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SECTION-I

	IMPORTANT FEATURES OF THE TENDER
1	**INSTRUCTIONS TO BIDDERS FOR FILLING TECHNICAL BID**
1.1	Unless otherwise stated, latest alterations/ revisions of specifications/ standards/ drawings shall be applicable. In respect of safety standards and environmental standards relevant to the machine, the machine manufacturers shall ensure compliance with International (CE/ISO/DIN/JIS)/National standards (IS) (wherever applicable).
1.2	Tenderers should offer and quote for all the specified concomitant accessories, as these are considered essential for commissioning and utilization of the machine. Even if bidder does not recommend the purchase of any of these accessories, the price must be quoted for comparison purposes and their recommendation/suggestion to be indicated in the offer. Tenderers should also quote for optional accessories, spares and consumable spares as asked in the specifications.
1.3	In case, any item is required in sets, please specify nos. /pieces per set. This is essential for proper technical evaluation of the offer. Offers received without this may be considered as incomplete and liable to be rejected.
1.4	The bidder should quote only for the specified make of sub-assemblies and equipment wherever specified. In case, some other make is quoted, specific reasons for the same including its features/ advantages over specified makes should be submitted. Past performance of a same/similar machine from two or more end users may be submitted to evaluate performance of other items offered. Details of industries/ entities/ Customers/ products using the offered brand, details of manufacturer, should be submitted to evaluate the market presence of the make quoted; in case details are not submitted alternate brand/ item will not be considered & offer will be evaluated accordingly.
1.5	In case there is a contradiction in any information provided (some parametric values given in the specification and those given in the brochure or some other document enclosed by the tenderer), unless specifically mentioned in the deviation cum confirmation statement under Annexure A of Section-III, the values as given in Bid shall be taken as confirmed by the tenderer and offer evaluated accordingly.
1.6	Bidder or his authorized agent, in their own interest, should visit the consignees listed in clause 3 Section-I with prior appointment with Controlling Officer of the consignee and acquaint themselves with existing process of manufacturing/remanufacturing, site conditions, availability of material handling facilities etc.
1.7	The Purchaser may accept internationally accepted alternative specifications which ensure equal or higher quality than the specifications mentioned in the Technical Specification. However, the decision of the Purchaser in this regard shall be final. A copy of the alternative specifications offered should be sent along with the offer. The Tenderer should also furnish "Statement of Deviations" from tender specifications (as per Annexure A of Section-III) along with the offer.
1.8	In order to assess the manufacturing capability of OEM and to be assured regarding OEM's manufacturing facility/ facilities in India and hence the ability of its Authorized Distributor to supply the said machine, a self certified Capability Assessment report of the OEM as per **Annexure-G** must be submitted by the bidder along with their offer. In addition to above, if felt necessary by the Purchaser, an inspection by actual visit to his works/ office can be carried out by representative of Purchaser/ Third party agency as nominated by the purchaser (TPI cost to be borne by the bidder) to verify the details furnished vide Annexure-G. The bidder is bound to comply with the same, without fail.
1.9	The CAMC (Comprehensive Annual Maintenance Contract) shall be kept for a period of 05 years after the completion of the warranty period, irrespective of the type of machine/equipment. The tendered item shall be treated as **Critical/** ~~Non-Critical~~ from CAMC point of view.
1.10	Bidder shall quote year-wise CAMC cost for a period of 5 years in the following format:

Year	AMC Charges (in Rupees) Without Taxes	Remarks
Ist Year		

	IInd Year	
	IIIrd year	
	IVth year	
	Vth year	
	In case, any bidder has not quoted year-wise cost of CAMC and only single value has been offered for 05 years CAMC, linear cost division method shall be followed for calculating yearly CAMC cost. It will imply that CAMC cost of each of the 05 years will be total quoted CAMC cost divided by tenure in years of CAMC.	
1.11	For CAMC, a Bank Guarantee (BG) equivalent to 10% of the PO value of the machine/ equipment shall be deposited by the contractor to the concerned division/section of Executive department as authorized by PHOD/ CHOD of the department, 90 days before the expiry of warranty. BG shall have validity of 5 years and 6 months. The period of CAMC can also be decided to be less than 5 years, if need be at this stage, with the approval of PHOD/CHOD, in which case the validity of BG will be decided accordingly. In addition to the above, Railway reserves the right to cancel the CAMC at any stage of Contract.	
1.12	The CAMC payment will be made quarterly after certification by the consignee/user regarding satisfactory performance.	
2.	**DESCRIPTION:** The Automated Bogie Load Testing Machine as per specification no. **Mech/M&P/4000/GM/6** is required for static ~~bogie~~ load testing ~~machine for testing~~ of Vande Bharat and FIAT bogies of Indian Railways broad gauge coaching stock with parameters as per the requirement of Schedule-I of Section-I. The machine shall be used for testing axle loads, load on each wheel, height of primary and secondary suspension unit, to check the reduction of a vehicle or locomotive wheels.	
2.1	The machine shall also have pneumatic system with FRL unit on both the columns of the machine for charging of Air Springs. The machine shall be equipped with following major (not limiting to) assemblies/ sub-assemblies:	
2.1.1	Main Frame	
2.1.2	Ram cylinder Assembly	
2.1.3	Hydraulic System	
2.1.4	Measuring System	
2.1.5	Controls	
2.1.6	Machine cycle	
2.1.7	Track-Rails	
2.2	**Leading parameters:** The Automated Bogie Load Testing Machine shall conform to the following major & other parameters.	

SCHEDULE-I

2.2.1	**MAJOR PARAMETERS:**	
2.2.1.1	Capacity	50 Tons (Double Ram) 25 Tons x 02 Nos ~~without~~ with chrome plated Guide Rods.
2.2.1.2	Productivity	~~10 bogies per 8 hrs. shift~~ As per Annexure-E
2.2.1.3	Min. lateral clearance between the bogie frame and the structural columns of the testing machine (To enable manual measurement of bogie dimensions).	505 ± 5MM
2.2.1.4	Motor power	12 HP (Min.)
2.2.2	**OTHER PARAMETERS:**	
2.2.2.1	Height from Rail level to bottom of ram position (in retracted position)	1800 mm
2.2.2.2	Ram Stroke	1100mm
2.2.2.3	Main Cylinder Working pressure (Min.)	180 Kg/cm^2

2.2.2.4	Operation	Vertical
2.2.2.5	Least count of digital Load indication	±50 Kg.
2.2.2.6	Accuracy of Load indication	±0.5%
2.2.2.7	Range of adjustable pressure pads	Both the Cylinders shall have Adjustment provision towards LH & RH for the distance of 400 mm each.
2.2.2.8	Power Supply	415 V+10%, -20, 50Hz±3%
2.2.2.9	Operation	PLC operated, Programmable with SCADA
2.2.2.10	Pneumatic Control Panel pressure	6 bar
2.2.3	**Bogie Parameters**	As per details mentioned below: • 3-Ph MEMU DMC Bogie- ICF/MRVC/M-9-0-006 alt. j • Vande Bharat MC Bogie- Drg No. TS/MC-9-0-005 alt. 'g' • For FIAT Bogies LW90033 alt `c'
2.2.3.1	Length	
2.2.3.2	Width	
2.2.3.3	Uncompressed Height	
2.2.3.4	Height of assembled Bogie	
2.2.3.5	Weight	

2.3	**PERFORMANCE STANDARD**
2.3.1	The machine shall be suitable for **static load testing of Vande Bharat and FIAT type bogies** of Indian Railways as detailed in **Annexure-E of Section-III**, conforming to the leading parameters indicated in **Schedule-I**.
2.3.2	The system shall facilitate checking of **deflection of both Coil Springs and Air Springs** and associated clearances under load. • Air Spring deflection shall be measured using **pressure pads** with an **air filling system**. • The system shall be capable of generating **Load vs. Deflection plots** for coil springs. • The measuring system shall include **digital pneumatic gauges** with **least count 0.01 bar** for checking air leakage in air springs.
2.3.3	The machine shall be capable of performing **load tests on bogies** and shall meet the following functional requirements: i. Application of any specified **constant load up to 50 tonnes**. ii. Generation of **Load vs. Deflection plots** with real-time display and recording.
2.3.4	The machine shall be capable of applying specified loads on **each side bearer of bogies**, as per relevant drawings indicated in **Annexure-E of Section-III**, through a **Double hydraulic ram** using suitable fixtures.
2.3.5	Testing shall be possible for **fully assembled bogies mounted on wheelsets**.
2.3.6	The equipment shall be designed for **regular operation of 8 hours per shift**, suitable for **three-shift working (6 days/week)**, with **minimum machine availability of 95%**.
2.3.7	The system shall measure **actual wheel load** in both **tare and gross load** conditions and display **deviation from average load value**. • Load and ram travel shall be controlled through **hydraulic valves** and **calibrated linear scales**. • Test results shall be editable, printable, and storable in tabular format through the system's PLC-based control panel.
2.3.8	The machine shall measure the **actual wheel base** (distance between axle centers). • If the wheel base difference between left and right sides exceeds **±1 mm**, it shall be automatically highlighted. This parameter has been kept for the capability of the machine and shall not be considered for proving out the machine. • Measurement shall be made through **linear scales** fitted to roller carriages, with data fed to the recording system.

2.3.9	The system shall perform **automatic Bogie Centering** prior to testing. Positioning and centering of bogie in X and Y directions shall be achieved by **hydraulic cylinders** mounted on the carriage assemblies and controlled automatically from the operator panel.
2.3.10	The machine shall measure **wheel back-to-back spacing** using **laser sensors** mounted on the wheel carriages. Measurement data shall be recorded in the control system. The system shall be capable of measuring distances up to **1600 mm**.
2.3.11	The system shall check **axle parallelism**. During load application, the wheel measuring carriages shall move longitudinally with the wheels, and such movement shall be recorded **online** through **integrated linear measuring scales** with accuracy of **±0.1 mm**.
2.3.12	The equipment shall measure **height of air suspension from rail level**, with data acquisition and recording through the control system.
2.3.13	The system shall check **wheel diameter and profile and wheel axial/radial run-out** automatically. Measurement shall be performed through a **motorized drive** on roller carriage and a **hand-held device**, capable of measuring wheel circumference, profile, and displaying diameter on screen. <u>This measurement of wheel should be checked where the wheel and axle are being pressed. This parameter has been kept for the capability of the machine and shall not be considered for proving out the machine.</u>
2.3.14	The machine shall measure **Shim Height at Secondary Suspension**, and based on the results, shall recommend the shim height required at secondary suspension.
2.3.15	The machine shall measure **Primary Suspension Gap** manually at **tare load condition** and record the data in the system.
2.3.16	The system shall measure **Shim Height at bottom of primary spring**, and based on the readings, shall suggest the shim height required at the primary suspension.
2.3.17	The system shall measure **height difference between shaft centers of motor and pinion** manually for motor bogies under tare load condition.
2.3.18	The system shall facilitate **Gear Case Oil Level Check** for motor bogies. Data shall be recorded manually and entered in the PLC system.
2.3.19	The system shall perform **Air Leakage Tests** automatically for each side individually and record data in the PLC.
2.3.20	The machine shall perform **Top of Rail Measurement**, i.e. the distance from the top of rail to top of air suspension. Measurement shall be done using **rope governors** (as required).
2.3.21	The equipment shall have **automatic sliding arrangement** for movement and alignment of carriage assemblies, operated through **hydraulic cylinders** mounted on the machine base.
2.3.22	The **main cylinder sliding mechanism** shall be **servo motor driven**, with positional readout on the screen. All operations shall be controlled from the **operator control panel**.
2.3.23	**Synchronous movement of lifting beams** shall be achieved through a **rack and pinion mechanism** coupled with **hydraulic cylinders** and **linear position scales**, ensuring precise movement and level alignment.
2.3.24	All components, sub-assemblies and systems shall conform to the latest editions of the following standards (or equivalent IEC/ISO standards): • **IS 325** – Three-Phase Induction Motors • **IS 4722** – Rotating Electrical Machines • **IS 2147 / IEC 60529** – Degree of Protection (IP Rating) • **IS 302 (Part 1)** – Safety of Electrical Equipment • **IS 13875** – Hydraulic System Safety Requirements • **IS 9205 / IEC 61557** – Electrical Measurement and Testing • **IS 8132** – Industrial Hydraulic Systems – General Requirements • **IS 9000 (Series)** – Environmental Testing • **IEC 60204-1** – Electrical Equipment of Machines – Safety Requirements • **IS 1239 / IS 3589** – Steel Tubes and Fittings (for hydraulic piping) • **IS 808 / IS 1730** – Rolled Steel Sections
2.3.25	The complete system shall be capable of withstanding **workshop environmental conditions** up to **50°C**

