

रेल डिब्बा कारखाना, कपूरथला

MD35131

Date: 26.04.2024

Sub: Issue of purchase specification no. RCF-MD-PS-2023-5 Revision '3' for design development, verification, manufacture, validation & supply of improved Bogies compatible for IR-LHB Coaches.

Please find enclosed copy of purchase specification no. RCF-MD-PS-2023-5 Revision '3' for design development, verification, manufacture, validation & supply of improved Bogies compatible for IR-LHB Coaches, for information and necessary action please.

(Kulwinder Singh)
Dy.CME/Design (S&B)

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

Dy.CMM/Fur/LHB, Dy.CMM/G, ACMT, Dy.CPLE-I, Dy.CPLE-II, Dy.CPLE-III,
Dy.CMM/Fur

SSE/Filing Section
SSE/Library
SSE/Records
SSE/Dev.

Copy for kind information to:

CDE
Dy. CME/D/VD
Dy.CME/DP
Dy.CME/D/FI

भारत सरकार
रेल मंत्रालय
रेल डिब्बा कारखाना
कपुरथला
पंजाब 144602
स्थापित: 1986



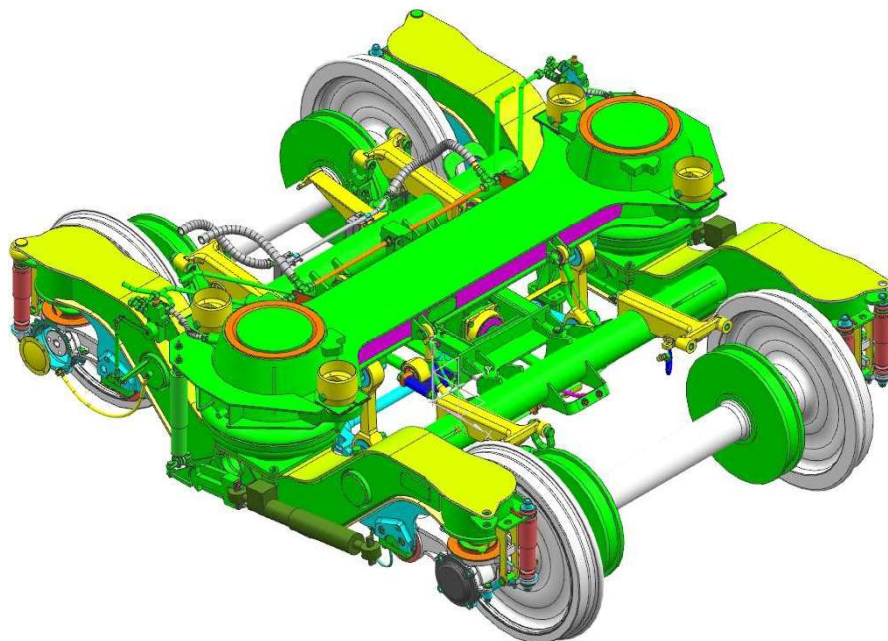
RCF

KAPURTHALA

Government of India
Ministry of Railways
Rail Coach Factory
Kapurthala
Punjab 144602
ESTT: 1986

आईआर-एलएचबी कोचों के अनुकूल बेहतर बोगियों के डिजाइन,
विकास, सत्यापन, निर्माण, सत्यापन और आपूर्ति के लिए खरीद
विशिष्टता

**PURCHASE SPECIFICATION FOR DESIGN,
DEVELOPMENT, VERIFICATION, MANUFACTURE,
VALIDATION & SUPPLY OF IMPROVED BOGIES
COMPATIBLE FOR IR-LHB COACHES**



Specification Number	RCF-MD-PS-2023-5		
Revision Number	3	Date of Issue	24/04/2024

Brief Description

This document contains the requirements for purchase of fully assembled bogies with improved design for retro fitment of LHB coaches of Indian Railways.

FOREWORD

The modern railway vehicles manufactured at the Rail Coach Factory Kapurthala (RCF/KXH) are designed for high safety and reliability and enable economical operations.

It is proposed to improve the operational performance and maintainability of bogies used on the LHB-FIAT design of coaches manufactured at RCF.

This specification has been prepared to enable purchase of improved design bogies by fostering development of the design to address issues currently seen in maintenance and operations.

This specification is drafted In line with the Government of India Policies, this document aims to leverage, and further build the design and manufacturing capabilities of both RCF and its contractors in a synergetic manner to deliver world class coaches for Indian Railways.

DISCLAIMER

This specification is based on the studies, trials& experience by RCF/KXH. Although every care is taken in specifying details adequately and unambiguously, RCF/KXH shall not be liable for any kind of damages / losses incurred by any and all due to errors or omissions in this document. When using the information described herein, the user is ultimately responsible for their own actions, as well as the actions of subordinates and assistants, and the consequences arising therefrom.

This document may mention numerous commercial and proprietary trade names, registered trademarks and the like (not necessarily marked as such), patents, production and manufacturing procedures, registered designs, and designations. RCF wishes to state clearly that the present legal situation in respect of these names or designations or trademarks must be carefully examined before making any commercial use of the same.

Names of industrially produced apparatus and equipment may be included to a necessarily restricted extent only and any exclusion of products not mentioned in this document does not imply that any such exclusion has been based on quality criteria or any other qualifying consideration.

COPYRIGHT

RCF/KXH has the copyright of all its publications. No part of these publications may be reproduced in any form without the prior permission of RCF. Enquires relating to the copyright should be addressed to Public Relations Officer, RCF/KXH.

ADDRESS FOR COMMUNICATION

Public Relations Officer
Government of India - Ministry of Railways,
Rail Coach Factory
Kapurthala
Punjab
India
Pin: 144602
Website: www.rcf.indianrailways.gov.in

Document No:	RCF-MD-PS-2023-5	Revision No:3	Date Issued: 24/04/2024
Specification Title: Purchase specification for design, development, verification, manufacture, validation & supply of bogie compatible for IR-LHB coaches			

DOCUMENT CONTROL

Name	Designation	Signature	Role
Rishi Raj Ranga	SSE/BD	RISHI RAJ RANGA Digitally signed by RISHI RAJ RANGA Date: 2024.04.25 10:35:32 +05'30'	Prepared
Aman Bhardwaj	SSE/BD	AMAN BHARDWAJ Digitally signed by AMAN BHARDWAJ Date: 2024.04.25 10:41:56 +05'30'	Checked
Naib Singh Mehta	SSE/BD	NAIB SINGH Digitally signed by NAIB SINGH Date: 2024.04.25 10:36:56 +05'30'	Checked
Kulwinder Singh	Dy CME/D(S&B)	KULWINDER SINGH Digitally signed by KULWINDER SINGH Date: 2024.04.25 17:47:09 +05'30'	Reviewed
Lalit Kishore	CDE	LALIT KISHORE Digitally signed by LALIT KISHORE Date: 2024.04.26 17:27:52 +05'30'	Approved

LIST OF AMENDMENTS

S. No.	Amendment Date	Revision	Details
1.	28/12/2023	0	First issue.
2.	19/01/2024	1	Amendments to clauses 5.1.1.2 & 5.1.1.4
3.	14/02/2024	2	Clause 5.4 added. Clause 5.1.1.4 amended. Annexure 9 amended. Corrections to headers & footers of annexures.
4.	24/04/2024	3	Clause 2, 3, 4, 5, 5.1.1.1, 5.1.1.2, 5.1.1.3, 5.1.1.4, 5.1.1.5, 5.1.2.1, 5.3(6), 8.1(1), 8.2.3(3), 8.2.4, 8.2.6, 8.2.7, 8.2.9, 11.1.1, 13.1, 21(2) amended/updated Clause 0.1(3), 8.1(3), 8.2.5, 18.2 deleted, Annexure 7 & 8 deleted and Annexure-9 updated

CONTENTS

0	Background & Introduction	4
0.1	Brief statement of scope of supply	4
1	Objective of this document	4
2	Scope of the specification	4
3	List of standards and documents referred	5
4	Abbreviations / Terminology	5
5	Eligibility for bulk (regular) and development orders	5
5.1	Eligibility for Bulk / Regular Purchase	6
5.2	Eligibility for Developmental Purchase	8
5.3	Conditions for a consortium bidding in the tender	8
5.4	Splitting of orders	9
6	Current bogie and coach configurations	9
7	Brief of field operations issues and corrective & preventive measures	10
8	Scope of Work & Supply	10
8.1	The summarized scope of work is:	11
8.2	Activities & Deliverables to meet scope requirements	11
9	Free supply items provided by IR (RCF)	14
10	Identification and marking of bogies and components	14
11	Acceptance Criteria and performance incentives / penalties	14
11.1	B10 Life or MFOP	14
11.2	B50 Life of Bogies	15
11.3	MTTR	15
12	Project Schedule	15
12.1	Approvals during project execution	15
13	Pre-contract activities	15
13.1	Provision of design information by RCF/RDSO	15
13.2	Site Visits	16
13.3	Tender processing	16
14	Quality Assurance and Inspection Plan	16
14.1	Quality Assurance, Tests & Documents for manufacture and supply	16
14.2	Inspection Plan	17
15	Provisioning of facilities for working	17
15.1	Facilities to be provisioned by RCF at RCF/KXH	17
15.2	Facilities to be provisioned by the contractor	17
16	General Terms & Conditions	18
16.1	Make in India mandate	18
16.2	Intellectual Property Rights (IPR)	18
16.3	Sub-contracting and outsourcing	19
16.4	Follow RCF production plan	19
16.5	Safe-keep during storage and transit	19
16.6	RCF right to inspect and audit	19
16.7	Requirements of Conduct of Contractor's Personnel	19
16.8	COVID-19 Safety	20
16.9	Compliance of Statutory & Regulatory requirements	20
16.10	Quality Management	20
16.11	Communication & Coordination	20
16.12	Stage inspection Hold & Witness Points	20
16.13	Record of activities, instructions, and compliances	20
16.14	Errors omissions & discrepancies	20
17	Guarantee/Warranty	20
17.1	Maintenance spares & consumables during warranty period	21
18	Payment Milestones and Terms	21
18.1	Payment for Design Costs	21
18.2	Deleted	22
18.3	Payment for supply of fully assembled bogies	22
19	Price Variation	22
20	Penalties while under warrantee	22
20.1	Attention during warranty	22
21	Important instructions for bidding	23

Document No:	RCF-MD-PS-2023-5	Revision No:3	Date Issued: 24/04/2024
Specification Title: Purchase specification for design, development, verification, manufacture, validation & supply of bogie compatible for IR-LHB coaches			

LIST OF FIGURES

No table of figures entries found.

