रेल डिब्बा कारखाना, कपूरथला
RAIL COACH FACTORY, KAPURTHALA

MD35131 **Date:25.08.2025**

Sub: Issue of specification MDTS-39423 Rev. 00

Please find enclosed a copy of under mentioned specification MDTS-39423 Rev. 00, for information and necessary action at your end.

Description: Purchase specification for Design, Supply , Fitment & Commissioning of furnishing items in GS coach with Guard Compartment for Kalka-Shimla Railways

nitin yadav
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Dy.CME/FD

CQM-I,II CPLE CWE/Fur CMM/ HSQ CMM/TKJ CWE/Shell

Dy.CMM/LHB/HSQ Dy.CMM/G CMT Dy. CPLE-I,II Dy.CMM/Fur

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DOCUMENT CONTROL

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LIST OF AMENDMENTS

S.No.	Amendment Date	Revision	Details

0. Introduction

This specification covers scope of work as "Design, Supply, Fitment & Commissioningof complete furnishing of GS with Guard Compartment for Narrow Gauge coaches for Kalka-Shimla Railways " by the firm on Turnkey basis, general requirements & other guidelines regarding execution of work.

1. Objective of this document

This document contains the techno-commercial requirements for enabling a tender and contract and post contract activities for the items included in the scope.

This document is to be read along with the other tender documents i.e.

1. Notice Inviting Tender
2. RCF Bid Document
3. GCC or other standard conditions as applicable.

2. Scope of the specification

This document is a purchase specification for enabling purchase and installation of interior furnishing items for

SN	Coaches	Layout No.
1.	GS with Guard Compartment for Narrow Gauge	NR90003

The document specifies the requirements scope of design, supply, quality assurance requirements, prototype approval and inspection requirements, as supplied requirements, project schedule, payment milestones and guarantee warranty.

This document is planned to be used as part of the tender specifications for the purchase of Furnishing item kits and for manufacture of coaches.

The Supplier shall be responsible for commissioning of these coaches. All the items in the scope shall be manufactured as per relevant standards, and as per good engineering practices. Supply & apply of all items except the items indicated for RCF, shall be in the scope of the Supplier.

3. **List of standards and documents referred:**

S. No.	Standard / Document	Title
1.	NR 90003	Layout Drgs
2.	RDSO/PE/SPEC/TL/0091-2016, Rev.1 (or latest)	Specification
3.	EDTS215, Rev-Nil, AM-3	
4.	EDTS117, Rev-A	
5.	ELPS/TP/AC/01 ,JAN-94	
(i)	EL/SPEC/EOG/001.	Code of Practice
(ii)	**RDSO/PE/O/0008-2005 (Rev.-0).**	
6.	MDTS-116	Specification
7.	MDTS-156	Specification
8.	MDTS-237	Specification
9.	MMDTS-19020 Rev-3	Specification
10.	MMDTS-19021 Rev-2	Specification
11.	MDTS-086	Specification
12.	MDTS-075	Specification
13.	MDTS-095	Specification
14.	MDTS25267	specification
15.	MDTS44388	Specification
16.	EDTS-215 (Latest)	Specification
17.	EDTS-411 (Latest)	Specification
18.	EDTS-422 (Latest)	Specification
19.	EDTS-186 (Latest)	Specification
20.	EDML-177, Corr-1	List of Electrical items
21.	EDML-178, Corr-1	List of Electrical items
22.	EDML-179, Corr-1	List of Electrical items
23.	EDML-246	List of Electrical items
24.	RDSO/PE/O/0008-2005	Code of Practice
25.	ELPS/SPEC/EOG/01	Code of Practice
26.	RDSO/PE/SPEC/TL/0091-2016	Specification
27.	RDSO/2008/CG-04	Specification

Table 1: List of referred standards& documents

4. **Abbreviations / Terminology**

S. No.	Abbreviations / Terminology	Expansion / Explanation
1.	BOM	Bill of Materials
2.	KXH	Indian Railways station code for Kapurthala
3.	LHB	Linke-Hofmann-Busch the TTT partner for RCF/KXH.
4.	QAP	Quality Assurance Plan
5.	RCF	Rail Coach Factory
6.	TOT	Transfer of Technology.
7.	IR	Indian Railway

Table 2: Abbreviations / Terminology

5. Scope of work:

The scope shall cover Design, Supply, Fitment & Commissioningof complete furnishing of GS with Guard Compartment for Narrow Gauge coaches for Kalka-Shimla Railways

5.1. Items:

A. Following items shall be supplied &applied by the firm. Firm shall follow drawings mentioned below for manufacturing of prototype coach . During prototype fitment improvements observed shall be incorporated in subsequent supplies by the firm.

SN	Description of items	Drawing	Remarks
1.	Layout drawing no.	NR90003	
2.	General Installation No.	NR90005	
3.	Partition Frames & Pillar assembly	NR10002	
4.	Complete Flooring i) Coach Floor ii) Floor Board iii) Floor Covering Arrangement iv) Layout of Sylomer pad	 NR41121 NR41123 NR41124 NR41122	
5.	Sanitary Facilities complete	NR63104	
6.	Door Arrangements	NS56001	
7.	Roof Ceiling arrangement	Annexure -A	
8.	Location of Paneling & moulding of sidewall & end-wall	NR42100	
9.	Location of Paneling & moulding of partition frame	NR43101	
10.	Seating Arrangement	NR61002	
11.	Layout of Windows	NR54100	
12.	Guard's Compartment General Arrangement	NR64100	
13.	Layout of Fire Extinguisher Arrangement	NR64001	
14.	Layout of Lettering Inside	NR64002	
15.	Ceiling Arrangement in Guard Room	NR44127	
16.	Doorway Ceiling Arrangement	NR44128	
17.	Hammer Box	NZ64001	
18.	Water tank piping arrangement on underframe	NR63100	
19	Painting System with Anti-graffiti	Annexure-B	
20	Integrated CCTV Camera and PAPIS	Annexure-C	

SN	Description of items	Drawing	Remarks
21	Sound Insulation	NR80102	Annexure B
22	Marking Diagram Outside	NR83211	Annexure B
23	Coach Insulation	NR80101	
24	Exterior Garniture	NR26100	
25	Electrical Luminaries		Annexure-D
26	Switch Plate Assembly with USB charging points		Annexure-E
27	Fans		Annexure-F
28	Electrical Wiring of Coach		Annexure-G

Note: - 1) Drawings provided above are for reference. Firm shall develop design for the items mentioned in specification for Design work & for any interface not covered in specification. These shall also be in firm's scope. Design shall be approved by RCF.

2) Make & model of touch & feel items shall be approved by RCF

3) The scope of supply and installation covers major items and not limited to the above. The contractor shall supply the items as required for installation as per the scope of supply. Firm shall get prior approval of OGA, Make, drawings, specification and schematics from RCF before procurement.

4) Color scheme for each item shall be as approved by RCF.