	ambient temperature and **98% relative humidity**, typical of Indian Railway workshop environments (demonstration not necessary).
2.4	**PRODUCTIVITY REQUIREMENT/CYCLE TIME**
2.4.1	The bidder shall furnish (for the purpose of records) the estimated floor to floor time of all operations for the components listed in Annexure-E.
2.4.2	The basis of the timing should be clearly given with break up of all the parameters.
2.4.3	The clause shall be applied for 03 shift working and machine availability of 95%.
2.5	**PROVE OUT AT FIRM'S PREMISES**
2.5.1	The firm is required to demonstrate the machine performance at the time of inspection in addition to the normal checks carried out during assembly / testing as part of quality control measures. The supplier shall submit the test scheme and proposed material requirement for this purpose.
2.6	**PROVE OUT AT CONSIGNEE'S PREMISES**
2.6.1	The consignee shall arrange the bogies for the prove out at their end with in 3 days of the dry run of the machine (Installation, power connection, auxiliary connection like air, water etc).
2.6.2	Productivity/ Performance test shall be performed for two consecutive shifts for a period of 06 days covering the components as per Annexure-E within the time period for installation, commissioning and prove out, stipulated in the Delivery Schedule Chart (clause 7 of section-I). The cycle time/ productivity per item/ component shall be arrived at by calculating the average of the time taken per products of the total numbers produced in a shift or over the time/Quantity specified for the test. If the cycle time/ Productivity is as per clause 2.4, the machine shall be considered as commissioned. Thereafter the performance shall be watched for a period of one month by the consignee before the final PTC is issued.
2.6.3	If the supplier fails to demonstrate during the first Performance/ Productivity Guarantee Test/, the Performance as per Clause 2.4 above, the Railway shall permit the supplier to carryout necessary modifications and repairs to the equipment and to repeat the Performance/ Productivity Guarantee Test. Joint inspection in the presence of Inspecting Agency, consignee and supplier, shall be carried out before permitting supplier for any modification/repair (if any).
2.6.4	Extra cost incurred for retention of specialists and for modifications and repairs to the equipment in connection with the repetition of Performance/ Productivity |Guarantee Test shall be borne by the contractor.
2.6.5	In case the supplier fails to demonstrate the performance Guarantee figures stipulated in clause 2.4 above, even after repeated tests, the Railway reserves the right to reject the machine or accept it with lower performance. Railway shall be entitled to recover from the Contractor as penalty as given below, for accepting the machine with lower performance.

Productivity Drop	**Rate of penalty (% of the contract value) not cumulative**
up to 5%	2%
More than 5 % to 10 %	4%
More than 10% to 15 %	6%
More than 15 %	Rejection and Railways will have option to encash PBG, record poor performance other steps as per tender conditions like recovery etc.

2.6.6	The repetition of performance guarantee/ tests shall be completed within 90 days after the expiry of stipulated time period provided in the contract for Installation, commissioning and proving out of machine.
2.6.7	Offers not meeting the cycle time at bid stage itself i.e. as per clause 2.4 shall not be considered even with loading penalty.
2.6.8	Any break down time caused by reasons beyond the control of contractor during prove out will not be reckoned for the purpose of levying the penalty.

3.0 QUANTITY & CONSIGNEE

S. NO.	CONSIGNEE	QUANTITY REQUIRED
1.	AWM/MTC	01

4.0	**SCOPE OF SUPPLY:**	
4.1.1	The scope of supply shall include design, supply, and installation, testing, commissioning and proving of Machine ON TURNKEY BASIS. It includes all the concomitant accessories/ equipment's as detailed in the specification and other concomitant accessories/ equipment, which the manufacturer considers essential to make the machine operational, when installed and commissioned. It shall also include installation and commissioning of related equipment, training of personnel in operation and maintenance of machine and supply of technical documentation.	
4.2	**CONCOMITANT ACCESSORIES:** The machine should be accompanied with the following concomitant accessories. The cost of the each listed concomitant accessory should be quoted separately. Wherever for any reason the cost of any concomitant accessories is included in the basic price of the machine, the same should be specifically mentioned.	
4.2.1	First fill of hydraulic oil and lubricants Quantity of each item shall be indicated in the bid.	1 Set
4.2.2	Electrical cables to connect machine and control cabinet (Rate per meter beyond this be indicate separately and shall be payable on actual measurement at site)	10 meter
4.2.3	All fasteners required for installation of the machine. List of items to furnished in the bid.	1 Set
4.2.4	A set of maintenance tools. List of tools to be furnished in the bid .	2 Set
4.2.5	Set of Testing pressure pads (each set comprising of a pair of testing pressure pads in accordance with Cl. 2.2.2.7 of schedule –I)	1 Set
4.2.6	A separately designed load **calibration & geometry calibration tool.**	1 no.
4.2.7	Adaptor for spring pressing	2 nos.
4.2.8	Any other accessory/ equipment, which the manufacturer considers essential to make the machine fully operational, when installed and commissioned connected to power source and give the specified output/productivity.	
4.3	**OPTIONAL ACCESSORIES:** Any other accessory, which can improve the productivity, performance, reliability, efficiency, or enhance the capability of the machine as a whole or part thereof, should be quoted as optional accessory. Cost of optional accessories shall be quoted separately, shall not be included in the basic price of the machine, and will not be taken for commercial evaluation of the firms.	
5.	**EVALUATION CRITERIA**	
	Total value of the offer will be calculated based on	
(i)	The cost of the basic machine	
(ii)	Cost of the concomitant accessories according to tender specifications.	
(iii)	Cost of any other accessory which in the opinion of supplier is essentially required for making the machine fully functional.	
(iv)	Cost of Turnkey Charges viz. foundation, installation & commissioning etc.	
(v)	Duties and taxes as quoted by the bidder, insurance and freight.	
(vi)	Cost of comprehensive AMC for five years after the warranty. However, this will not form part of Contract Value.	
(vii)	Cost of Preventive Maintenance during 1st & 2nd year of Warranty Period.	

6.	**OTHER ITEMS TO BE QUOTED:**
	The following items will need to be quoted additionally though will not be part of commercial evaluation:
(i)	Optional Accessories with breakup of individual items as specified in clause 4.3 of section-I.
(ii)	Consumables as per clause 6 of section-II with breakup of individual items as applicable.
(iii)	Spares for two years normal operation and maintenance as per clause 5 of section-II.

7. DELIVERY SCHEDULE CHART:

In the event of acceptance of the offer, the machine(s) shall be supplied as per the following Milestone Chart:

S. No	Activity	Activity Code	Outer Limit of Time Schedule

1.	Issue of LOA	D1	-
2.	Submission of PBG by Successful Bidder	D2	D1+21 days
3.	Issue of PO	D3	D2+15 days
4	Submission of GA drawings to consignee by Successful Bidder/Supplier along with information on power and other utilities required for machine.	D4	D3 + 30 days
5.	Approval of GA drawings by consignee (to be governed by clause 11.2 of Section-II)	D5	D4+ 30 days
6.	Confirmation of availability of clear site by consignee	D6	By D5 (i.e. at the time of approval of GA drg.)
7	Completion of foundation	D7	D6+ 90 days or latest by D8
8	Supply/ Delivery of machine	D8	D5+120 days
9	Power connection for the machine and other on-site requirement to be provided by railways and Railway to give call to supplier for the commissioning of machine	D9	D8 + 7 days
10	Installation, commissioning and proving out of machine by supplier	D10	D9 + 90 days or
11	Issue of PTC by consignee	D11	D10 + 30 days
12	Warranty by supplier	D12	D11 + 2 years
13	CAMC	D13	D12 + 5 years

Notwithstanding the delivery period indicated elsewhere in the tender document, the delivery indicated in this schedule shall be taken as overriding and final.

Section-II

1.	**BASIC DESIGN FEATURES:**
1.1	**SAFETY FEATURE**
1.1.1	The machine design shall ensure safety of the operator and the machine at all times including accidental slipping of the sample under test. Details of safety features provided in the machine shall be furnished in the bid.
1.1.2	Suitable Interlocks with the ram movement to eliminate the possibility of injury to operator due to breaking of test sample while testing.
1.1.3	Load meter should be provided to indicate the load on Machine, so that the load on the Machine can be maintained within the safe limits. Pressure Gauge with marking of safe load limit indication shall be provided on power pack.
1.1.4	The machine shall be provided with fluorescent splash proof light to illuminate work area. The illumination level at work piece shall be 300 lux. The no. of lamps provided their Wattage and operating voltage maybe specified in the offer.
1.1.5	When any of the machine functions come to a stop without being programmed to stop, the machine should come to a stop and should be operative only in the manual mode till the fault is rectified.
1.1.6	Suitable interlocks should be provided to protect the machine in the event of hydraulic oil failure, lubrication failure, pneumatic system failure, fluctuation in voltage and frequency.
1.1.7	Mushroom type emergency stop shall be provided on the machine, which shall be easily accessible and capable of disabling the machine, drives in case of any emergency.
1.1.8	The noise level should not exceed 85 dB at full load when measured at distance of 1 meter away from the periphery of the machine. Noise measurement should be carried out as per NMTBA noise measurement Technique/ ISO-3746.
1.1.9	Operator/Electronic/electrical Panel shall be mounted separate from the machine base.
1.1.10	All the pipes, cables etc. on the machine should be well supported and protected. These should not create any hindrance to machine operator's movement for effective use of machine.
1.2	**SPECIFIC CHARACTERISTICS**
1.2.1	**GENERAL CHARACTERISTICS**
	The general characteristics of equipment shall be as per clause 3 of Section-II.
1.2.2	**MAIN FRAME :**
1.2.2.1	The main frame shall be a rigid and sturdy fabricated structure of steel conforming to IS-2062, duly stress relieved. All welds shall be tested for defects. The method of checking weld defects and method of stress relieving shall be explained in the bid.
1.2.2.2	The main frame shall comprise of two main columns connected by a cross beam duly stress relieved. The hydraulic cylinder-ram assembly shall be fitted on the cross beam, with the moving beam, with the provision of mounting fixture for applying the test pressure on the bogie through suitable pressure pads. Details of the main frame shall be furnished in the bid.
1.2.2.3	The resilient pressure pads for load transmission shall be wear resistant and designed for applying load on the side bearers in ICF bogies and on the transverse beam hoods in IR-20 bogies, FIAT bogies and Vande Bharat Bogies through appropriate fixtures.
1.2.2.4	Test loads shall be equally distributed between the pressure pads over the complete range of load application. To ensure this, the cross beam must be guided throughout its movement.
1.2.3	**CYLINDER-RAM ASSEMBLY :**
1.2.3.1	The machine shall have two hydraulic cylinders 50 tonnes capacity (total) made of seamless steel pipes. The type of seamless pipes shall be indicated in the bid. It should be possible to generate requisite pressure/load in cylinder for applying load (through suitable fixtures) for application on two side bearers of the bogies. Provision of mounting fixture on machine ram shall be explained in the offer. The cylinders shall be honed to a surface finish of 0.25 microns or better. The maximum pressure generated in the cylinder shall be indicated in the bid.
1.2.3.2	The cylinder should be double acting, machined out of a steel forging, hard chrome plated and

