

RAIL COACH FACTORY, KAPURTHALA		
Specification No.	Description	Covering Page
Mech/M&P/3200/GM/24 Rev.- NIL	Electronic Weigh Bridge Cap-100 Ton	

Designation	Name	Signature	Date	Level
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Issue/ Rev	Changes	Date

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1.0 IMPORTANT INSTRUCTIONS TO TENDERERS FOR FILLING TECHNICAL BID

- 1.1 Bidders are required to give clause wise comments on the technical specifications, confirming compliance/non-compliance with details of deviations if any along with their effect on the performance. Back references to be avoided, offers are likely to be ignored in case of non-compliance of these instructions for furnishing the information.
- 1.2 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).
- 1.3 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 any of these accessories, the price must be quoted for comparison purposes and their recommendation/suggestion indicated in the offer. Tenderers should also quote for optional accessories, spares and consumable spares as asked in the specifications.
- 1.4 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.
- 1.5 The bidder should quote only for the specified make of sub-assemblies and equipment wherever specified. Makes of sub-systems other than the specified ones will normally not be acceptable. In case, some other make is quoted, specific reasons for the same including its features/advantages over specified makes must be brought out in the offer.
- 1.6 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 the values as given in the specification shall be taken as confirmed by the tenderer and offer evaluated accordingly.
- 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.
- 1.8 Purchaser reserves the right to verify the details submitted by the bidder by actual site visits.
- 1.9 Other terms & condition of the contract will be as per Indian Railway Standard conditions of contract.

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2.0 PURPOSE

An Electronic Weigh Bridge, Cap-100 Ton is required for Rail Coach Factory, Kapurthala for weighing different consignments upto 100 Metric Tonne loaded in different types of trucks/trailers. The weighbridges should be static type suitable for weighing upto 100MT as per technical Specifications and Leading Parameters detailed in Schedules-I.

3.0 DESCRIPTION AND SCOPE OF SUPPLY

3.1 The scope of supply shall include design, supply, manufacturing, installation, testing, commissioning and proving of static type pitless electronic road weighbridge to be installed on turnkey basis (including all electric works, earthing works and civil works) for weighing of road vehicles as specified in different clauses. It includes all the concomitant accessories/ equipments as detailed in the specification and other concomitant accessories/ equipment, which the manufacturer considers essential to make the machine fully operational, when installed and commissioned. The electrical components shall conform to general specification (electrical) Schedule-II.

3.2 It shall also include installation and commissioning of related equipment, training of personnel in operation and maintenance of machine and supply of technical documentation.

3.3 The total value of the offer will be calculated based on –

- i) The cost of basic weighbridge complete in all respects including weighing electronics, etc.
- ii) The cost of the concomitant accessories according to tender Specification as per clause 5.0 including cost of any other accessory offered as concomitant accessory
- iii) The Cost of civil engineering works on turnkey basis as per clause 8.6.
- iv) Cost of optional accessory, if ordered and charges for each of the 5 year for AMC, if ordered.
- v) Applicable duties and taxes and charges for insurance, freight, installation and commissioning, training etc.

4.0 GENERAL FEATURES

4.1 There shall be a control room to house the weigh electronics. The control room shall be preferably located near the weighbridge platform.

4.2 In addition to the technical Specification given at Schedules-I, the weighbridge shall also be able to meet the technical requirements given below :

- (a) Final calibration of the weighbridge should be through software. The calibration program should be accessible only through a double password.
- (b) A separate resident file should be created on HDD of the optional PC (detailed at 7.1), if asked, to automatically log date and time.
- (c) The junction box, if any, and the control room etc. should have the arrangement of bolting/locking to prevent it being tampered by

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unauthorised persons. All the subassemblies/ assemblies, alteration of which can lead to erroneous weightment should be made tamperproof.

- 4.3 The system shall work in an ambient condition of temperature range of **-5° to 65°C** for weighbridge-A and relative humidity of 98% and comparatively dusty atmosphere. All equipments should be designed to function effectively under these conditions.

