/04	-
ALT. ITEM	AUTHY.	DESCRIPTION	DATE	ASSLY. DRGS.	

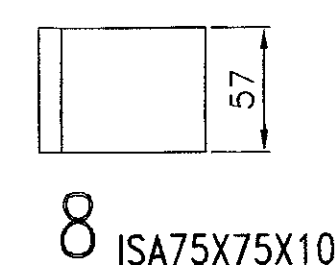
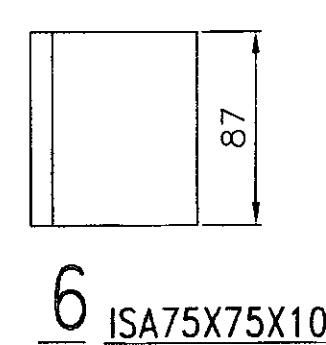
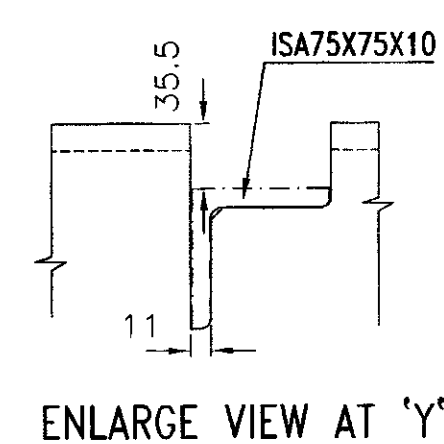
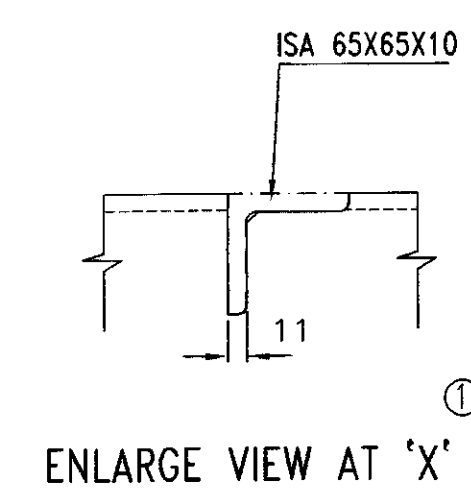
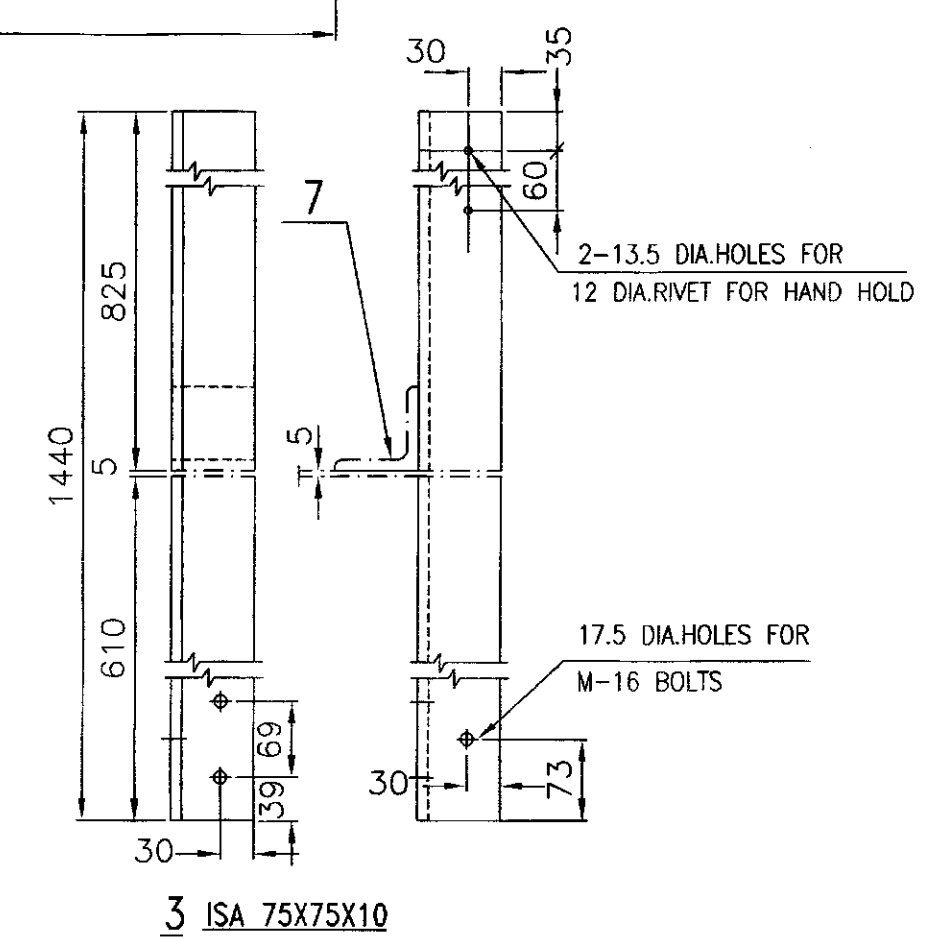
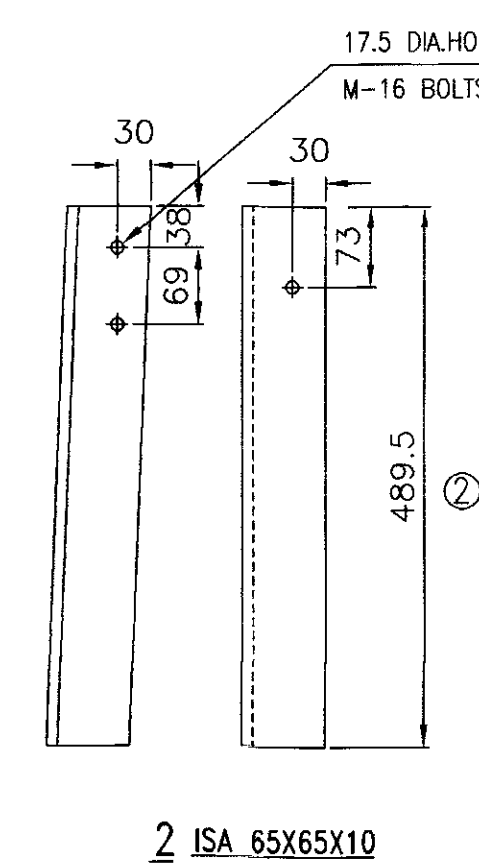
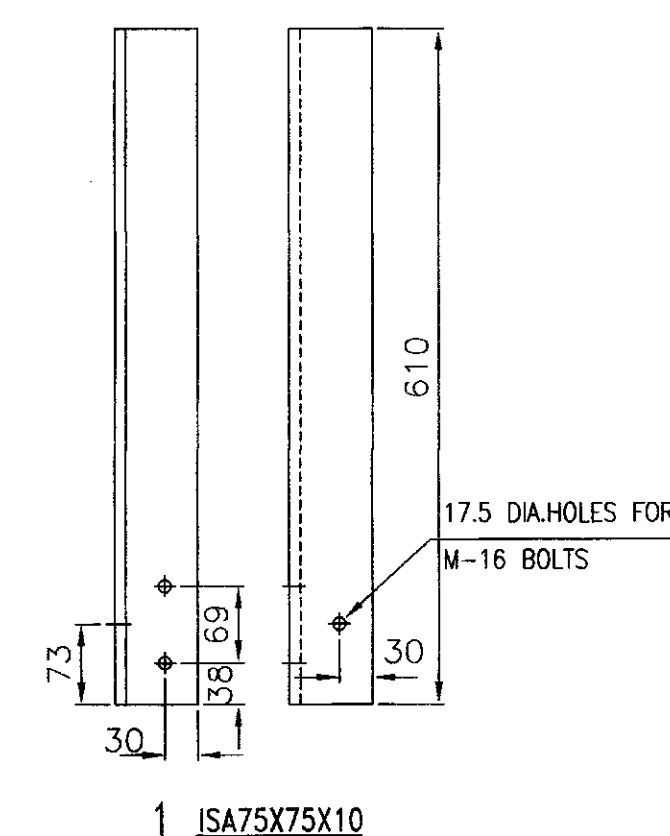
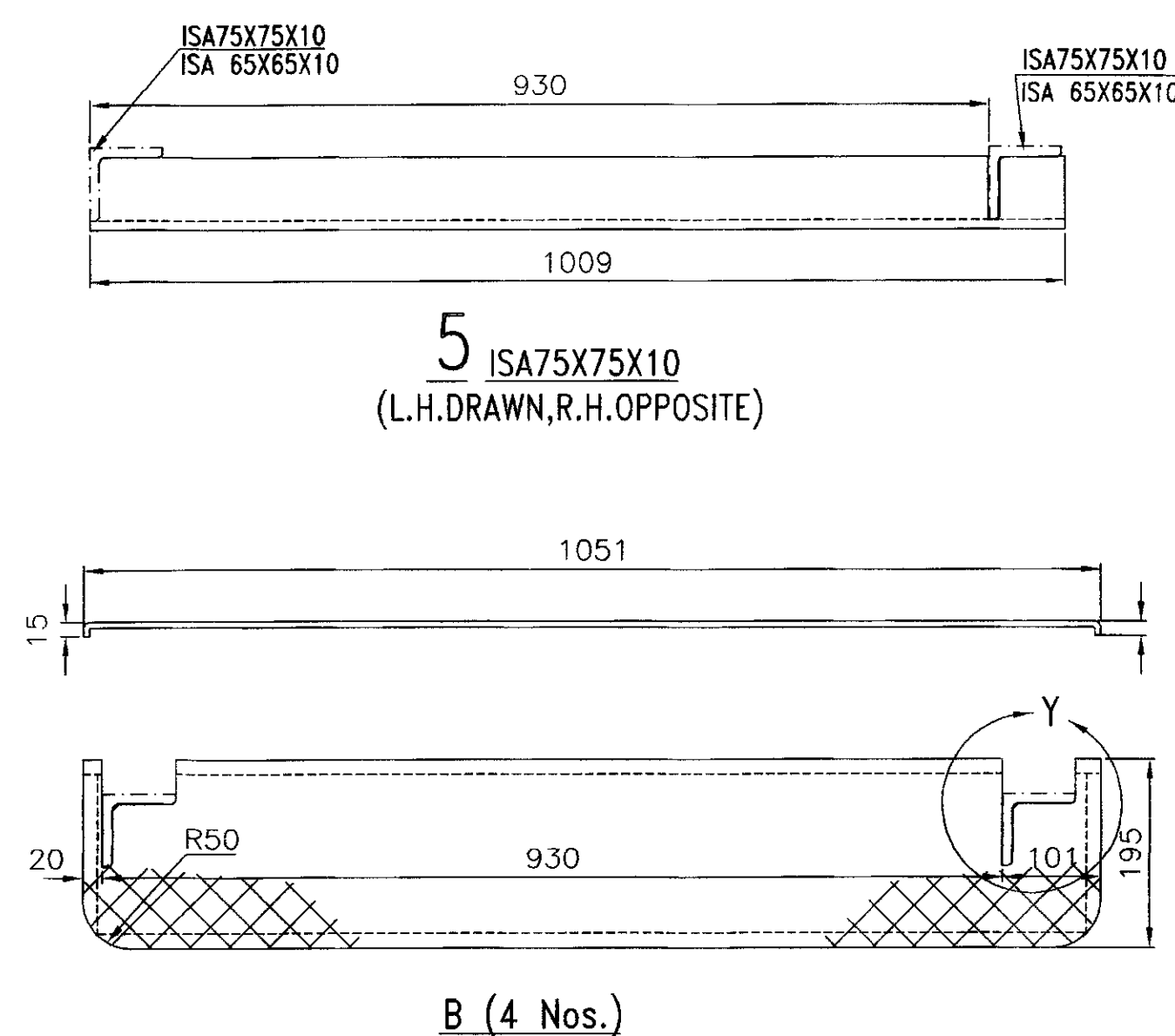
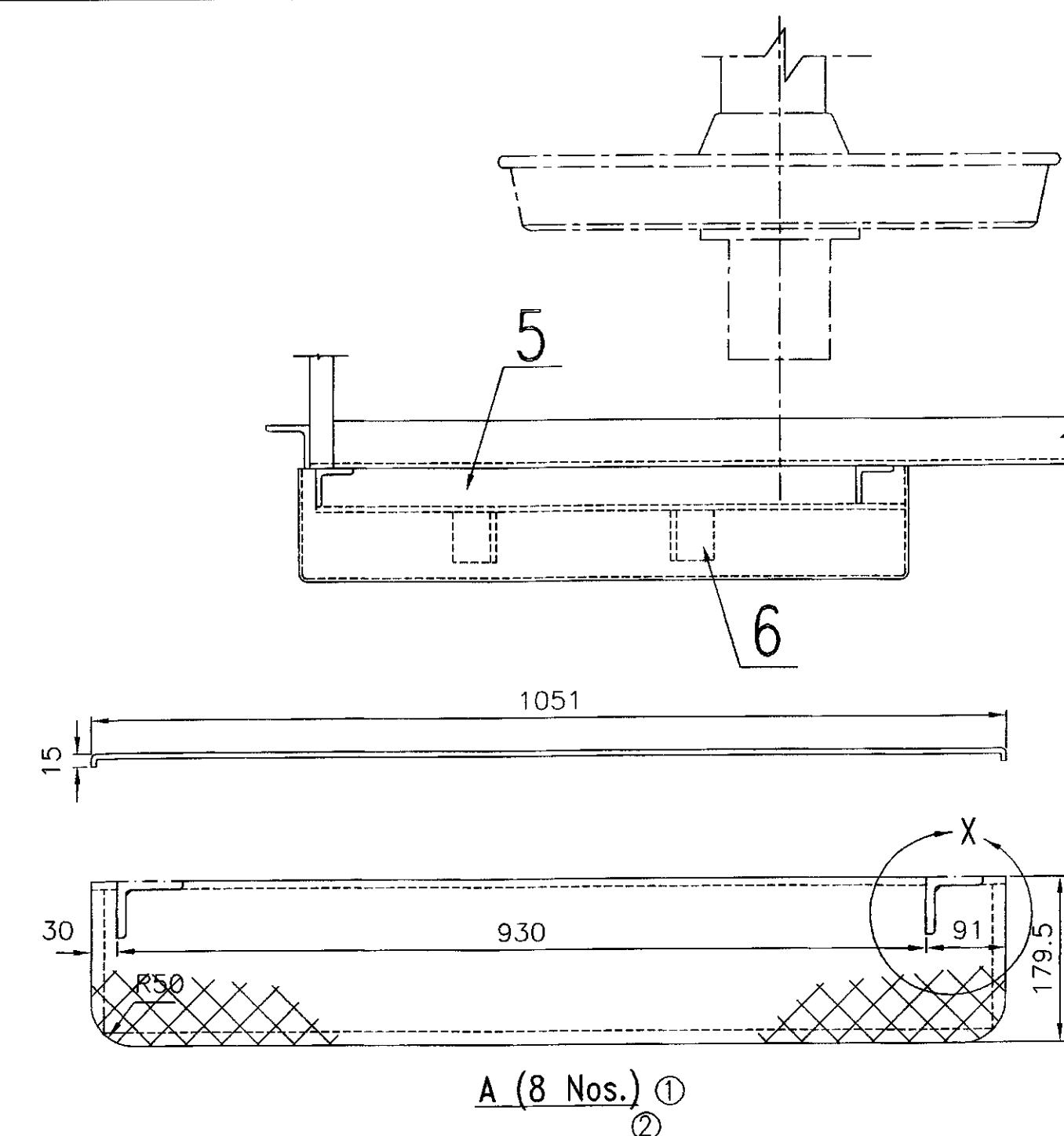
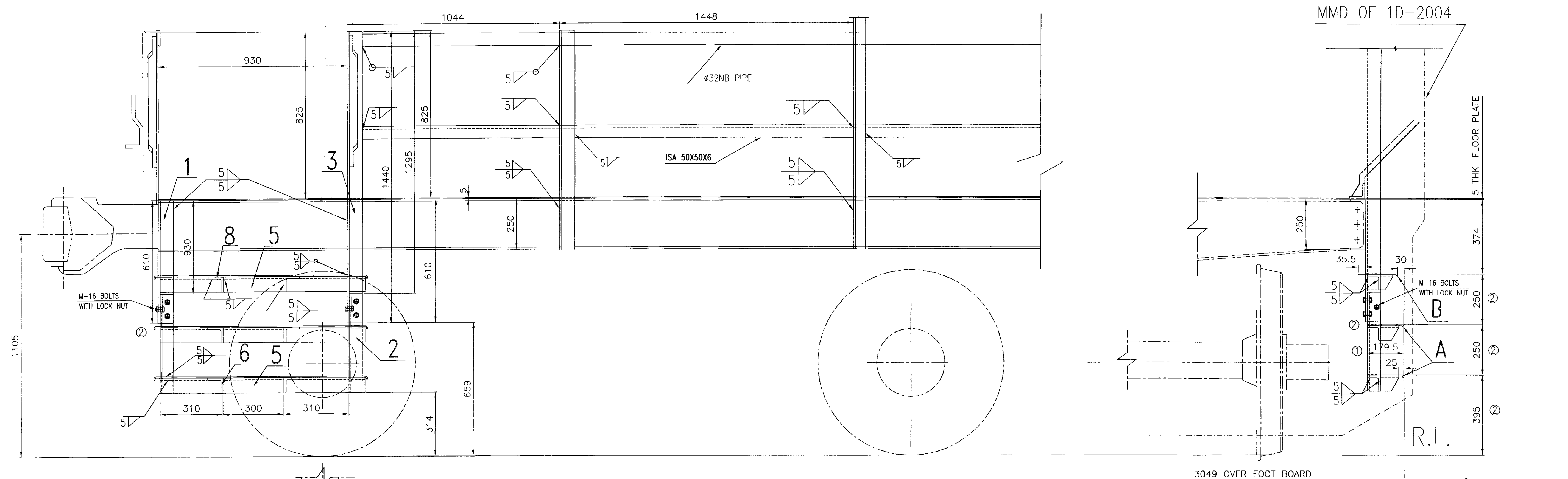
A1 06/24



I. WELDING SYMBOLS TO ISO 813.

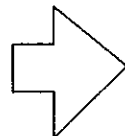
③		WD-94046	MATL & SPEC REVISED	6/5
②	3,4,10	WD-94056	SAFETY STRAP FOR BEARING PIECE ADDED & PART DRGS FOR ITEMS 3,4,10 INDICATED	10/10
		MF-A00739	MICRO FILMED	7/8
ALT.	LETT	AUTHY	DESCRIPTION	DATE

MF 400 1... 521... 7110000... 100

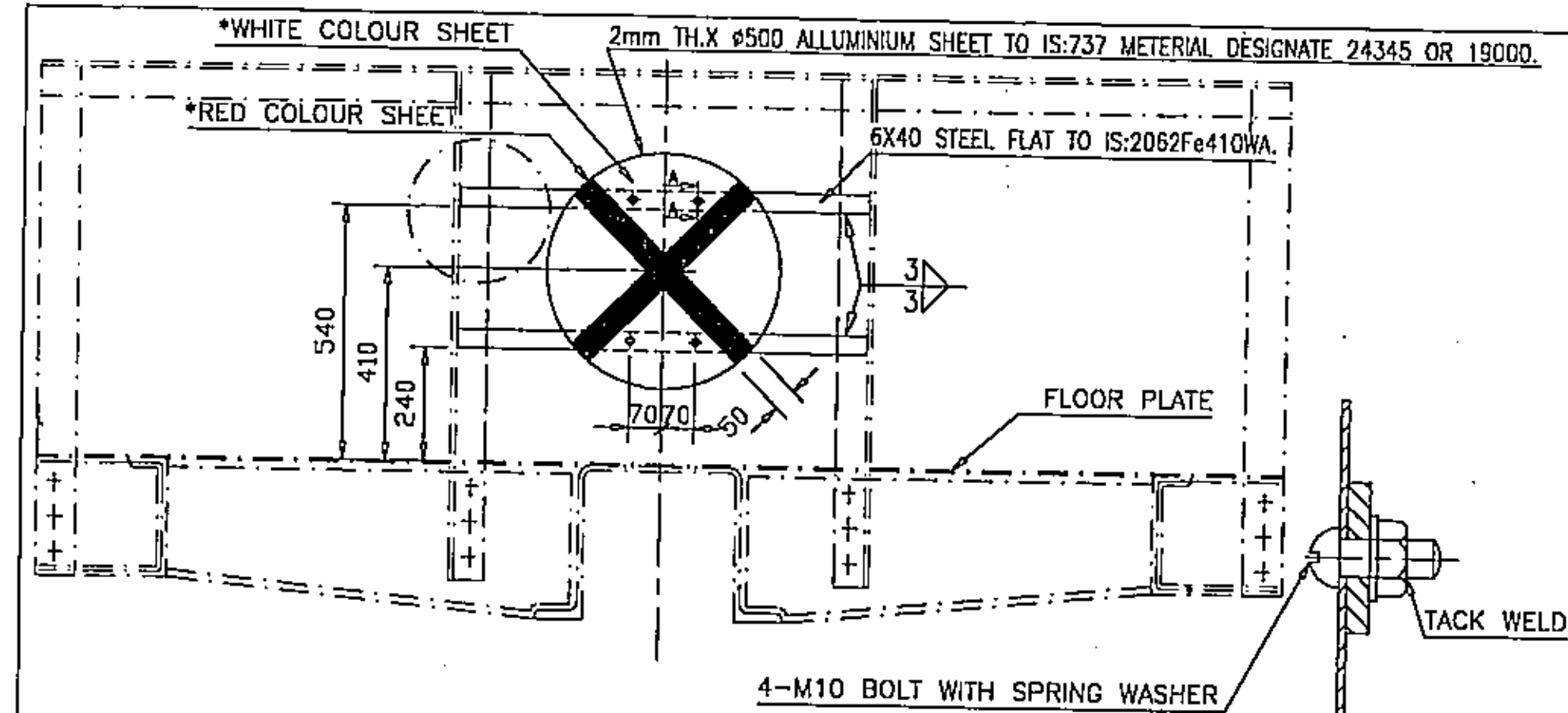


NOTE:-

FOOT STEPS ARE MADE WITH TWO STEPS, TOP ONE WITH ISA 75X75X10 SUPPORT ANGLES AND BOTTOM FOOT STEP WITH ISA 65X65X10 SUPPORT ANGLES WHICH ARE CONNECTED WITH FASTENERS TO FORM COMPLETE FOOT STEP.

⑧	8	FOOT STEP SUPPORT ANGLE TOP	8			IS:2062 Fe 410 CuWA	
	7	CLEAT	4			IS:2062 Fe 410 CuWA	
②	6	FOOT STEP SUPPORT ANGLE	16			IS:2062 Fe 410 CuWA	
②	5	FOOT STEP SUPPORT ANGLE	12			IS:2062 Fe 410 CuWA	
②	4	FOOT STEP PLATE	12			IS:3502 TYPE-A	
	3	FOOT STEP BRACKET ANGLE	4			IS:2062 Fe 410 CuWA	
	2	FOOT STEP BRACKET ANGLE	8			IS:2062 Fe 410 CuWA	
	1	FOOT STEP BRACKET ANGLE	4			IS:2062 Fe 410 CuWA	
ITEM	DESCRIPTION		NO. OFF. PER WAGON	REF. DRGS.	WT. OF ONE (Kg)	MATL.&SPEC	REMARKS
			PRELIMINARY SKETCH		ONLY FOR PROTOTYPE APPLICATION UNDER GUIDANCE OF R.D.S.O.(WAGON)		
SUPERSEDED BY			Bogie BRAKE VAN TYPE 'BVZI'				
SUPERSEDES			DATE				
SCALE	PASSED	Sd/- O. P. Yadav 26/11/12					
	CHECKED	Sd/- J. Ahmad 12/11					
	DRAWN	J. AHMAD 10/11					
	TRACED	—					
	COMPARED	—					
	J.S.NO.	WD-11064 12/11					
B.G.		R.D.S.O.		GROUP	WD-81035-S-19		
		[w]					

②	4-A	WD-22071	ONE ADDITIONAL BOTTOM FOOT STEP ADDED & BOTTOM FOOT BOARD MODIFIED	08/22	<i>[Signature]</i> 08/22
①	4-A	WD-22052	SHORTEN LOWER FOOT STEP SIZE	06/22	
ALT.	ITEM	AUTHY.	DESCRIPTION	DATE	ASSLY. DRGS.



NOTE:-

- *1. RED/WHITE COLOUR SHEET SHALL BE AS PER RDSO SPECIFICATION FOR RETRO REFLECTIVE ENGINEERING INDICATORS USING HIGH INTENSITY GRADE SHEETING (ENCAPSULATE LENS TYPE)
2. REFLECTOR INDICATOR BOARD SHALL BE FITTED AT BOTH ENDS OF BRAKEVANS.

