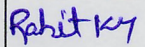
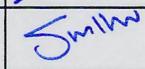
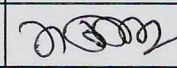


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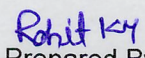
Name	Designation	Signature	Date	Level
Rohit Kumar	SSE / Design		20.05.2020	Prepared
A.K. Agnihotri	SME / Design		20.05.2020	Agreed
Kumar Sambhav	Dy. CME / Design		20.05.2020	Reviewed
Mahesh Kumar	CDE		20.05.2020	Approved

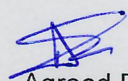
1. Introduction:

This specification covers technical and special requirements for developing State of the Art interiors for various LHB Sleeper coaches of Tejas Rake, to be manufactured by Modern Coach Factory of Indian Railways utilizing global expertise in the field of interior furnishing, materials/manufacturing technologies.

2. Scope of work:

S. No.	Item	Description & specification
i.	General	This covers the entire furnishing activity (both mechanical and electrical) to be done by contractor on AC-2Tier coaches. Firm shall take approval from MCF before bulk supply of items for executing the work. The contractor is expected to improve upon the drawings as per MCF to get best finish of the interiors and fitment, with due approval from CDE/MCF.
ii.	Contractor's scope of work	The interior furnishing (Supply and Apply Turnkey work) of the coaches shall be carried out at MCF in shells allotted to them as per functional requirement of each variant as per scope of work and as mentioned in this specification. The term furnishing broadly includes the activities to be carried out in bare shells as mentioned in this specification and Purchase order. Prototype coach made by the firm with the design to be got approved by CDE/MCF


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iii.	Description and specifications	This supply and apply furnishing turnkey work covers complete interior furnishing of AC 2 Tier sleeper coaches for Tejas rake as per this specification. This specification is not exhaustive and overall responsibility to produce coaches with 6 years Warranty and upgraded interiors.
iv.	Contractor's responsibility	The contractor shall be entirely responsible for supply, Installation, testing, commissioning and project supervision of the Furnishings and fittings for the coaches. The entire coach which includes the furnishing items under the scope of contractor shall be tested & commissioned at MCF. The contractor shall have MOU with OEMs/Manufacturers for items that are installed in coaches as per scope of work, in case these are bought out from any other firm and must submit the same before executing the work.
v.	MCF's scope of work	The MCF shall provide bare Shell with Makore flooring MDTs-075 Rev-03, thermal insulation on inside roofs, sidewalls & under frame (wherever applicable), electrical wirings, air conditioning units and control panels, battery and EFT boxes. Exterior painting as per RDSO/2010/CG-08, Dust sealed gangway to spec no MMDTS 20034, Automatic body side entrance doors (Plug door) as per MDTs 25267 Rev-08, Bio Vacuum Evacuation system as per RDSO/2017/CG-06 Rev-03, Automatic Smoke/fire alarm system for passenger coaches as per RDSO/2008/CG-04 Rev-05 and Smart Coach Features shall be in scope of the MCF. The MCF shall also provide Bogie, Lowering & buffer height the coach on bogie, air brake system, draw gear and under gear equipment.

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3. Scope of work- AC- 2Tier Coach (LWACCW)

The details of functional improvements and features which are to be incorporated in LHB AC-2T sleeper coaches for using it in improved Tejas Rake has been detailed below –

S.No	Features	Description& specification
i.	Layout drawing no	MLW90005 alt-a
ii.	General Installation	MLW90002 alt-nil Existing drawings will be used along with upgraded features as mentioned in below paras.
iii.	Seats and Berths (Drg. no. MLW61056 alt-nil or latest)	Ergonomic Seats and berths with improved cushioning, should be modular in design for all Seats & Berths with colour scheme as approved by CDE/MCF. PU Foam Cushioning material as per specification MMDTS 19020 Rev-03 Amnd-01 and should be covered with a suitable Fire Barrier cloth to MMDTS 19021 Rev-03. Upholstery should be as per MMDTS 19023 Rev-01.
iv.	Fixing arrangement of chair angle and berth mounting bracket	Fixing arrangement of chair angle and berth mounting bracket should be as per drawing no. MLW61033 alt-a.
v.	Upper Berth Climbing Arrangement (Drg. no. MLW61057 alt-nil or latest)	Climbing arrangement should be of AISI 304 buffed and Satin finished as per drawing no. MLW61057 alt-nil or latest . It has to be rugged enough to last up to coach life.
vi.	Doors	Existing Compartment doors should be used as per drawing no. LW56004 (except item no. 2). (Main entrance doors will not be in this scope since automatic plug door will be in the scope of MCF)
vii.	Flooring (Reference Drg. no. LA41115 alt-nil)	Existing drawing no. LW41108 Alt 'Nil' should be used. Rubberised floor covering as per Specification No. MMDTS 20017(2 mm thick) in lieu of existing PVC covering and EN45545 complied coating as per specification No. MMDTS 20018 with patterns suiting the interiors of the coach to be used in lavatory only. Colour shade and pattern shall be approved by CDE/MCF before bulk supply.
viii.	Panelling (Reference Drg. no. MLE42001, Item-6 of this drawing to be replaced with drawing no. MLW42004)	Sidewall panels should be of LRTM as per specification no. MMDTS 19044 or Vacuum bagging process as per specification no. MMDTS 20019 comply EN45545 HL3, colour & pattern (as approved by CDE/MCF) Size of panels shall not be more than existing panels and shall have opening/provision to accommodate Smart coach features. Provisions for Double Roller blinds at window opening.