5.0 CONCOMITANT ACCESSORIES:

- 5.1 UPS facility with battery backup of one hour.
- 5.2 Window AC of 1.5 Ton including stabilizer, cabling and installation in the control room.
- 5.3 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.
- 5.4 The cost of each of the listed concomitant accessory should be quoted separately. Wherever, for any reason, the cost of any concomitant accessory is included in the basic price of the machine, the same should be specifically mentioned.
- 5.5 The tenderer shall supply a list of concomitant accessories, which will be supplied along with the machine. The cost of each listed concomitant accessory should be quoted separately. Wherever for any reason the cost of any concomitant accessory is included in the basic price of the machine the same should be specifically mentioned.

6.0 SPARES

- 6.1 The tenderer should furnish details of spares covered under warranty.
- 6.2 List of important spare parts and accessories with their part number and costing.
- 6.3 The tenderer should be furnishing the price list of spare parts required for two years normal maintenance of the equipment. Sources of supply of spares used other than that of manufacturer should be furnished by the tenderer.
- 6.4 List of recommended spares for normal maintenance after expiry of warranty period to till useful life of the equipment.
- 6.5 List of recommended consumables for two years shall be quoted separately.
- 6.6 Useful life estimated/expected for each equipment and its sub assembly should be indicated by the tenderers

7.0 OPTIONAL ACCESSORIES:

One PC to run parallel with the weigh electronic system of the machine as an additional data storage and retrieval device particular with configuration as Core-i-7, 3rd generation of make IBM/HP/DELL with Alpha numeric Keyboard with 1 TB hard Disk, 8 GB RAM & DVD R/WR, LCD colour monitor, 80 columns 100 cps Dot matrix printer of WIPRO/EPSON/HP make, mouse etc (with UPS facility of 1 KVA with battery back up for one hour.

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8.0 ESSENTIAL CHARACTERISTICS AND TECHNICAL PARAMETERS.

8.1 Rigidity-control-safety

- 8.1.1 The weighbridges shall be rugged and designed to meet the weightment requirements specified under Schedule-I.
- 8.1.2 The weighbridges shall be provided with all safety devices against over load, lightening/surge and should incorporate safety devices so as to ensure complete protection for operation and weighbridges from all operational failures. Suitable interlocking arrangements against faulty sequence of operation, sudden power failure/fluctuation in supply voltage beyond permissible range and malfunctioning in system shall be provided. Protective guards wherever necessary should be provided. The bidder shall explain in detail the various safety provisions available in the weighbridges.
- 8.1.3 The controls of weighbridge shall be governed by keyboard provided with the weighing electronics/P.C.

8.2 Platform Structure

- 8.2.1 The weighbridge platform shall be a robust modular construction with heavy-duty platform rigid deck with adequate ribbed section and antiskid chequered plate, and of approximate 18000mm X 3000mm size designed for adverse load of VOLVO type trucks/trailers
- 8.2.2 The weighbridge platform structure shall be suitably painted with anti corrosion paint.
- 8.2.3 The design details of platform shall be fully explained along with material specifications in the offer.
- 8.2.4 The structure should be designed considering highly concentrated load carrying capacity of VOLVO trucks/trailers.

8.3 Load Cells

- 8.3.1 The weighing system shall comprise of double-ended shear beam strain gauge load cells/Compression type load cells. The weighbridge shall be supported by these load cells. The no. of load cells provided shall be indicated in the offer. The weighbridge shall be so designed as to ensure that lateral force and other undesirable forces do not act on load cells. The design details of load cells shall be explained in the offer.
- 8.3.2 The load cells should be weather proof and shall be suitably protected to withstand environmental conditions viz. flooding, rain water, temperature variations form -10° C. to 70° C. with humidity level max. upto 98% - The degree of protection should be IP-68.
- 8.3.3 The load cell shall be provided with integral cable.

8.4 Weigh Electronics.

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8.4.1 The weigh electronic system should be provided with digital display unit which should be microprocessor based having the following features:

- i) analogue to digital converter enabling flicker free display,
- ii) facility for auto calibration,
- iii) auto balance,
- iv) diagnostics load cell connectors
- v) weight display and
- vi) weight indicator, and
- vii) Provision for connection to PC.
- viii) Provision of connecting weigh electronics with other weigh Bridges/Server/Computer by LAN for sharing common database.
- ix) Provide password protection for editing and operating.