SUPERSEDED BY	
SUPERSEDES	DATE
SCALE PASSED	10/01
CHECKED	S.S.GILL
DRAWN	S.S.PARAVAN
TRACED	
LS-TEXT	WD-01064

B.G. R.D.S.O.
M.G. [W]

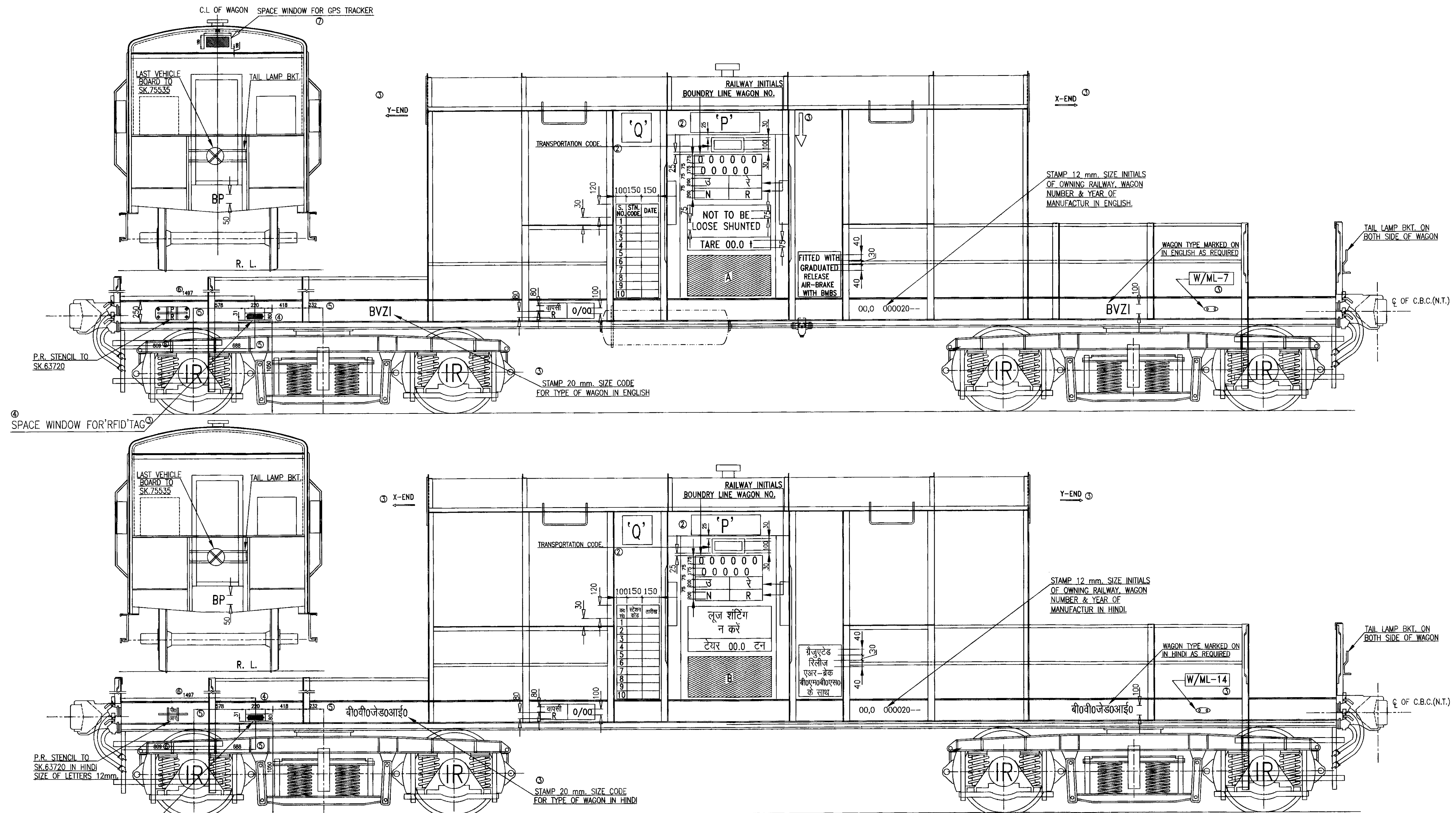
4-WHEEL GOODS BRAKEVANS

ARRGT. FOR REFLECTOR
INDICATOR BOARD

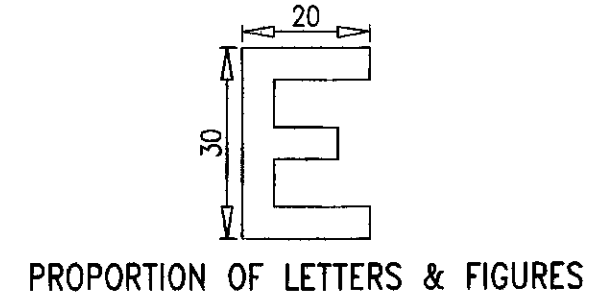
GROUP

WD-01064-S-01

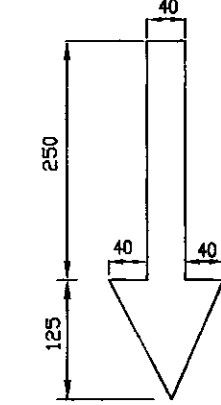
ALT	ITEM	AUTHY	DESCRIPTION	DATE	ASSEMBLY DRAWING
-					



- NOTE:-
1. MARKING ON WAGONS SHALL BE IN HINDI ON ONE SIDE AND IN ENGLISH ON THE OTHER SIDE.
 2. FOR RAILWAY INITIALS IN HINDI REFER R.D.S.O. SK. NO.66511
 3. THE WAGON SHALL BE PAINTED WITH SILVER ALUMINIUM PAINT AS PER IS:2339 ON OUT SIDE & WHITE ENAMEL PAINT TO IS:2932 ON INSIDE.
 4. THE RAILINGS SHALL BE PAINTED WITH SIGNAL RED COLOUR PAINT TO IS:5-2007 ISC:537.
 5. STENCIL MARKING AFTER SICKLINE REPAIRS:- WHENEVER WAGON IS ATTENDED IN SICKLINE THE PARTICULARS OF STATION CODE AND DATE ATTENDED ARE TO BE STENCILLED STATION CODE IN HINDI/ENGLISH TO STENCILLED ON THE CORRESPONDING HINDI/ENGLISH MARKING SIDE OF THE WAGON.
 6. AREA AS SHOWN SHADED ON BODY SIDES SHOULD BE MARKED WITH LEGEND 'A' AND LEGEND 'B' ON ENGLISH MARKING SIDE AND HINDI MARKING SIDE RESPECTIVELY(WARRANTY MARKINGS TO BE DONE BY BUILDERS ONLY.)
 7. FOR PROPORTION OF HINDI ALPHABETS REFER R.D.S.O. SK. 66510
 8. BRAKE PIPE(B.P.) WITH ITS TWO ANGLE COCK, HOSE PIPE NIPPLE WITH CLAMPS TO BE PAINTED WITH READY MIX PAINT RED OXIDE TO IS:123-1962, ISC:446 TO IS:5-1994.
 9. 'P' - SPACE FOR FIRMS EMBLEM/LOGO & NAME IN WHITE LETTERS.
 10. 'Q' - UNDER WAGON INVESTMENT SCHEME.
 11. LEGEND 'K' & 'KK' ARE USED ONLY FOR TWIN PIPE SYSTEM AND SHOULD BE PAINTED WITH BLACK LETTERS ON YELLOW BACKGROUND WITH WHITE BAND AROUND IT.
 12. ON D.V. SIDE AN ARROW ARE TO BE PAINTED WITH SIGNAL RED COLOUR PREFERABLY BELOW THE TOP COPING WHICH CENTERED TO D.V.
 13. a. FACING SIDE WALL WILL BE RIGHT SIDE WALL WHERE MARKING WILL BE IN ENGLISH AND OPPOSITE SIDE WALL WILL BE LEFT SIDE WALL WHERE MARKING WILL BE IN HINDI.
 14. b. FACING TO D.V. RIGHT HAND END WALL WILL BE X-END AND LEFT HAND END WALL WILL BE Y-END.
 15. c. FACING EACH SIDE WALL 'RFID' TAG WILL BE ALWAYS ON LEFT PORTION OF THE WAGON. 'RFID' TAG ARE LOCATED DIAGONALLY OPPOSITE ON EACH SIDE OF THE WAGON ABOVE BOGIE ON SOLEBAR.
 16. d. WAGON SHOULD BE FITTED WITH 'RFID' TAGS AT THE MARKED LOCATIONS. DETAILS OF QTY/SPEC. OF THE RFID TAGS BE OBTAINED FROM RDSO/RLY BOARD/CRIS
 17. 12. PAINT LEGENDS AND OTHER MARKINGS UNLESS OTHERWISE SPECIFIED WITH READY MIXED SYNTHETIC BLACK PAINT TO IS:13607-1992.



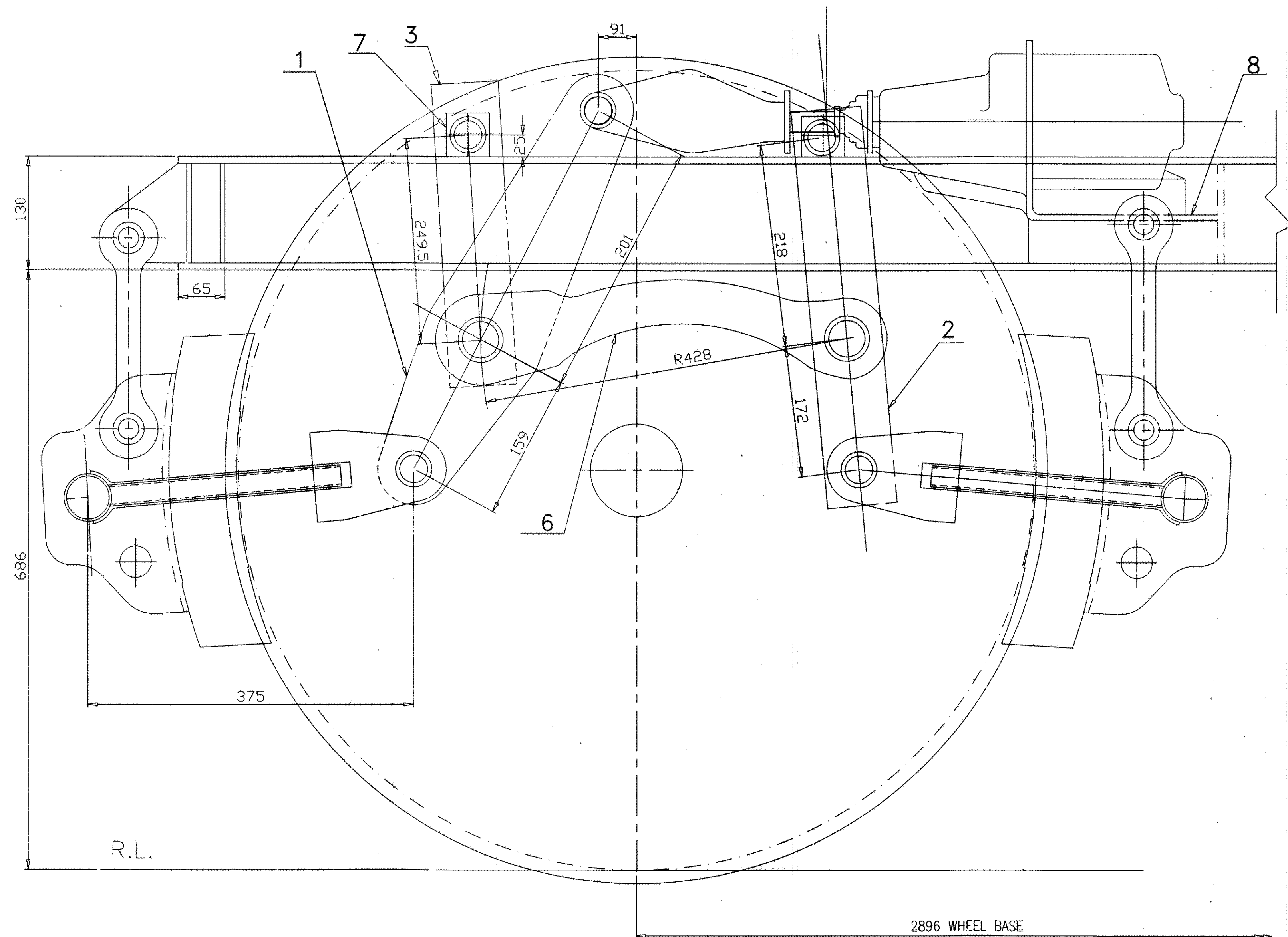
12. SPACE WINDOW MARKED FOR FIXING ONE GPS TRACKER ON RIGHT END PANEL (X-END) ABOVE END TOP COPING CENTER AS SHOWN IN END VIEW.



LEGEND-'A'		LEGEND-'B'	
CONTRACT NO.	कन्ट्रैक्ट नं०	कमीशनित तारीख	
DATE OF COMMISSIONING	कमीशनित तारीख	निरीक्षण की तिथि तारीख	
COMMISSIONED BY	निरीक्षक	निरीक्षक द्वारा कर्मचारी	
INSPECTION DUE ON	निरीक्षण की तिथि तारीख	निरीक्षक द्वारा कर्मचारी	
INSPECTION DONE BY DEPOT	निरीक्षण की तिथि तारीख	निरीक्षक द्वारा कर्मचारी	
DATE	निरीक्षण की तिथि तारीख	निरीक्षक द्वारा कर्मचारी	

ALT.	ITEM	AUTHY.	DESCRIPTION	DATE	ASSLY. DRGS.
7	—	WD-23110	SPACE WINDOW FOR GPS TRACKER ADDED	11/23	
6	—	WD-21047	RFID TAG POSITION FROM HEAD STOCK NOTE-12 ADDED, NP, C.C., R.P. LOGO & NOTE-10 TWIN PIPE MARKING REMOVED	08/21	
5	—	WD-18021	NOTE: 4.8x11 MODIFIED RFID TAG WINDOWS DIMENSION FROM FIRST AXLE & C.L. OF BOGIE ADDED	04/18	
4	—	WD-18022	NOTE: 11(c) MODIFIED RFID TAG WINDOWS SIDES MARKED RE-ALLOCATED ON LEFT SIDE ON EACH SIDE WALL	04/18	
3	—	WD-15047	NOTE:-11 ADDED RFID TAG WINDOWS SIDES MARKED. STD. PLATE STAMPING/HINDI/ENGLISH MARKING RE-ALLOCATED	08/15	
2	—	WD-10004	LEGEND 'K' & 'KK' ADDED FOR TWIN PIPE. LEGEND 'P' & 'Q' ARE ADDED FOR WIS.	01/10	
1	—	WD-09041	NOTE: 3 SILVER PAINT SPEC. ADDED & SERIAL NO. 4 MODIFIED	08/09	

PRELIMINARY SKETCH		ONLY FOR PROTOTYPE APPLICATION UNDER GUIDANCE OF R.D.S.O. (WAGON)	
SUPERSEDED BY	DATE	BOGIE BRAKE VAN TYPE 'BVZI'	
SUPERSEDES	DATE	MARKING DIAGRAM	
SCALE/PASSED	DATE	चिन्हन आरेख	
CHECKED	DATE	WD-04050-S-01	
DRAWN	DATE		
TRACED	DATE		
COMPARED	DATE		
J.S.NO.	DATE		
B.G.	R.D.S.O. [W]	GROUP	WD-04050-S-01



SPRING DATA

DESCRIPTION	BOLSTER SPRING	AXLE BOX SPRING
DIAMETER OF WIRE (d)	38.5 mm	33.5 mm
FREE HEIGHT (Lo)	362.6 $\pm$ ³ mm	330.3 $\pm$ ³ mm
SOLID HEIGHT (Lc)	195.6 mm	209.5 mm
NO. OF EFFECTIVE COILS (n)	3.98	5.15
VERTICAL STIFFNESS (Kg/mm)(R)	30.22 kg/mm	26.98 kg/mm
MEAN COIL DIA (D)	263.5 mm	208.5 mm
LOAD AT SOLID HEIGHT	5044 Kg	3259.5 Kg
OUTER DIA OF COIL (Do)	302 mm	242 mm
SCRAG TEST LOAD	5044 Kg	3259.5 Kg
WINDING	L.H	L.H
TOTAL NO. OF COIL (nt)	5.48	6.65

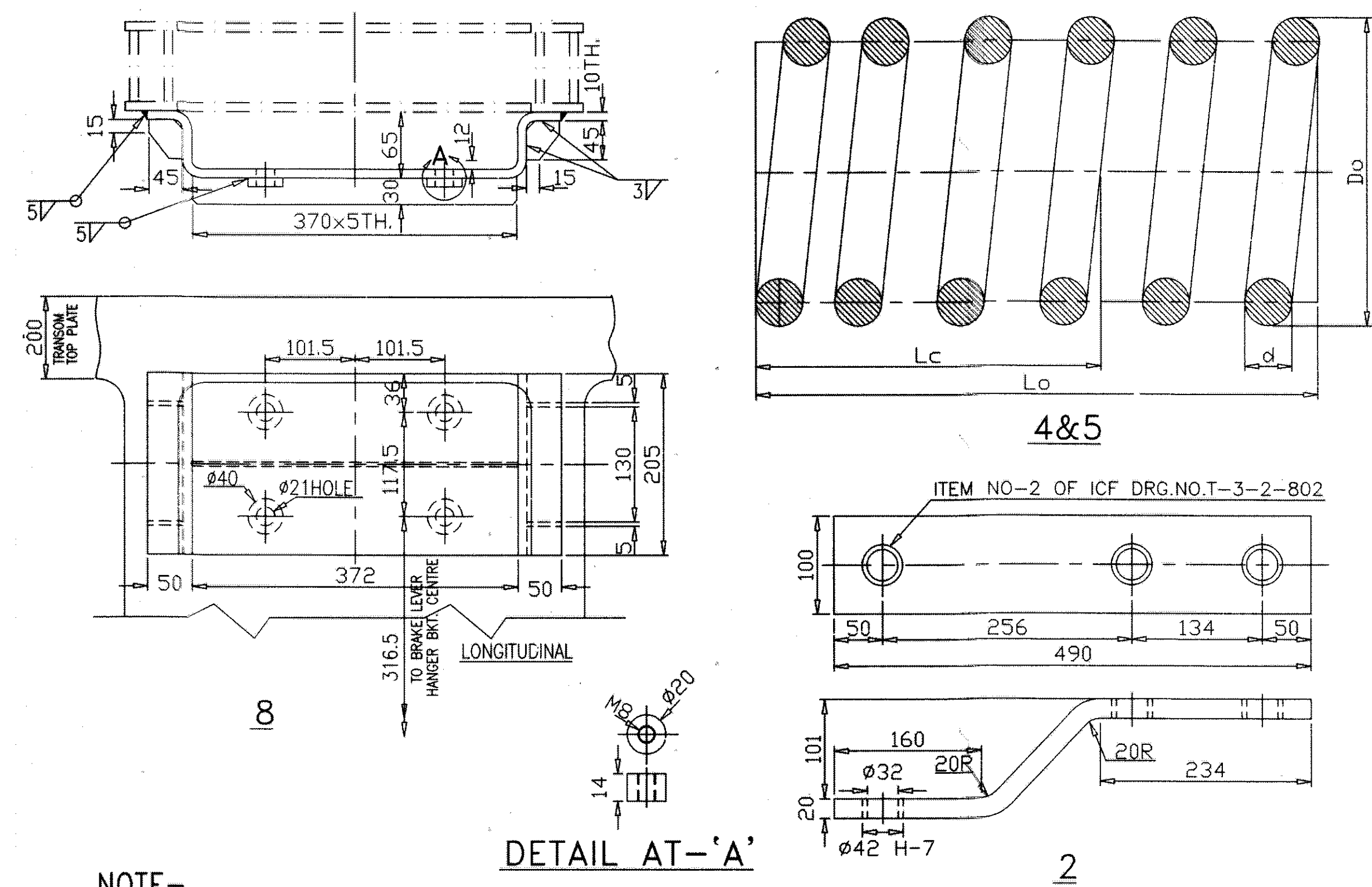
ESTIMATED TEST TABLE

DESCRIPTION	LOAD IN TONNES								
	0.5	1.0	1.5	2.0	2.5	3.0	3.2595	4.0	5.044
BOLSTER SPRING HT. (mm)	346.0	329.4	313	296.4	279.8	263.3	—	230.2	195.6
AXLE BOX SPRING HT. (mm)	311.7	293.2	274.7	256.2	237.6	219.1	209.5	—	—

SPECIAL REQUIREMENTS FOR SPRINGS:-

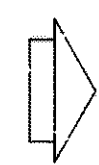
1. RAW MATERIAL TO BE PEELED AND CENTRELESS GROUND.
2. MIN. STOCK REMOVAL SHALL BE 6% OF BAR DIA. OR 2mm WHICHEVER IS MORE.
3. 100% BARS SHALL BE TESTED BY MAGNA-FLUX/EDDIE CURRENT FOR DEFECTS AFTER PEELING AND CENTRELESS GRINDING, AFTER THIS NO ARC BURNS OR SPOTS ON BARS TO BE PERMITTED.
4. INCLUSION RATING SHALL NOT BE WORSE THAN 2A,B,C,D FOR BOTH THICK AND THIN SERIES WHEN CHECKED AS PER CLAUSE 6.2.1 OF IS:4163.
5. THE SPRING SHALL BE SCRAP TESTED UP TO SOLID HEIGHT.
6. BOTH OF THE TAPERED ENDS, WHILE STILL IN HOT CONDITION. SHALL BE SUITABLY STAMPED WITH DRG. NO./ITEM NO., MANUFACTURER'S INITIAL, MONTH & YEAR OF MANUFACTURE IN SUCH A WAY THAT STAMPED PARTICULARS ARE VISIBLE ON THE OUTER COIL SURFACE OF THE INEFFECTIVE COIL.
- ① 7. THE SPRINGS SHALL BE MANUFACTURED AS FOR RDSO SPECIFICATION No.WD-01-HLS-94 OR LATEST.

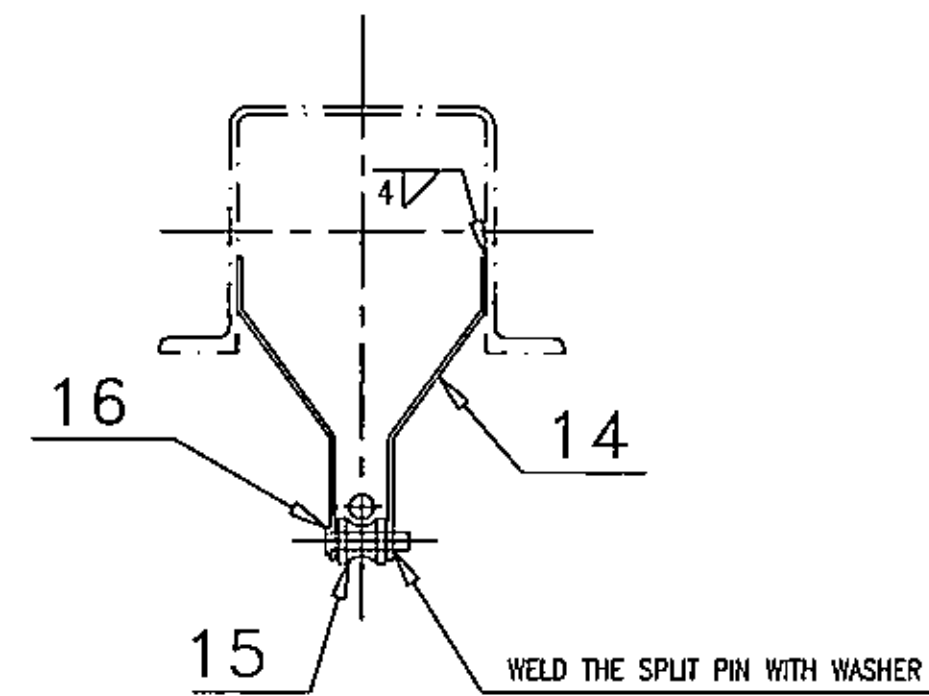
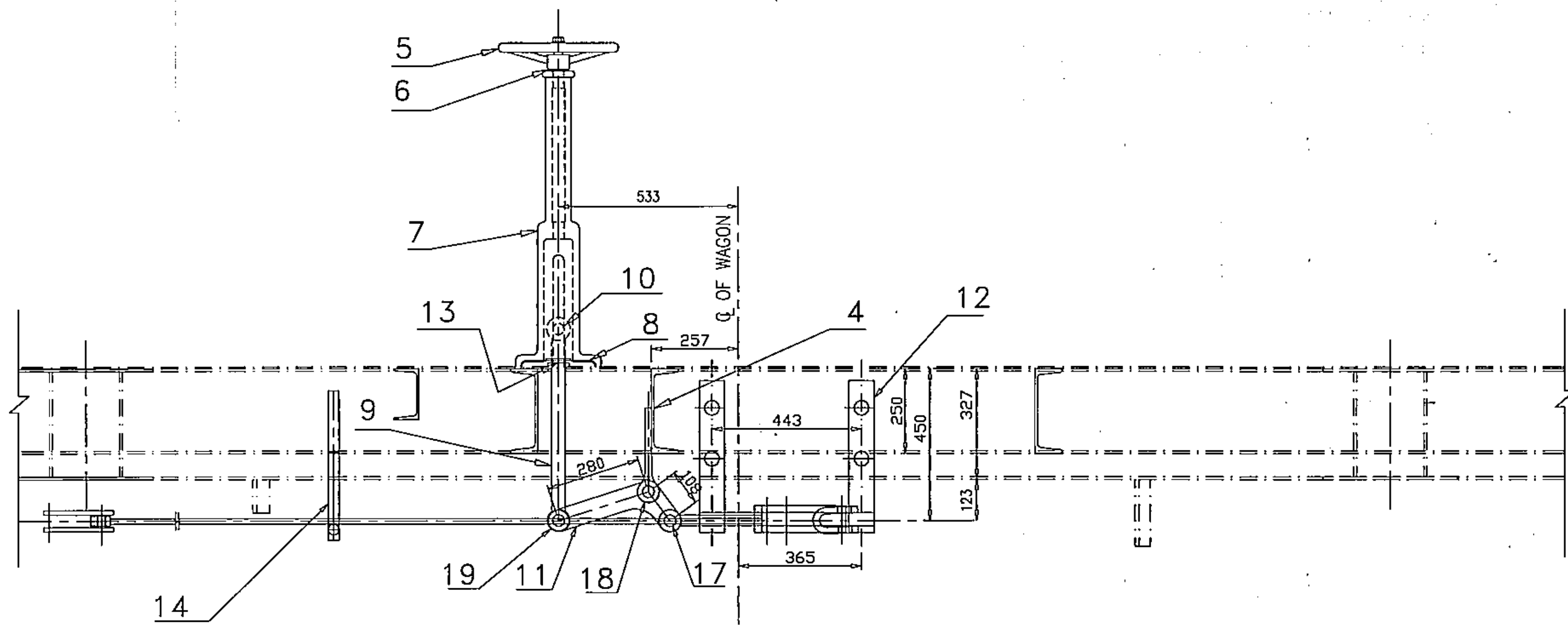
④	—	WD-19001	NOTE- 1-g MODIFIED WITH FRICTION SNUBBER-SELF-LUBRICATING GUIDE BUSH DELETION	01/19	
③	7	WD-14026	NOTE 1-e & ITEM-7(DRG. NO.) CORRECTED & 1-g MODIFIED . FS-SLB AS AN ALTERNATIVE IN PLACE OF OILDASHPOT ADDED.	10/14	
②	—	WD-13036	NOTE 1-g MODIFIED & 3 DELETED. FRICTION SNUBBER & SELF LUBRICATING GUIDE BUSH REPLACED WITH OILDASHPOT	10/13	
①	—	WD-11020	NOTE ADDED AND SPECIAL FEATURE IT.7 MODIFIED.	3/11	
ALT.	ITEM	AUTHY.	DESCRIPTION	DATE	ASBLY.DRG.