LIST OF TABLES

Table 1: List of referred standards & documents	5
Table 2: Abbreviations & Terminology	5
Table 3: Salient Parameters & Attributes of the LHB-FIAT Bogies	9
Table 4: Brief description of operational issues and status of action taken for issue mitigation	10
Table 5: Penalty on B10 life criterion	15
Table 6: Quality Assurance Tests & Documents	17
Table 7: Maintenance during warranty period	21
Table 8: Payment milestones for cost of design	21
Table 9: Payment milestones for supply of fully assembled bogies	22

LIST OF ANNEXURES

1.	Format of Power of Attorney for signing of Bid
2.	Format for Power of Attorney for Lead Member of Consortium
3.	Format for Consortium/Association Agreement
4.	CONFIDENTIALITY & PERMITTED USE UNDERTAKING
5.	FIAT Bogie Configuration
6.	LHB Coach type and FIAT Bogie Configuration deployed
7.	Deleted
8.	Deleted
9.	Project Schedule with Witness-Hold points and RASCI in a combined chart.

Document No:	RCF-MD-PS-2023-5	Revision No:3	Date Issued: 24/04/2024
Specification Title: Purchase specification for design, development, verification, manufacture, validation & supply of bogie compatible for IR-LHB coaches			

0 Background & Introduction

The LHB-FIAT bogie was introduced on IR under a ToT agreement with Alstom in the year 1995. This bogie is the current mainstream bogie for passenger rolling stock of Indian Railways.

LHB coaches fitted with FIAT bogies were inducted on Indian Railways from the year 2000. These coaches are designed to operate up to 160 km/h speed and could be upgraded for operation up to 200 km/h with some modifications in brake system (up-gradation of brake disc & brake pad). Oscillation trials of LHB coaches have been done up to 180 km/h by Indian Railways.

While the bogie designs were optimized for Air-conditioned Chair Cars and Power Cars, over the years Indian Railways have developed many different configurations of superstructures (AC/Non-AC sleeper class, parcel van, double Decker coaches etc) using the same basic bogie design. Pneumatic suspension has also been introduced in secondary suspension of LHB coaches with FIAT bogies. Other minor changes have also been made to the suspension arrangements, but most of the original design remains unchanged.

Over the years, issues have been noticed in operations and maintenance. This project is an attempt to address these issues by upgrading and improving the design of the bogies.

0.1 Brief statement of scope of supply

LHB coaches with FIAT bogies have shown satisfactory riding behavior on IR track on higher speed required for Semi High Speed train operation. Several issues have been noticed during maintenance and operations. This specification has been developed to address the current issues by reviewing and revisiting the design of the bogies and its components culminating in a manufacture and supply of the improved bogies.

The summarized scope of work is:

1. To analyze (determine root causes), design, simulate & verify, productionize, validate, field test & fatigue test, initiate series manufacturing and supply of bogies for LHB design of coaches for Indian Railways.
2. Training of IR personnel in the design development process, manufacturing and assembly processes, testing & commissioning, quality assurance processes and maintenance & overhaul processes shall also form a part of the scope of work.
3. Deleted

1 Objective of this document

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

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

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

2 Scope of the specification

This document is a purchase specification for enabling tender purchase of upgraded design of bogies & retrofitable on the LHB Coaches currently in use on Indian Railways.

The document specifies the requirements for eligibility criteria, scope of supply, quality assurance requirements, prototype approval and inspection requirements, as supplied requirements, project schedule, payment milestones and guarantee warrantee.

These have been framed keeping in view the lifecycle requirements of the items to be supplied.

This document is to be used as part of the tender document.

3 List of standards and documents referred

S. No.	Standard / Document	Title
1.	AFNOR NF X 60-000	Industrial maintenance – Maintenance function
2.	EN 13749	Railway applications – Wheelsets and bogies – Method of specifying the structural requirements of bogie frames
3.	EN 14363	Railway applications – Testing and Simulation for the acceptance of running characteristics of railway vehicles – Running Behaviour and stationary tests
4.	EN 15827	Railway applications — Requirements for bogies and running gears
5.	EN15085	Standard for Railway applications — Welding of railway vehicles and components
6.	ISO 22163	Standard for Railway applications — Railway quality management system
7.	ISO: 3834-2	Standard for Quality requirements for fusion welding of metallic materials
8.	RCF-MDTS-49398	Technical Requirements and General Instruction for Direct Part Marking on Coach / Bogie Components
9.	RCF-MDTS-20322	Schedule of Technical Requirements for manufacture and supply of Fully Assembled FIAT Bogie with Air spring in secondary suspension

Table 1: List of referred standards & documents

4 Abbreviations / Terminology

S. No.	Abbreviations / Terminology	Expansion / Explanation
1.	BoM / PSL	Bill of Materials / Product Structured List
2.	FIAT	FIAT is the designer of the bogies supplied to IR with the LHB coaches.
3.	WSP	Wheel Slide Protection
4.	IPR	Intellectual Property Rights
5.	KXH	Indian Railways station code for Kapurthala
6.	LHB	Linke-Hofmann-Busch
7.	MBDS	Multi body Dynamic Simulation
8.	MBDS	Multi-Body Dynamic Simulation
9.	MDTS	Mechanical Design Technical Specification
10.	MFOP	Maintenance Free Operations Period
11.	MTTR	Mean Time to Repair
12.	OMRS	Online Monitoring of Rolling Stock
13.	PLM	Product Lifecycle Management
14.	QAP	Quality Assurance Plan
15.	RCF	Rail Coach Factory
16.	RDSO	Research Design & Standards Organization
17.	ToT	Transfer of Technology.
18.	WILD	Wheel Impact Load Detector

Table 2: Abbreviations & Terminology

5 Eligibility for bulk (regular) and development orders

The following eligibility criteria shall be followed for evaluation of offers. These are grouped into technical and financial requirements.

The eligibility criteria detailed here shall be met by the bidder who can be an individual firm or its associate/subsidiaries or consortium

Note: The pre-requisites provided here are to be used as default requirements. These may be overruled by the eligibility requirements prescribed while processing the purchase.

Document No:	RCF-MD-PS-2023-5	Revision No:3	Date Issued: 24/04/2024
Specification Title: Purchase specification for design, development, verification, manufacture, validation & supply of bogie compatible for IR-LHB coaches			

Note: In case of a consortium, the lead associate shall ensure that the requisite credentials are in the respective names of the associates who execute the work. The consortium as-a-whole shall meet the pre-requisites for eligibility described here.

5.1 Eligibility for Bulk / Regular Purchase

The following clauses list the eligibility for bulk (regular) purchase.

5.1.1 Technical Eligibility

The following shall be the technical eligibility requirements to qualify for bulk purchase.

Note: If supporting documents for credentials as per the eligibility criteria are not enclosed, then RCF may use its own available records or reject the bid.

5.1.1.1 Capability & Quality certification

The bidder including its associate/subsidiary or consortium member shall have the following certifications valid as on the date of bid opening. The copies of the certificate shall be provided as a part of the bid document. The copies provided shall be verifiable.

1. ISO 22163 (IRIS) certification or ISO 9001:2015 (latest).
2. EN 15085 certification or ISO 3834 certification (latest).

Note:

ISO9001 or IRIS certification is mandatory for all bidders and shall be mandatory for all members of the consortium for the respective areas of work.

EN15085 or ISO 3834 certification is mandatory for the firm / premises where the bogies shall be manufactured.

5.1.1.2 Design Experience

The bidder including its associate/subsidiary or the consortium member or design agency having MOU with bidder, shall have developed bogies for passenger rolling stock suitable for operational speed of 160kmph or above, that are successfully running in service for 3 (three) years or more, as reckoned on the date of tender opening.

The following documents shall be required to be submitted by the bidder in support of meeting the above requirements.

1. Certificate of Incorporation of the design agency
2. ISO9001/IRIS certificate indicating the scope of the product / services of the design agency.
3. Product design & delivery portfolio of the design agency.
4. Documentation to support the bogie design that are deployed in service at 160 kmph or above for three years or more, along with the contact details of the end-users.
5. CVs of the design agency employees that have worked on the development of the bogie design that are deployed.
6. CVs of the design agency employees that shall be responsible for handling the work detailed in this document.

5.1.1.3 Design Infrastructure

The bidder includes its associate/subsidiary or the consortium member or design agency having MOU with bidder, shall have requisite design infrastructure capable of handling the models provided by RCF and generating the manufacturing part drawings.

Document No:	RCF-MD-PS-2023-5	Revision No:3	Date Issued: 24/04/2024
Specification Title: Purchase specification for design, development, verification, manufacture, validation & supply of bogie compatible for IR-LHB coaches			

RCF uses NX as the CAD platform and Team-Centre as the PLM application. All design data exchange shall be compatible with these applications.

The design infrastructure may be in-house or outsourced. The following documents shall be submitted with the bid supporting the compliance.

1. For in-house infrastructure, details of design workstations and the certificate of NX licenses owned by the firm.
2. For outsourced design support, the copy of the agreement with the firm and the details of design workstations, certificate of NX licenses owned, details of designers employed by the firm.

5.1.1.4 Manufacturing experience of OEM and capability of Manufacturing

1. **Manufacturing experience:** The bidder including associate/subsidiary or the consortium member shall have manufactured and supplied minimum 50 numbers of fully assembled bogies for passenger rolling stock fit to run at 160 kmph and above in last four financial years and upto the date of tender opening in the current financial year as reckoned on the date of tender opening.

“Manufacturing unit/agency located in India” shall make tie-up/collaboration with OEM to establish same manufacturing practices for manufacture of improved bogies if bidder is using manufacturing credentials of unit located out of India.

2. **Manufacturing Capability of manufacturing agency** located in India for manufacture of improved bogie, shall have minimum “Key M&P as specified in Clause 5.1.1.5”.

The following documents shall be required to be submitted by the bidder in support of meeting the above requirements.

1. Certificate of Incorporation of the manufacturing agency. This certificate shall clearly show the place of manufacture.
2. ISO9001/IRIS certificate indicating the scope of the product / services of the manufacturing agency.
3. EN 15085 / ISO 3834 for Weld quality certification.
4. Product manufacture & delivery portfolio of the manufacturing agency.
5. Documentation to support the quantum of manufactured bogies that are deployed in service, along with the contact details of the end users.
6. Tie-up/collaboration with OEM to establish same manufacturing practices for manufacture of improved bogies if bidder is using manufacturing credentials of unit located out of India

5.1.1.5 Manufacturing Infrastructure

The bidder including associate/subsidiary, or the consortium member handling the manufacture in India, shall have minimum “Key M&P as mentioned in Para 4.1 of MDTs:20322 Rev 02 (or latest)” for manufacturing the improved bogies developed under this contract detailed in this document.

