

# **SOUTHERN RAILWAY ELS/ED**

**(Technical Specification)**

**(SA/A/RS/ED/Spec-1/Jack)**

## Section-IV

### IMPORTANT FEATURES OF THE TENDER

- 1 INSTRUCTIONS TO TENDERERS FOR FILLING TECHNICAL BID
- 1.1 The bidder must submit the technical offer as per the format given in Annexure-A in section. VI. All the information as asked for, in the format must be given accordingly e.g. wherever a parametric value is asked it should be furnished, if a write up is asked for this should be provided and if a brochure or drawing or sketch is expected this should be provided. In case of incomplete/sketchy information, the technical offer will be treated as incomplete and is liable to be rejected.
- 1.2 Unless otherwise stated, latest alterations/ revisions of specifications/ standards/ drawings shall be applicable. In respect of safety standards and environmental standards relevant to the machine, the machine manufacturers shall ensure compliance with international (CE/ISO/DIN/JIS)/National standards (IS) (wherever applicable).
- 1.3 Tenderers should offer and quote for all the specified concomitant accessories, as these are considered essential for commissioning and utilization of the machine. Even if bidder does not recommend the purchase 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.
- 1.4 In case, any item is required in sets, please specify nos./pieces per set. This is essential for proper technical evaluation of the offer. Offers received without this may be considered as incomplete and liable to be rejected.
- 1.5 The bidder should quote only for the specified make of sub-assemblies and equipment wherever specified. Makes of sub-systems other than the specified ones will normally not be acceptable. In case, some other make is quoted, specific reasons for the same including its features/advantages over specified makes must be brought out in the offer.
- 1.6 In case there is a contradiction in any information provided (some parametric values given in the specification and those given in the brochure or some other document enclosed by the tenderer), unless specifically mentioned in the deviation cum confirmation statement under Annexure A of Section VI, the values as given in the specification shall be taken as confirmed by the tenderer and offer evaluated accordingly.
- 1.7 Bidder or his authorized agent, in their own interest, should visit the consignees listed in clause 3 of Section-IV with prior appointment with Controlling Officer of the consignee and acquaint themselves with existing process of manufacturing/remanufacturing, site conditions, availability of material handling facilities etc.
- 1.8 The Purchaser may accept internationally accepted alternative specifications , which ensure equal or higher quality than the specifications mentioned in the Technical Specification. However, the decision of the Purchaser in this regard shall be final. A copy of the alternative specifications offered should be sent along with the offer. The Tenderer should also furnish "Statement of Deviations" from tender specifications (as per Annexure A, Section-VI) along with the offer.
- 1.9 Purchaser reserves the right to verify the details submitted by the bidder by actual site visit.

## 2. DESCRIPTION:

Supply and commissioning of the synchronized lifting jacks electrically operated screw jacks (Set of 5 Jacks), Capacity of each jack: 35 Ton , **Spec No. SA/A/RS/ED/Spec-1/Jack** for Electric Locos for their inspection and maintenance

### 2.1 Leading parameters.

#### 2.1.1 Major & Other parameters for 35 T jack: As per Schedule-I-A

##### **Purpose for which required and Capability**

- 2.2.1. The screw jacks shall be capable of lifting and lowering electric locos for their inspection and maintenance.
- 2.2.2. Each jack shall have the capacity to lift the load specified in respective Schedule-I, and four such jacks plus one spare Jack shall make one complete set.
- 2.2.3. It shall be possible to operate the jacks individually, in pairs, or all 4 together in synchronization for lifting and lowering, and sustaining functions from a central control panel. The accuracy of synchronization when operated in pairs or in fours shall be within  $\pm 5$  mm.
- 2.2.4. Each jack shall be capable of lifting and sustaining the proof load at any point between the maximum and minimum heights specified in respective Schedule-I.
- 2.2.5. Each jack shall be tested at 1.25 times the proof load

## 3 QUANTITY for CONSIGNEE

SL.NO	CONSIGNEE	As per Spec No	QTY REQUIRED
1.	SR.DEE/ELS/ED	SA/A/RS/ED/Spec-1/Jack	1 SET (5 JACK)

## 4.SCOPE OF SUPPLY.

- 4.1 The specification covers the design, manufacture, supply, installation, testing and commissioning of Electrically Operated Synchronized Screw Jacks. It includes all the concomitant accessories/ equipments as detailed in the specification and other concomitant accessories/ equipment, which the manufacturer considers essential to make the machine fully operational, when installed and commissioned. It shall also include installation and commissioning of related equipment, training of personnel in operation and maintenance of machine and supply of technical documentation.