	ground to a surface finish of 0.25 microns or better. Surface hardness of the chrome plated ram shall not be less than HRC 65. The cylinder-ram assembly should be effectively sealed to prevent leakage of oil. Details of the sealing arrangement shall be explained in the bid with a sketch. Material, make, source and sizes of seals should be indicated in the bid.
1.2.4	**MEASURING SYSTEM :**
1.2.4.1	Electronic load cells shall be connected with the main cylinder-ram assembly to read the generated test loads directly & the same shall be displayed on provided PC Screen. It shall be possible to read the load on each side bearer on PC Screen & Computer printout of the load along with date, time, bogie no. and operator name shall be made available.
1.2.4.2	A provision shall be made for error compensation in the readings of the load cells in case standard values of actual readings. A separately designed load **calibration & geometry calibration tool** shall be provided for periodic calibration of load cells and geometric errors.
1.2.4.3	An electronic linear scale must be provided for measuring the displacement of the bogie during testing. The least count of the scale shall be 0.1mm. Computer printout of the displacement along with date, time, bogie no. and operator name should be made available.
1.2.5	**CONTROLS :**
1.2.5.1	All functions of the machine shall be controlled from an ergonomically designed centralized control desk within easy reach of the operator with unobstructed view of the PC screen and other gauges and indicators. The controls shall necessarily include the following:
(i)	A three position manual control valve for:
a.	Downward movement (load application)
b.	Holding the ram in any intermediate position during load application for at least 45 minutes & variation in the applied load should not exceed $\pm$ 50 Kg.
c.	Upward movement
(ii)	A hand operated flow control valve for increasing/decreasing the speed of operation.
(iii)	The electronic control and hydraulic system shall automatically maintain the constant load (max. variation $\pm$ 50 Kg) during testing of bogie irrespective of varied air pressure in the air springs.
1.2.6	**HYDRAULIC SYSTEM:**
1.2.6.1	A gear or vane pump shall be provided for the high-pressure oil circuit. Type and model number of pump shall be indicated in the bid. Model number of each hydraulic element shall be indicated in the bid only. The maximum working pressure shall be 180 Kg/cm^2 (min.).
1.2.6.2	The hydraulic system shall be provided with suitable air breather, oil gauges, over flow and drainage connections.
1.2.6.3	Filters of 10 µ shall be provided in the pressure line and 25 µ return line. Type, make and model number of each filter element shall be indicated in the bid. If reusable filters are provided, the procedure and periodicity of cleaning shall be indicated in the bid.
1.2.6.4	Bye-pass valves shall be provided to operate in case of clogged filters. The bidder shall clearly mention the percentage of clogging after which the bye pass valve shall operate. A clogging indicator shall be provided to indicate clogged filters. Details of the clogging filters shall be furnished in the bid.
1.2.6.5	Hydraulic pipes shall be corrosion resistant and made out of cold drawn/ seamless tubes capable of withstanding high working pressure. The type and make of hydraulic pipes shall be furnished in the bid.
1.2.6.6	The hydraulic system shall be capable of performing efficiently in the ambient temperature range which may vary from 0^0 C to 50^0 C. A refrigerant type Chiller shall be provided for cooling of hydraulic oil. Temperature controller should be provided to prevent heating of hydraulic oil beyond 60^0 C, with an arrangement to cool the oil if oil temperature exceeds 60^0 C. Hydraulic pipes/ hose pipes shall not have sharp bend. The manufacturer should guarantee satisfactory performance of the hydraulic system. The bidder should explain in detail the hydraulic system and its cooling system, giving supporting literature and drawing/diagrams.
1.2.6.7	The hydraulic fluid used in the hydraulic system should be non-corrosive, stable and safe for the

	operator. Technical details of the hydraulic fluid should be furnished in the bid along with equivalent brands of the same available in India.
1.2.6.8	A hydraulic circuit diagram giving full details about pipe sizes, working pressure, peak pressure, type, makes and model number of the pumps and hydraulic elements should also be furnished in the bid. The hydraulic circuit diagram should be properly labeled clearly bringing out the various elements used. Complete Pipe size including pipe length, diameter, pressure rating and end connection type must be clearly mentioned.
1.2.6.9	Glycerin filled calibrated pressure gauges should be provided at all places where pressure is to be set or indicated. The bidder shall provide the make, capacity and the least count of the gauges being provided for the same.
1.2.6.10	Safety valve for every hydraulic circuit shall be provided to cater to the need of pressure relief valve failures during service.
1.2.7	**Track-Rails :**
1.2.7.1	The bidder shall be laying BG 52 Kg/ 60 Kg embedded track with rails on the rigid machine bed for positioning of the bogies for static load test below the load-applying crossbeam. The track with rails should be positioned accurately for measurement of deflection under load and further Track with PIT arrangement will also be required similar to existing track arrgt of static load testing machines. The rail shall be provided as free supply item by the consignee as per railway standards.
1.2.8	**Machine cycle :**
1.2.8.1	The machine cycle should be explained with an elemental break-up of all operations required for testing of bogies. The total cycle time including set up time ~~type~~ shall be indicated in the bid.
1.2.8.2	The logic diagram for sequence of operation must be submitted.
1.2.9	The firm should give a clear commitment in the offer that if after some years of service of the machine when the purchaser approaches the firm for complete overhauling and fine tuning of the machine so as to achieve the original accuracy and capability of the machine, the firm would be prepared to take up this job at a reasonable price within a reasonable time frame. The approximate time frame for reconditioning and re-calibration/fine tuning should be clearly indicated in the bid.

2.	**GENERAL ELECTRIC SPECIFICATION**		
2.1	The provision of this General Specification shall apply, where ever relevant.		
2.2	All equipments and material shall comply with appropriate Indian Standards (latest), International Standards or National Standards of the country of origin provided the latter are equivalent to or better than the former. The tenderer shall indicate the Standards applicable. The following standards are applicable in particular. (Corresponding International Standards like ASA, NEMA, BSS, DIN etc. may also be quoted).		
IS :	325-1979 (latest)	-	Three phase induction motors (corresponding to IEC pub-341) (Latest).
IS :	1248 (Latest)	-	Direct acting indicating analogue electrical measuring instruments and their accessories (corresponding to IEC Pub-51) (Latest).
IS :	1231-1974 (Latest)	-	Dimensions of three phase induction motors (corresponding to IEC Pub-72-1) (Latest).
IS :	1271-1985 (Latest)	-	Classification of insulation material for electrical machinery & apparatus in relation to their thermal stability in service (corresponding to IEC-Pub-85) (Latest).
IS :	6875 (Latest)	-	Push Buttons and related control switches corresponding to IEC Pub/73) (Latest).
IS :	375-1963 (Latest)	-	Marking and arrangement of switch gear, bus bars, main connection & auxiliary wiring.
IS :	996-1979 (Latest)	-	Single phase small AC and universal electrical motors.
IS :	1356 (Latest)	-	Electrical equipment of machine tools.
IS :	2516 (Latest)	-	Circuit breakers (corresponding to IEC Pub-56) (Latest)

2.3	Unless specified in the main specification, the AC motors and starters shall be of the following type. Tenderer is, however, free to give alternative proposal along with justification, if in his view alternative proposal in warranted by site conditions. Type of motor type of starter.	
	TYPE OF MOTOR	**TYPE OF STARTER**
2.3.1	Any type of AC motor starting current of which does not exceed 75 amps.	Direct on line.
2.3.2	AC squirrel cage, introduction motors, starting current of which is above 75 amps. if started direct on line	Star delta or Auto transformer type.
2.3.3	AC slip ring type motor	Resistance type air/fan Cooled
2.3.4	AC synchronous or synchronous induction motor.	Suitable makers standard.
2.3.5	DC motor	Resistance type/ Thyristor type.
2.4	The control gear for AC/DC motors shall incorporate the following protection devices as concomitant accessories.	
2.4.1	**No Voltage Protection** - No voltage protection shall be provided so that machine will not start up again by itself when, following an interruption the supply is restored.	
2.4.2	**Short Circuit Protection -** To protect against short circuits due to insulation failure of faulty connections ~~HRC fuses~~ MCB shall be provided for each motor. The rating of the ~~fuse~~ same shall be such as to take care of the over current due to motor starting.	
2.4.3	**Over Load Protection -** To prevent motors from overloading, overload protection shall be provided separately for each motor. Three phase motors shall be protected by overload tripping devices on each phase.	
2.4.4	**Single Phasing Protection -** A separate current sensitive delayed action single phasing prevent or shall be provided for each motor separately. Overload protection shall not be treated as single phasing prevent or.	
2.5	Control equipment shall be mounted in separate drip proof enclosures. Control enclosures and compartments are to be so designed as to give adequate protection against ingress of dust, oil, coolant or chips. All control devices like contractors etc. shall be front mounted on a rigidly fabricated metal panel for ease of operation. All other electrics shall be installed that they are readily accessible when the doors and covers are opened. Hinged covers shall be interlocked with the machine tool control to prevent operation of the machine when cover is open.	
2.6	The motor shall be totally enclosed with or without fan cooled frame. Screen protected drip proof type motor may be provided if it is mounted inside protective enclosures.	
2.7	The electrical equipments shall comply with the requirement of Indian Electricity Act and Rules (latest).	
2.8	All instruments shall be of the Industrial Grade "A" (IS-1248) switch board type the range of the instrument shall be such that the maximum load expected in the circuit shall produce a deflection of 60% to 80% of the full scale.	
2.9	The supplier shall furnish 3 sets of complete electrical and electronic wiring diagrams in full details to enable the maintenance staff to locate faults in the circuits, 3 sets of part catalogues, maintenance manuals operating instructions with details of coils and windings, used in the equipment to facilitate repairs and maintenance should also be supplied.	
2.10	For main motor class minimum "B" Class insulation shall be provided. If any other class of insulation is proposed, detailed justification for providing different class of insulation shall be given.	
2.11	Motors shall be designed to withstand frequent starts, stops and reversals as demanded in the operation of the machine.	
2.12	Two earthing terminals shall be provided on all electric motors including the control gear.	
2.13	**POWER SUPPLY**	
2.13.1	The machine shall be suitable for operation on 415 volts 3 phase 50 cycles AC 3 wire or 4 wire system with neutral solidity earthed. The supply voltage may very up to +10% -20%. The	

	frequency may vary up to ± 3%. However, full rated power of the motor shall be available at the lower voltage. Firm should confirm satisfactory performance of the machine at incoming power supply in the range 415V+10%-20% and 50HZ±3% frequency or should provide voltage stabilizer as specified against clause 2.13.2 below of required capacity.		
2.13.2	The voltage stabilizer, if required, shall conform to :		
i)	Input Voltage	-	320 to 460 volts 3 phase 4 wire supply.
ii)	Out put Voltage	-	415 volts
iii)	Regulation	-	± 1% from No load to Full load.
iv)	Rate of correction	-	20 volts per second per phase.
v)	Wave from distortion	-	NIL
vi)	Efficiency	-	Not less than 97%.
vii)	Winding and class of insulation	-	Copper wire wound with "B" class of insulation or better.
2.13.3	In case of machines equipped with NC, SS, CNC, Thyristor controlled devices and other sophisticated electronic gadgets including microprocessors etc. which are susceptible to power line spikes and surges, a suitable voltage stabilizer and ultra isolation transformer of adequate capacity to cover for the entire electrical load of the machine shall be offered as a concomitant accessory conforming to Specification for voltage stabilizer as mentioned in clause 2.13.2 above and isolation transformer to the parameters mentioned below.		
i)	Transformer ratio	-	1:1
ii)	Winding	-	Copper wire wound with "F" class insulation or better.
iii)	Protection	-	To arrest spikes and surges to the order of 3 KV for 200-400 micro seconds duration.
iv)	Common mode rejection ratio	-	120 dB
v)	Isolation	-	Capacitance 005 Pf: resistance greater than 1000 Mega Ohms.
2.13.4	Voltage stabilizer shall be equipped with a protective relay to trip the AC power supply to the machine instantaneously with audio and visual indication to the operator. Settings of the protective relay for low and high voltage shall be 320 volts and 460 volts respectively.		
2.14	**ATMOSPHERIC CONDITIONS**		
2.14.1	The ambient temperature at the site at which the machine will be installed may vary from -4ºC to +50ºC over the year. The relative humidity may be as high as 98%. The atmosphere is expected to be dusty. The machines offered shall be suitably tropicalised to work under these atmospheric conditions without any adverse effect on their performance.		
2.15	The temperature rise shall not reach such a value that there is a risk of injury to any insulating material or adjacent parts.		
2.16	The drive shall be capable of operating at any one of the speed required independent of the load in accordance with the requirements of the machine.		
2.17	Information/data shall be furnished as per the format of submission of technical bid Annexure–A of Section-III.		
3.	**GENERAL MECHANICAL CHARACTERISTIC**		
3.1	**RIGIDITY AND STABILITY**		
3.1.1	The machine shall be robust, rigid and of sturdy construction. It shall be designed to meet heavy duty demands of various operations on the machine under normal Workshop environment for such machines. It shall be free for vibrations even when working at full capacity.		
3.1.2	All machine castings shall be made of close grained high grade cast iron like Meehanite or equivalent materials meeting IS-210 Standards to ensure durability and rigidity. The casting shall be thermal stress relieved to ensure stability and continued accuracy.		

