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Train B28

Procurement Technical Specification of Driver's Footrest

	Name	Date	Signature
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REVISION HISTORY:

Rev. No.	Clause No.	Page No.	Changes	Revision Date
Nil	-			-

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1. Introduction

1.1. General

New Generation energy efficient Trainset variant is a high speed (operating speed 249 kmph) 8 car trainset is being design, developed, manufactured, testing, commissioning and maintenance by BEML.

This Procurement Technical specification (PTS) specifies the technical requirements of Driver's footrest assembly.

BEML will carry out all required works and activities as Contractor to the Employer for this project, while the subcontractor shall be responsible for all works required in this PTS with regard to Driver's footrest assembly and shall be responsible for supporting BEML activities as contractor for ICF/NHSRCL project.

The scope of work covers design, development, testing, manufacture, supply, commissioning and integrated testing of Driver's footrest assembly and the training of Operation and Maintenance personnel of the owner/operator on the Driver's footrest assembly. The scope also covers supply of spares, O&M and spare parts manual, special tools, testing and diagnostic equipment, jigs and fixtures for maintenance, repair and overhaul of footrest assembly.

The scope of work includes all items of work which may be required to meet the performance requirements, reliable and efficient operation of trains and meeting the best international practices even if not specifically mentioned in this PTS.

1.2. Train Composition

The trainset configuration (tentative) is as follows:

For 8-Car formation: 2 basic units, each unit consisting of 4 cars.

* DTC1 + MC1 + TC1(PRM) + MC1 + MC1 + TC2(Ex)+ MC1 + DTC2 *

DTC1/DTC2: Driving Trailer Car,

MC1: Motor Car,

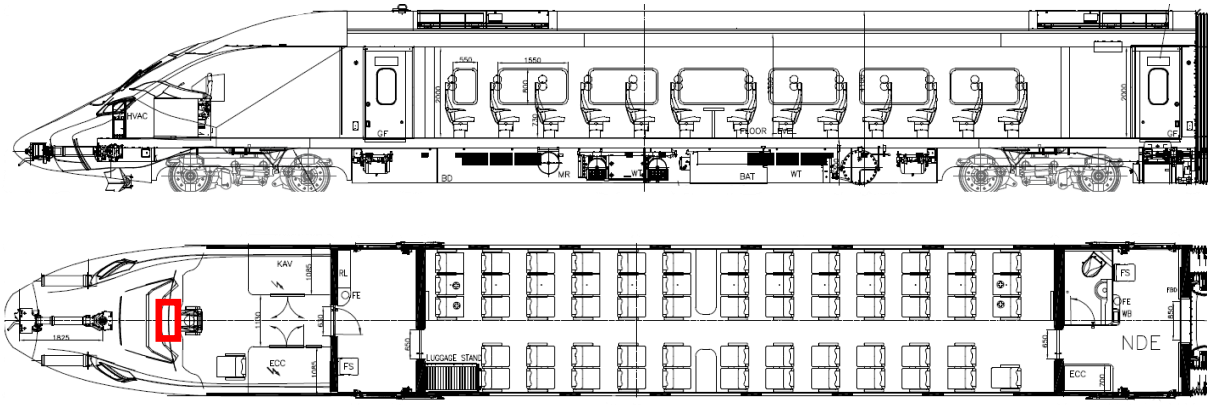
TC1(PRM): Trailer Car with PRM seat,

TC2(Ex): Trailer Car (Executive Car with PRM)

" * ": Automatic Coupler

" + ": Semi-permanent Coupler

1.3. Driver's footrest assembly arrangement



DT Car

1.4. Climatic and Environmental Conditions

The climatic and environmental conditions prevailing in India are the following:

Description	Limiting Values
Atmospheric Temperature	Minimum temperature -5°C Maximum temperature 50°C Maximum touch temperature of metallic surface under the sunlit and shade shall be considered and calculated as per ASHRAE 2021.
Humidity	100% saturation during rainy season
Solar radiation	Value and calculation method shall be based on ASHRAE 2021.
Altitude	1000 meter above mean sea level
Rainfall	Very heavy and continuous rainfall in certain areas (heavy continuous rainfall up to 2500mm, rainy season is as long as 5 months in some stretches)
Atmosphere conditions	Extremely dusty and desert terrain in certain areas. The dust concentration in air may reach a high value of 0.4 mg/m3.
Coastal area	Humid, salt laden and corrosive atmosphere as prevailing in coastal region.
Wind speed	High wind speed in certain areas, with wind pressure reaching 216 kg/m2. [Note-2]
Flood level	The Train shall function in accordance with these Specifications and Standards in the event of flooding up to 50 mm above Rail Level as follows: • In the event of flooding at any level below Rail Level,

	the Train shall operate in full compliance with these Specifications and Standards. • In the event of flooding at a height between Rail Level and 50 mm above Rail Level, the Train shall operate in full compliance with these Specifications and Standards with the exception that it is permissible to restrict the operation of the Train to a maximum of 10 km/h. • Allowance is to be made in addition for increase in the height of water level due to the "bow wave" effect of the Train passing through the water.

In developing the detailed design, the sub-contractor shall acquaint himself and take note of the environmental operating conditions prevailing on the Trial Section during Heavy monsoon, track flooding conditions, saline, humid and dusty atmosphere etc.

1.5. Performance Requirements

The performance requirements of the train shall be governed according to following table.

Item	Values
Maximum operational speed during service	249 kmph
Maximum Design speed	280 kmph
Minimum deceleration during full service braking followng jerk limit as specified	0.8 m/s^2
Jerk rate (Maximum)	0.7 m/s^3 during full service braking (for all speed range) 1 m/s^3 during emergency braking (for speeds >10kmph)
Passenger load	80 kg/person 2-4 standing/m^2
Average running distance of a rake	2,000 km/day

2. Definitions and Abbreviations

The following definitions and abbreviations are applicable to the PTS.

2.1. Definitions

The following definitions are applicable to the PTS.

- **"Employer**" means ICF-Chennai, its legal successors and assignees.
- **"Nominated Agency"** shall mean NHSRCL and its representatives including an

ISA (if any) deployed by NHSRCL for the purpose of carrying out Design approvals, Tests, Trials etc.

- "**BEML**" means the contractor for Design, Development, Manufacture, Testing and Commissioning of Trainsets for the project.
- "**Subcontractor** " means the subcontractor who supplies the required footrest.

2.2. Abbreviations

ICF	: Integral Coach Factory, Chennai, Indian Railways
NHSRCL	: National High Speed Rail Corporation Limited
PTS	: Procurement technical specification
OEM	: Original Equipment Manufacturer
DNP	: Defect Notification Period

3. Qualification Criteria

(i) The tenderer shall be a stainless steel/ Aluminium fabricator and shall have requisite in-house infrastructure facilities for manufacture and testing of stainless steel and aluminium fabricated items. Company profile along with product range, infrastructure and test facility details shall be submitted along with the technical bid.

(ii) The firm shall have qualified welders for stainless steel/ Aluminium fabrication. Welder qualification certificate and Welding Process Qualification (WPS & PQR) as per EN / ISO / DIN standard shall be submitted along with the technical bid.

(iii) The firm should have manufactured and supplied similar item. Supporting documents for the supplies made shall be submitted along with the technical bid.

(iv) The firm shall hold ISO 9001 certification and shall manufacture the product accordingly. The firm shall submit a copy of ISO 9001 certification along with the technical bid.

4. Standards

The design, testing and manufacturing of Driver's footrest assembly shall conform to the latest editions of internationally recognized Standards viz., Indian, American, European, Japanese, ISO, etc.