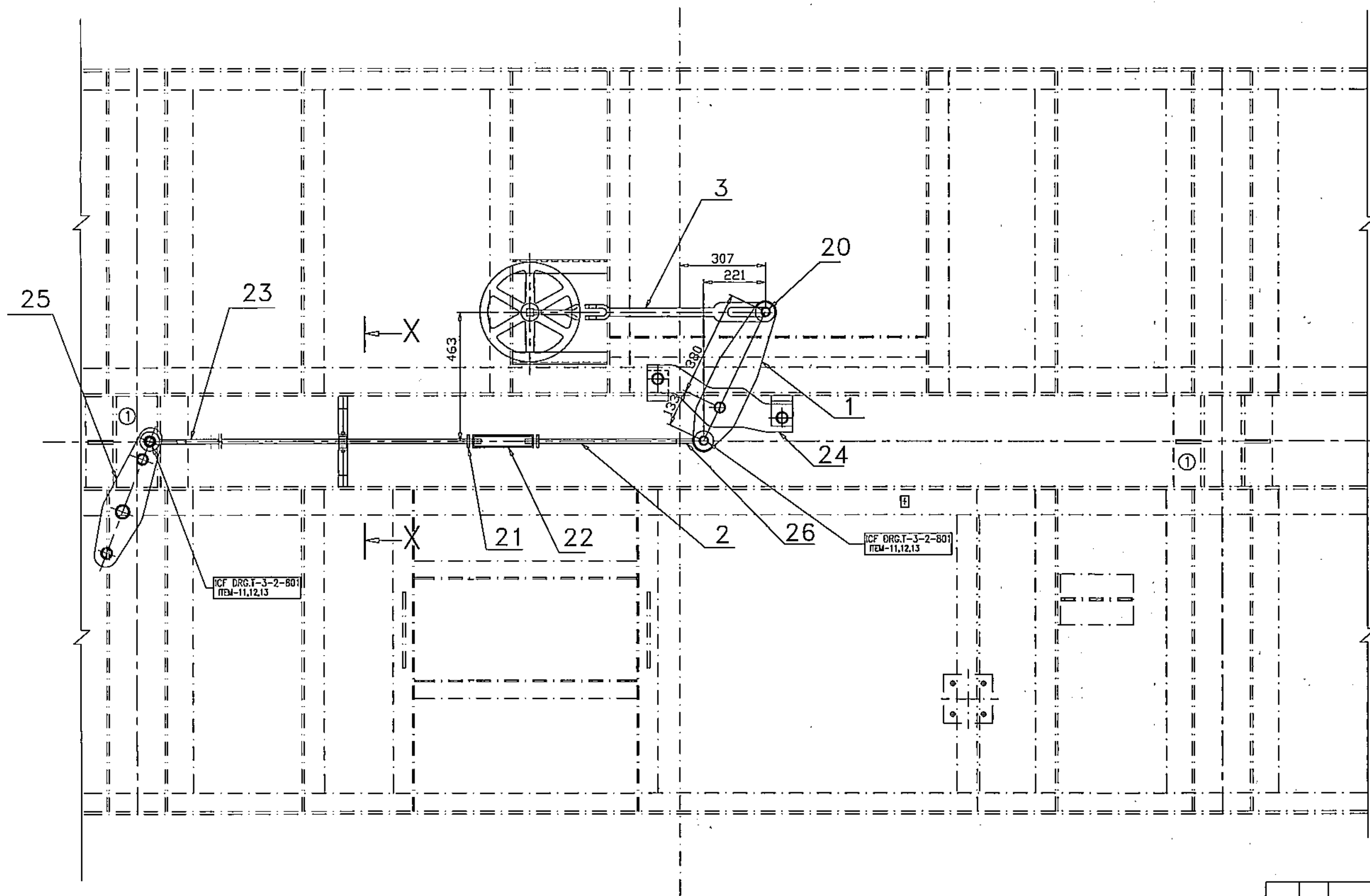
NOTE—

1. THE DESIGN OF BOGIE SHALL BE AS PER ICF DRG. NO.T-0-0-801 EXCEPT FOR THE FOLLOWING CHANGES
- (a) AXLE BOX SPRING AND BOLSTER SPRING SHALL BE AS PER ITEM 4 & 5 OF THE DRG INSTEAD OF ICF DRG NO. F-0-1-006 AND DRG NO. F-0-5-002 RESPECTIVELY.
 - (b) LEVER SHALL BE AS PER ITEM 1 OF THE DRG. INSTEAD OF ICF DRG NO. T-3-2-801 ITEM 4.
 - (c) LEVER HANGER SHALL BE AS PER ITEM 3 OF THE DRG INSTEAD OF ICF DRG NO.T-3-2-801 ITEM 6.
 - (d) PULL ROD SHALL BE AS PER ITEM 6 OF THE DRG INSTEAD OF ICF DRG NO. T-3-2-801 ITEM 7.
- ③ (e) BRAKE LEVER HANGER BRACKET SHALL BE AS PER ITEM 7 ICF DRG. NO. T-0-3-632 INSTEAD OF ICF DRG NO. T-0-3-631.
- (f) BRAKE CYLINDER FIXING BRACKET SHALL BE AS PER ITEM-8 OF THE DRG. INSTEAD OF ITEM-13 OF ICF DRG. NO. T-0-3-801
- ④ ② (g) BOGIE SHALL BE FITTED ~~EITHER WITH OIL DASHPOT ARRANGEMENT AS PER ICF DRG. NO. T-0-0-801 OR FRICTION SNUBBER~~
③ ~~WITH SELF LUBRICATING GUIDE BUSH AS PER RDSO SPECIFICATION No. CK-401 & RDSO/2006/CG-14 (Rev.1 OR LATEST)~~.
2. THE VARIOUS CLEARANCES OF THE BOGIE SHALL BE AS PER ICF DRG NO.T-9-0-712 FOR GS COACH WHEREVER APPLICABLE.
- ② ① 3. FITMENT OF FRICTION SNUBBER SHALL BE ~~DONE WITH SELF LUBRICATING GUIDE BUSH AS PER RDSO SPECIFICATION No. RDSO/2006/CG-14 OF DEC.'06 OR LATEST.~~

	8	BRAKE CYLINDER FIXING BRACKET	2	-	-	IS:2062 Fe410CuWA	-
③	7	BRAKE LEVER HANGER BRACKET	4	T-0-3-632	-	-	-
	6	PULL ROD	2	T-3-2-801 ITEM NO.-7	-	-	MODIFIED
	5	BOLSTER SPRING	8	-	-	IS:3195 Gr52Cr4Mo2V	415-480 BHN
	4	AXLE BOX SPRING	16	-	-	IS:3195 Gr52Cr4Mo2V	415-480 BHN
	3	LEVER HANGER	4	T-3-2-801 ITEM NO.-6	-	-	MODIFIED
	2	LEVER	4	-	-	IS:2062 Fe410CuWA	-
	1	LEVER	4	T-3-2-801 ITEM NO.-4	-	-	MODIFIED
ITEM	DESCRIPTION		NO.OF PER BOGIE	REF.DRG.	WT. OF ONE(Kg)	MATL.&SPEC.	REMARKS
	PRELIMINARY SKETCH			ONLY FOR PROTOTYPE APPLICATION UNDER GUIDANCE OF R.D.S.O. (WAGON)			
SUPERSEDED BY			BOGIE BRAKE VAN TYPE 'BVZI' MODIFICATION IN ICF BOGIE FOR USE ON BRAKE VANS (WITH BMBS)				
SUPERSEDES		DATE					
SCALE	PASSED	Sd/A.N.MEHTA 11/04					
	CHECKED	Sd/J.AHMAD 11/04					
	DRAWN	S.S.KUMAR 09/10					
	TRACED	- -					
	COMPARED	- -					
	J.S.NO.	WD-04050 7/04					
B.G.	R.D.S.O. [W]		GROUP	WD-04050-S-02			



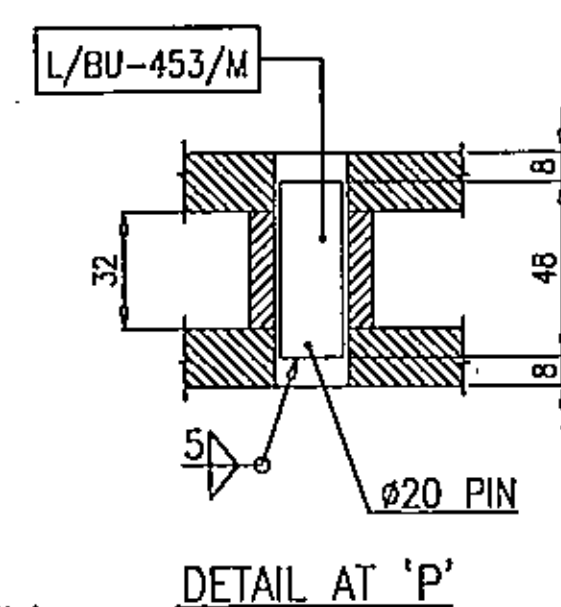
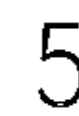
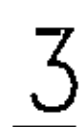
SECTION 'XX'



ITEM	DESCRIPTION	QTY	REF. DRGS.	MT. OF ONE (kg)	MATL & SPEC	REMARKS
26	PULL ROD END PIECE	2	SKETCH-K1034 ITEM-1	-	-	
25	LEVER	2	WD-04050-S-04 ITEM-06	-	-	
24	SUPPORTING PLATE	1	WD-04050-S-04 ITEM-04	-	-	
23	PULL ROD (ø25X1255)	1	SKETCH-K1034 ITEM-4	-	-	MODIFIED
22	TURN BUCKLE	1	EMU-3-4-010	-	-	
21	HEX NUT-M24	2	-	-	-	
20	PIN COTTERED	1	SK-74540 ITEM-09	-	-	
19	PIN COTTERED	1	W/PN-57	-	-	
18	PIN COTTERED	1	W/PN-55	-	-	
17	PIN COTTERED	1	W/PN-47	-	-	
16	PIN FOR PULL ROD ROLLER	1	W/BG-6236	-	-	
15	ROLLER FOR PULL ROD	1	W/BG-6200	-	-	
14	HANGER FOR PULL ROD ROLLER	2	W/BG-6350	-	-	
13	HAND BRAKE SCREW BEARING WASHER	1	W/BG-1217	-	-	
12	SUPPORTING BRACKET	2	WD-04050-S-04 ITEM-03	-	-	
11	HAND BRAKE BELL CRANK	1	WD-04050-S-04 ITEM-05	-	-	
10	HAND BRAKE SCREW NUT	1	W/BG-1102	-	-	
9	HAND BRAKE SCREW LINK	2	WA/BG-1220	-	-	
8	HAND BRAKE SCREW FOOT	1	W/BG-1105	-	-	
7	HAND BRAKE COLUMN	1	W/BG-1104	-	-	
6	HAND BRAKE SCREW	1	WA/BG-1216	-	-	
5	HAND BRAKE WHEEL	1	W/BG-1100	-	-	
4	" " BELL CRANK BKT.	1	W/BG-1219	-	-	
3	HAND BRAKE CONNECTING LINK	1	WD-04050-S-04 ITEM-02	-	-	
2	PULL ROD (ø25X740)	1	SKETCH-K1034 ITEM-2	-	-	MODIFIED
1	HORIZONTAL LEVER	2	WD-04050-S-04 ITEM-01	-	-	

PRELIMINARY SKETCH		ONLY FOR PROTOTYPE APPLICATION UNDER GUIDANCE OF R.D.S.O.(WAGON)	
SUPERSEDED BY		BOGIE BRAKE VAN TYPE 'BVZI'	
SCALE	PASSED	DATE	
1:10	CHECKED	12/04	
	DRAWN	12/04	
	TRACED		
	COMPARED		
J.S.NO.	WD-04050	8/04	
B.G.		R.D.S.O.	GROUP I
		[W]	WD-04050-S-03

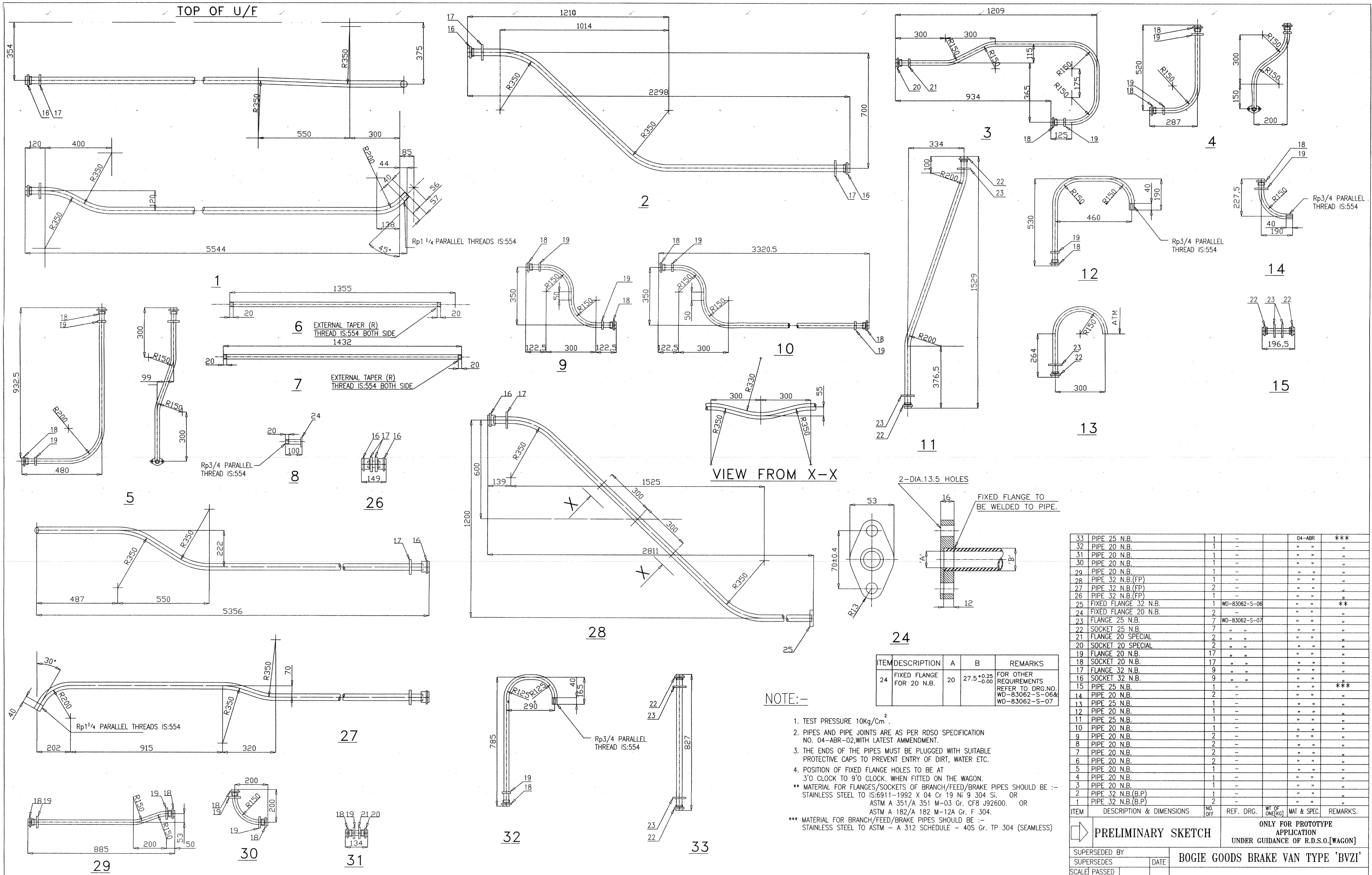
ALT.	ITEM	AUTHY.	DESCRIPTION	DATE	ASSLY. DRGS.
①	-	WD-10070	BOLSTER BOTTOM GUSSET REMOVED & STIFFENER, FILLER PLATE ADDED	10/10	--



① NOTE:-
BRAKE GEAR BUSHES OF NYLON-66 SHALL BE USED AS PER STR No. WD-04-NYLON BUSHES-2002 OR LATEST.
STEEL PINS USED SHALL BE WITH FINE FINISH MACHINED ON ALL CONTACT SURFACE WITH THE BUSH.

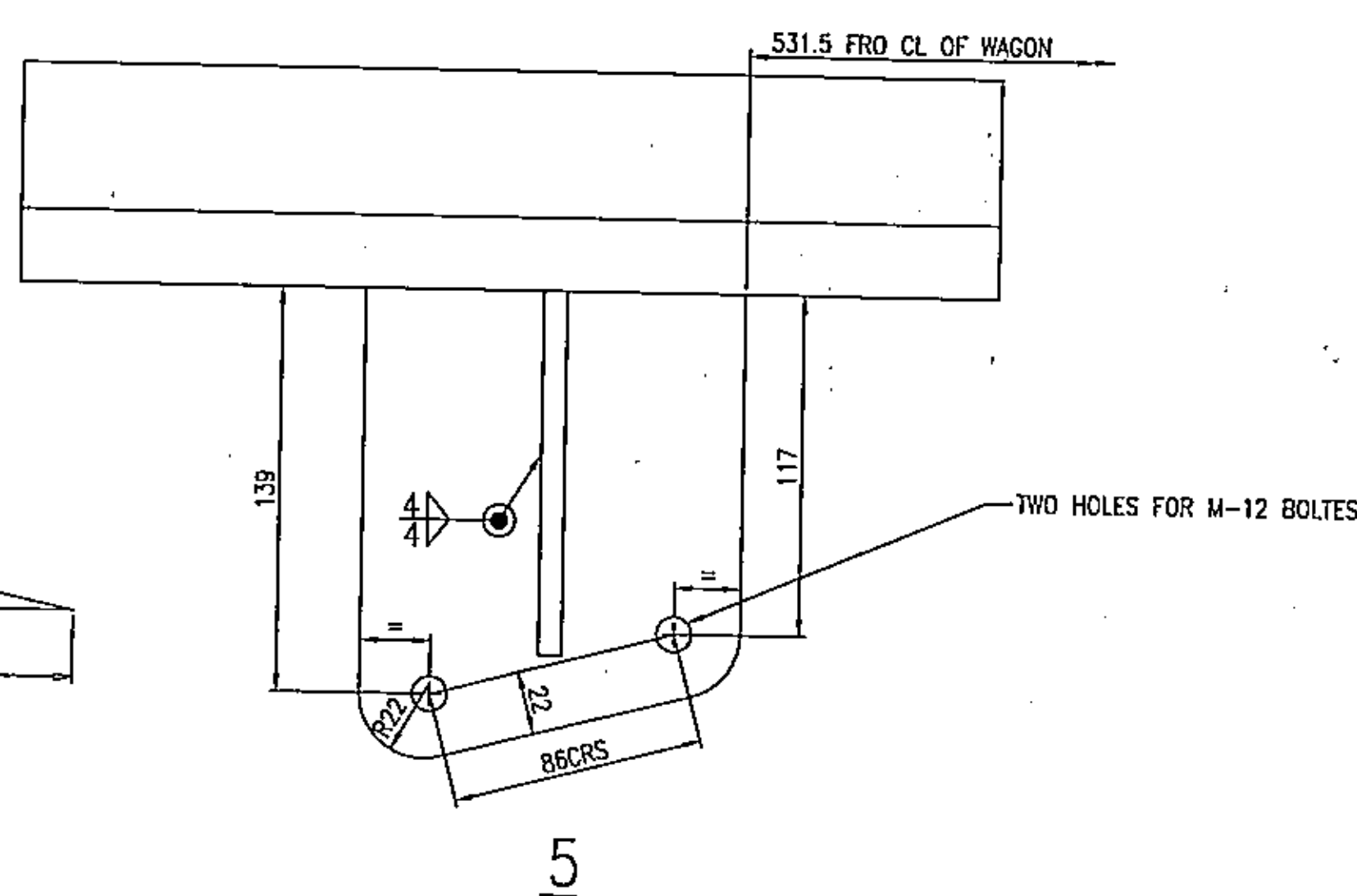
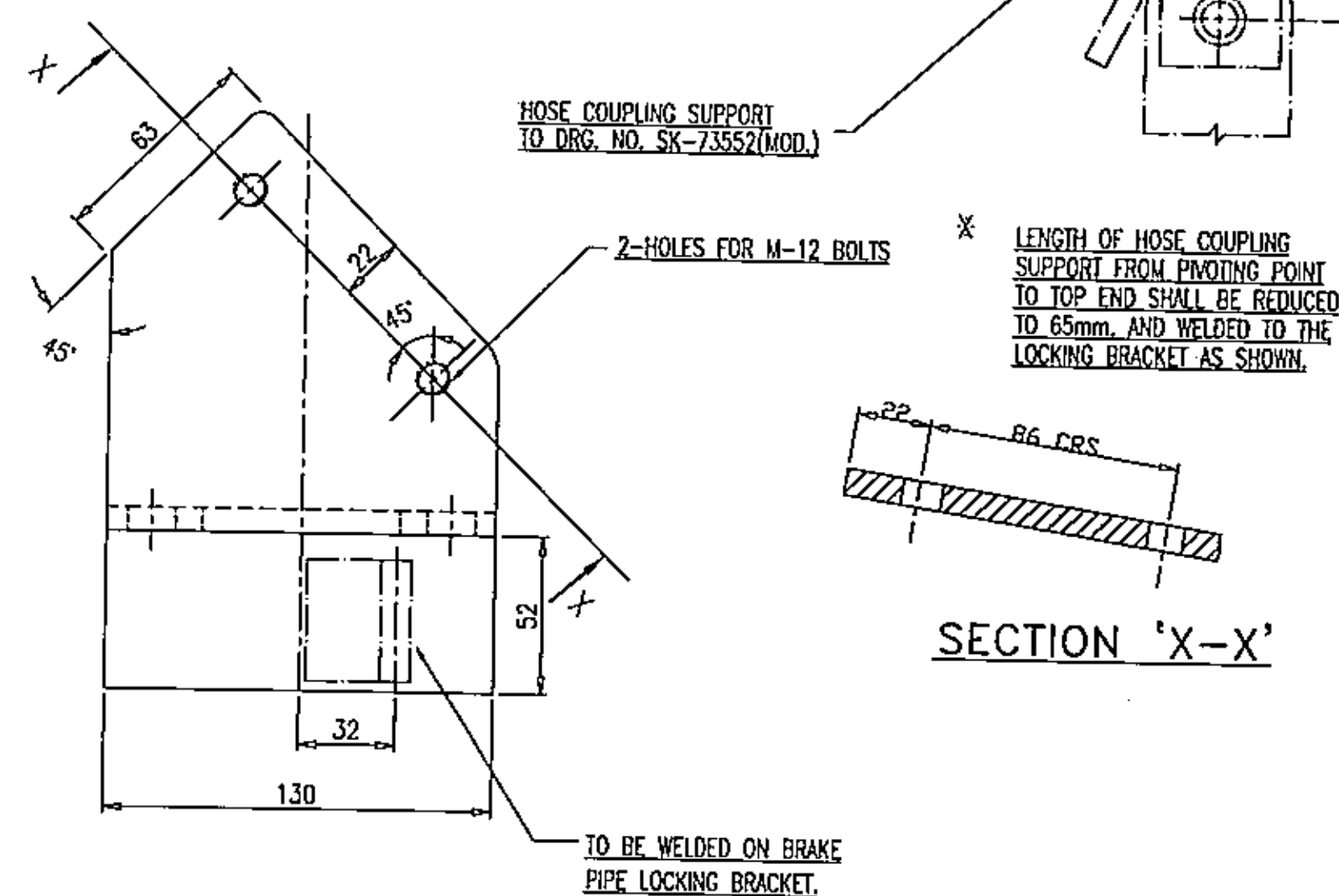
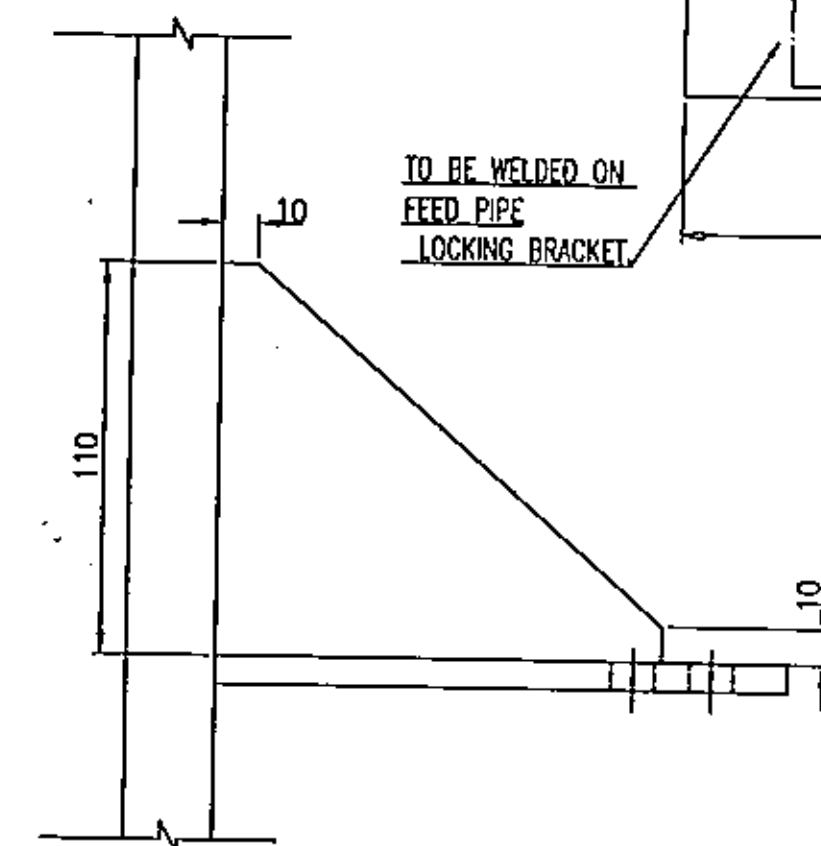
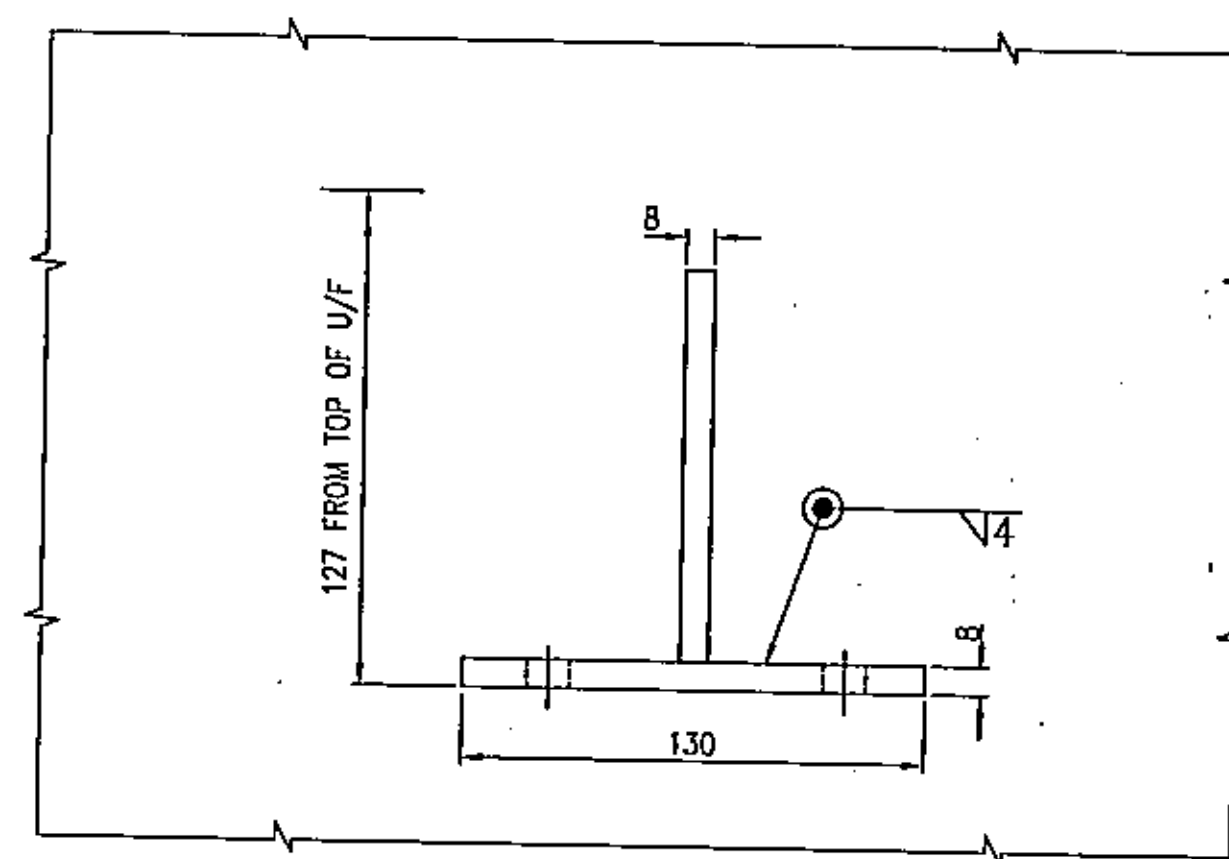
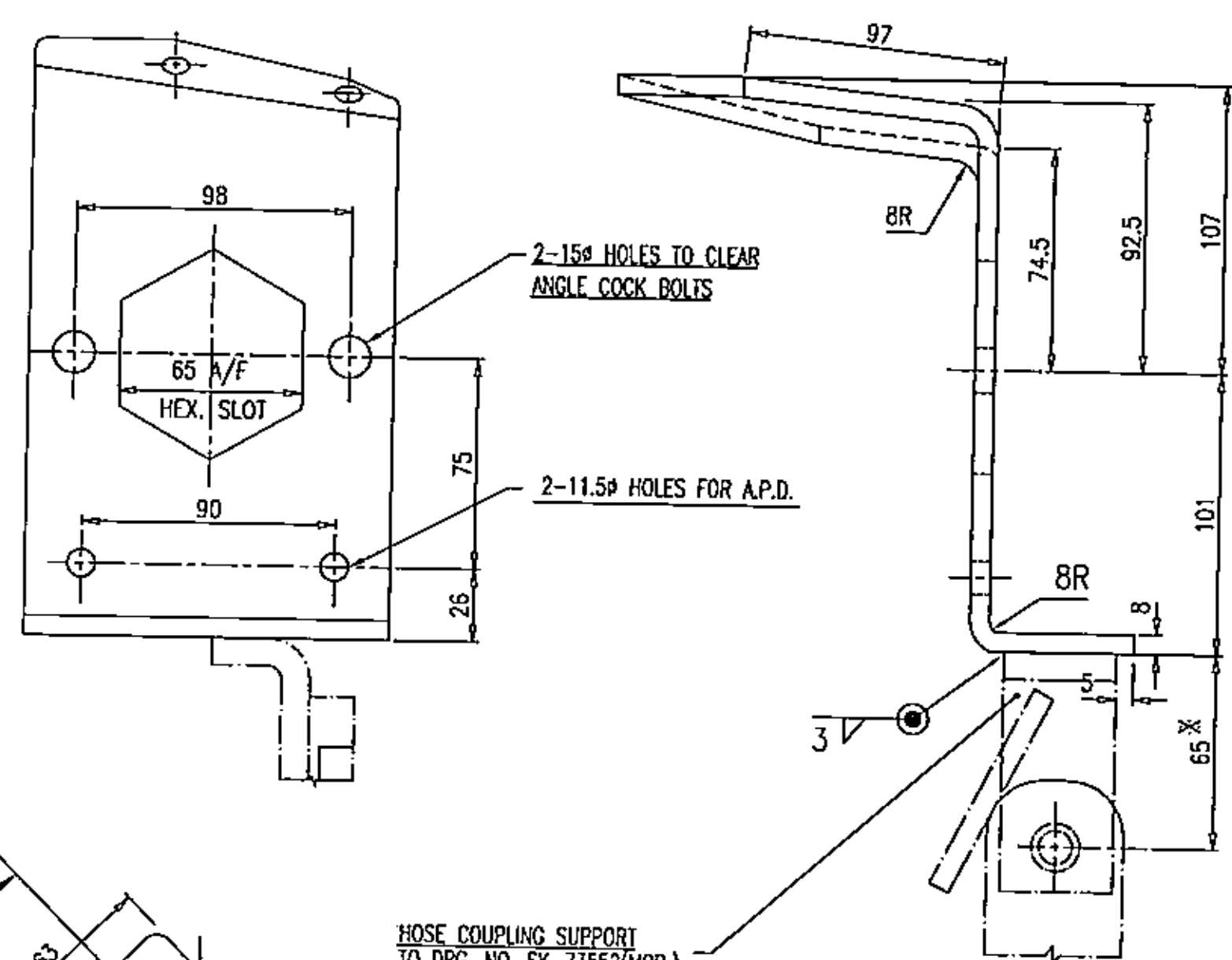
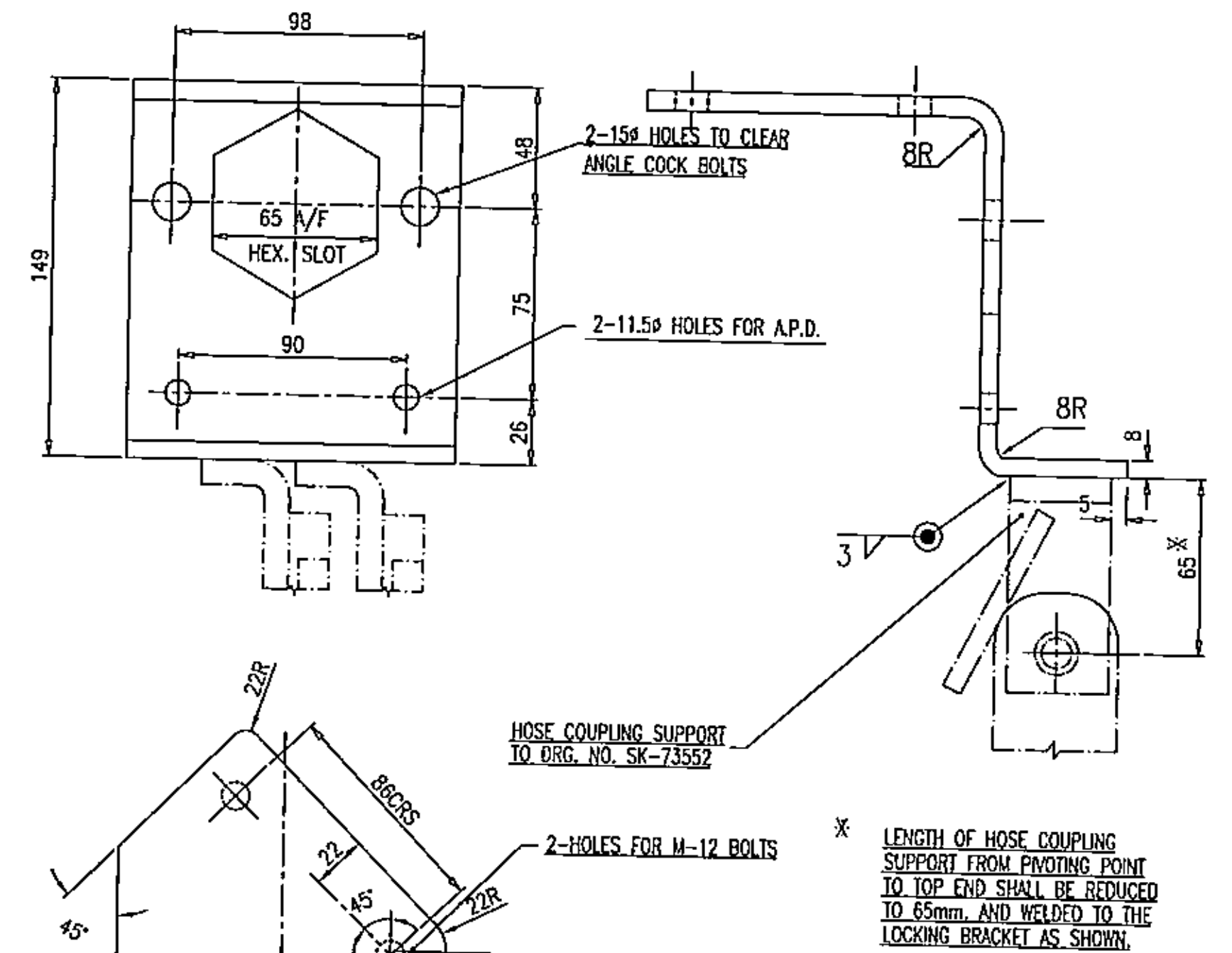
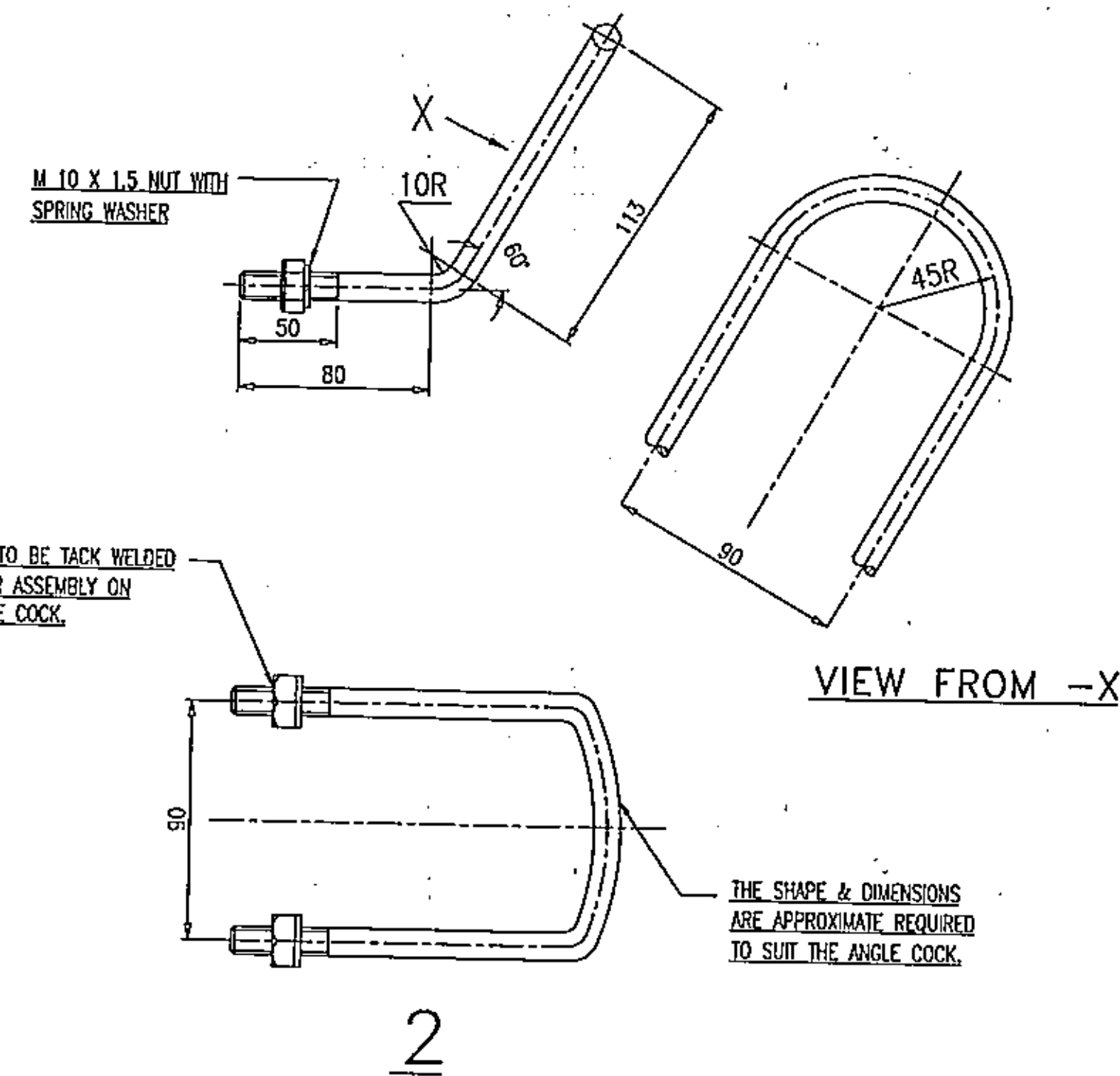
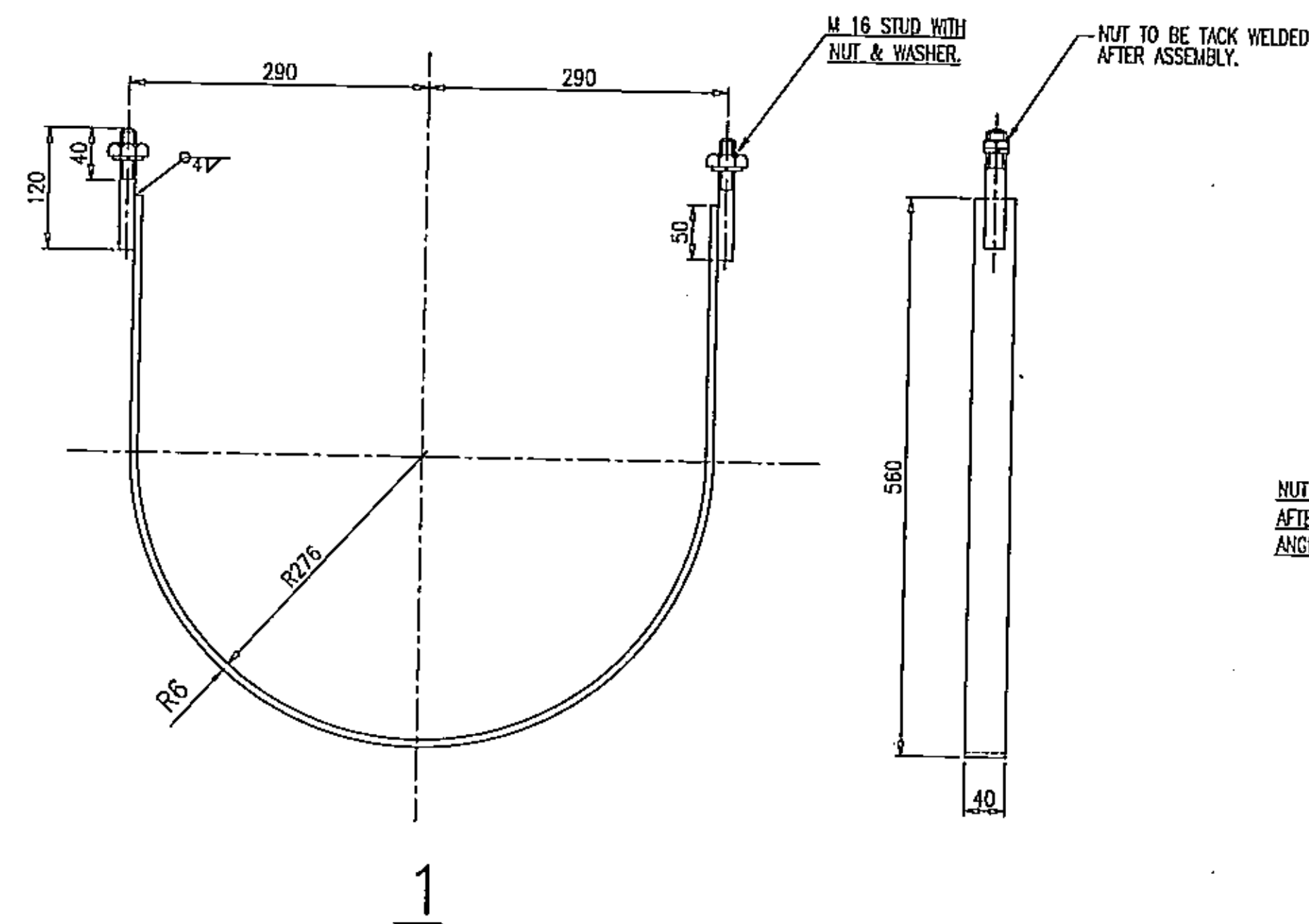
6	LEVER 20x120x512	2	—	IS:2062 Fe 410 CU WA			
5	HAND BRAKE BELL CRANK	1	—	IS:2062 Fe 410 CU WA			
4	SUPPORTING PLATE	1	—	IS:2062 Fe 410 CU WA			
3	SUPPORTING BRACKET	2	—	IS:2062 Fe 410 CU WA			
2	HAND BRAKE CONNECTING LINK	1	—	IS:2062 Fe 410 CU WA			
1	HORIZONTAL LEVER	2	—	IS:2062 Fe 410 CU WA			
ITEM	DESCRIPTION	NO.OFF	REF. DRG.	W/O (OVER)	MAT.&SPEC.		
 PRELIMINARY SKETCH		ONLY FOR PROTOTYPE APPLICATION UNDER GUIDANCE OF R.D.S.O. (W)					
SUPERSEDED BY		BOGIE GEAR VAN TYPE 'BVZI'					
SUPERSEDES							
DATE		HAND BRAKE GEAR DETAILS (WITH BMBS)					
SCALE	PASSED					Sd/ALUMBA	11/04
1:10	CHECKED					Sd/J.A.HMAD	11/04
	DRAWN					D.KUMAR	8/00
	TRACED					—	—
	J.S.NO.	WD-00039	8/00				
B.G.		R.D.S.O.	GROUP	WD-04050-S-04			
		[W]					