3.1.3	All machine fabrications of critical load bearing assemblies like beds, columns etc. shall be adequately strengthened and stress relieved.
3.1.4	Change in ambient temperature shall not affect the performance of the machine.
3.1.5	There shall be no change in the performance of the machine either on switching on the machine or after continuous running.
3.1.6	There shall be no resonant vibrations throughout the working range of the machine at all load levels.
3.2	**SAFETY CONTROLS**
3.2.1	The machine shall incorporate safety devices to provide protection to the operator and machine against all possible operational and machinery failures.
3.2.2	Suitable interlock shall be provided to prevent machine operations in the event of:
3.2.2.1	Faulty sequence of operation.
3.2.2.2	Fluctuation in supply voltage.
3.2.2.3	Resumption of power supply after power failure.
3.2.2.4	Non-positioning of safety guards.
3.2.2.5	Failure of hydraulic system (where applicable)
3.2.2.6	Failure of lubricating system (In case of automatic including drop in pressure lubrication)
3.2.3	A fault or damage in the control circuit or interruption re-establishment after an interruption of fluctuation in whatever manner in the power supply to the machinery must not lead to dangerous situations in particular.
3.2.3.1	The machinery must not start unexpectedly.
3.2.3.2	The machinery must not be prevented from stopping if command has already been given.
3.2.3.3	No moving part of the machinery or piece held by the machinery shall fall or be ejected.
3.2.3.4	The protection devices must remain effective.
3.2.4	The machine shall be fitted with an emergency stop device to enable actual or impending danger to be averted. This device must be:-
3.2.4.1	Conveniently located.
3.2.4.2	Clearly identifiable.
3.2.4.3	Stop the machine as quickly as possible without causing additional hazards.
3.2.4.4	The emergency stop must remain engaged. It should be possible to disengage it only by appropriate operation. Disengaging the control must not restart the machinery but only permit restarting.
3.2.5	Safety features shall also include.
3.2.5.1	Safety device against overload for all mechanical and electric items to the extent possible.
3.2.5.2	Safety stops against over-running of slides.
3.2.6	Guard and protection devices shall protect exposed persons against risks related to moving transmission parts (such as pulleys, belts, gears, rack and pinion, shafts etc.) and moving parts directly involved in the process to the extent possible. This shall meet the following requirements:-
3.2.6.1	Be of robust construction
3.2.6.2	Not give rise to any additional risk
3.2.6.3	Not be easy to by pass or render non-operational
3.2.6.4	Be located at an adequate distance from danger zone
3.2.6.5	Cause minimum obstruction to the view of the production process.
3.2.6.6	Rigidly connected and not prone to rattling
3.2.6.7	Enable essential work to be carried out without the guard or protection device having to be dismantled
3.2.7	A load meter (pressure gauge) shall be provided to indicate the load on the machine. The meter shall have a suitable mark to indicate the maximum load the machine can take. Fixed pressure relief valve shall be provided for safety of the machine. Full details of the above and other safety features indicating how each one functions must be explained in the offer.

3.3	**OPERATIONAL CONTROLS**
3.3.1	The operation of the machine shall be by push buttons or levers. The basic rules for the direction of operation of controls and the corresponding direction of movements of the machine tools shall be as per IS:2987-1985.
3.3.2	The control devices shall be
3.3.2.1	Clearly visible and identifiable.
3.3.2.2	Ergonomically positioned for safe operation without hesitating or loss of time, and without ambiguity.
3.3.3	Digital Load Indicator must be password protected and output to be displayed on PC screen.
3.3.4	Programming or parameter setting shall be through soft keys.
3.3.5	Display should be high resolution and preferably in RED colour so that can be seen from approx. 3 mtrs distance in day light.
3.4	**LIGHTING**
3.4.1	Integral lighting suitable for the operations concerned where its lack is likely to cause a risk despite ambient lighting of normal intensity shall be provided.
3.4.2	The manufacturer must ensure that there is no area of shadow likely to cause nuisance, that there is no irritating dazzle and that there are no dangerous stroboscopic effects due to lighting provided by the manufacturer.
3.4.3	Integral parts requiring frequent inspection and adjustment and maintenance areas must be provided with appropriate lighting.
3.4.4	The machine lighting should be of low voltage so as to prevent any hazard to the operator.
3.5	**MACHINE MAINTAINABILITY**
3.5.1	The machine shall be so designed as to require minimum possible maintenance and to give trouble free service.
3.5.2	All assemblies/parts of the machine shall be easily accessible for maintenance.
3.5.3	The machine shall not require major dis-assembly for checking and replacement of a particular part, especially for parts requiring periodical check up and replacement.
3.5.4	The manufacturer must provide means of access e.g. stairs, ladders, cat walks etc. to allow access safety to all areas used for production, adjustments and maintenance operations.
3.6	**WEAR COMPENSATION ADJUSTMENT**
3.6.1	The original built in accuracy of the machine shall be capable of being maintained conveniently and economically by suitable adjustments for taking up wear on slides, bearings and load screws. The system of adjustments incorporated shall be explained in the offer.
3.7	**COOLANT SYSTEM (WHERE APPLICABLE)**
3.7.1	Suitable coolant system with pump, motor, tank, filter etc. shall be provided. The coolant pump shall be as per IS:2161-1962. The filter shall be of reusable type and indigenously available. If reusable filter cannot be offered the filter cartridge shall be readily available in India. Source of supply shall be indicated. Adequate no. of filters for 2 years working on double shift basis shall be offered as spare. Details of the coolant system shall be indicated in the offer.
3.7.2	The supply of coolant shall be in ample volume. Provision to re-circulate the coolant shall be available. A chip and coolant tray shall be provided. The volume of coolant flow shall be indicated. It shall be adjustable.
3.7.3	An enclosure shall be provided to prevent the coolant from splashing outside the machining zone. Details of enclosure shall be provided. Specific requirements of coolant system for grinding machines etc. shall be clearly indicated.
3.8	**LUBRICATION SYSTEM (WHERE APPLICABLE)**
3.8.1	The machine shall be provided with an automatic lubricating system for ensuring delivery of adequate quantity of lubricant to areas requiring continuous lubrication. Suitable arrangements must be provided for indication of failure of the lubricating system.
3.8.2	The system shall be provided with interlock to prevent machine operating/starting in the event of the failure lubrication system.

3.8.3	Reusable filters capable of filtering chips, dust particles etc. shall be provided. Indicators for showing clogged condition of filters shall be available. The filters shall be indigenously available. If reusable filter cannot be offered the filter cartridge shall be readily available in India. Source of supply shall be indicated. Adequate no. of filters for 2 years working on double shift basis shall be offered as spare.
3.8.4	Lubrication and filter cleaning chart shall be displayed on a metal plate at a conspicuous location on the machine indicating :-
(a)	Specific location of points on the machine to be oiled lubricated/greased.
(b)	Periodicity of lubrication of these points.
(c)	Filter to be cleaned.
(d)	Periodicity of cleaning filters.
(e)	Periodicity of replenishing lubricating oil for the centralized system.
(f)	Any other similar relevant information.
3.8.5	Points where manual lubrication is needed shall be separately indicated. Frequency of lubrication shall be also clearly mentioned.
3.8.6	Lubricating oils used in the machine shall be available in India. Successful tenderer will be required to indicate brand names of approved oils manufactured by various Indian Oil Companies.
3.8.7	First fill of lubricating oils used in the machine shall be provided with the machine. Details of lubricating system provided shall be indicated.
3.9	**PNEUMATIC SYSTEM (WHERE APPLICABLE)**
3.9.1	The compressed air supply will be provided by the customer at the machine within pressure range of 4.5-7.5 kg/cm^2 and a moisture content or 1000 ppm. The pneumatic system of the machine should be designed accordingly. An alarm shall be provided for low air pressure.
3.9.2	Suitable filter/moisture trap shall be provided by the contractor in the system of pneumatic air intake. The filter shall be reusable type and indigenously available. If reusable filter cannot be offered, the filter cartridge shall be easily available in India. Source of supply shall be indicated. Adequate no. of filters for 2 years working on double shift basis shall be offered as spare.
3.9.3	Air pressure regulator, if necessary, shall be provided by the tenderer.
3.9.4	The make of pneumatic control equipment shall be of reputed make. The makes shall be indicated.
3.10.	**HYDRAULIC SYSTEM (WHERE APPLICABLE)**
3.10.1	Hydraulic circuit must be equipped with the following safety and inspection equipments:
(a)	Pressure gauges at all places, where pressure has to be set up or inspected.
(b)	Safety valves for hydraulic circuit if relief valve does not fulfill this function.
(c)	Equipment for checking of temperature in the circuit or in the pump wherever necessary.
(d)	Arrangement to show if the filters (including those in the pump set) are choked and need cleaning. The filters shall be of reusable type and indigenously available. If reusable filter cannot be offered, the filter cartridge shall be readily available in India. Source of supply shall be indicated. Adequate no. of filters for 2 years working on three shift basis shall be offered as spare.
(e)	Alarm for low oil level.
3.10.2	The sump aggregate shall have the following:
(a)	Oil level sight gauges or any other equipment showing the minimum and maximum oil levels in sump.
(b)	A drain plug at the lowest portion of the tank.
(c)	It shall be possible to drain the oil from the tank without disconnecting any pipes or other fittings.
3.10.3	The temperature of oil in hydraulic circuits shall not exceed 60 degrees C in any case. Suitable arrangement shall be incorporated to ensure that the oil is not overheated under local weather conditions at continuous normal working of the machine.
3.10.4	Facilities for bleeding of air in case of air lock shall be provided.
3.10.5	The hydraulic reservoir, pump and allied equipment shall be suitably segregated from the machine

	in order to remove major source of heat.
3.10.6	Hydraulic oils used on the machine shall be available in India. Successful tenderer will be required to indicate brand names of approved oils supplied by various Indian Oil Companies.
3.10.7	First fill of hydraulic oils used on the machine shall be provided with the machine.
3.10.8	All solenoid valves in Hydraulic system should be provided with LEDs to give an indication whenever the valve is energized.
4.0	**TECHNICAL LITERATURE:**
4.1	One copy of the printed illustrative catalogue showing features of the machine and its elements must be enclosed with each copy of the bid.
4.2	The technical literature shall be provided for the complete machine, including imported and indigenously purchased components / sub- assemblies. The successful tenderer will have to furnish 4 (four) copies each of the following manuals directly to the consignee along with the machine. Out of these 04 sets, the bidder shall be required to submit one set of all documents in best available condition one month prior to the training for the machine. The said documents shall also be submitted in PDF also. One set of technical literature should cover the following details (whichever applicable):
i.	Operational & Maintenance manual of the machine.
ii.	Operational & Maintenance manual of the servo controlled voltage stabilizer.
iii.	Operational & Maintenance manual of the ultra isolation transformer.
iv.	Instruction & Maintenance manual for Hydraulic Oil Cooling Unit.
v.	User manual for Tool changer system (if provided).
vi.	Technical & Maintenance manual including circuits for Hydraulic System.
vii.	Technical & Maintenance manual for Lubrication System.
viii.	Operator Guide for CNC Control System (if provided).
ix.	Programming Guide for CNC Control System (if provided).
x.	Diagnostic & Trouble shooting Guide for CNC Control System (if provided).A trouble shooting manual should be provided which contains fault codes and remedial action.
xi.	Start-up Guide for CNC Control System (if provided).
xii.	Machine Software Listing (if provided).
xiii.	Soft and hard copies of HMI machine & PLC Program in ladder form with cross reference listing and PLC Project file.
xiv.	Drawings of tooling & fixtures, hard copies in A-2 size as well as soft copy in PDF format.
xv.	Complete Electrical/Electronic Wiring diagram with the details of PLC/PLB, in which length of wires must be mentioned, hard copies in A-3 size as well as soft copy in PDF format.
xvi.	Mechanical drawings (spindle assembly, table assembly, column assembly), hard copies in A-1 size as well as soft copy in PDF format. <u>All assembly parts in detail along with the part number and size of each component to be included in Bill of material.</u>
xvii.	Spare part manual including part lists no., hard copies in A-4 size as well as in PDF Format.
xviii.	Lay out drawings in A-1 size, which clearly shows the position of all type of electrical Components in machine.
xix.	All type of software and program of the machine and its downloading/ uploading procedure for the complete machine included imported and indigenously purchased components/ sub assemblies shall be provided in portable SSD of atleast 1TB size (Make- Seagate, WD Elements, Sandisk)

Note: All manual and literature should be in English/Hindi.