Following standards to be considered as minimum of the driver's footrest assembly:

Sl No.	Standard No./ Code No.	Title
1	EN 16186-1	Railway applications - Driver's cab - Part 1: Anthropometric data and visibility
2	EN 16186-4	Railway applications - Driver's cab - Part 4: Layout and access

Sl No.	Standard No./ Code No.	Title
3	EN 45545-1:2013+A1:2015 (Part 1-7)	Railway applications - Fire protection on railway vehicles, Cat. OC-3
4	EN 45545-2:2020+A1:2023	Railway applications -Fire protection on railway vehicles -Part 2: Requirements for fire behaviour of materials and components
5	EN 12663-1:2010+A1:2014	Railway applications - Structural requirements of railway vehicle bodies - Part 1: Locomotives and passenger rolling stock (and alternative method for freight wagons).
6	EN 50126-1:2017	Railway Applications - The Specification and Demonstration of Reliability, Availability, Maintainability and Safety (RAMS) - Part 1: Generic RAMS Process
7	DIN 25201-2:2015	Design guide for railway vehicles and their components - Bolted joints - Part 2: Design - Mechanical applications
8	PN-EN 61373 : 2010/AC:2017	Railway applications –Rolling stock equipment – Shock and vibration tests
9	---	Indian Anthropometric Dimensions

5. Technical Requirements

(i) Th footrest dimensions should follow 3D/2D guidelines:

a. VB280-233400-00.stp

b. VB280-233400-00.pdf

(ii) The height adjustable footrest is self-standing element, attached firmly to the floor in the driver' cab. It shall be possible to adjust the height between 150-255mm.

(iii) The height adjustment is controlled via footswitch releasing air spring load. The height of the footrest can be selected by pressing the upper surface of the footrest, after releasing air spring brake (footswitch located in central part of the footrest).

(iv) The upper footrest surface shall be provided by aluminum alloy sheet with anti-skid surface treatment (checker patterns duet or quintet are preferred).

(v) All parts of the footrest must be sealed against water penetration or properly drained - it also refers to the footrest upper surface (bended edges)

(vi) Maximum permissible weight of the footrest is 25 kg.

(vii) The footrest will be fastened with 4-6 bolts on the lower abutment surface to the threaded inserts in the floor, accessible e.g. by taking off the upper pedal surface. The supplier will design the exact positions of these bolts taking into account the internal arrangement of the footstool.

(viii) Maximum noisiness of the footrest when rearranging the position is 45 dB(A). The footrest or its parts must not resonate or create disturbing sounds during operation.

(ix) Unintentional movement of the footrest is not allowed. The footrest blocking element should withstand the whole weight of the driver (90kg).

(x) The supplier should indicate force needed to surpass the blocking mechanism.

(xi) The foot rest assemblies shall be fabricated using dedicated tooling, jigs & fixtures and the final part shall be free of bend marks & scratches.

(xii) In case of the different material used in the assembly, the mating surfaces of shall be painted/coated with suitable material before assembly to avoid Bi-metallic corrosion. The preferred colour is Aluminium metal colour.

6. Scope of Supply

6.1. General

(i) The subcontractor shall be responsible for the scope of supply of footrest assembly mentioned in the PTS which shall comprise, unless specifically excluded, the design, manufacture, testing, delivery, commissioning and rectification of defects during the Defects Liability Period.

(ii) The supplier shall submit detailed manufacturing process used for foot rest assy. along with the technical bid.

(iii) The design of footrest assemblies shall be rugged and shall ensure a durable life of 30 years in Indian environmental conditions.

(iv) After fabrication, the finish products shall be of sound quality without any defects.

(v) All the parts of foot rest assembly shall be subjected to visual and dimensional inspection. Inspection reports shall be submitted along with supplies.

(vi) The supplier shall obtain sample approval and fitment trials for foot rest assy. from BEML before taking up mass production.

(vii) The Foot Rest assemblies. shall be packed to ensure that no damage will occur during transit & storing at BEML.

(viii) Part number shall be marked on the assembly. However, use of label for mentioning the part number is not acceptable.

(ix) The firm shall undertake to provide DNP spares which have to be stocked by the firm at the depots during the DNP period of 15 years, at his own cost. List of DNP spares shall be submitted along with the technical offer.

6.2. Submission of Documents

The subcontractor shall submit, all necessary documents viz., Design calculations and Design drawings, but not limit, to the following.

