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SECTION-I

1.0 INSTRUCTIONS TO TENDERERS FOR FILLING TECHNICAL BID

- 1.1 The machine must fully adhere to the legal requirements and regulations of the country or region in which it is intended to be used or sold. Any non-compliance with these mandatory stipulations could have detrimental effects on the validity of the agreement. It is the sole responsibility of the party involved in the tender process to ensure that the machine meets all applicable laws, certifications, safety standards, and environmental guidelines. Failure to comply with any legal obligations may lead to disqualification from the tender process and legal repercussions. To safeguard the integrity of the agreement and avoid any potential issues, the machine's conformity with all relevant legal requirements should be verified and documented prior to submission.
- 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 the event of any discrepancy between the parametric values stated in the technical specifications of the tender document and those presented in the tenderer's enclosed brochure or other associated documents, unless explicitly addressed in the deviation cum confirmation statement, the values as indicated in the Bid Document shall be deemed affirmed and confirmed by the tenderer. Subsequently, the evaluation of the tenderer's offer shall be conducted in accordance with the values provided in the Bid Document.
- 1.4 Bidders or their representatives are advised to visit the consignee's premises before submitting their bid. They should schedule an appointment with the consignee to familiarize themselves with the manufacturing process, site conditions, and crane facilities etc. This visit will help them prepare a competitive bid.
- 1.5 The machine shall be supplied complete in all respects. The tenderer shall furnish complete details regarding type, material of construction, specifications and special features, if any, for the main items. Any variations from the specifications shall be brought out with reasons for the same. Any variations involving lower standards of design, performance and rating are not acceptable.
- 1.6 All important component make(motor, Hydraulic Cylinders, Hydraulic Valves & Pumps, cables, wire, MCB etc and as mention in tender documents) shall be mention in offer in deviation statement
- 1.7 Whenever any IS/ISO similar standard used in this specification, it shall be latest and updated version.
- 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-F 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-F. The bidder is bound to comply with the same, without fail.

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SECTION-II

1.0 DESCRIPTION:

The specifications covers the design, manufacture, supply, installation, testing and commissioning of CNC Hydraulic Wheel Press cap.- 500 T(LHB,3- phase MEMU/DMC & 3-phase MEMU/TC)) for doing mounting and dismounting operations as detailed in specifications below.

1.1 The machine shall have following configuration:

1.1.1 *The Machine shall be equipped with hydraulic cylinders from both sides for:*

- i) *Mounting and dismounting of wheel discs, Brake disc for LHB type coaches.*
- ii) *Mounting and dismounting of wheel discs for 3-Phase MEMU/TC Coaches.*
- iii) *Mounting & dismounting of Wheel discs & Gear units for 3-Phase MEMU/DMC as per Annexure-C of prove out components.*

1.1.2 Dismounting wheel discs, brake disc, gear units, suspension tubes and collars of wheel sets.

1.1.3 Controlling the ram stroke within + 0.1mm (or better) to interrupt the mounting process.

1.1.4 Achieving a positioning accuracy of + 0.2 mm with respect to the centre of the axle, for each component to be mounted on the axle. Thus, the total tolerance on wheel gauge (measured as the distance between inner faces of wheel flanges) after pressing of wheel discs shall not be more than 0.8 mm.

1.1.5 Stopping immediately the mounting operation when the pre-set position for a component is reached.

1.1.6 Finding the axle centre and displaying the distance of wheel disc with respect to the centre of the axle.

1.1.7 Developing actual pressing force at ram face at least 500T and ram stroke of at least 600 mm.

1.1.8 Working in normal Indian Railway workshop environment with ambient temperature up to 48° C and relative humidity up to 98%.

1.1.9 The maximum noise should not exceed 85 dB when measured at a distance of 1 meter from the machine in the free field conditions as per IS: 4758-1968 and ISO test code 230 part-5.

1.1.10 *The wheel must be pressed in single stroke.*

1.1.11 *The Wheel Pressing Machine shall be equipped with a correctly calibrated and automatic recorder producing a plot of pressing in force as a function of wheel displacement relative to the axle wheel seat throughout the wheel pressing operation. This plot shall be enough to permit a precise determination of pressing in force at any position on the curve & same should be saved on the system & printed.*

1.1.12 *The complete records for wheels pressed for gauge adjustment should also be maintained as for initial wheel pressing.*

1.1.13 *The facility of speed control of the RAM during pressing should be provided.*

1.1.14 *Machine should be equipped with two panels at the both ends of pressing as available in existing machine.*

1.1.15 *It is pertinent working instruction that during pressing activity no variation in journal dia i.e bulge should be developed as no tolerance is accepted in Journal dia after grinding.*

1.1.16 *Mounting & dismounting facility should be available for Vande Bharat Wheel sets.*

1.2 Leading parameters:

Leading parameters and type of Machine have been specified in Schedule – I.

1.3 **Prove out at Firm's Premises:** A performance test shall be carried out at the manufacturer's works to check the machine with respect to the purpose and capability requirement to the satisfaction of the appointed inspector or inspecting agency. For this purpose, the manufacturer may either arrange wheel sets or collect minimum 5 wheel sets (on a returnable basis) from the consignee against a bank guarantee of the value of the wheel sets. The value of the wheel sets shall be indicated by the consignee at the time of requirement of wheel sets. The supplier shall make all arrangement for transporting the wheel sets to their works and back.

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1.4 Prove out at consignee's site: The machine performance shall be demonstrated by the supplier or his agent for Proving out successful commissioning at the consignee's works for a period of two Shifts of eight-hour each. The claimed cycle time for pressing of wheel sets available with the consignee and specified in Annexure-C for prove out components have to be proved out during commissioning. The Claimed cycle time for tool changing as per clause for cycle time in section-II shall also be proved out during commissioning.

2.0 SCOPE OF SUPPLY

2.0 Design of Machine: The firm shall design the machine in accordance with relevant standards, for which the bidder shall appoint a consultant third party or a suitable Original Equipment Manufacturer (OEM) with a minimum of 10 years of experience in this field. The appointed consultant/OEM will visit the site, record parameters, and submit a report of the design parameters along with calculations and simulation testing using appropriate software systems.

2.1 The design process shall include Load Calculation, Layout Design, Structural Analysis, Material Selection, Mechanical System Design, Electrical System Design, Safety Features, Control System Design, Power Supply and Distribution, Testing and Validation, Detailed Engineering Drawings, and approval from the purchaser. The related software shall be provided by the bidder to the purchaser for validating the design.

2.2 As per Schedule-I.

2.3 The successful bidder must separately quote for essential warranty spares to cover two years of normal maintenance, encompassing mechanical, hydraulic, and electrical equipment. The cost of these spares should not be factored into the tender evaluation. Furthermore, the bidder must reserve 20% of annual consumption of warranty spares with RCF (Rail Coach Factory) and follow any adjustments advised by RCF. Once the warranty period expires, all warranty spare materials will be returned to the bidder. These measures ensure comprehensive warranty coverage and proper management of warranty spares throughout the crane's maintenance period.

