TECHINCAL SPECIFICATION FOR

ELECTRICALLY OPERATED WIND SCREEN WIPER ASSEMBLY COMPLETE WITH WATER SPRAY ARRANGEMENT

FOR 3-PHASE ELECTRIC LOCOMOTIVES.

Specification no.- CLW/ES/3/0674

Issue Date :

ISSUED BY:
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PREPARED BY	CHECKED BY	APPROVED BY
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SPECIFICATION FOR ELECTRICALLY OPERATED WIND SCREEN WIPER ASSEMBLY COMPLETE WITH WATER SPRAYING ARRANGEMENT FOR 3-PHASE AC ELECTRIC LOCOMOTIVES (WAG-9 HC).

1.0 SCOPE

This specification prescribes the requirements for Design and supply of the wind screen wiper assembly complete with wiper motor, wiper arm with blade & pipe connections & water spray wind screen washing system complete for WAG-9 class of 3-phase locomotives.

2.0 SCOPE OF SUPPLY

2.1 One loco set (4 Nos.) of wiper assembly complete are to be fitted in each loco.

3.0 CLIMATIC & ENVIRONMENTAL CONDITIONS

3.1 Maximum atmospheric Temp : Under sun 70ºC
In shade 50 ºC

Humidity : 100% saturation during rainy season

3.2 Reference site conditions : i) Ambient Temp : Max. 47 ◦C
Min. 0 ◦C
ii) Humidity : 60%

iii) Altitude : 160 mts. Above sea level.

3.3 Rain fall : Very heavy in certain areas. The locomotive will be designed to permit its running of 10 km/hr in flood water level of 102 mm above rail level.

3.4 Atmosphere during hot weather : Extremely dusty & desert terrain in certain areas.

3.5 Coastal Area : Locomotive & equipment will be designed to work in coastal areas in humid And salt laden atmosphere.

3.6 Vibration : The equipment, sub-system & their mounting arrangement will be designed to withstand vibration & shock encountered in service as specified in corresponding IEC publications for rolling stock application, unless otherwise stated.

4.0 STANDARD

Manufacturer should follow all relevant standard for manufacturing of wiper assembly complete e.g. IS: 320 Gr. II, IS: 2062 Gr. C, IS: 3063, IS: 1364.
Manufacturer should follow all relevant latest standard for manufacturing of electrically operated wiper assembly complete.

5.0 GENERAL AND TECHNICAL DATA

5.1 The operating speed of the wiper motor shall be adjustable between 35 and 55 strokes/minute.

5.2 Wiping angle of the winds screen wiper shall be 65° with 8° over travel on both sides of the vertical axis.

5.3 Recommended pressure force of the flexible wiper blade on the glass shall be 1 kg. for wiper blade length of 508 mm ± 5.

5.4 Wiper assembly will also be provided with water spray wind screen washing systems.

6.0 DESIGN PRINCIPLE

6.1 The torque of the wiper motor working the wiper system should be approx. 84 Nm and will be supplied in the required 110 V DC and capable of working at minimum 35 to 55 stroke/min. The motor should be able to give a wiping angle between 50° and 120°. The motor will be fully EMC complaint to EN 50121-3-2:2016 and rated to IP 67.

6.2 The wiper motor will be mounted on a fabricated Stainless Steel bracket which is polyester powder coated to prevent corrosion. The motor is connected electrically by means of a multi-pin connector.

6.3 A drive mechanism is provided which transfers the rotary output from the motor to the reciprocating motion of the spindles.

6.4 Spindles that drive the wiper arms pass through the bulkhead, connecting the drive mechanism to the wiper arm are manufactured from stainless steel, to prevent corrosion.

6.5 The wiper blade is secured to the arm assembly using the blade clip arrangement on the arm with a blade retaining screw and Nylock nut.

6.6 Stopper with rubber pad are to be provided on end cover with the adjustment to set the opening position against piston.

6.7 All rubber components should be procured from RDSO/Railway approved sources.

6.8 The wiper motor spindle is to be made from standard bar of stainless steel to grade 304.

6.9 The Motor is fitted with a parking mechanism so that when the wiper is disengaged it will automatically returned to the park position.

6.10 The wiper arm assembly is manufactured from stainless steel and is polyester powder coated to prevent corrosion and to be of good appearance.

6.11 The tension of spring of wiper arm should be adjustable type to achieve appropriate spring tension during assembly.

6.12 One control box, control switch/knob for wiper motor to be supplied with proper mounting arrangement (Existing cut out dimension for control switch/knob is 76 mm x 60 mm). The control box is fabricated from stainless steel and polyester powder coated black to be of good appearance. The control switch provides simple wiper functionality. The Control switch type is of Toggle Switch with 4 positions :-

- Off – Park – this will always stop the wiper in the agreed park position
- Intermittent
- Slow wipe
- Fast wipe

Push to Wash option.

6.13 The design of control unit should be in such a way that in case of failure of one wiper motor does not affect the operation/function of another wiper motor. There must be provision of Isolating switches in driver's cab for isolation of defective wiper motor. In addition, Protective Switchgear of suitable rating to be provided for each cab by the supplier which shall be mounted in Auxiliary cubicles of respective cabs.

6.14 Water spray system consists of a washer tank of 8 litres capacity with suitable pumping arrangement and water spraying nozzles, water tube and reduction nipple fitted to the body of wiper assembly.

6.15 The washer tank can be filled by removing the cap located on the externally mounted filler spout. The mounting arrangement of wash tank to be provided by the supplier. Submersible wash pump is mounted inside the tank. The suitable power supply to the wash pump from the control unit to be provided by the manufacturer. The pump supplies washer fluid to the wash jet mounted on the wiper arm, through suitable tubing.

6.16 The drawings of Cab Structure (Drg. No. 1209-08.130-511), Wind Screen Assembly (Drg. No. 1209-08.130-263), Front Sheet (Drg. No. 1209-08.130-019) of existing WAG-9 HC locomotives are attached for guidance only.

7.0 INSPECTION AND ACCEPTANCE

7.1 Type Test:

The manufacturer shall indicate along with their offer the following type tests to be carried out at the time of inspection at firm's premises. They shall have complete test equipments (including test racks) at their work premises to conduct such tests. Type test plan shall include –

i) Endurance test for continuous 1 MILLION CYCLE with water pump for 10 cycles operation at 30 minutes intervals.
ii) Test of wiper blade pressure on the glass.
iii) Operating speed of the wiper motor according to Clause 5.1.
iv) Material test certificate.

7.2 Routine Test

Routine inspection with various tests will be carried out by an authorized representative of the purchaser as per approved routine test programe approved by the purchaser.

7.3 Inspection Plan

The tenderer shall indicate the sample size including minimum size for routine inspection of each lot.

8.0 SUPPLY OF DOCUMENTS

8.1 Along with tender offer :-

a) The tenderer shall submit details dimension drawings of assembly and sub-assemblies.
b) Any deviation from the specified value shall be spelled out by the tenderer clearly.
c) Test facilities for the type and routine tests as indicated in clause 7.1 available with the tenderer.

8.2 Along with supplies :-

The successful tenderer shall submit along with supply the required copies of maintenance/overhaul manuals and instruction and material tests certificate from RDSO/Rly./Govt. approved test laboratory.

9.0 QUALITY ASSURANCE

As per ISO 9001.

PREPARED BY	CHECKED BY	APPROVED BY
SSE/DESIGN	AEE/DESIGN	DY. CEE/D-II

10.0 **MARKING**

10.1 Each assembly, sub-assembly/component shall have clear readable marking on its body. The marking shall be as follows :-

A. Manufacturer's Name/Trade Mark clearly engraved/embossed.
B. part No./Drawing No./Type No.
C. Year & Month of the manufacturer.
D. Batch No.
E. Minimum & Maximum working pressure.
F. Proper identification (either punched/embossed) of parts for wiper motor.