1. Cbc (clause-by-clause) comment to specification,
2. Technical description,
3. 3D model and 2D drawings of system components
4. Cooperation in integration
5. User's manual
6. Maintenance instruction
7. Spare parts list
8. Installation instructions
9. RAMS & LCC
10. Certifications

All drawings, calculations and design documents shall be submitted in English language.

6.3. Fire Safety

All components shall be designed to reduce to the maximum extent practical, the heat load, rate of heat release, propensity to ignite, rate of flame propagation, spread of flame, smoke, emission and toxicity of combustion gases. The complete assembly shall confirm to fire safety requirements of EN 45545, (HL2).

Firm shall submit the fire test certificates of the non-metallic components.

6.4. Mockup

The sub-contractor shall provide one number of footrest assembly for the mock-up car.

The sub-contractor shall demonstrate fixing and functioning of the assembly. All the items required for proper mounting and functioning of the footrest are in the scope of the sub-contractor.

7. Quality Assurance Program

7.1. General

The subcontractor shall hold ISO 9001/ IRIS certification and shall manufacture the product accordingly. The subcontractor shall submit a copy of ISO 9001 / IRIS certification along with the offer. The subcontractor shall monitor and control the Quality systems as per ISO 9001/IRIS guidelines. BEML and/or NHSRCL's representative may periodically conduct compliance audits of the Subcontractor's Quality management system.

7.2. Quality assurance plan

The subcontractor shall develop and submit a Quality assurance plan (QAP) to BEML for review and approval based on ISO 9001 / IRIS guidelines.

8. Type Test & Routine Tests

Assemblies shall be type and routine tested in accordance with relevant standards and specifications.

All such tests shall be carried out at the subcontractor's cost, wherever performed, in the presence of and to the satisfaction of BEML/NHSRCL, who reserves the right to witness any or all of the tests and to require submission of any or all test specifications and reports.

BEML/NHSRCL reserve the right to reasonably call for additional tests, if necessary.

The subcontractor shall carryout the following type tests and routine tests as a minimum, and shall submit the reports.

BEML and NHSRCL reserve the right to reasonably call for additional tests, if necessary.

The subcontractor shall carryout the following type tests and routine tests, as a minimum.

SL No.	Type of Test	Type Test	Routine Test	Remarks
1	Visual Inspection	✓	✓	
2	Dimensional Inspection	✓	✓	
3	Function Test	✓	✓	
4	Strength Test	✓	—	
6	Material Test	✓	✓ (For every batch)	
7	Fire Safety Test	✓	—	For non-metallic components

The type test procedure document shall be prepared by the sub-contractor and BEML/NHSRCL approval shall be obtained before conducting the tests.

The routine test reports shall be submitted along with every batch of supplies.

9. Attachments

1. Annexure 2: 843-18085.pdf

10. Submittals with Technical Offer

The Subcontractor shall provide as a minimum, the following along with the technical offer:

(i) CBC (clause-by-clause) comment to specification

(ii) Complete Technical offer of proposed footrest assembly along with drawings.

(iii) OEM Drawing with Bill of Material.

(iv) Technical description document of footrest assemblies.

(v) List of spares as per this PTS.

(vi) Supporting documents for qualification criteria as at clause-3 of this PTS.

(vii) Documents like QAP, ITP, Company profile with infrastructure facilities, product range etc.

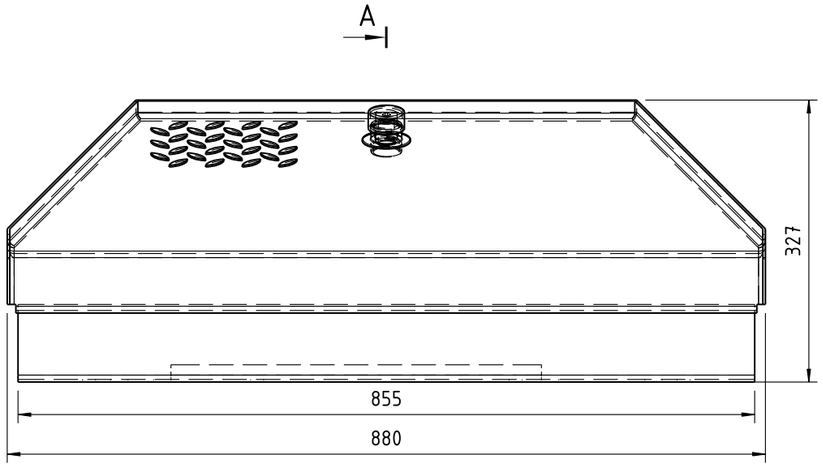
(viii) ISO 9001/ IRIS certification.