8.4.2 The system should also have digital display of weight through a remote weight indicator. The remote weight indicator should be of electromagnetic type and should be of 7 numeric characters and shall be installed outside the control room. Character size should be minimum 4”.

8.4.3 The design details of remote weight indicator shall be explained in the offer.

8.4.4 The printed weight tickets shall have the following information:

- i) Date and time
- ii) Lorry/vehicle number
- iii) Product code/description
- iv) Source
- v) Destination
- vi) User message

The format for above data may be submitted along with the tender bid.

Modifications if required shall be suggested by the consignee for incorporation.

8.4.5 The system shall also have facility of diagnostics. In case of fault, descriptive message should be displayed on visual display unit. The details of diagnostics available shall be explained in offer.

8.5 Cabling – Junction Box

The control room will be constructed at a distance of approximate 10m from the weighbridge. The system shall have cables from the load cells, which shall terminate in a weatherproof junction box suitably fixed on the weighbridge. Further, from junction box the cable will run to the control room housing the digital weight indicator. The cable shall preferably run in a MS conduit pipe for providing extra protection to the cables. Alternatively armoured cable to be provided. The firm should also quote prices per meter length of cable including laying charges to assess the additional cost if the control room is beyond 10m, upto 20m, upto 50m, upto 100m.

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8.6 Civil Works and Control Room

8.6.1 The road weighbridges shall be supplied on Turnkey basis including civil works like construction of formation for the weighbridge, and construction and furnishing of the control room of size 4.0m x 3.0m x 3.0m (with dust-room facilities of size 1.0m x 3.0m x 3.0m) for housing the weigh electronics on table for weigh electronics and keyboard and stacking records etc. The room should be provided with 3 Nos. of fluorescent lights and 2 Nos. of ceiling-fans. The purchaser will only provide site for room and electrical connection 230V \pm 10%, 50Hz upto the room. In case the power supply is not near the room, the supplier shall draw the line upto the room and for this eventually shall quote in rate as rate per meter.

8.6.2 Control room should be dust free and air-conditioned and will house the weigh electronics and the P.C. (optional).

8.7 P.C. (Optional)

8.7.1 The supplier shall quote for PC which will be parallel and in addition to the weigh electronics. The PC shall have the following characteristics :

- (i) Core i-7, 3rd Generation computer of IBM/HP/DELL make with Software package suitable for operating applications of the weighbridges will be directly linked to the control console for operation, viewing and printing output. The complete configuration shall be specifically designed for weighing system.
- (ii) Keyboard light enough to be placed on a small table. The keyboard shall be a detachable unit connected by a recoiling cord for allowing user positioning.
- (iii) Colour LCD monitor of 19" provided for monitoring the results.
- (iv) Dot Matrix printer of WIPRO/Epson/HP make 80 column 100 CPS providing a copy of print out of lorries/truck weight data.
- (v) The printer unit shall have the facilities through indicators such as power on, on line, operate control, power on/off, line on/off, manual paper advance, form feed and line feed etc.
- (vi) UPS facility with battery back up facility of one hour.
- (vii) Computer table and chair of suitable size.
- (viii) The complete details of the offered computer and printer with make, model no. etc. shall be submitted in the bid.

9.0 INSPECTION OF EQUIPMENT & TESTING AT MANUFACTURER'S WORKS

9.1 The inspection of weighbridges shall be carried out by M/s. RITES.

9.2 In addition to 9.1, before despatch an inspection will also be carried out by Railway's authorised representative for road electronics weighbridges at the manufacturer's works. Capability of the machine must be demonstrated as per technical Specification to the satisfaction of such authorised representative also.

9.3 Manufacturer must have suitable facilities at their works for carrying out various performance tests on the machines.

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9.4 The tenderer should clearly confirm that all the facilities exist and shall be made available to the inspecting authority.

9.5 The tenderer will submit quality assurance plan being followed at the manufacturers' works for ensuring quality of the product offered.