### 4.2 CONCOMITANT ACCESSORIES:

- 4.2.1 The scope of supply shall include the following concomitant accessories that are required to make the equipment fully operational on installation. The cost of such accessories shall be included in the basic price of the machine. For information of the purchaser, the price of each concomitant accessory shall also be quoted separately in the offer.

#### **Applicable for Consignees other than ICF**

- 4.2.1.1 First fill of oil/grease with sufficient quantity of lubricants for initial commissioning of the equipment.
- 4.2.1.2 All PVC flexible copper cables of adequate ratings required to connect electrical control cabinet, terminal box, jacks, etc. The length of cabling between control panel and jacks shall be 15 m., and between power supply and control panel 10 m.(sizes of cables to be furnished in the bid).
- 4.2.1.3 One set of tools for maintenance of the equipment. The list of tools shall be furnished in the offer.
- 4.2.1.4 Any other accessory/ equipment, which the manufacturer considers essential to make the Jacks fully operational, when installed and commissioned connected to power source and give the specified output.
- 4.2.1.5 The calibration of all the gauges and other devices used in the jack must be done by the firm every time when calibration certification becomes due within the period of warranty and this must be covered as part of AMC also.

### **4.3 OPTIONAL ACCESSORIES**

4.3.1 The following optional accessories should be quoted for separately. Any other accessories which, in the opinion of the bidders, can contribute to higher productivity rates should be quoted for separately explaining the advantages and limitations.

- (i) Load gauges to be provided on control panel for indication of load distribution on each jack separately.
- (ii) The load screw, both above and below the carriage, shall be protected by telescopic bellows covers.

The prices of above items should not be included in the basic cost.

4.3.2 Any other accessory, which can improve the performance, reliability, efficiency, or enhance the capability of the machine as a whole or part thereof, should be quoted as optional accessory.

## **5 EVALUATION CRITERIA**

Total value of the offer will be calculated based on

- (i) The cost of basic machine i.e. one set consisting of four jacks and one spare jack.
- (ii) Cost of the concomitant accessories according to clause 4.1.1 of section-IV.
- (iii) Cost of any other accessory, which in the opinion of supplier is essentially required for making the machine fully functional.
- (iv) Installation & Commissioning charges.
- (v) Duties and taxes, insurance, freight etc.
- (vi) Spares & Essential Spares as per clause 5.1.1 & 5.1.2 of Technical Specification.
- (vii) AMC cost for the next 5 years which has to be quoted separately the tenderer excluding the cost of machine

## **6 DELIVERY SCHEDULE CHART:**

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

## 7. TIME SCHEDULE

S. No.	Activity	Activity Code	Outer Limit of Time Schedule expected	Remarks (If any)
1.	Issue of LOA	D1	-	
2.	Submission of PBG by successful bidder	D2	D1 + 30 days	
3.	Issue of Contract (after verification of PBG)	D3	D2+15 days	
4.	Submission of GA drawings to consignee by successful bidder	D4	D3 + 15 days	
5.	Approval of GA drawings	D5	D4 + 15 days	
6.	Delivery of Jacks at site by supplier	D6	D5 +90 days	
7.	Commissioning and prove out of Jacks by supplier	D7	D6 + 30 days or within 30 days from the date of handing over of clear site by consignee.	
8.	Issue of PTC by consignee	D8	D7 + 30 days (each working day having 2 shifts of 8 hrs)	
9.	Warranty	D9	D7 + 2 years	

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

## **8. SPECIAL CONDITIONS**

- 8.1 General Arrangement Drawings complete in all respect, will be sent by the „Contractor“ to Consignee as per Delivery schedule annexed in LOA/PO. Consignee will deal with this even if his copy of LOA/PO has not been received by him. To facilitate early examination of the drawings, Contractor will also supply a copy of the LOA and a copy of these these Conditions to each consignee along with the GA Drawings. The Contractor shall ensure that drawings sent to consignee are complete in all respects. The GA drawings shall be approved by the consignee and given back to the contractor, as per the Delivery schedule in the Contract.
- 8.2 Delays in approval of the drawings by Consignee will not be on account of Contractor, as detailed below.
- a. 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.
  - b. Where GA Drawing cannot be prepared due to clear site not being available etc., the Consignee must inform Contractor, explaining the exact delay. In both cases, however, initiative must be taken by Contractor to obtain such a certificate from Consignee. Any difficulty/dispute must be brought to the notice immediately by Contractor.
- 8.3 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, unless and until clearly certified by consignee as being on their own account, for special circumstances like change in location, review of arrangement etc. Thus, Contractors must take utmost care in ensuring completeness of drawings as per requirements of the Consignee.
- 8.4 In their own interest, contractor must maintain a log of events in this respect with clear dates and get this countersigned by consignee for submission along with his bills 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.