3.0 CONCOMITANT ACCESSORIES:

3.1 The machine should be accompanied with the following concomitant accessories. 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.

| | | |
|-------|---|-------------------------------|
| 3.1.1 | First fill of hydraulic fluid and lubricants Quantity of each item shall be indicated in the bid. | |
| 3.1.2 | Electrical cables to connect machine terminal box and control console. | 10 meter |
| 3.1.3 | Maintenance tools <i>(Complete list of tools should be included indicating quantity of each tool shall be furnished in the bid. It should contain at least 02 set of tools (One each for Electrical and Mechanical Maintenance)</i> | One set |
| 3.1.4 | Computer based system for recording ram force (Ref.cl. for Recording and measuring system in section-III) <i>Digital/analog Pressure Gauge showing tonnage with least count of 02 Ton Digital/analog Pressure Gauge should be present on both main cylinders</i> | One set Total Qty. 02 nos. |
| 3.1.5 | Handling system (Ref.cl. for Handling System in section-III) | One set |
| 3.1.6 | 90 degree retractable hydraulic centres (as spare in addition to those fitted on the machine) (as per para 4 of clause for Hydraulic centers in section-III). | One set each |

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| 3.1.7 | An independent motorized/pneumatic operated high pressure oil pump with pressure gauge, safety valves, oil tank and other requisite accessories for injecting oil in the wheel bore through the oil nipple during pressing off operations. The pump shall be capable of generating pressure upto 3000 Kg./cm ² . Details of the system offered shall be given in the bid. | One set |
| 3.1.8 | Servo controlled voltage stabilizer suitable for the plant as per specifications given in clause for Power supply in section-III. | One set |
| 3.1.9 | Ultra isolation transformer suitable for the plant as per specifications given in clause for Power supply in section-III. | One set |
| 3.1.10 | Any other accessory considered essential for the operation of the plant to meet the purpose and capability specified in Clause no.1.1 of Section II. | One set |

4.0 OPTIONAL ACCESSORIES

| | |
|-----|--|
| 4.1 | An independent manual operated high pressure oil pump with pressure gauge, safety valves, oil tank and other requisite accessories for injecting oil in the wheel bore through the oil nipple during pressing off operations. The pump shall be capable of generating pressure upto 3000 Kg./cm ² . Details of the system offered shall be given in the bid- 1 no. |
| 4.2 | Any other accessory which can improve accuracy and reliability of the machinemay be quoted separately as optional accessories clearly bringing out its advantages. Its price shall not be included in the basic price of the machine forpurpose of commercial evaluation. |
| 4.3 | <i>Separate calibration setup should be present for proper calibration of main cylinder force.</i> |

4.4 Any other accessory/ equipment which in the opinion of the tenderer can contribute to better performance/operation shall be clearly indicated and quoted separately as optional accessory. The advantages should be clearly explained.

5.0 EVALUATION CRITERIA

5.1 The offer from bidder on turnkey basis shall include the following items

- (i) The cost of basic machines as per this specification and as per Schedule-I including concomitant accessories and conforming to the relevant standard
- (ii) Cost of any other accessory which in the opinion of supplier is essentially required for making the machine fully functional.
- (iii) Cost of Turnkey Charges viz. foundation, installation & commissioning etc.
- (iv) GST, Duties, taxes, insurance, freight and packing charges and any other charges.
- (v) Cost of preventive maintenance during 1st & 2nd year of Warranty Period.
- (vi) Cost of Comprehensive AMC for ten years after the warranty as per the warranty clause.

Note: Cost of CAMC for 10 years to be a part of commercial evaluation. However this will not form a part of contract value.

6.0 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 break up of individual items.
- (ii) Spares with break up of individual items.

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- (iii) Consumables with break up of individual items as applicable
- (iv) Cost for IoT solution compatible for IoT enabled machines must be quoted mandatorily
- (v) Break up of individual items and additional spares and items viz sling/lifting tackles as specified in Schedule-I

7.0 PERFORMANCE STANDARDS:

7.1 Geometric and Performance Standards- The machine shall conform to following Standards in addition to the accuracy desired in this specification.

- 7.1.1 The machine shall conform to IS: 4758-1968 and ISO test code 230 part-5 for maximum noise,85dB,when measured at a distance of 1 meter from the machine in the free field conditions.
- 7.1.2 Cold bent, solid drawn, seamless steel tubes should conform to DIN 2391/C, used in the hydraulic circuit.
- 7.1.3 The crane girders shall conform to IS-807 and crane design shall generally conform to IS-3177 or equivalent international standards

7.2 Productivity:

- 7.2.1 The bidder shall offer per wheel set floor to floor cycle time for pressing in and out including all activities like initial programming *time*, all measurements on positioning system, mounting, gauging and unloading *time as per Annexure-C* for prove out items- Tool setting up time for mounting or dismounting shall not be included in the cycle time.
- 7.2.2 *Floor to Floor average time for Wheel assembly Sr. No. 1&2 of Annexure-C is 51min, Sr.No. 3&5 of Annexure-C is 45 min and Sr. No. 4&6 of Annexure-C is 34 min. Wheel assembly operation including programming time, setting time, loading and unloading time, Pressing time and inspection time of assembly as per Annexure-C.*
- 7.2.3 Details of automatic modes of operations of the machine during one complete cycle and the numbers of operators required for achieving claimed productivity shall be indicated in the bid. This shall be achieved with the accuracies as indicated against clause no. 1.1.4 of section II.
- 7.2.4 *Programmable Mounting and Dismounting frame integrated with machine is required instead of manual mounting and dismounting frame.*

8.0 DELIVERY SCHEDULE CHART:

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

| S.No. | Activity | Activity Code | Outer Limit of Time Schedule expected by RCF | Offered by Bidder. |
|--------------|--|----------------------|---|---------------------------|
| 1. | Issue of LOA | D1 | - | |
| 2. | Submission of PBG By Successful Bidder | D2 | D1+30 days | |
| 3. | Issue of PO By RCF (after verification of PBG) | D3 | D2+30 days | |
| 4 | Submission of GA drawings, Foundation drawings and other drawing as mention in tender document 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-III). | D5 | D4+ 45 days | |
| 6. | Confirmation of availability of clear site by consignee | D6 | By D5 (i.e. at the time of approval of GA | |

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| | | | drg.) | |
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| 7 | Completion of foundation | D7 | D6+90 days | |
| 8 | Supply/ Delivery of machine | D8 | D6 + 150 days | |
| 9 | Power connection for the machine and other on site requirements to be provided by railways | D9 | D8 + 7 days | |
| 10 | Issue of Joint Receipt Note as per Annexure-A and railway to give call to supplier for the commissioning of machine | D10 | D9+7 days | |
| 11 | Generation of Receipt Note through UDM by Consignee | D11 | D10+7 days | |
| 12 | Installation, commissioning and proving out of machine by supplier | D12 | D11 + 120 days | |
| 13 | Issue of PTC by consignee | D13 | D12 + 60 days | |
| 14 | Generation of CRC in UDM by Consignee | D14 | D13+7 days | |
| 15 | Warranty by supplier | D15 | D14 + 2 years | |
| 16 | AMC by supplier | D16 | D15+10years | |

Signature of Bidder

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

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SECTION-III

1.0 BASIC DESIGN FEATURES

1.1 Safety features:

The machine design shall ensure complete safety of the operator and the machine at all times. Suitable interlocks against faulty operational sequence, sudden power failure, fluctuation in supply voltage beyond permissible range and malfunctions in the hydraulic system shall be provided. Protective guards wherever necessary shall be provided. Details of the safety features provided in the machine shall be furnished in the bid.

1.2 Specific Characteristics

1.2.1 Cylinder Column and pressure Cylinder:

1.2.1.1 The cylinder column shall be of steel casting conforming to IS-1030; duly stress relieved, ultrasonically tested for cracks and machined to accommodate the piston cylinder assembly. All major castings shall be of cast iron grade FG: 260 of IS: 210 or better and of rigid construction to ensure vibration free operation. Constructional details and material specification should be furnished in the bid.

In case a fabricated cylinder column is offered, all critical welds shall be tested for weld defects and the structure shall be duly stress relieved. Method of testing weld defects and method of stress relieving shall be explained in the bid. The records of stress relieving shall be furnished during the inspection of the machine. The detailed design calculations for the suitability of the critical sections or the FEM analysis should be furnished along with the bid. A cross sectional schematic diagram shall be furnished in the bid to indicate the constructional features. Welding procedures shall conform to IS-822.

1.2.1.2 The main pressure cylinder shall be of double acting design, of solid steel casting or forging, bored, hard chrome plated and honed to a surface finish of 0.3 microns or better. Hardness of chrome plating shall be at least HRC-65 and thickness of chrome plating shall be at least 25 microns. The bidder shall offer the cylinder to inspecting agency before assembly. The cylinder shall be ultrasonically tested for cracks. The ram cylinder should be able to generate an effective force of at least 500 Ton. Design calculation, taking into consideration, friction losses in the hydraulic circuit as well as in the ram cylinder assembly shall be explained in the bid.