----------End of Document----------

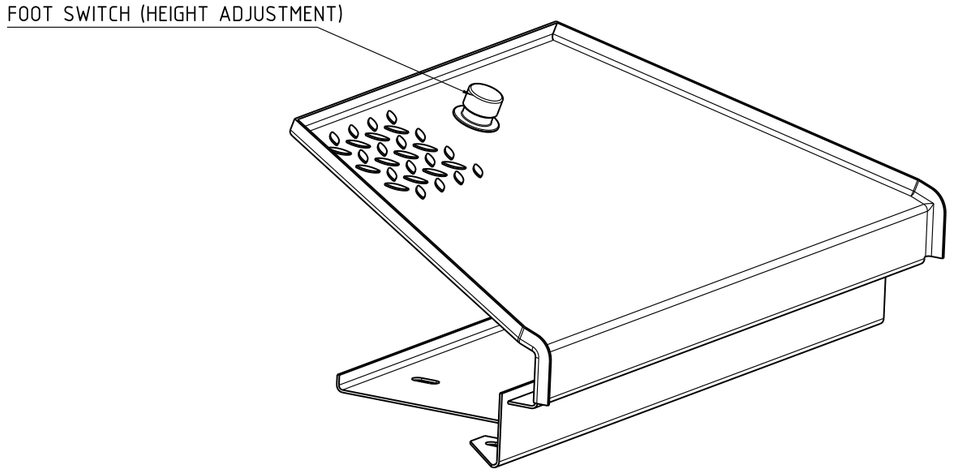
MACHINING DEVIATIONS FOR LINEAR DIMENSIONS CLASS - MEDIUM	RANGE	0.5 - 3	3 - 6	6 - 30	30 - 120	120 - 400	400 - 1000	1000 - 2000	2000 - 4000
	TOLERANCE	±0.1	±0.1	±0.2	±0.3	±0.5	±0.8	±1.2	±2

GENERAL TOLERANCES FOR LINEAR & ANGULAR DIMENSION SHALL BE AS PER ISO 2768-1		GENERAL GEOMETRICAL TOLERANCES SHALL BE AS PER ISO 2768-2	
GENERAL TOLERANCES FOR WELDED STRUCTURE SHALL BE AS PER ISO 13920		VALUES OF SURFACE TEXTURE SHALL BE AS PER ISO 1302.	
WELDING SHALL BE CARRIED OUT AS PER EN 15085-3	WELDING PROCESS SHALL BE AS PER EN ISO-4063	STATUS:	TENDER
WELDING SYMBOLS SHALL BE AS PER EN ISO-2553	WELDING POSITIONS SHALL BE AS PER EN ISO 6947		
QUALITY LEVELS FOR IMPERFECTIONS IN FUSION WELDED JOINTS SHALL BE AS PER EN ISO 5817			
WELD JOINT PREPARATIONS SHALL BE AS PER EN ISO 9692 & EN 15085-3	INSPECTION & TESTING OF WELDED JOINTS SHALL BE AS PER EN 15085-5		