10.0 CALIBRATION, TESTING AND CERTIFICATION

10.1 The firm shall arrange for calibration, testing and certification of the weighbridges. The certificate shall have to be got done from Weight and Measurement department of the State concerned in accordance with standards for Weights and Measures General Rules (Latest).

10.2 Firm should provide Foundation and related drawings for Road Weigh Bridge, the supplier shall furnish directly to consignee foundation drawings and related diagrams (mechanical and electrical) within 15 days of the receipt of advance P.O.

11.0 DOCUMENTATION REQUIREMENT

11.1 **Operator's manual** : Instructions for operating the system for the purpose of weighing and printing should be clearly laid down in an operators instruction manual. It should contain complete information on using the software; auto calibration and zero balance, carrying out diagnostic tests and system set up before start of weighing.

11.2 **Maintenance manual** : It shall contain detailed description of the system and its functioning. This manual shall contain -

- i) Drawings and circuit diagrams with component layout wherever required.
- ii) Complete wiring diagram with all wires numbered and components/cards labeled.
- iii) List of parts with part number of the assembly and also part number of the original manufacturer and manufacturer's address.
- iv) Details of assembly and installation with dip switch setting and jumper settings on electronic cards if any.
- v) Diagnostics and fault finding with check points and parameters to be measured and their value.

12.0 ERECTION, COMMISSIONING AND PROVING TESTS:-

12.1 The contractor or his agent would be required to carry out a joint check at the 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 inspection be done immediately on receipt of the machine by consignee to avoid commissioning delays due to shortages/transit damages.

12.2 Installation and commissioning of weighbridges would be done by the contractor to the satisfaction of the consignee/inspecting agency.

12.3 The contractor or his agent shall commission the machine within 60 days from the date of intimation of clear site by the consignee in respect.

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12.4 The machine performance shall be demonstrated by the contractor or his agent after successful commissioning at the consignee's works for a period of two 8 hrs. shifts or 4 trucks. Thereafter the machine performance shall be watched by the consignee for a period of one month (each working day having two shifts of 8 hrs.) or weighing of 30 trucks before the final proving test certificate is issued.

12.5 If an assembly/sub-assembly requires to be taken back to the manufacturer's premises for repairs/replacement either before commissioning or during warranty, the manufacturer or his agent would be required to submit an Indemnity Bond. In case the entire weighbridge has to be taken back, a Bank Guarantee would have to be submitted. The Indemnity Bond/Bank Guarantee should be of adequate value so as to cover the cost of the assembly/sub-assembly/paid up cost of the weighbridge.

13.0 ELIGIBILITY CRITERIA

13.1 The tenderer shall be registered on IREPS website (www.ireps.gov.in) to participate in the tendering process.

13.2 The tenderer shall have established quality control system and organization to ensure adequate control at all stages of the manufacturing process.

13.3 The tenderer shall provide a performance statement giving a list of major supplies of same/similar equipments effected in last 5 years to the reputed organizations giving details of the order no. and date and the quantity supplied and whether the supply was made within the delivery schedule. Such period shall be reckoned from the date of opening of tender. Tenderer should also provide the prove out test certificate of his supply/supplies.

13.4 Tenderer not submitting the requisite information may note that his offer is liable to be ignored.

14.0 TECHNICAL LITERATURE

14.1 One copy of the printed illustrative catalogue showing isometric view/sketch & features of the machine and its elements must be enclosed with each copy of the bid.

14.2 The successful tenderer will have to furnish for each machine 02 copies of spare parts catalogue giving the part list number of each component with exploded views and assembly drawings, maintenance manual, trouble shooting guide, operational manual of the machine and all electrical circuit diagrams including PCB circuits to the consignee directly within 1 month of placement of order. The bidder should provide a list of literature they will supply along with the Machine. The technical literature shall be provided for complete machine including important and indigenously purchased components/sub-assemblies.

14.3 Document in the service / technical manual. Firm shall also provide time within which all service calls shall be attended.

15.0 SPECIAL FEATURES

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Special features incorporated into the machine, if any shall be indicated separately by the tenderer, clearly indicating the advantage of these features.