1.2.2 Main Piston/Ram

1.2.2.1 The ram shall be machined from steel casting or forging duly stress relieved and Ultrasonically tested for cracks. It shall be hard chrome plated and ground to a Surface finish of 0.3 microns or better. Hardness of chrome plating shall be at least HRC-65 and thickness of chrome plating shall be at least 25 microns. Material specification of the ram shall be indicated in the bid.

1.2.2.2 Arrangement shall be provided to prevent ram rotation during operation of the Machine. Arrangement provided shall be explained in the bid.

1.2.2.3 Replaceable inserts of highly wear resistant material shall be provided on the ram face. Material of the inserts shall be indicated in the bid.

1.2.2.4 The piston/ram assembly shall be effectively sealed to prevent leakage of oil. The Sealing arrangement shall be explained in the bid with a sketch.

1.2.3 Resistance Column

1.2.3.1 The resistance column shall be machined out of stress relieved steel casting, ultrasonically tested for

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cracks. It shall have sufficient structural rigidity and adequately mounted to withstand heavy mounting forces. Material of the resistance column shall be indicated in the bid. In case a fabricated resistance column is offered, all critical welds shall be tested for weld defects and the structure shall be duly stress relieved. The records of stress relieving should be furnished during the inspection of the machine. Method of testing weld defects and method of stress relieving shall be explained in the bid. The detailed design calculations for the suitability of the critical sections or the FEM analysis should be furnished along with the bid. A cross sectional schematic diagram shall be furnished in the bid to indicate the constructional features. Welding procedures shall conform to IS-822.

- 1.2.3.2 The resistance column shall have balanced, guided and powered movement between the rear column and the cylinder column without stick-slip effect. Details of the power drive shall be furnished in the bid.
- 1.2.3.3 The machine shall have top and bottom clamping of the resistance column on the guide members with a push button control for clamping/release. The clamping arrangement shall utilize maximum surface of the guide member for reduced contact pressure. Suitable interlocking to prevent power clamping during traverse of the resistance column shall be provided. Details of the clamping and release arrangement shall be explained in the bid with a sketch.
- 1.2.3.4 The resistance column guide members shall not support the weight of the resistance column. Separate arrangement for supporting the weight shall be provided and explained in the bid.
- 1.2.3.5 It shall be possible to adjust the distance between the cylinder column and the resistance column so that the mounting operation can be carried out with minimum ram overhang. The guide members of the resistance column shall be provided with suitable bellow covers for protection from dust etc.
- 1.2.3.6 A safety device to prevent damage to the machine shall be provided in case resistance column encounters any obstruction during its powered travel. Details of the safety device shall be furnished in the bid.
- 1.2.3.7 The gap in the resistance column shall be large enough so that parts like gears/disc brakes already mounted on the axle do not obstruct the positioning system and mounting/dismounting operations. Size of the gap in the resistance column shall be indicated in the bid
- 1.2.3.8 The resistance column shall have an inclined front face. The top and bottom guide members shall not be in the same vertical plane. The gap in the resistance column shall be so designed that the wheel set does not roll out of the machine during mounting as well as dismounting operation and the wheel set can be easily front loaded with the help of the overhead crane unit of the machine.

1.2.4 Rear Column:

The rear column shall be a rigid steel casting conforming to IS-1030; or fabricated structure duly stress relieved and ultrasonically tested.

1.2.5 Hydraulic Centers

- 1.2.5.1 The axle is to be held between two hydraulic centres fitted in the main ram and the resistance head.
- 1.2.5.2 The main ram shall carry a hydraulic, retractable, hardened centre capable of supporting wheel sets weighing up to 3000 Kg
- 1.2.5.3 The resistance head shall carry a hydraulic retractable, hardened centre to hold the axle in conjunction with a similar centre fitted in the main ram.
- 1.2.5.4 90° centres shall be provided with the machine. Details of the hydraulic centres in the main ram and resistance head shall be furnished in the bid with a sketch of the arrangements. Also furnish the diameters/ parameters which have been decided for hydraulic cylinders sufficient to take the load

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of wheel and axle mentioned in the specification and also provide the calculation for deciding the dimensions/parameters of hydraulic centres.

1.2.5.5 The centering arrangement shall ensure that axle stay inline to the centre line of both the hydraulic centres of the press. The mounting tooling surfaces used for pressing operation should be machined to get the pressing surface perpendicular to the press centre line. This shall ensure that wheels/ components are pressed on the axle parallel to the axle line and are perpendicular to the press centre line. The arrangement provided in the machine shall be explained in the bid.

1.2.6 Hydraulic System

1.2.6.1 Positive displacement hydraulic pumps shall be provided for the high-pressure oil circuit. Oil flow shall be pulsation free. The hydraulic system shall incorporate two pumps, each having its independent oil supply, so that in the event of failure of one pump, the machine can be operated at low speed with the other pump. Number of pumps provided, their type, make, model no. and capacity shall be clearly indicated in the bid. Also provide the capacity of the motors and calculations of motor power to be used for hydraulic pumps.

1.2.6.2 The hydraulic system shall be provided with an air breather, temperature indicator gauge, oil level gauge, over flow and drainage connections

1.2.6.3 Filters for suction 25 microns, pressure line and return line of 10 microns shall be provided to prevent entry of dust and foreign particles. Type, make and model no. of each filter element shall be indicated in the bid.

1.2.6.4 The filtering system shall be provided with a bye-pass valve which shall operate in case of clogged filters. A clogging indicator shall be provided to indicate clogged filters. Details of the clogging indicator shall be furnished in the bid.

1.2.6.5 Cold bent, solid drawn, seamless steel tubes conforming to DIN 2391/C shall be used in the hydraulic circuit with the only exception that the resistance head shall be connected with high pressure flexible rubber hoses to enable its movement. Pipe fittings shall be Ermeto type, vibration proof. The pipes shall be treated for corrosion prevention. The type of hydraulic pipes shall be indicated in the bid

1.2.6.6 The temperature of oil in hydraulic circuit shall not exceed 60 degree C in any case. A suitable refrigeration type of cooling system with environment friendly refrigerant shall be provided to ensure that oil is not overheated under local weather conditions at continuous normal working for two shifts of the machine. Arrangement shall be explained in the bid.

Note: Firm should provide the heat removal calculations, capacity, details and make of the Refrigerated type oil cooling system in the offer

1.2.6.7 The hydraulic oil used shall be non-corrosive, stable and safe for human handling. It shall be indigenously available. Indigenous brands of hydraulic oils that can be used shall be indicated in the bid

1.2.6.8 The hydraulic shall be of modular construction (With logic control valve/proportional control valves). The drive of the wheel press shall be through Servo Hydraulic motor/ variable displacement pumps.

1.2.6.9 The working pressure of the system shall not exceed 300 Kg/cm². Hydraulic elements shall be design to withstand 125% of normal working pressure.

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- 1.2.6.10 The hydraulic system shall be provided with double safety pressure relief valves. The first setting shall be at the maximum working pressure while the second setting shall be at a pressure approximately 5% higher than the maximum working pressure. In the event of failure of the first system, the second system shall take over automatically, disconnect the pump output to the cylinder and allow discharge to the hydraulic tank. The system shall be explained in the offer with a line diagram of the hydraulic circuit. The names of individual hydraulic element shall be indicated in the bid.
- 1.2.6.11 The hydraulic system shall be sealed for protection against contamination.
- 1.2.6.12 A drain plug at the lowest portion of the tank shall be provided so that oil can be drained out without disconnecting any pipe.
- 1.2.6.13 Oil level sight gauge to show maximum and minimum oil levels shall be provided on the oil tank. In case of low oil level, the wheel press shall stop automatically with an audio visual indication.
- 1.2.6.14 A hydraulic circuit diagram shall be furnished in the bid. The circuit diagram shall clearly indicate the model number and make of hydraulic elements, piping sizes and other details. The bid will be treated as unresponsive in absence of this information.