B. Detailed scope of supply of Electrical Items for GS with Guard Compartment Coach (Furnishing contractors scope)

S.No	Group	Item	Specification/ Make/Part No	Scope of Work and Technical Req.	Reference Drawing
1	**Light Fittings**	Round type LED Light (9W)	RDSO/PE/SPEC/ TL/0091-2016	Annexure-D	CC76475
		LED type light fitting Doorway/Gangway area, Type-B1 (9W)			CC76453
		LED type light fitting for Mirror/Lavatory area, Type-D (9W)			LW76092 Alt-'a'
		Standalone type Accidental Emergency Light Fitting (AEL)			EDML 178, Corr-1
2	**Switch Plate Assemblies**	Switch Plate Assembly with USB	EDML-246	Annexure-E	-
3	**Linear Fans**	Linear Fans/ Tangential-Cross flow Fans Assembly	-	Annexure-F	-
	Exhaust Fan Assembly	Exhaust Fan Assembly (with Metallic blade)	-		ICF/7-6-177, Alt-'b'
	Wall Mounted Fans	110V AC, 225 MM Sweep, Wall Bracket Mounted Fans.	IS:6680-92 with RDSO Anx.-H & RCF Am-4, Type-IV		-

3. Scope of Installation and Commissioning of Free Supply Items (RCF Scope):

Lifting, Loading, Installation & Commissioning of free supply items as per under given details shall be in the scope of the contractor:

S.No.	Item Desc.	Ref. Spec/Doc. No.
1	Laying of Electrical Wiring	Annexure-F
2	3 KVA Transformer, 415V/190V AC	EL/EOG/4-74
3	Water Raising Apparatus	EDTS-186 OGA as per Annexure-D
4	Tail Light with Flasher Unit	EDTS-215, AM-2, OGA as per Annexure-D
5	Pre cooling socket (415VAC)	Cat no. 139 Walther (Hensel) or equivalent approved make
6	Hand Lamp Socket (110VDC)	Cat no. 239 Walther (Hensel) or equivalent approved make
7	Set of Connection Boxes (1 Set consists of 4 no. Boxes)	LN71103 Alt-'b'
8	Set of Distribution Boxes (1 Set consists of 4 no. Boxes)	LN71104 Alt-'c'
9	Cover for Connection Box for Protection against Water Ingress.	SKED-968, Alt-'a'

Note:

The Supply of Cables/harness, Cable Protection System, ferrules, sleeves, Hardwares **and other accessories other than tools and test Instruments will be in the scope of RCF. However the Installation, Commissioning inside the coach will be in firm's scope.**

Additional brackets/back pieces required for fixing of flexible conduits/PVC Conduits or any other items for laying of wiring for better aesthetics in coach as per site requirements shall be in firmsscope . Necessary reviews shall be conducted with Elect/D accordingly.

Any additional hardware required as per site requirement will be in firm scope.

4.Electrical code of practice:

The connections of all electrical items under the scope of supply/installation & free supply items mentioned in Cl. 3.0 shall be done by the contractor in accordance with the code of practice of wiring: ELPS/SPEC/EOG/01, and Code of practice for fire prevention in AC coaches: RDSO/PE/O/0008-2005 (Rev.-0).

The contractor shall handover the coach in fully ready condition after conducting IR and HV testing as per Work Instruction Sheet no.EDW0024 VER. 1.0 (110V DC, 110V AC and 415V AC level) for functional testing and QC clearance by Quality department. Final electrical clearance shall be accorded by Dy. CEE/EP, RCF/KXH.

5.Electrical Contractor License:

Contractor shall submit a valid class "A" Electrical contractor's License as applicable from the concerned statutory authority at the time of placement of Purchase Order.

OR

The Firm shall make a formal agreement with suitable Sub contractor, for executing electrical portion of work with Sub contractor holding a valid Electrical contractor's license as applicable. The contractor shall submit a formal agreement duly notarized, legally enforceable in the court of law, between main contractor and sub-contractor for the Electrical component of work proposed to be executed by the sub-contractor at the time of placement of Purchase Order.

5.2. Changes after prototype :-

Firm shall collect latest version of above mentioned drawings. Design for the items mentioned in specification for Design work & for any interface not covered in specifcation shall be made by firm. Firm shall manufacture furnishing items for prototype coach as per drawings detailed above , RCF design advice & RCF approved drawings and assemble in RCF. Firm shall complete the work based on above information.

After manufacturing of prototype coach, firm shall then incorporate changes noted in manufacturing of prototype coach in design. Drawings of changes shall be submitted to RCF for approval.

5.3. **Installation**

(i)Contractor shall install all the items under the scope of work as per layout.

(ii) Installation procedure and process for the items under the scope of work shall be submitted to RCF design for approval.

(iii) All hinges, latches and locks used shall be of proven make viz. Southco / Dirak / Emka/ Sugatsune, as approved by RCF.

(iv) Sealant of make M/s. Henkel, 3M & Sika shall be used and the same shall be approved by RCF.

5.4. As**-built Design & Documentation**

The contractor shall submit the following design documents and artefacts:

1) All the drawings required for installation/fitment of furnishings & fittings.
2) Sources of supply with approximate cost (more than one alternative indigenously sources)
3) Operations Instructions & Installation manuals in soft and hard (3 copies) formats.
4) Maintenance manuals soft and hard (3 copies) formats.
5) Complete catalogue for items, fittings instruction including trouble shooting for easy maintenance by the Railways
6) Any other documentation, as identified and required, by RCF during the process of design development.
7) Operation and Maintenance manuals

Operation and Maintenance manuals/instructions with trouble shooting guides, shall be supplied for all the items under the scopę of the contractor. Maintenance manuals /instructions shall be supplied in the form of A4 size book, giving explored views of assemblies, 3D snap shots, part numbers, drawings & dimensions. Photos shall be incorporated to the manual for easy identification of the process. The manuals shall be submitted both in hard and soft copies and in a presentable manner. 15 hard. copies in each manual shall be supplied . This is prerequisite for claiming 100% payment

Note: All design and drawings of successful bidder as approved by RCF shall be the property of the RCF. RCF shall have the proprietary rights of these designs.

5.5. **Accessories and hardware :-**

The scope of supply installation testing commissioning includes all accessories including necessary hardware and consumables etc.

All items shall be proposed for approval by CDE/RCF during the design approval process. Only approved items shall be used.

5.6. **Spares**

The Scope of supply shall also include a set of spares for maintenance depot. The set of spares shall be as per following table :-

The contractor shall provide these spares in individual vacuum sealed packing with labeling carrying the following details:

1) Name /Logo of the manufacturer.
2) Date of manufacture
3) Estimated shelf life
4) Parts list inside the packing with part/drawing numbers
5) Contact phone/address for support.

The list of items as spares shall be prepared post the design approval and approved by RCF as part of the design approval process.

5.7. **Trial & coach commissioning in user railways**

Contractor shall be responsible for design validation during trial of coach & for coach commissioning in user railways in all aspects.

6. Requirement of interior furnishing

a) Any extra back piece required for the fitment shall be in scope of the firm.
b) The firm shall submit the prototype for approval before regular supply.
c) Firm to carry out activities listed in scope of work in Table as per indicate drawing.
d) There shall not be any sharp corners, on items exposed to passengers
e) Gap at the paneling joints to be avoided.
f) Passenger amenity items such as bottle holder, mobile holder, mobile charging socket etc to be provided uniformly and aesthetically in all coaches, in an identical manner. ln this regard, a template may be used to ensure the same relative location of various amenity items in all compartments.
g) Care to be taken while fixing the stickers/notices, for proper alignment and uniformity to improve aesthetics

h) lt is to be ensured that Alarm pull box alignment is proper
i) FRP modular toilet with improvements such as, additional slope in the floor along with improved drain arrangement shall be provided to ensure positive draining of water and also to prevent water accumulation in lavatories.
j) All hinges in the toilet should be of reputed makes like Southco/Derek
k) All joints of toilets shall be made leak proof
l) Proper sealant to be used in lavatory, to withstand water jet cleaning, in service
m) Floor board shall be of compreg to spec.-C-9407 , Rev-04 & PVC sheet shall be as per spec RDSO|2006lCG-12, Rev-01 with AMD 01- 05.
n) Floor board joints to be without any projection
o) PVC sheet joints to be joined by means of hot air welding, ensuring water tightness, and the PVC joint should be neat and clean, with aesthetic finish.
p) Proper sealing around the partition pillar on the floor, at the fixing point, to prevent water seepage to the under frame, and subsequently to the electrical equipment below under frame.
q) All the floor boards shall be properly fitted in such a way that there is no level difference
r) All the floor joints shall be properly sealed with sealant
s) All pipe joints entering in to the car body shall be properly sealed with pipe sealing kit.
t) To avoid water seepage, sealant shall be used at all joints on the floor and in the lavatory.
u) Fire extinguishers and notices to be provided as per drawings linked to the mentioned drawings
v) Efforts shall be taken by the Supplier to minimize visible screws. Further, it shall be easy to remove and fit the panels for maintenance. Aluminum extrusion can be used for proper panel fitment.

