




# BEML LIMITED BANGALORE

DOC NO.	FPIIC/TD/HSR0008
DATE	07.12.2024
REV. No.	1
PAGE NO.	1 / 8

## Procurement Technical Specification for engaging Design consultancy for Setting up of climatic chamber Facility for Rolling stock


Approved	07.12.2024	SHIVAKUMAR HG	
Reviewed	07.12.2024	MAHANTHESH GM	
Prepared	07.12.2024	RAM KRISHNA RAJPUT	
	Date	Name	Signature



	<b>Climatic Chamber Facility Setup Consultancy</b>	DOC No.	FPIIC/TD/HSR0008
		DATE	07.12.2024
		REV. No.	1
		PAGE NO.	3 / 8


## TABLE OF CONTENTS

<b>1. Introduction.....</b>	<b>4</b>
<b>2. Qualification Criteria.....</b>	<b>5</b>
<b>3. Time Schedule.....</b>	<b>5</b>
<b>4. Scope of work of the consultancy .....</b>	<b>5</b>
4.1. General .....	5
4.2. Support/Guidance in purchase of Climatic Chamber equipment: .....	6
4.3. Support/Guidance in Climate Chamber design and construction:.....	6
4.4. Climatic test demonstration for an existing train: .....	7
4.5. Documentation and Training .....	7
4.6. Deliverables .....	8
<b>5. Submittals with Technical Offer .....</b>	<b>8</b>

	<b>Climatic Chamber Facility Setup Consultancy</b>	DOC No.	FPIIC/TD/HSR0008
		DATE	07.12.2024
		REV. No.	1
		PAGE NO.	4 / 8

## 1. Introduction

- a) BEML Limited (BEML) has been awarded with Contract for Design, Manufacture, Supply, Testing, Commissioning of High-Speed Train (249 kmph). Integral coach Factory, Chennai (ICF) is the Purchaser of the project. In addition to the Rolling Stock, the contract on BEML calls for setting up of the climatic chamber laboratory at ICF.
- b) In this regard, BEML intends to appoint a consultancy with relevant experience to provide support/guidance for Climatic chamber design and construction, purchasing of equipment and to conduct test for an existing train within climatic chamber at ICF, in accordance to international norms and standards.
- c) ICF is one of the rolling stock manufacturing units under Ministry of Railways, Government of India at Chennai. ICF manufactures passenger rolling stock and other rolling stock required for domestic consumption operated by Indian Railways and for export market. Chennai is a city at southern part of India, which has good connectivity by road, air and sea.
- d) ICF will propose the place for the setup of the climatic chamber within their rolling stock production premises. ICF will be responsible for laying the multi-gauge rail line for movement of rail cars/coaches intended for testing at climatic chamber. In addition, the power and water supply will be provided by ICF.
- e) Rolling Stock size vary from 3600 mm on broad gauge / 3450 mm on standard gauge with maximum length of 30000 mm and the height of 4500 mm depending upon rail cars manufactured. The schedule of dimension for accommodating the various sized rail cars/coaches for broad guage and standard guage will be provided after placement of contract.
- f) This document specifies the requirements of the technical support/guidance for design, construction and purchase of equipment for setting up of the climatic chamber facility at ICF for carrying out the evaluation of the energy consumption of rolling stock Heating, Ventilation and air conditioning equipment (HVAC). In addition, the consultancy will conduct test on an existing train within climatic chamber.
- g) The climatic chamber shall enable the Purchaser to measure HVAC energy usage under different climatic conditions, to produce data which could be combined with

	<b>Climatic Chamber Facility Setup Consultancy</b>	DOC No.	FPIIC/TD/HSR0008
		DATE	07.12.2024
		REV. No.	1
		PAGE NO.	5 / 8

meteorological information from rolling stock's future operating environment to provide an accurate prediction of annual/periodical energy usage, enabling operators to optimize the operating costs.

- h) The climatic chamber shall meet the requirements for testing of rolling stock as per EN-14750 for passenger comfort under various climatic conditions.

## 2. Qualification Criteria

- a) The firm/consortium shall have carried out the consultancy activity related to climatic chamber for rolling stock according to international norms and standards. The firm shall have established their satisfactory performance and reliability on at least one project for design climatic chamber, which are in revenue service. Supporting documents for the same shall be submitted along with the technical offer.
- b) The firm/consortium shall have adequate experience and knowledge of climatic chamber test for rolling stock requirements. The firm shall have established performance and reliability on at least three projects for rolling stock climatic test.
- c) The firm/consortium shall have experience in supporting rolling stock climatic chamber test in climatic chamber with wind speed. At least one project reference shall be submitted along with the tender documents.
- d) firm/consortium should not have been debarred/ black listed by Government of India or any State Government in India / Central or state Government undertaking.
- e) Supporting document meeting all above criteria shall be provided along with offer.


## 3. Time Schedule

Schedule for completion of Climatic chamber facility setup in all aspects and ready for testing at ICF is 31<sup>st</sup> Jan. 2026.