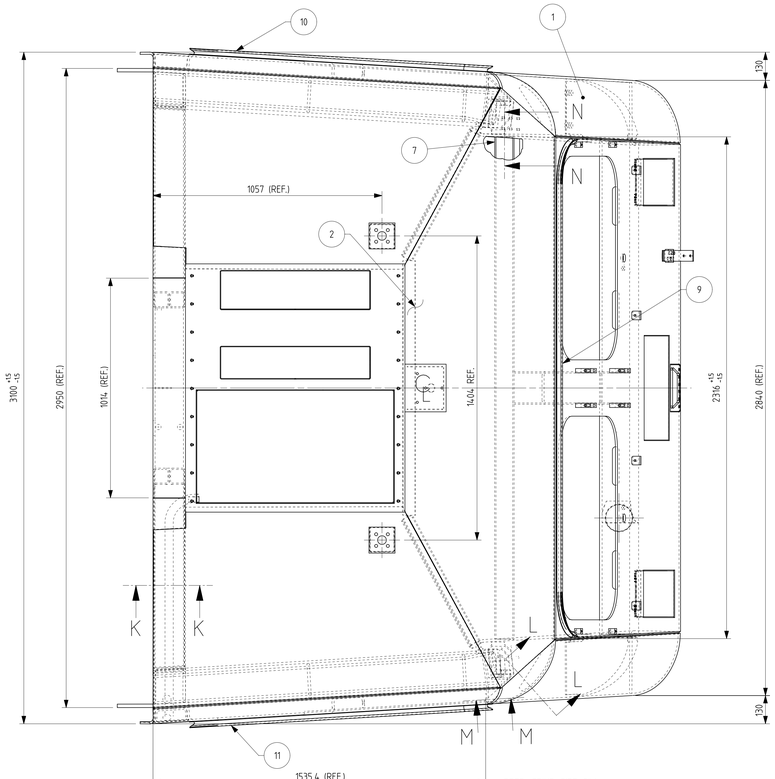
11.0 **GUARANTEE**

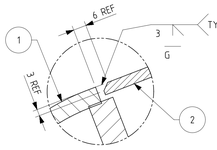
11.1 The equipment and its accessories shall be guaranteed for satisfactory performance for a period of 36 months from the date of delivery or 30 months from the date of commissioning of the locomotive whichever is earlier. All aspects of workmanship and material will be covered by the guarantee.

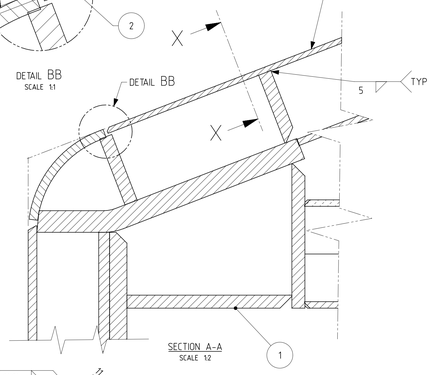
11.2 The components/material, which fails during the guarantee period, must be replaced by the manufacturer/contractor free of cost.

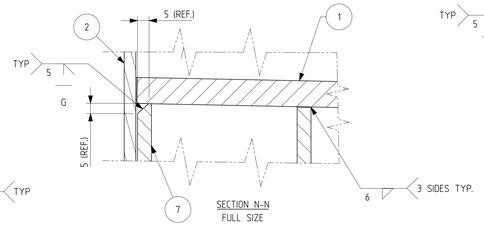
12.0 **PACKING**

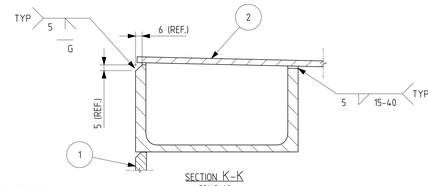
The wind screen wiper assembly will be properly packed to avoid damages during transit and storage.