59	PACKING 100X40X56	2				* SEE NOTE NO. 7
58	ANGLE 50X50X6X 327 LONG	3			E:2005-2006 E:410Cu	
57	APD FOR QUICK COUPLING	2	WD-99021-S-01			
56	PACKING 110X40X64	3				* SEE NOTE NO. 7
55	PIPE 25 N.B	1	WD-10004-S-03 ITEM-15			AR BRIVE WAGON FACTORY'S SUPPLY
54	ANGLE 50X50X6X 442 LONG	1			E:2005-2006 E:410Cu	
53	ANGLE 50X50X6X 200 LONG	1				
52	ANGLE 50X50X6X 384 LONG	5				
51	ANGLE 50X50X6X 264 LONG	2				
50	ANGLE 50X50X6X 285 LONG	2				
49	ANGLE 50X50X6X 527 LONG	4				
48	TEE 20X20X20	1	SK-96074 ITEM-2			AR BRIVE WAGON FACTORY'S SUPPLY
47	HOSE COUPLING ASSY 20 NB	6				
46	GUARD EMERGENCY BRAKE VALVE	1	SK-73549			
45	PIPE 20 N.B	2	WD-10004-S-03 ITEM-14			
44	QUICK COUPLING PLUG	2	WD-91101-S-05			
43	QUICK COUPLING SOCKET	2	WD-91101-S-06			
42	PRESSURE GAUGE (63mm) FOR B.P	1	WD-92047-S-01			
41	PIPE 25 N.B	1	WD-10004-S-03 ITEM-13			
40	PIPE 20 N.B	1	WD-10004-S-03 ITEM-12			
39	ISOLATING COCK	2	WD-83062-S-04			
38	SOCKET REDUCING 20X10mm	2				
37	TEE FLANGE WITH NIPPLE	1				
36	PIPE 25 N.B	1	WD-10004-S-03 ITEM-11			
35	BOLT M10X75 LONG WITH NUT AND SPRING WASHER	8				
34	CLAMP FOR PIPE 25 N.B.	3	WD-04058-S-01 ITEM-2			
33	AUXILIARY RESERVOIR SUSPENSION STRAP.	2	WD-10004-S-04 ITEM-1			
32	A.P.D. FOR CUT OFF ANGLE COCK	4	WD-10004-S-04 ITEM-3			
31	LOCKING BRACKET(BP)	2	WD-10004-S-04 ITEM-4		E:2005-2006 E:410Cu	
30	COUPLING SUPPORT	4	SK-73552			
29	BOLT M10X140 LONG WITH NUT AND SPRING WASHER	10				
28	BOLT M16X70 LONG WITH NUT AND SPRING WASHER	4			IS:1364 & IS: 3063	
27	BOLT M12X40 LONG WITH NUT AND SPRING WASHER	8				
26	BOLT M10X90 LONG WITH NUT AND SPRING WASHER	22				
25	BOLT M10X110 LONG WITH NUT AND SPRING WASHER	34			IS:1364 & IS: 3063	
24	PACKING 100X40X40	11				* SEE NOTE NO. 7
23	PACKING 140X40X5.5	2				
22	PACKING 120X40X40	15				
21	CLAMP FOR PIPE 20 N. B	13	WD-04058-S-01 ITEM-1			
20	CLAMP FOR PIPE 32 N.B	4	WD-04058-S-01 ITEM-4			
19	CLAMP FOR PIPE 32 N.B	17	WD-04058-S-01 ITEM-3			
18	PIPE 20N.B	1	WD-10004-S-03 ITEM-10			AR BRIVE WAGON FACTORY'S SUPPLY
17	PIPE 20N.B	1	WD-10004-S-03 ITEM-9			
16	PIPE 20N.B	2	WD-10004-S-03 ITEM-8			
15	PIPE 20N.B	2	WD-10004-S-03 ITEM-7			
14	PIPE 20N.B	2	WD-10004-S-03 ITEM-6			
13	PIPE 20N.B	1	WD-10004-S-03 ITEM-5			
12	PIPE 20N.B	1	WD-10004-S-03 ITEM-4			
11	PIPE 20N.B	1	WD-10004-S-03 ITEM-3			
10	PIPE 32 N.B.	1	WD-10004-S-03 ITEM-2			
9	PIPE 32 N.B.	2	WD-10004-S-03 ITEM-1			
8	TEE FLANGE	2	WD-94956-S-01 ITEM-1			
7	LOCK NUT Rp 1 1/4	4			IS:3468	
6	AIR BRAKE HOSE COUPLING (B.P)	2	SK-73547			
5	DIRT COLLECTOR	2	WD-92051-S-03			
4	CUT-OFF ANGLE COCK	4	WD-85123-S-01			
3	AUXILIARY RESERVOIR (200 lts).	1	SK-96081			
2	PIPE BRACKET WITH CONTROL RESERVOIR	1	WD-9751-S-10			
1	DISTRIBUTOR VALVE	1	—			
ITEMS	DESCRIPTION & DIMENSIONS	NO. OF	REF. DRC.	WT. OF ONE Kg.	MAT. & SPEC	REMARKS
PRELIMINARY SKETCH			ONLY FOR PROTOTYPE APPLICATION UNDER GUIDANCE OF R.D.S.O.(WAGON)			
SUPERSEDED BY		DATE	Bogie Brake Van Type 'BVZI'			
SCALE/PASSED		04/10	FITMENT OF AIR BRAKE EQUIPMENT AND TWIN PIPE LAYOUT			
CHECKED		01/10				
DRAWN						
TRACED						
COMPARED						
J.S.NO.		WD-10004/G1/10				
B.G.		R.D.S.O. [w]	GROUP		WD-10004-S-02	

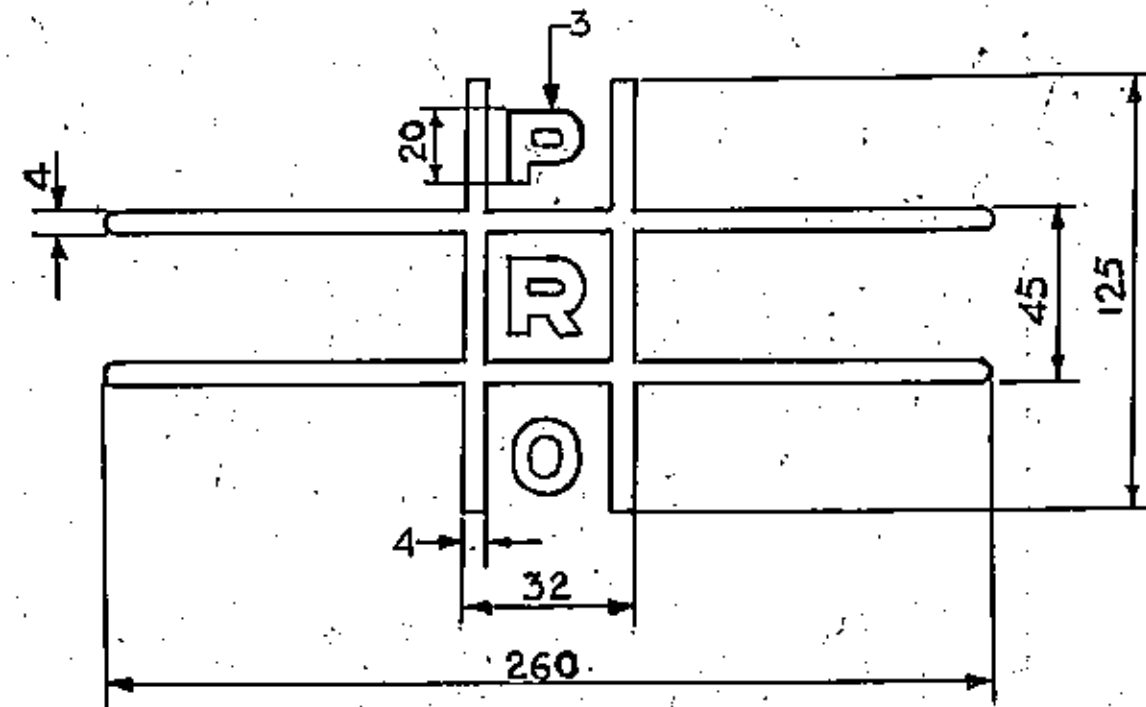


①	—	WD-19074	MATERIAL REVISED OF PIPE & SOCKET AND FLANGE	11/19	WD-10004-S-02
ALT	ITEM	AUTHY	DESCRIPTION	DATE	ASSY. DRG.

PRELIMINARY SKETCH		ONLY FOR PROTOTYPE APPLICATION UNDER GUIDANCE OF R.D.S.O.[WAGON]	
SUPERSEDED BY	DATE	BOGIE GOODS BRAKE VAN TYPE 'BVZI'	
SCALE	PASSED	DETAIL OF PIPES FOR FITMENT OF TWIN PIPE AIR BRAKE EQUIPMENT	
1:5	CHECKED		
1:10	DRAWN	Shailendra 01/10	
	TRACED		
	J.S.NO	WD-10004	
B.G.	R.D.S.O.	GROUP	WD-10004-S-03
	[W]		



5	BRACKET SUPPORTING PLATE(FP)	2	1.22	IS:2062-2006 E-250-Cu		
4	LOCKING BRACKET(BP)	2	2.235	" "		
3	LOCKING BRACKET(FP)	2	-	" "		
2	APD. FOR CUT-OFF ANGLE COCK	4	0.367	" "		
1	AUXILIARY RESERVOIR SUSPENSION STRAP	2	-	" "		
ITEM	DESCRIPTION & DIMENSIONS	NO. OFF	REF.DRG.	WT.OF ONE(KG)	MAT.&SPEC	REMARKS
PRELIMINARY SKETCH			ONLY FOR PROTOTYPE APPLICATION UNDER GUIDANCE OF RDSO [W]			
SUPERSEDED BY						
SUPERSEDES		BOGIE GOODS BRAKE VAN TYPE 'BVZI'				
SCALE PASSED		DATE				
1:2 CHECKED		01/10				
DRAWN		01/10				
1:5 TRACED		01/10				
J.S. NO.		WD-10004/01/10				
B.G.		R.D.S.O.		GROUP		
[W]				WD-10004-S-04		

**NOTE:**

1. TO BE STENCILLED WITH WHITE PAINT
2. FOR WAGONS FITTED WITH ROLLER BEARING
AXLEBOXES LETTERS P&R ONLY TO BE
STENCILLED.
3. ALL DIMENSIONS IN MILLIMETRES.

COMP BY	SIG.	DATE
M.L. BAHL	<i>[Signature]</i>	19/5/97

ALT.	LETT	AUTHY	DESCRIPTION	DATE
-	-	-	RETRACED	2/97
①	-	CW-978	REVISED	9/63

MF AQU/393 MICROFILMED 7/89

SUPERSEDED BY	
SUPERSEDES	DATE
ENT/PASSED	Sd. -
CHECKED	Sd. -
DRAWN	Sd. -
TRACED	S. PLAN 2/97
J-SHEET	CW-978 9/63

B.G.
MGR.D.S.O.
(W)

GROUP

**PRO/PR
STENCIL****SK-63720**

A3

मध्य पूर्वी दक्षिण पूर्व

दक्षिण पूर्व उत्तर पूर्व दक्षिण

पूर्व पूर्व उत्तर पूर्व पूर्व

उत्तर दक्षिण पूर्व पूर्व

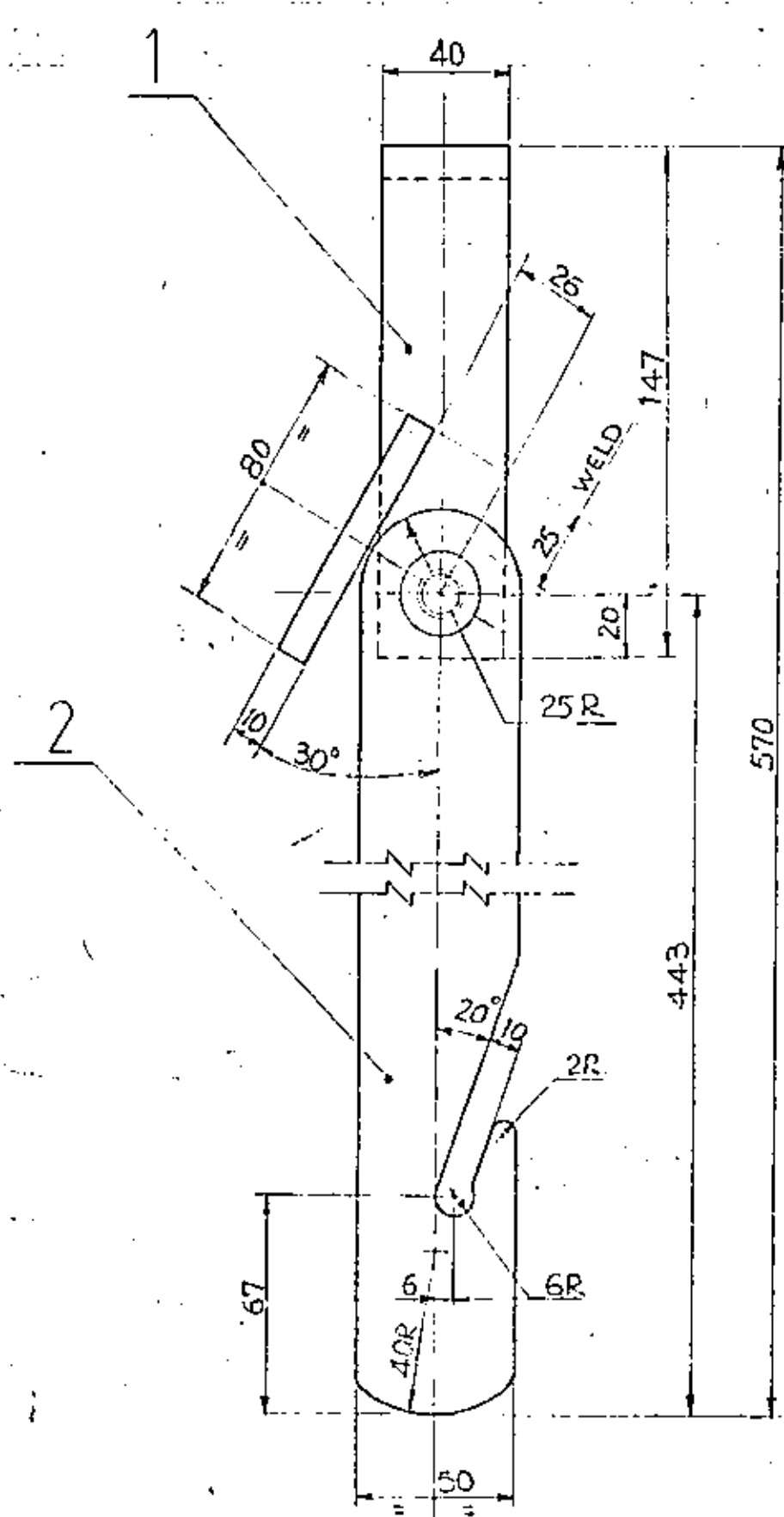
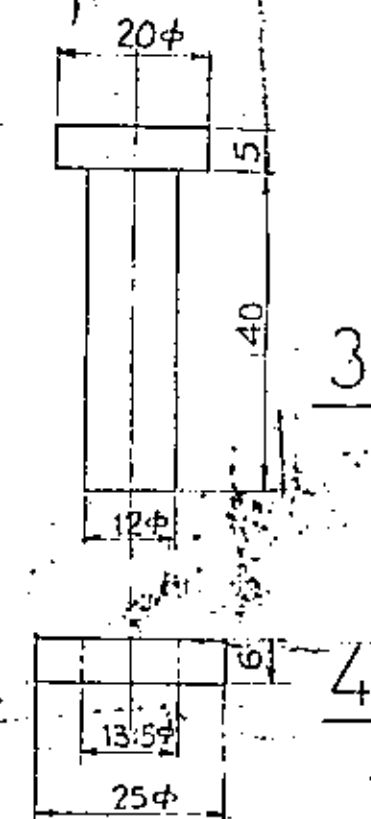
RAILWAY	INITIALS	रेलवे	प्रथमाक्षर
CENTRAL	CR	मध्य	मध्य
NORTH EAST FRONTIER	NFR	पूर्वोत्तर सीमा	पू सी
SOUTH EASTERN	SER	दक्षिण पूर्व	द पू
EASTERN	ER	पूर्व	पूर्व
SOUTHERN	SR	दक्षिण	द रे
WESTERN	WR	पश्चिम	प रे
NORTHERN	NR	उत्तर	उ रे
NORTH EASTERN	NER	पूर्वोत्तर	पू उ
SOUTH CENTRAL	SCR	दक्षिण मध्य	द म
EAST CENTRAL	ECR	पूर्व मध्य	पू म
EAST COAST	ECOR	पूर्व तटीय	पू त
NORTH CENTRAL	NCR	उत्तर मध्य	उ म
NORTH WESTERN	NWR	उत्तर पश्चिम	उ प
SOUTH EAST CENTRAL	SECR	दक्षिण पूर्व मध्य	द पू म
SOUTH WESTERN	SWR	दक्षिण पश्चिम	द प
WEST CENTRAL	WCR	पश्चिम मध्य	प म

NOTE:-

- THIS SKETCH SHOULD BE FOLLOWED ONLY FOR THE SHAPE AND PROPORTION OF THE LETTERS.
- THE ACTUAL MARKING & SIZE SHOULD BE AS PER THE RELEVANT PLATES OF IRCA RULES BOOK PART III OF LATEST REVISION.