The following documents shall be submitted with the bid supporting the compliance.

1. Current details of the machinery plant and infrastructure available at the manufacturing locations.
2. Copies of the factory license(s).
3. The bidder, or the consortium member handling the manufacture of improved bogie, shall provide an undertaking that bidder shall setup any additional infrastructure for manufacture of the improved bogies developed under the contract if required and comply the delivery schedule of supply order.

5.1.2 Financial Eligibility

Bidder shall concurrently meet the following eligibility criteria mentioned in paragraphs as below for consideration of their offer for regular order.

5.1.2.1 Financial Capability

The bidder including associate/subsidiary or the consortium member's total Gross Revenue from Operations/Gross Sales Value, within the period of current financial year & previous three financial years

Document No:	RCF-MD-PS-2023-5	Revision No:3	Date Issued: 24/04/2024
Specification Title: Purchase specification for design, development, verification, manufacture, validation & supply of bogie compatible for IR-LHB coaches			

(period to be reckoned as on the date of tender opening) must be minimum 50% of the estimated tender value.

The bidder must submit the following documents as a part of the bid documents

1. Summary of financial year-wise Gross Revenue from Operations/Gross Sales Value to show the compliance of eligibility requirements.
2. Supporting copies of Income & Expenditure Statement or Profit & Loss account pertaining to the above period.
3. These financial statements must be certified by a Chartered Accountant or any Statutory Auditor. Onus of submission of these documents shall solely lie on the bidder.

5.2 Eligibility for Developmental Purchase

The tender is for development and supply of an improved design of bogie. There are no criteria proposed for developmental bidders.

5.3 Conditions for a consortium bidding in the tender

1. The number of members in a Consortium/Joint Venture shall not exceed 4 (Four).
2. A firm can be a partner in only one Consortium. Bids submitted by Consortium including the same firm as partners in more than one bid, will be rejected. (This restriction will not apply to sub-contractors for the bought-out items)
3. The Bid should contain the required information for each member of the Consortium/Joint Venture.
4. Members of the Consortium/Joint Venture shall nominate one member as the "Lead Member".
 - 4.1. Lead Member shall meet 51% of the financial eligibility condition in case of Consortium or shall have minimum 51% shareholding in the Joint Venture.
 - 4.2. The nomination of Lead Member shall be supported by a Power of Attorney, as per the format at Annexure 1&2, signed by all the other members of the Consortium/Joint Venture.
 - 4.3. The lead partner shall be responsible for coordinating the scope of supply / work as detailed in this document. There should be an authorization to this effect evidenced by submission of a power of attorney with bid duly signed by legally authorized signatories of all partners.
 - 4.4. The lead partner shall be authorized to incur liabilities and receive instructions for and on behalf of any and all partners of the Consortium, and the entire execution of the contract, including payment, shall be done exclusively by the lead partner.
 - 4.5. The lead member of Consortium shall be responsible for all financial covenants and bank guarantees.
5. Technical Eligibility requirements is to be satisfied by any member of Consortium/Joint Venture having minimum 26% share of financial eligibility in case consortium or 26% shareholding in the Joint Venture.
6. Consortium/Joint Venture as whole shall cumulatively/collectively fulfill the 100% Technical eligibility and 100% Financial eligibility.
7. The Bid shall include a brief description of the roles and responsibilities of individual members, particularly with reference to financial, technical and defect liability obligations;
8. The Lead Member shall carry out works directly under its own supervision and through its own personal.
9. Members of the Consortium/Joint Venture shall have entered into a binding Joint Bidding Agreement, substantially in the form specified at Annexure 3, for the purpose of making the Bid.
10. A copy of the agreement entered into by the Consortium partners shall be submitted with the bid. Alternatively, a "letter of Intent" (to execute a Consortium agreement, meeting with all specified requirements, in the event of a successful bid) shall be signed by all Consortium partners and submitted with the bid together with a copy of the proposed agreement. Consortium agreement duly signed by all Consortium partners shall form part of the contract agreement. The Consortium agreement should precisely indicate the responsibility of all members of Consortium in respect of planning, design, manufacturing, supply, installation, system integration, commissioning, training and warranty obligations etc. This should not be varied/ modified subsequently without the prior approval of the purchaser. The Consortium agreement should be Registered/Notarized anywhere in India, if the lead partner/Consortium partners are registered in India. For foreign companies, they should be

Document No:	RCF-MD-PS-2023-5	Revision No:3	Date Issued: 24/04/2024
Specification Title: Purchase specification for design, development, verification, manufacture, validation & supply of bogie compatible for LR-LHB coaches			

Registered/Notarized as per the laws of their respective country, so as to be legally valid and binding on all partners. (Annexure-3)

11. All partners of the Consortium shall be liable jointly and severally for the execution of the contract in accordance with the contract terms.
12. Approval for change of constitution of Consortium/Joint Venture shall be at sole discretion of the Authority. The constitution of the Consortium/Joint Venture shall not be allowed to be modified after submission of the Bid by the Consortium/Joint Venture, except when modification becomes inevitable due to Succession laws etc., provided further that there is no change in qualification of minimum eligibility criteria by Consortium/JV. However, the Lead member shall continue to be the Lead Member of the Consortium/Joint Venture. Failure to observe this requirement would render the offer invalid.
13. Similarly, after the contract is awarded, the constitution of Consortium/Joint Venture shall not be allowed to be altered during the currency of contract except when modification becomes inevitable due to Succession laws etc., provided further that it does not change the minimum eligibility criteria. Failure to observe this stipulation shall be deemed to be breach of contract with all consequential penal action as per contract condition.

5.4 Splitting of orders

The order for this project shall be placed on a single bidder selected from the due process of selection. There shall be no splitting of the order quantity.

Note: This special condition has been mandated as multiple designs of the bogies is to be avoided.

6 Current bogie and coach configurations

The currently used bogies have the following common attributes and parameters:

#	Parameter / Attribute Description	Value / Attribute
1.	Axle load capacity	16.25t
2.	Axle distance	2560 mm
3.	Diameter of wheel (New)	915 mm
4.	Diameter of wheel (Worn)	845 mm
5.	Distance between wheel	1600 mm
6.	Brake disc dia	640 mm
7.	Bogie width	3030 mm
8.	Bogie length	3534 mm
9.	Bogie weight	6635 kg
10.	Primary suspension	Coil Spring
11.	Secondary suspension	Air spring
12.	Coach length over body	23540mm
13.	Coach length over buffer	24000mm
14.	Max. width of coach over body	3240mm
15.	Coach floor height under tare condition	1320mm
16.	Distance between center pivot	14900mm
17.	Max. CBC height tare/ Min. CBC height loaded	1105/1030mm
18.	Emergency Braking Distance required	1260m @ 160kmph & 1600m @ 200kmph

Table 3: Salient Parameters & Attributes of the LHB-FIAT Bogies

The currently deployed configuration of coaches and bogies are listed tables provided in Annexure 5 & 6 of this document. These annexures provide a quick overview of the range of configurations and the salient parameters of the coaches and the bogies.

7 Brief of field operations issues and corrective & preventive measures

The following table lists the field issues that need to be addressed for improving the operational performance of the bogie. Summary of the action taken by IR / RDSO for mitigation is also described in brief.

#	Brief Description of the Issue	Status of action taken for issue mitigation
1.	Premature failure of rubber bonded components	The maintenance free interval of the bogie is expected to be 1.2 million kilometers. On IR coaches with these bogies are expected to run on average about 1000 km per day. Hence the bogies hit 1 million km cumulative run by end of the 3rd year. However, the rubber bonded components require change in 18-24 months resulting in unscheduled maintenance. Some review has been done on the quality of materials, but the design, materials selection and supplier qualification needs to be looked into in more detail.
2.	Control Arm housing lug hitting & breakage	To create more gap between axle box housing lug and stiffer in damper bracket, TPU ring has been inserted below coil spring.
3.	Primary damper failures	It has been observed that primary damper operates from closed length to mid length and mounting of damper is with stud and rubber disc type on both the ends. Stroke length optimization and silent type block type mounting at one end are being explored.
4.	Primary Coil Spring failures	Many solutions like prescribing minimum contact line length as 15% of line coil diameter etc. have been tried but this problem still persists. TPU ring above & below primary spring has also been put under trial as coil springs in primary spring of LHB coaches did not have any rubber/PU component under primary spring.
5.	Dropping of phonic wheel & oiler ring of earthing device	Integrated phonic wheel having fasteners of size M20 X 60 from existing M8 X 35. Further, length of fasteners of oiler ring is being increased from existing M8 x 25 to M8 x 30
6.	Air Spring tilting in secondary suspension	Air spring OEMs have been advised to improve the design. One of OEM has strengthened air bellow to resolve this.
7.	Corrosion of Bogie Frame	Suitable paint system is being explored
8.	Hot axle & bearing failure	Most of the failures have been due to outer cup crack or breakage of polyamide cage. Heat treatment of outer cup is being improved from through Martensitic to through Bainitic and polyamide cage being strengthened while reducing number of rollers.
9.	Wheel Shelling	Obstructions and blockages in pipeline have been removed. Choke size of WSP of brake system optimized. Hardness of wheel has been kept on higher range.

Table 4: Brief description of operational issues and status of action taken for issue mitigation

Many incremental changes have been made to tackle the field issues over the years. However, it is now felt that the bogie design needs to be reviewed afresh for a detailed root cause analysis and addressing improving the core design for mitigation of defects and improvement of performance.

8 Scope of Work & Supply

The prime objective of this project is to address these issues and design, development, manufacture, and deploy bogies that:

1. Are suitable and optimized for all current rolling stock superstructure configurations of LHB coaches.
2. Have a maintenance intervention free operational duration of 3 years or more or 1.2 million kilometres
3. Are retrofittable under the existing LHB coach superstructures.

Along with the development of the bogie design certain concurrent deliverables are defined. These are detailed in the clauses below.

Document No:	RCF-MD-PS-2023-5	Revision No:3	Date Issued: 24/04/2024
Specification Title: Purchase specification for design, development, verification, manufacture, validation & supply of bogie compatible for IR-LHB coaches			

8.1 The summarized scope of work is:

1. To analyze, design, simulate & verify, productionize, validate, field test (short & long term)& fatigue test, initiate series manufacturing and supply of bogies for LHB design of coaches for Indian Railways.