7. .Design , development & Documentation

The contractor shall submit the following design documents and artifacts:

1. All relevant drawings in Tiff format will be given after entering intoNon Disclosure Agreement (NDA).
2. Supplier shall study the drawings and"make a Bill of Material (BOM). The same shall be submitted to lCF, for approval.
3. Sources of supply with procurement Invoices approximate cost (more than one alternative indigenously sources)
4.
5. Operations Instructions & Installation manuals (3copies)
6. Maintenance manuals (3copies)
7. Complete catalogue for items, fittings instruction including troubleshooting for easy maintenance by the Railways
8. Supplier shall prepare a detailed Quality Assurance Plan (QAP) covering all the aspects of manufacturing, inspection etc., and to be submitted to RCF for approval.
9. Regular inspection will be carried out as per approved QAP and inspection plan.

10. Based on the drawings and other details, the Supplier shall make detailed work instructions for each process, with illustrations.
11. Bill of materials.
12. Sources of supply with procurement Invoices approximate cost (more than one alternative indigenously sources)
13. Operations Instructions & Installation manuals (3 copies)
14. Maintenance manuals (3 copies)
15. Complete catalogue for items, fittings instruction including troubleshooting for easy maintenance by the Railways
16. Supplier shall provide necessary data for Rolling stock certificate for the fully finished coach during delivery. ln this regard, RCF will provide the template for rolling stock certificate to the Supplier. Supplier shall submit the filled rolling stock certificate to RCF during delivery of the coach.
17. Any other documentation, as identified and required, by RCF during the process of design development.
18. .The contractor shall submit samples along with technical details and WTC, OEM details for following furnishing materials /fitting for finish/ color/shade/pattern/functionality
19. Notwithstanding approval, the contractor shall be completely responsible for the satisfactory performance of the coaches supplied.
20. The contractor's team in collaboration with RCF Team shall develop a QAP documenting the Hold and Witness points (stages, pre-dispatch, post-receipt and final inspections) for the project. The final QAP shall be approved by RCF Design.
21. Contractor shall manufacture the furnishing kits as per the approved designs and in conformance to the approved QAP and dispatch the same to RCF as per the advised schedule by Dy.CME/Design-II/RCF.
22. During furnishing of prototype coach, the supplier shall offer for stage wise prototype inspection.

Note: All design and drawings of successful bidder as approved by RCF shall be the property of the RCF. RCF shall have the proprietary rights of these designs.

8. . Technical requirements

1. Tolerances of coach shell dimensions

Minor variations are likely in dimensions of the coach shell, due to fabrication tolerances. The same shall be taken into consideration.

2. Management of expected shock and vibration for improved NVH

During installation, it shall be ensured to control vibrations of items so that

reliability/life is not affected and no damages take place.

3. **Aesthetically pleasing and safe, anti-pilferage**

   All interior fittings should have aesthetic look and flush with the interior decor. Sharp edges shall be avoided. All the interior fittings should have anti-pilferage feature.

4. **Accessories and hardware**

   The scope of supply installation testing commissioning includes all accessories including necessary hardware and consumables etc.

9. Assembly of furnishing kits at RCF/KXH

Work on the supplied furnishing kits, at RCF, shall be done as follows.

Note: The all furnishing kits assembly at RCF shall be done by contractor's manpower. Modifications required to be done on the supplied items for enabling assembly shall also be done by the contractor's manpower.

1. **Installation of the furnishing kits on the prototype coach shells at RCF**

   The furnishing Contractor's team shall install the furnishing kits in the coach shells at RCF initially for one no. of prototype coach as per attached drawings. Material for the prototype shall be inspected by the concerned TPI agency. Firm shall call RCF representative to oversee the material inspection of prototype by TPI agency.

2. **Proto type Review**

   RCF and Contractor's teams shall jointly conduct detailed review. Observations shall be made during this exercise for improving the tolerances and quality of the final coach.

3. **Review of modifications required in furnishing kits**

   The detailed observations and required modification information collected in the preceding activities shall be compiled and designs shall be updated in a collaborative process by the Contractor's and RCF teams.

4. **Supply of change validation kits to RCF and fitment**

   The design changes planned in the preceding activities shall be implemented and the supply of remaining furnishing kits shall be made as per the updated designs.

   The furnishing kits shall be supplied to RCF for assembly into shells as detailed earlier. Detailed observations shall be made for validating all design changes.

5. **Go-ahead for series production of Coaches.**

   A go-ahead shall be given to the contractor for supply of remaining furnishing kits and its installation on the successful completion of the previous activities.

6. **Series manufacture and supply of furnishing kits and its installation**

   Once the go-ahead for series production is granted, the contractor shall start series

production and supply the furnishing kits and its installation as per the advised schedule.

The contractor's team at RCF shall install these kits into the coach shells as per the schedule advised by Dy.CME/Fur-I/RCF.

10. Quality Assurance and Inspection Plan

10.1. Quality Assurance, Tests & Documents

A QAP framework document that been provided as an annexure to this document. The contractor shall use the same and prep area QAP to ensure requisite quality throughout the progress of the project.

The following table provides the overview of the system for quality assurance:-

Requirement Description	Requirement Detail	Remarks
Quality Assurance Plan	The manufacturer shall have detailed quality assurance plan. The plan shall be submitted for approval by the indenter/purchaser. The QAP document shall clearly document the following and control the test record formats. 1. Control over out sourced products and processes 2. Testing of raw material and establishing it traceability. 3. Sampling Plan 4. Type Tests 5. Routine Tests 6. Acceptance Tests 7. Witness & Hold Points	The QAP shall be submitted in PDF softcopy, digitally signed by the Head of Quality Department of the manufacturer.
Type Tests	These tests shall be conducted as per the QAP and are normally required in case of change of design.	There cords of the type tests shall be maintained by the manufacturer and shall be made available upon demand. These records shall be traceable and verifiable.
Routine Tests	The manufacturer shall conduct routine tests as per the approved QAP. The records of tests conducted shall be	The records of the type tests shall be maintained by the manufacturer and shall be made available upon

	verifiable upon request.	demand. These records shall be traceable and verifiable.
Acceptance Tests	The acceptance test shall be conducted on batches offered for delivery. The tests shall be conducted as per the details mentioned elsewhere in the document.	These shall be conducted by the consignee or their authorized agency prior to dispatch. All infrastructures required to enable acceptance tests shall be provided by the bidder /OEM.

Table 6: Quality Assurance Tests & Documents

10.2. Inspection Plan

The inspection plan shall be proposed by the contractor based on the QAP framework provided as an annexure to this document. This plan shall be proposed as a set of the following events:

1. **Hold Points:**means an identified point in a process beyond which the Contractor must not proceed without written authorization or the release of a designated authority of RCF or 3rdparty agency duly authorized by RCF.
2. **Witness Points:** means an identified point in a process where the Contractor must give prior notice to RCF to allow a designated authority of RCF or 3rdparty agency duly authorized by RCF, to attend and witness the point in the work process should it choose to do so.
3. Prototype inspection of complete furnishedcoach shall be carried out by RCF/ RCF Nominated agency. The Supplier shall submit a detailed inspection plan to RCF for approval Regular inspection (other than Prototype) of coaches shall be carried out by RCF/RCF authorized agencies, as per PO condition. All bought out items used in the coach shall be pre-inspected by Supplier/Reputed TPI Supplier shall carry out internal inspection before offering for stage inspection to RCF/RITES/TPI. The Supplier shall offer adequate facility for carrying out inspection work at Supplier's premises
4. The inspection plan as made by RCF to be followed for inspection.

11. Provisioning of facilities for working

The following shall be the distribution of provisioning of facilities for working during the course of the project.