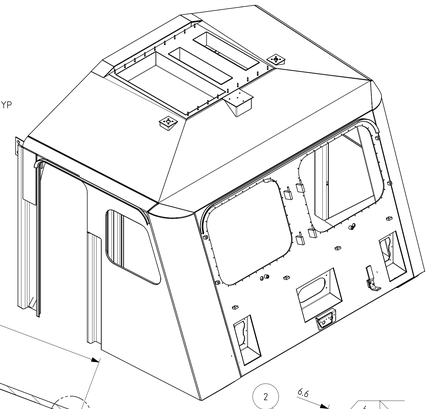


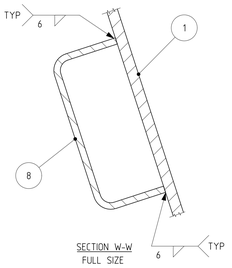


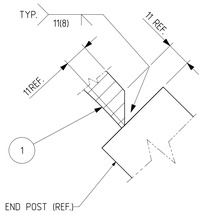


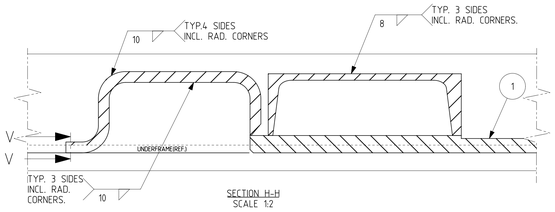


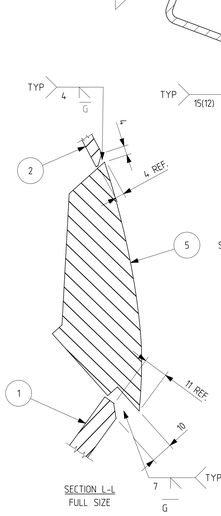


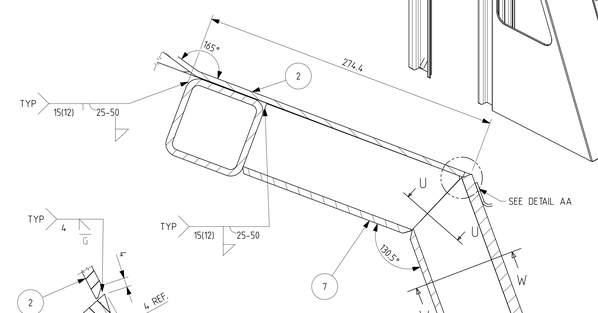


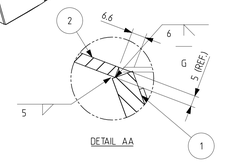


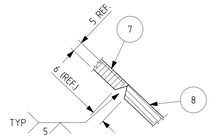


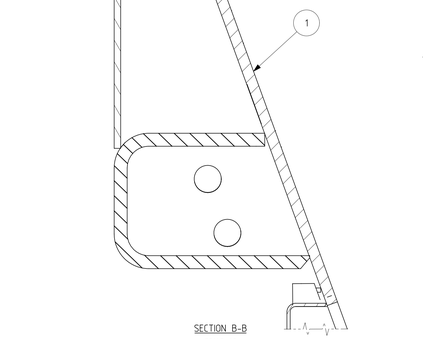


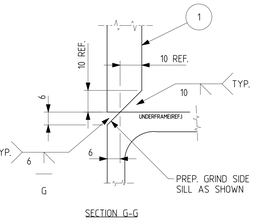


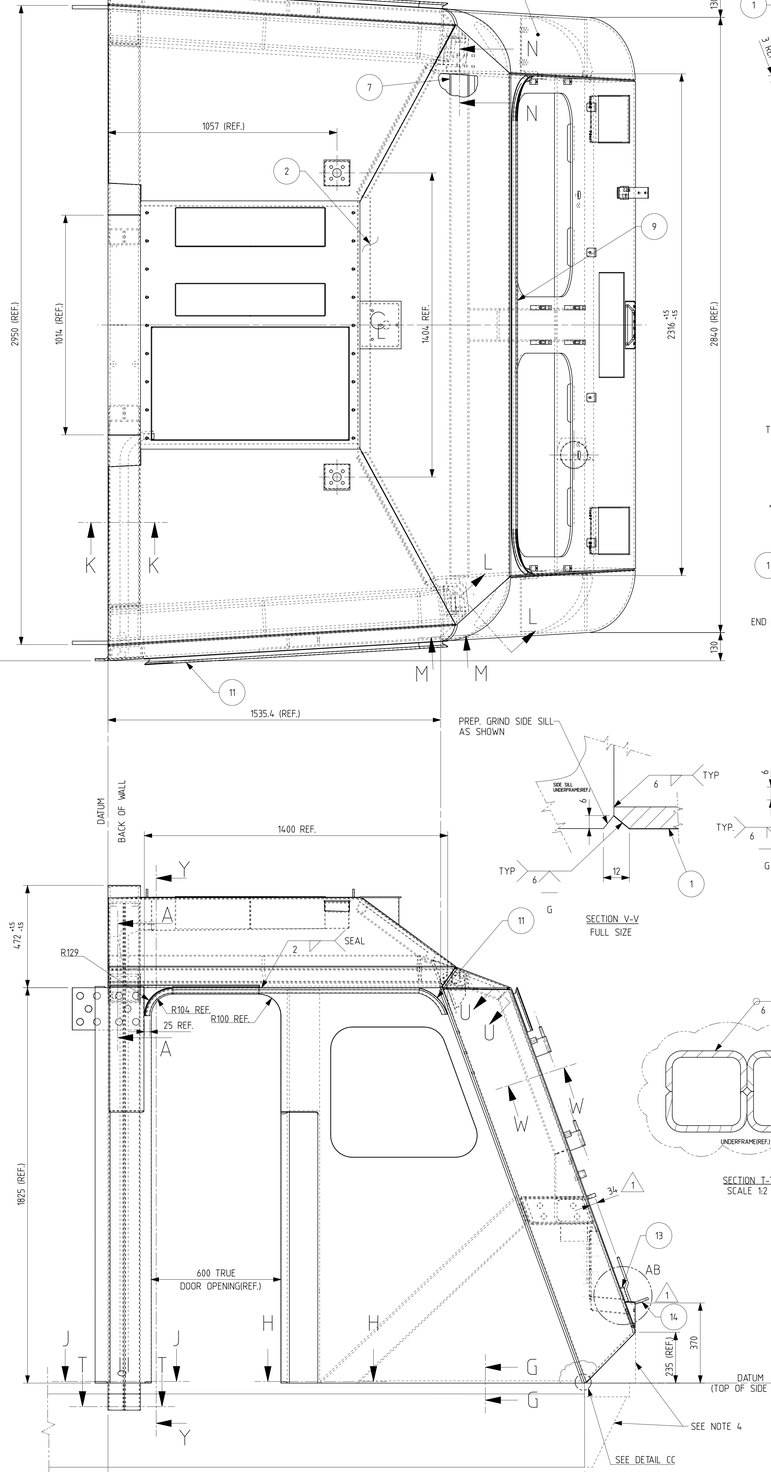


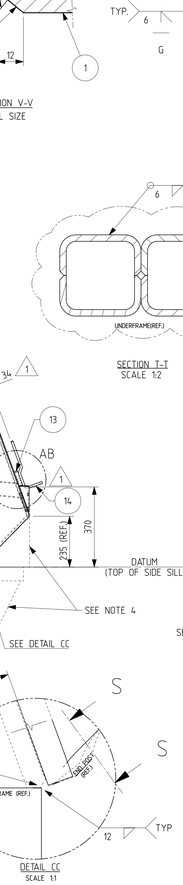


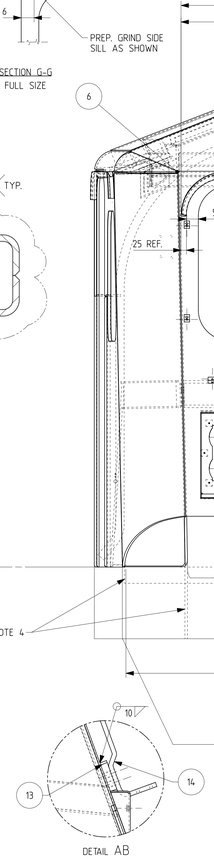


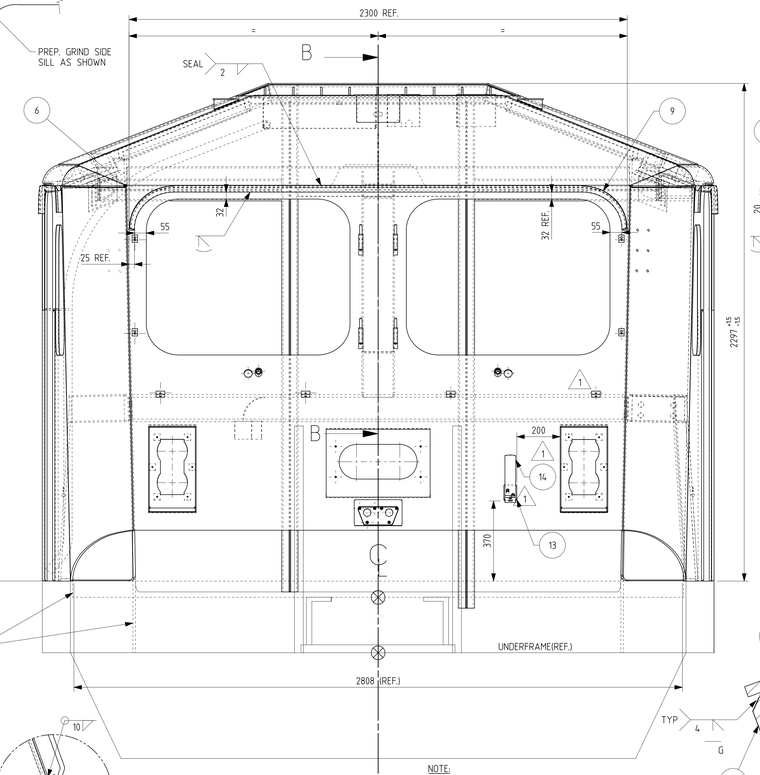


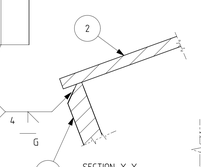


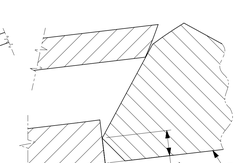












1. ALL DIMENSIONS ARE IN mm
2. C&D NO. T306/000
3. QTY./LOCO: 2 NOS.
4. NEXT LEVEL ASSEMBLY DRG. NO. 1209-03.025-001
5. USED FOR LOCO- WAG9HC, WAP-7
6. UNSPECIFIED TOLERANCE IN THE DIMENSIONS MENTIONED AT DRAWINGS TO BE FOLLOWED AS PER IS:2102(PART 1):1993-TOLERANCE CLASS-MEDIUM OF TABLE-1

निर्देश संख्या REF. NO.	लागत एवं वितरण संख्या C&D NO.	अंग आरेखण संख्या PART DRG. NO.	वर्णन DESCRIPTION	मात्रा QTY.	पदार्थ MATL	विशिष्टि SPECN	प्रति भार कि. ग्रा. WT. EACH IN K.G.
14	/	1209-08.330-577	TAIL LAMP BRACKET	1	STEEL	IS:2062:2011 Gr. E250 CU QUALITY-C, KILLED NORMALIZED	0.30
13	/	1209-08.430-578	BASE PLATE FOR TAIL LAMP BRACKET	1	STEEL	IS:2062:2011 Gr. E-250 CU QUALITY-C KILLED NORMALIZED	0.56
12	/	1209-07.332-149	TUBE SEAMLESS DIA 38.1 x 2.0 THK, 2.712 m.	1	STAINLESS STEEL	ASTM A 269, GR.304	
11	T308/174	1209-08.231-074-003	RAIN GUTTERS ON THE TOP OF DOOR & WINDOW LH	1	STAINLESS STEEL	ASTM-A240 GR.304	1.67
10	T308/173	1209-08.231-074-002	RAIN GUTTERS ON THE TOP OF DOOR & WINDOW RH	1	STAINLESS STEEL	ASTM-A240 GR.304	1.67
9	T308/172	1209-08.231-074-001	RAIN GUTTERS ON WIND SCREEN	1	STAINLESS STEEL	ASTM-A240 GR.304	2.80
8	T306/113	1209-08.230-054	VERTICAL STIFFENER FRONT CENTRAL	1	STEEL	IS:2062:2011 Gr. E250 CU QUALITY-C, KILLED NORMALIZED	9.20
7	T306/110	1209-08.130-294	ROOF STIFFENER ASSEMBLY	1			30.00
6	T306/109	1209-08.130-027	CAB CORNER CASTING LH.	1	CAST STEEL	DIN-17182 GS20Mn5	7.30
5	T306/108	1209-08.130-170	CAB CORNER CASTING RH.	1	CAST STEEL	DIN-17182 GS20Mn5	7.30
2	T306/103	1209-08.030-512	ROOF SHEET SUB. ASSEMBLY FOR AC	1			234.00
1	T306/001	1209-08.030-295	CAB SUB. ASSY.	1		-	1651.20

NOTE:

1. WELDING SHALL BE IN ACCORDANCE WITH AS1554.1-1991SP. ENSURE SEALING OF ALL EXTERNAL WELDS.
2. ENSURE ITEMS 5&6 BLENDS WITH BUT DOES NOT PROJECT ABOVE SURROUNDING SURFACES.
3. ASSEMBLY SEQUENCE-ADD ITEMS TO ITEM 1 IN THE FOLLOWING ORDER - 7,8,9,2,5,6.
4. REFER TO DWG. 1209-02.025-001 FOR ASSEMBLY DETAILS OF FRONT FRONT VERTICAL PANELS.