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ix.	Partition Frames (Ref. Drg.no. LE10001 alt-f)	The partition frame laminated panels (of existing thickness) should be LRTM or Vacuum bagging process (with the wooden pattern & colour scheme) sandwiched with Aluminium honeycomb as per MDTs 097 / Fire Retardant Composite Panel (FRCP) board (16 mm Thick as per specification MMDTS 20016) (Thickness 20 mm). Flange head rivet and socket head bolts to MMDTS18037 will be used in place of metallic inserts inside the honeycomb partition for fixing accessories i.e. magazine bag, bottle holder etc. Bottle holder as per specification no. MMDTS 20020 shall be provided.
x.	Ceiling (Reference Drg. no. MLE44100 alt-j)	Ceiling panels (of existing thickness) should be LRTM as per specification no. MMDTS 19044 or Vacuum bagging process as per specification no. MMDTS 20019, colour & pattern (as approved by CDE/MCF).
xi.	Windows/ Emergency Windows	Existing window arrangement as per drawing no. MLW54001, Alt-a or latest (except item no. 3) with Double Roller blinds as per specification MMDTS 20022.
xii.	Lavatories (Reference Drg. no. MLE63001 Alt-a)	Lavatories should be of LRTM as per specification no. MMDTS 19044 or Vacuum bagging process as per specification no. MMDTS 20019. LRTM modular lavatory as per MMDTS 20021, with suitably sloped floor with Interior panels should be coated with anti graffiti coating as per RDSO Specification no. M&C/PCN/127-2009 with improved toilet seat mounting arrangement and all the amenities like mirror, foot operated water tap as per MMDTS 20031, soap dispenser for touch less experience and tissue paper dispenser as per MMDTS 20020. Attachment wall shall be provided as per drawing no. MLE64129 Alt'a' & MLE64130 Alt'a' shall be of LRTM as per specification no. MMDTS 19044 or Vacuum bagging process as per specification no. MMDTS 20019 Lavatory flooring pattern should be floor tiles type as per Specification No. MMDTS 20025 (2 mm thick) or EN45545 complied coating as per specification No. MMDTS 20018.
xiii.	Air Circulation System	Existing AC ducting arrangement to be used as per drawing no. MLW44101 Alt-Nil.
xiv.	Passenger Amenity Items	Snack table should be as per specification MMDTS 20020 with suitable arrangement for 4 water bottles and it shall bear minimum 80Kg weight at the end/100Kg weight in the centre of the table. All passenger amenity fittings as per specification no. MMDTS 20020 such as Coat hook, Luggage rack (small) and compartment mirror with suitable tilting to access Vago terminals behind the mirror.
xv.	Luminaries and Lighting	Existing LED Lighting with Lux level as per RDSO specification no. RDSO/PE/SPEC/TL/0091-2016. All

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		luminaries and lighting in entire coach including signages and Braille script should be as per LWACCW drawing.
xvi.	Reading Lights	Existing Adjustable reading lights integrated with panels as per Spec No. RDSO/PE/SPEC/TL/0091-2016
xvii.	Charging point	Mobile Laptop charging point for individual berth with 5-Pin point switch and also USB port as per specification EDML-0064.
xviii.	Pantry Equipment	As per RCF specification EDTS 139 Rev-e, corr-1, 2 & 3
xix.	Marking diagram	Marking diagram as per drawing no. MLW83010 alt-nil or latest
xx.	Grips & level	LW24101 alt-c: Builder plate -Drg. No.MCF-LE64101 alt-nil
xxi.	Layout of lettering inside (Braille script)	MLW64006 alt-nil: Furnishing plate-Drg. No.MCF-LE64102 alt-b Integrated Braille display / Braille stickers which shall be as per specification No. MMDTS 20024.

4. Important considerations:

i.	Fire Smoke Toxicity Standards	All furnishing materials should comply the UIC 564-2 OR standards of fire retardant properties is as given below i.e.: - Resistance to spread of flame: Class A, as per UIC 564-2 OR - Deterioration in visibility due to smoke: Class A, as per UIC 564-2 OR - Limiting Oxygen Index: Minimum 35 as per UIC 564-2 OR (IS:13501) - Toxicity: < 1 as per NCD-1409 (expect PU Foam)
ii.	Source Development:	Firm should enable development of interior furnishing materials indigenously through MAKE IN INDIA effort to eliminate dependence on imports and ensure availability on priority.
iii.	Material to be applied in the coaches should be environment friendly, non health hazards during application and when disposed off as scrap.	