11.1. Facilities to be provisioned by RCF at RCF/KXH

RCF shall provide the following provisions for enabling the contractor working at RCF premises only.

1. RCF shall provide limited space inside covered shed (not enclosed) to the contractor for keeping the material/consumables& tools required for day today work.
2. RCF will provide suitable cranes with drivers, as available at RCF/KXH, for loading unloading of furnishing items i.e. FRP modular lavatory.
3. RCF will provide bare coach shells fitted atop dip-lorries at the designated places for working. The necessary assistance for movement of shells to the designated places shall be done by RCF/KXH.
4. Power supply, Compressed Air and water etc. for working at site shall be provided by RCF/KXH.
5. Access to toilets and drinking water facilities shall be provided at RCF/KXH.

11.2. **Facilities to be provisioned by the contractor**

1. Contractor shall deploy a site office structure in ISO container(s) to function as site office and site tools and material storage. The site office shall be setup by the contractor and removed and taken away by the contractor at the end of the contract.
   a. The site office shall be self-contained, however electrical supply shall be provided by RCF at RCF/KXH.
   b. The maximum footprint of the site office and store shall be limited to 2x40'containers. Double stacking can be permitted where required.
   c. Special cranes & lifting tackles for deployment and removal of the containers shall be provided where needed.
2. Material handling equipment and fork lifters with drivers.
3. All workbenches, hand tools, IMTE's with their respective spares and consumables.
4. Ladders / Maintenance Access Platforms / Man lifts Hand trolleys / powered trolleys for transporting tools and IMTE's.
5. Any other tools & plants required for progress of work (and not explicitly listed in facilities provided by RCF/KXH shall be the contractor's responsibility.

Battery/Hydraulic operated Automatic Crimping Tools shall be used by the firm for crimping.

11.3. **Safety and performance of tools and equipment of the contractor**

All the tools and equipment e.g. drills, lighting arrangement inside the coach, work benches, ladder &working platform etc. as required to execute work as per scope of work shall be arranged by the contractor. The contractor shall use safe tools. Proper extension boards shall be used. Extension wires with joints and without insulation shall not be used. All the electrical power tools shall be equipped with proper

electrical plugs.

Note: The contractor shall be responsible for keeping all assigned areas clean and injury free during the progress of the contract.

12. General Terms & Conditions

The following terms and conditions shall be applicable for the project. These are considered in addition to statutory, regulatory requirements and IRS standard conditions.

12.1. Sub-contracting and outsourcing

The contractor may sub-contract or outsource as per requirement. The following must be complied under these conditions:

1. Prior approval shall be taken from RCF/KXH.
2. The confidentiality of shared information is ensured.
3. The contractor shall remain responsible for meet all conditions and requirements of this contract, even in case of outsourced items and services. (The responsibility does not shift to the sub-contractor).

12.2. Follow RCF production plan

All shells to be furnished as per production plan of RCF; Supply schedule of each variant will be in staggered manner and will be manufactured and supplied as per schedule of supply advised by Dy.CME/Fur/RCF from time to time.

12.3. Safe keep during storage and transit

The contractor shall be responsible for safe transporting and loading/un-loading of supplied products. Adequate measures shall be taken to avoid damage to surface body shell surface during transport/storage.

12.4. RCF right to inspect and audit

RCF shall have the right to take item/assembly supplied by the firm into Audit for checking of parameters as per laid down procedure.

12.5. Handling of changes post approvals

Any changes from approved models, detailed part drawings, BoM, material specifications shall be done via a design approval process and be released for implementation with the approval of CDE/CEDE/RCF.

Any modification arising out of design review process shall be incorporated by the firm in bulk supply without any financial implication.

12.6. Sourcing of raw material and assemblies

Items to be procured from RDSO/RCF/ICF/MCF approved sources only as per applicable drawings and specifications. Any exception to be reported and approval

taken..

12.7. **Change in quantity distribution**

The quantity distribution between successful bidders can be changed based on the performance in due course of the turnkey project. The firm lagging in completion of work or with poor quality shall be penalized with reduced quantity as decided by the competent authority.

12.8. **Damage to RCF property**

In case of any damage to RCF property, Coach Item or Shell during commissioning, the same shall be repaired/replaced by the Firm. In case any alternation in shell is required, prior approval of competent authority is required.

12.9. **Damaged to supplied/fitted materials**

Any item supplied by firm damaged during commissioning or before the issue of Completion Certificate; the same is to be replaced by the firm as free of cost.

12.10. **Requirement of Contractor's Personnel**

Site Manager

Contractor shall deploy at least 1 dedicated site manager in charge of all activities at the wok sites including workers safety and management of materials.

Identification

All contractors' workers shall be duly identified and shall always carry a contractor provided ID card on their person during their presence on the shop floor at RCF/KXH.

Qualifications of personnel

The contractor shall ensure that all personnel deputed are duly qualified and have adequate experience to handle the delegated jobs.

Note:The contractor shall provide the detailed CV of all personnel of their team deputed to work at RCF/KXH.
The contractor shall ensure that the technicians having experienced on working on first prototype coaches are not changed/replaced till the execution of whole contract.

Adequate man power

All coaches to be furnished as per production plan of RCF. Contractor shall depute adequate manpower to ensure the production targets.

Working dress and PPE

All contractors' workers shall be suitable attired and shall be wearing the

requisite PPE's for the job.

The following minima PPE's shall be worn by all contractor personnel at all times during their presence on shop floors of RCF/KXH

1. Hardhat with contractor's logo/name
2. High visibility vest with contractor's logo/name
3. Industrial safety shoes

Note1: Jeans and T-shirts with the contractor's logo / name may be considered as shop floor uniform for the contractor's team.

Note2: The contractor shall be solely responsible for the orderly and proper conduct of his staff during the period of work inside the RCF/KXH. The staff shall be polite and courteous.

Fines

1. If any safety instruction is not adhered to and if any of the contract worker is found without PPE, penalty for the same shall be applied @₹500/person-day.
2. Chewing of Pan/Gutka/any intoxicant is strictly prohibited at workplace, violations shall attract a penalty @₹500/person-day.

12.11. Compliance of Statutory & Regulatory requirements

All compliances with respect to statutory and regulatory requirements for the activities handled by the contractor shall been sourced by them.

Indemnification of RCF

The contractor shall provide a written undertaking to indemnify RCF from action resulting from breach of compliance of statutory and regulatory requirements for activities handled by them.

12.12. Miscellaneous Terms and Conditions

Quality Management

The Contractor shall maintain prescribed quality of work and good workmanship.

If any quality deviation is identified, necessary corrective and preventive actions shall be taken by the Contractor at the first instance of identification. If the Contractor fails to maintain the required quality standards and gets repeated rejection/rework, the contract will be terminated. Further action may be taken to duly disqualify the firm from quoting for future tenders.

Communication & Coordination

The contractor shall ensure proper communication and coordination with nominated personnel of RCF/KXH for progress connected to the project.

Stage inspection Hold & Witness Points

Stage Inspections, as required work shall be carried out by authorized personnel of RCF/KXH. The schedule of such inspections shall be prepared jointly by the RCF and contractor in the form of "Hold & Witness Points"

The contractor shall offer for inspection in writing after completion of work duly indicating the date of work and Shell number. Any inspection points raised on the installation work done till the dispatch of the coach, shall be cleared by the Contractor before turning out of coach.

Record of activities, instructions and compliances

The contractor shall maintain proper record of all activities, instructions and compliances in a register which will be checked periodically by concerned nominated personnel of RCF/KXH.

12.13. **Errors omissions & discrepancies**

The bidder(s)/contractor shall not take advantage of any misinterpretation of the conditions due to typing or any other error and if any doubt shall bring it to the notice of CDE/CEDE/RCF without delay in case of any contradiction.

Only the printed rules and books should be followed and no claim for the misinterpretation shall been entertained.