धातु–वेल्डन चिन्ह भा. मा. : 813 / अ. मा. सं. :2553 WELDING SYMBOLS TO IS:813 / ISO:2553	अनिर्दिष्ट सह्य – सीमा भा. मा. : 2102 / अ. मा. सं. : 2768 UNSPECIFIED TOLEARANCE TO IS : 2102 / ISO : 2768												TOL. CLS.
	पदांक GRADE NO.	सं1 N1	सं2 N2	सं3 N3	सं4 N4	सं5 N5	सं6 N6	सं7 N7	सं8 N8	सं9 N9	सं10 N10	सं11 N11	सं12 N12
सतह – रुक्षता का मान भा. मा. 3073 / अ. मा. सं. 1302 SURFACE ROUGHNESS VALUE TO IS:3073 / ISO:1302	Rz	0.16-0.3	0.5-0.7	0.9-1.1	1.5-2.0	2.5-3.8	5.0-6.3	9.0-12	16-25	30-40	50-63	75-100	160-250
	Ra μm	0.025	0.05	0.1	0.2	0.4	0.8	1.6	3.2	6.3	12.5	25	50
	चिन्ह SYMBOL												

परिवर्तन संख्या ALT. NO.	प्राधिकार AUTHY	वर्णन DESCRIPTION	दिनांकित आद्यक्षर DATED INITIAL
1	DY.CEE/D-I	ITEM 13 & 14 ADDED.	06-04-17

अभिकल्पित DGN	
जाँचा व.अ.अ. CHD SSE	SHIB NARAYAN KUNDU
समीक्षित स.वि.अ. / व.वि.अ. REVIEWED AEE / SEE	
अनुमोदित उ.मु.वि.अ. APPROVED DYCEE	SYAMA PRASAD PATRA
दिनांक DATE	22-03-21
रैखिक अनुपात SCALE	1:10
संदर्भ / REF.	IB081-00313 ALT- 2