5.0	**SPARES**

5.1	Two lists of recommended perishable and non-perishable spares required for normal maintenance to cover complete range of mechanical, hydraulic and electrical equipments including controls on double shift working basis for two years should be furnished and quoted separately. The quantities should relate to, in case of nonperishable spares, to two years' normal maintenance. And in case of perishable spares to the duration of its shelf life or two years whichever is less. Shelf life, make and supplier with address should be indicated with the quotation for spares.
5.2	Spares shall be supplied along with the machine, if ordered.
6.0	**CONSUMABLES (If applicable)**
6.1	Since the machine will be under PMC during warranty period of two (02) years, the purchaser reserves the right to order only urgent essential items. The tenderer should quote and give detailed list of such consumables like hydraulic oil, lubricant oil & grease etc. in the format given in Para 7 of Annexure –A of Section-III for smoother execution of PMC during warranty in order to achieve response time in compliance to machine availability as per stipulated requirements.
6.2	These consumables shall be supplied along with the machine or as per agreed time table, if ordered.
7.0	**SPECIAL FEATURES:**
7.1	Special features incorporated in the machine, if any, shall be indicated separately in the bid clearly indicating the advantages.
8.0	**DEVIATIONS:**
8.1	The tenderer shall certify that the offered machine fully meets the specification. Various design features incorporated in the machine to fulfill different technical performance requirements shall be fully explained in the offer. However, minor deviations from these specifications which do not affect or in any way interfere with the stipulated performance standards or would result in improved safety/ reliability or would reduce recurring maintenance/operating cost of the machine, can be considered for acceptance. The tenderer in such eventuality shall clearly indicate the details of these deviations and their implications.
8.2	All Deviations shall be clearly indicated in the deviation statement as per the format of submission of technical bid Annexure–A of Section-III.

9.0	**INSPECTION AND TESTING AT MANUFACTURER'S WORKS:**
9.1	The machine shall be inspected and tested as per QAP, by the purchaser or his authorized representative at the supplier's or his sub-supplier's works. The Quality Assurance Programmed as per Annexure-F shall be submitted along with the bid. The bidder must submit the exhaustive QAP incorporating the tests as given in Annexure-F along with other tests /stage inspection as followed by them.
9.2	A load and functional test like no load test and maximum Horse Power test must be carried out at the manufacturer's works. Rigidity of the machine shall be demonstrated to the satisfaction of appointed inspector or inspecting agency.
9.3	Manufacturers must have suitable facilities at their works for carrying out various performance tests on the sub-assembly/assembly/machine. The tenderer shall clearly confirm that all facilities exist and shall be made available to the inspecting authority.
9.4	A Sample Inspection Chart for inspecting the equipment shall be supplied along with the bid. The inspection chart should indicate all the tests that are carried out during the machine manufacture and also the tests to be offered to inspecting agency. The standard to which this inspection chart conforms should be clearly indicated. Against each test, acceptable limit/ range of values shall be indicated.
9.5	The complete machine shall be inspected at manufacturer's premises as per approved GA drawing. Inspecting authority shall not carry out the final inspection in case GA Drawing is not approved by the consignee.
9.6	The Manufacturer shall produce invoices of bought out items/sub-assemblies to ensure genuineness of such products / verification by the Inspecting agency.

10.0	**TRAINING**
10.1	Free training by the firm shall be imparted in operation and maintenance of the machine. The training to be imparted shall cover operation, troubleshooting and repair of all mechanical, hydraulic, electrical & electronics equipment's (CNC Control & AC Drives) and CNC/PLC part programming. This training shall be provided to 04 per consignee as nominated by the consignee (including Operations and maintenance personnel), for a period of one week free of cost at the manufacturer's premises. One-week training will also be provided to one person free of cost from M&P in design and construction of the machine. All charges pertaining to travel, boarding and lodging shall be borne by Indian Railways.
10.2	Subsequently, technical experts from the manufacturer will fully and adequately provide training to operators and maintenance staff nominated by the consignee at the time of commissioning of the machine.
10.3	The supplier will be responsible for co coordinating with the consignee the travel plans of trainees to ensure that the training is imparted on the machine at its assembly and testing stage. The bidder shall also submit training schedule along with the offer.
	Note: all training should be Imparted in English/Hindi Only.
11.	**FOUNDATION & RELATED DRAWINGS**
11.1	**SUBMISSION OF GA, FOUNDATION & RELATED DRAWINGS FOR APPROVAL:**
11.1.1	The supplier shall first submit 01 copy of foundation drawings with details of construction of foundations, complete layout of machine elements like bed, hydraulic tank, coolant tank, electrical panel, Servo Controlled Voltage Stabilizer etc. and other related diagrams (Mechanical, Hydraulic, Electrical & Electronics) along with machine weight, overall dimensions, electrical load with length of 3 phase, 415 V AC electric power cable for approval as per time schedule specified in Section-I to each consignee for approval and to enable the consignee for making necessary arrangements for Installation & Commissioning of Machine on receipt. After getting approval from consignee, the supplier shall supply directly to each consignee 6 copies of approved GA foundation drawings and related diagrams for each machine as per time schedule specified in Section-I from the date of approval of GA drawing for information only. This information should be furnished on the pattern indicated in detail in the following IS Specifications (Latest) or relevant international standards i) IS: 2974 (Pt.I Para 4.1) for reciprocating type machine. ii) IS: 2974 (Pt.III Para 3.1) for rotary type machine (medium & high frequency. iii) IS: 2974 (Pt.IV para 4.1) for rotary type machines of low frequency. iv) IS: 2974 (Pt.V para 3.1) for impact type machines other than hammers
11.2	**APPROVAL OF GA DRAWING** To be governed by Time Schedule in clause 7 of Section-I and following stipulations
11.2.1	General Arrangement Drawings will be sent by the Supplier to the Consignee as per Time Schedule annexed in Specification.. The supplier should ensure that drawings sent to consignee are complete in all respects as specified in technical specification. The GA drawings shall be approved by the consignee and given back to the contractor, as per the Time Schedule in the Specification.
11.2.2	**Delays in submission of drawings by Contractor would be added to the delay in supply of machine** in case submission of GA drawing is delayed beyond stipulated time as per time schedule and LD would be levied. Thus, the number of days delay in submission of GA drawing plus the number of days delay in supply of machine together will be taken as the delay in supply of machine, for the purpose of calculations of LD. However, if the contractor supplies the machine before original delivery period as per delivery schedule, the number of days by which machine has been supplied earlier than original delivery period that many days will be subtracted from the delay in submission of GA drawings and LD will be levied accordingly**.** Delays in approval of the drawings by consignee will not be on account of Contractor, except as detailed below.
11.2.3	In case, Consignee finds some deficiencies in the Drawings and returns the same for rectification to the 'Contractor', the contractor must return the rectified drawings within 30 days from the date of issue of letter by Consignee. This period will not be counted towards LD calculation. The consignee shall ensure that all deficiencies in the Drawings shall be pointed for clarifications to

	the firm together at one time only instead of piecemeal multiple reference.
11.2.4	A repeat back reference(s) by Consignee to Contractor pointing out further defects/deficiencies in the Drawings, will be considered a delay on account of the contractor, except for special circumstances like change in location, review of arrangement etc. Thus, Contractors must take utmost care in ensuring completeness as per requirements of the Consignee.
11.2.5	In their own interest, contractor must maintain a log of events in this respect with clear dates and regularly inform consignee to avoid wrong levy of LD. Consignee must cooperate with Contractors by providing all assistance, including clear information about any expected delays in site availability, promptly and in writing.
11.2.6	If an order has been placed on the firm, the firm will have to advise the consignee well in advance regarding requirement of road permit and assistance required from the consignee, if any, so that delay on this account is avoided. Firm should also visit the site before dispatch of machine to assess the condition of path to be used for movement of trailer.
11.3	**DISPATCH OF THE MACHINE FROM MANUFACTURER WORKS:**
11.3.1	The supplier should normally dispatch the machine only after the foundation is ready for installation and commissioning of the machine on arrival.
11.3.2	In case of delay on part of consignee in providing the clear site for construction of foundation or any other facility as specified in the contract to the supplier, the supplier will report the matter with M&P Department of RCF.
11.3.3	In case proving of component at manufacturer works, the supplier should request for the same as soon as possible after receiving contract, keeping allowance of transit time etc. and approximately 60 days for consignee to handover the parts after receipt of the request accompanied by appropriate and valid bid guarantee. In the event of consignee, certifying the non-availability of prove out components, such components will be deemed to be proved out at manufacturer works. However, the firm will prove out these components at consignee works subject to the availability.
12.0	**INSTALLATION, COMMISSIONING AND PROVING TESTS: (ON TURNKEY BASIS)**
12.1	**Joint Check –** The contractor or his agent would be required to carry out a joint check at consignee's end, along with the consignee, before unpacking is done, to avoid subsequent complaints regarding short shipment/transit damages. It is necessary that this joint receipt inspection be done immediately on receipt of the machine by consignee & bidder's representative to avoid commissioning delays due to shortages/transit damages. After receipt of the machine as above a Joint Receipt Inspection note (JRI) as per Annexure-B of Section-III shall be prepared by the consignee and the firms representative indicating the tentative time schedule for various activities of installation and commissioning.
12.2	**RESPONSIBILITIES OF CONSIGNEE AND BIDDER**
12.2.1	The consignee shall be responsible for- i. Provision of a clear covered (except where shed is in the scope of contract) site for construction of foundation as per the schedule to ensure its readiness before arrival of machine at site. ii. In case where construction of shed is also in the scope of contractor, the consignee shall ensure site is encroachment and encumbrance free. iii Electricity, water and compressed air for installation and commissioning of machine shall be provided free of cost within one week of arrival of machine at site. iv. Wherever a road mobile crane has to be arranged by the supplier for material handling, a clear approach for it up to the site has to be provided. v. Clear covered space for storage of material/equipment required for working/ construction of foundation and installation of the machine etc. vi. The consignee shall arrange the raw material for prove out at their end within 15 days of the dry run of the machine (installation, power connection, auxiliary connection like air, water connection) failing which such components will be deemed to have been proved out. The components supplied by the consignee in time will be required to be proved out as per time schedule chart. vii. The inspection of foundation, structures etc. and installation of the machine shall be done by authorized representative of consignee.

12.2.2	The bidder shall be responsible for- i. Design & Construction of foundation, flooring of sufficient thickness, civil works (in line with scope of supply) suiting local soil conditions at the site . ii. Advise consignee in time regarding schedule for requirement of clear site for construction of foundation and other infrastructure, resources & facilities required. iii. Construction of foundation as well as flooring (if required) of sufficient thickness suiting local soil conditions, for machine shall be completed by the bidder at the site provided by the consignee before receipt of the machine at their premises. iv. Provision of all tools and equipment, technical and unskilled manpower, material handling accessories/ equipment and material for installation and commissioning. v. Unloading of the machine on receipt and its movement to the site of installation including provision of road mobile crane. vi. The bidder should ensure the proper earthing for the machine and its peripherals/accessories. vii. Trench with cover plate (e.g. Chequered plate) may be provided for electrical/hydraulic/pneumatic lines. viii. The bidder shall be responsible for meeting all the criteria set by State Pollution Control Board and Central Pollution Control Board, wherever applicable, with respect to air, water, noise, land etc. The bidder shall be responsible for obtaining clearance/certificate for installation/commissioning /operation of the machine/system supplied. The consignee will provide the administrative help for establishment of communication with the Pollution Control Board.
12.3	Consignee will provide only 415 V+10%-20%, 3 phase 50 Hz±3% AC supply at a single point (mains). All types of cables, connections, circuit breakers etc. required for connecting power supply point to different parts of the machine/control cabinets, shall be the responsibility of the bidder. Requirement of grounding/earthing with required material shall also be incorporated by the bidder during construction of foundation. Electrical work like laying of power/electrical cables & earthing wires from mains to machine control panel (up to 20 meters) as well as within the machine, with supply of all materials shall also be carried out by the supplier.
12.4	The supplier shall demonstrate machine performance and prove out the claimed capability for successful commissioning at the consignee's works as per clause 2.4 of Section-I. The M&P shall be deemed to be "commissioned" at consignee premises on the date when it is tested and meets with the specified capabilities/functions according to the technical specifications. In addition to above, in case of tooled-up M&P , the M&P shall be deemed to be "Commissioned" at consignee premises on the date when "prove out" components specified as per the relevant clause of technical specification have been successfully proved out meeting the productivity requirements of Technical specification. The consignee shall arrange the raw material for prove out at their end within 15 days of dry run of the machine (installation, power connection, auxiliary connections like air, water etc.) failing which such components will be deemed proved out. The components supplied by consignee in time will be required to be proved out within 30 days thereafter. Any delay in providing the "raw material or any other input" for proving out shall not be logged on supplier's account. A Joint Commissioning Note (JCN) to this effect shall be made as per the format at Annexure-D of Section-III. After issue of JCN the performance shall be watched for a period of one month, after which the PTC shall be issued. The issue of PTC can not be delayed by more than 60 days from the issue of JCN. If some minor breakdowns are noticed after the issue of JCN, these shall be attended as per warranty obligations and suitable extension of the warranty period.
12.5	If an assembly/sub-assembly requires to be taken back to the manufacturer's premises for repair/replacement either before commissioning or during warranty, the manufacturer or his agent would be required to submit BG of suitable amount. In case the entire machine has to be taken back, a Bank Guarantee for the cost of the machine would have to be submitted. The bank guarantee should be of adequate value so as to cover the cost of the assembly/sub-assembly/paid up cost of the machine.