Bogies suitable for LWACCN (AC three tier) coach- 800 Nos, Bogie suitable for LWS (Second Class seating coach)-400 Nos. and Bogie suitable for LWSCN (Second class sleeper coach)-400 Nos shall be supplied.

2. Training of IR personnel in the design development process, guidelines for selection of materials and bought out components, manufacturing and assembly processes, testing & commissioning, quality assurance processes and maintenance & overhaul processes.
3. Deleted

8.2 Activities & Deliverables to meet scope requirements

The following activities are proposed for addressing and improving the long-term field performance of LHB-FIAT bogies.

8.2.1 Analysis of existing bogies

1. Available data of actual oscillation trials of LHB coaches and data of impacts & loads on track by LHB coaches over OMRS & WILD system in Indian Railways tracks shall be provided for framing boundary condition.
2. The contractor shall conduct Multi Body Dynamic Simulation (MBDS) of LHB coaches with existing bogies on Indian Railways track condition to identify boundary & load conditions during operation/service, to which each component of bogie is subjected to. Detailed report shall be prepared.
3. The contractor shall conduct and detailed running trial of the existing bogie to establish baseline reference data. All required instrumentation, data logging systems and data analytic system shall be provided by the contractor. The running of trial trains shall be responsibility of IR. Detailed report for the trials shall be prepared.
4. All the above shall be treated as inputs for development of the design of the upgraded bogie.

8.2.1.1 Deliverables

Reports in hard and soft (PDF & editable) copy as detailed above & configuration and input files and details of applications used for simulation to be provided.

8.2.2 Review of the existing design and planning of design interventions

1. The design of each component of bogie is to be reviewed, particularly of primary suspension, secondary suspension, dampers, rubber-metal bonded components, and axle box components in view of boundary conditions & inputs arrived at by above exercise.
2. Design review of existing design of bogie components (by calculations/FEA/computer simulations etc) for solving listed field issues shall be done as per applicable EN/AAR/JIS/any other reputed standard.
3. Identify the bogie components, whose design is found to be suboptimal & need improvement to arrest issues listed above. Deficiencies in design must be elaborated in detail with the help of calculations & simulations. Accordingly, propose the modifications in respective components of Bogie, whose design is found suboptimal.
4. For changes, the weight of upgraded bogie design should not be more than 1.05 X weight of existing bogie design. All efforts for design optimization& weight reduction shall be made by available methods including digital models. The interfaces of upgraded bogies must be such as to ensure that upgraded bogies can be easily & perfectly assembled with existing car bodies.
5. If existing design of any failing component such as coil springs, primary dampers, other type of dampers, rubber metal bonded items, axle box components etc. are found to be adequate in abovementioned review, it shall be required to identify issues in our existing specification & drawing of that failing item with help of vendors of international repute. If required, samples (approx.10 of each) of such failing components of existing design, specification & drawing will be provided free of

Document No:	RCF-MD-PS-2023-5	Revision No:3	Date Issued: 24/04/2024
Specification Title: Purchase specification for design, development, verification, manufacture, validation & supply of bogie compatible for IR-LHB coaches			

cost by Indian Railways for testing & analysis. Based on inputs, upgraded specification & drawing for such items shall be prepared.

6. Link particular type of failures as listed above for identified reasons with proper analysis, calculations & elaboration as detailed above or through suitable alternate method. Feasible solution in design, specification, drawings & maintenance shall be submitted with analysis, calculations & elaboration
7. Technical input for development of specifications, drawings & maintenance protocol for upgraded/ modified bogie and bogie items. For solving any issue listed above, if any other items beyond bogie, like brake system etc. are also to be studied, such exercise must be completed to resolve all the issues listed above.
8. During review, standardization of primary springs, bogie frame, dampers etc. shall be done to ensure lesser number of variants of bogies for LHB coaches in Indian Railway.
9. The design should be such as to minimize maintenance and should not require any scheduled maintenance other than checks up to 3 years from overhaul/ introduction.
10. Adoption of other available suspension technologies for primary suspension in place of helical coil spring may also be explored.
11. Good industrial, engineering & design practices shall be followed. All activities shall be fully document and reports prepared.

8.2.2.1 Deliverables

Reports / Models / Drawings / Documents in hard and soft (editable) copy as generated while executing the work detailed above.

8.2.3 Simulation for verification of performance of the new design of bogie and components

1. Design verification of upgraded bogie components (by calculations/FEA/computer simulations/Lab testing/field trials etc.) shall be done as per applicable EN/AAR/JIS/any other reputed standard.
2. The bogies rotational resistance (X factor) validation under inflated and deflated air spring conditions shall be carried out through suitable calculation/ simulation under tare and loaded conditions. The rotational resistance shall neither cause excessive flange wear nor cause any possibility of flange climbing but shall be adequate to avoid bogie hunting on straight track. The Supplier shall show by analysis that no flange climbing occurs on any curve and moving at all possible speeds set using suitable parameter.
3. Satisfactory train operation of LHB coaches fitted with modified (upgraded) FIAT bogie up to 180 kmph during on IR track testing and up to 220 kmph during simulation.
4. MBDS to establish its safety, stability & riding behavior as per 3rd report of standing criteria committee & EN 14363, MBDS as per 3rd report of standing criteria committee & EN 14363 shall be done & all parameters related to its safety, stability & riding behavior should be within respective limits. Oscillation trials in these cases shall be done as 3rd report of standing criteria committee (peak based method) to ensure field validation of modified bogie design. Criteria for assessment shall be as follows: -
 - 4.1. Ride index shall not be greater than 3.5; a value of 3.25 is preferred.
 - 4.2. The values of acceleration recorded, as near as possible to the bogie pivot shall be limited to 0.3g both in vertical and lateral directions. A peak value up to 0.35g may be permitted, if the records do not indicate a resonant tendency in the region of the peak value.
5. A general indication of stable running characteristics of the carriage as evidenced by the movement of the bogie on a straight and curved track, and by the acceleration readings and instantaneous wheel load variations/spring deflections.
6. The Ride Index and acceleration values listed are the maximum permissible. The designer shall optimize the values and provide the best possible design with superior ride index and lesser lateral & longitudinal accelerations.

Document No:	RCF-MD-PS-2023-5	Revision No:3	Date Issued: 24/04/2024
Specification Title: Purchase specification for design, development, verification, manufacture, validation & supply of bogie compatible for IR-LHB coaches			

8.2.3.1 Deliverables

Reports / Models / Drawings / Documents in hard and soft (PDF & editable) copy as generated while executing the work detailed above. Configuration and input files and details of applications used for simulation to be provided.

8.2.4 Prototype manufacture

Detailed models / drawings, process sheets, work instructions and quality assurance record templates to be prepared and deployed for manufacturing system setup.

04 Nos of Bogies for LWACCN, 04 Nos of Bogie for LWSCN and 04 Nos of Bogies for LWS coach shall be manufactured and supplied for running/performance trials.

8.2.4.1 Deliverables

Detailed models / drawings, process sheets, work instructions and quality assurance record templates to be prepared and deployed for manufacturing system setup shall be provided in hard and soft (PDF & editable) copies.

Supply of fully assembled bogies as per the contract schedule for prototypes approval and field tests.

Contractor shall source the free supply items from RCF.

8.2.5 Deleted

8.2.6 Validation of fatigue / endurance life of bogie frame and other major items

Major modified items shall be subjected to fatigue/endurance tests as per EN13749 or other applicable ISO/EN standards to prove out the life of improved bogies. Intermittent reports shall also be shared.

The testing shall be fully documented, and reports prepared.

8.2.6.1 Deliverables

Reports in hard and soft (PDF & editable) copy as detailed above.

8.2.7 Validation of running performance of the prototype bogies

The prototypes shall be validated by running trails and the performance of the bogies shall be evaluated by instrumenting the bogies.

The testing shall be fully documented, and reports prepared.

Any design iterations required, based on the outcome of the trials shall be done.

8.2.7.1 Deliverables

Reports in hard and soft (PDF & editable) copy as detailed above.

8.2.8 Start series production and supply bogies

Series production and supply of bogies shall commence after successful completion of trials. The bogies shall be supplied as per the schedule provided by the indenter / consignee.

Supply of fully assembled bogies as per the contract schedule.

The contractor shall source the free supply items from RCF.

8.2.8.1 Deliverables

Assembled bogies as per schedule with required quality assurance documentation.

8.2.9 Extended field trials

1000 bogies (400 for LWACCN, 300 for LWS and 300 for LWSCN) shall be manufactured and put into service. The performance of the bogies shall be monitored for 3 years. If field performance indicates requirements for further changes, the change shall be implemented without any additional cost to purchaser.

Document No:	RCF-MD-PS-2023-5	Revision No:3	Date Issued: 24/04/2024
Specification Title: Purchase specification for design, development, verification, manufacture, validation & supply of bogie compatible for IR-LHB coaches			

8.2.9.1 Deliverables

Reports in hard and soft (PDF & editable) copy as detailed above with performance analysis.

8.2.10 Maintenance schedule documentation infrastructure requirements

Comprehensive documentation for maintenance schedules and the required infrastructure for conducting the schedules shall be provided.

The documentation shall be arranged for handling all five levels of maintenance as per AFNOR NF X 60-000.

8.2.10.1 Deliverables

Documentation as in hardcopies and softcopies (PDF & editable).

8.2.11 Training of personnel of IR

Training of IR personnel in design, manufacturing, assembly, testing & commissioning, quality control, maintenance, and overhaul processes. (To be scheduled alongside development and manufacturing activities.)

8.2.11.1 Deliverables

Training of identified personnel. This is expected to be done along-with the progress of the project.

All training materials shall be provided in hard and soft (editable & PDF) copies.

9 Free supply items provided by IR (RCF)

The following items shall be supplied by RCF as free supply items for the fully assembled bogies.

1. Wheel sets fitted with axle bearings, brake-discs and wheel-discs.
2. Brake Caliper Units
3. Phonic Wheels (Wheel Speed Sensor System)

Note: During the design phase of the project, if it is noticed that the above free supply items also need to be upgraded, the contractor shall inform IR well in advance to plan procurement of the same.

10 Identification and marking of bogies and components

All components and sub-components of the bogies shall be marked using DPM technology.

Alternative technology for marking may be suggested. However, all marking / identification systems shall have a service life more than the service life of the components on which the marking is made.