16.0 **MAKE**

- 16.1 The supplier shall clearly mention whether the system quoted is Indian make or imported. If Indian make, the tender should be accompanied by duly sanctioned factory license & relevant documents & also produce records of installation & satisfactory after sales service performance of their equipment from at least one govt. Institution of similar or large size for duration at least 3 Years duration.
- 16.2 If imported item, the OEM firm should be registered for operations in India for a minimum period of last 3 years. In case this is not so, the dealer should be authorised regional supplier & service provide for the late 3 years. He should also produce installation & satisfactory after sales service record of duration at least last 3 years from at least one govt. Institution for a system of similar or larger size. Further the tender should be accompanied by authorisation certificate from OEM.
- 16.3 The supplier shall furnish the complete details of Model No. Make & Manufacturer's details/ address, Country and authorization details of Dealership.
- 16.4 The firm shall provide the calibration certificate of National / International Traceability along with validity of at least two years.

17.0 **SERVICING FACILITIES**

- 17.1 Service facility in Punjab, Address and contract details including phone and fax no. to be provided. The facility should have the necessary equipments recommended by the manufacture to carry out preventive maintenance test as per guideline provided in the service / maintenance manual. Firm should provide list of equipment available for providing calibrations and routine maintenance support as per manufacturer.
- 17.2 Supplier will undertake for service repairs & replacement of any needed part as & when needed.
- 17.3 Maintenance contract to be quoted after the expiry of maintenance period quoted above with details of scheduled visits, part covered under contract & cost of parts not covered as well.
- 17.4 The tenderer shall clearly spell out in the offer about the facility available with him or his agent/dealer for providing adequate after sales service in Punjab during warranty period.
- 17.5 The tenderer shall also indicate the service organization located at various places in India and availability of trained staff, maintenance spares etc.
- 17.6 The contractor shall give a comprehensive spare part list with OEM details and price for all the sub systems.
- 17.7 The tenderer/contractor shall provide list of spares, consumables required for maintenance for 5 years after completion of warranty period
- 17.8 For maintenance during warranty following criteria shall be considered.

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- A) Service engineer of the supplier shall be available for attending to the system faults during first 07 days after successful commissioning of equipments during 09.00 - 17.00 hrs on all working days including Saturdays.
- B) Service engineers shall visit RCF on quarterly basis thereafter till the end of warranty/extended warranty period for Preventive Maintenance at least for one full day at a time.
- C) In case of any breakdown affecting the performance of the system completely or partly, firm shall depute its service engineer as soon as and when informed by any suitable means like Fax, SMS or email possible after receiving such call.
- D) Breakdown period shall be calculated from 8 hours after it's reporting to the firm upto the time it is attended. If intimation to the firm is delayed from Railway's side, then the breakdown period calculation will start from the time by which it is reported to the firm.
- 17.9 Total up time of the system should be at least 90%. Up time shall be counted in following manner:-
- A) Total breakdown of less than 8 hours shall be ignored for the purpose of this calculation.
- B) Penalty may be imposed if the down time is more than 10% without any valid reasons. The levy of token penalty as deemed fit based on the merit of the case may also be consider as per clause 17 (b) of GCC -201.
- 17.10 Warranty period for part or machine shall be extended after completion of warranty period by the duration under which the part or machine remains under breakdown during warranty.
- 17.11 Tenderer shall provide list of spares, consumables required for maintenance for 5 years after completion of warranty period as per annexure-A
- 17.12 Tenderer shall provide expected life for the components of the system and provide the maintenance schedule required for 10years for as per annexure -A
- 17.13 Tenderer shall provide the service charges /per day/per man for deputing service engineer on the machine on requirement separately for Indian and Foreign engineer.

18.0 DEVIATIONS:

The tenderer should clearly certify that the machine offered fully meets the specification various design features incorporated in the machine to fulfil different technical performance requirements should be fully explained in the offer. However, minor deviations from this specification, 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.