13.0	**SERVICE FACILITY IN INDIA AND TECHNICAL SUPPORT**
13.1	The tenderer will clearly spell out in the offer the facilities available with him or his agent for providing adequate after-sales service in India during warranty period in the appropriate section of Annexure 'A' of Section-III. The complete details such as organization for after sales service, availability of technically competent engineers and warehousing facilities for spares should be clearly indicated. Bidders not offering complete servicing/repair facilities in India to ensure quick response to maintenance/ servicing calls are not likely to be considered.
13.2	After the warranty period and AMC period, if any, the manufacturer or his agent shall agree to provide service supports for trouble shooting and obtaining spare parts. The manufacturer shall be obliged to provide spare parts required by the Purchasers for a period of 15 years from the date of delivery of the machine at the ultimate destination to safeguard against obsolescence.
13.3	Tenderer who are OEM, shall undertake to supply spare parts for a period of expected life of machine. Other tenderers shall submit undertaking from OEM for supply of spare parts for a period of expected life of the machine.
13.4	During warranty period, the supplier or his authorized agent shall attend for break down as soon as possible, but in no case later than 48 hours of receipt of intimation of the breakdown.
14.0	**BOUGHT OUT ITEMS**
14.1	The bidder shall furnish along with the offer a list of all critical items/ sub-assemblies which are bought out by the bidder and proposed to be used, along with the manufacturer's name, brand model etc. The successful bidder may be required to produce invoices to ensure genuineness of such products/ verification by the inspecting agency.
14.2	The bidder should clearly indicate that in case of components/sub-assemblies taken from reputed ISI or IS standard companies, the parent company has already entered into contract with their Indian units/affiliates for undertakings repairs/after sales service during warranty and post warranty.

S. No.	**Sub-assembly**	**Make**
1.	Bearings	FAG/SKG/NBC/NTN/Timiken/RHP/NSK/Gamfior/SNFA/HSD //KOYO/ZKL/RKB/LIBE/INA/IKO//NRB/EVOLMEC
2.	Electromagnetic clutch	Vortex/Ghatge Patil
3.	A.C. Motors	NGEF/BBL/ABB/KEC/Crompton/ Siemens/ Allen Bradley / Hindustan Motors/ Bonfiglioli/Rossi/ NORD/Grundfoss/Lowara/Ebara
4.	Brake motors	Siemens/KEC/Crompton/NGEF/BBL
5.	D.C. Motor	KEC/Siemens/Crompton/NGEF/BBL
6.	Connectors	Harting/Kontact/L&T/Omron/ Indoelectric/ Phonix/ Connet well/Siemens/BCH/ABB/Schneider/L&T/GWE/C&S/Telemech anique/GE/Schemersal/Pilz/Balluff/Sick/Turck/Allen Bradley
7.	Limit switches	BCH/Siemens/L&T/Teknic/Euchener/Honeywell,USA/Balluff/P EPPERL & FUCHS/Omron/C&S/SPEED-O-CONTROL /CCE / ELECTROMAG /ANAND SYSTEM
8.	Push button switches	Siemens/L&T/BCH/Teknic/C&S
9.	'O' Rings & rubber seals	Merlin/Parker/Busak/Hunger/Merkel/Soloseal/ Walkersolo/ Halite/ Seal Mart/Aston/PRP
10.	Pump & Valves	Rexroth/Vickers/Yuken/Parker/Mico Bosch
11.	Pneumatic Control Equipment	Festo/Shavo Norgen/ Shradder Scovil/ Electro Pneumatics/Parker/SMC Pneumatics / PNEUMAX/ Dunker / IMI Norgen/Scovil/Luthra
12.	Control gears	L&T/Siemens/BCH/ABB/Schneider/C&SGroup/ Telemechanic/ Scheider Group/C&S
13.	Filters	Hydac/Parker/Rexroth/Vickers/Eaton/Argo-Hytos/ Yuken
14.	Cooling Tower	Paltech/ Paharpur

15.	Belts	Fenner/Hilton/Dunlop
16.	High Current Cable	Finolex, Skytone etc
17.	Screened Cables	Spectra
18.	Power Cable	Finolex, KEI.
19.	Gear box	Elecon/Greaves/Shanthi/ZF/New Allenbury
20.	Sprocket	RENOLD /T.I. Diamond/ B.L.Chain/ Bhumi/ Albro/ Nu-Techk
21.	Servo Controlled Voltage Stabilizer & Ultra Isolation Transformer	Servomax/Consul/Aplab/UNITY/Neelkanth
22.	AC Drive	Fanuc/Siemens/ABB/Allen Bradley /Schneider / MITSUBHISHI/ L&T/ /Indramat
23.	AC servomotor	Fanuc/Siemens/ABB/Allen Bradley /Schneider/Baldor/Indramat
24.	DC drive	Siemens, KEC
25.	PLC	Siemens/Fanuc/Mitsubhishi/Messung/Hitachi/ABB/ Allenbradley/Schneider/ L&T/LG/ Delta
26.	Couplings	Fenner/Love Joy Inc., USA/KTR-Rotex/NENCO/NU-Techk/Flex Couplings, Pune
27.	Hour meter	L&T
28.	Ammeter & Voltmeter	AE/ Meco/ RISHAB Instruments/IMP
29.	Ball screws	THK/INA/Tsubaki/Rexroth/Steinmeyerstar/ Gamfior Schenburger/Shuton/ Korta/ HIWIN/Star/NTN/Ipiranga
30.	Air circuit breaker	Siemens/L&T/ ABB/C&S
31.	Industrial Computer & Printer	Advantec/HP/Compaq/Lenova/Dell
32.	Feed back devices	Heidenhain/Ballerf/Fagor/Sony/Siemens/ Fanuc/Kubler/Hengtler/Honer/Burny/ Hypertherm/Mitsubishi/Renishaw/Mitsubishi/Balluf/Delem/Cybelec/Elgo/ESA/Robosoft/Cadman
33.	Lubrication System	Cenlub/Dropco/Vogel/ Rexroth/ Bijur Delimon/ Centraline/Jaguar/ SKF LINCOLN
34.	Electrical Control Cabinet	RITTAL/ Siemens/RISHA/ MAX or of other reputed make with IP55 Protection level
35.	Pressure Sensors	Measurement Specialities, USA
36.	Voltage and Current Sensors	LEM, Switzerland
37.	Temperature Sensors	Omega, USA
38.	Data Acquisition hardware software	National Instruments, USA
39.	CNC & Drive Controller	SIEMENS/FANUC/Heidenhain/Mitsubishi/HMT NUM/Burny/Hypertherm/ Eckelman/Fagor/Delem/Cybelec/Elgo/ESA/Robosoft/Cadman
40.	Hydraulic System	Rexroth/Vickers/Yuken/Atos/Parker/Hawe/Hydac/Wipro /L&T/Bosch/SLM/ Vickers-Sperry/
41.	Air Conditioner for control cabinet	RITTAL/Warner Finley/Kelvin / M&G Cooling / Advance/ Sunbeam/ WALIA/ Tropicool/Voltas/Carrier/Dry Cool System India Pvt. Ltd./COSMOTEC
42.	Cable/wire	Siemens/Indramat/ Hubershnuer/ Finolex/Havells / POLYCAB/ LAPP/ROLIFLEX /RR KABLE/R K Cable/KEI/C&S /UNIVERSAL/CCI/ICC/NATIONAL//IGUS/ RALLISON/ PARAGON/KabelSchlepp
43.	Gear reducer	Elecon/Greaves/Shanthi/ZF/New Allenbury/ Bongfilivali / ROSSI/NORD/ PREMIUM/ GIRAD/ Apex/ Siemens/ Rototech/ Kavistu/ Cyclo

15.0	**COLOR:** The machine and its accessories shall be painted in Apple Green Color No.281 to IS:5-1978, (if any specific color code standardized by BIS is available, the same be given). The machine can also be painted in equivalent RAL/DIN/other International Standards. If there is a standard color scheme of the manufacturer, the same can also be considered and may be specified.
16	**COMPREHENSIVE WARRANTY**
16.1	The machine under consideration shall be designed to have a life expectancy of 20 years. Both the structural components of the machine and its foundation shall be mandated to withstand normal operational conditions for a minimum of 20 years, safeguarding against cracks, breakages, and etc. during the course of normal operations. Tenderer would submit suitable undertaking.
16.2	In addition to warranty obligations as per IRS condition of contract (i.e. the equipment offered should be warranted against defective design, material, workmanship etc. for a period of 30 months from the date of delivery at ultimate destination or 24 months from the date of commissioning and proving test at destination, wherever, the contract stipulates, or from the date of placement in service whichever is earlier provided defects and/or claims are notified to Contractor within 2/3 months of such date) the warranty period would also cover comprehensive preventive maintenance, which will be inclusive of all spares, material and labour cost. All maintenance consumables like lubricants and grease except hydraulic oil / machine coolants shall form part of the scope of the preventive maintenance during the warranty. The cost of preventive maintenance to be carried out during warranty period should be quoted separately
16.3	If at any point of time during the first 20 years post commissioning including during the warranty/CAMC period or otherwise, in case the machine develops cracks in the main frame/beam for any reason including on account of failure/cracking of welded joint, the machine shall be liable to be replaced by the supplier with an equivalent new machine at no additional cost to the purchaser. Such replacement would normally be arranges at the earliest but in no case any later than 6 months from the date when a demand for such replacement has been communicated to the supplier by the purchaser.
16.4	The payment of preventive maintenance schedule carried out during warranty period shall be made by consignee annually at the end of each year after completion of the work and issue of certificate by the consignee.
16.5	The machine shall at all times give contractual out-put and accuracy. Any deficiency or break down for a total of 01 hr. or more for a day would be treated as failure for the day, for the purpose of extending warranty period in terms of IRS condition of contract.
16.6	The tenderer shall ensure that in case a failure is reported by a consignee qualified service engineers shall visit the site within 24 Hours from the date of complaint on calendar day basis. The period of 24 Hours (Excluding date of compliant) after the failure reported shall be treated as grace period, which will not count towards breakdown time for up to one failure per month and a maximum 3 failures per quarter. In case the number of failure exceeds one failure per month or three during any quarter of warranty, grace period of only one day will be permissible for such additional failures. Complaints shall be lodged by consignee by fax, phone, and email whatsapp message or per bearer at address given by the tenderer.
16.7	The details of preventive maintenance to be provided during warranty period shall be indicated by the tenderer giving details of type of preventive schedule, periodicity on items to be checked, items to be replaced and expected plant down time. Preventive maintenance schedules shall be conducted on weekends as far as possible or any other day through mutual agreement with consignees. Total breakdown hours shall be calculated after discounting grace period and preventive maintenance period.
16.8	Maximum permissible down time till it is restored back to the contractual output and accuracy levels, in any quarter of the year during the warranty period, shall be 150 hrs. To ensure this a record of breakdown (duly signed by shop in charge) in hours on quarterly basis should be