चित्तरंजन रेलइंजन कारखाना
CHITTARANJAN LOCOMOTIVE WORKS, INDIA

पदार्थ MATL

प्रति भार कि. ग्रा. WT. EACH IN KG: 1967.6

विशिष्टि SPECN

वर्णन DESCRIPTION: CAB STRUCTURE FOR AC

आरेखण संख्या DRAWING NO.: 1209-08.130-511

परिवर्तन संख्या ALTERATION NO.: 1

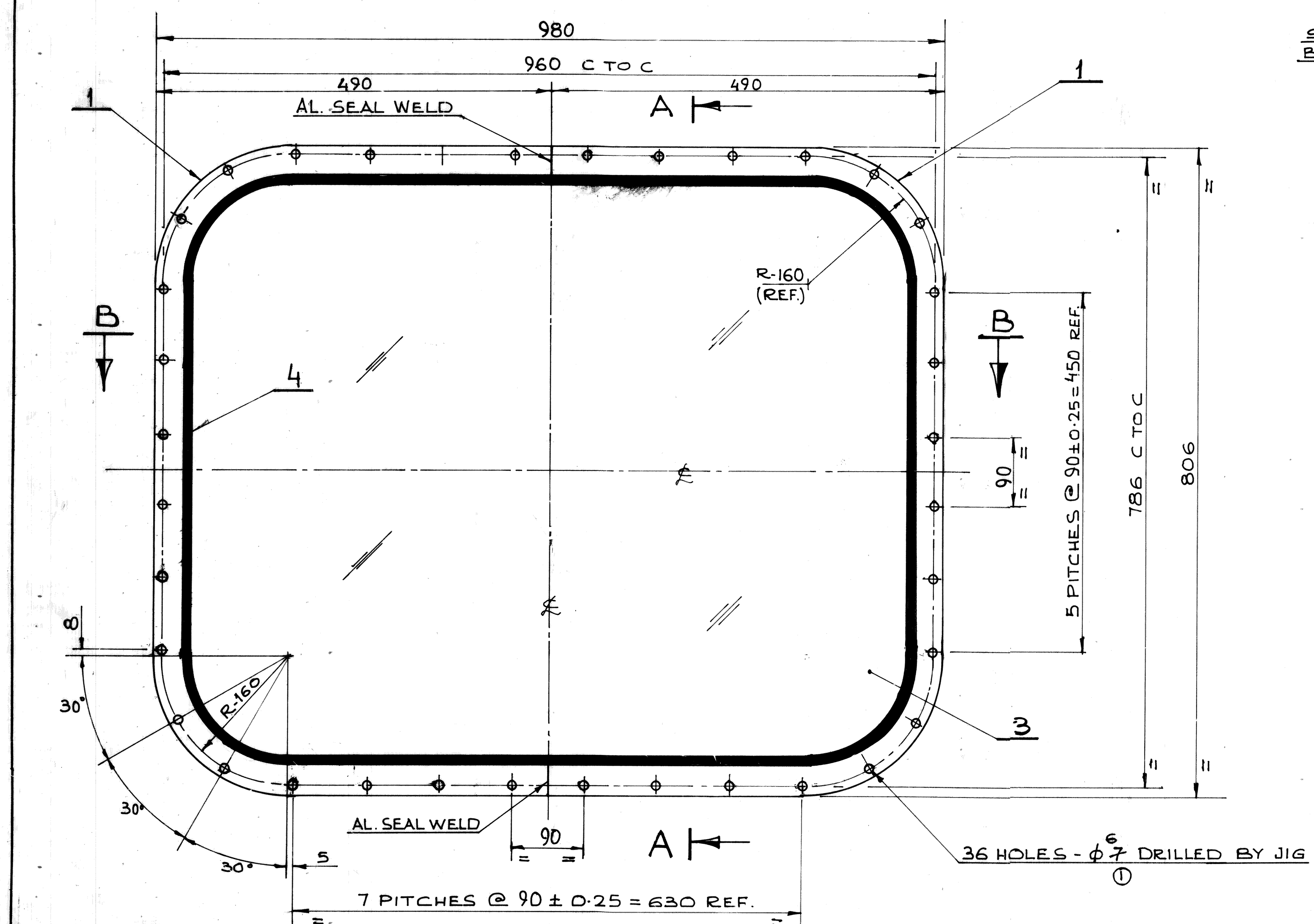
पर्ण SHEET: 1 OF 1

A0

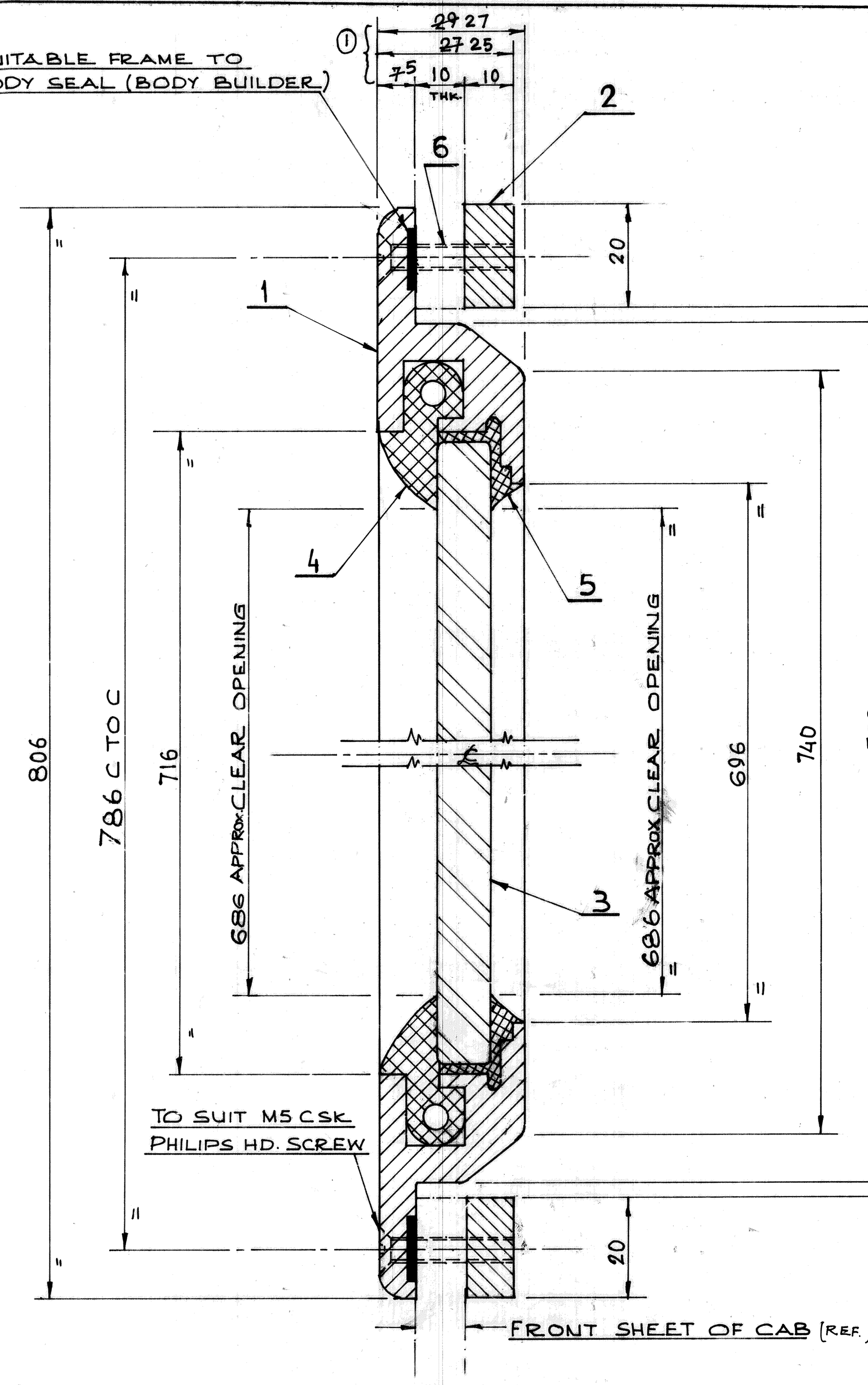
REDRAWN BY TCS

FORMAT NO :- D&D/05

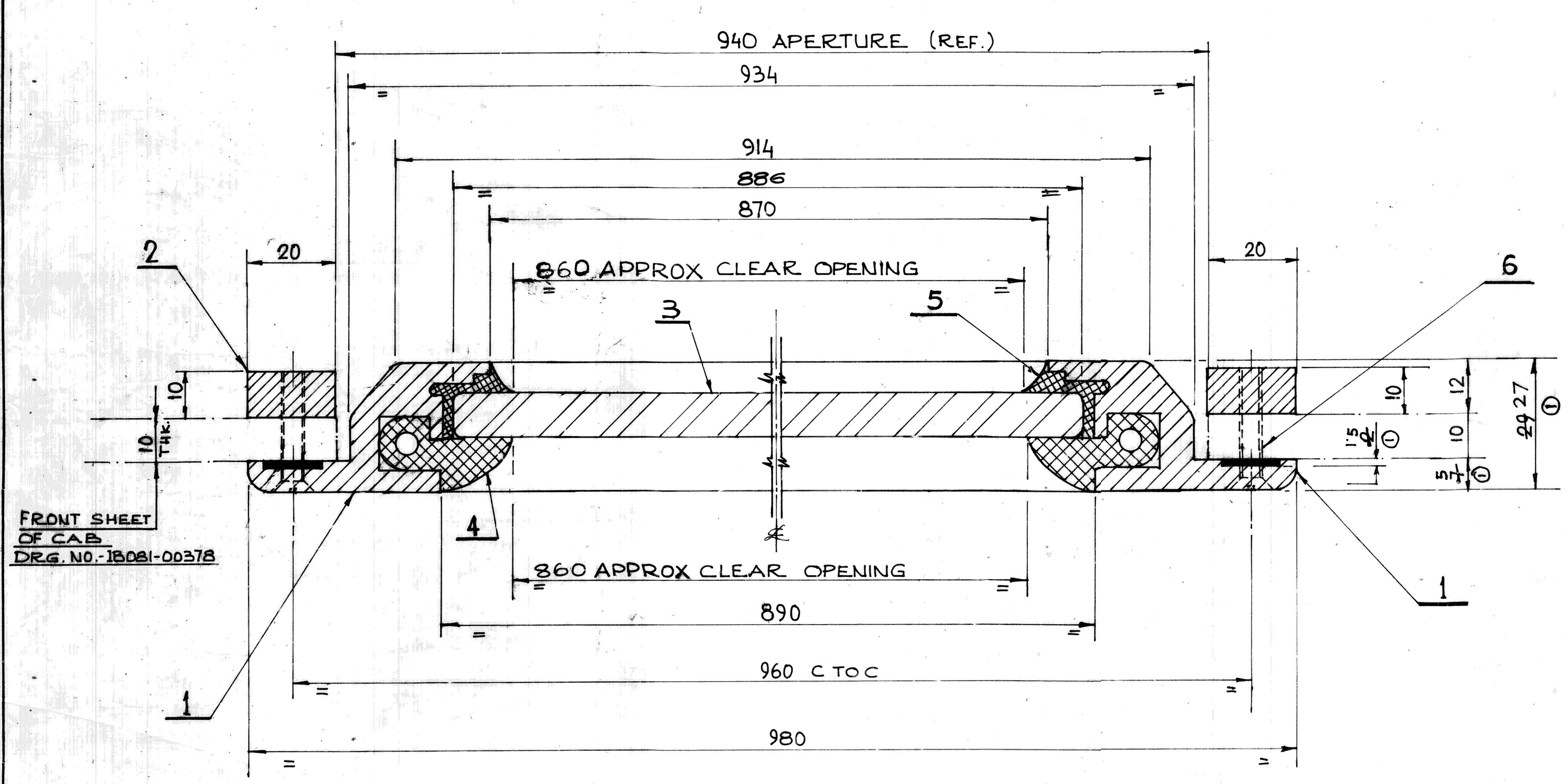
THIS DRG. SUPERSEDES CLW DRG. NO. 1209-08.130-125 Alt.4