5. Other Conditions:

S. No.	Item	Description & specification
i.	General conditions	a) All tools and machineries required for the furnishing work shall be in the scope of contractor. b) All measuring instruments/ Gauges required for the subject work shall be in the scope of contractor. c) The contractor shall supply and install all items as per requirements specified in this scope of work. d) Normally the Shell will have the provision of back pieces as per standard arrangement. However, if there is any specific requirement by the contractor the same shall be met by the contractor himself and the same shall be provided with the

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		approval of the CDE/MCF. e) It shall be noted that there may be minor variations in dimensions of the coach due to fabrication. The same shall be taken into consideration during furnishing work. f) During installation of all items under the scope of contractor, it shall be ensured that there is no resonant tendency in any of the sub assembly fitted by the contractor. All interior fittings should comply the functional requirements as mentioned in clauses of this specification. Sharp edges shall be avoided. All the interior fittings should have anti-pilferage feature. g) The composition and finish of all the materials covered under contractor's scope of supply shall meet respective specification requirements as covered in the relevant drawings/ specifications. h) The contractor shall execute any minor modifications/ improvements in design as suggested by competent authority without any financial implication. However, any modification required for meeting the functional objective shall necessarily be carried out. i) Coach interior dimensions such as furnishing thickness of sidewall, partition, roof, end wall, gangway and toilets shall be strictly followed as per this specification. j) The movement of all the items under the scope of the contractor from depot/ feeder shop to assembly line will be contractor's responsibility.
ii.	Packing instructions	All Components shall be packed in such a way so as to prevent any transit/ storage damages.
iii.	Receipt, installation & fitment	(a) The firm or their Authorized representative shall jointly inspect each of the consignment received at the MCF before unpacking is done and shall carry out a joint check of the receipt of components/ assemblies to avoid subsequent complaints regarding short receipt or transit damages. The joint check should be done within a fortnight of advice given by the MCF failing which the consignment shall be unpacked for installation at the risk of the firm in respect of shortage and damages. (b) The contractor shall depute adequate supervisors and staff for installation work. (c) All special tools, fixtures and other devices required for installation of fittings shall be provided by the firm and these items shall become the property of the MCF/IR after completion of work.

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iv.	Facilities to be provided by MCF to contractor:	The Contractor shall be provided free of charge, the following facilities during the operation of the Contract by MCF near the site of work: Power Supply, Compressed Air and water will be provided free of cost. However, the tenderer is advised to examine the actual site conditions for the last mile arrangements which is to be done by the firm for taking the compressed air and water from nearest tapping point (of compressed air and water) provided by Railways to the site and quote the rates, keeping in view these costs. All other facilities to be arranged by contractor himself. MCF shall provide adequate space inside covered shed (not enclosed) to the Contractor for keeping the material & tools required for day to day work. However, Contractor shall arrange the requisite lockers, cup boards, almirah etc of standard size for keeping the tools, materials, belongings etc. in safety in an orderly manner. MCF shall provide suitable crane for loading of Toilet modules. Fork lifters with driver for handling of materials free of cost.
v.	Inspection	Inspection of materials by MCF on WTC provided by the firm after clearance of first prototype of each type of coaches. The furnishings and fittings supplied by the firm shall be supported by an inspection/ manufacturers test certificates from the supplier/ contractors.
vi.	Warranty	The furnishings and fittings supplied by the firm should be warranted for a period of 72 months from the date of installation at the MCF for any customer complaint related to Design, Material and Manufacture.
vii.	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 MCF's premises, and should confirm to the rules and regulations of the MCF/IR. b) The contractor should abide by all MCF/IR 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 MCF's premises and any loss or damage to Railway/MCF 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 MCF.

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		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 equipments) commensurate with the severity of work. g) The contractor shall ensure industrial safety methods in executing his work at the MCF. The contractor shall ensure that all wastes (includes cable bits, packing materials, wooden crates) generated during his 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 then completion of the work. h) The contractor has to give prior information whether any hazardous chemical is used in his wok and if so, the operational control has to be exercised. i) The contractor has to ensure that all his material handling equipments/ transport vehicles are emission tested. Emission test certificate issued by competent Authority for fitness of the vehicle should be submitted. j) The contractor's staff shall be competent to operate emergency appliances like fire extinguishers. k) For any welding process carried out in the work, the Contractor shall certify that the Welders to be engaged shall possess minimum ITI qualification or have suitable experience and sufficient working knowledge. l) If on any day of work the number of workers employed by the Contractor is equal to or exceeds 20 (twenty) persons, the Contractor shall obtain Labour License from the Licensing Officer as per Contract Labour Act 1970 before commencement of the work and shall follow the latest guidelines as laid down by the Labour Commission rate, revised from time to time. m) The contractor shall comply with the latest provisions of the Factory Act, Employee's Compensation Act, contract labour Act, Employees Provident Fund and Miscellaneous Provisions Act or any other laws relating thereto and rules made from time to time and maintain relevant records. n) The contractor shall have MOU with electrical contractor having valid electrical license and experience for executing all electrical works and proof of the same shall be submitted before executing the work. Certified Electrical fitters only shall be deputed for installation of electrical fittings/appliances and wiring connection.
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