13. Guarantee/Warranty and Spares:

The supplier shall provide a warranty for all supplied items for a period of 3 (three) years from date of turnout of coaches for items whose specification is not given.

For items whose specification has been referred in this document individually & specification has warranty period, then warranty period shall be as per item specification. However minimum warranty period of 3 (three) years from date of turnout of coaches should be there for all items.

This warranty shall survive notwithstanding the act that the goods/stores/articles may have been inspected, accepted and payment hereof made by the Purchaser. In case any part/assembly/full assembly of the items under the scope of work failing or proving unsatisfactory in service due to defective design, material or poor workmanship, shall be replaced by the contractor on his own expense. Further, should any design modification be made in any part of the equipment offered, the period of 24months would commence, when the modified part is commissioned in the service.

13.1 Attention on site:

Warranty claims will be applicable as per IRS terms and conditions. The warranty complaints/issues to be attended at respective depot.

13.2 Preventive Maintenance during warranty:

Preventive maintenance of all the items in the scope of turnkey is to be carried out by the contractor for a period specified at the primary maintenance depot from the date of dispatch of coach from RCF.

14 Payment Milestones and Terms:

1) The supply of the furnishing kits and its installation shall be made as per the schedule specified by RCF.

Note: No payment claim is tenable for supplies / installation out of the agreed schedule.

2) Payment shall start after the prototype coach has been successfully assembled and cleared in quality checks by RCF.

3) Coach wise payment shall be released upon successful completion (including quality
clearance) of the furnishing and finishing of the coaches.

4) 90% of the installation bills shall be payable on the successful completion of the deliverables. The remaining 10% shall be retained as the performance guarantee for the duration of the warrantee period. The firm may submit an irrevocable bank guarantee, or any other suitable / acceptable instrument mandated by the purchase officer, to release the 10% amount withheld.

Note: Performance guarantee shall be released on NOC provided by the primary maintenance depot of the coaches.

15 Penalties

15.1 Penalty for non-completion of the coach work

Penalty of Rs. 5000 per day per coach shall be levied upon the contractor if he/she is not able to fit/install the material supplied and clear the coach from the Quality department as per the agreed scope and schedule.

15.2 Attention during warranty

A trouble-free operation of contractor supplied items is expected.

Warranty claims will be applicable as per IRS terms and conditions. Warranty complaints/ issues to be attended at the respective depot.

Preventive maintenance of all the items in the scope of the turnkey is to be carried out by the contractor for a period specified in IRS conditions at the primary maintenance depot from the date of dispatch of coach from RCF.

16. Safety norms / Environmental Management System Norms to be followed by the Contractor:

a. The contractor should take all precautionary measures in order to ensure the protection of his own personnel moving about or working on the Railway/ RCF premises, and should conform to the rules and regulations of the Railway/RCF.

b. The contractor should abide by all railway regulations in force from time to time and ensure that the same are followed by his representative, agents or sub-contractors. or workmen.

c. The contractor should ensure that unauthorized, careless or inadvertent operation of installed equipment which may result in accident to staff and/or damage to equipment does not occur.

d. The Contractor should indemnify and keep the purchaser indemnified and harmless against all actions, suits, claims, demands, costs, charges or expenses arising in connection with any accident, death or injury, sustained by any person or persons. within the Railway premises at RCF and any loss or damage to Railway/RCF property sustained due to the Acts or omissions of the contractor irrespective of whether such liability arises under the workmen's compensation Act or the fatal accidents Act or any other statute in force from time to time. The Jurisdiction lies in the state of Punjab.

e. To ensure Human safety the Contractor should use 24V hand lamp wherever lighting is not adequate inside the coach and Pneumatic drilling/tapping machines should be used for coach wiring and other related works wherever required.

f. The contractor shall ensure that all his workmen wear PPEs (Personal protection equipment's) commensurate with the severity of work.

g. The contractor shall ensure industrial safety methods in executing his work at RCF. The contractor shall ensure that all wastes (includes cable bits, packing materials, wooden crates) generated during their activities/work both on coach as well as on the shop floor are segregated and moved to the respective dump sites or earmarked drums kept in shop floor on the day of the completion of the work.

h. The contractor has to give prior information whether any hazardous chemical is used in his work and if so, the operational control has to be exercised.

i. The contractor has to ensure that all his material handling equipment's/ transport vehicles are emission tested. Emission test certificate issued by competent Authority for fitness of the vehicle should be submitted.

j. The contractor has to ensure that his activities are in tune with the RCF EMS Policy (to be incorporated as part of contract).

k. The contractor's staff must be aware of contents of Material safety data sheet (M in respect of chemicals/materials (if any).

l. The contractor's staff shall be competent to operate emergency appliance extinguishers.

m. For any Welding process carried out in the work, the Contractor shall certify Welders to be engaged shall possess minimum ITI qualification or have sufficient experience and sufficient working knowledge.

n. Firm has to comply RCF letter No. RCF/HSQ/PLG/PPMF/16122 Dt 21-03-25 or any other guideline issued by RCF of safety.

17. Installation guidelines:

(i) Contractor shall deploy skilled supervisor & worker as per RCF requirement.

(ii) Contractor shall install all the items under the scope of work.

(iii) Work on coach to be commenced only after allotment of coach by Furnishing shop.

(iv) The scope of supply installation testing commissioning includes all accessories including necessary hardware and consumables etc.

(v) All items shall be proposed for approval by CDE/RCF during the design approval process. Only approved items shall be used.

(vi) Installation procedure and process for the items under the scope of work shall be submitted to RCF design for approval.

(vii) All hinges, latches and locks used shall be of proven make viz. Southco / Dirak / Emka/ Sugatsune, as approved by RCF.
(viii) Sealant of make M/s. Henkel, 3M & Sika shall be used and the same shall be approved by RCF.

(ix) The contractor shall supply and install all items as per requirements specified in this scope of work.

(x) The coach interior shall be based on modern aesthetics with considerations to optimize passenger comfort, safety and security as well as to minimize noise in the coach

(xi) All furnishing items including electrical items should be of superior quality in nature. as per specification and approval of RCF in respect of capacity, type and make should be taken prior to supply.

(xii) The design of interior fittings shall be safe under all conditions of passenger impact, during emergency braking and buffing under fully loaded condition.

(xiii) The coaches shall be furnished with lightweight, fire retardant, non-toxic materials . The furnishing shall be of highest international standards.

(xiv For Electrical items, RDSO Specification No.RDSO/PE/SPEC/EMU/0196-2019 (Rev.0) with all addendum/corrigendum and annexures should generally be referred to. Any deviation should be got approved by RCF.

(xv) All interiors must be finished with good blending and slow ageing properties to provide a pleasant, high-quality interior and for ease of cleaning and maintenance.

(xvi) As far as possible, fastening devices, fixings and securing screws shall not be visible from within the saloon.

(xvii) All holes and gaps in the shell structure shall be provided with proven sealing arrangement to avoid water and dust entry, before doing paneling.

(xviii) For fitment of all items under the scope of contractor as mentioned in scope, supply and fitment of back pieces in coach Shell shall rest with the contractor. Fitment of new back pieces/modifications to the existing back pieces or any minor alterations in the coach Shell in this regard, shall be made with the approval of RCF.

(xix) Stainless steel hardware's shall be used for the fitment of all items in the scope of contractor. All hardware viz. screws, bolts, nuts and other fasteners required for installation of items under the scope of work shall rest with the contractor.

(xx) Adhesives, brackets, fasteners, back pieces and moulding used for installation of items under scope of work, shall be of reputed brand.

(xxi) No welding activity is permitted in RCF furnishing division. Welding activity of all items viz. partitions, back pieces etc. in the scope of work of contractor shall be done by the contractor at RCF shell division. Items shall be planned accordingly by the contractor.