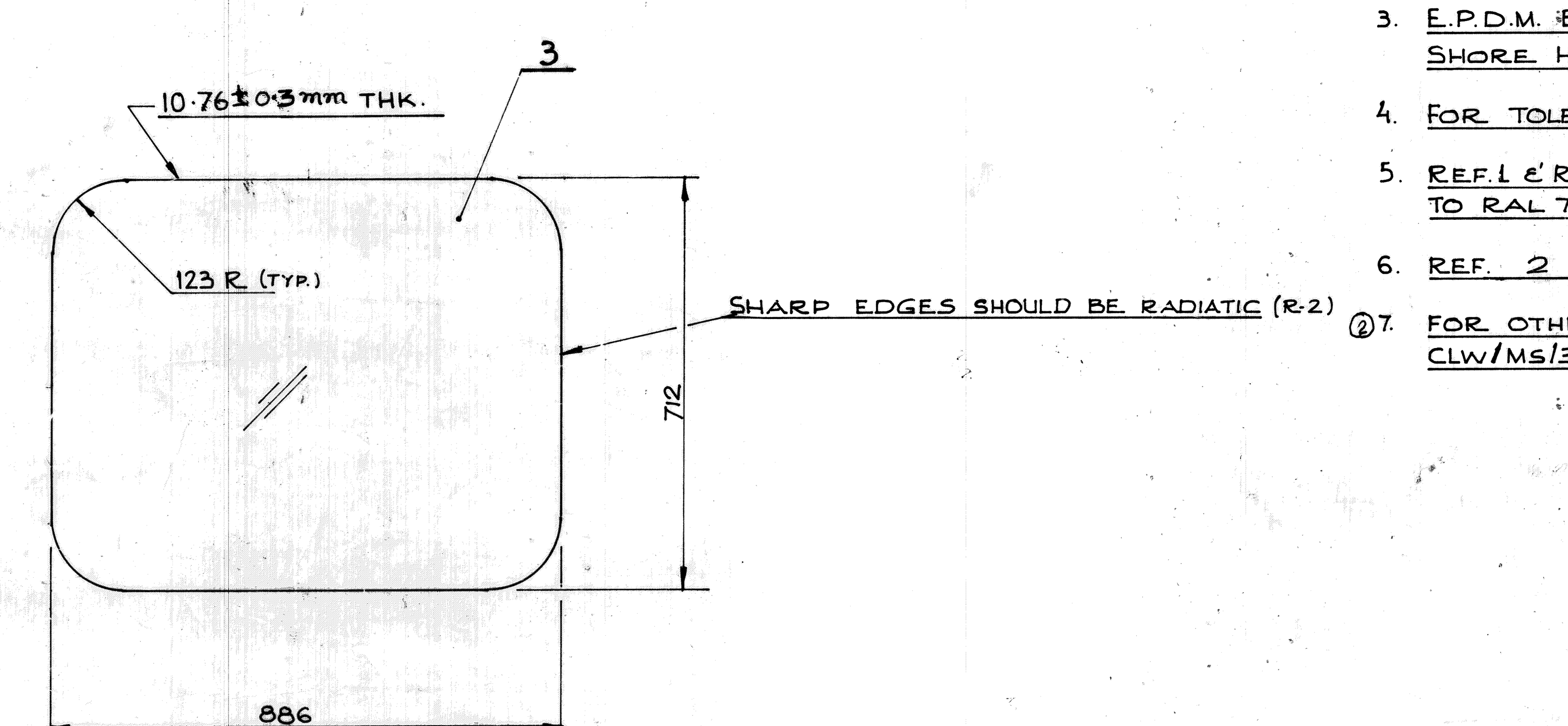
VIEW FROM OUTSIDE



SECTION - A-A

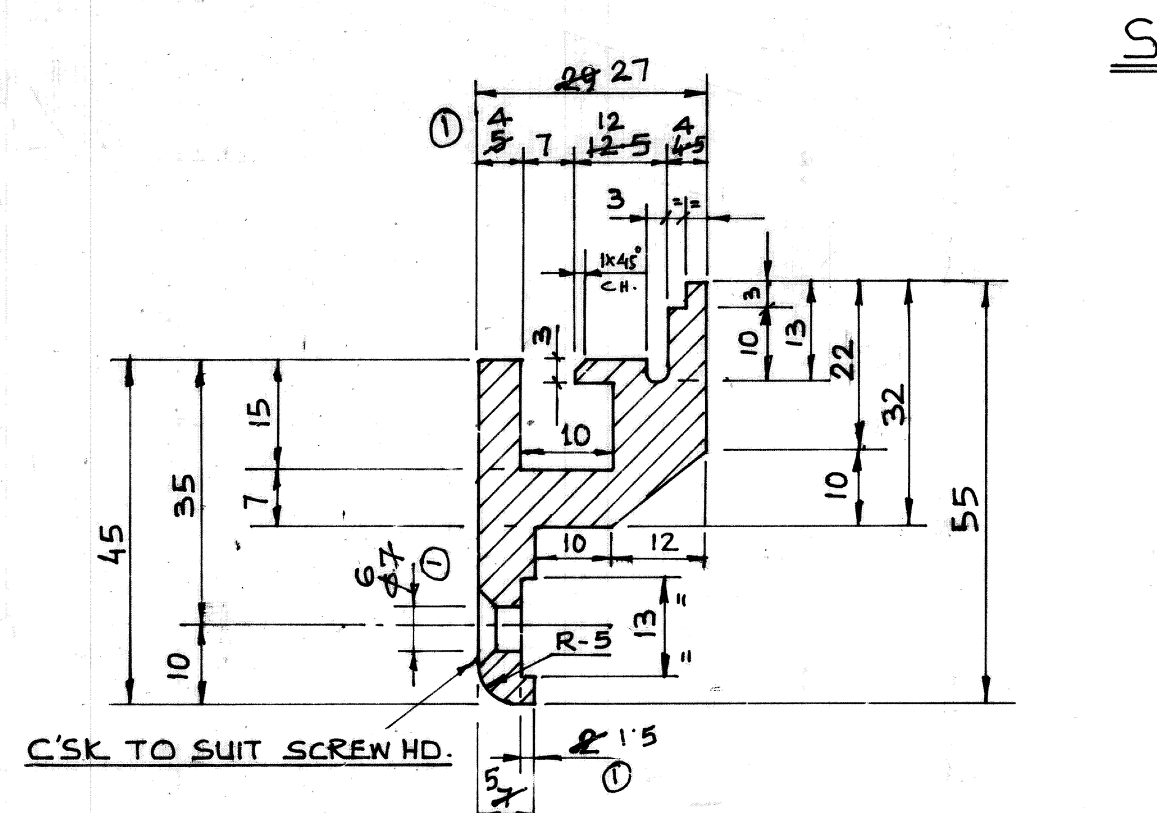


SECTION- B-B

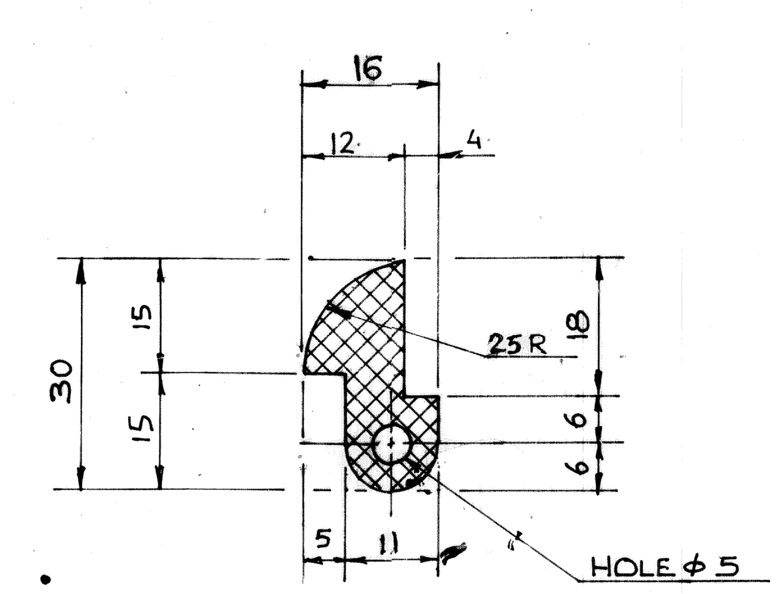


NOTES:

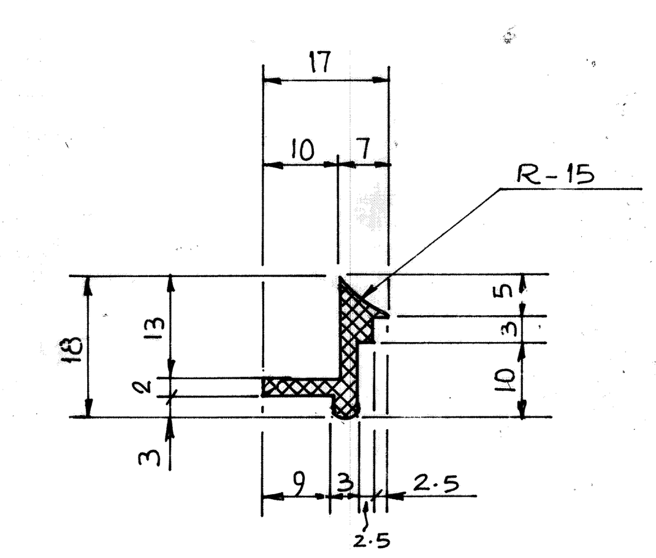
1. FULL ASSEMBLY SHOULD BE WATER TIGHT. WATER TIGHT TEST TO BE CONDUCT AS PER IEC-1133. SECTION-5.12
2. LAMINATED GLASS TEST AS PER IS:2553 (L).
3. E.P.D.M. BLACK RUBBER TEST AS PER ASTM-D573. SHORE HARDNESS ~~55±5~~ 65 ③
4. FOR TOLERANCE IN DIMENSIONS, IS:2102 TO BE FOLLOWED.
5. REF.1 & REF.2 TO BE FINISH WITH POWDERCOATED COLOUR TO RAL 7032 - PEBBLE GREY.
6. REF. 2 & 6 TO BE SUPPLIED LOOSE WITH ASSL'Y.
7. ② FOR OTHER TECH. DETAIL REFER CLW TECH. SPECN. NO. CLW/MS/3/027. ALT.②④.