**Section-V**  
**TECHNICAL SPECIFICATION**

**ABBREVIATIONS**

A-1,A-2, A-3, A-4	Standard paper sizes
AC	Alternating Current
AMC	Annual Maintenance Contract
AT	Acceptance of Tender
BG	Bank Guarantee
CME	Chief Mechanical Engineer
CME/PCM	Chief Mechanical Engineer/Post Contract Management
CNC	Computer Numeric Control
COFMOW	Central Organisation for Modernization of Workshops
COS	Controller of Stores
Db	Decibel
DC	Direct Current
FA&CAO	Financial Advisor & Chief Accounts Officer
GA (Drawing)	General Arrangement (Drawing)
HRC	Hardness Rockwell 'C' Scale (value)
Hz	Hertz
IEC-Pub	International Electro technical Commission - Publication
JCN	Joint Commissioning Note
JRI	Joint Receipt Inspection
kW	Kilo Watt
LC	Letter of Credit
LD	Liquidated Damages
LOA	Letter of Acceptance
NC	Numeric Control
NIT	Notice Inviting Tenders
PBG	Performance Bank Guarantee
PDF	Portable Document Format
PLC	Programmable Logic Controller
PTC	Proving Test Certificate
PU	Production Unit (Any of the six Railway Production Units e.g. RCF, ICF etc.)
RDSO	Research Design & Standards Organization
SS	Stainless Steel
WBG	Warranty Bank Guarantee

**1. BASIC DESIGN FEATURES:  
1.1 DESIGN**

- 1.1.1 The electrical components shall conform to general electrical specification (Clause 2). However, single phasing preventer and other controls shall be as per clause 1.2.5. Under & Over voltage protection with Audio & Visual indication as required vide clause 2.4.3, need not to be quoted.
- 1.1.2 The general characteristics of the equipment shall be as per clause 3, to the extent that these clauses are applicable.
- 1.1.3 The design of the jacks shall be such that the load screw shall be subjected to tensile and torsional stresses only, while lifting and supporting loads.
- 1.1.3 The design of the jacks shall be reliable based on sound engineering practices and shall be adequate to ensure safety of operation at all times.
- 1.1.4 Jacks shall automatically go into locked position in case of power failure, failure of any components or faulty operation, to ensure safety. Arrangement for manual over-ride shall also be provided so that each jack can be operated individually, if required.
- 1.1.5 Jacks shall be provided with retractable steel wheels of adequate strength, mounted in such a manner that when the claw Carriage is moved upwards under load, the wheels are automatically raised and the base of the jack sits firmly on the floor. Similarly, when the claw is lowered and the jack is released, the wheels shall automatically be lowered to rest on the floor so that the base of the jack is raised to provide the specified ground clearance. **(Applicable for consignees other than ICF)**
- 1.1.6 The tenderer shall also indicate details of the safety devices provided in case of failure of load nut threads during operation.
- 1.1.7 Drawings indicating supporting details of the load screw, connection between load screw and the worm wheel, and the mechanism to protect load screw from transverse loading shall be submitted with the offer. The offer shall also include interlocking arrangement to ensure stoppage of all the jacks in case of failure of any one while operating in synchronized mode. Details of lifting head design which contribute to avoidance of slipping during operation, shall necessarily be furnished.
- 1.1.8 Care must be taken during design to ensure safety of operation at all times. All moving parts, where practicable, shall be fitted with adequate safety guards.
- 1.1.9 A factor of safety of minimum 5 shall be built into the jack design. The actual factor of safety shall be indicated in the bid.
- 1.1.10 The full technical details of the jacks being offered and design calculations will need to be brought out clearly in the offer.

**1.2 SPECIFIC CHARACTERISTIC**

**1.2.1 Jack Frame**

- 1.2.1.1 The Jack frame shall be of robust design and preferably be a fabricated steel structure and shall be capable of withstanding an overload of 25%.
- 1.2.1.2 The steel used shall conform to IS: 2062. All welded joints shall be checked for weld defects and stress relieved. The welding shall conform to IS:816 or 823, as the case may be. A cross-sectional drawing shall be submitted, clearly showing the various stiffeners provided for structural strength.



1.2.1.3 The frame assembly shall basically consist of a base plate and two main upright columns, with adequate rigidity and strength for stability at all positions of load screw and projection arms and their attachments. The uprights shall be perpendicular to the base of jack frame to ensure verticality on the level cement floor

1.2.1.4 The upright column shall be fully machined, hardened and ground for smooth movement of the carriage. The surface finish and the hardness should be indicated in the offer.