(xxii) During installation of all items under the scope of contractor, it shall be en control vibrations of items so that reliability/life is not affected and no take place. All interior fittings should have aesthetic look and flush with décor. Sharp edges shall be avoided. All the interior fittings should pilferage feature.

(xxiii) The composition and finish of all the materials covered under contractor's scope supply shall meet respective specification requirements as covered in the relevant drawings/specifications.

(xxiv)The contractor shall execute any modifications/improvements in coach body shell with the approval of RCF as suggested by competent authority without any financial implication.

(xxv) For all electrical equipment access hatch opening to be provided for maintenance which will be decided during detailed design stage.

(xxvi)Coach dimensions such as furnished thickness of sidewall, partition, roof, end wall shall be strictly followed as per layout drawing.

(xxviii) RCF will provide bare shell for carrying out the furnishing work, Electricity, air & water shall be provided free of cost by RCF.

(xxix)The furnishing of the coach shall be carried out at a place nominated by RCF.

(xxx) The Electricity act 2003: Relevant provisions stipulated in the Electricity act 2003 shall strictly be followed in the interest of safety of users/staff as well as for equipment/ instruments provided in the Cars.

(xxxi)The skilled labour proposed to be engaged for the Electrical work shall have minimum technical qualification of ITI or equivalent in the respective fields. The firm or supervisor in-charge should have valid appropriate electrical contractor license.

Annexure - A : **Panelling and Ceiling:**

Scope:	i. Ceiling Panels and associated accessory required for installation for the coach ii. Suitable brackets/backpieces required to be welded /bolted on the Shell for mounting the panels/accessory.
Specification:	All panels shall be made with FRP to MDTS 133 Latest version

Special Condition:	1) FRP ceiling panels are to be designed for the coach as per RCF requirement . Ceiling to be designed for light , fan & any other item specified in specification. . Suitable fans are to be provided on the side ceiling panels above the back rest of seats with the provision of maximum head space for passengers sitting on chairs. Center ceiling panels may be designed suitably after removing linear fans being provided presently. Ceiling arrangement drawing NR44101 may be taken as reference. Ceiling shall be designed in such a way that maximum head height is available for passengers. Design & drawing shall be approved by RCF. FRP ceiling paneling shall be of minimum 3 mm thickness. 2) Panels should be designed in such a way that, all the interface should be proper and no gaps should be there. 3) The Design of the Panels shall be aesthetically pleasant & color scheme (approved by RCF) should suit overall ambience with flooring / seat & berth etc. The contours and curves shall be such to provide maximum space envelop to the passenger. 4) Panels shall have necessary cut outs/back pieces for luminary's fittings. 5) There shall be no sharp edges/corners/ protrusions. 6) All paneling shall have no visibility of screws, easy to fit and replace, does not give drumming effect due to vibrations induced by the motion of the coach. There should be no gaps and if unavoidable it should be uniform at the interfaces of side wall panels, roof ceiling and partition frames. Aluminum Extrusions may be used to enhance aesthetics 7) There shall be suitable mechanism for opening of the panels for maintenance purpose. 8) The firm shall submit the location drawing of back pieces required for mounting of Panel and all accessory/electrical items in the panels for approval before fitment.Back pieces shall be provided by firm. 9) The Gaps between the side Panels, Partition frame and Ceiling Panel are to be suitably covered. There should not be any open shell area which can be used for insertion/collection of any foreign material by the passengers. All such pockets should be aesthetically covered. 10) Material Enhancements: a) Anti-Microbial Coating: Apply anti-bacterial or anti-fungal coatings to improve hygiene b) Quick-Release Mechanism: Include panels with an easily removable mechanism for maintenance or cleaning purposes. d) Scratch-Resistant Coating: Add scratch-resistant finishes to maintain aesthetics over time. d) Easy Cleaning: Use non-porous surfaces that are stain-resistant and easy to wipe clean. 20) Design and Aesthetic Integration:

	a) Customizable Textures: Allow the integration of textured finishes or customizable patterns for premium segments. b) LED Light: Offer ambient lighting in the ceiling panels. c) Color Consistency: Ensure panels are color-matched with adjacent fixtures like berths, flooring, and sidewalls. d) Emergency lighting provisions integrated seamlessly into ceiling panels.
Requirement:	1. Light weight 2. Aesthetically pleasant 3. No gaps in side wall and roof ceiling should be visible to passengers.
Additional Clause	·All individual panel should be designed to be taken out and refitted without disturbing adjacent panel. Coach structural members and internals shall not be visible between panel gaps. ·No panel should be joined by application of putty. ·Panel should be suitably packed to prevent damage during transportation and fitment.

Annexure-B
Title: Painting System for the Coach exterior and marking diagram
Scope:
(i) The Coaches to be painted as per RCF approved colour scheme, design and pattern. Reference drawing no. NR83212 for exterior color scheme to be followed. (ii) Painting Quality shall be as per the Automotive Grade. (iii)The Coaches shall be painted including marking diagram at RCF only on Supply & Apply Basis. (iv)The required infrastructure Painting Booth, Drying Oven shall be provided by RCF. (v)The Material for Painting with applicator Guns shall is in the scope of the Supplier. (vi)ICF Specification no. ICF/MD/Spec-362 issue status 01 Rev .0 with all amendments shall be referred for complete exterior painting of the coaches. Underframe complete and coach interior to be applied with Adhesion promoting primer to MDTS 48279.Underframe bottom (outside) shall be painted with 2-components epoxy high build elastified paint as per Spec. MDTS-094 after APP. (vii) Sound Insulation Paint As per MDTS- 28377to be applied on all the steel surfaces inside the coach.
Acceptance Criteria: 1.DFT of the Paint shall be checked as per Specification on the Coach. 2.Gloss and undulation as per Specification.

Annexure-C

Title: Integrated PAPIS and CCTV

Scope:

Integrated PAPIS and CCTV system.

1.The Integrated PAPIS and CCTV system shall generally be compliant to RDSO/CG-18001 Rev.2 & RDSO/SPN/TC/106/2025, Version 3.1. STQC certification as per RDSO specification is essentially required.

2.It shall feature a compact controller unit having a high degree of integration to suit the space constraints of the coach. The system's controller shall have an overall envelope as per specification.

3.The GPS based PIS displays shall be sleek, LED Backlit, flush mounted with provision for display of station name, next station, distance, time delay, speed, ambient and inside temperature, humidity, Altitude along with these sensors. It shall generally comply to CG 18001 rev 2, Clause 14.3 and 14.6.6 to 14.6.9. The general dimensions shall be as per RCF requirement.

4.LED display boards for outside coach to display the destination generally shall be functionally as per clause 14.6 to 14.6.5 and technically as per 15.2 of CG-18001 of the specifications shall be provided.

5.Audio Speakers generally confirming to Figure 3 shall be provided with Line Matching transformers and shall be functionally as per clause 14.4 and technically as per 15.14 B, C, D of CG-18001 of the specifications shall be provided.

6.The audio amplifier unit meeting functional requirements of clause 14.4 and technically as per 15.14 A shall be an integral part of the MPU and fixed within the overall envelope specified above.

2.The MPU shall also have an integrated 7" touch screen panel and attractive UI for system operation.

3.There shall be individual MPU for the passenger Coaches.

Scope of supply per coach :-

S.No.	Description	QPC
1.	Multi Colour LED displays as per clause 15.3 of CG18001 Rev 2. (Except LRM Coach) Display mounting brackets and hardware	2
2.	Audio Speakers as per clause 15.14 B of CG-18001 Rev 2 and noise sensor for automatic volume adjustment	2
3.	CCTV camera IP based camera with M12 plug connector SSD for NVR-2TB	4
4.	Train operator network managed switch 8 port-Ring topology with M-12 plug connector. Networking and data cables prebuilt	1
5.	CCTV software application for MPU having features as per annexure 1	1
6.	Wires and Cables	1
7.	Installation and commissioning	1
8.	Emergency Electrical Push Button	2

Annexure 1: Specification for IP-based Closed-Circuit Television (CCTV) Surveillance System.