The contractor shall propose and seek approval of IR, for the scheme prior to application.

The guidelines contained in RCF-MDTS-49398 shall be applicable for setting up the marking scheme.

11 Acceptance Criteria and performance incentives / penalties

11.1 B10 Life or MFOP

The expected B10 life or MFOP (Maintenance Free Operation Period) shall be 3 years or 1.2 million kilometres. The overall bogie design, design of the wear components shall meet this requirement and the same shall be demonstrated via technical documentation and simulation.

This criterion shall be the KPI for the extended field trial of 3 years (1.2 million kms) from fitment of the bogies on rolling stock.

11.1.1 Performance based penalties for B10 evaluation

Actual % of Population meeting B10 life criterion of 3 years or 1.2 million kilometres	
Penalty Zone	Target Zone
Population% <90%	Population% =>90%
Penalty to be imposed @1% (of the contract value) for every 1% loss of availability. The exact deduction percentage is to be calculated by linear extrapolation.	No penalties or incentives. Full payment as per contract.

Table 5: Penalty on B10 life criterion

11.1.2 Epidemic Failure

Failure of more than 20% of population at 3 years or 1.2 million kilometres shall be treated as epidemic failure. This shall require a review of the contract with an option for pre-closure.

11.2 B50 Life of Bogies

The expected B50 life of bogies shall be 18 years of age or 7.2 million kms more. This requirement shall be demonstrated in the simulation of the fatigue in the stress components of the bogie.

11.3 MTTR

The expected MTTR to be within 8 hours. This includes inspection, dismantling, repair / replace, reassemble and testing.

Note: Failure in meeting the performance criteria detailed above shall result in contract review and short closure if necessary.

12 Project Schedule

The proposed schedule for the execution is attached as Annexure 9 of this document.

12.1 Approvals during project execution

Approvals and sign-offs shall be required from RCF at various stages of the project. These are identified as the Hold and Witness Points

These approvals shall be sought on digitally signed PDF documents. These documents shall be submitted via email to the authorized persons and via the DMS of a project management system. The detailed process of submissions and approvals shall be mutually agreed and documented as a part of the agenda for the kick-off meeting.

The approvals sought shall be replied within 2 weeks of submission. The time taken for approvals shall not be counted against the project schedule durations.

13 Pre-contract activities

The following activities are planned to enable likely bidders to have an informed understanding of the scope of work and the targeted improvements expected from the redesign and manufacture project.

13.1 Provision of design information by RCF/RDSO

RCF/RDSO shall provide available track data, the present design of the bogies and available information via an online share.

1. Available CAD Models and Drawings.
2. Material Details and Properties of all the components.
3. Component Manufacturing Processes
4. List of components for which models or drawings are not available.
5. Availability of the components for Reverse Engineering

Document No:	RCF-MD-PS-2023-5	Revision No:3	Date Issued: 24/04/2024
Specification Title: Purchase specification for design, development, verification, manufacture, validation & supply of bogie compatible for IR-LHB coaches			

6. Bogie Body Interfaces of coach.

NX native format 3D model files and other concomitant files shall be provided.

The files shall be uploaded on an internet accessible server. Bidders shall be able to access and download the files from the provided URL.

Note: This is being provisioned as above IREPS permits only PDF files to be uploaded.

13.1.1 Permission to download and NDA / End use undertaking

Bidders shall be required to submit a Non-Disclosure and End-Use Undertaking as provided in the Annexure 4.

The undertaking shall be generated as a digitally signed PDF copy and the same shall be mailed to dycmedesignsb@gmail.com requesting access for downloading the files.

13.2 Site Visits

The authorized personnel of the bidders that have submitted the undertaking as described above, can schedule a visit to manufacturing, vehicle assembly, maintenance and overhauling sites of Indian Railways to collect information for bidding.

The request for site visit shall be submitted by email to the above address.

13.3 Tender processing

Bidders shall participate in the tender on IREPS, and the tender shall be awarded as per the extant process.

14 Quality Assurance and Inspection Plan

The Quality Assurance Plan for the project is one of the deliverables. This shall be jointly developed by IR and the contractor.

The following aspects shall be covered as a part of the QAP development.

14.1 Quality Assurance, Tests & Documents for manufacture and supply

The following table provides an overview of the system for development of the quality assurance plan.

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 outsourced products and processes 2. Testing of raw material and establishing its traceability. 3. Sampling Plan 4. Type Tests 5. Routine Tests 6. Acceptance Tests	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.	The records of the type tests shall be maintained by the manufacturer and shall be made available upon demand. These records shall be traceable and verifiable.

Document No:	RCF-MD-PS-2023-5	Revision No:3	Date Issued: 24/04/2024
Specification Title: Purchase specification for design, development, verification, manufacture, validation & supply of bogie compatible for IR-LHB coaches			

Requirement Description	Requirement Detail	Remarks
Routine Tests	The manufacturer shall conduct routine tests as per the approved QAP. The records of tests conducted shall be verifiable upon request.	The records of the routine tests shall be maintained by the manufacturer and shall be made available upon 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 infrastructure required to enable acceptance tests shall be provided by the bidder / OEM / contractor at the place of inspection.

Table 6: Quality Assurance Tests & Documents

Note: The contractor shall ensure that all purchase and supply documents of all purchased items, including raw materials are available for audit as and when required.

14.2 Inspection Plan

The inspection plan shall be proposed by the contractor based on the QAP framework developed. 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 3rd party 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 3rd party agency duly authorized by RCF, to attend and witness the point in the work process should it choose to do so.

The inspection plan shall be reviewed and agreed jointly by RCF and the contractor.

15 Provisioning of facilities for working

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

15.1 Facilities to be provisioned by RCF at RCF/KXH

RCF shall provide the following provisions, free of costs, 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 to day work.
2. RCF will provide suitable crane, material handling equipment and fork lifters with driver for handling of sub-assemblies/body shells at RCF/KXH.
3. Power supply, Compressed Air (@ approximately 2-3 kg/cm² pressure) and water etc. for working at site shall be provided by RCF/KXH. These shall be put to judicious use and only for activities related to the project.
4. Access to toilets and drinking water facilities shall be provided at RCF/KXH.

15.2 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.

- 1.1. The site office shall be self-contained, however electrical supply shall be provided by RCF at RCF/KXH.

Document No:	RCF-MD-PS-2023-5	Revision No:3	Date Issued: 24/04/2024
Specification Title: Purchase specification for design, development, verification, manufacture, validation & supply of bogie compatible for IR-LHB coaches			

- 1.2. The maximum footprint of the site office and store shall be limited to 2x40' containers. Double stacking can be permitted where required.
- 1.3. Special cranes & lifting tackles for deployment and removal of the containers shall be provided where needed.
2. Welding and other consumables required for assembly activities and modifications done at RCF/KXH.
3. All hand tools, IMTE's with their respective spares and consumables.
4. Hand trolleys / powered trolleys for transporting tools and IMTE's.

15.2.1 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 tools should have proper electrical plugs.

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

16 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.

16.1 Make in India mandate

The contractor shall ensure that more than 50% (80% preferable) of the value of supply billed to IR is localized in accordance with the policy.

16.2 Intellectual Property Rights (IPR)

RCF shall be providing detailed 3D Models and manufacturing processes documentation to the bidders / contractors. The contractors are expected to ensure that all such documents having IPRs are not transferred to third parties without prior written approval of CDE/RCF.

The contractor is expected to create detailed manufacturing design and process documentation for the manufacture of the items detailed in this document. All such design artefacts, 3D models, drawings, process documentation etc., shall the property of RCF/KXH and the same shall form a part of deliverables of the contract.

Note: The models, drawings, documents etc. shall be provided in the respective native formats. If there is a need for conversion of formats, the same shall be mutually agreed.

The contractor can seek permission to use the available IPR for third party applications from CDE/RCF. The same shall be sought in writing prior to such use.

Note2: All information shared and developed during the progress of this contract shall be the property intellectual property of RCF/KXH. As such, the contractor shall ensure that this information is not shared to a 3rd party or put to any other end use (other than to work as per the scope of this contract) Kindly also see the undertaking mandated at Annexure 4.

The decision of CDE/RCF, regarding permission to use such IPR for third party applications shall be final and binding.

Document No:	RCF-MD-PS-2023-5	Revision No:3	Date Issued: 24/04/2024
Specification Title: Purchase specification for design, development, verification, manufacture, validation & supply of bogie compatible for IR-LHB coaches			

16.3 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).

16.4 Follow RCF production plan

All body 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 RCF from time to time.

16.5 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.

16.6 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.

16.7 Requirements of Conduct of Contractor's Personnel

16.7.1 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.

16.7.2 Qualifications of personnel

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

The contractor shall provide the detailed CV of all personnel of their team deputed to work at RCF/KXH.

16.7.3 Working dress and PPE

All contractors' workers shall be suitable attired and shall be wearing the requisite PPE's for the job.

The following minimal 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 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 should be polite and courteous.

16.7.4 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.

Document No:	RCF-MD-PS-2023-5	Revision No:3	Date Issued: 24/04/2024
Specification Title: Purchase specification for design, development, verification, manufacture, validation & supply of bogie compatible for IR-LHB coaches			

2. Chewing of Pan/Gutka/ any intoxicant is strictly prohibited at workplace, violations shall attract a penalty @ ₹ 500/person-day.

16.8 COVID-19 Safety

COVID-19 guidelines issued by Government of India/RCF/Punjab/State Govts are to be followed.

16.9 Compliance of Statutory & Regulatory requirements

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

16.9.1 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.

16.10 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.

16.11 Communication & Coordination

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

16.12 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. Any inspection points raised, shall be cleared by the Contractor before proceeding further.

16.13 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.

16.14 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/RCF without delay in case of any contradiction.

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

17 Guarantee/Warranty

The expected life of the structures is more than 18 years.

The contractor shall provide a guarantee/warranty for all supplied items as detailed below:

1. 78 months for all structural components of the bogies.
2. 42 months for all wear components of the bogies.

The warranty period shall be reckoned from the date of fitment on a coach.