19.0 SCHEDULE OF ANNUAL MAINTENANCE CONTRACT (AMC) FOR PERIOD OF 5 YEARS AFTER COMPLETION OF WARRANTY PERIOD

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- 19.1 Tenderer shall provide proposal for 5 year Annual Preventive Maintenance schedule to be executed after completion of warranty period in the format as per annexure-B.
- 19.2 The firm shall maintain the machine in good working condition during the contract period and shall correct the fault or failures, repair or replace the worn or defective parts/equipment during the normal working hours of shop where the equipment has been installed. Unserviceable parts/equipment need to be replaced at no extra cost with brand new parts/equivalent or superior specification.
- 19.3 The firm shall respond by deputing service personal to oral / telephonic/ or other modes of intimation for repair and maintenance of the said machines within 2 hours.
- 19.4 The firm shall ensure that the machine is in proper working condition, to the full capacity, after repair and maintenance.
- 19.5 To have a timely supply of spares during AMC, the contractor shall furnish a total list of spares which should contain list of spares that shall be arranged by the firm, both chargeable, duly mentioning the charge against each item, and spares which shall be non-chargeable, and list of spares to be held by RCF.
- 19.6 The contractor shall clearly list-out the list of consumables required for day-to-day operation of the machine. It shall be the scope of RCF to arrange the consumables once the completion certificate is issued for the retrofitted machine.
- 19.7 The tenderer/contractor shall provide suitable standby when repairs exceeds 2 hours. When any equipment is taken for repair to the tenderer/contractor's premises suitable standby equipment should be provided.
- 19.8 Besides attending the breakdown calls, the firm shall attend to the corrective and preventive maintenance of the machines once in a month.
- 19.9 The AMC is valid for five years from the date of completion of the warranty period . No freight is admissible.
- 19.10 During the AMC period, whatever equipment is defective shall be handed over to RCF. During completion of the AMC period the machines should be handed over in full working condition to its full capacity.
- 19.11 The firm should maintain a register duly indicating the nature of defects and repair attended and got signed by RCF authority. Preventive maintenance schedule should be made. The schedule should be made in such a way that more than one machine should not be attended on the same day. A copy of the schedule should be given to RCF at the beginning of the AMC and the schedule should be strictly followed and on carrying out the preventive maintenance the same should be entered in the register and got signed by RCF authority.
- 19.12 AMC charges shall be paid quarterly as one quarter of the total AMC charges applicable for that year on submission of bills duly certified by the engineers in charge with regard to the satisfactory execution of AMC during the period for which the bill is claimed. Duties & taxes as applicable at the time of payment shall be deducted at source.

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ANNEXURE-A

S.N.	ITEM	PART NO.	SERVICE LIFE	PRICE

ANNEXURE –B

S.N.	YEAR	AMC CHARGES
1.	IST YEAR	
2.	IIND YEAR	
3.	IIIRD YEAR	
4.	IVTH YEAR	
5.	VTH YEAR	

20.0 **WARRANTY**

As per IRS conditions or as quoted by the tenderer whichever is later.

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**SCHEDULE-I
LEADING PARAMETERS**

MAJOR PARAMETERS

1.	Platform size	18m x 3m
2.	Least count	10 Kg.
3.	No. of load cells	06 nos. or more
4.	Load cells type	Double Ended shear beam type/ Compression type
5.	Load cell capacity (each)	50 MT (approximately)
6.	Weighing Electronics	Microprocessor based tabletop type with Alpha numerical keyboard
7.	Memory of weighing electronics (Truck)	1200 nos. (minimum)
8.	MIS reports	Weigh slip/truck-wise/material wise/ date wise/ challan wise/ Customer wise/ daily/monthly/yearly
9.	Operation	Through keyboard
10.	Printer	80 column dot matrix
11.	Non-linearity (Accuracy level)	(+)/(-) 0.025%
12.	Sensitivity	3 mV/Volt
13.	Protection of load cells	IP68 Class.
14.	Type of Mounting	Surface Mounted
15.	Load Cell Construction	Stainless Steel
16.	Corrosion Protection	External Steel surface must be blast cleaned before application of primer and epoxy Coatings.
17.	Safe load in Load Cell	125% of rated capacity
18.	Max. load in Load Cell	150% of rated capacity
19.	Destructive load in Load Cell	220 % of rated capacity
20.	Accuracy class	Confirming to OIML minimum class C3
21.	Repeatability & Creep	Better than +/- 0.010% FS in load

Note: Tenderer to furnish following detail of the Electronic Weigh Bridge offered

S.no.	Technical Parameter	Offered by Tenderer

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ANNEXURE TO SCHEDULE-I

NOTE : The tenderer should ensure that all the relevant data mentioned below be also furnished positively.