1.The Main Processing Unit as per clause 14.1 of CG-18001 rev 2 shall also provide the function of an IP based Closed Circuit Television (CCTV) Surveillance System in Coaches of Indian Railways by interfacing with Fixed Dome IP colour Camera, Video Recorder Unit, System Software, The PoE Ethernet Switch as per clause 15.7 of CG18001 shall be used for interfacing the cameras to the MPU.

2.Surveillance System Description:

2.1Each Coach shall be installed with tentatively 4 nos. of Cameras shall be installed in each coach.

Note: The above scheme is tentative, and no. of cameras may vary as per the type of Coaches or as specified by the purchaser.

2.2The MPU in each coach shall be provided with Video Management and Video Recording software. The Video and Alarm data of Cameras shall be stored in the SSD provided in the MPU.

2.3The health of the Cameras of running trains shall be viewable on a real-time basis.

2.4It shall be possible to download clipping on basis of time and GPS location from the coaches.

3.GENERAL REQUIREMENTS:

3.1The Video Surveillance system shall be based on non-proprietary open architecture where the Video Management Software and Recording Software can work and integrate with any make of IT hardware as per RDSO specification.

3.2The Closed-Circuit Television (CCTV) Surveillance Subsystems shall be end-to-end IP (Internet Protocol) based.

3.3Fixed Dome type IP cameras with IR illumination and day and night recording shall be installed on the coach roofs.

3.4The Unique Digital ID of the MPU installed in individual Coaches shall be provided with a unique digital identification number.

3.5The Video Recorder Unit shall provide non-tamper-able videos for evidence

purposes. Adequate measures to protect data integrity and security of the system shall be implemented as per prevalent industry-standard/ as per purchaser requirements.

4.TECHNICAL REQUIREMENTS: The technical requirements of different components required to integrate the CCTV surveillance system shall be as below: -

4.1. Fixed Dome type IP Colour Camera: As per RDSO specification RDSO/SPN/TC/106/2025 Version 3.1. 4.2. MPU components to support NVR function:

4.2.1. The MPU shall be provided with a 1 TB SSD for CCTV storage.

4.2.2. Purchaser may specify additional Ports of ethernet switch to facilitate the addition of the cameras to the system and enable train-wide surveillance.

4.2.3. The MPU shall be loaded with Video Surveillance Software having the following features in order to support the Video Surveillance requirements. The Surveillance software shall use the components already built into the system, viz, the ethernet switch, LTE Module, Wi-Fi Access Point, processor, storage etc, for achieving the functions of the Surveillance Software.

4.2.4. Processors of the MPU may be upgraded by the supplier to meet the requirements of the surveillance system including additional co-processing capability as per requirement and prior approval of RDSO.

4.3. Surveillance System software:

The CCTV Surveillance System Software for NVR shall have the following features:

4.3.1. The Software shall support continuous Recording of cameras in 1 TB SSD slot of the MPU in First in First Out (FIFO) manner. When the SSD is full, oldest footage shall be overwritten. H.264/ H.265 or any other commercially used compression technology shall be used for optimizing storage space such that 30 days storage at 18 hours of operations per day is available.

4.3.2. On failure of the SSD or removal of the SSD, the system shall extend limited storage onto the SD card of the MPU in a FIFO manner.

4.3.3. The Software shall provide for live Display of Camera feed on the touch screen of the MPU with single and multi-screen views. It shall be possible to playback stored videos.

4.3.4. The health of cameras and online status shall be viewable on the touch screen.

4.3.7. It shall be possible to extract the stored videos by authorized personnel having authentication and password to extract the stored videos onto a USB pen drive using the MPU USB port.

4.3.8. In case Video Recorder Unit operation is interrupted, like power disconnection and once the Video Recorder Unit is restarted, the Video Recorder Unit shall automatically resume

recording of cameras.

4.3.9. The system software shall support network fault-tolerant recording such that if the network connection between Video Recorder Unit and Camera is unavailable, the Video Recorder Unit shall automatically recover when the connection is restored.

4.3.10. Search and Export: The system software shall support recording search by camera, date and time, events etc. and support export of video clips to USB drives.

4.3.11. The system software shall maintain system log such as alarms, events and operator log.

4.3.12. The Software shall support activity control recording, motion detection recording, and Alarm and Trigger input recording.

4.3.13. The system software shall support user management through online user authentication such as authentication of user login, the configuration of users, and user access rights.

4.3.15. The system software shall be video analytics capable of automatic facial detection and extraction of CCTV footage of cameras facing the entrance doors. Faces detected shall be clustered and uploaded to the central server.

4.3.16. Camera Tampering (Camera Blinding) analytics shall be provided for each Camera. The Camera Tampering alert shall be sent over Wi-Fi or 4G (LTE)/3G networks to Datacenter/ Cloud.

4.3.17. Face image cropping tool shall run on CCTV camera footage. Face image cropping tool on the camera and/or video recording unit/Mobile NVR shall identify the faces of the person from the live feed and crop it which should meet the requirement of FRS.

3. Emergency Electrical Push Button:

• Emergency Electrical Push button 2 Nos. per Coach are to be provided for the emergency condition.

• The Emergency Push button shall have through rake connectivity.

• A LED indicating the Coach No. and sound Alarm to be generated in the Guard Room.

• It shall integrate with existing Ringer unit system of coaches.

Integrated PAPIS and CCTV system.

1. The Integrated PAPIS and CCTV system shall generally be compliant to RDSO/CG-18001 Rev.2 & RDSO/SPN/TC/106/2025, Version 3.1

2. It shall feature a compact controller unit having a high degree of integration to suit the space constraints of the coach. The system's controller shall have an overall envelope as per specification.

3. The GPS based PIS displays shall be sleek, LED Backlit, flush mounted with provision for display of station name, next station, distance, time delay, speed, ambient and inside temperature, humidity, Altitude along with these sensors. It shall generally comply to CG 18001 rev 2, Clause **14.3** and **14.6.6 to 14.6.9.** The general dimensions shall be as per RCF requirement.

4. LED display boards for outside coach to display the destination generally shall be functionally as per clause **14.6 to 14.6.5** and technically as per **15.2** of CG-18001 of the specifications shall be provided.

5. Audio Speakers generally confirming to Figure 3 shall be provided with Line Matching transformers and shall be functionally as per clause **14.4** and technically as per **15.14 B, C, D** of CG-18001 of the specifications shall be provided.

6. The audio amplifier unit meeting functional requirements of clause **14.4** and technically as per **15.14 A** shall be an integral part of the MPU and fixed within the overall envelope specified above.

Annexure-D

Title: Electrical Luminaries

Scope:

The following types of light fittings shall be provided in the coach. Exact design type, model and layout to be described in the offer:

LED Light fittings shall be conforming to RDSO Spec. RDSO/PE/SPEC/TL/0091-2016, Rev.-1 with RCF Annexure-1, 2 & 3 and shall be aesthetically matching with the interiors of the Coach Furnishings. It shall be of warm color having color temperature of 3000°K and on the doorway/gangway areas and Lavatory. 03 nos. Accidental Emergency LED lights as per RCF EDML 178 shall also be provided with 02 nos. in Passenger Area and 01 No. in Guard Compartment of the coach. Suitable WAGO cage clamp type terminal strips with fixing flanges to part no. 262-208 for termination of each circuit shall also be in firm's scope of supply. The details of various types of LED luminaries shall be as per under given details :

S.N	Description	Ref. Drg. No.	QPC
1.	Round type LED Light (9W)	CC76475	16
2.	LED type light fitting Doorway/Gangway area, Type-B1 (9W)	CC76453	02
3.	LED type light fitting for Mirror/Lavatory area, Type-D (9W)	LW76092 Alt-'a'	01
4.	Standalone type Accidental Emergency Light Fitting (AEL)	EDML-178	03

* The LED type light fitting Type-B1 (9W) in Doorway/Gangway area of Guard Compartment, shall be fixed after removal of Driver due to space constraints, however the Driver shall be suitably fixed separately near by the light on metallic base plates & connections shall be made accordingly to make the light functioning.