PROFILE DETAIL OF FRAME (REF.1)



CROSS SECTION OF REF.4
SCALE : 1:1



CROSS SECTION OF REF.5
SCALE - 1:1

परिवर्तन संख्या Alt.No.	प्राधिकार AUTHY.	वर्णन DESCRIPTION	दिनांकित आद्यक्षर DATED INTITIAL
③	DyCEE D-I.	IN NOTE-3 SHORE HARDNESS RECTIFIED. MAT. SPEC. OF REF.NO.1,2 ALTERED.	[signature]
②		ALT.④ AGAINST SPECN. NO. IN NOTE-7 IS ADDED.	[signature]
①	DY.CEE/CON/TW	DIMNS. 27,25,5,4.12,4 & 1.5 WERE 29,27,7,5,12.5,4.5 & 2 RESPECTIVELY. ϕ6 WAS ϕ7. WT. 21Kg. WAS 22.5Kg.	[signature] 2/11

धातु-वेल्डन चिह्न भा.मा. 813 के अनुसार / WELDING SYMBOLS TO IS : 813

अनिर्दिष्ट सह्य-सीमा भा.मा. 2102 के अनुसार UNSPECIFIED TOLERANCE TO IS : 2102

सतह-रुक्षता का मान भा.मा 3073 के अनुसार SURFACE ROUGHNESS VALUE TO IS - 3073	स 1	स 2	स 3	स 4	स 5	स 6	स 7	स 8	स 9	स 10	स 11	स 12
पदाक GRADE NUMBER	N 1	N 2	N 3	N 4	N 5	N 6	N 7	N 8	N 9	N 10	N 11	N 12
R a µm	0.025	0.05	0.1	0.2	0.4	0.8	1.6	3.2	6.3	12.5	25	50
चिह्न SYMBOL	▽▽▽▽			▽▽▽			▽▽			▽		~

निर्देश संख्या REF. NO.	व्यय एवं विस्तरण सख्या C & D No.	अंग आरेखण संख्या PART DRG. NO.	वर्णन DESCRIPTION	संख्या/ रेलइंजिन NO./LOCO	पदार्थ MATL.	विशिष्टि SPECN.	प्रति भार कि.ग्रा. WT. EACH IN KG.
7							
6			C'SK-HD. PHILIPS SCREW-M5×25	144	ST. ST.	S.S.304	
5			EXTRUDED RECEPTACLE	13.5 mt.	RUBBER BLACK	E.P.D.M	
4			EXTRUDED RECEPTACLE	13.5 mt.	RUBBER BLACK	E.P.D.M.	
3			GLASS - 10.76±0.3 THK.	4	LAMINATED GLASS	IS:2553 (L)	
2		1209-08 330-239	MOUNTING BAR ASSL'Y	4	ALUMINIUM ALLOY	IS:733 ~~Gr. 24534~~ 64430WP	③
1			FRAME	8	ALUMINIUM ALLOY	IS: 733 ~~Gr. 24534~~ 64430 WP.	③
A			WIND SCREEN ASSL'Y	4	—	—	~~21~~ 22.5 ①

अभिकल्पित DGN	[signature]
जाँचा CHD	[signature] 2-9-02
अधीक्षक SUPDT.	J. Nale 3.9.02
समीक्षित व.अ (या/वि) REVIEWED SE (M/E)	[signature] 3/9/02
अनुमोदित Approved अ.मु.वि.अ DYCEE	[signature] 3/9/2002
दिनाक DATE	29-08-2002
रैखिक अनुपात SCALE	1:1 ; 1:5 ; 1:10
सदर्भ / REF.	

आरेखण संदर्भ
REF. ASSLY. DRG. NO. IA081-00160 ALT. 5

WIND SCREEN ASSEMBLY

अभिकल्प - एवं विकास केन्द्र
D & D CENTRE
चित्तरंजन रेलइंजन कारखाना, भारत
CHITTARANJAN LOCOMTIVE WORKS, INDIA

संस्वरे क. CAD NO.

प्रयोग मे USED FOR LOCOS WAG-9 / CO-CO

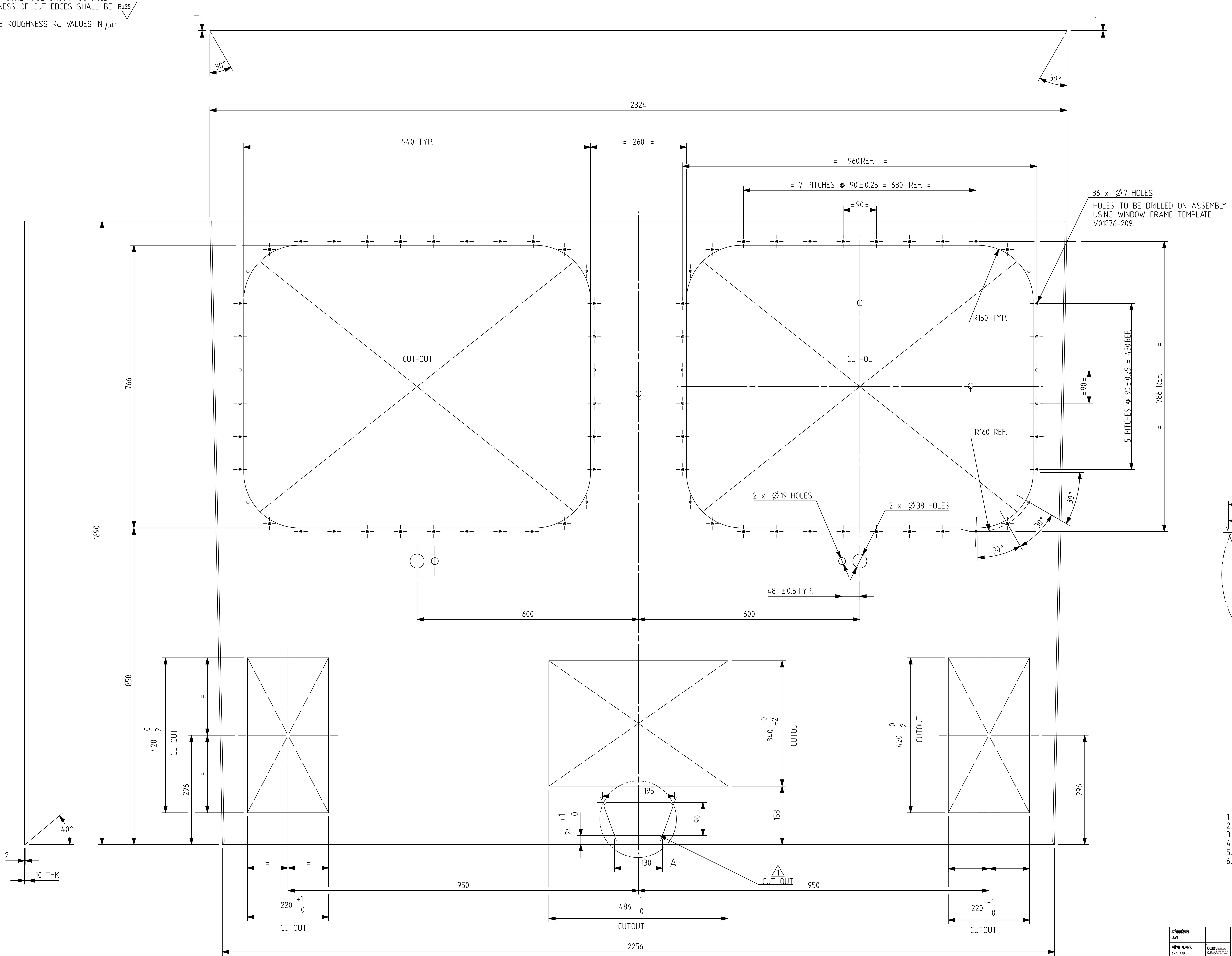
1ST ANGLE PROJECTION

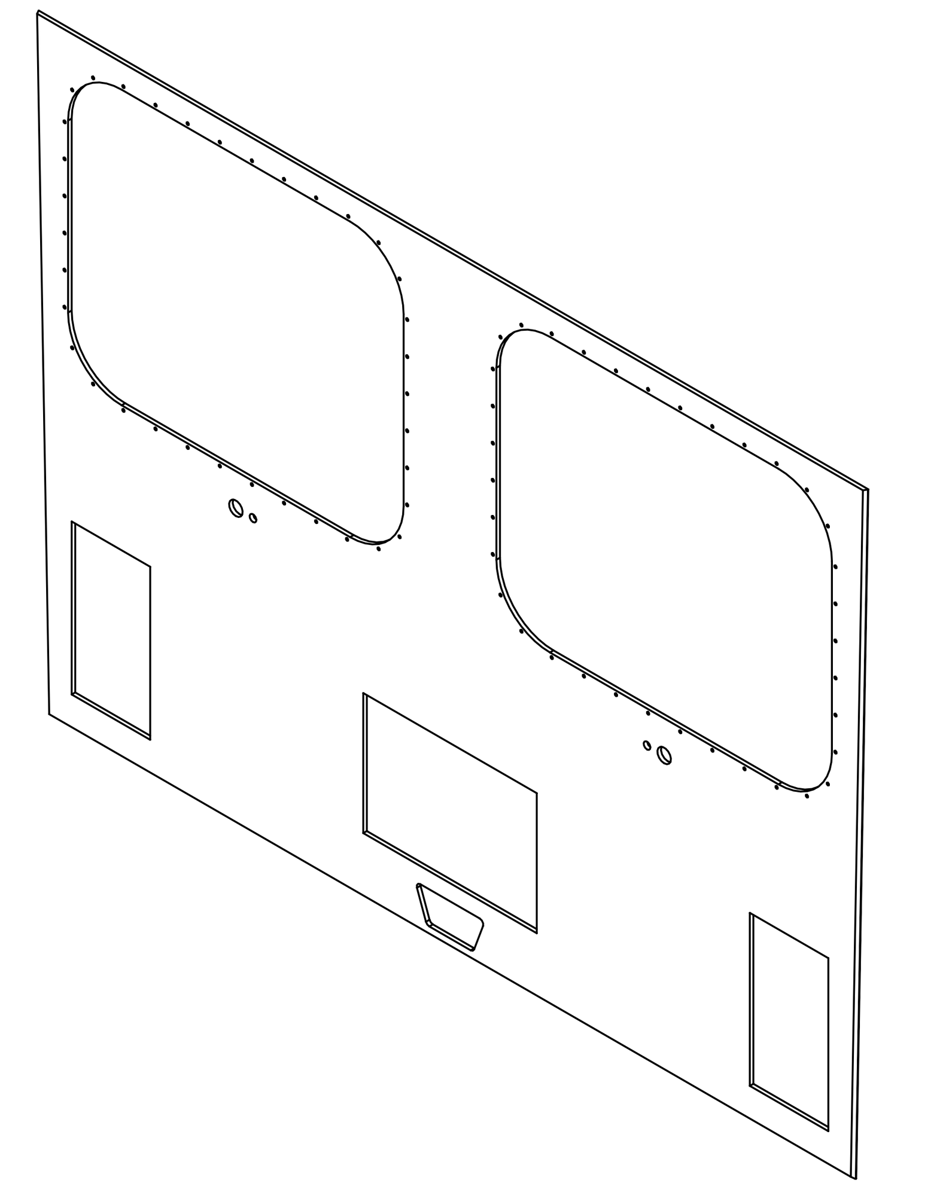
आरखण संख्या / DRAWING NO.
1209-08.130-263