1.2.1.5 The load shall be transmitted to the floor through the base plate.

### **1.2.2 Lifting Arm and Carriage.**

1.2.2.1 The fixed lifting arm and carriage shall be a fabricated steel structure.

1.2.2.2 The carriage shall be mounted on suitable carbon/alloy steel rollers fitted with self-lubricating antifriction bearings.

1.2.2.3 The carriage rollers shall be engaged on hardened and ground upright column for smooth and wear less movement of carriage. Hardness of rollers shall be mentioned in the bid.

1.2.2.4 The design of the mounted rollers shall be such that wear does not adversely affect the alignment of the load nut with the screw.

1.2.2.5 The vertical downward load on the lifting arm shall be countered by a set of rollers mounted on the carriage against upward frame. The arrangement should be clearly described in the offer with the help of drawings.

1.2.2.6 The moving carriage shall be of rigid construction, provided with machined housings accurately bored to receive the load bearing lifting nut trunnion in relationship to the roller axles.

1.2.2.7 The claw portion getting engaged with the body of the High Horse Power Electric Locos, shall be manufactured from suitable steel with knurled surface for ensuring sufficient friction for holding.

1.2.2.8 The contact with the body of the High Horse Power Electric Locos and coaches shall be sensed through micro sensor provided in the lifting claw and interlocked electrically so that all the jacks shall be operated in simultaneous mode on getting the feedback from this sensing device so that claws are in contact with the body of the High Horse Power Electric Locos and coaches. Switching in to synchronization mode is possible only when all load sensors of the selected jacks are activated.

### **1.2.3 Load Nut and Screw**

1.2.3.1 The load screw shall be suspended from the top of the jack frame, so as always to be under tension to eliminate the risk of buckling.

1.2.3.2 The load screw shall be of EN19 having either single start buttresses or saw tooth thread (in accordance with IS:4696 (latest) with inherent self-locking features. The screw shall be manufactured through thread milling process for thread formation. The material specification, procedure for heat treatment and inspection of screw at various stages should be fully explained in the offer.

1.2.3.2.1 The screw rod shall be ultrasonically tested. The test shall be witnessed by the inspecting authority.

1.2.3.3 The upper end of the screw shall be supported by a ball thrust bearing having a spherical seated housing and held in position by a retaining nut suitably clamped at the top and self-aligning ball bearing at the bottom.

- 1.2.3.4 The load carrying lifting nut, which shall be single piece for easy removal for inspection and shall be of bronze, and shall incorporate a flange to transmit the load to the housing forming the trunnion block.
- 1.2.3.5 The lifting nut trunnion block shall be capable of swiveling in the moving carriage headstock.
- 1.2.3.6 A safety steel nut shall be provided as a safety device underneath the load nut to prevent any accidental falling of load. The arrangement provided to prevent rotation of the safety nut with respect to the load nut, and its wear compensation, shall be clearly described with a sectional drawing in the offer.
- 1.2.3.7** The turning of the screw shall be monitored through PLC (programmable logic control) and pulse counter provided at each spindle so that simultaneous movements of all the four load screw in synchronization mode is ensured. In case of difference in height of lifting head by  $\pm 5$  mm, the movement of all jacks shall stop and an audiovisual alarm will appear to draw the attention of operator. If anyone screw stops turning during synchronized working, it automatically shuts down all the jacks in the set. This will prevent a jack set from becoming unequally loaded or a vehicle tilted if any one of the jacks in the set stops due to a failure in the drive train.
- 1.2.4 Drive Motor and Transmission**
- 1.2.4.1 A motorized transmission arrangement shall be provided to allow push button control of rotating vertical screws for lifting speeds as specified in Schedule -I.
- 1.2.4.2 A standard totally enclosed, oil-immersed reduction gear system shall be provided for transmission. The reduction gear box preferably shall be one of the following makes – Elecon / Shanti Gears / Allenberry / Nord / SEW Euro drive / Bonfiglioli.
- 1.2.4.3 The tenderer should explain in full detail with the help of assembly drawing the transmission arrangement and reduction gear system in the offer. The tenderer should explain the external and internal configuration of the gear box, the number of reduction stages and the types of gears used.
- 1.2.4.4 The load screw shall be self-sustaining in operation under proof load conditions.
- 1.2.4.5 The tenderer shall submit detailed motor power calculations duly taking into account the efficiencies of the screw/nut, gear box, chain/V Belt drive, thrust bearing and motor. The basis on which the figures of various efficiencies are based must be explained through detailed calculations where necessary or reference to standard published data.
- 1.2.4.5.1 The HP of the motors shall be computed taking into account ambient temperature of 50 deg. C and voltage fluctuation of  $\pm 10\%$  For calculating motor power derating factors for both, operating conditions should be taken as per manufacturers catalogues.
- 1.2.4.5.2 The motor shall be totally enclosed, intermittent duty, hoist type reversible electric motor. Each motor shall have a disc brake integrally mounted on it.
- 1.2.4.6 Calculations for nut diameters and screw rod and nut stress calculations shall be submitted with the offer. The permissible stress of the materials used must be indicated.
- 1.2.4.7 The ball/roller bearings used in the manufacture of screw jacks shall be of reputed makes such as SKF/FAG/NORMA/NTN only. The make of bearings offered shall be indicated in the bid. The successful tenderer shall submit inspection certificates from the manufacturer (foreign or indigenous) of the bearings.