<table>
<tr><td></td><td>maintained by the consignee and joint report with the contractor shall be made for each breakdown attention. At the end of first and second year of warranty, these details of breakdown hours during warranty period should be prepared as per performance appraisal report given in Annexure – E of section –III. The firm will then request RCF for release of WBG annexing the performance appraisal report as per Annexure-E of Section-III and the breakdown details mentioned above.</td></tr>
<tr><td>16.9</td><td>Penalty will be levied on the contractor for breakdown period on hours' basis (including holidays) after discounting for the response time. Penalty will be calculated with full/partial deduction of amount of WBG, which shall be deducted from the WBG deposited with RCF:
<table>
<tr><th>Breakdown period</th><th>Applicable penalty</th></tr>
<tr><td>Up to 500 hours in entire duration of warranty of 02 years (plus extended warranty period, if any)</td><td>Nil</td></tr>
<tr><td>Exceeding 500 hours to 1200 hours in entire duration of warranty of 02 years (plus extended warranty period, if any)</td><td>25% of WBG amount</td></tr>
<tr><td>Exceeding 1200 hours to 2100 hours in entire duration of warranty of 02 years (plus extended warranty period, if any)</td><td>50% of WBG amount</td></tr>
<tr><td>Exceeding 2100 hours in entire duration of warranty of 02 years (plus extended warranty period, if any)</td><td>Full encashment of Warranty Bank Guarantee besides other action like noting adverse performance of the bidder and/or agent for future tenders and their offer in the subsequent tenders will not be considered for placement of any order for next 02 years.</td></tr>
</table></td></tr>
<tr><td>16.10</td><td>The Contractor shall warrant that everything to be furnished hereunder shall be free from defects and faults in design, material, workmanship and manufacture and shall be of the highest grade and consistent with the established and generally accepted standards for goods of the type ordered and in full conformity, with the contract specifications and samples if any and shall if operatable, operate properly.</td></tr>
<tr><td>16.11</td><td>This warranty shall survive inspection of, payment for and acceptance of the goods and shall expire after 24 months from the date of commissioning of machine at ultimate destination, Any approval of acceptance by purchaser of the Stores or of the material incorporated here in shall not in any way limits the contractor's liability.</td></tr>
<tr><td>16.12</td><td>The contractor's liability in respect of any complaints defects and or claims shall be limited to the furnishing and installation of replacement parts free of any charge or the repair or defective parts only to the extent that such replacement or repairs are attributable to or arise from faulty workmanship or material or design in the manufacture of the stores, provided that the defects are brought to the notice of Contractor with in 3 (Three) months of their being first discovered during the warranty period or 3 (Three) months from the date of expiry of warranty period or at the option of the Purchaser to the payment of the value, expenditure and damage as hereafter mentioned.</td></tr>
<tr><td>16.13</td><td>The contractor shall, if required, replace or repair the goods or such portion thereof as is rejected by the Purchaser free of cost at the ultimate destination or at the option of the purchaser, the contractor shall pay to the purchaser value thereof at the contract price or in the absence of such price at price decided by the Purchaser, and such other expenditure and damages as may arise by reason of the breach of the condition herein specified.</td></tr>
<tr><td>16.14</td><td>The contractor shall, if required, replace or repair the goods or such portion thereof as is rejected by the Purchaser free of cost at the ultimate destination or at the option of the purchaser, the contractor shall pay to the purchaser value thereof at the contract price or in the absence of such price at price decided by the Purchaser, and such other expenditure and damages as may arise by</td></tr>
</table>

	reason of the breach of the condition herein specified.
16.15	If the Contractor so desires, the replaced parts can be taken over by him or his representative in India for disposal as he deems fit at the time of replacement of goods/parts. No claim whatsoever shall lie on the Purchaser for the replaced parts thereafter.
16.16	The warranty herein contained shall not apply to any material which shall have been repaired or altered by the Purchaser, or on his behalf in any way without the consent of the Contractor, so as to effect the strength, performance or reliability or to any defects to any part due to misuse, negligence or accident.
16.17	The decision of the Purchaser in regard to Contractor's liability and the amount, if any, payable under this warranty shall be final and conclusive.
16.18	The warranty period in the offer shall survive for a period of 24 months from the date of commissioning of machine. If the offer is found with less than 24 months or ambiguous/uncertain on warranty conditions, the tender is liable to be rejected.
16.19	The Purchaser, without prejudice, shall be entitled and it shall be lawful on his part to forfeit the amount of the Guarantee Bond furnished in respect of Warranty in whole or in part in the event of any default, failure or neglect on the part of the Contractor in the fulfillment or performance in all respects of the warranty provisions under reference or failure to extend the validity of Guarantee Bond for the period of break down occurred during warranty period and for such part(s) replaced and/or repaired and part(s) immediately connected thereto as per clause 16.14.
17	**PAYMENT TERMS & CONDITIONS**
17.1.	80% payment will be made on receipt of the material duly pre inspected and receipted at site by the consignee in good condition.
17.2.	Balance 20% payment will be made on furnishing a Bank Guarantee in favor of PFA/RCF for an amount equal to 10% of the contract value after, the installation and commissioning of the machine. The Bank Guarantee as mentioned above should be from a Nationalized Indian Bank/Schedule Commercial Bank in India. The validity of bank guarantee will be up to warranty periods of the machine.

SECTION- III

ANNEXURE-A

FORMAT FOR SUBMISSION OF TECHNICAL BID

1. (a)We, M/s.---------- offer our --------- machine, model no. ------- as per the description given in Schedule of Requirements.

(b) We further state that, except for the following, for which clause wise brief description and justification for deviation has been indicated, our machine fully complies with all the clauses as given in technical specification Section-I & II.

S.No.	Clause/Item	Brief description of Deviation	Justification for deviation

(c) We also confirm all the schedules given in the Delivery Schedule at para 7 of **Section-I.**

Note1: The bidder shall mention all technical deviations only in the format enclosed above and/or in proforma for statement of deviation from technical specification

Note2: The deviation mentioned elsewhere in the bid shall not be considered and the bid shall be evaluated based on the information provided against Annexure-A of Section-III.

Note3: In case tenderer offers internationally accepted alternative specifications as per clause 1.7 of Instructions to Tenderers for filling technical bid, complete details of alternative specification, apart from filling above deviation statement, may be enclosed.

2. We further certify that we are meeting the reference clause as;

(A) We are the regular manufacturer of this type of machine.

(B) We have made the following past supplies of similar machines as per special conditions of tender: -

SN	Name of purchaser with postal address	Purchasers' phone, email address, name of contact person	Purchase/ Supply Order number and date (along with a copy of the PO)	Quantity Supplied (with proof of supply) @	Date of Supply (@)	Date of Installation and/ or Commissioning @	Major Parameter
							Capacity
							50T

@ Along with copies of relevant documents to establish linkages of documents/ entities as detailed in clause 5 of Qualifying Requirements

(C) We are submitting following performance certificate from past users as per clause of Special Conditions:-

S. No.	Name of the Purchaser with Address	Purchase/ Supply Order number and date (along with a copy of the PO) (It should be the one(s) which are enlisted at clause 2 B above)	Quantity Supplied	Date of Supply	Date of Installation and/ or Commissioning	Date of issue of Performance Certificate	Performance

3. We are having following facilities available with us or our agent for providing adequate after-sales service in India during warranty period. Complete details of after sales service, availability of technically competent engineers and warehousing facilities for spares is indicated below:
   - After sales service centers:
   - Availability of technically competent engineers;
   - Warehousing facilities for spares:

4. We have quoted for the following optional accessories as indicated under clause 4.3 of Section-I

Sr No.	Description of the optional accessory	Quantity (in Nos.)	Rate (in Rest.)	Indigenous	Shelf Life (in Months)

5. We have quoted for following recommended perishable and non-perishable spares required for normal maintenance to cover complete range of mechanical, hydraulic and electrical equipments including controls on double shift working basis:

Perishable Spares

SNo.	Description of the spares	Part number	Quantity (In Nos.)	Rate (In Rs)	Shelf Life (in Months)

Non perishable spares

S.No.	Description of the spares	Part number	Quantity (In Nos.)	Rate (In Rs)

6. *We hereby confirm that we are the OEM and undertake to supply spare parts for a period of expected life of machine.

OR

*We hereby confirm that we are not the OEM, but are submitting undertaking from OEM for supply of spare parts for a period of expected life of the machine to provide maintenance spares (as and when ordered) after the expiry of the Warranty/AMC for 5 years (life of machine 15 yrs) including the maintenance spares required for the bought out sub-assemblies and parts.
(*Strike out which ever is not applicable)

7. We have quoted consumables required as per clause 6.1 of Section-II of Bid Document Pt-II, in the format give below

Sr No.	Description of the consumable spares	Qty	Unit	Rate

8 It is certified that we are having suitable facilities at our works for carrying out various performance tests on the sub-assembly/assembly/machine and these shall be made available to the inspecting authority.

9. **BOUGHT OUT ITEMS:** We hereby furnish a list of all critical items/ sub-assemblies which are bought out by us and proposed to be used, along with the manufacturer's name, brand model etc.

Sr No.	Description	Item no.1	Item no. 2	Item no. 3
1.	Brief description of item			

2.	Model no.			
3.	Make			
4.	Quantity/machine			
5.	Manufacturer's name and complete address			
6.	Whether imported or indigenous			
7.	Country of origin			

10. We have quoted for Preventive Maintenance during warranty and comprehensive Annual Maintenance Contract as per clause 16 & clause 17 of Section-II respectively. Details of preventive maintenance services including cleaning of machine to be provided under PMC during warranty and AMC is given in the following format. **(The information shall be provided whether Preventive Maintenance/AMC is in Scope or not)**

S.No.	TYPE OF PREVENTIVE SCHEDULE	PERIODICITY	ITEMS TO BE CHECKED	ITEMS OF REPLACEMENT	EXPECTED PLANT OWN TIME

11. We further submit the following information about the offered machine as per the technical specification Section-III and Important Features of the tender Section-I. We understand that any omission of any of the below mentioned information will render our offer incomplete to that extent.
Note: Bidder shall photocopy the specification (Section-I& II) and furnish comments/details against each clause or link to deviation statement. Any fraudulent change(s) made in specifications (while making photocopy) will lead to summarily rejection of offer. Appropriate punitive action may be initiated.