1.2.7 Wheel positioning system

- 1.2.7.1. Machine should be equipped with a positioning system capable to achieve positioning accuracy as indicated in clause 1.1.4 of section II of the specification.
- 1.2.7.2. *Laser probe mechanism of automatic cut off and wheel gauge measuring system is required.* The positioning system should be capable of measuring axle length and finding the centre of axle to ensure that the inner faces of both wheel discs are equi-distant from the centre of axle. Pressing should get cut off automatically to ensure required Positioning accuracy. It should also be possible to measure the wheel gauge at 3 or more points on the inner faces of the wheel discs after pressing of wheels on the axle, without having to unload the same from the press. The mechanism of automatic cut off and wheel gauge measuring system should be explained in the bid. *Measuring system shall be robust to work efficiently and accurately in dusty environment.*
- 1.2.7.3. The distance of inner faces of wheel disc from the axle centre shall be shown on a screen/DRO and shall be recorded by the computer system. All the measurement and positioning should be done from the centre of the axle to ensure that there are minimal variations from the desired value of the wheel gauge.
- 1.2.7.4. The measuring system should be such that there is no need of manual positioning of measuring probes by the operator. The details shall be furnished in the offer along with schematic diagrams.
- 1.2.7.5. The positioning system should be designed in such a manner that entire system is installed on the machine and there is no interference in any machine operation or handling of wheel set.
- 1.2.7.6. The positioning system should take minimum time in taking all measurements and in ensuring required positioning. The cycle time for the measurement and positioning of wheels etc. shall be included in the total cycle time of pressing operation.
- 1.2.7.7. The bidder shall furnish complete details of positioning system indicating operation sequence, procedure of measuring the axle length and locating axle centre, positioning of wheels, and constructional details along with drawing of complete system.

1.2.8 Recording and measuring system

- 1.2.8.1. The machine shall be provided with a computer-based system for recording pressing force in relation to ram travel. The recorded and indicated force values shall be identical and shall be

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indicated in tones.

- 1.2.8.2. The recording system shall have a recording range from 0 to 625 tonnes. Least count of the digital recorder shall be one ton. The recorder shall automatically get disconnected if the pressing force exceeds 500 tones.
- 1.2.8.3. The digital readout to indicate ram force shall have a range upto 25% beyond the maximum rated capacity of the machine. The DRO shall be clearly legible from a distance of at least 500mm. The DRO must necessarily have peak value holding facility.
- 1.2.8.4. *Digital*/analog gauge for indicating ram force shall also be provided on the machine. Least count of the gauge shall be around 2.0 ton. An additional connection shall be provided for fitment of a master pressure gauge for calibration.
- 1.2.8.5. Recording system should indicate graphical representation of the pressing operation along with maximum value of the pressing force in tonnes. *Graphical representation (Force vs Time Graph) shall have real time wheel pressing graph and the corresponding Ideal graph.* Recording system shall have one data storage unit, which will compile and record additional information and particulars of each wheel set. *The particulars shall be recorded and saved in Excel Sheet Format separately for every working shift and shall include following:*
- i. Date and time of wheel mount
 - ii. Operator's identification code Type of wheel set
 - iii. Mount side of axle (left/right) Maximum force tonnage
 - iv. Serial no., manufacturer, type and size of wheel disk/ axle/ gear/ collar/brake disk
 - v. Wheel serial no., manufacturer, type and size Total mount for the day (shift and month)
 - vi. Inner distance between back faces of both wheels (track gauge)
- 1.2.8.6. All the measuring and recording devices shall be calibrated and valid calibration certificate shall be supplied along with the machine. The type and periodicity of calibration should be indicated by the tenderer.
- 1.2.8.7. The minimum configuration of the computer system shall be as given below: *HP202G2Desktop-(4th Generation) Intel Core i3 4th Gen 4130/ 4 GB DDR3 RAM/ 500 GB SSD, Bluetooth/Wi-fi/Hotspot/ODD/DOS/3-3-3 Years Warranty/20" HP Display, OS- Win 10 (Professional) or above and UPS of having minimum 30 minutes backup, Ink tank printer of make EPSON (Model-L380)/ Brother (Model DCP-T510W) or better. Computer shall have Auto shutdown mechanism in case of power Failure or direct power OFF.*
- 1.2.9 **Lubrication System:** A Suitable lubrication system shall be provided and details indicated in offer

1.2.10 Handling System:

- 1.2.10.1. *Handling system is required as a Gantry type crane for Wheel Set loading, unloading Mounting & Dismounting as per existing wheel press in Wheel Shop.* The hoists shall have coarse as well as fine hoisting speeds. The end hoists shall have synchronized as well as independent movements. All the three hoists shall be provided with cross traverse movement, which shall be in coarse as well as fine speed ranges. The crane bridge shall also have coarse and fine speeds, which shall be same as hoist, cross traverse speeds.
- 1.2.10.2. The handling system supplied with suitable lifting tackles shall be capable of lifting a wheel set from a distance 5000mm from the stroke axis in front of the press. In the rear, the crane hook shall be capable of lifting a load up to a distance of 500 mm from the stroke axis.

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- 1.2.10.3. The overall height of the crane unit shall not exceed 4500mm from floor level.
- 1.2.10.4. The crane girders shall conform to IS-807 and crane design shall generally conform to IS-3177 or equivalent international standards.
- 1.2.10.5. The control panel for operating the hoist and the crane bridge should be pendant operated so that it can be used over the total width of the crane bridge.
- 1.2.10.6. All the three hoists shall be operated from a single pendant only.

2.0 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-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 (corresponding to IEC Pub-72-1) (Latest) motors |
| 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) | Circuitbreakers (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 is 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, induction motors, starting current of which is above 75 amps. if started direct on line | Star delta or Auto transformer type |
| 2.3.3 | AC slipring type motor | Resistance type air/fan Cooled |
| 2.3.4 | AC synchronous or synchronous induction | Suitable makers standard. motor. |

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| | | |
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| 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 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.
- 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 preventor shall be provided for each motor separately. Overload protection shall not be treated as single phasing preventor.
- 2.4.5 **Energy Saving Feature in Electrical circuit to shutdown high energy consuming motors if machine is idle for specific period of time or more.**
- 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.

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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 solidly earthed. 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. 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 | Copper wire wound with "B" class of insulation or insulation 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 | 120 Db rejection ratio | |
| 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 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. | | |

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2.14 **ATMOSPHERIC CONDITIONS**

The ambient temperature at the site at which the machine will be installed may vary from -4°C to +50°C 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.
- 2.18 *Control System of machine shall be compatible and support;
Industry 4.0 technology.
Ethernet communications (internal & external)
Internet port for remote diagnosis.*
- 2.19 *Firm shall provide a declaration that there are no hidden passwords related to operation and maintenance of the machine.*

3.0 GENERAL 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 Mechanite 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

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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 bypass 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 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. 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.

3.4 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

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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 Predictive Maintenance:

Sensor Integration: Install sensors to monitor critical components such as hydraulic systems, bearings, and motor performance.

Data Analytics: Implement predictive maintenance algorithms to analyze sensor data and predict potential failures.

Condition Monitoring: Continuous monitoring of machine conditions to detect anomalies and trends.

3.5.2 Remote Monitoring and Diagnostics:

IoT Integration: Connect the press to the Internet of Things (IoT) for real-time monitoring.

Remote Diagnostics: Enable technicians to remotely diagnose issues, troubleshoot, and update software.

3.5.3 Modular Design:

Modular Components: Design the press with modular components to simplify replacements and upgrades.

Plug-and-Play Modules: Allow for easy replacement of components without extensive reconfiguration.

3.5.4 Quick Change Tooling System:

Tooling System Design: Implement a quick change tooling system to reduce setup times

Tool Library Management: Store and manage tooling information digitally for quick retrieval.

3.5.5 Automatic Lubrication System:

Automated Lubrication: Install an automatic lubrication system to ensure consistent and proper lubrication of critical components.

Lubrication Monitoring: Implement sensors to monitor lubrication levels and provide alerts when maintenance is required.

3.5.6 Advanced Control Systems:

Adaptive Control Algorithms: Utilize adaptive control algorithms for real-time adjustments based on material variations and machine conditions

Energy Optimization: Implement energy-efficient control systems to reduce overall power consumption.