Document No:	RCF-MD-PS-2023-5	Revision No:3	Date Issued: 24/04/2024
Specification Title: Purchase specification for design, development, verification, manufacture, validation & supply of bogie compatible for IR-LHB coaches			

17.1 Maintenance spares & consumables during warranty period

All maintenance requirements during the warranty period shall be handled as under

Maintenance Level #	IR Responsibility	Contractors Responsibility
1	Conduct L1 maintenance by trained personnel at respective maintenance depots.	Impart training to all personnel for L1 maintenance. Provision of spares, consumables and SMT's .
2	Conduct L2 maintenance by trained personnel at respective maintenance depots.	Impart training to all personnel for L2 maintenance. Provision of spares, consumables and SMT's. Provide supervision and handholding support.
3	Provide all necessary support to the contractor for conducting maintenance. Deploy personnel to be trained on the job.	Impart training to all personnel for L3 maintenance. Provision of spares, consumables and SMT's. Provide supervision and manpower for conducting the maintenance schedule.
4	Provide all necessary support to the contractor for conducting maintenance. Deploy personnel to be trained on the job.	Impart training to all personnel for L4 maintenance. Provision of spares, consumables and SMT's. Provide supervision and manpower for conducting the maintenance schedule.
5	Provide all necessary support to the contractor for conducting maintenance. Deploy personnel to be trained on the job.	Impart training to all personnel for L5 maintenance. Provision of spares, consumables and SMT's. Provide supervision and manpower for conducting the maintenance schedule.

Table 7: Maintenance during warranty period

18 Payment Milestones and Terms

The scope of work includes 3 distinct categories of goods / services to be supplied. The payment terms and conditions for each category shall be as per the details given below.

18.1 Payment for Design Costs

The following payment milestones shall be applicable for the design cost

#	Milestone Description	Payment%	Cumulative Payment%
1.	Upon completion of design of the bogie and that of the manufacturing system with requisite quality assurance framework, submission of all design documents and artifacts in native, editable and PDF copies (as applicable)	20%	20%
2.	After completion of running oscillation trials and submission of updated documentation as detailed at milestone #1 above.	30%	50%
3.	Upon completion of B10 field operational service life trials	30%	80%
4.	Handing over all design related deliverables at completion of the project.	20%	100%

Table 8: Payment milestones for cost of design

18.2 Deleted

18.3 Payment for supply of fully assembled bogies

Payments shall be made in tranches of 10 bogies after successful completion of the running trials and fatigue testing of the prototypes.

The quantity for the first tranche shall include the prototypes.

#	Milestone Description	Payment%	Cumulative Payment%
1.	<p>Upon inspection and receipt of 10 fully assembled bogies.</p> <p><i>Note: First tranche shall be paid after completion of running oscillation trials and supply of 10 complete bogies (including prototypes).</i></p>	70%	70%
2.	Upon Commissioning the supplied bogies on the rolling stock	10%	80%
3.	<p>Upon completion of B10 field operational service life trials</p> <p><i>Note: This implies that max. 80% shall be payable until completion of B10 trial period for the bogies supplied upto this period.</i></p>	10%	90%
4.	<p>Upon completion of warrantee guarantee period of 6 years.</p> <p>Or</p> <p>The firm may opt to submit an irrevocable bank guarantee, or any other suitable and acceptable instrument, mandated by the purchase officer, to release the 10% withheld against warrantee-guarantee.</p>	10%	100%

Table 9: Payment milestones for supply of fully assembled bogies

Note: Performance guarantee shall be released on completion of the warranty period and upon NOC provided by the primary maintenance depot of the coaches.

19 Price Variation

As applicable as per IRS conditions and policies.

20 Penalties while under warrantee

As applicable as per IRS conditions and policies.

20.1 Attention during warranty

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

In case of breakdown, a grace period of 72 HRS shall be given, from time of intimation to time of attention, beyond which penalty of ₹10,000/- per coach-day downtime shall be levied.

Document No:	RCF-MD-PS-2023-5	Revision No:3	Date Issued: 24/04/2024
Specification Title: Purchase specification for design, development, verification, manufacture, validation & supply of bogie compatible for IR-LHB coaches			

21 Important instructions for bidding

1. The bidders shall familiarize themselves with the scope and conditions mentioned in this document and other linked documents.
2. There are two components of cost i.e. Design & Supply of Upgraded Bogies. All two components need to be quoted in the bid. Incomplete bids shall be rejected.

Document No:	RCF-MD-PS-2023-5	Revision No:3	Date Issued: 24/04/2024
Specification Title: Purchase specification for design, development, verification, manufacture, validation & supply of bogie compatible for IR-LHB coaches			

ANNEXURE- 1

Format of Power of Attorney for signing of Bid (To be executed on stamp paper of appropriate value)

Know all men by these presents, We, (name of the firm and address of the registered office) do hereby irrevocably constitute, nominate, appoint and authorise Mr./Ms (Name), son/daughter/wife of and presently residing at, who is presently employed with us/the Lead Member of our Consortium and holding the position of, as our true and lawful attorney (hereinafter referred to as the "Attorney") to do in our name and on our behalf, all such acts, deeds and things as are necessary or required in connection with or incidental to submission of our bid for the Project proposed or being developed by the (the "Railways") including but not limited to signing and submission of all applications, bids and other documents and writings, participate in bids and other conferences and providing information/responses to the Railways, representing us in all matters before the Railways, signing and execution of all contracts and undertakings consequent to acceptance of our bid, and generally dealing with the Railways in all matters in connection with or relating to or arising out of our bid for the said Project and/or upon award thereof to us.

AND we hereby agree to ratify and confirm and do hereby ratify and confirm all acts, deeds and things done or caused to be done by our said Attorney pursuant to and in exercise of the powers conferred by this Power of Attorney and that all acts, deeds and things done by our said Attorney in exercise of the powers hereby conferred shall and shall always be deemed to have been done by us.

IN WITNESS WHEREOF WE,, THE ABOVE NAMED PRINCIPAL HAVE EXECUTED THIS POWER OF ATTORNEY ON THIS DAY OF, 20.....

For.....
(Signature, name, designation and address)

Witnesses:

- 1.
- 2.

Accepted

Notarised
(Signature, name, designation and
address of the Attorney)

Signature and stamp of the bidder

- Note:- 1. TO BE NOTORIZED
2. TO BE SUBMITTED IN ORIGINAL

Notes:

Document No:	RCF-MD-PS-2023-5	Revision No:3	Date Issued: 24/04/2024
Specification Title: Purchase specification for design, development, verification, manufacture, validation & supply of bogie compatible for IR-LHB coaches			

(i) The mode of execution of the Power of Attorney should be in accordance with the procedure, if any, laid down by the applicable law and the charter documents of the executant(s) and when it is so required, the same should be under common seal affixed in accordance with the required procedure.

(ii) Wherever required, the Bidder should submit for verification the extract of the charter documents and documents such as a board or shareholders resolution/power of attorney in favour of the person executing this Power of Attorney for the delegation of power hereunder on behalf of the Bidder.

(ii) For a Power of Attorney executed and issued overseas, the document will also have to be legalised by the Indian Embassy and notarised in the jurisdiction where the Power of Attorney is being issued. However, the Power of Attorney provided by Bidders from countries that have signed the Hague Legislation Convention 1961 are not required to be legalised by the Indian Embassy if it carries a conforming Appostille certificate.

Signature and stamp of the bidder

Document No:	RCF-MD-PS-2023-5	Revision No:3	Date Issued: 24/04/2024
Specification Title: Purchase specification for design, development, verification, manufacture, validation & supply of bogie compatible for IR-LHB coaches			

ANNEXURE- 2

Format for Power of Attorney for Lead Member of Consortium

(To be executed on stamp paper of appropriate value)

Whereas the (the "Railways") has invited bids from pre-qualified and short-listed parties for the Project (the "Project").

Whereas,, and (collectively the "Consortium") being Members of the Consortium are interested in bidding for the Project in accordance with the terms and conditions of the Request for Proposals and other connected documents in respect of the Project, and

Whereas, it is necessary for the Members of the Consortium to designate one of them as the Lead Member with all necessary power and authority to do for and on behalf of the Consortium, all acts, deeds and things as may be necessary in connection with the Consortium's bid for the Project and its execution.

NOW THEREFORE KNOW ALL MEN BY THESE PRESENTS

We, having our registered office at, M/s., having our registered office at, and M/s., having our registered office at, (hereinafter collectively referred to as the "Principals") do hereby irrevocably designate, nominate, constitute, appoint and authorise M/s., having its registered office at, being one of the Members of the Consortium, as the Lead Member and true and lawful attorney of the Consortium (hereinafter referred to as the "Attorney") and hereby irrevocably authorise the Attorney (with power to sub-delegate) to conduct all business for and on behalf of the Consortium and any one of us during the bidding process and, in the event the Consortium is awarded the Agreement/Contract, during the execution of the Project, and in this regard, to do on our behalf and on behalf of the Consortium, all or any of such acts, deeds or things as are necessary or required or incidental to the submission of its bid for the Project, including but not limited to signing and submission of all applications, bids and other documents and writings, accept the Letter of Award, participate in bidders' and other conferences, respond to queries, submit information/documents, sign and execute contracts and undertakings consequent to acceptance of the bid of the Consortium and generally to represent the Consortium in all its dealings with the Railways, and/or any other Government Agency or any person, in all matters in connection with or relating to or arising out of the Consortium's bid for the Project and/or upon award thereof.

AND hereby agree to ratify and confirm and do hereby ratify and confirm all acts, deeds and things done or caused to be done by our said Attorney pursuant to and in exercise of the powers conferred by this Power of Attorney and that all acts, deeds and things done by our said Attorney in exercise of the powers hereby conferred shall and shall always be deemed to have been done by us/Consortium.

IN WITNESS WHEREOF WE THE PRINCIPALS ABOVE NAMED HAVE EXECUTED THIS POWER OF ATTORNEY ON THIS DAY OF, 20....

Signature and stamp of the bidder

For.....
(Signature, Name & Title)

For.....
(Signature, Name & Title)

Document No:	RCF-MD-PS-2023-5	Revision No:3	Date Issued: 24/04/2024
Specification Title: Purchase specification for design, development, verification, manufacture, validation & supply of bogie compatible for IR-LHB coaches			

For.....
(Signature, Name & Title)

(Executants)
(To be executed by all the Members of the Consortium)

Witnesses:

1.

2.

Note:-

1. TO BE NOTORIZED
2. TO BE SUBMITTED IN ORIGINAL

Notes:

- (i) The mode of execution of the Power of Attorney should be in accordance with the procedure, if any, laid down by the applicable law and the charter documents of the executant(s) and when it is so required, the same should be under common seal affixed in accordance with the required procedure.
- (ii) Wherever required, the Bidder should submit for verification the extract of the charter documents and documents such as a board or shareholders resolution/power of attorney in favour of the person executing this Power of Attorney for the delegation of power hereunder on behalf of the Bidder.
- (iii) For a Power of Attorney executed and issued overseas, the document will also have to be legalised by the Indian Embassy and notarised in the jurisdiction where the Power of Attorney is being issued. However, the Power of Attorney provided by Bidders from countries that have signed the Hague Legislation Convention 1961 are not required to be legalised by the Indian Embassy if it carries a conforming Appostille certificate.