The above light fittings shall be procured from RCF/ICF/MCF approved sources only by the contractor and provided in coaches keeping the fixing/interface requirements as per existing design.

The area of application of the above mentioned luminaries is as per the existing scheme being followed in LHB design coaches however the contractor may design illumination scheme with any type of above mentioned light fittings for illumination of interiors of the coach. However, prototype design approval for general layout arrangement of light fittings shall be taken from office of the CEDE/RCF.

Alternatively for improved performance/aesthetics/safety standards, the contractor may provide alternate design lighting fixtures duly complying with the requirements of the specification for 'LED based luminaries' to spec. no. RDSO/PE/SPEC/TL/0091-2016, Rev.1 (or latest) with prior approval from office of the CEDE/RCF. Prototype approvals for any new design LED Light fitting shall also be obtained from office of the CEDE/RCF or RDSO before bulk supply.

All the brackets/back pieces required for fixing of LED Luminaries shall be embedded in FRP Panels & necessary reviews shall be conducted with Elect/D.

No item shall be fixed with use of 3M Tape.

Annexure-E
Title: Switch Plate Assembly with USB charging points

Scope:

A. Passenger Area

Modular type Switch plate assembly with USB Charging point shall be provided inside the passenger area of the coach. The Modular type Switch plate assembly shall comprises of the following:

- USB Charging Point (01 No.)
- 3-Pin Socket (01 No.)
- CS Switch (01 No.)
- Fan Switch (01 No.)
- VLT Switch (01 No.)

However the construction of the complete Modular switch plate assembly shall generally be as per EDML-246, Rev-Nil. The switches shall be modular type. Total 10 Nos. Switch Plate Assemblies i.e. 05 nos. on each side wall shall be provided in the Passenger Area.

B. Guard Compartment

Modular type switch plate assembly without USB Charging points shall be provided inside the Guard Compartment of the coach. The Modular type switch plate assembly shall comprise of following:

- 5-Pin socket (01 No.)
- CS switch (01 No.)

The switches shall be modular type (Screw type/Snap fittings). Total 01 No. Switch plate assembly shall be provided.

The above switch plate assembly shall be procured from RCF/ICF/MCF proven or any other reputed sources only by the contractor and provided in coaches keeping the fixing/interface requirements as per the existing design. The switches/sockets will be developed/designed blending with the interiors of the coach. The switches and sockets shall be proven, world-class products suitable for application in Coaches/Rolling stock.

The overall general arrangement of electrical amenities for furnishing the coach shall be got approved from CEDE before start of the work at RCF. All switches and Charging sockets, USB Charging Points shall be tested according to relevant IS/International standards. Certificates in this regard shall be submitted by the firm.

All the brackets/back pieces required for fixing of Switch Plates shall be embedded in FRP Panels & necessary reviews shall be conducted with Elect/D.

Annexure-F

Title: Fan Assembly for Narrow Gauge Coaches

Scope:

a)Linear Fans/Tangential-Cross Flow/Radial type Fans Assembly :

Linear Fans/ Tangential-Cross Flow fans/Radial type BLDC fans shall be provided inside the coach meeting the min air delivery requirement of 337m^3/min and shall be suitable for 110V DC.

Fan assembly including inlet and outlet louvers etc. shall be designed for low noise (less than 60 db) inside passenger compartment area. Fans shall be maintenance friendly having easy access for cleaning and replacement and it should be light weight. Suitable WAGO cage clamp type termination for inlet supply shall be provided.

All material shall be fire retardant to UL 94 V0.

Firm shall provide either Linear or radial/Carriage type fan. However, air delivery parameter shall not less than as mentioned above.

The fans shall be provided inside coaches keeping the fixing/interface requirements as per coach roof layout. However, prototype design approval for general layout arrangement of Fans along with CFD analysis shall be taken from office of the CEDE/RCF.

b)Exhaust Fan Assembly:- (Reference Drawing No.- ICF/SK-7-6-177, Alt-'b')

01 no. exhaust fan (with metallic blades) for Lavatory suitable for 110V AC shall be generally conforming to ICF Drg. No. ICF/SK-7-6-177, Alt-'b' shall be suitably integrated in the Lavatory module to exhaust the foul air from the lavatories.

The fans shall be procured from RCF/ICF/MCF approved sources only by the contractor and provided in coaches keeping the fixing/interface requirements as per existing design.

c)Wall mounted Bracket fan (225mm Sweep)

(Reference Document No.- IS: 6680-92 with RDSO ANNEX.-H & RCF AM-4, TYPE-IV))

02 Nos. 110V AC, 225MM Sweep Wall Bracket Mounted type fan as per IS: 6680-92 with RDSO ANNEX.-H & RCF AM-4, TYPE-IV shall be provided in Guard Room.

The fans shall be procured from RCF/ICF/MCF approved sources only by the contractor and provided in coaches keeping the fixing/interface requirements as per existing design.

The details of various types of fans in NG GS with Guard Compartment Coaches are as under:

	Description	Qty/Coach	Ref. drg. No.
	Linear fans/tangential Cross-flow /Radial type fans	As per requirement	-
	Exhaust Fan	01	Drg. No. ICF/SK-7-6-177, Alt-'b'
	Wall mounted Bracket fans (225mm Sweep)	02	IS:6680-92 with RDSO Annex.-H & RCF AM-4, TYPE-IV

d). Additional brackets/back pieces required for fixing of fans as per site requirements shall be in firmsscope . Necessary reviews shall be

conducted with Elect/D accordingly..

Annexure-G

Title: Electrical Wiring of NG GS Coach with Guard Compartment

Scope:

Laying of Complete coach wiring harness shall be carried out on the under frame, Roof, Side wall & End-wall structure for NG GS with Guard Compartment as per under given reference drawings:

S.N.	Description	Ref. Drg. No.
1.	General Installation (Electrical) for NG GS Coach with Guard Compartment.	NR70002
2.	Schematic Diagram of Roof for NG GS Coach with Guard Compartment.	NR70104
3.	Harness Chart of Roof for NG GS Coach with Guard Compartment.	NR70105
4.	Block Diagram and Harness Chart of Under-frame for NG GS Coach with Guard Compartment.	NR70103
5.	Wiring Arrangement of Roof for NG GS Coach with Guard Compartment.	NR70109
6.	Arrangement of Under frame Wiring for NG GS Coach with Guard Compartment.	NR71101

7.	Arrangement of Side wall Wiring for NG GS Coach with Guard Compartment.	NR74101
8.	Arrangement of End-wall Wiring (PP) for NG GS Coach with Guard Compartment.	NR75102
9.	Arrangement of End-wall Wiring (NPP) for NG GS Coach with Guard Compartment.	NR75103
10.	Arrangement of Roof Wiring for NG GS Coach with Guard Compartment.	NR76101

Note: The Supply of Cables/harness, Cable Protection System, ferrules, sleeves, Hardwares and other accessories other than tools and test Instruments will be in the scope of RCF. However the Installation, Commissioning inside the coach will be in firm's scope.

Special Conditions:

- All tools & machineries required for the furnishing and fitment of Electrical items will be provided by the tenderer.
- Battery/Hydraulic operated Automatic Crimping Tools shall be used by the firm for crimping.
- For OGA of all the equipments in firms scope of supply, Firm shall take prior approval from office of the CEDE/RCF. Supply of all electrical items in the scope of bidder shall be taken up after prototype approval from office of the CEDE/RCF.
- Any other activity deemed necessary for the furnishing of coach from Electrical design context, the same shall be carried out by the contractor without any financial implications. Hence, contractor must go through the requirements in details while offering the quote.