3.5.7 Augmented Reality (AR) Maintenance Assistance:

AR Maintenance Guides: Provide AR-assisted maintenance guides for technicians to visualize instructions and information

Remote Assistance: Enable remote technical support using AR technology for complex problem-solving.

3.5.8 Digital Twin Technology:

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Digital Twin Creation: Develop a digital twin of the press for virtual testing and simulations.

Performance Analytics: Use digital twin data for performance analytics and predictive maintenance.

3.5.9 Enhanced HMI (Human-Machine Interface):

Intuitive Interface: Design a user-friendly interface for operators and maintenance personnel.

Diagnostic Tools: Include advanced diagnostic tools within the HMI for troubleshooting

3.5.10 Documentation and Training:

Interactive Manuals: Provide interactive digital manuals for maintenance procedures.

Training Simulators: Develop training simulators for maintenance personnel.

3.5.11 Spare Parts Management:

Automated Reordering: Implement automated systems for reordering critical spare parts

Digital Spare Parts Catalog: Maintain a digital catalog of spare parts with easy ordering and tracking capabilities.

3.5.12 Environmental Monitoring:

Temperature and Humidity Sensors: Install sensors to monitor environmental conditions that may impact machine performance.

Corrosion Resistance: Implement materials and coatings to enhance resistance to environmental factors.

3.5.13 The machine shall be so designed as to require minimum possible maintenance and to give trouble free service.

3.5.14 All assemblies/parts of the machine shall be easily accessible for maintenance.

3.5.15 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.

3.5.16 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.

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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 :-
- Specific location of points on the machine to be oiled lubricated/greased.
 - Periodicity of lubrication of these points.
 - Filter to be cleaned.
 - Periodicity of cleaning filters.
 - Periodicity of replenishing lubricating oil for the centralized system.
 - 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/cm² 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:
- Pressure gauges at all places, where pressure has to be set up or inspected.
 - Safety valves for hydraulic circuit if relief valve does not fulfill this function.
 - Equipment for checking of temperature in the circuit or in the pump wherever necessary.
 - 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

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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.

(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.

3.11 CNC SOFTWARE SPECIFICATION FOR HYDRAULIC WHEEL PRESS

3.11.1. Controller System

Preferred System: Delem DA-66T, Cybelec ModEva 15T, Amada AMNC-PC, ESA S530, Siemens Sinumerik, Fanuc CNC, etc.

Compatibility: Ensure compatibility with the Hydraulic Wheel Press machines.

User Interface: Intuitive and user-friendly interface for ease of operation.

Support: Support for touch screen interfaces.

3.11.2. Programming Capabilities

Offline Programming: Capability to create and simulate programs without direct connection to the machine.

3.11.3. Automation and Optimization

Optimization Algorithms: Features to optimize pressing parameters for better results.

3.11.4. Compatibility and Connectivity

Machine Compatibility: Ensure compatibility with the specific make and model of the hydraulic press.

File Formats: Support for common file formats for importing and exporting programs.

Network Connectivity: Ability to connect to networks for file transfer and updates

3.11.5. Security and User Management

Access Control: User authentication and access control features.

Data security: Measures to secure program data and sensitive information.

3.11.6. Documentation and support

User Manuals: Comprehensive user manuals for operators and programmers.

Technical Support: Availability of technical support from the software provider.

3.11.7. Updates and Maintenance

Software Updates: Regular updates to address bugs, introduce new features, and ensure compatibility.

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Maintenance Requirements: Clear documentation on software maintenance procedures.

3.11.8. Training and Learning Resources

Training Materials: Documentation, tutorials, and training resources for operators and programmers.

Training Programs: Availability of training programs from the software provider.

3.11.9. Customization and Integration:

Customization Options: Ability to customize settings and parameters to suit specific requirements.

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 must have clearly defined electrical circuits, pneumatic circuits, lubrication circuits and machine assembly drawings alongwith the details of all the components mentioning about make, qty, description etc.*

4.3 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. One set of technical literature should cover the following details:

- 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 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).
- xi. Start-up Guide for CNC Control System (if provided).
- xii. Machine Software Listing (if provided).
- xiii. Soft and hard copies of 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. Wiring diagram, 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.
- 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.

4.4 *Backup of machine software, machine data/ parameters shall be provided in 1TB portable SSD*

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Hard Disk(Make-WD, Seagate, Sandisk, Crucial only)

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

5.0 SPARES

5.1 Since the machine will be under comprehensive preventive maintenance during warranty period of two (02) years and under AMC for ten (10) years after the warranty period, it is the sole responsibility of bidders to stock such spares as required for smoother execution of PMC during warranty and AMC in order to achieve response time in compliance to machine availability as per stipulated requirements.

5.1.1 Spares shall be supplied along with the machine, if ordered.

6.0 CONSUMABLES:

6.1 The list of consumable spares shall be furnished and quoted along with their unit rate.

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 in the offer.

8.2 All Deviations shall be clearly indicated in the deviation statement.

9.0 INSPECTION AND TESTING AT MANUFACTURER'S WORKS:

9.1 The machine shall be inspected and tested during different stages of its manufacture starting from raw material till the completion of machine, by the purchaser or his authorized representative at the supplier's or his sub-supplier's works. The Quality Assurance Programme as per Annexure-D shall be submitted along with the bid. The bidder must submit the exhaustive QAP incorporating the tests as given in Annexure-D along with other tests /stage inspection as followed by them.

9.2 A load and functional test shall be done as specified in CI. No. 1.3 of Section II.

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.

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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 equipments (CNC Control & AC Drives) and CNC/PLC part programming. This training shall be provided to 4 person nominated by the consignee, for a period of 2 weeks free of cost at the manufacturer's premises. Two weeks training will also be provided to one person free of cost from M&P/RCF 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.

11.0. FOUNDATION & RELATED DRAWINGS

11.1. SUBMISSION OF GA, FOUNDATION & RELATED DRAWINGS FOR APPROVAL:

- 11.1.1. For each machine, the supplier shall first submit 01 copy of GA, 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-II to consignee 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 as per time schedule specified in Section-II 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 (Applicable for machines wherever delivery period is linked with approval of GA drawing)

To be governed by Time Schedule in clause 8 of section-II and following stipulations.

- 11.2.1 General Arrangement Drawings will be sent by the 'Contractor' to the Consignee as per Time Schedule annexed in LOA/AT. The 'Contractor' 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 LOA/AT.
- 11.2.2 Delays in submission of drawings by Contractor will 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 will be levied as per IRS Conditions of contract. Thus the number of days delay in submission of

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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 supply the machine before original delivery period as per Specification and 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 Where GA Drawing cannot be approved by consignee due to clear site not being available etc., the Consignee must inform Contractor and M&P/RCF, explaining the exact delay. However, initiative must be taken by Contractor to obtain such a certificate from Consignee. Contractor must bring any difficulty/dispute to the notice of M&P/RCF immediately.
- 11.2.6 In their own interest, contractor must maintain a log of events in this respect with clear dates and regularly inform consignee and M&P/RCF to avoid wrong levy of LD. Consignees must cooperate with Contractors by providing all assistance, including clear information about any expected delays in site availability, promptly and in writing.
- 11.2.7 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 to M&P/RCF and consignee.
- 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 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

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above a Joint Receipt Inspection note (JRI) as per Annexure-A shall be prepared by the consignee and the firms representative indicating the tentative time schedule for various activities of installation and commissioning. For Indian manufacturers, JRI note shall accompany the bill for 80% payment.

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) Whenever 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.

12.2.2. The bidder shall be responsible for-

- i) Design of foundation as well as flooring (if required) of sufficient thickness, 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 (both imported and indigenous machine) and its movement to the site of installation including provision of road mobile crane.

12.3. The bidder should ensure the proper earthing for the machine and its peripherals/accessories.

12.4. Consignee will provide only 415 V+10%-20%, 3 phase 50 Hz+3^o/» 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 (upto 20 meters) as well as within the machine, with supply of all materials shall also be carried out by the supplier.