①	-	WD-17024	NEW RLY ZONES, INITIALS ADDED & REVISED	04/17	
-	-	-	RETRACED	6/97	
ALT	ITEM	AUTHY	DESCRIPTION	DATE	ASSLY. DRG

SUPERSEDED BY	DATE
SUPERSEDES	
SCALE	PASSED
CHECKED	Sd/YAGASIA 6/66
DRAWN	Sd/JP SINGH 5/66
TRACED	Sd/SUKHADEV 5/66
J.S.NO.	R.JAIN 6/97
WG66031	5/66
B.G.	R.D.S.O. [W]
GROUP	SK.66511

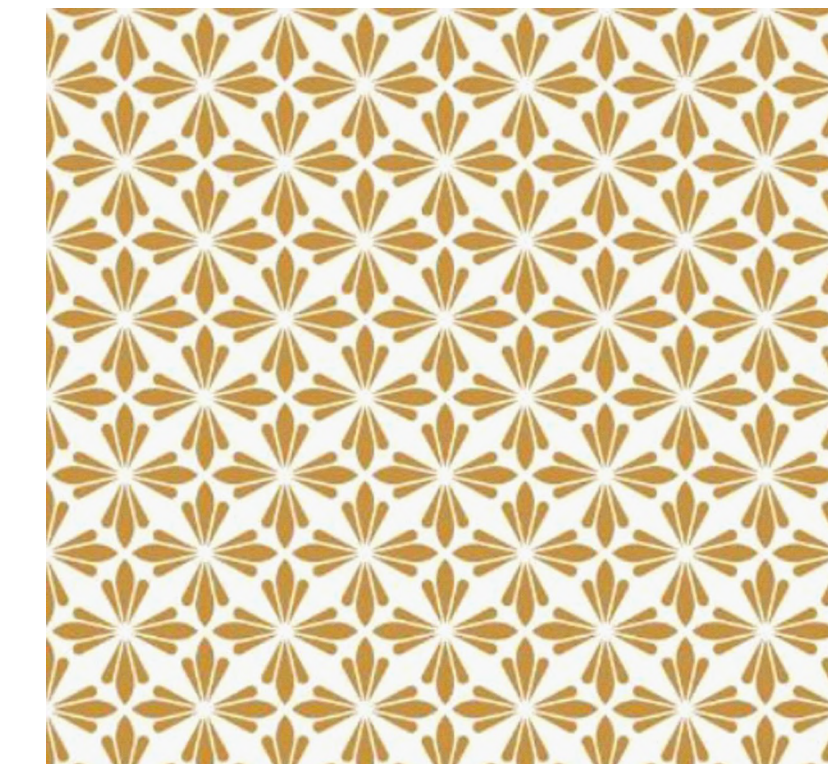
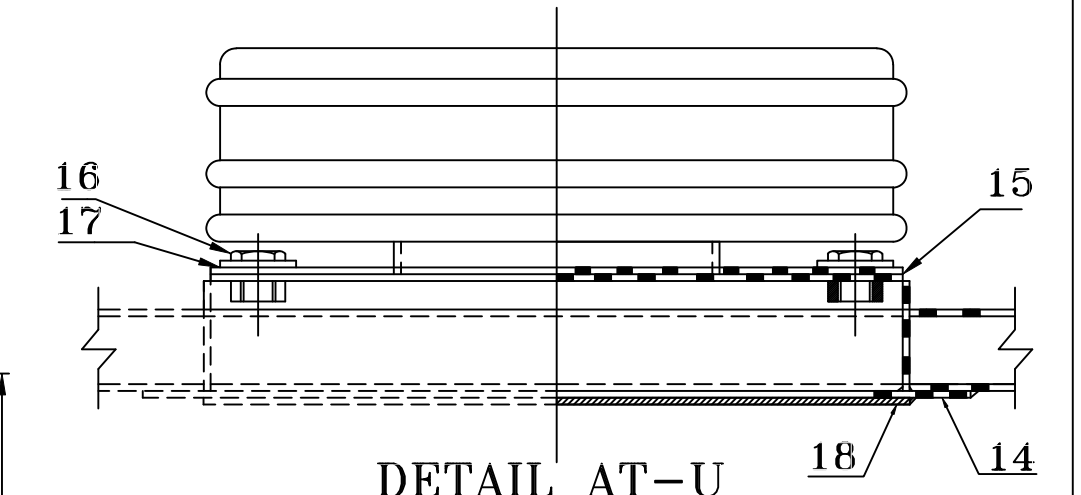
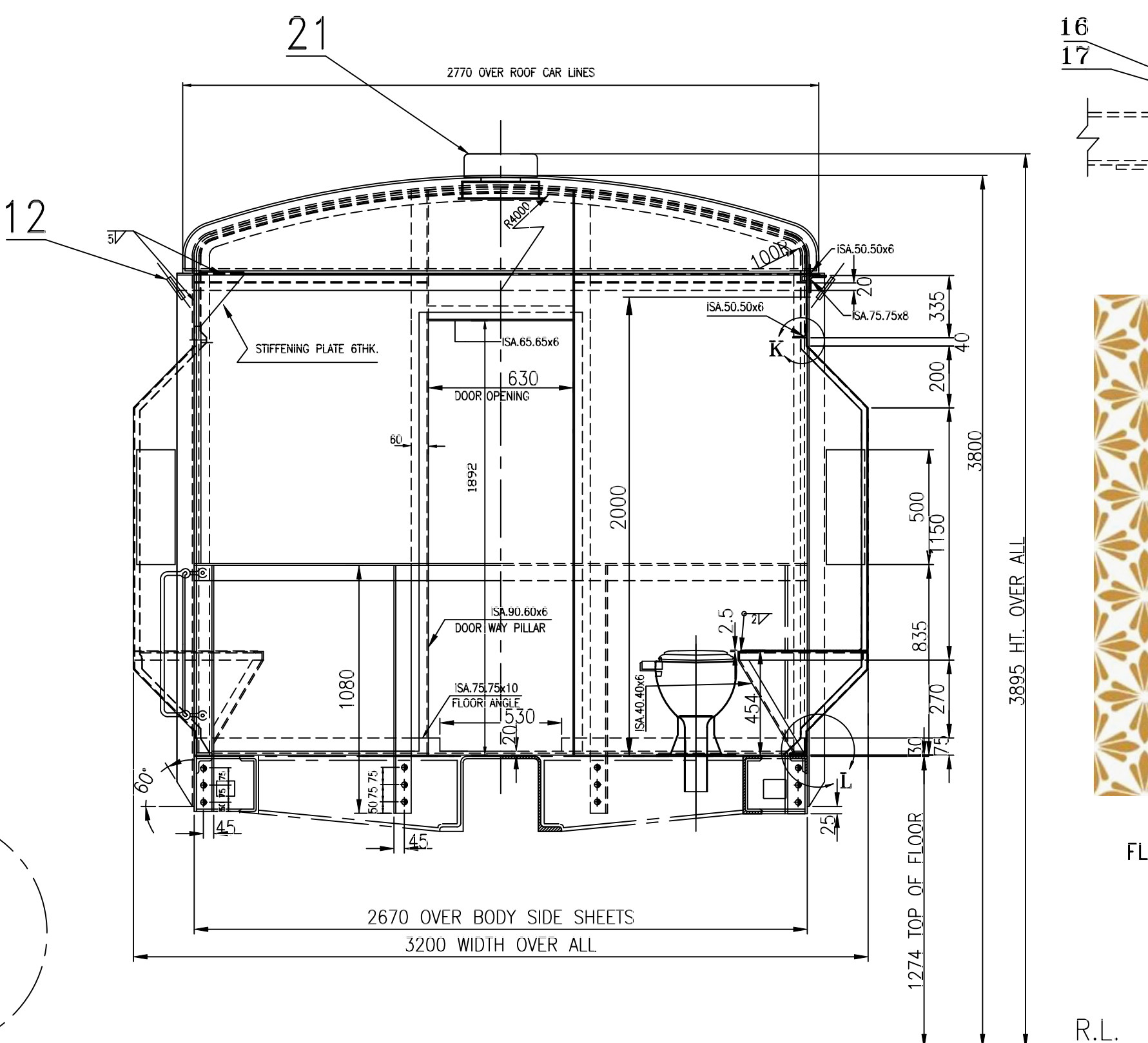
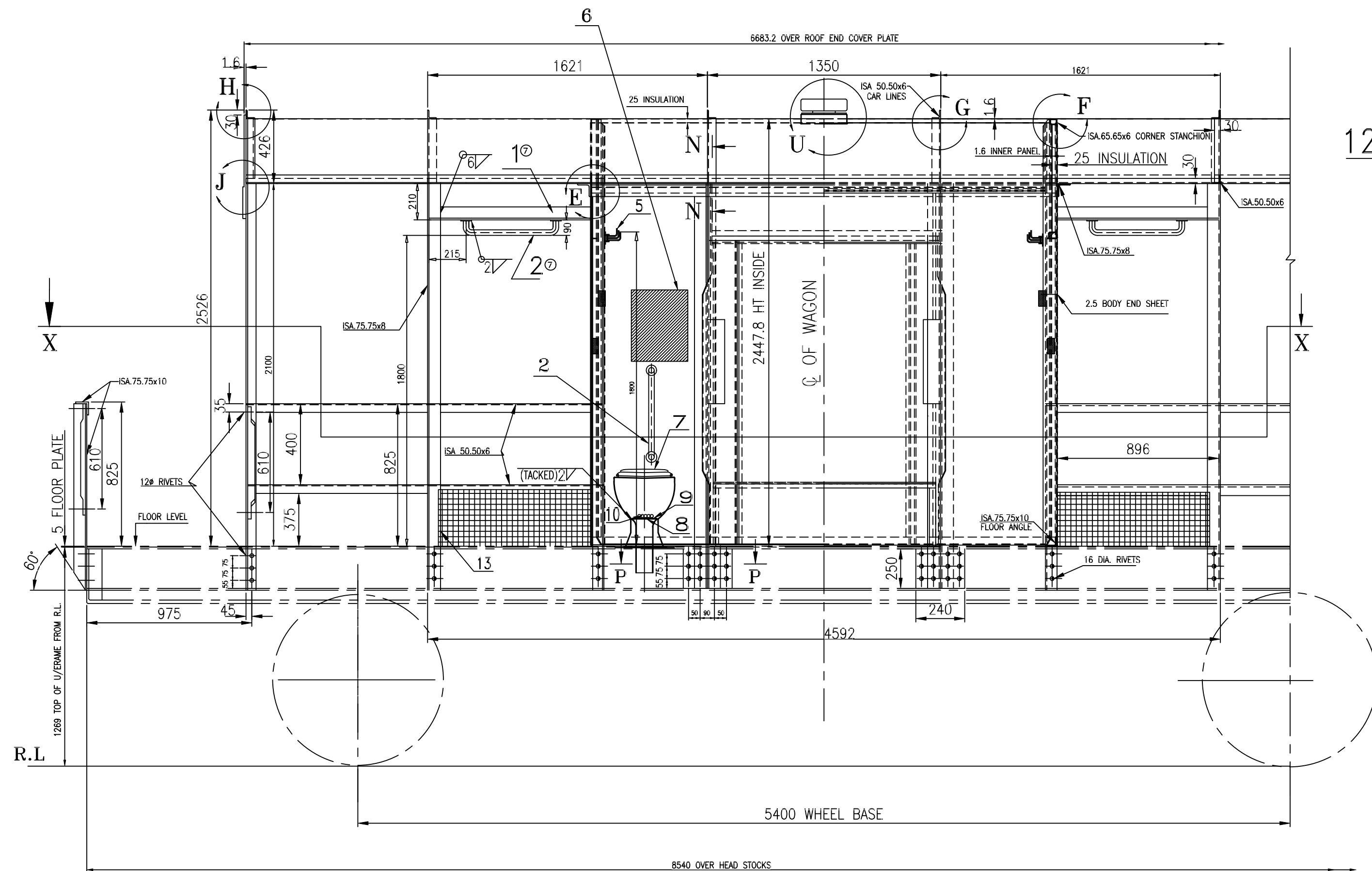
13.5 ϕ HOLE
ON ITEM 1 & 22
GAP

⑤	-	WD-04089	REVISED	3/06	
⑤	-	WD-03037	MATERIAL UPDATE	7/03	
④	-	WD-91027	REVISED & REDRAWN	4/91	
ALT.	ITEM	AUTHY.	DESCRIPTION	DATE	ASSY. DRG.

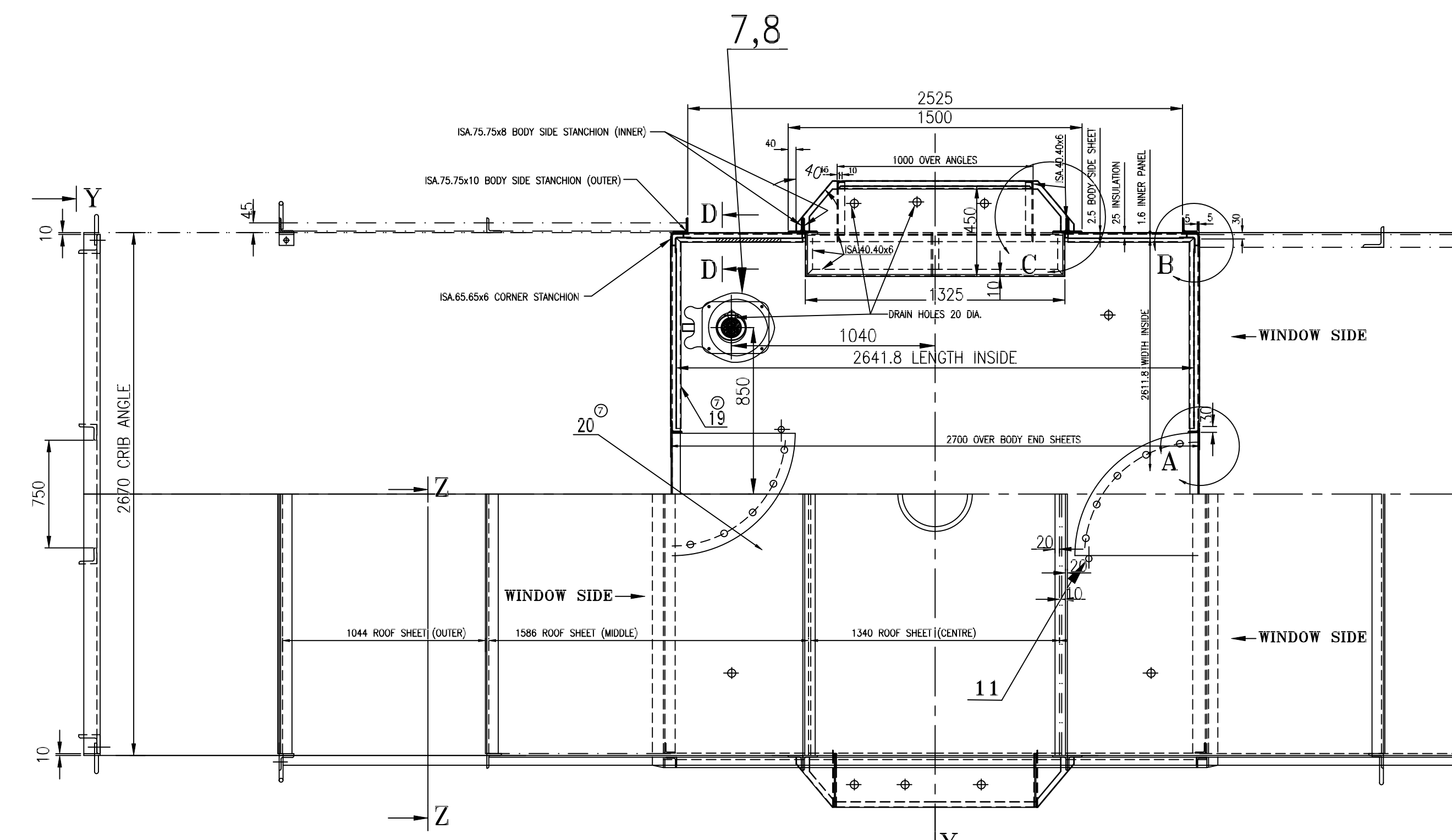
4.	WASHER	1			IS:2152 FE-PLA	
3.	PIN	1			" "	
2.	COUPLING SUPPORT	1			" "	
1.	COUPLING BRACKET	1			" "	
S.No	DESCRIPTION	No. OFF.	REF. DRG.	WT. OF ONE Kg.	MAT. & SPEC.	REMARKS

SUPERSEDED BY			FOR AIR BRAKE ON WAGON		
SUPERSEDES		DATE			
SCALE	PASSED	1:1	AIR BRAKE HOSE COUPLING SUPPORT		
1:2	CHECKED	1:1			
1:1	DRAWN	1:1			
	TRACED				
	SHEET				

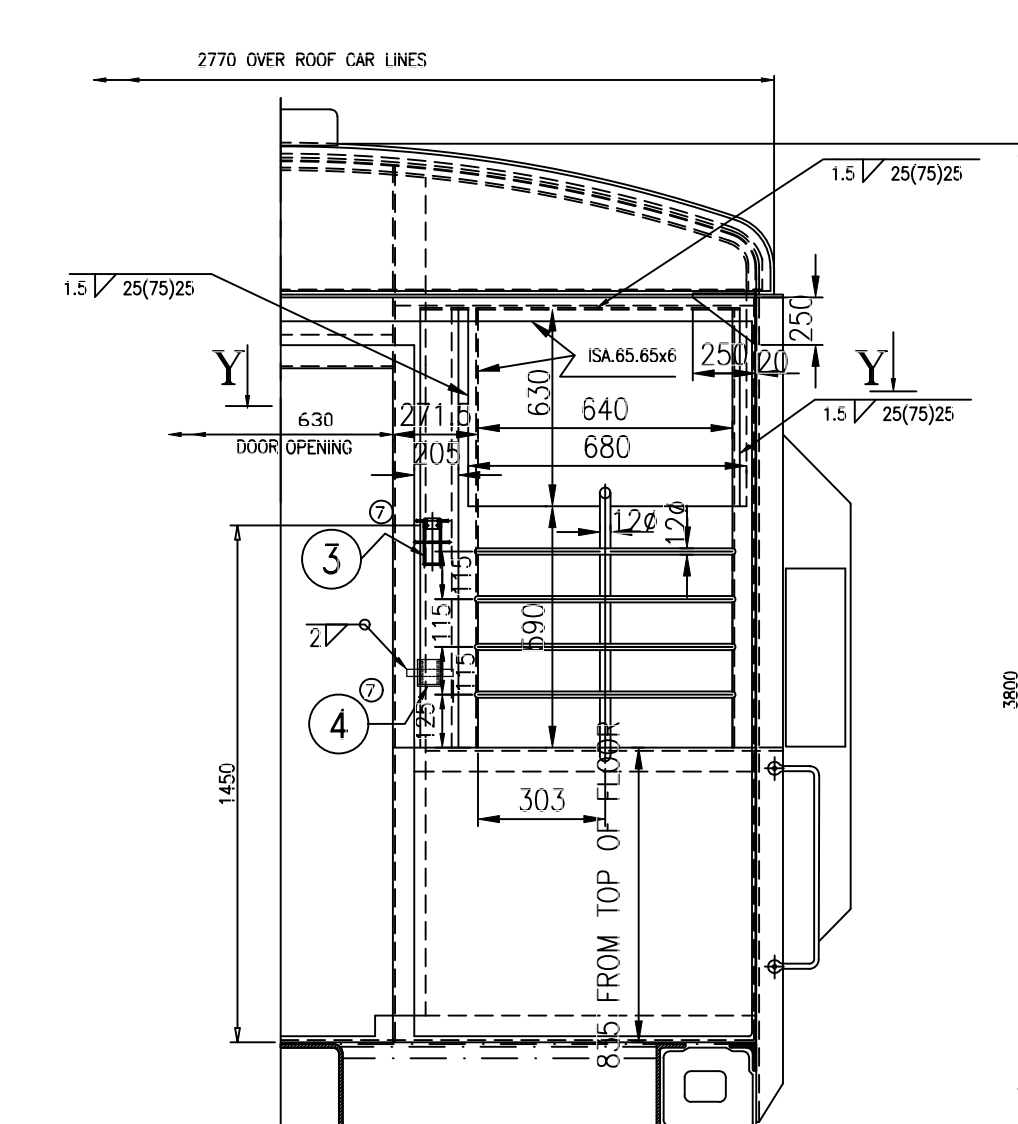
B.G.	P.D.S.O.	GROUP	SK-73552
	[W]		



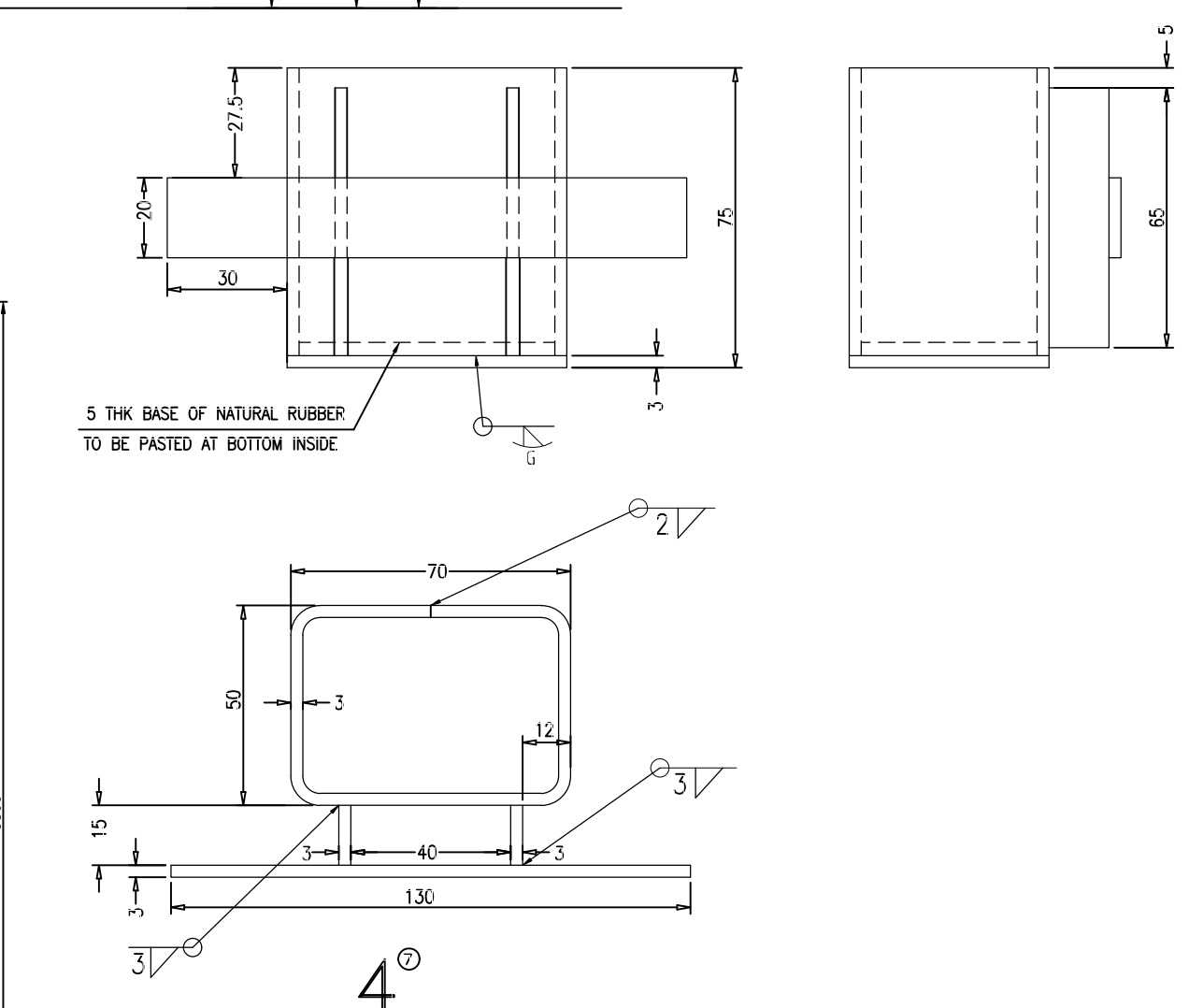
FLEET GRAPHICS FILM PATTERN AND COLOUR



HALF SECTION AT-YY

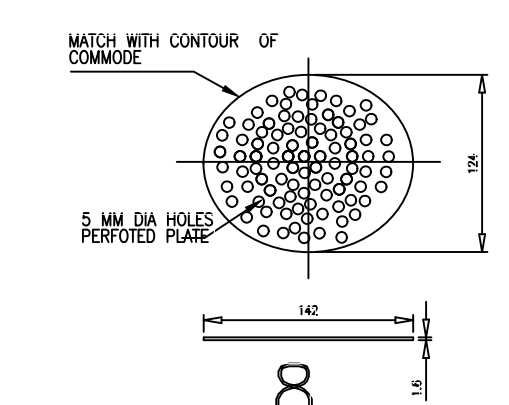


VIEW-ZZ



NOTE:-

1. FOR BODY & ROOF JOINT DETAILS REFER DRG. NO. 75528
2. 16# RIVETS SHOWN THUS
3. FOR ITEM NOS. AT DETAIL 'U' REFER TO ITEM NOS. OF DRG. SK-75527
4. FOR TYPE OF VENTILATOR REFER DRG. NO. CSC-1015