## **1.2.5 Control Panel & Electrical System**

1.2.5.1 The mobile control panel shall be operated at a control voltage of 110 V, and shall be provided with, but not necessarily limited to, the following equipments:

- Pilot light indicators to show whether the mains supply is 'ON' or 'OFF' for each Jack separately.
- 2 limit switches for each jack.
- One number main rotary switch.
- Voltmeter for incoming power supply with selector switches
- Jack ON/OFF selector switch for each jack.
- Control panel ON/OFF switch.

1.2.5.2 Apart from the main central control unit, a pendant control with following characteristics must be provided:

- (i) The pendant control shall control all the four jacks simultaneously.
- (ii) The pendant control shall be a rubberized pendant type control with one button to control UP movement of all four jacks simultaneously and one button to control DOWN movement of all four jacks simultaneously.
- (iii) UP and DOWN movement buttons should be suitably labeled.
- (iv) The pendant control unit should be attached to fixed central control unit through a plug type control.
- (v) The pendant control cable should be attached to a column with a suitable swivel arm to give accessibility to both sides of the locomotive (Locomotive width is 3.2 M and height is 4.2 M and length is 21.3 M).
- (vi) Tenderer may also go for wireless control for the remote or pendant thereby eliminating all the cables on floor.

The tenderer may offer any other pendant control cable layout, which will avoid cable lying on the shop floor to avoid damages.

1.2.5.3 Each Jack shall be provided with a push-button station for initial adjustment of the lifting claw and the central control panel shall be mounted on wheels for group or sub-group operation. Inter-connection cable with plug and sockets both for power and control circuits shall be provided for inter-connection between central control panel and each individual jack. The set of 4 jacks shall be placed at the 4 lifting points of the locomotive/carriage/wagon to be lifted.

1.2.5.4 The control console shall comprise a cabinet mounted on three or four (i.e. two fixed and one or two swivel) oil resistant neoprene (or equivalent) tyred wheels, of 150mm minimum diameter, and have a pram type handle at the swivel wheel end for maneuvering purposes. The two fixed wheels shall be fitted with foot operated brakes. The operating face of the console shall be approximately 800 mm above floor level. The panel shall have IP-44 enclosure.

1.2.5.5 The control panel shall comprise of a cabinet with an operating panel face at an appropriate height. The cabinet shall be water resistant and dust proof.

1.2.5.6 The control panel shall be equipped with the following: -

- i. Triple-pole load break heavy duty main circuit isolating switch.
- ii. One double-pole quick break miniature circuit breaker (MCB) for the control circuit.
- iii. Thermal overload along with built in single phasing preventor for each motor and

HRC fuses for total short-circuit protection of the system. The circuit should be foolproof so that all the motors will be immediately stopped as and when any motor is overloaded and an indication of the same will be available by observing the Trip-Indication Signal Lamp.

- iv. HRC fuses for control circuits.
- v. Triple-pole air-break contactors Direct on line suitable for AC3 duty for hoisting and lowering.
- vi. Selector switch/push button/master switch.
- vii. Indicating lamps for power supply 'ON'/'OFF'.
- viii. Overload trip indicating lamp for each drive.
- xi. Emergency stop button.
- x. Ammeter for each jack motor

1.2.5.7 Each lifting device shall be provided with a motor overload cut out. In case of overload on one drive, all drives shall be cut off.

1.2.5.8 The electric control shall be equipped with phase protection to monitor the electric rotating field. In case of fault in phase protection for example disconnection in a conductor, all lifting devices shall be cut off.

1.2.5.9 The system shall be suitable for  $415 \pm 10\%$  volts, 3-phase, 50 cycle AC supply. The motors shall conform to IS-325 latest or equivalent international standard. The starter shall be provided with suitable Circuit Breaker of adequate capacity for motor control applications. Only reputed make of motors of Siemens / ABB / Crompton / Marathon / BBL shall be used in the equipment. If any deviation firm may quote along with the tender.

1.2.6 Operation of the Equipment

1.2.6.1 Any one or all or any combination of two or four jacks shall be capable of being operated by selection of independent switches as well as master control switch on the control panel, with pilot lamps to indicate the status of each function.