12.5. The supplier shall demonstrate machine performance and prove out the claimed capability for successful commissioning at the consignee's works as per clause 7.2 of Section-II. The M&P shall be deemed to be "commissioned" at consignee premises on the date when it is tested and

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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 as per time schedule chart. 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-B. 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 cannot 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, under intimation to M&P/RCF. If no intimation is given to M&P/RCF and the PTC is not issued till the expiry of 60 days from the issue of JCN, then the issue will be discussed in a meeting between CPE/RCF and the consignee. Based on this, decision to issue PTC will be taken by CPE/RCF, the concerned technical officer and PCME/RCF.

- 12.6. 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.
- 12.7. The performance appraisal report/ Warranty Discharge certificate in the format as per the Annexure-E would be issued by consignee on completion of warranty period should be prepared by the consignee and given to the firm. Copies of this performance appraisal report/ Warranty Discharge certificate should also be sent to PCMM, PFA/RCF and CPE. On getting the performance appraisal report/ Warranty Discharge certificate, the firm will request PCMM for release of WBG. If this report is not received within the validity of WBG, the WBG should either be extended for one year or encashed as the case may be as provided under the rules.

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. 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

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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 72 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 companies such as Vickers, Rexroth, RITTAL, THK, and Shenburger etc., the parent company has already entered into contract with their Indian units/affiliates for undertakings repairs/after sales service during warranty and post warranty.

| | | |
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| 1. | CNC & Drive Controller | SIEMENS/FANUC/Heidenhain/Mitsubishi/HMT/NUM |
| 2. | Hydraulic system | Rexroth/Vickers/Yuken/Atos/Parker |
| 3. | Feed back devices | Heidenhain, Fagor, Siemens, Fanuc |
| 4. | Ball screws | THK/INA/Tsubaki/Rexroth/Steinmeyerstar/Gamfior / Schenburger/Shuton |
| 5. | Air conditioner for Control cabinet | RITTAL/Warner Finley/Kelvin |
| 6. | Spindle Bearings | FAG/SKF/Timken/NTN/KOYO |
| 7. | Lubrication System | Cenlub/Dropco/Vogel/ Rexroth |
| 8. | Electrical Control Cabinet | RITTAL/ Siemens or of other reputed make with IP55 Protection level |
| 9. | Servo Controlled Voltage Stabilizer | Neel/Servomax/Consul/Aplab |
| 10. | Ultra Isolation Transformer | Neel/Servomax/Consul/Aplab |
| 11. | Electromagnetic clutch | Vortex /Ghatge Patil |
| 12. | A.C. Motors | NGEF/BBL/ABB/KEC/Crompton/ Siemens/ Allen Bradley |
| 13. | Brake | Siemens/KEC/Crompton/NGEF/BBL |
| 14. | Proximity Switch | Elap/Schneider/Omron/Scanner |
| 15. | Contactors | Siemens/BCH/ABB/Schneider/L&T/C&S |
| 16. | Limit switches | BCH/Siemens/L&T/Teknic/Euchener/Honeywell, USA |
| 17. | Push button | Teknic/Siemens/ Schneider/BCH |
| 18. | 'O' Rings & rubber seals | Merlin/Parker/Busak/Hunger/MerkeI/Soloseal/ Walkersolo/Halite |
| 19. | Pneumatic Control Equipment | Festo/Shavo Norgen/Shradder Scovil/Electro Pneumatics/Parker/SMC Pneumatics |
| 20. | Control gears | L&T/Siemens/BCH/ABB/Schneider/C&S |
| 21. | Cable/wire | Siemens/Indramat/ Hubershnuer/ Finolex/HaveIIs/C&S |
| 22. | Gear reducer | Elecon/Greaves/Shanthi/ZF/New Allenbury/ Bongfilivali |
| 23. | AC Drive | Fanuc/Siemens/ABB/Allen Bradley /Schneider |
| 24. | AC servo motor | Fanuc/Siemens/ABB/Allen Bradley /Schneider |

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| 25. | PLC | Siemens/Fanuc/Mitsubhishi/Messung/Hitachi/ABB/AIlenbradley/Schneider |
| 26. | Air circuit breaker | Siemens/L&T/C&S |
| 27. | Connectors | Kontakt/L&T/Omron Harting/ |
| 28. | Hydraulic seamless tubes | Parker/Maharashtra seamless/indian seamless |
| 29. | MCCB | Schneider/ABB/Siemens/L&T/C&S |
| 30. | Cutting tools | SANDVIK/KENNAMETAL — WIDIA/ISCAR/ TAEGU-TEC |
| 31. | Drills and Taps | Addison/Zenith(IT)/Universal |

- Note:**
1. In case any other reputed make is offered, satisfactory justification for the same will have to be given in the offer.
 2. The bidder should explicitly mention “Not applicable”, against the items, indicated above, whichever is not applicable in the offered machine.

15.0 COLOUR: The machine and its accessories shall be painted in Apple Green Colour No.281 to IS:5-1978,(if any specific colour 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.

16.0 WARRANTY OBLIGATION -The following conditions regarding Maintenance and reliability shall also apply:-

16.1. The machine shall be designed for a life of 20 years with regular maintenance and all the structural members of the machine and the foundation shall be guaranteed for 20 years against cracks breakages and etc. during the course of normal operations. Tenderer would submit suitable undertaking.

16.2. The machine shall at all times give contractual out-put and accuracy. Any deficiency or break down for a total of 02 hr. or more for a day would be treated as failure for the day, for the purpose of extending warranty period in terms of clause IRS conditions of contract.

16.3. *During warranty period contractor maintenance staff should be available in workshop.*

16.4. 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. in case the total breakdown period in any one of year during warranty period, exceeds 500 hrs., penalty will be levied on the bidder for breakdown period on working days basis(excluding holidays). Penalty will be calculated as %age of Annual Preventive Maintenance charges and will be deducted from the respective annual payments as under:

16.4.1 Penalty Clause: Complaint Resolution

a. Fast Complaint Resolution:

1. In the event that the Client raises a complaint regarding the quality, performance, or adherence to contract terms by the Service Provider, the Service Provider shall acknowledge to initiate a resolution process within 24 hours of receiving the complaint.
2. Failure to initiate the resolution process within the specified timeframe shall result in an immediate penalty equivalent to 1/2% per week of the total contract value for each unresolved complaint.

b. Prompt Rectification:

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1. Upon identification of any issue leading to a complaint, the bidder shall undertake all necessary measures to rectify the issue within 48 hours from the initiation of the resolution process(i.e after completion of first 24 hrs of receiving of complain).
 2. Should the Service Provider fail to rectify the issue within the stipulated timeframe, a penalty equivalent to 1/2% per week of the total contract value for each unresolved complaint shall be applied.
 - c. **Calculation and Application of Penalties:**
 1. Penalties shall be calculated based on the total contract value specified in this Agreement.
 2. The maximum penalty for any breach under this clause shall not exceed 10% of the total contract value.
 - d. **Cumulative Penalties:**
 1. The penalties outlined in this clause are cumulative and do not replace other penalties stipulated in this Agreement.
- 16.4.2** Contractor shall provide regular and scheduled maintenance for all supplied items as per the manufacturer's guidelines and industry standards. Maintenance shall include inspections, cleaning, adjustments, and necessary repairs to ensure the items remain in optimal working condition. The maintenance schedule shall be submitted to the consignee for approval within 15 days after the commissioning.
- 16.4.3** In the event of any maintenance-related issues or concerns, OEM/supplier shall have web-based complaint management system to lodge a complaint. The web-based system shall possess the following qualities:
- a. **User-Friendly Interface:** The system should be intuitive and easy to navigate, allowing users to submit and track complaints seamlessly.
 - b. **Secure Access:** Authorized users shall require login credentials to maintain confidentiality and prevent unauthorized access.
 - c. **Mobile Compatibility:** The system should be accessible on various devices for convenient complaint submission.
 - d. **Instant Notifications:** Users shall receive automated updates on complaint submission, acknowledgment, and resolution.
 - e. **Categorization and Priority Setting:** Users should categorize complaints and set priorities for clarity and urgency.
 - f. **Attachment Support:** Users can attach relevant documents, images, or videos to provide context.
 - g. **Timeline Tracking:** A built-in timeline or dashboard shall enable real-time tracking of complaint progress.
 - h. **Communication History:** All interactions related to a complaint shall be documented within the system.
 - i. **Multi-Language Support:** The system shall accommodate users from diverse linguistic backgrounds.
 - j. **Escalation Mechanism:** Unresolved complaints shall be escalated through an automated process.
 - k. **Data Analytics and Reporting:** The system shall generate reports on complaint trends and resolution metrics.
 - l. **Data Security and Compliance:** The system shall adhere to data protection regulations and industry standards.
- 16.4.4** The contractor shall acknowledge complaints within 24 hours and provide an estimated resolution timeline. Any unexpected issues or breakdowns shall be addressed within 24 hours.