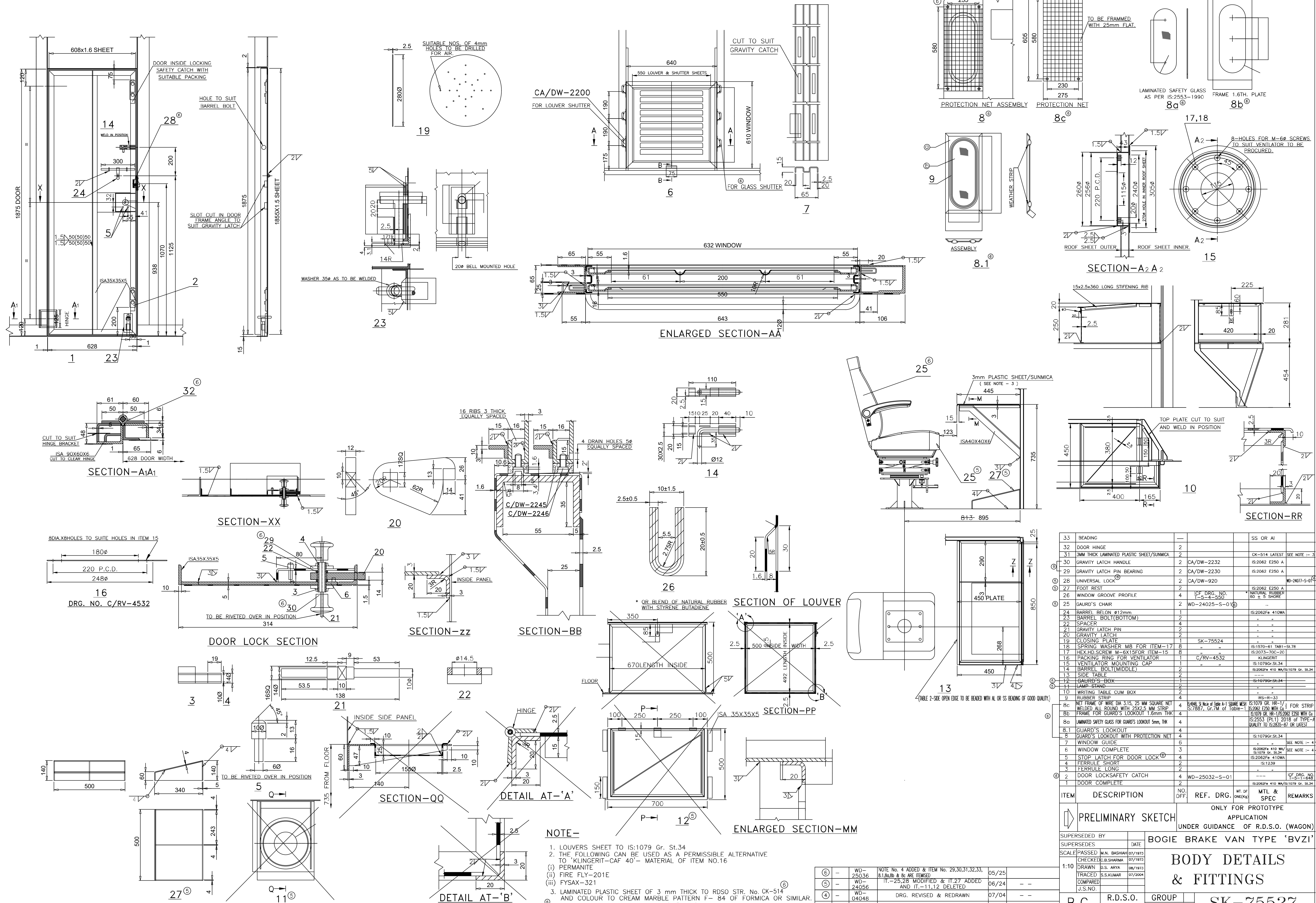
8

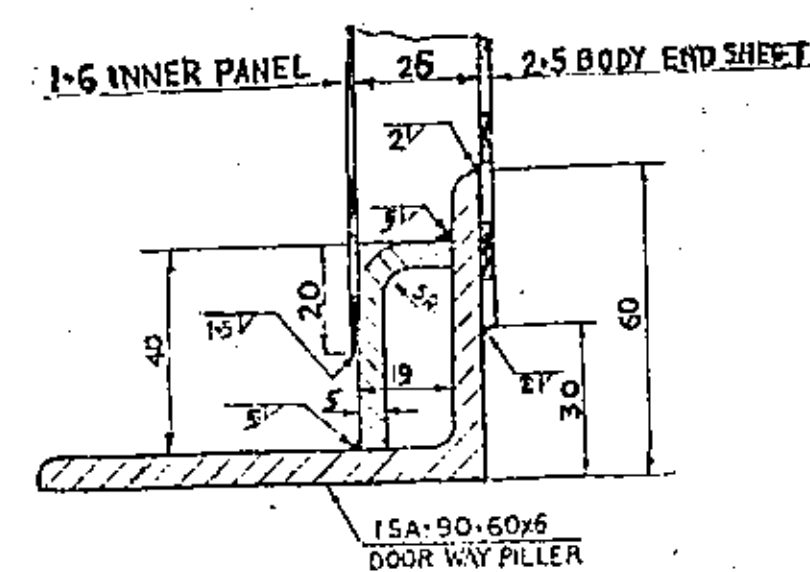
- NOTE:-
1. INSIDE CABIN FLOOR TO BE COATED WITH POLYAMINE EPOXY RESIN AS PER RCF SPEC. No. MDTs 44289.
 2. INTERIOR OF CABIN TO BE WRAPPED WITH FLEET GRAPHICS FILM AS PER RDSO SPEC. NO. RDSO/2010/CG08.
 3. COMMODOE TO DRG. No.ICF/STD-6-3-025 WITH SUITABLE CHUTE TO BE PROVIDED BY TAKING CARE OF ANY INFRINGEMENT AND PROPER SEATING.
- ITEM NO. 8 (PERFORATED PLATE) WILL BE TACK WELDED AT 12 TO 15 PLACES IN COMMODOE.

21	ROOF VENTILATOR	1	SK-78186		CSC-1015
20	POLYMER EPOXY RESIN FOR FLOOR	-	SEE NOTE-1	RCF SPEC NO. MDTs 44289	COLOR CODE RAL=1015
19	FLEET GRAPHICS FILM FOR INTERIOR	-	-	RDSO SPEC NO. RDSO/2010/CG-08	SEE NOTE-2
18	CLOSING PLATE	1	SK-75527		
17	SPRING WASHER M6 (FOR ITEM-7)	6	SK-75527		
16	HEX HEAD SCREW M6X15 (FOR ITEM-5)	6	SK-75527		
15	PACKING RING FOR VENTILATOR	1	SK-75527		
14	VENTILATOR MOUNTING CAP	1	SK-75527		
13	NET TENSILE OF WIRE OR 3.15 TO 3.5 MM SURFACE IN 1000 MM AT LEAST WITH 150X75 MM STRIP	4	SK-75527	IS 1079 GR. HR-17	FOR STRIP
12	25 DIA BORE PIPE (L=150)	4	SK-75527	IS 2062 250 WITH GR	
11	DOOR STOP	2	C/CF-311	IS 1239 MEDIUM	
10	NAPHTHALENE BALLS FOR WATERLESS URINAL	12		NAPHTHALENE	
9	PUFF FOR WATERLESS URINAL	1	-		
8	PERFORATED PLATE	1	-	SS 316 L	SEE NOTE-3
7	SS WATERLESS UNISEX URINAL	1	ICF/STD-6-3-025	ICF DRG.	
6	MIRROR ASSEMBLY	1	ICF/STD-6-3-008	ICF DRG.	
5	COAT HOOK	2	CC64254	RCF DRG.	
4	WALKIE-TALKIE HOLDER	2		IS 2062:2011 E250 A	
3	BOTTLE HOLDER	2	AB64134		PL No. 0118024
2	GRAB HANDLE	5	1E 2315B IR DRG.		
1	SUPPORT ANGLE ISA 75X75X10	4		IS 2062:2011 E250 A	
ITEM	DESCRIPTION	QTY	REF. DRGS.	MATL & SPEC	REMARKS
PRELIMINARY SKETCH					
ONLY FOR PROTOTYPE APPLICATION					
UNDER GUIDANCE OF R.D.S.O. (WAGON)					
GOODS BRAKE VAN TYPE 'BVZC', 'BVZI'					

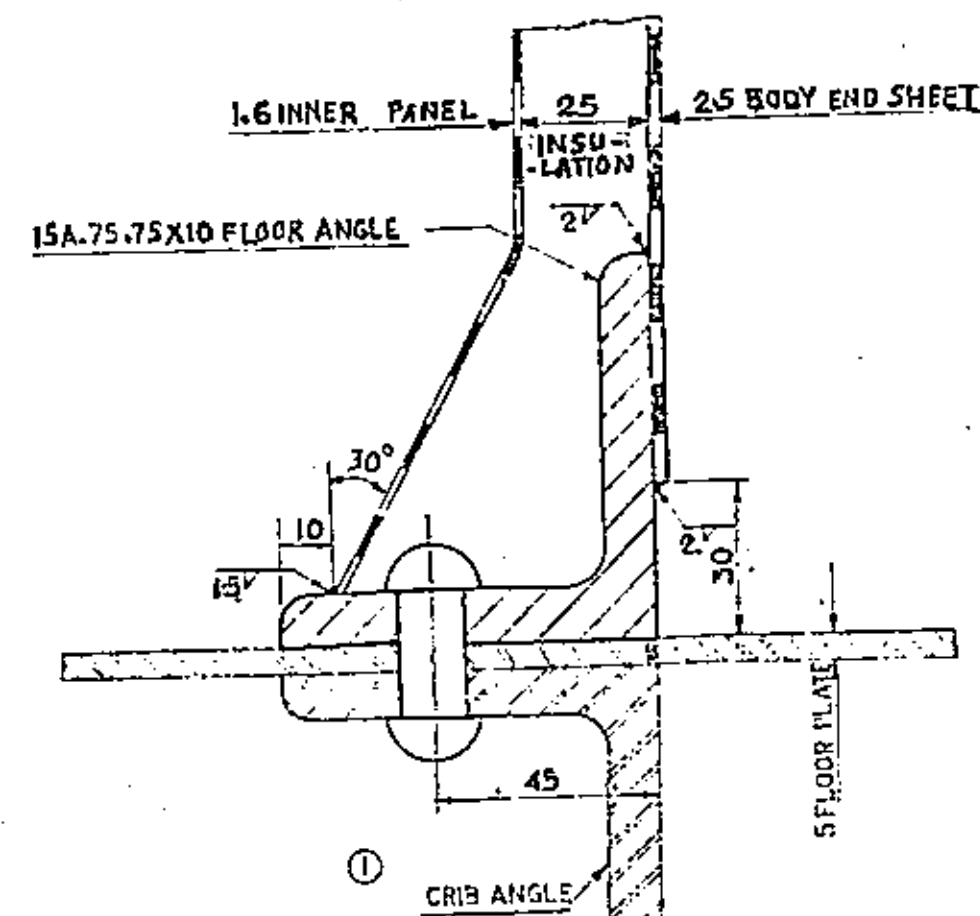
⑥	-	WD-23036	ITEM-5 TO 20 ARE ITEMIZED IN BOM & NOTE NO 3 ADDED	5/25	
⑦	-	WD-24056	DRG. REVISED, NOTE AND ITEM 1 TO 4 ADDED	6/24	
⑧	-	WD-04048	DRG. REVISED & REDRAWN	6/04	
ALT.	ITEM	AUTHY.	DESCRIPTION	DATE	ASSLY. DRGS.

SUPERSEDED BY	DATE	SCALE	PASSED BY	DATE
SUPERSEDED		SCALE	PASSED BY	DATE
CHECKED BY	DATE	CHECKED BY	DATE	
TRACED BY	DATE	TRACED BY	DATE	
COMPALED BY	DATE	COMPALED BY	DATE	
GROUP		GROUP		
B.G.	R.D.S.O. [W]	GROUP		
ARRANGEMENT OF SUPER STRUCTURE				
SK-75524				