Signature and stamp of the bidder

ANNEXURE- 3

Format for Consortium/Association Agreement

The Partners of the Consortium shall provide Consortium/Association Agreement for Association/ Participation which includes at least the followings:

M/s _____ having its registered office at _____ (hereinafter referred to as) is the Lead Partner of the Consortium/Association and acting as the authorized representative of the Consortium on first part; and

M/s _____ having its registered office at _____ (hereinafter referred to as _____) in the capacity of a Joint Partner of the Consortium/ Association on the other part.

The expression of _____ and _____ and _____ shall wherever the context admits, mean and include their respective legal representatives, successor interest and assigns and shall collectively be referred to as "the Parties" and individually as "the Party"

WHEREAS:

Rail Coach Factory, Kapurthala [hereinafter referred to as "Employer"] has invited bids for

[Put tender details here]

NOW, THEREFORE, THE PARTIES AGREE AS FOLLOWS:

1. The following documents shall be deemed to form and be read and construed as an integral part of this Consortium/Association Agreement.
 - i) Invitation for bid;
 - ii) Bid Documents issued by the Employer
 - iii) Any Addendum/Corrigendum to the Bid Documents issued by the Employer
 - iv) The Bid submitted on our behalf jointly by the Authorized Signatory from the Lead Partner.
2. The 'Parties' have studied the Bid Documents and have agreed to participate in submitting a 'Bid' jointly.
3. Mr./Ms. _____ authorized Signatory of the Lead Partner and whose details are provided as under, shall be the Authorized Signatory of the Consortium/ Association for all intents and purpose. He/She shall have the authority to conduct all business for and on behalf of any and all the Partners of Consortium/Association during the bidding process and in the event the Consortium/Association is awarded the contract, during contract execution.

Name,	Designation,	Address,	Tel/Fax no	Email ID
-------	--------------	----------	------------	----------

4. We undertake that
 - a) The Lead Partner of our Consortium/Association _____ (Name of the Lead Partner) shall have the maximum financial stake amongst the other partners of the Consortium/ Association.
 - b) The distribution of responsibilities in execution of work and the percentage participation amongst various Partners of the Consortium for the subject work shall be as under:

SN	Name of the Partner	Role (Lead Partner/ Partner)	Distribution of Responsibilities in execution of the work	% Participation

Document No:	RCF-MD-PS-2023-5	Revision No:3	Date Issued: 24/04/2024
Specification Title: Purchase specification for design, development, verification, manufacture, validation & supply of bogie compatible for IR-LHB coaches			

5. JOINT AND SEVERAL RESPONSIBILITY

The Parties undertake that they shall be jointly and severally liable to the Employer in the discharge of all the obligations and liabilities as per the contract with the Employer and for the performance of contract awarded to their Consortium/Association.

In case one party fails or delays to perform its obligations either partially or totally, it shall be responsible for all the out comings concerned, and upon such conditions the other parties shall be obliged to take measure to perform well all the obligations under the contract with the Employer.

6. ASSIGNMENT AND THIRD PARTIES

The Parties shall cooperate throughout the entire period of this Consortium/Association Agreement on the basis of exclusivity and neither of the parties shall make arrangement or enter into agreement either directly or indirectly with any other party or group of parties on matters relating to the Work except with prior written consent of the other party.

7. EXECUTIVE AUTHORITY

The said Consortium/Association through its Authorized Signatory (as specified above) shall receive instructions, payments from the Employer. The management structure for the work shall be prepared by mutual consultations to enable completion of the work of quality requirements within permitted cost and time.

8. GUARANTEES

Till the award of the work, all the Bank guarantees to the Employer shall be furnished in the name of the Consortium/Association or by the Lead Partner on behalf of the Consortium/Association which shall be legally binding on all the partners of the Consortium/Association.

9. DOCUMENTS & CONFIDENTIALLY

Each party shall maintain in confidence and not use for any purpose other than those related to the project all commercial and technical information received or generated in the course of preparation and submission of the Bid.

10. ARBITRATION

Any dispute, controversy or claim arising out of or relating to this agreement shall be settled in the first instance amicably between the parties. If an amicable settlement cannot be reached as above, it will be settled by _____ [Bidder to specify]

11. VALIDITY

This Agreement shall remain in force till the occurrence of the earliest to occur of the following, unless by mutual consent, the Parties agree in writing to extend the validity for a further period.

- The bid submitted by the Consortium/Association is declared unsuccessful, or
- Cancellation/shelving of the project by the Employer for any reason prior to award of work
- Execution of detailed Association/Consortium agreement by the parties, setting out detailed terms after award of work by the Employer, substantially covering the requirement as mentioned in Bid Documents.

12. This Consortium/Association Agreement shall be construed under the laws of India.

13. NOTICES

The name, addresses and fax numbers of Authorized Signatory of the other partners of the Consortium/Association to which notices may be given in writing by fax confirmed by registered mail or commercial courier shall be as under:

- _____ [Name], _____ [Designation], _____ [Address], _____ [Ph. No., Fax No. , E-mail ID]

Document No:	RCF-MD-PS-2023-5	Revision No:3	Date Issued: 24/04/2024
Specification Title: Purchase specification for design, development, verification, manufacture, validation & supply of bogie compatible for IR-LHB coaches			

- b) _____ [Name], _____ [Designation], _____ [Address], _____ [Ph. No., Fax No. , E-mail ID]
- c) _____ [Name], _____ [Designation], _____ [Address], _____ [Ph. No., Fax No. , E-mail ID]

14. Any Other Clause, the Bidder wish to include

(For Bidders in India to be execute on non-judicial stamp paper of appropriate value. For Bidders from outside India, to be executed according to the applicable laws in the Bidder's country and by taking into account the Notes shown below).

Notes:

1. In case of existing Consortium/Association, the certified copy of Consortium/Association Agreement may be furnished.
2. The mode of execution should be in accordance with the procedure, if any, laid down by the applicable law in the bidder's country and the charter documents of the executants(s) and when it is so required, the same should be under common seal affixed in accordance with the required procedure.
3. Whenever required, the Bidder should submit for verification the extract of the charter documents and the shareholder resolution in favour of the person executing this document on behalf of the bidder.
4. For a required document executed and issued overseas, the document will also have to be legalized by the Indian Embassy in the Bidder's country and notarized in the jurisdiction where it is being issued. However, documents provided by Bidders from countries that have signed the Hague Legislation Convention 1961 are not required to be legalized by the Indian Embassy, if they carry a conforming Apostille certificate.

Document No:	RCF-MD-PS-2023-5	Revision No:3	Date Issued: 24/04/2024
Specification Title: Purchase specification for design, development, verification, manufacture, validation & supply of bogie compatible for IR-LHB coaches			

ANNEXURE 4

CONFIDENTIALITY & PERMITTED USE UNDERTAKING (On Bidders Letter Head)

I, _____ (the name of tenderer/contractor), the undersigned (hereafter addressed as contractor), do hereby declare and confirm that I am aware that I may be assigned by Rail Coach Factory, Kapurthala, to render certain services as tendered for in tender number _____ date _____.

In connection therewith, I hereby undertake and agree as follows:

Certain Definitions

(a) "Confidential Information" means any data, documents, materials, or other information disclosed to me in connection with the Services, in any form whatsoever, whether orally, visually, in writing or otherwise (including in computerized or electronic form).

(b) "Permitted Purpose" means the use of the Confidential Information to perform the Services.

The Contractor's Confidentiality Obligations

(a) I understand that the Contractor is subject to confidentiality obligations pursuant to the information supplied as a part of specifications for the abovementioned tender.

Undertakings

(a) I undertake to conduct myself and render services with a view to ensuring full compliance of Conditions of Contract for the Provision of Services.

(b) I shall:

(i) use the same care and discretion to avoid disclosure, publication or dissemination of the Confidential Information as I use with my own similar information that I do not wish to disclose, publish or disseminate; and,

(ii) use the Confidential Information solely for the Permitted Purpose.

(c) I hereby undertake that in the case of this tender being awarded to another party, or upon the request of the Rail Coach Factory, Kapurthala, I shall immediately return (or destroy) all Confidential Information disclosed to me or to which I had access during or as a result of the process of tendering, together with all copies thereof.

(d) I understand that in the case of the contract being awarded to us, this requirement of confidentiality stands and shall be applicable throughout the contract. I shall immediately return (or destroy) all Confidential Information disclosed (together with all copies thereof) to me or to which I had access during or because of the process of servicing the tender and the following contract.

SIGNED:

Name:

Date:

Place:

Document No:	RCF-MD-PS-2023-5	Revision No:3	Date Issued: 24/04/2024
Specification Title: Purchase specification for design, development, verification, manufacture, validation & supply of bogie compatible for IR-LHB coaches			

ANNEXURE-5

FIAT Bogie Configuration

Following types of suspension combinations are being used in FIAT Bogies of LHB Coaches presently in IR:

Group	Bogie frame drg. no.	Primary Springs RDSO drawing nos.		Dampers (Primary Vertical, Secondary Vertical, Secondary Lateral, Yaw dampers) as per RDSO drawing nos.				Secondary pneumatic suspension	Min tare weight of coach for the group	Max Gross weight of coach for the group		
				PVD	Yaw Damper	SLD	SVD					
1.	LW03002	Outer	1267411	RDSO/CG/DRG/21047	RDSO/CG/DRG/21048	RDSO/CG/DRG/21049	RDSO/CG/DRG/2104 6	160 kN Air spring	43.70t	53.38t		
		Inner	1267412									
2.	LW03002	Outer	1277142								48.20t	60.00t
		Inner	277143									
3.	LW03002	Outer	1267411							46.10t	55.80t	
		Inner	1277143									
4.	LG03001	Outer	LG01100							RDSO/CG/DRG/21018	36.5t (With overloading 65t)	56.19t (With overloading 65t)
		Inner	LG01101									

Bogie frame is same in all types of coaches except length of metal bump in spring pot of primary suspension is shorter by 15 mm in LG03001 in comparison to that in 1267401.
Differnet weight ranges of coaches are catered with different coil spring combinations in primary suspension.