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- 16.4.5** Documentation of all maintenance activities and reports, including complaint resolution, shall be submitted to the consignee through the web-based system on a monthly basis. These reports shall detail the maintenance performed, parts replaced, and recommendations.
- 16.4.6** The contractor shall ensure that qualified and trained personnel perform maintenance tasks. If a specialized repair is needed, personnel with expertise shall be deployed.
- 16.4.7** Should the contractor fail to address maintenance concerns within the agreed-upon timeframe, the consignee reserves the right to engage third-party maintenance services, with costs borne by the contractor.
- 16.4.8** Additionally, the contractor shall conduct an annual comprehensive inspection and maintenance review, providing a detailed report on the item's condition, risks, and preventive measures.
- 16.4.9** Failure to adhere to the maintenance schedule, timely resolution of complaints, provision of proper documentation, or neglecting the annual comprehensive inspection may result in penalties, deductions, or contract termination."
- 16.4.10** **Personnel at consignee premises for service support:** The firm must provide technically skilled manpower, with a minimum qualification of ITI, proficient in all technical aspects related to the machinery, including expertise in IoT implementation. This manpower should be available on a full-time basis throughout the entire warranty period and stationed at the office of Dy.CPE-II/ RCF/KXH. The cost of the machinery as quoted by the bidder should encompass the expenses associated with the aforementioned manpower. Any separate quotation for manpower will not be considered in the commercial evaluation of the bid."
- 16.4.11** *In the event that the aforementioned manpower is associated with a Railway employee, particularly an RCF (Rail Coach Factory) employee, the firm is required to submit a formal undertaking before deploying the said manpower to the consignee premises.*
- 17.0** **ANNUAL MAINTENANCE CONTRACT**
- 17.1** Tenderers are required to quote for a comprehensive Annual Maintenance Contract for the machine supplied against this specification for a period of ten years on yearly basis giving the rates for each year i.e. first year, second year..so on., which will be inclusive of all spares, material and labour costs. The duties and taxes as applicable should be indicated separately. All consumables spares and materials shall form a part of the scope of comprehensive AMC except as follows.
- a. Diesel/Fuel, lubricating oils or coolant
- b. Major machines elements/structural members which are under guarantee for a period specified in clause 16.1 as stipulated in 'warranty obligations' requirement.
- 17.2** AMC shall be operated, managed and paid by the Dy. Chief Plant Engineer (Mechanical Maintenance). Dy. Chief Plant Engineer (Mechanical Maintenance) shall indicate the bill payment authority & custodian of the AMC BG. No further agreement is required for operating AMC at consignee end.
- 17.3** AMC is a part of scope of supply, in case of concomitant requirement and included in commercial evaluation criteria vide clause 5 of Section-II.
The detailed terms and conditions of AMC shall be as given in following clauses.
- 17.3.1** The duration of AMC shall be 10 years from the date of expiry of warranty. Rates for AMC shall be quoted by the tenderer on yearly basis, which will remain applicable during the duration of AMC and not subject to any variation except any statutory changes in taxes and duties as compared to quoted rates.
- 17.3.2** The tenderer must provide AMC services at the consignee location without any precondition. The

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AMC should include complete responsibility for the bought out sub assemblies and components like CNC system, diesel engine, AC unit etc. *AMC Services shall be done by qualified service personals of OEM Only*

17.3.3 The details of preventive maintenance services including cleaning of machine to be provided under AMC shall be provided by the tenderer in the following format.

| S.No | TYPE OF PREVENTIVE SCHEDULE | PERIODICITY | ITEM TO BE CHECKED | ITEMS OF REPLACEMENT | EXPECTED PLANT DOWN TIME |
|------|-----------------------------|-------------|--------------------|----------------------|--------------------------|
|------|-----------------------------|-------------|--------------------|----------------------|--------------------------|

17.3.4 Preventive maintenance shall preferably be conducted on weekends through mutual agreement with the consignee. Each preventive maintenance schedule normally shall not exceed one day. The total shutdown time for preventive maintenance should be kept as low as possible but not more than 60 hours/month (averaged over the quarter) including time for cleaning, weekly, fortnightly, monthly, quarterly schedules etc. The preventive maintenance regime offered must be aimed at achieving minimum 90% uptime of the plant excluding the plant down time for preventive maintenance schedules.

17.3.5 *In case of AMC, the tenderer shall ensure 24x7 availability of qualified service engineer (At least one representative should stay at RCF in order to minimize response time) at the consignee premises to attend the machine in case a failure occurs and no grace period shall be provided. If no qualified service engineer is available to attend the machine in case a failure occurs then suitable penalty (apart from the penalty levied due to non-availability of machine) shall be levied on the tendered (Rs. 6000/day basis). Complaints shall be lodged by consignee by fax, e-mail or per bearer at address given by the tenderer. The responsibility to keep the failure reporting address details current will rest with the tenderer.*

17.3.6 In case preventive maintenance is carried out alongwith breakdown maintenance schedule; preventive maintenance time will be deducted from breakdown time of the plant.

17.3.7 Penalty Clause: Penalty shall be levied on the tenderer for maintaining plant up time below the limit of 90% calculated on working days basis, after discounting for grace period and preventive maintenance period. Penalty shall be calculated as %age of quarterly payment and will be deducted from the respective quarterly payments. Penalty calculation will be done over quarter

| S.No. | Availability Slab | Applicable Penalty |
|-------|-------------------|--|
| 1. | 90% to 80% | 0.5% for every 1% (or part there of} reduction in availability of plant below 90%. |
| 2. | below 80% | 1% for every 1% (or part thereof) reduction in availability of plant below 80%. |

17.3.8 A Bank Guarantee equal to 1/4 of annual value (highest of the annual values if the rates offered for various years are different) of AMC subject to a minimum value of 1.25% of the quoted cost of machine including concomitant accessory (in case the annual AMC rate quoted is less than 5% of the cost of machine), will be submitted by the tenderer to the consignee 90 days before the expiry of warranty. AMC will have the validity of 10 years 6 months. The bidder can submit multiple BG for lesser duration to cover the period of 10 year 6 months ensuring the uninterrupted validity of the AMC BG for 10 year 6 months. The confirmation for the submission of this BG will be returned on completion of AMC period. In case, the tenderer fails to provide AMC services successfully, the AMC BG will be forfeited. This will be in addition to penalty as

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per clause 17.3.7 above. This provision would not be applicable where the advance payment is made.