1.2.6.2 Before commencing lifting operations, the jacks are to be maneuvered as follows: The jacks shall be positioned correctly to engage with the vehicle to be lifted. Individual jacks shall then be operated until all load-lifting arms are just engaged. The jacks should then be operated on synchronization mode by master controller.

1.2.6.3 A linear scale graduated in mm. preferably should also be provided on the upright column to facilitate checking of relative heights during operation. Correction of errors shall be achieved by selection or otherwise of any jack or jacks for movement in either direction.

1.2.6.4 Each jack shall be fitted with upper and lower electrical limit switches of the self-resetting type to prevent over travel of the lifting head at top and bottom. A secondary lower limit switch shall also be provided. A backup limit switch assembly shall be provided for eliminating the danger of damage to a jack or a raised vehicle in case of malfunction of upper travel limit switch at the top of lifting head allowable travel.

1.2.6.5 Each jack shall be capable of being maneuvered easily and safely in any direction by one person. The arrangement provided shall be clearly explained in the offer with the help of drawings.

1.2.6.6 Each lifting jack shall be provided with an emergency switch for monitoring the wear of lifting nut. In new conditions, the clearance between main nut and follow-up nut shall be 3.6 mm to 4.2 mm. In case of clearance falling below 1mm because of wear of main nut as well as in the case of main nut breaking, this switch shall operate and cut off the complete equipment.

- 1.2.6.7 In case lifting jack movement is stopped during lowering operation under any circumstances what so ever for example collision of the bracket with an obstacle, a drive screw lift off switch shall be actuated which in turn shall bring the complete machine to a stop. Any alternative arrangement to meet the requirements shall also be acceptable.

## **1.2.7 Lubrication**

- 1.2.7.1 The jacks shall be provided with a suitable lubricating system to automatically supply lubricant to each lubrication point. Details of the lubricating system offered shall be described in the bid along with a diagram.

## **2. GENERAL ELECTRIC SPECIFICATION**

- 2.1 The provision of this General Specification shall apply, where ever relevant.

- 2.2 All equipments and material shall comply with appropriate Indian Standards (latest), International Standards or National Standards of the country of origin provided the latter are equivalent to or better than the former. The tenderer shall indicate the Standards applicable. The following standards are applicable in particular. (Corresponding International Standards like ASA, NEMA, BSS, DIN etc. may also be quoted).

- IS :325-1979 (latest) - Three phase induction motors (corresponding to IEC pub-34-1) (Latest).
- IS :1248 (Latest) - Direct acting indicating analogue electrical measuring instruments and their accessories (corresponding to IEC Pub-51) (Latest).
- IS :1231-1974 (Latest) - Dimensions of three phase induction motors (corresponding to IEC Pub-72-1) (Latest).
- IS :1271-1985 (Latest) - Classification of insulation material for electrical machinery & apparatus in relation to their thermal stability in service (corresponding to IEC-Pub-85) (Latest).
- IS :6875 (Latest) - Push Buttons and related control switches corresponding to IEC Pub/73) (Latest).
- IS :375-1963 (Latest) - Marking and arrangement of switch gear, bus bars, main connection & auxiliary wiring.
- IS :996-1979 (Latest) - Single phase small AC and universal electrical motors.

- 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.

	<b>TYPE OF MOTOR</b>	<b>TYPE OF STARTER</b>
2.3.1	Any type of AC motor starting current of which does not exceed 75 amps.	Direct on line.
2.3.2	AC squirrel cage, introduction motors, starting current of which is above 75 amps. if started direct on line	Star delta or Auto transformer type.

2.3.3	AC slipring type motor	Resistance type air/fan Cooled
2.3.4	AC synchronous or synchronous induction motor.	Suitable makers standard.
2.3.5	DC motor	Resistance type/Thyristor type.