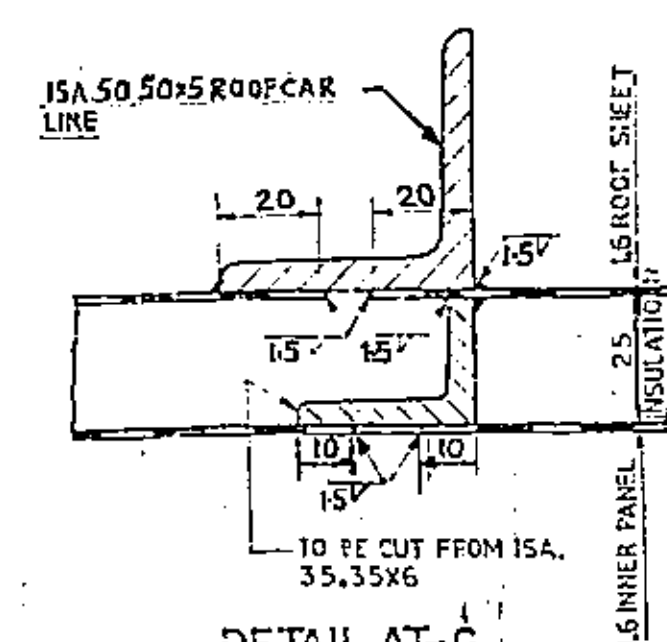




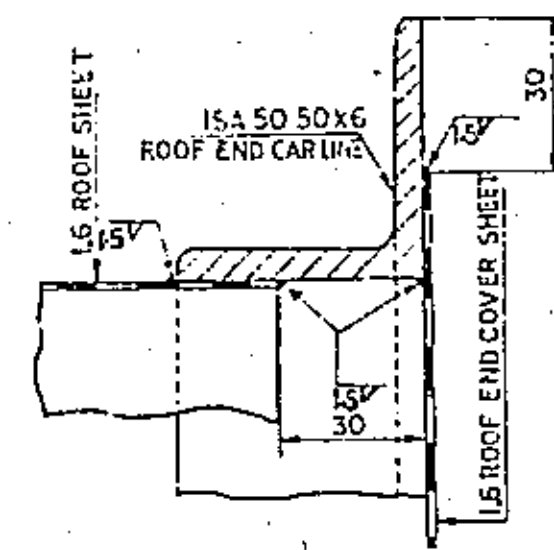
DETAIL AT-A



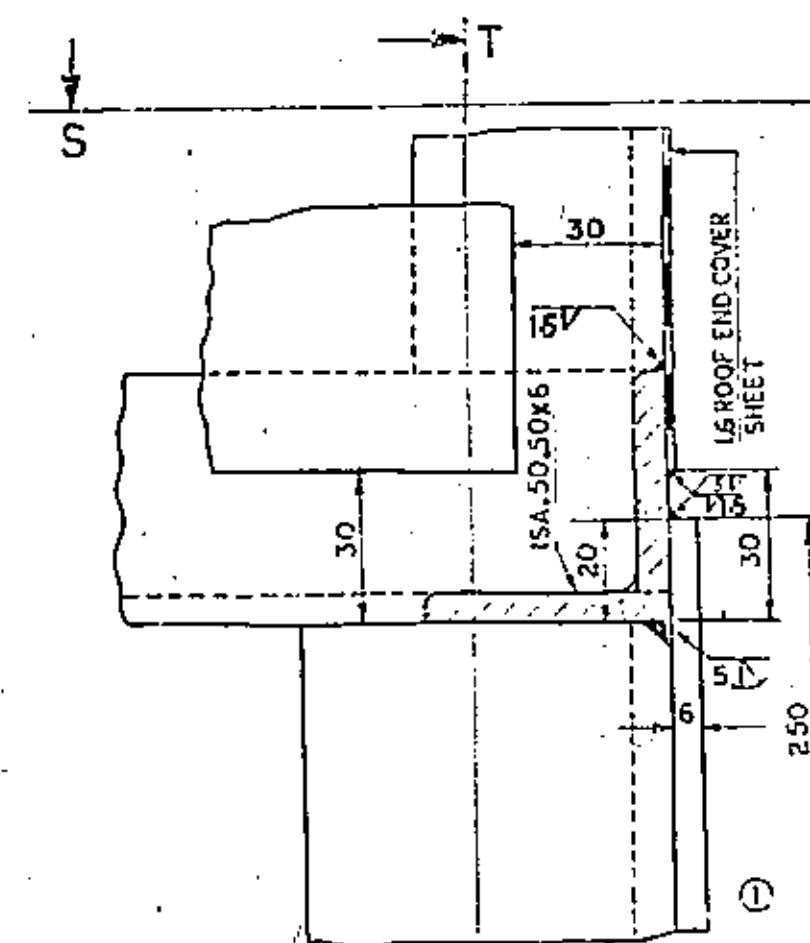
SECTION-DD



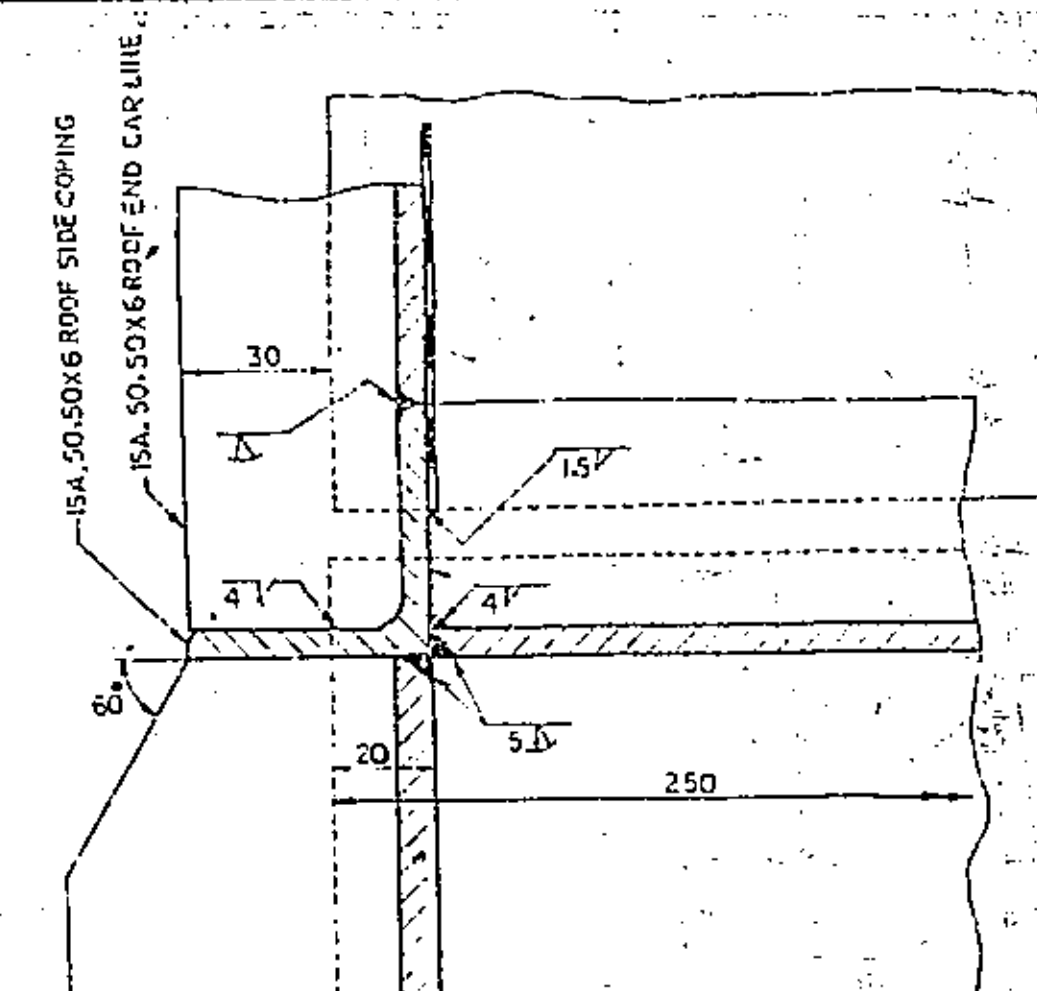
DETAIL AT-G



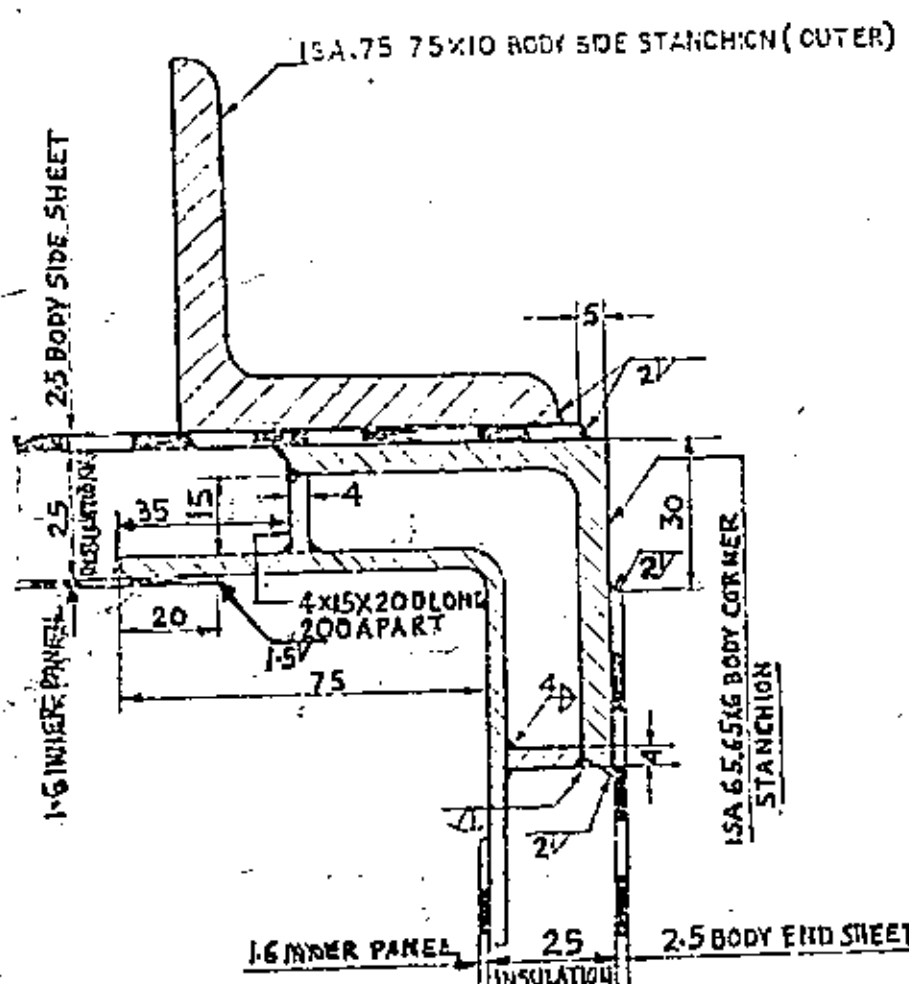
DETAIL AT-H



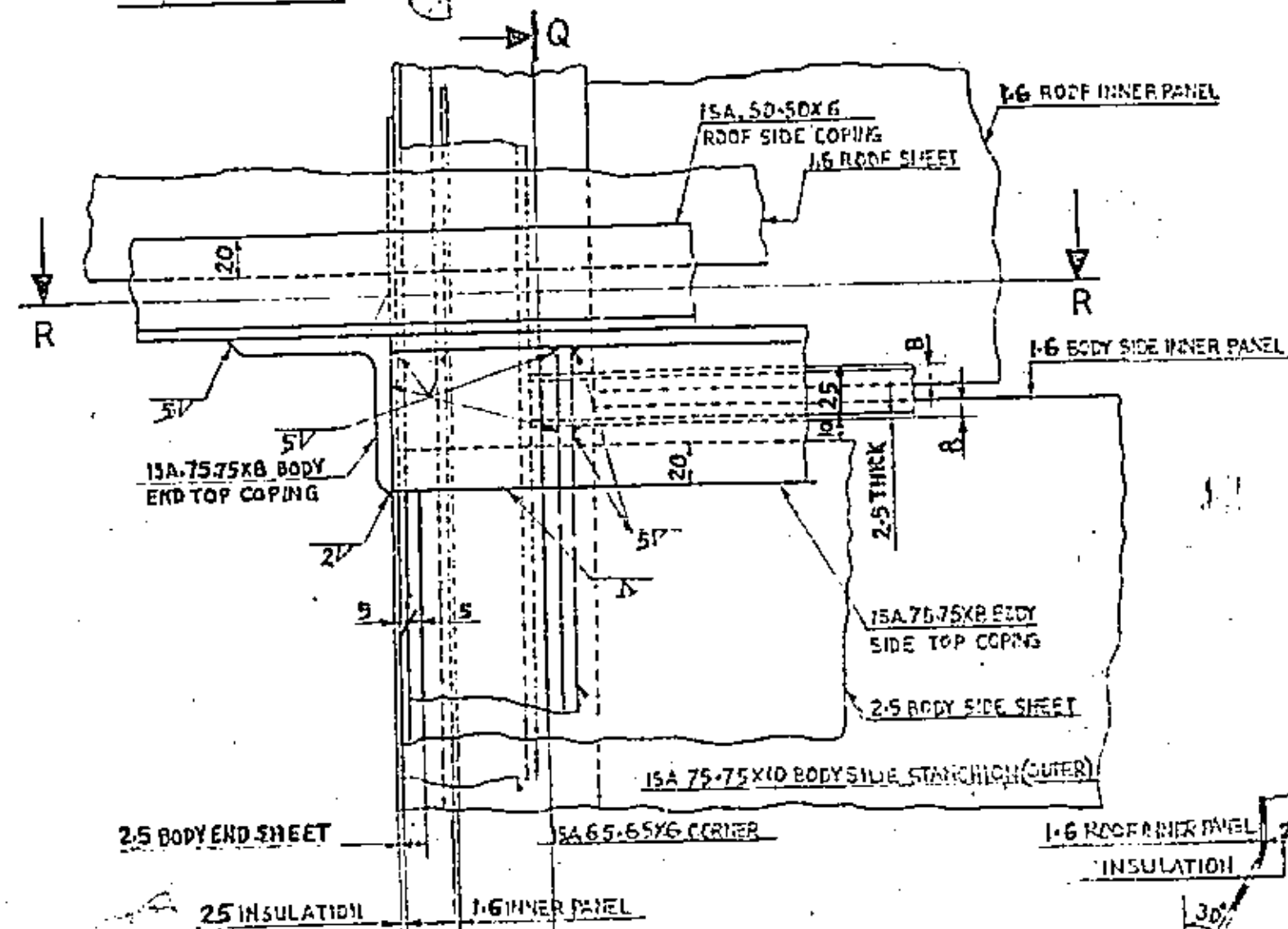
DETAIL AT-J



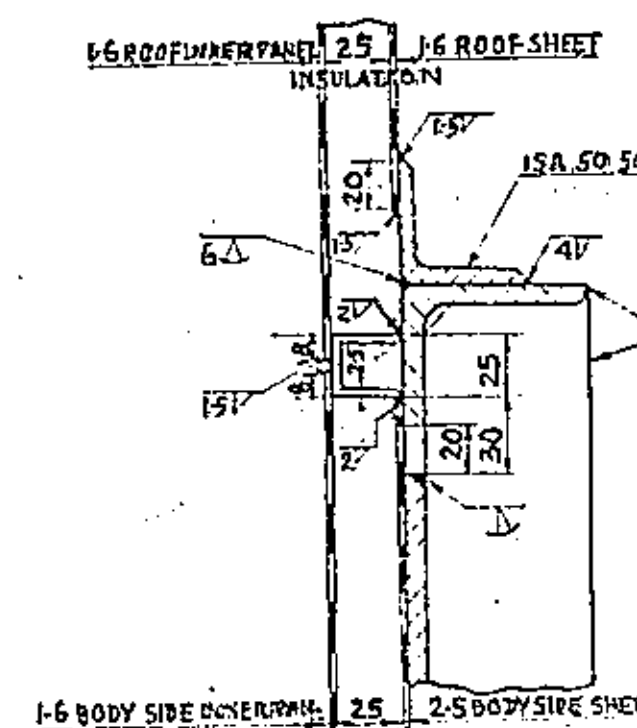
SECTION-T T



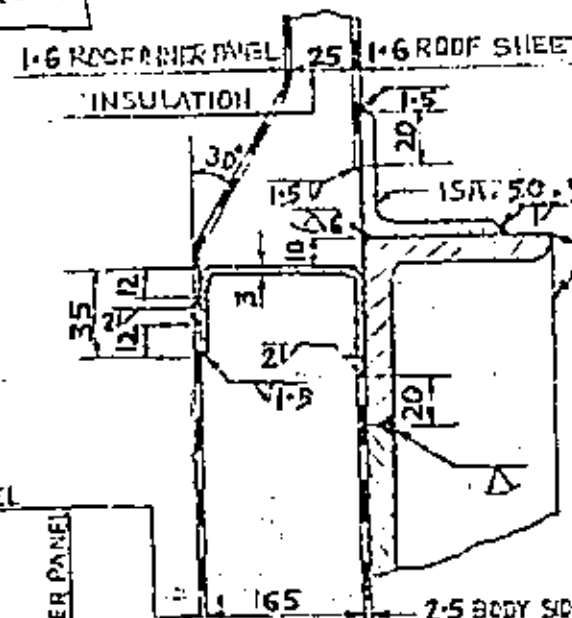
DETAIL AT-E



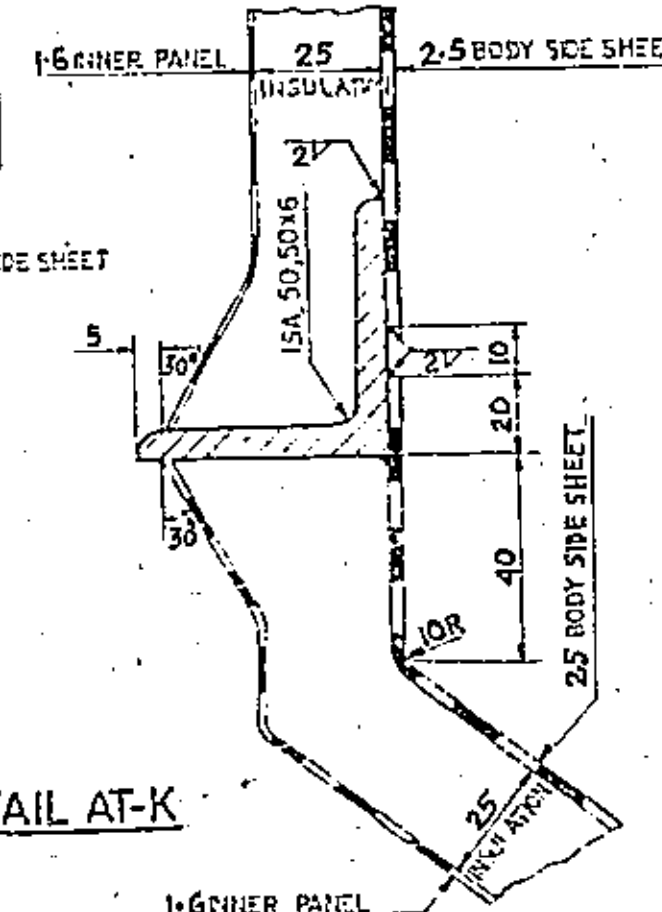
DETAIL AT-E



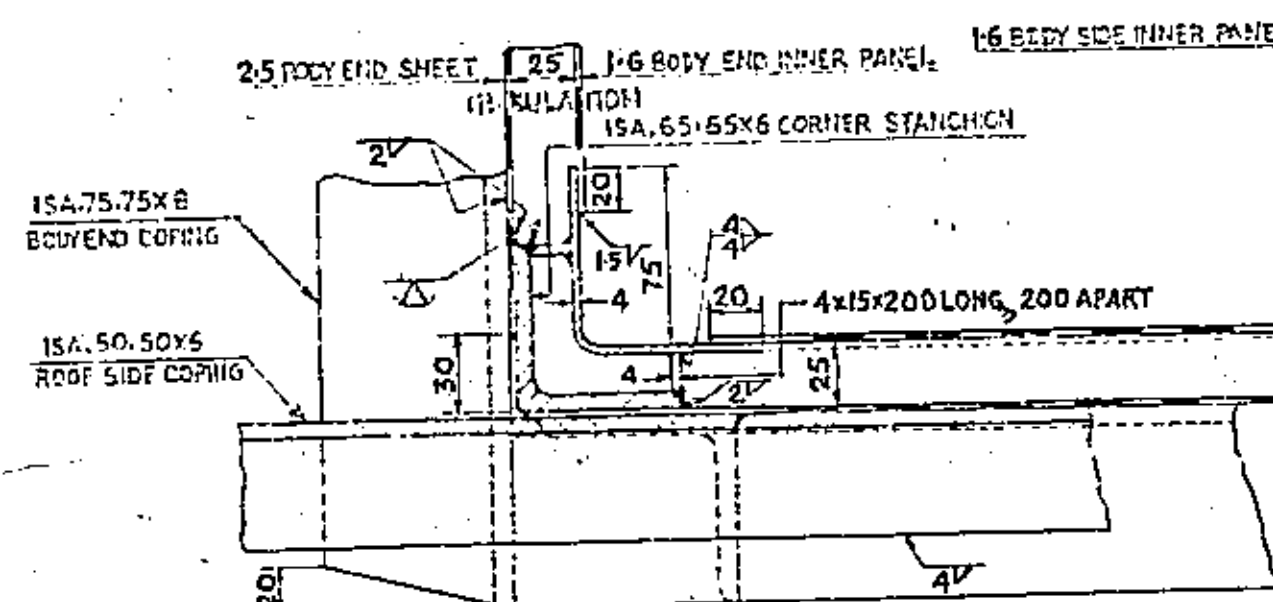
SECTION-Q Q
NON WINDOW SIDE



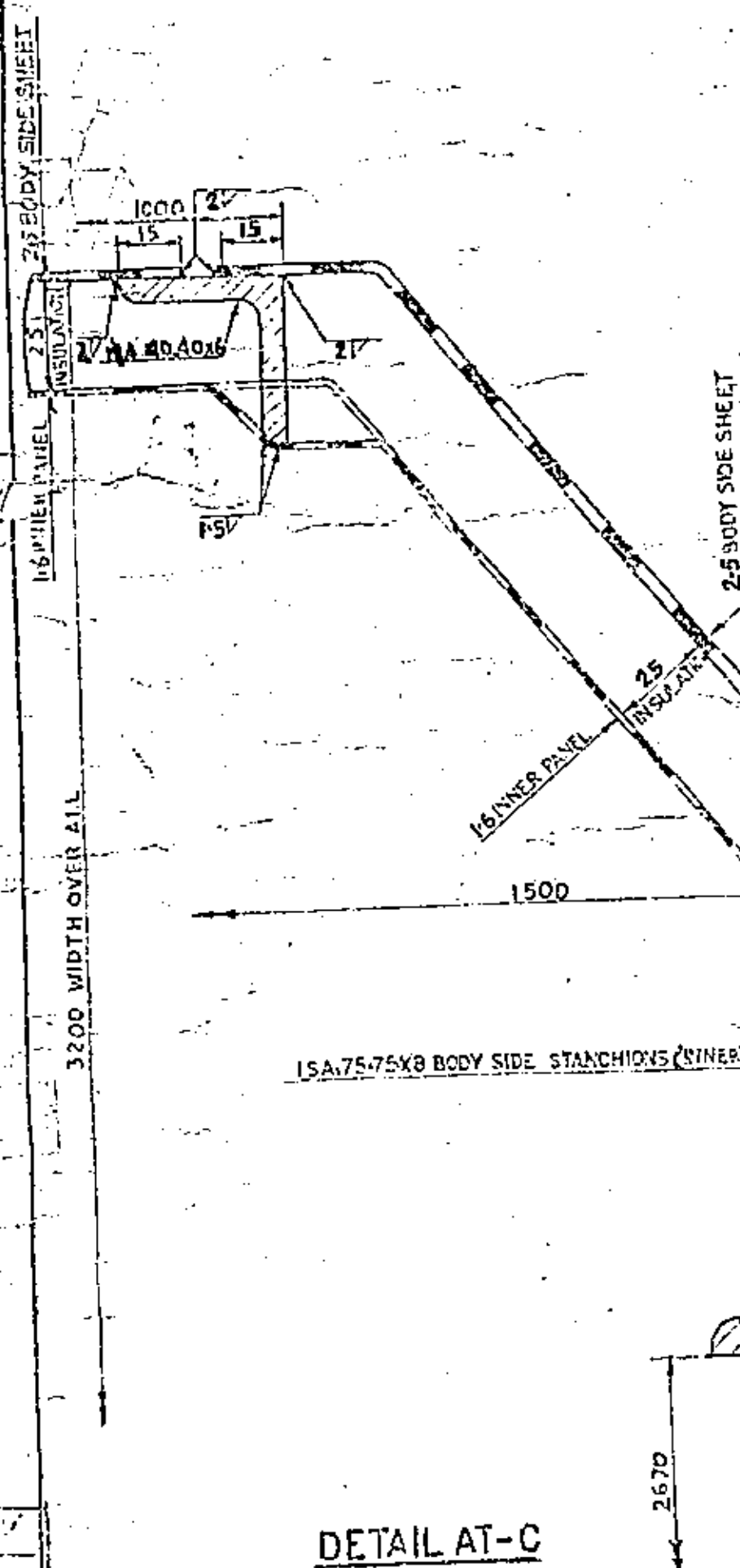
SECTION-Q Q
WINDOW SIDE



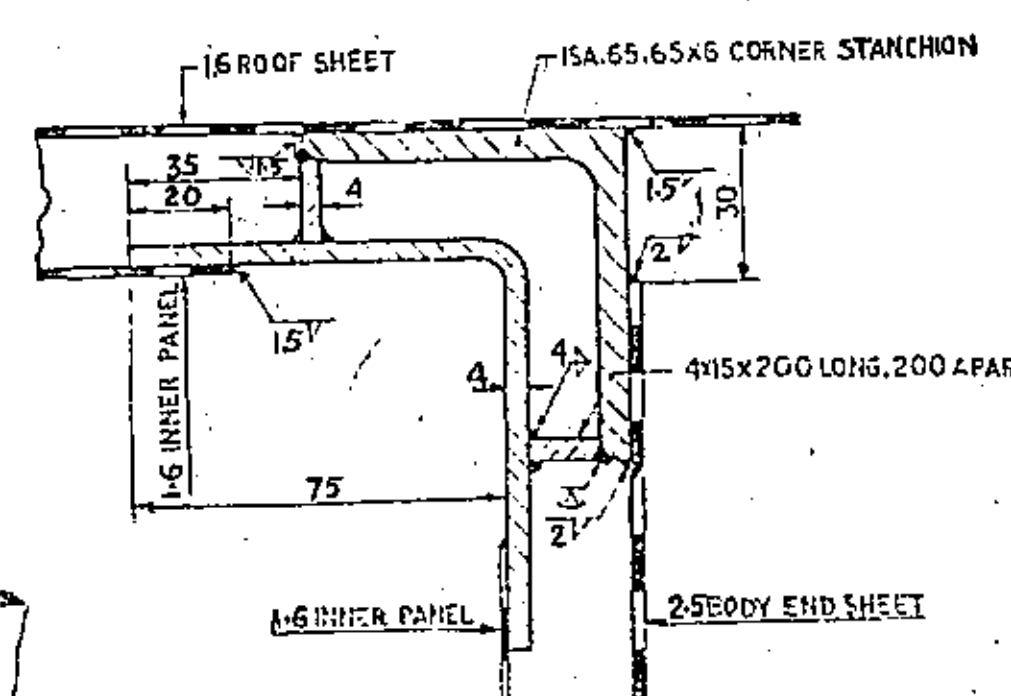
DETAIL AT-K



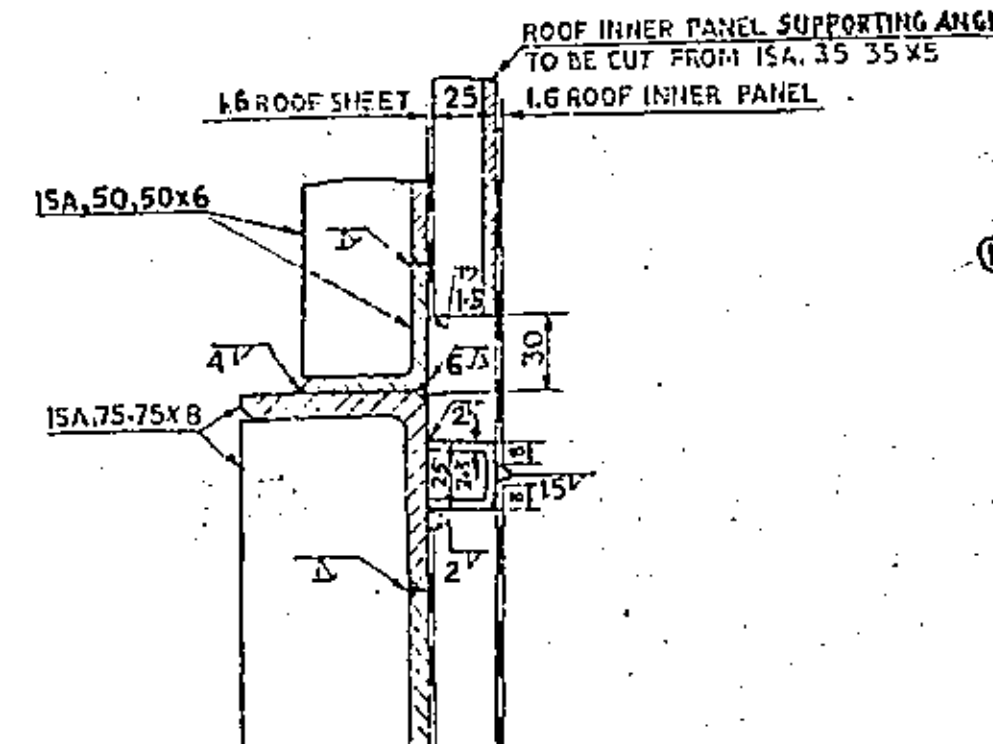
SECTION-RR



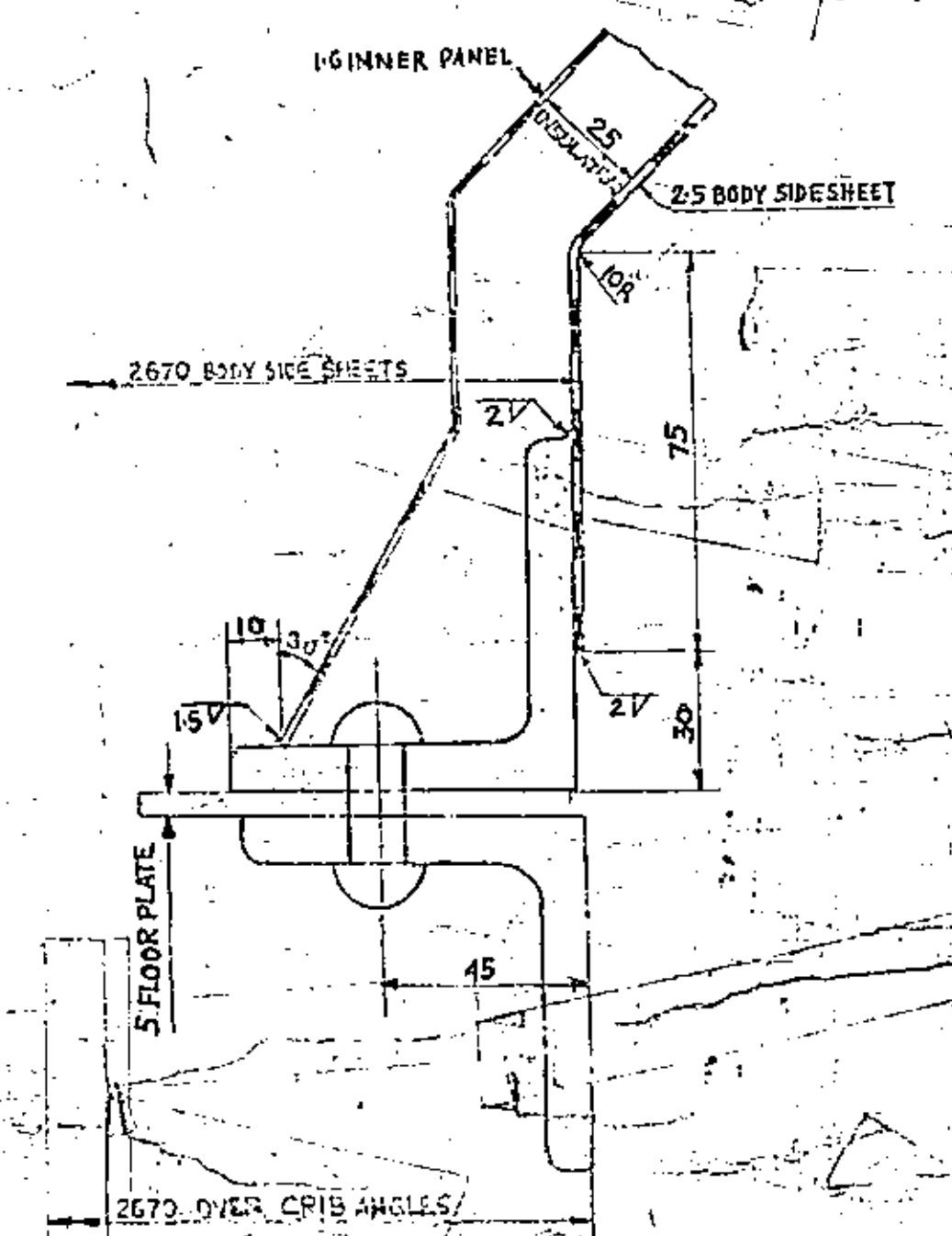
DETAIL AT-C



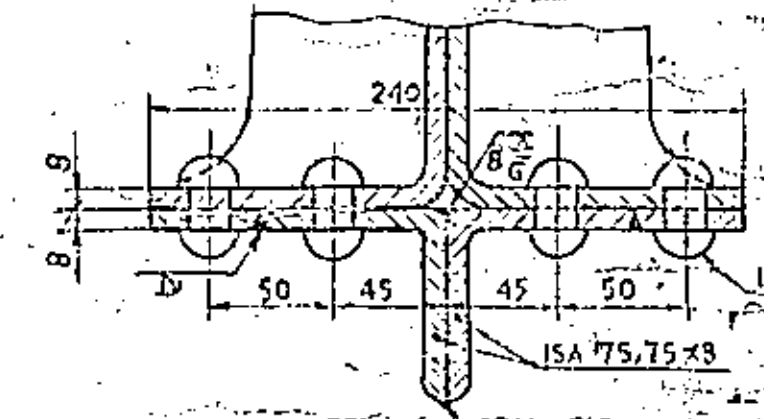
DETAIL AT-F



SECTION-NN



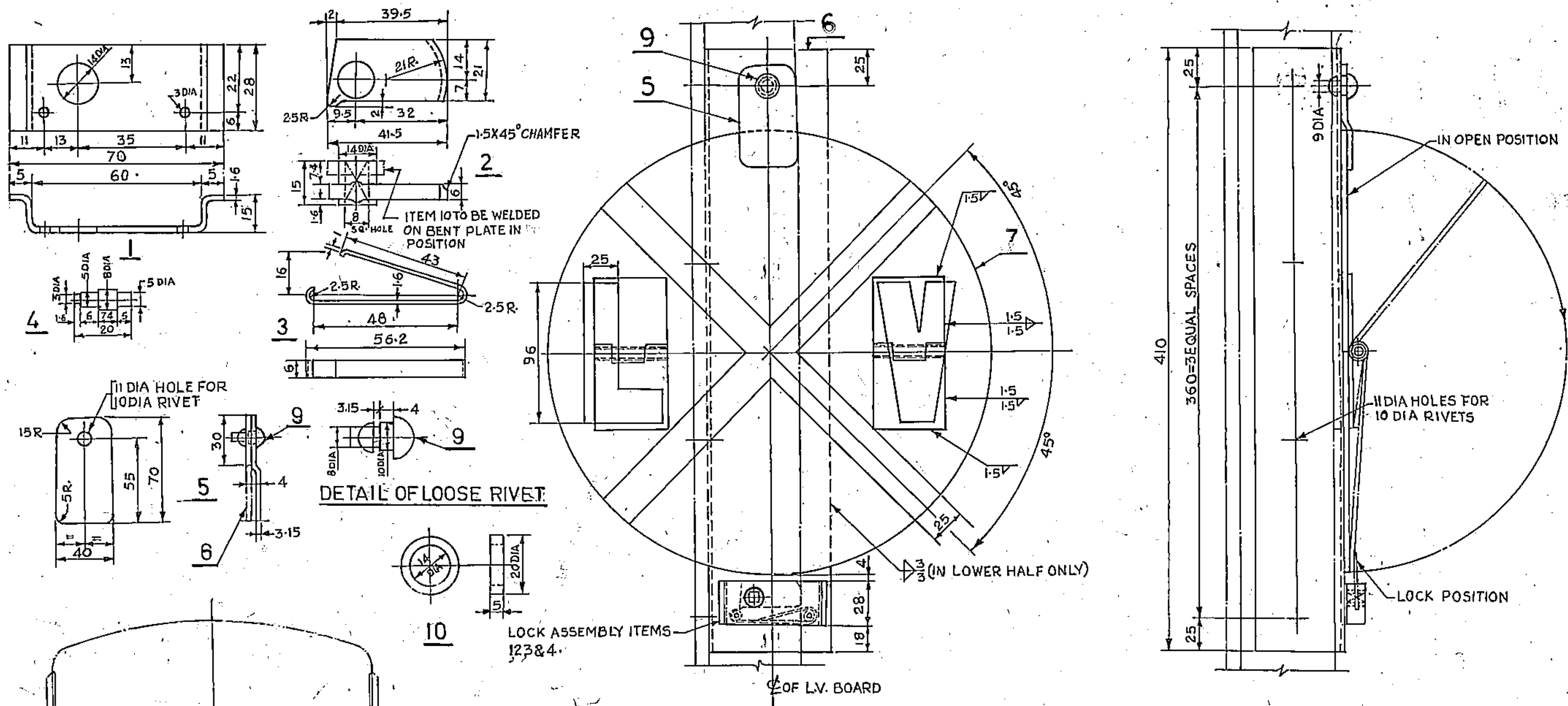
DETAIL AT-L



SECTION-PP

DRG. NO. WD2.7341-S/8 RE-NUMBERED
① AS 75528.

	PRELIMINARY SKETCH		ONLY FOR PH. COPIES APR 1964	
	SUPERSEDED BY SUPERSEDES 141 00771 142 00771 143 00771		UNITS CLASSIFICATION 4-WHEELED GOODS BRAKE VAN, TYPE "B" VZ	
BODY & ROOF JOINT DETAILS				
B.G. R.D. 5. O. (W)		GROUP		SK. 75528 H



KEY DIAGRAM SHOWING THE LOCATION OF L.V. BOARD ON B.G. AND M.G. GOODS BRAKEVAN

COMP BY	SIG	DATE
SK-75535	SK-75535	12/98

NOTE:-

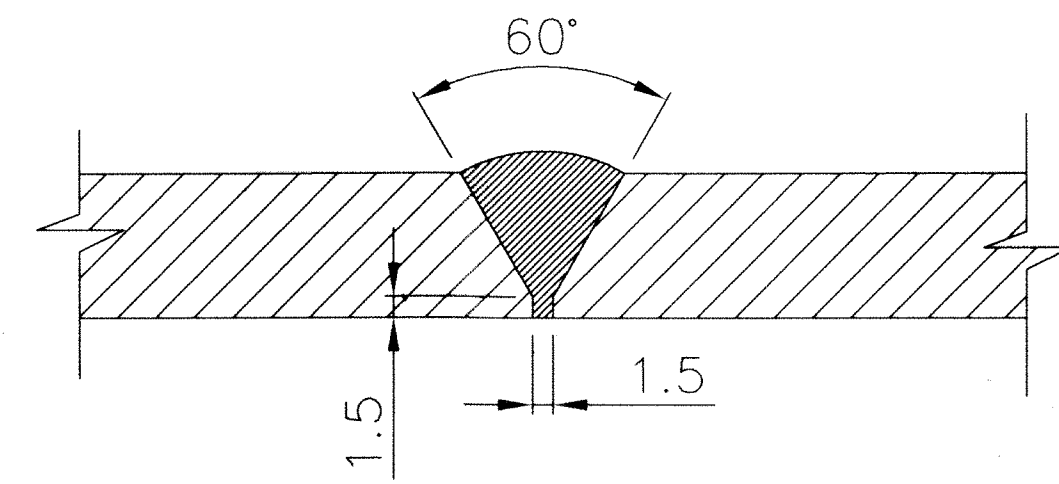
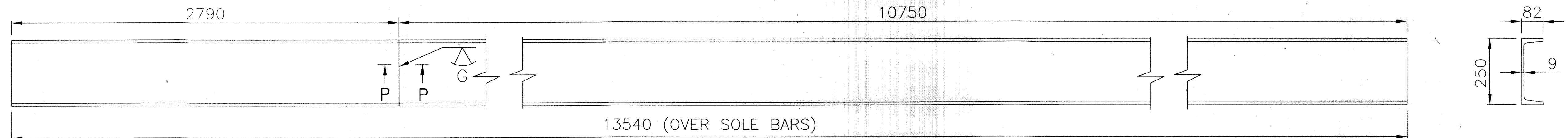
- ITEM-7 TO BE PAINTED BRIGHT RED WHICH SHOULD BE LUMINOUS WITH A CROSS MARK AND LETTER 'L.V.' IN WHITE.
- LOCK SHOULD BE OPERATED BY GUARDS KEY TO R.D.S.O. DRG-NO C/DW-1076
- FOR M.G. GOODS BRAKE VAN L.V. BOARD TO BE FIXED DIRECTLY ON END PILLAR (INNER) (REF. SK-70560 ITEM-7) WITHOUT USING BENT PLATE TO ITEM NO-6 ALSO A FLAT PIECE OF SUITABLE SIZE TO BE WELDED WITH END PILLAR (INNER) TO INCREASE ITS FLANGE WIDTH FOR FITMENT OF LOCK.
- WELDING SYMBOLS TO IS: 813.
- ALL DIMENSIONS IN M.M.