- 17.3.9** Plant up time of less than 60% for two consecutive quarters will constitute complete failure of tenderer to provide the AMC services successfully and will result in forfeiture of AMC BG, 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. This will be in addition to penalty clause 17.3.7 above for the period of actual performance.
- 17.3.10** As per clause 5.1 of section II, where AMC is part of evaluation of offer, it is the sole responsibility of bidders to stock all spares and materials as required for smoother execution of AMC in order to achieve response time in compliance to machine availability as per stipulated requirements.
- 17.3.10.1** In all cases of plant failure except as mentioned in clause 17.3.10.2, any other spare part or material necessary to restore the plant to proper working order will be arranged by the tenderer as a part of AMC.
- 17.3.10.2** In case of damage to the machine on account of any external factor, viz., floods, earthquake, fire, arson or sabotage, entire cost of spare parts and material necessary for repair of the plant shall be borne by the railways. However, the tenderer shall provide services of their engineers free of cost as a part of AMC to restore the plant to working order.
- 17.3.10.3** In case of damage to the plant as mentioned in para 17.3.10.2, any spare parts and material necessary to restore the plant to proper working order shall be arranged by the tenderer and charged on actual basis duly certified by authorized railway official in the next quarterly bills. The rates charged for such spare parts shall be based upon the spare part rate list provided by tenderer. The tenderer shall furnish documents to support the rates charged for spares used for repair under para 17.3.11(a).
- 17.3.11** Normally quarterly payment (@ 1/4* of the annual quoted rates) under AMC will be made to the tenderer within 30 days from the end of that quarter subject to submission of the following documents by the tenderer to the paying authority assigned by the consignee:
- Consignee's certificate for work done with calculation of down time and penalty applicable.
 - A certificate by consignee that no spare part is due with the tenderer as per clause 17.3.10 above.
 - Bills submitted by the tenderer & accepted by consignee.
 - Attested photocopy of the AMC BG.
- 17.3.12** The AMC contract can be terminated in following ways:
Consignee may terminate the AMC in the event of failure of tenderer to provide AMC services of the AMC agreement in addition to encashing of AMC BG as per clause 17.3.8.
- 17.3.13** Other general conditions shall be governed by Section-I, II and III as applicable to respective specification.

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Leading parameters (Schedule-I)

Major parameters

Note: 1. No deviation is permitted in major parameters. The bidder should indicate the actual parameters offered.

| S.NO. | DESCRIPTION OF PARAMETER | VALUES |
|----------------|---|--|
| 1.0 | Ram force | 500 T (minimum) |
| 2.0 | Piston stroke | 600mm (minimum) |
| 3.0 | Ram speeds | |
| 3.1 | Approach | 30mm/sec (minimum) |
| 3.2 | Return | 40mm/sec (minimum) |
| 4.0 | Mounting (Infinitely variable) | 0 to 5 mm/sec |
| 5.0 | JOB PARAMETERS | |
| 5.1 | Wheel Tread diameter | 600 to 1250 mm |
| 5.2 | Axle Length | 1500 to 3000 mm |
| 6.0 | OTHER PARAMETERS | |
| 6.1 | Handling System Speeds (Approx.) | |
| 6.1.1 | Hoisting Speed | |
| 6.1.1.1 | Coarse | 5 meter/min. |
| 6.1.1.2 | Fine | 0.5 meter/min |
| 6.1.2 | Cross Traverse Speed | |
| 6.1.2.1 | Coarse | 15 meter/min. |
| 6.1.2.2 | Fine | 1.5 meter/min |
| 6.1.3 | Handling System Load Carrying Capacity | |
| 6.1.3.1 | Left & Right Hoists | 5000 kg each (minimum) |
| 6.1.3.2 | Central Hoist | 5000 kg (minimum) |
| 6.2 | Power Supply | 415V+10%/-20%, 50 Hz +/- 3 % |
| 7.0 | Available Space Envelope (Lx B X H) | 12 m x 15 m x height as per manufacturers design |

| | | | |
|-------------------------------|-----------------------|-----------------|-------------|
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ANNEXURE-A

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 Contract 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)**

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ANNEXURE –B

JOINT COMMISSIONING NOTE

Date:.....

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

Ref: RCF/KXH AT 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)

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ANNEXURE —C

LIST OF COMPONENTS TO BE PROVED OUT ON HYDRAULIC WHEEL PRESS.

| S.No. | Item Description | Drawing NO. | Qty. to be proved out per shift (408 min) with 85% m/c availability |
|-------|--|-------------------------|--|
| 1. | Wheel and Axle complete for FIAT type Bogie (02 Wheel & 02 Brake Disc) | LW02001 Alt-e | 08 |
| 2. | Wheel & Axle complete for HP AC-DU/DPC Bogie (3-Phase MEMU/DMC) (BHEL Type) (02 Wheels & 01 Gear) | DMU/DPC/SS-02-002 alt-a | 08 |
| 3. | Wheel and Axle complete for HP AC-DU/DPC Bogie (3- Phase MEMU/DMC) (MEDHA Type) (02 Wheels) | DMU/DPC/SS-02-002 alt-a | 09 |
| 3. | Wheel and Axle Set for High Capacity Trailer Bogie (3-Phase MEMU/TC) (02 Wheels) | DC/EMU/H-0-1-202 | 12 |
| 4. | Wheel & Axle Set for Trainset Motor Coaches (Vande Bharat) (MEDHA Type) (02 Wheels) | 89002005 | 09 |
| 5. | Wheel & Axle Set for Trainset Trailer Coaches (Vande Bharat) (02 Wheels) | 89102006 | 12 |

Note:

1. Prove out components /Assembly are based on the RCF current production rate/out put per shift. If any components is not available at the time of commissioning then any other suitable components/ assembly from the revised production programme may be taken.
2. Floor to Floor average time Wheel assembly Sr. No. 1&2 is 51min , Sr.No. 3&5 is 45 min and Sr. No. 4&6 is 34 min . Wheel assembly operation including programming time , setting time, loading and unloading time , Pressing time and inspection time of assembly as per Annexure-1

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ANNEXURE-D

QUALITY ASSURANCE PLAN

MACHINE DESCRIPTION

| Category | S No. | Component/process | Sample Size | Type of Check | Quality Record | Type of Check | Remarks |
|-----------------------------|-------|--|---------------|----------------------------------|----------------|---------------|---------|
| Bought Out Raw Material | | Steels | 1 Sample/Size | | 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 | 100% | RT | IR | CHP | |
| | | Others | 5% | DPT | IIR | V | |
| | | Hardness and | 100% | Hardness | IIR | V | |
| In Process Inspection stage | | | | | IIR | V | |
| | | Heat Treatment | 100% | Review of Inv. | IIR | V | |
| | | Casting | 100% | Visual | IIR | V | |
| | | Spindles | 100% | | IIR | V | |
| | | Surface Finish of Components | Random | Surface | IIR | V | |
| | | Cylinder Assembly | 100% | Surface | V | CHP | |
| | | 1) Surface Finish | 100% | Testing for cracks | V | CHP | |
| | | 2) Ultrasonic Testing | | | | | |
| | | Noise level | 100% | Sound | IIR | CHP | |
| | | Temperature rise | 100% | Measurement | IIR | V | |
| | | Structures Geometry alignment Guide ways | 100% | Relevant ISO/DIN/IS/JIS standard | IIR | CHP | |

INV- Invoice

TC- Test Certificate

V- Verification

CHP- Customer Hold Point

IIR- Internal Inspection Report

IR- Inspection Report

| | | | |
|-------------------------------|-----------------------|-----------------|-------------|
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ANNEXURE –E

PERFORMANCE APPRAISAL FORM/ WARRANTY DISCHARGE CERTIFICATE
APPRAISAL ON COMPLETION OF WARRANTY PERIOD

Dated:.....

To, M/s.

| | | |
|-------|---|--------|
| 1. | RCF PO No. | |
| 2. | Consignee/Railway | |
| 3. | Name of supplier | |
| 4. | Machine Name | |
| 5. | Machine received on | |
| 6. | Machine commissioned on | |
| 7. | PTC issued on | |
| 8. | Warranty period expired on | |
| 9. | Performance during warranty period: | |
| 9(a) | Total number of breakdowns | |
| 9(b) | Total downtime in number of days | |
| 10(a) | Any warranty complaint pending on date | Yes/No |
| 10(b) | If yes, then the date and nature of defect(s) | |

11. In case, Reliability clause of the machine during warranty period is also given in, then following details of breakdown hours for preceding eight quarters may also be furnished.

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

In view of the foregoing, the successful Warranty Completion, all obligations in respect of Warranty for the said machine on part of _____ (Supplier Name) stand discharged/ not discharged as on ____ (date)

Signature-----

Name-----

Designation: DY.CME (User Shop)
Office Stamp

PCMM/RCF

PFA/RCF

CPE/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.

| | | | |
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ANNEXURE -F

**PROFORMA FOR ASSESSING MANUFACTURING CAPABILITY OF THE OEM TO
MANUFACTURE HYDRAULIC WHEEL PRESS**

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.....