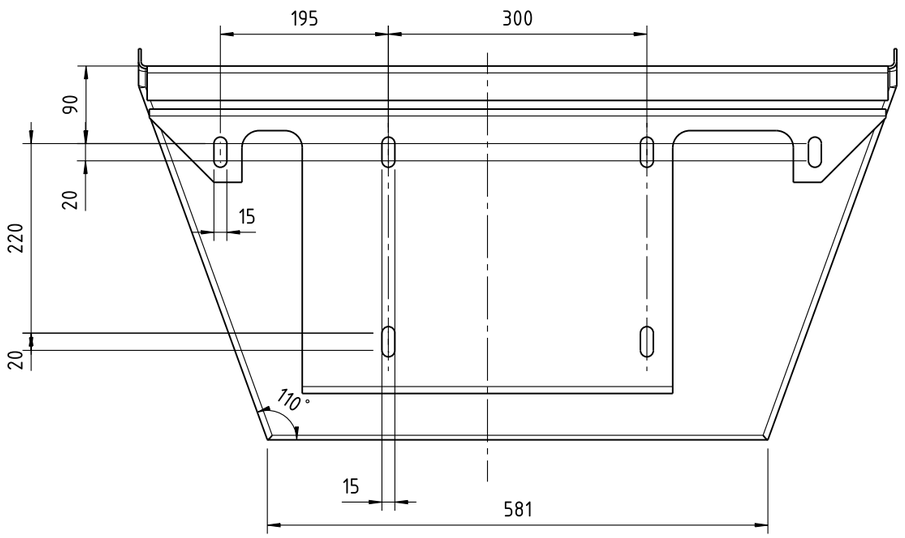
GRADE No.	N1	N2	N3	N4	N5	N6	N7	N8	N9	N10	N11	N12
VALUE	100	50	0.1	0.2	0.4	0.8	1.6	3.2	6.3	12.5	25	50
SYMBOL												
SURFACE ROUGHNESS												



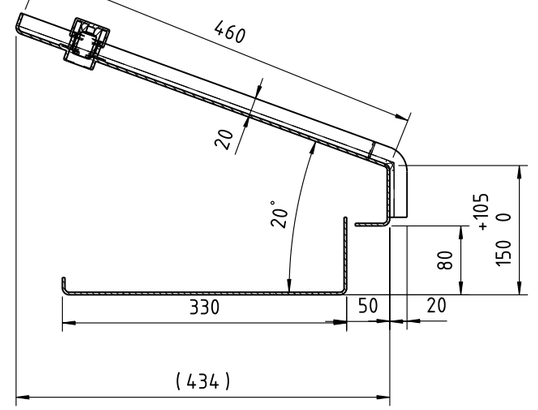
BOTTOM VIEW
SCALE: 1:5



ISOMETRIC VIEW
SCALE: 1:5



FRONT VIEW
SCALE: 1:5



SECTION VIEW A-A
SCALE: 1:5

NOTES:

*-DETAILED DIMENSIONS SHALL BE INDICATED BY SUPPLIER

1.THIS DRAWING SHALL BE TREATED AS REFERENCE ONLY
2.TECHNICAL PROPOSAL SHALL INCLUDE ALL RELEVANT ZONES DETAILY DESCRIBED ON 3D/2D.
3. SUPPLIER SHALL INDICATE REQUIRED MOUNTING DIMENSIONS WITH TOLERANCES.
4. THE ASSEMBLY SHALL CONFIRM TO DOC.NO. FPIIC/TD/066.
5. ALL THE DIMENSIONS ARE IN mm.

SL.No.	QTY	PART / STOCK No.	DESCRIPTION	SIZE (mm)	COMPANY STD./I.S	Wt. (Kg)
		---		---	MATERIAL	

ALT.No.	ECN No./CHANGES	DATE	BY	CHKD	APPD
△					
△					
△					
△					

PRODUCT	TRAIN B28		
REF DRG			
MATERIAL	---		
HEAT TREAT.		APPD PARTHASARDHI	14.10.2025
SURFACE TREAT.		REVD RK RAJPUT	14.10.2025
TITLE	DRIVER'S FOOTREST ASSY	CHKD RK RAJPUT	14.10.2025
		DRWN ABHIRAM BIJU	14.10.2025
		SCALE 1:1 / SHEET 1 OF 1 / Wt.(kg) 0	
BANGALORE COMPLEX		DRG No. 843-18085	ALT 0

A2