- 2.4 The control gear for AC/DC motors shall incorporate the following protection devices as concomitant accessories.
- 2.4.1 No Voltage Protection - No voltage protection shall be provided so that machine will not start up again by itself when, following an interruption the supply is restored.
- 2.4.2 Short Circuit Protection - To protect against short circuits due to insulation failure of faulty connections HRC fuses 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.
- 2.5 Control equipment shall be mounted in separate drip proof enclosures. Control enclosures and compartments are to be so designed as to give adequate protection against ingress of dust, oil, coolant or chips. All control devices like contractors etc. shall be front mounted on a rigidly fabricated metal panel for ease of operation. All other electrics shall be installed that they are readily accessible when the doors and covers are opened. Hinged covers shall be interlocked with the machine tool control to prevent operation of the machine when cover is open.
- 2.6 The motor shall be totally enclosed with or without fan cooled frame. Screen protected drip proof type motor may be provided if it is mounted inside protective enclosures.
- 2.7 The electrical equipments shall comply with the requirement of Indian Electricity Act and Rules (latest).
- 2.8 All instruments shall be of the Industrial Grade "A" (IS-1248) switch board type the range of the instrument shall be such that the maximum load expected in the circuit shall produce a deflection of 60% to 80% of the full scale.
- 2.9 The supplier shall furnish 3 sets of complete electrical and electronic wiring diagrams in full details to enable the maintenance staff to locate faults in the circuits, 3 sets of part catalogues, maintenance manuals operating instructions with details of coils and windings, used in the equipment to facilitate repairs and maintenance should also be supplied.
- 2.10 For main motor class minimum "B" Class insulation shall be provided. If any other class of insulation is proposed, detailed justification for providing different class of insulation shall be given.
- 2.11 Motors shall be designed to withstand frequent starts, stops and reversals as demanded in the operation of the machine.
- 2.12 Two earthing terminals shall be provided on all electric motors including the control gear.

## 2.13 POWER SUPPLY

2.13.1 The machine shall be suitable for operation on 415 volts 3 phase 50 cycles AC 3 wire or 4 wire system with neutral solidly earthed. The supply voltage may vary up to +10% -20%. The frequency may vary up to  $\pm 3\%$ . 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 $\pm 3\%$  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 -  $\pm 1\%$  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 better.  
insulation

2.13.3 In case of machines equipped with NC, SS, CNC, Thyristor controlled devices and other sophisticated electronic gadgets including microprocessors etc. which are susceptible to power line spikes and surges, a suitable voltage stabilizer and ultra isolation transformer of adequate capacity to cover for the entire electrical load of the machine shall be offered as a concomitant accessory conforming to Specification for voltage stabilizer as mentioned in clause 2.13.2 above and isolation transformer to the parameters mentioned below.

i	Transformer ratio	1:1
ii	Winding	Copper wire wound with "F" class insulation or better.
iii	Protection	To arrest spikes and surges to the order of 3 KV for 200-400 micro seconds duration.
iv	Common mode rejection ratio	120 dB
v	Isolation	Capacitance 005 Pf: resistance greater than 1000 Mega Ohms.

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.

## **2.14      ATMOSPHERIC CONDITIONS**

- 2.14.1      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 tropicalized to work under these atmospheric conditions without any adverse effect on their performance. The temperature rise shall not reach such a value that there is a risk of injury to any insulating material or adjacent parts. The drive shall be capable of operating at any one of the speeds required independent of the load in accordance with the requirements of the machine.
- 2.15      Information/data shall be furnished as per the format of submission of technical bid Annexure-A.

## **3.      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 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. Stop the machine as quickly as possible without causing additional hazards. 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 - : Safety device against overload for all mechanical and electric items to the extent possible. 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:- Be of robust construction . Not give rise to any additional risk. Not be easy to by pass or render non-operational. Be located at an adequate distance from danger zone. Cause minimum obstruction to the view of the production process. Rigidly connected and not prone to rattling. 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 Ergonomically positioned for safe operation without hesitating or loss of time, and without ambiguity.
- 3.3.3 CNC Controls (where applicable) - The general requirements of CNC controls are given at Schedule-IV.

### **3.4 LIGHTING**

- 3.4.1 Integral lighting suitable for the operations concerned where its lack is likely to cause a risk despite ambient lighting of normal intensity shall be provided.
- 3.4.2 The manufacturer must ensure that there is no area of shadow likely to cause nuisance, that there is no irritating dazzle and that there are no dangerous stroboscopic effects due to lighting provided by the manufacturer.
- 3.4.3 Integral parts requiring frequent inspection and adjustment and maintenance areas must be provided with appropriate lighting. The machine lighting should be of low voltage so as to prevent any hazard to the operator.

### **3.5 MACHINE MAINTAINABILITY**

- 3.5.1 The machine shall be so designed as to require minimum possible maintenance and to give trouble free service. All assemblies/parts of the machine shall be easily accessible for maintenance. 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.
- 3.5.2 The manufacturer must provide means of access e.g. stairs, ladders, cat walks etc.

to allow access safety to all areas used for production, adjustments and maintenance operations.

### **3.6 WEAR COMPENSATION ADJUSTMENT**

- 3.6.1 The original built in accuracy of the machine shall be capable of being maintained conveniently and economically by suitable adjustments for taking up wear on slides, bearings and load screws. The system of adjustments incorporated shall be explained in the offer.