	CAPACITY	
1.	<u>LOAD CELL</u>	
1.1	Type/Manufacture	
1.2	No. of load cells per weighbridge	
1.3	Capacity of each load cell (design)	
1.4	Overload on each load cell (without affecting load cell functioning)	
1.5	<u>Accuracy</u>	
1.5.1	Non linearity	% of output
1.5.2	Hysteresis	% of output
1.5.3	Repeatability	% of output
1.5.4	Creep over 20 minutes	% of output
1.5.5	Combined error	% of output
1.5.6	Temp. limit	Degree C.
1.5.7	Supply voltage	
1.5.8	Output voltage	
1.5.9	Protections provided from dust and water	
1.10	Overall dimensions	
1.11	Influence of lateral forces	%
1.12	Input Resistance	ohms
1.13	Output Resistance	ohms
2.	<u>Digital data system</u>	
2.1	Make	
2.2	Details	
2.3	Computer complete with necessary input/ output parts, memory, real time clock, monitor, keyboard, processor unit and printer unit. (Attach details)	
2.4	Junction box (Attach details)	
2.5	Cables (Attach details)	
2.6	Layout drawing giving location of various elements with dimensions etc.	

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SCHEDULE-II

1.0 GENERAL ELECTRIC SPECIFICATION

- 1.1 The provision of this General Specification shall apply, where ever relevant. 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.
- 1.2 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-34-1) (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 switchgear, busbars, main connection & auxillary 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)
IS:3043	Earthing confirming to latest IS: 3043

- 1.3 Unless specified in the main specification, the AC motors and starters shall be of the following type:

S.No.	TYPE OF MOTOR	TYPE OF STARTER
1.	Any type of AC motor starting current of which does not exceed 75 amps.	Direct on line.
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.
3.	AC slipring type motor	Resistance type air/fan Cooled
4.	AC synchronous or synchronous induction motor	Suitable makers standard.
5.	DC motor	Resistance type/Thyristor type.

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- Tenderer is, however, free to give alternative proposal along with justification, if in his view alternative proposal is warranted by site conditions
- 1.4 The control gear for AC/DC motors shall incorporate the following protection devices as concomitant accessories.
 - a) **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.
 - b) **Short Circuit Protection** To protect against short circuits due to insulation failure of faulty connections HRC fuses shall be provided for each motor. The rating of the fuse shall be such as to take care of the over current due to motor starting.
 - c) **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.
 - d) **Single Phasing Protection** - A separate current sensitive delayed action single phasing preventor shall be provided for each motor separately. Overload protection shall not be treated as single phasing preventor.
 - 1.5 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.
 - 1.6 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.
 - 1.7 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.
 - 1.8 The electrical equipments shall comply with the requirement of Indian Electricity Act and Rules (latest).
 - 1.9 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.
 - 1.10 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.
 - 1.11 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.
 - 1.12 Motors shall be designed to withstand frequent starts, stops and reversals as demanded in the operation of the machine.
 - 1.13 Two earthing terminals shall be provided on all electric motors including the control gear.

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2.0 POWER SUPPLY

- 2.1 The machine shall be suitable for operation on 415 volts 3 phase 50 cycles AC 3 wire or 4 wire system with neutral solidly earthed.
- 2.2 The supply voltage may vary 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.
- 2.3 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.
- 2.4 The voltage stabilizer, if required, shall conform to following :

S.No.	Description	Value
1.	Input Voltage	320 to 460 volts 3 phase 4 wire supply.
2.	Out put Voltage	415 volts
3.	Regulation	+ 1% from No load to Full load.
4.	Rate of correction	20 volts per second per phase.
5.	Wave from distortion	NIL
6.	Efficiency	Not less than 97%.
7.	Winding and class of insulation	Copper wire wound with "B" class of insulation or better.

Voltage stabilizer shall be equipped with a protective relay to trip the AC powersupply 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.