SCHEDULE-I

The information against leading parameters are as under:-			
1A.	**Clause 2.2.1 of Section-I- Major Parameter**		
Clause no. of Section-I	**Item Description**	**As specified**	**Value/Write-up/Brochure (as offered)**
2.2.1.1	Capacity	50 Tons (Double Ram) 25 Tons x 02 Nos chrome plated with Guide Rods	
2.2.1.2	Productivity	As per Annexure-E	
2.2.1.3	Min. lateral clearance between the bogie frame and the structural columns of the testing machine (To enable manual measurement of bogie dimensions).	505 ± 5MM	
2.2.1.4	Motor power	12HP (Min.)	
1B.	**Clause 2.2.2 of Section-I- Other Parameter**		
2.2.2.1	Height from Rail level to bottom of ram position (in retracted position)	1800 mm	
2.2.2.2	Ram Stroke	1100mm	
2.2.2.3	Hydraulic working pressure	180 Kg/cm2	
2.2.2.4	Operation	Vertical	

2.2.2.5	Least count of digital Load indication	±50 Kg.	
2.2.2.6	Accuracy of Load indication	±0.5%	
2.2.2.7	Range of adjustable pressure pads	Both the Cylinders shall have Adjustment provision towards LH & RH for the distance of 400 mm each.	
2.2.2.8	Power Supply	415 V+10%, -20, 50Hz±3%	
2.2.2.9	Operation	PLC operated, Programmable with SCADA	
2.2.2.10	Pneumatic Control Panel pressure	6 bar	

S.N.	Clause No.	Information required	Value /Write up/Brochure
2.	1.2 and 2 of Section-II	**Technical Details/Particulars of Motors, Control Gears, Voltage Stabilizer & Isolation Transformer**	Value /Write up/Brochure
2.1		**A.C. Servo & other AC Motors and Control Gears** • **AC SERVO & OTHER AC MOTORS** • Manufacturer's Name • Type of enclosure • Type of duty (Ref. IS: 325) (Latest) • Rating-Continuous/intermittent • Output (KW/BHP) • AC voltage across phases, number of phases & frequency. • Speed in RPM • Class of insulation	
		• Normal full load current • Starting current • Maximum current at the time of change over from lower speed to higher speed • Type of motor-Squirrel cage/slipring (wound rotor) • Temperature rise of windings and other parts allowed above an ambient temperature of 50 degree C. • Frame size of motor • End use of motor **CONTROL GEARS** ▪ Manufacturer's Name ▪ Type of control gear (Direct on line/Star Delta/Auto-transformer etc.) ▪ Rating of starting gear in KW & amps. ▪ Short circuit protection (y/n) ▪ No volt trip (y/n) ▪ Overload trip (y/n) ▪ Delayed action current sensitive single phasing preventor (y/n) ▪ Standard specifications to which the motor control gear and its ancillary offered conform to	

2.2	1.2 and 2 of Section-II	D.C. Motors and Control Gears • **DC MOTOR** • Manufacturer's Name • Type of enclosure • Type of duty (Ref. IS: 4722) (Latest) • Rating-Continuous/intermittent • Output (KW/BHP) • DC voltage across phases, number of phases & frequency • Method of excitation whether shunts, series, compound or separately excited, if separately excited state excitation voltage. • Speed in RPM • Class of insulation • Normal full load current in amps. • Starting current • Temperature rise of windings and other parts allowed above an ambient temperature of 50 degree C. • Frame size of motor • End use of motor **CONTROL GEARS** • Manufacturer's Name • Type of control gear (Direct on line/Resistance type/Thyristor type) • Rating of starting gear in KW & amps. • Short circuit protection (Y/N) • No volt trip (y/n) • Overload trip (y/n) • Standard specifications to which the motor control gear and its ancillary offered conform to • Standard specification to which control gear conforms to	
2.3	2.13.2 and 2.13.3 of SectionV	Voltage Stabilizer & Ultra Isolation Transformer (if required) **VOLTAGE STABILISER** • Manufacturer's Name • Type of voltage stabilizer : a) DC servo motor type b) AC servo motor type c) Solid state • Rated capacity in KVA • Nos. of phases & frequency • Type of input supply unbalanced • Input voltage • Output voltage • Rate of correction • Class of insulation & winding (only copper wound is acceptable) • Type of control circuitry • Class of duty • Type of cooling • Indicating instruments and their ranges • Safety features **ULTRA ISOLATION TRANSFORMER** • Manufacturer's Name • Rated capacity	Value /Write up/Brochure

<table>
<tr><td></td><td></td><td>• Ratio of input/output voltage
• Class of insulation
• Arrangement for suppression of power line surges, spikes, transients and noises
• Type for cooling.</td><td></td></tr>
<tr><td>3.</td><td>2.4 of section - IV</td><td>Process sheet with cycle time & others details
<table>
<tr><td>Set up time</td><td>Loading</td><td>Mountin g on fixtures</td><td>Testing</td><td>Inspec -tion time</td><td>Print out</td><td>unloading time</td><td>Total floor to floor time</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
</table></td><td>Write-up (tabular sheet)</td></tr>
<tr><td>4.</td><td>4.2 of section - IV</td><td>Concomitant Accessories
• Make
• Type
• Quantity
• Details</td><td>Compliance/writ e-up/values</td></tr>
<tr><td>5.</td><td>4.3 of section - IV</td><td>Optional Accessories
• Make
• Type
• Quantity
• Details</td><td>Compliance/writ e-up/values</td></tr>
<tr><td>6.</td><td>Section - IV</td><td>Clause wise compliance & details as applicable of rest of clauses of Section-I</td><td>Compliance/writ e-up/values</td></tr>
<tr><td>7.</td><td>Section - V</td><td>Clause wise compliance & details as applicable of rest of clauses of Section-II</td><td>Compliance/writ e-up/values</td></tr>
</table>

Signature of the
Authorized representative of the bidder
With company stamp

Annexure-B

JOINT RECEIPT INSPECTION NOTE

***Note**: With the issue of JRI, payment is released to the contractor, as per the terms of contract. Consignee shall satisfy themselves that the conditions of contract are met before issue of the JRI.*

Date……..

Sub: Receipt of consignment for machine…….
Ref: RCF/KXH PO No…….

1.	Name of consignee/Railway	
2.	Machine name	
3.	Quantity	
4.	Name of supplier	
5.	Consignment of the machine received on	
6.	The foundation & associated works essential for "Safe Installation of Machine" are ready (for turnkey contracts only) *	

** If there are Delays on account of Consignee such as clear site is not given, then the condition 6 will not be a valid ground for holding JRI.*

It is certified that the consignment of the machine has been received complete and in good condition as per specification shown in the contract.

Tentative plan for installation and commissioning of the machine is as under

1.	Date of clear site provided	
2.	Contract	Turnkey/Non-turnkey
3.	**Status of readiness of foundation:**	
3(a)	Already constructed on	
3(b)	Under construction & likely date of its completion	
3(c)	Construction yet to be started from ……. and likely date of its completion	
4.	Status of availability of electrical power, water and compressed air etc.	Available/ Not-available
5.	Number of components to be proved out on the machine	
6.	Likely date for start of erection/installation	
7.	Likely date for switch-on the machine	
8.	Likely date of completion of commissioning of the machine	

Representative of firm

Designation

Representative of consignee

Designation
(Minimum Gazetted level)

Annexure–C

JOINT COMMISSIONING NOTE

Date:……

Sub: Commissioning of (name of machine) …….

Ref: RCF/KXH PO No…….

1.	Name of consignee/Railway	
2.	Machine name	
3.	Quantity	
4.	Name of supplier	
5.	Machine received on	

6. All the parameters of the machine are found okay. The proving test on the machine was conducted from …… to …….. and machine is working satisfactorily.

7. Machine has finally been commissioned on…….. . The machine has been handed over for regular use and kept under one-month observation to watch its performance.

8. Following minor deficiencies (if any) found during joint observation trials are to be attended/rectified by the firm during one-month observation and before issuing the PTC for the machine:

   a.

   b.

   c.

Representative of firm
Designation

Representative of consignee
Designation
(Minimum Gazetted level)

ANNEXURE-D

PERFORMANCE APPRAISAL FORM

APPRAISAL ON COMPLETION OF WARRANTY PERIOD

Dated:……

To, M/s. ……

1.	RCF/KXH PO No.	
2.	Name of supplier	
3.	Machine Name	
4.	Machine received on	
5.	Machine commissioned on	
6.	PTC issued on	
7.	Warranty period expired on	
8.	**Performance during warranty period:**	
8(a)	Total number of breakdowns	
8(b)	Total downtime in number of days	
8(c)	Any warranty complaint pending on date	Yes/No
8(d)	If yes, then the date and nature of defect(s)	

9. In case, Warranty clause No.16 of the machine during warranty period is also given in Bid Document Pt.II, then following details of breakdown hours for preceding eight quarters may also be furnished.

Quarter	**Period From -------To--------**	**Breakdown hours**
1		
to		
8		

Signature----------
Name----------

Designation: DY.CME/Bogie
Office Stamp

1. **PCMM/RCF**
2. **CPM/RCF**
3. **PFA/RCF**

Note:

i.)This appraisal may please be sent immediately on completion of warranty period. If any extension of warranty period required, may please also be mentioned with details.

ii) Sr. Scale Officer having independent charge is also authorized to sign.

ANNEXURE-E

LIST OF COMPONENTS TO BE LOADED ON THE MACHINE

S.No.	Type of Bogie	Description	Drawing No.	Qty to be proved out per Shift (8hrs) with 85% m/c availability
1	LHB coaches AC -3T /2T/FC/ HOT BUFFET CAR /LGS/SCN with air spring	Measuring drawing sheet	LW90033 Alt-c	8
2	3- Phase MEMU/DMC coaches . (MEDHA)	Measuring drawing sheet	ICF/MRVC/M-9-0-006 Alt-j	8
3	Train set Motor car & Trailer Coaches. (Vande Bharat)	Suspension Diagrammatic arrangement for Train set coaches	TS/MC-9-0-005 alt. 'g'	8

NOTE:– 1)Prove out components are based on the RCF current Production Plan ,If any components is not available at the time of commissioning then any other suitable components from the revised Production Plan may be taken.

2) Firm will prove out Qty per shift (8Hrs) as per Annexure-1 , Set up time, Load Testing time , Bogie loading time, Bogie unloading time & inspection time including in proved out Qty.

SSE/PRP/Mfg
19/04/2024

ANNEXURE-F

QUALITY ASSURANCE PLAN

MACHINE DESCRIPTION - Automated Bogie Load Testing Machine

Category	**S. No.**	**Component/ Process**	**Sample Size**	**Type Of Check**	**Quality record**	**TYPE OF CHECK**	**REMARKS**
Bought Out Raw Material		Steels	1 Sample / Size	Chemical & Mech.	TC & INV.	CHP	
Bought Out Components		Bearings	100%	Visual	Inv	CHP	
		Electric Motors	100%	Review of TC	TC & INV	V	
		Hydraulic Pumps & Elements	100%	Review of TC	TC & INV	V	
		Rubber Seals, O Rings & Seals	100%	Visual	TC & INV	V	
		Controllers	100%	Review of TC	TC & INV	V	
		Ball Screw	100%	Visual	IIR	V	
Bought out sub assemblies		Weld joints Load Bearings Others	100 % 5 %	RT DPT	IR IIR	CHP V	
		Hardness and	100%	Hardness	IIR	V	
In process Inspection stage							
		Heat Treatment	100%	Review of Inv.	IIR	V	
		Castings	100%	Visual	IIR	V	
		Spindles	100%		IIR	V	
Final Inspection		surface finish of components	Random	Surface	IIR	V	
		Noise level	100 %	Sound	IIR	CHP	
		Temperature rise	100 %	Measurement	IIR	V	
		Structures Geometry alignment, Guideways	100%	Relevant ISO/DIN/IS/JIS standard	IR	CHP	

INV - Invoice
TC – Test Certificate
V – Verification
CHP – Customer Hold Point
IIR – Internal Inspection Report
IR – Inspection Report

Annexure-G

PROFORMA FOR ASSESSING MANUFACTURING CAPABILITY OF THE OEM TO MANUFACTURE AUTOMATED BOGIE LOAD TESTING MACHINE

Tender No. ..... Date of Opening.....

1. NAME OF THE OEM/ BIDDER

2. LOCATION & ADDRESS

Postal Address

i) Head Office

ii) Works/Factory

Telephone No. (with STD code)/ Mobile Number

i) Regd. Office

ii) Works/Factory

3. DESCRIPTION OF FACTORY/WORKS

i) Total Land area (in Sq. meters)

ii) Total covered area(in Sq. meters)

iii) Different Sub-units (with details of covered/uncovered area, etc.)

iv) Special features, if any:

4. NO. OF PERSONNEL EMPLOYED (CATEGORY-WISE)

i) Managerial*

ii) Supervisory*

iii) Skilled artisans

iv) Unskilled

* The qualification may also be indicated.

5. GENERAL INFORMATION- TECHNICAL

Description of different departments in the Factory/Works along with an organization chart

Detailed description of machinery and plant in each department (make and year of procurement). For special type of equipment /machinery, copy of pamphlet/ write-up tbe furnished to support the description.

Details of raw-materials held in stock (state whether imported/indigenous).

Production capacity of the quoted items

i) Per month

ii) Per year

List of other items, which the firm regularly manufactures and corresponding production capacity.

6. DESIGN CAPABILITY

Details of Qualified Personnel (indicating qualification and experience)Other facilities available.

7. MANUFACTURING PROCESS

Level of in-house facilities

Important items for which work done by outside vendors.

Brief details of manufacturing process relevant to the items quoted.

8. QUALITY ASSURANCE

Does the factory have an established Quality Assurance Programme? If yes, please enclose a copy of the write up? If not, what plans are there if any for setting it up?

Details of Quality Assurance Organization. Quality Control Testing Facilities and Laboratory equipment available. In-house facilities available for inspection and QC. Availability of gauges (details to be furnished)

9. AFTER-SALES-SERVICE

Facilities available at works and branch offices/ authorized service centres/ service delivery partners.

Signature.....