## 4. Scope of work of the consultancy

### 4.1. General

- a) Consultancy will be responsible for prepare a technical proposal for erection of the climatic chamber keeping BEML/ICF involved in all stages.
- b) The civil construction and ancillary system contractor(s), climatic chamber

	<b>Climatic Chamber Facility Setup Consultancy</b>	DOC No.	FPIIC/TD/HSR0008
		DATE	07.12.2024
		REV. No.	1
		PAGE NO.	6 / 8

equipment supplier(s) will be appointed by BEML. The consultancy shall provide the layout of the climatic chamber considering the equipment for meeting the climatic chamber desired functionality.


- c) The consultancy shall prepare and submit the detailed technical specification of the climatic chamber for civil structure and layout suitable for installation/mounting of all required functional equipment of climatic chamber for varied size of rail cars/coaches and all other ancillary requirements viz., laboratory office, meeting hall, safety apparatus, medical first aid, proper amenities for working personnel, ventilation, lighting, accessibility etc., BEML/ICF shall be involved during layout design and specification.
- d) Based on Consultancy technical specification BEML will tender out the for the equipment supplier. During selection process of the ancillary contractor(s) and equipment supplier(s), the scrutiny of the technical proposal shall be reviewed and the technical recommendation shall be submitted by the consultancy.
- e) It is the responsibility of the consultancy to participate (physically) in the FAI of all the equipment planned to be installed in the climatic chamber before the supply of the equipment's. All the type test reports shall be verified by the consultancy.
- f) After installation of the climatic chamber the consultancy shall certify for the proper functioning of the climatic chamber.

#### **4.2. Support/Guidance in purchase of Climatic Chamber equipment:**

- a) Freezing of Technical specification to enable BEML for preparing procurement technical specification (PTS) documents.
- b) Identification of potential supplier's as per PTS requirements.
- c) Technical review of the received offers and recommendation to BEML.

#### **4.3. Support/Guidance in Climate Chamber design and construction:**

- a) Civil construction layout shall be prepared by the consultancy. BEML will provide civil works, power supply and additional installations as per the layout.
- b) Support during technical interlocution with the chamber supplier(s) for specific chamber characteristics.

	<b>Climatic Chamber Facility Setup Consultancy</b>	DOC No.	FPIIC/TD/HSR0008
		DATE	07.12.2024
		REV. No.	1
		PAGE NO.	7 / 8


- c) Climatic chamber commissioning and tune-up.
- d) Elaboration and Execution of a procedure for the verification of the correct performance of the climatic chamber and test equipment.

#### **4.4. Climatic test demonstration for an existing train:**

- a. The Consultancy shall demonstrate climatic test for an existing train in the climatic chamber.
- b. In reference to EN 14750 standards, a test procedure shall be prepared and submitted for approval.
- c. The test procedure shall include test conditions, sensor positions, measurement equipment, parameters and measuring its values, description validation criteria and other information which are required to be arranged before conducting the tests.
- d. Test preparation and Project Management.
- e. Test Execution
  - i. Instrumentation and cabling: Installation, set up and removal of the measuring instrument.
  - ii. Vehicle air balance verification and execution of internal testing.
  - iii. Any other preparation shall be covered.
  - iv. Execution of climatic chamber test on vehicle.
- f. Data analysis and post processing.
- g. Test Report:
  - i. A test report for the test performed shall be prepared and submitted.
  - ii. The test report shall describe the test outcome and the relevant details of the test outcome, post-processing method, assessment values, limits and graphical information of the results.

#### **4.5. Documentation and Training**

- a) Training: Provide training for client personnel on how to operate and maintain the chamber (2 days in person). The video record of the training shall be provided. Post

	<b>Climatic Chamber Facility Setup Consultancy</b>	DOC No.	FPIIC/TD/HSR0008
		DATE	07.12.2024
		REV. No.	1
		PAGE NO.	8 / 8

training, training support in terms of clarifications shall be provided in written or online calls/VC.

- b) Manual/documents w.r.t training imparted shall be shared in 2 hardcopies to BEML.

#### **4.6. Deliverables**

- a) Post-Installation Support: The consultancy shall extend its support during the testing of second car for any technical clarifications/ issues arising during testing.
- b) All the documentation and meetings shall be in English.
- c) The firm/consortium representative shall be present on climatic chamber site during climatic chamber commissioning and tune-up.
- d) The firm shall visit Bangalore/Chennai during installation, commissioning and testing phase in order to ensure that the system/test setup is working satisfactorily. The firm shall support through VC whenever required for technical assistance/ support during execution stage.

#### **5. Submittals with Technical Offer**

Consultancy shall provide following details along with the offer

- a) Clause-wise compliance statement against PTS doc. No. FPIIC/TD/HSR0008.
- b) Propose project plan covering sequence of activities to be carried out for this project.
- c) Supporting documents for Qualification Criteria compliance (Clause 2).

\*\*\*END OF THE DOCUMENT\*\*\*