Document No:	RCF-MD-PS-2023-5	Revision No:3	Date Issued: 24/04/2024
Specification Title: Purchase specification for design, development, verification, manufacture, validation & supply of bogie compatible for IR-LHB coaches			

ANNEXURE-6

LHB Coach type and FIAT Bogie Configuration deployed

S. No	Bogie Gen. Arrangement	Applicability	Bogie Frame	Bogie Bolster	Primary Suspension	Outer Spring	Inner Spring	Secondary Suspension	Damper	Sup. Dia. Argt.	PSL (BoM) No
1	LW00009	LWFAC, LWFCZAC, LWFAC-USBRL, LWCBAC-USBRL, LWCZAC, LWFCZAC-TEJAS, LWCBAC, RA NON AC NON GUARD SIDE	LW03002	LW04001	1268732	1267411	1267412	LW05004, Air Spring 120kN	PVD - RDSO/CG/DRG/21047, SVD - RDSO/CG/DRG/21046, SLD - RDSO/CG/DRG/21049, YD - RDSO/CG/DRG/21048	LW90033	MD317
2	LW00007	LWACCW, LWACCW – USBRL, LWFCWAC	LW03002	LW04001	LW01001	1267411	1277143	LW05004, Air Spring 120kN			MD316
3	LW00007	, LWACCN, LWACCN - USBRL	LW03002	LW04001	LW01001	1277142	1277143	LW05004, Air Spring 160kN			MD316
4	LE00101	AC-3T ECONOMY, AC-3T Garib Rath	LW03002	LW04001	LE01100	1277142	1277143	LP05100, Air Spring 160kN			MD737
5	LW00010	LWLRRM - SIDE-1, (GUARD SIDE)	LW03003	LW04100	1272174	1277142	1277143	LP05100, Air Spring 120kN			MD318
6	LP00102	LWLRRM - SIDE-2, (NON GUARD SIDE)	LW03002	LW04100	1272174	1277142	1277143	LW05004, Air Spring 120kN			MD767
7	LG00004	LWSCN, LGS, LGS-AC, DEEN DAYALU, ANTYODYA, LWSCZ	LG03001	LW04001	LG01103	LG01100	LG01101	LG05108, Air Spring 160kN	SAME AS ABOVE EXCEPT SVD - RDSO/CG/DRG/21018		MD580
8	VP00102	LVPHR, LVPHX	LG03001	LW04001	LG01103	LG01100	LG01101	LG05108, Air Spring 140kN			MD768

Document No:	RCF-MD-PS-2023-5	Revision No:3	Date Issued: 24/04/2024
Specification Title: Purchase specification for design, development, verification, manufacture, validation & supply of bogie compatible for IR-LHB coaches			

S. No	Bogie Gen. Arrangement	Applicability	Bogie Frame	Bogie Bolster	Primary Suspension	Outer Spring	Inner Spring	Secondary Suspension	Damper	Sup. Dia. Arrgt.	PSL (BoM) No
9	LR00004	LSLRD-NON GUARD SIDE	LG03001	LR04100	LG01103	LG01100	LG01101	LR05002, Air Spring 160kN			MD713
10	LR00005	LSLRD- GUARD SIDE	LG03001	LR04100	LG01103	LG01100	LG01101	LR05002, Air Spring 160kN			MD714
11	RA00003	RA-AC GUARD SIDE	LW03003	LR04100	LW01001	1267411	1277143	LR05002, Air Spring 160kN			MD802
12	RA00004	RA-AC NON G SIDE	LW03002	LR04100	LW01001	1267411	1277143	LR05002, Air Spring 160kN			MD803
13	LW00106	RA-NON AC GUARD SIDE	LW03003	LW04001	1268732	1267411	1267412	LW05004, Air Spring 120kN	PVD - RDSO/CG/DRG/21047, SVD - RDSO/CG/DRG/21046, SLD - RDSO/CG/DRG/21049, YD - RDSO/CG/DRG/21048		MD715
14	LD00004	DOUBLE DECKER-CARGO LINER	LW03002	LR04100	1272174	1277142	1277143	LD05002, Air Spring 160kN			MD813
15	LW00011	DOUBLE DECKER (UDAY/AC CHAIR CAR)	LW03002	LW04001	1272174	1277142	1277143	LD05002, Air Spring 160kN			MD633

Document No:	RCF-MD-PS-2023-5	Revision No:3	Date Issued: 24/04/2024
Specification Title: Purchase specification for design, development, verification, manufacture, validation & supply of bogie compatible for IR-LHB coaches			

Annexure-9

#	Activity	Planned Duration (Weeks)	Completion Milestone (Weeks)	Cumulative Weeks	Deliverables	Witness / Hold Mandate	Contractor	RCF	RDSO
0	Tender Finalization (Issue of Purchase Order)	START	D	0			S	R	I
1	Project Kick-Off Meeting	2	D+2	2			R	R	R
2	Sharing of all available information on bogie design and issues	2	D+4	4	All available information, models drawings, specifications etc to be provided		I	R	R
3	Conduct of instrumented run trials of existing bogies.	6	D+10	10	Report in Hard and Soft (editable & PDF) copy detailing the process and outcome of the trials	HOLD	R	S	R
4	Review of existing bogie design and identification of areas for improvement	12	D+22	22	Report in Hard and Soft (editable & PDF) copy detailing the issues identified and the improvement proposed.	HOLD	R	S	S
5	Development of designs for modifications / improvements / new bogie to address the areas identified for improvement	20	D+42	42	CAD Models, drawings, specification, calculation sheets all design development artifacts. These shall be provided as soft copies.	HOLD	R	A	A
6	Simulation based verification of the developed design for static / dynamic stress analysis. Fatigue life analysis Multi-body dynamic analysis for ride quality estimation	4	D+46	46	Reports of simulations in hard and soft copies. Digital Parametric Simulation Models files of improved bogie & bogie items. All configuration and simulation setup files in native formats. Details of software (with version numbers) used for simulation.	HOLD	R	A	A
7	Development of manufacturing bill of materials.	4	D+50	50	Bill of Materials in hard and soft copies (editable & PDF)	HOLD	R	A	A
8	Development of manufacturing design / documentation and tooling / fixtures for manufacturing of the new design of the bogie	4	D+54	54	Manufacturing drawings in hard and soft copies (editable & PDF), Manufacturing drawings of all jig / fixtures and tooling required in hard and soft copies (editable & PDF).	WITNESS	R	A	A
9	Development of purchase / quality assurance requirements documentation for bought out components and assemblies.	2	D+56	56	All documentation in hard & soft (editable & PDF) copies.	WITNESS	R	A	A
10	Development of bogie assembly and quality assurance requirements documentation.	2	D+58	58	All documentation in hard & soft (editable & PDF) copies.	WITNESS	R	A	A
11	Setting up the production setup at the manufacturing location of the contractor / consortium partner / design agency having MOU with bidder.	4	D+62	62	Setup manufacturing system. All documentation in hard & soft (editable & PDF) copies.	HOLD	R	A	A
12	Prototype manufacturing of the new design of bogies	4	D+66	66	Progress with prototype manufacture.	WITNESS	R	A	A
13	Running oscillation trials and fatigue testing of bogies on IR.	4	D+70	70	Report in Hard and Soft (editable & PDF) copy	WITNESS	R	S	R
14	Review the trial results	4	D+74	74	Report in Hard and Soft (editable & PDF) copy	HOLD	R	A	A
15	Finalize the design of the bogies and update the required documentation	8	D+82	82	All modified documents / drawings /models etc in hard & soft (editable & PDF) copies.	HOLD	R	A	A
16	Manufacture and supply the bogies as per the contract schedule	64	D+146	146	Fully assembled bogies and maintenance spares as per agreed list.	WITNESS	R	S	C
17	Training of IR personnel in design, manufacturing, assembly, testing & commissioning, quality control, and maintenance and overhaul process. (Also to be scheduled alongside development and manufacturing activities)	4	D+150	150	Training of identified personnel. This is expected to be done alongwith the progress of the project. All training materials shall be provided in hard and soft (editable & PDF) copies	HOLD	R	S	S
18	B10 (MFOP) review at 3 years (say 160 weeks) of first 1000 bogies {400 LWACCN+300 LWSCN+300 LWS} as per contract. Trial period expected to start after start of bogie manufacture and supply (#16 say D+90)	4	D+254	254	B10 life calculations and report, in Hard & Soft (editable & PDF) copies.	HOLD	R	R	R
19	Handing over of all pending deliverables and project closure.	4	D+258	258	Handing over and confirmation check of all documents, drawings, models, check sheets, reports and all design artifacts.	HOLD	R	R	R

RAIL COACH FACTORY, KAPURTHALA, PUNJAB 144602

Printed: 2024/04/24

Page 4 of 5

Document No:	RCF-MD-PS-2023-5	Revision No:3	Date Issued: 24/04/2024
Specification Title: Purchase specification for design, development, verification, manufacture, validation & supply of bogie compatible for IR-LHB coaches			

RASCI	Role Full Form	Description of the role	Witness / Hold Mandate	Description
R	RESPONSIBLE	Responsible (also recommender) Those who do the work to complete the task. There is at least one role with a participation type of responsible, although others can be delegated to assist in the work required (see also RASCI below for separately identifying those who participate in a supporting role).	WITNESS	A Witness point is an identified point in the work process where the contract administrator may review, witness, inspect or undertake tests on any component, method or process of works. The contractor is required to notify the contract administrator who may or may not take the opportunity. The subsequent activity however, may proceed.
A	ACCOUNTABLE/ APPROVER	Accountable (also approver or final approving authority) The one ultimately answerable for the correct and thorough completion of the deliverable or task, the one who ensures the prerequisites of the task are met and who delegates the work to those responsible. In other words, an accountable must sign off (approve) work that responsible provides. There must be only one accountable specified for each task or deliverable.	HOLD	A Hold point is a mandatory verification point beyond which a work process cannot proceed without authorization by the contract administrator. Hold points are usually assigned to those critical aspects of the work that cannot be inspected or corrected at a later stage because they will no longer be accessible. The relevant work cannot proceed until the contract administrator is able to verify the quality of the completed work and releases the Hold point.
S	SUPPORTING	Support Resources allocated to responsible, unlike consulted, who may provide input to the task, support helps complete the task.		
C	CONSULTED	Consulted (sometimes consultant or counsel) Those whose opinions are sought, typically subject – matter experts and with whom there is two – way communication.		
I	INFORMED	Informed (also informee) Those who are kept up-to-date on progress, often Only on completion of the task or deliverable and with whom there is just one-way communication.		