ALT	ITEM	AUTHY	DESCRIPTION	DATE
-	-	-	RETRACED	12/98
-	-	-	MF-A008/92 MICROFILMED	8/84

ITEM	DESCRIPTION	NO OFF	REF DRG	WT. OF ONE (KG)	MATL & SPEC.	REMARKS
10	WASHER	1			STEEL ST 425 TO IS: 226	
9	LOOSE RIVET	1			ST 15: 1148	
8	HINGE COMPLETE	2			TYPE II-15:3843	
7	L.V. BOARD (INTWOHALVES)	1			ST GYO-15:1079	
6	BENT PLATE	1			" "	
5	LATCH	1			" "	
4	LOCK PIN	1			ST 425-15:226	
3	LOCK SPRING	1			SPRING STEEL GY1-15:2507	
2	LOCK TONGUE	1			STEEL CL-2 15:1875	
1	LOCK PLATE	1			ST-GY-0 15:1079	

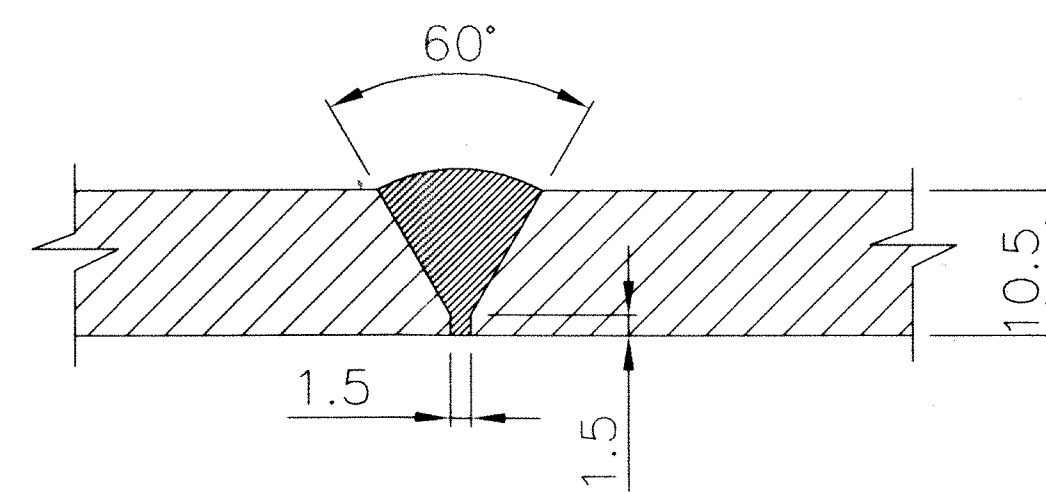
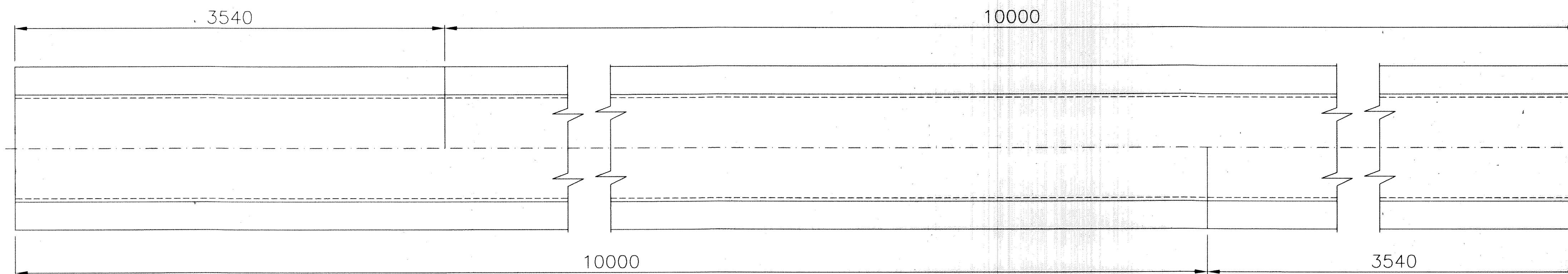
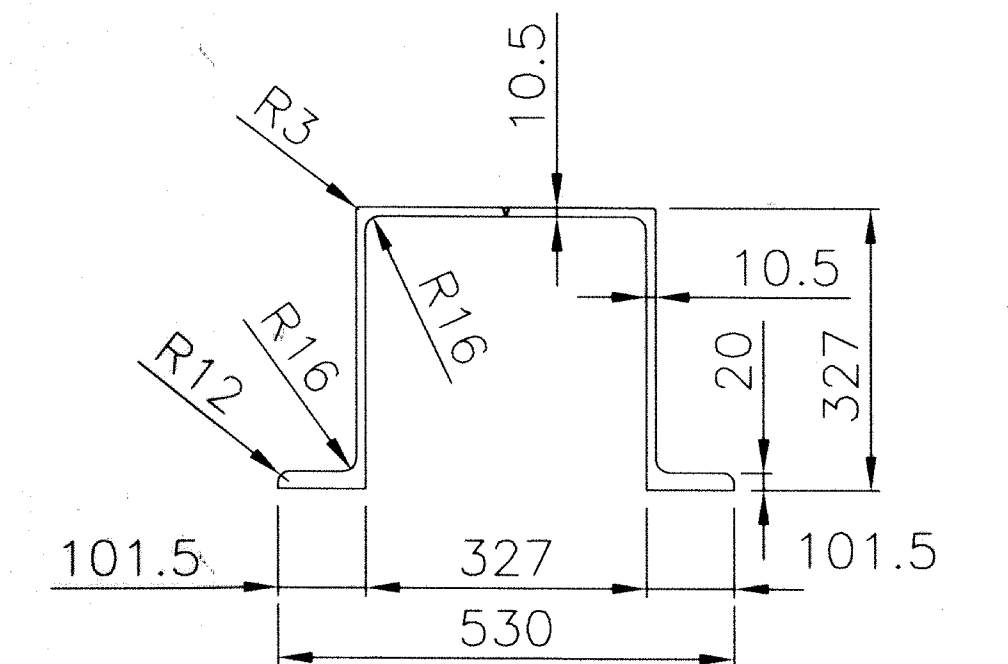
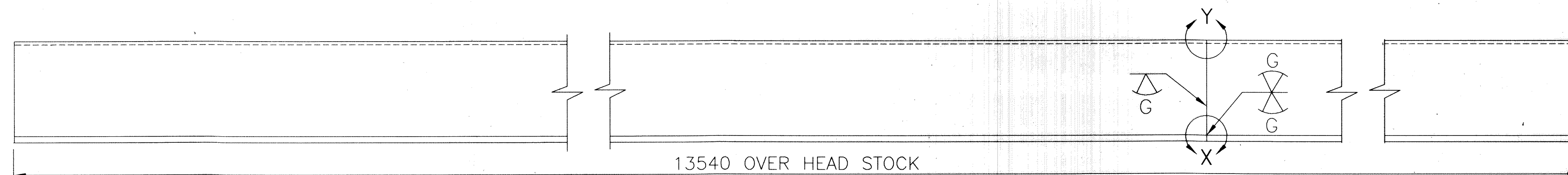
SUPERSEDED BY				FOUR WHEELED GOODS BRAKEVAN	
SUPERSEDES		DATE			
SCALE	PASSED	Sd	20/12		
1:1	CHECKED	Sd	22/75		
1:2	DRAWN	Sd	11/75		
	TRACED	S. Puri	12/98		
	J. SHEET	WG-2 75049	12/75		

B. G.	R. D. S. O.	GROUP	SK-75535
M. G.	(W)		



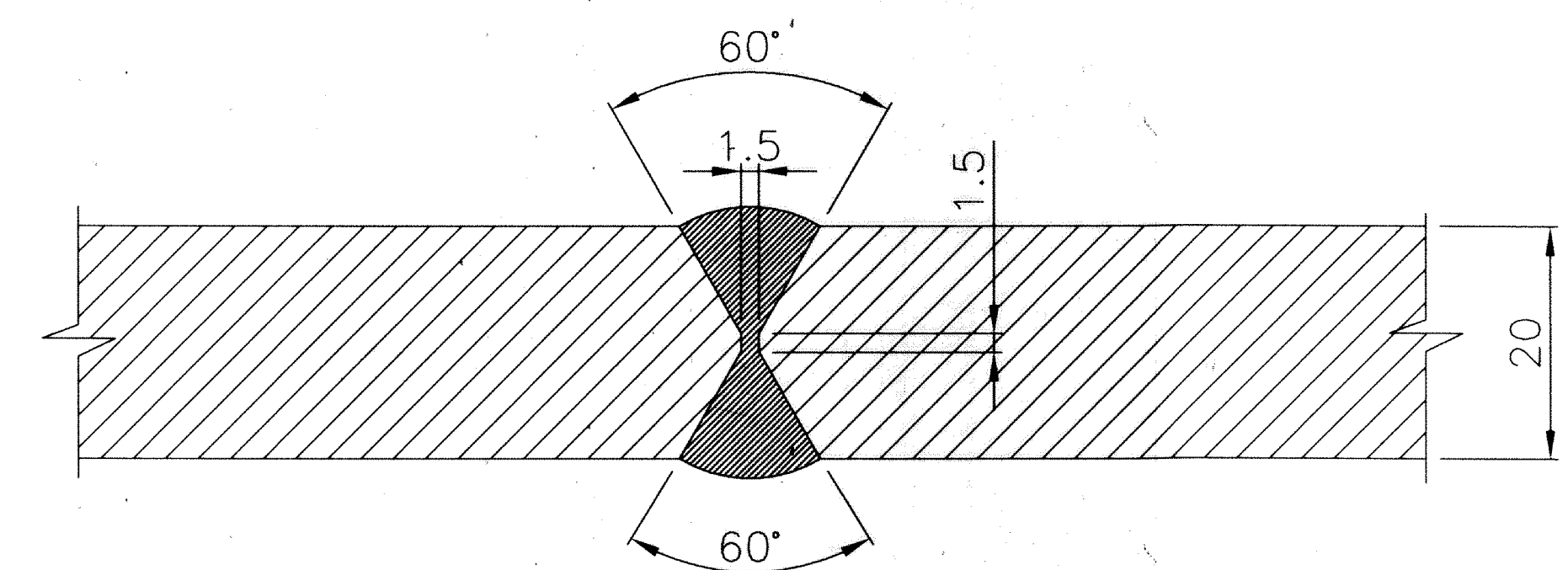
ENLARGE SECTION-PP

① SOLE BAR (ISM 250X82X9)



ENLARGE DETAILS AT-Y

② CENTRE SILL STD. (Z-SECTION)



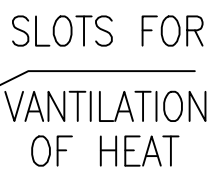
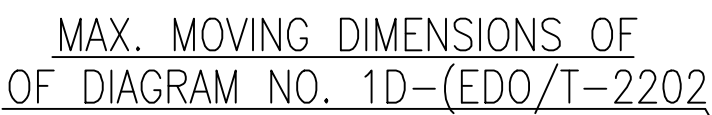
ENLARGE DETAILS AT-X

NOTE:-

1. ALL DIMENSIONS ARE IN MM.
2. THE JOINTS IN THE SOLEBARS & Z-SECTION-
2.1 SHOULD CLEAR ALL RIVET HOLES.
2.2 SHOULD BE LOCATED DIAGONALLY ON OPPOSITE SIDES.
3. FOR DETAIL DIMENSIONS OF CENTER SILL REFER SK-121-62651..
4. WELDING SYMBOLS TO IS:813
5. WELDING SURFACES (OVER SPLICE JOINTS) SHOULD BE CHIPED & GROUND FLUSH.

PRELIMINARY SKETCH		ONLY FOR PROTOTYPE APPLICATION UNDER GUIDANCE OF R.D.S.O. (WAGON)	
SUPERSEDED BY		BOGIE BRAKE VAN TYPE 'BVZI'	
SCALE	PASSED	DATE	
1:10	CHECKED	11/14	
	DRAWN	11/14	
	TRACED	-	
J.S.NO.	WD-14031	11/14	
B.G.		R.D.S.O. [W]	GROUP
		WD-14031-S-01	

ALT	ITEM	AUTHY	DESCRIPTION	DATE	ASSEMBLY DRGS.



ITEM	DESCRIPTION	NO. OFF PER WAGON	REF. DRGS.	WT. OF ONE (Kg)	MATL&SPEC	REMARKS
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SUPERSEDED BY		BOGIE BRAKE VAN TYPE 'BVZI'
SUPERSEDES	DATE	

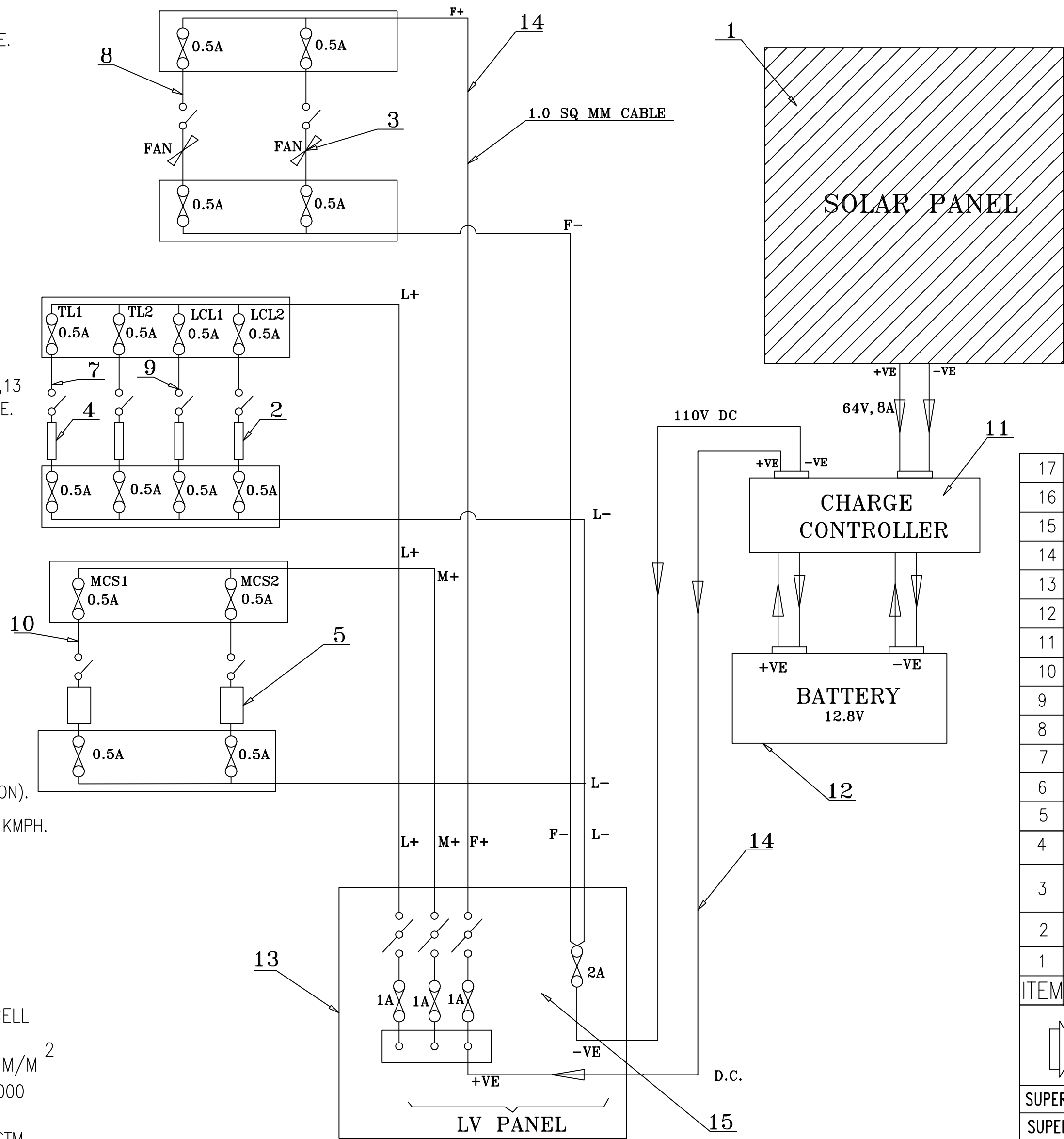
B.G.	R.D.S.O.	GROUP	WD-25036-S-01
	[W]		

ALT	ITEM	AUTHY	DESCRIPTION	DATE	ASSEMBLY	DRAWING
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NOTE:–

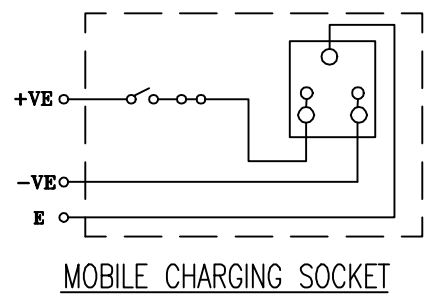
1. FLEXIBLE SOLAR PHOTO VOLTAIC (SPV) MODULE SHALL BE OF POLYCRYSTALLINE CELL WITH ETHYLENE TETRA FLOURO ETHYLENE AS TOP LAYER WITH MINIMUM PEAK WATTAGE W_p OF 500W AND ATLEAST 9 BYPASS DIODES.
2. FLEXIBLE PV MODULE SHALL BE HIGHLY RELIABLE, FLEXIBLE AND LIGHT WEIGHT AND HAVE SERVICE LIFE OF MORE THAN 25 YEARS.
3. CONVERSION EFFICIENCY OF SPV MODULE SHALL NOT LESS THAN 15% AND FILL FACTOR SHALL NOT BE LESS THAN 72%.
4. FLEXIBLE SPV SHALL BE FIXED WITHOUT PIERCING ROOF AND CAPABLE OF WITHSTANDING BODY VIBRATION THERMAL VARIATION OF WAGON
5. SPV ENCAPSULATION SHALL BE COMPATIBLE WITH THERMAL EXPANSION OF SILICON CELLS AND MOISTURE PROOF.
6. SPV TERMINAL BLOCK SHALL BE IEC 61215 CERTIFIED AND HAVE WATER PROOF DESIGN (MIN. IP65) AND HAVE PROVISION FOR OPENING/REPLACING CABLES.
7. MARKINGS:
 - (i) NAME, MONOGRAM OR SYMBOL OF MANUFACTURER OF SOLAR MODULE
 - (ii) NAME OF THE MANUFACTURER OF SOLAR CELLS
 - (iii) TYPE OR MODEL NUMBER
 - (iv) SERIAL NUMBER
 - (v) POLARITY OF TERMINALS OR LEADS (COLOR CODING IS PERMISSIBLE)
 - (vi) OPEN CIRCUIT VOLTAGE AND OPERATING VOLTAGE
 - (vii) MAXIMUM SYSTEM VOLTAGE FOR WHICH THE MODULE IS SUITABLE.
 - (viii) OPERATING CURRENT AND SHORT CIRCUIT CURRENT
 - (ix) DATE AND PLACE OF MANUFACTURE
 - (x) WEIGHT OF THE MODULE
 - (xi) MODULE W_p AND TOLERANCE
8. FOR BATTERY BANK LITHIUM FERRO PHOSPHATE BATTERY SHALL BE USED WITH MINIMUM CAPACITY OF 12.8V/110Ah
9. BATTERY SHOULD BE FREE FROM FIRE HAZARD AND SEALED IN SUITABLE CASING.
10. OPERATING CONDITION OF BATTERY BANK AS PER IEC 62133–2:2017/IS 16046 AND SHALL WITHSTAND VIBRATION AND SHOCKS AS PER IEC 61373.
11. BATTERY BANK MUST HAVE MORE THAN 3000 CHARGE CYCLES AT 90% DEPTH OF DISCHARGE.
12. BATTERY MANAGEMENT SYSTEM (BMS):
 - (i) BMS SHOULD BE ABLE TO MONITOR PARAMETER LIKE VOLTAGE, CURRENT, TEMPERATURE, ETC. OF BATTERY BANK.
 - (ii) BMS SHOULD HAVE PROTECTION LIKE OVER VOLTAGE, UNDER VOLTAGE, SHORT CIRCUIT, REVERSE POLARITY AND OVER TEMPERATURE.
 - (iii) BMS SHOULD BE SYCRONIZED WITH CHARGE CONTROLLER UNIT AND SHOULD BE CAPABLE OF CELL BALANCING.
13. BATTERY PACK ALONG WITH OTHER ACCESSORIES SHOULD BE KEPT IN ANTI PILFERAGE DEVICE WITH LOCKING MECHANISM
14. MAXIMUM POWER POINT TRACKING (MPPT) SOLAR CHARGE CONTROLLER UNIT (CCU) SHALL BE PROVIDED BETWEEN SOLAR ARRAY, DC LOADS AND LITHIUM FERRO PHOSPHATE BATTERY.
15. CCU SHOULD HAVE INTEGRATED ENERGY METER, VOLT METER, AMPS METER.
16. CCU SHALL HAVE 'TEMPERATURE COMPENSATION' FEATURE.
17. CCU SHOULD HAVE FOLLOWING LIST OF INDICATIONS THROUGH LEDS/LCD DISPLAYS:
 - (i) CHARGE CONTROLLER ON/OFF
 - (ii) CHARGE CONTROLLER OVER VOLTAGE/UNDER VOLTAGE.
 - (iii) CHARGE CONTROLLER OVER TEMPERATURE.
 - (iv) DISPLAY ON SCREEN AS PV VOLTAGE, PV CURRENT, BATTERY VOLTAGE, BATTERY CURRENT, LOAD VOLTAGE, LOAD CURRENT.
18. CCU SHOULD HAVE GROUND FAULT DETECTION DEVICE (FOR AC SYSTEM ONLY).
19. COMBINED UNIT BOX WITH HINGE DOOR AND SHELF'S SHOULD BE MADE OF 3.15 MM THICK SHEET AND SHOULD ENCLOSE ITEM–11,12,13 AND 15 ETC. THE BOX SHALL BE FIXED WITH SUPPORTING ANGLES WITH WELDING ALL AROUND TO PREVENT VANDALISM AND PILFERAGE. HINGE DOOR OF COMBINED UNIT BOX SHOULD BE FITTED WITH UNIVERSAL LOCK TO RDSO DRAWING NO. WD–24077–S–01 AND "DANGER" SHALL BE MARKED OUTSIDE OF HINGE DOOR BY RED PAINT OR STICKER. A CUTOUT OF SIZE 200X200MM MINIMUM COVERED WITH TRANSPARENT ACRYLIC SHEET OF 8MM THICK SHOULD BE MADE TO SEE THE DISPLAY OF CHARGE CONTROLLER.
20. ELECTRICAL WIRING SHALL BE PROTECTED BY METALLIC CONDUITS WELDED TO THE STRUCTURE.
21. 110V BLDC FANS AND 110V LED LIGHTS WITH TAMPER PROOF FITTINGS TO BE PROCURED BY RDSO APPROVED SOURCES.
22. COMPONENTS AND HARDWARE SHALL BE VANDAL AND THEFT RESISTANT. ALL PARTS SHALL BE CORROSION–RESISTANT AND HARDWARE SHOULD BE STAINLESS STEEL.
23. METHOD OF FIXING SPV ON BVZI/BVCM WAGON ROOFTOP:
 - (A) MODULE MOUNTING STRUCTURE:
 - (i) MODULE MOUNTING STRUCTURE SHOULD BE MADE OF HOT DIPPED GALVANIZED MS ANGLE OF SUITABLE SIZE. WELDING ELECTRODES IF REQUIRED, SHALL BE COMPATIBLE WITH ROOF MATERIAL AND SHOULD NOT DAMAGE THE ROOF.
 - (ii) BOLTS, NUTS, SHIMS ETC. SHALL BE ZINC PLATED AND FASTENERS SHALL BE OF STAINLESS STEEL SS–304.
 - (iii) MODULE MOUNTING STRUCTURE SHALL BE DESIGNED THAT IT SHALL OCCUPY MINIMUM SPACE WITHOUT SACRIFICING OUTPUT FROM SPV PANELS AND SHALL ALLOW EASY REPLACEMENT OF SPV PANELS IF REQUIRED.
 - (iv) OVERALL MOUNTING ARRANGEMENT FOR BVZI/BVCM WAGON SHALL BE WITHIN IRSOD (INDIAN RAILWAYS SCHEDULE OF DIMENSION).
 - (v) THE SUPPORT STRUCTURE, DESIGN AND FOUNDATION SHALL NORMALLY BE DESIGNED TO WITHSTAND WIND SPEED UP TO 200 KMPH.
 - OR
 - (B) FLEXI SOLAR PANEL PASTING ARRANGEMENT:
 - (i) FIXING SCHEME SHOULD WITHSTAND THE VIBRATIONS IN WAGON BODY FOR LIFE TIME OF PANELS
 - (ii) MATERIAL USED FOR PASTING SHOULD BE ANTI–CORROSIVE.
 - (iii) DOUBLE SIDED ACRYLIC FOAM TAPE OR ELASTIC ADHESIVE SEALANT SHALL BE USED IF REQUIRED.
 - (iv) ACRYLIC FOAM TAPE SHALL BE MINIMUM 1 INCH WIDE AND THICKNESS RANGE OF 2–2.5 MM. HAVING CLOSED CELL CONSTRUCTION TO AVOID INGRESS OF WATER/AIR.
 - (v) ACRYLIC FOAM TAPE SHALL HAVE MINIMUM FOAM DENSITY OF 700 KG/M³ AND SURFACE RESISTIVITY OF 10¹⁴OHM/M²
 - (vi) ACRYLIC FOAM TAPE SHALL CONFORM TO ASTM D 3330 FOR PEEL ADHESION (300N/100MM) AND HAVE AT LEAST 10,000 MINUTES OF STATIC SHEAR RESISTANCE AS PER ASTM D3654.
 - (vii) ACRYLIC FOAM TAPE SHOULD HAVE BEEN TESTED AGAINST SUSTAINED WIND SPEED OF MINIMUM 200 KMPH AS PER ASTM E330 WITH TEST REPORT CORROBORATED WITH NABL ACCREDITED LAB OR INTERNATIONAL LAB OF REPUTE.
 - (viii) ACRYLIC FOAM TAPE SHALL HAVE BEEN TESTED FOR ITS STRENGTH RETENTION, UNDERWATER SUBMERSION FOR MINIMUM 5 YEARS AND HAVE 25 YEARS OF SERVICE LIFE MODELING.

- (ix) ACRYLIC FOAM TAPE SHALL DISPLAY THE MANUFACTURER LOGO WITH CLEAR MENTION OF LOT/BATCH NUMBER AND YEAR OF PRODUCTION
 - (x) ELASTIC ADHESIVE SEALANT SHALL BE A SINGLE COMPONENT MOISTURE CURING POLYURETHANE SEALANT WITH NORMAL CURING UNDER ATMOSPHERIC CONDITIONS.
 - (xi) ADHESIVE SHALL HAVE SHORE A HARDNESS BETWEEN 55 AND 60 AS PER ASTM C661 AND ELONGATION AT BREAK MORE THAN 300% (AS PER ASTM D412).
 - (xii) EDGE SEALING TAPE OF MINIMUM 2 INCH WIDE AND 2 MM THICK TRANSLUCENT, SINGLE SIDE COATED PRESSURE SENSITIVE ACRYLIC ADHESIVE TAPE WITH IONOMER BACKING, HAVING ELONGATION OF 530% AT BREAK WHEN TESTED AS PER ASTM D3759.
 - (xiii) UV STABLE ADHESIVE PROMOTER/PRIMER CONTAINING ACRYLATE POLYMER SHALL BE APPLIED BEFORE APPLICATION OF ACRYLIC TAPE.
 - (xiv) UV STABLE ADHESIVE PROMOTER/PRIMER SHALL HAVE VISCOSITY LESS THAN 25CPS AND FAST DRYING PROPERTIES, THAT IS COMPATIBLE WITH ACRYLIC BASED ADHESIVE.
24. BRANCH WIRING FOR CONNECTION OF ELECTRICAL EQUIPMENTS TO ROUTED THROUGH FLEXIBLE POLYAMIDE CONDUIT AS PER RDSO SPECIFICATION NO. RDSO/PE/SPEC/AC/0138–2009 (REV.1)
 25. ROTARY SWITCH PANELS/LV PANEL TO BE PROVIDED AS PER ICF DRAWING NO. GS6–7–2–602.
 26. AEROSOL BASED FIRE SUPPRESSION SYSTEM TO BE PROVIDED IN THE LV PANEL AS PER RDSO LETTER NO. EL/7.1.108/MSSBC/MAIN DATED 17.07.2023
 27. CODE OF PRACTICE FOR WIRING FOR 110V DC SELF GENERATION TRAIN LIGHTING SYSTEM AS PER RDSO SPECIFICATION NO. EL/TL/48 REV.1–2005 NEEDS TO BE FOLLOWED.
 28. CODE OF PRACTICE FOR TRAIN LIGHTING MAINTENANCE ON PREVENTION OF FIRES ON 110V DC SELF GENERATING COACHES AS PER RDSO SPECIFICATION NO. EL/TL/56–1992 NEEDS TO BE FOLLOWED.
 29. THE FITMENT AND MOUNTING OF ELECTRICAL EQUIPMENTS INSTALLED IN THE BOGIE BRAKE VAN MAY BE ENSURED AT ZONAL RAILWAY LEVEL.



SCHEMATIC DIAGRAM FOR WIRING

CIRCUIT	DISCRIPTION	WATTAGE	QUANTITY	TOTAL LOAD IN WATTAGE
LCL	LED COMPARTMENT LIGHT	09	2	18
TL1/TL2	TABLE LAMP	02	2	04
F	FAN (FIXED 400mm SWEEP)	32	2	64
MCS	MOBILE CHARGING SOCKET	05	2	10
TOTAL				96



17	UNIVERSAL LOCK		WD–24077–S–01			SEE NOTE–19
16	COMBINED UNIT BOX WITH HINGE DOOR				IS:2062 E250 A	SEE NOTE–19
15	AEROSOL BASED FIRE SUPPRESSION SYSTEM				RDSO LETTER NO. EL/7.1.108/MSSBC/MAIN DATED 17.07.2023. SEE NOTE–28	
14	2.5 & 1 SQ. MM CABLE				RDSO SPEC. NO. ELRS/ SPEC/ELC/0019, REV.4	
13	LV PANEL				EN 61439–1	
12	BATTERY				IEC 62133–2:2017/ IS 16046	SEE NOTE–8
11	CHARGE CONTROLLER				IEC 60068–2(1,2,14,30)/ EQUIVALENT BIS STD.	
10	SWITCH FOR MOBILE CHARGING				IS: 3854–1997	
9	SWITCH FOR LED COMPARTMENT LIGHT				IS: 3854–1997	
8	SWITCH FOR FAN				IS: 3854–1997	
7	SWITCH FOR TABLE LAMP				IS: 3854–1997	
6	SWITCH MAIN BOARD				–	
5	MOBILE CHARGING SOCKET				IS: 1293–2019	
4	TABLE LAMP				RDSO SPEC. NO. RDSO/ PE/SPEC/TL/0091–2016(REV.1)	
3	FAN (FIXED 400mm SWEEP)				RDSO SPEC. NO. RDSO/ PE/SPEC/TL/0021/2005 (REV.3) WITH AMENTMENT No.1	
2	LED COMPARTMENT LIGHT				RDSO SPEC. NO. RDSO/ PE/SPEC/TL/0091–2016(REV.1)	
1	SOLAR PANEL				IEC: 61215 Ed 2/IS: 14286	

ITEM	DESCRIPTION	NO. OF WAGON	REF. DRGS.	WT. OF ONE (Kg)	MATL&SPEC	REMARKS
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PRELIMINARY SKETCH		ONLY FOR PROTOTYPE APPLICATION UNDER GUIDANCE OF R.D.S.O. (WAGON)			
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SUPERSEDED BY		BOGIE BRAKE VAN TYPE 'BVZI'			
SUPERSEDES		DATE			
SCALE	PASSED	RAGVIR	05/25		
	CHECKED	SUNIL	05/25		
1:25	DRAWN	SHUBHAM	05/25		
	TRACED				
	J.SHEET	WD–25036	05/25		

FITMENT OF SOLAR SYSTEM WITH LIGHT, FAN & COMBINED UNIT BOX

B.G.	R.D.S.O. [W]	GROUP	
		WD–25036–S–02	

ALT	ITEM	AUTHY	DESCRIPTION	DATE	ASSEMBLY DRAWING
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