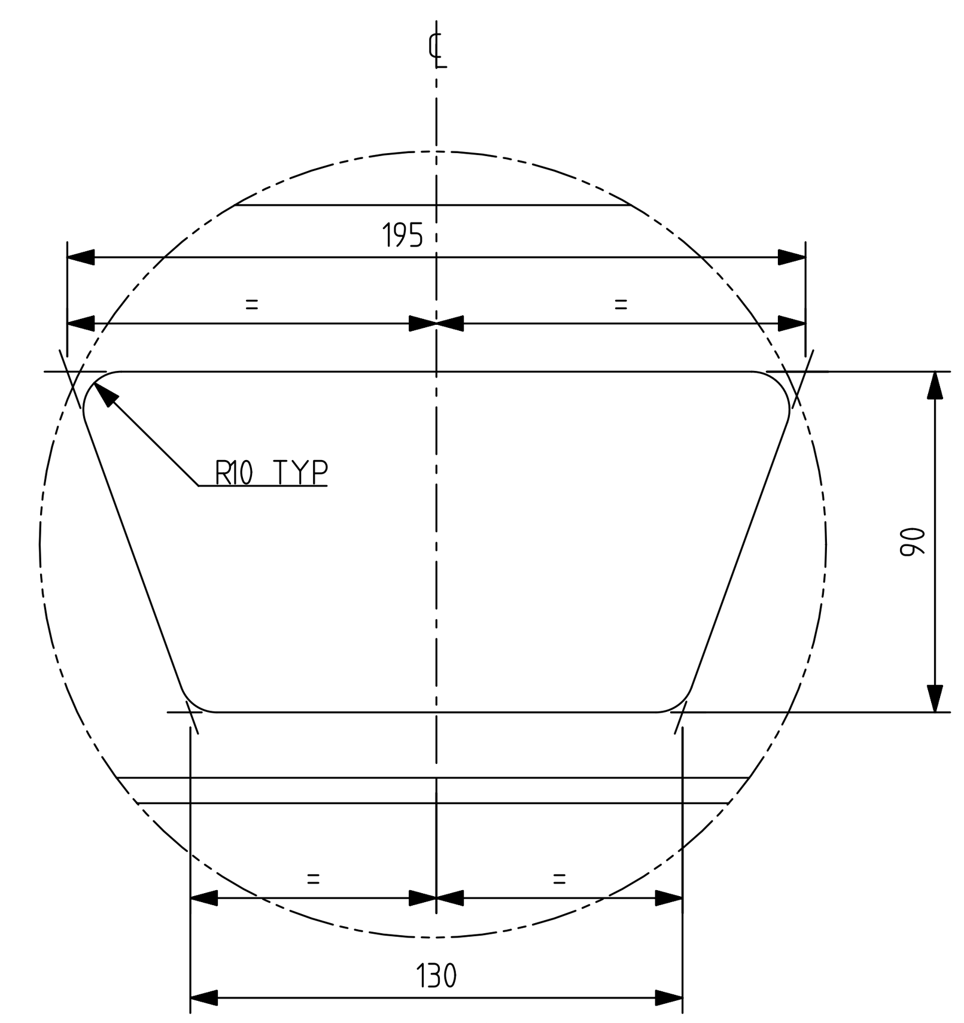
ALT ①②③

UNLESS OTHERWISE SHOWN SURFACE ROUGHNESS OF CUT EDGES SHALL BE Ra25

SURFACE ROUGHNESS Ra VALUES IN µm







DETAIL A
SCALE 1:2
ENLARGE VIEW OF CUT OUT FOR UIC SOCKET

1. ALL DIMENSIONS ARE IN mm
2. C&D NO. T306/065
3. QTY./LOCO: 2 NOS.
4. NEXT LEVEL ASSEMBLY 1209-08.130-011
5. USED FOR LOCO WAG-9HC & WAP-7
6. UNSPECIFIED TOLERANCE IN THE DIMENSIONS MENTIONED AT DRAWINGS TO BE FOLLOWED AS PER IS:2102(PART 1):1993-TOLERANCE CLASS-MEDIUM OF TABLE-1

धातु–वेल्डन चिन्ह भा. मा. : 813 / अ. मा. सं. :2553
WELDING SYMBOLS TO IS:813 / ISO:2553

सतह – रुक्षता का मान भा. मा. 3073 / अ. मा. सं. 1302
SURFACE ROUGHNESS VALUE TO IS:3073 / ISO:1302

अनिर्दिष्ट सह्य – सीमा भा. मा. : 2102 / अ. मा. सं. : 2768 UNSPECIFIED TOLEARANCE TO IS : 2102 / ISO : 2768												TOL. CLS.
पदांक GRADE NO.	सं1 N1	सं2 N2	सं3 N3	सं4 N4	सं5 N5	सं6 N6	सं7 N7	सं8 N8	सं9 N9	सं10 N10	सं11 N11	सं12 N12
Rz	0.16-0.3	0.5-0.7	0.9-1.1	1.5-2.0	2.5-3.8	5.0-6.3	9.0-12	16-25	30-40	50-63	75-100	160-250
Ra µm	0.025	0.05	0.1	0.2	0.4	0.8	1.6	3.2	6.3	12.5	25	50
चिन्ह SYMBOL												

परिवर्तन संख्या ALT. NO.	प्राधिकार AUTHY	वर्णन DESCRIPTION	दिनांकित आद्यक्षर DATED INITIAL
1	DY.CEE/D/CONV.	CUT OUT FOR UIC SOCKET CHANGED FROM CIRCULAR TO TRAPEZIUM SHAPE	

चित्तरंजन रेलइंजन कारखाना

CHITTARANJAN LOCOMOTIVE WORKS, INDIA

अभिकल्पित DGN	
जाँचा व.अ.अ. CHD SSE	RAJEEV KUMAR (Digitally signed by RAJEEV KUMAR Date: 2023.01.24 17:57:21 +05'30')
समीक्षित स.वि.अ. / व.वि.अ. REVIEWED AEE / SEE	
अनुमोदित उ.मु.वि.अ. APPROVED DYCEE	SYAMA PRASAD PATRA (Digitally signed by SYAMA PRASAD PATRA Date: 2023.01.25 17:50:58 +05'30')
दिनांक DATE	14-12-2022
रैखिक अनुपात SCALE	1:5
संदर्भ / REF.	IB081-00378 ALT.- 3

पदार्थ MATL	STEEL	प्रति भार कि. ग्रा. WT. EACH IN KG	167.5
विशिष्टि SPECN	IS:2062:2011 Gr. E250 CU QUALITY-C, KILLED NORMALIZED		
वर्णन DESCRIPTION	FRONT SHEET		
आरेखण संख्या DRAWING NO.	1209-08.130-019		
परिवर्तन संख्या ALTERATION NO.	1	पर्ण SHEET	1 OF 1

A1