### **3.7 COOLANT SYSTEM (WHERE APPLICABLE)**

- 3.7.1 Suitable coolant system with pump, motor, tank, filter etc. shall be provided. The coolant pump shall be as per IS:2161-1962. The filter shall be of reusable type and indigenously available. If reusable filter cannot be offered the filter cartridge shall be readily available in India. Source of supply shall be indicated. Adequate no. of filters for 2 years working on double shift basis shall be offered as spare. Details of the coolant system shall be indicated in the offer.
- 3.7.2 The supply of coolant shall be in ample volume. Provision to re-circulate the coolant shall be available. A chip and coolant tray shall be provided. The volume of coolant flow shall be indicated. It shall be adjustable.
- 3.7.3 An enclosure shall be provided to prevent the coolant from splashing outside the machining zone. Details of enclosure shall be provided. Specific requirements of coolant system for grinding machines etc. shall be clearly indicated.

### **3.8 LUBRICATION SYSTEM (WHERE APPLICABLE)**

- 3.8.1 The machine shall be provided with an automatic lubricating system for ensuring delivery of adequate quantity of lubricant to areas requiring continuous lubrication. Suitable arrangements must be provided for indication of failure of the lubricating system.
- 3.8.2 The system shall be provided with interlock to prevent machine operating/starting in the event of the failure lubrication system.
- 3.8.3 Reusable filters capable of filtering chips, dust particles etc. shall be provided. Indicators for showing clogged condition of filters shall be available. The filters shall be indigenously available. If reusable filter cannot be offered the filter cartridge shall be readily available in India. Source of supply shall be indicated. Adequate no. of filters for 2 years working on double shift basis shall be offered as spare.
- 3.8.4 Lubrication and filter cleaning chart shall be displayed on a metal plate at a conspicuous location on the machine indicating :-
- (a) Specific location of points on the machine to be oiled lubricated/greased.
  - (b) Periodicity of lubrication of these points.
  - (c) Filter to be cleaned.
  - (d) Periodicity of cleaning filters.
  - (e) Periodicity of replenishing lubricating oil for the centralized system.
  - (f) Any other similar relevant information.
- 3.8.5 Points where manual lubrication is needed shall be separately indicated. Frequency of lubrication shall be also clearly mentioned.
- 3.8.6 Lubricating oils used in the machine shall be available in India. Successful tenderer will be required to indicate brand names of approved oils manufactured by various Indian Oil Companies.
- 3.8.7 First fill of lubricating oils used in the machine shall be provided with the machine. Details of lubricating system provided shall be indicated.

### **3.9 PNEUMATIC SYSTEM (WHERE APPLICABLE)**

- 3.9.1 The compressed air supply will be provided by the customer at the machine within pressure range of 4.5-7.5 kg/cm<sup>2</sup> and a moisture content or 1000 ppm. The pneumatic system of the machine should be designed accordingly. An alarm shall be provided for low air pressure.
- 3.9.2 Suitable filter/moisture trap shall be provided by the contractor in the system of pneumatic air intake. The filter shall be reusable type and indigenously available. If reusable filter cannot be offered, the filter cartridge shall be easily available in India. Source of supply shall be indicated. Adequate no. of filters for 2 years working on double shift basis shall be offered as spare.
- 3.9.3 Air pressure regulator, if necessary, shall be provided by the tenderer.
- 3.9.4 The make of pneumatic control equipment shall be of reputed make. The makes shall be indicated.

### **3.10. HYDRAULIC SYSTEM (WHERE APPLICABLE)**

- 3.10.1 Hydraulic circuit must be equipped with the following safety and inspection equipments:
  - (a) Pressure gauges at all places, where pressure has to be set up or inspected.
  - (b) Safety valves for hydraulic circuit if relief valve does not fulfill this function.
  - (c) Equipment for checking of temperature in the circuit or in the pump wherever necessary.
  - (d) Arrangement to show if the filters (including those in the pump set) are choked and need cleaning. The filters shall be of reusable type and indigenously available. If reusable filter cannot be offered, the filter cartridge shall be readily available in India. Source of supply shall be indicated. Adequate no. of filters for 2 years working on 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.

#### **4.0 TECHNICAL LITERATURE:**

- 4.1 One copy of the printed illustrative catalogue showing features of the machine and its elements must be enclosed with each copy of the bid.
- 4.2 The technical literature shall be provided for the complete machine, including imported and indigenously purchased components / sub- assemblies. The successful tenderer will have to furnish 4 (four) copies each of the following manuals directly to the consignee along with the machine. Out of these 04 sets, the bidder shall be required to submit one set of all documents in best available condition one month prior to the training for the machine. One set of technical literature should cover the following details:
- Operational & Maintenance manual and trouble shooting guide of the jacks.
  - Technical & Maintenance manual for Lubrication System.
  - Wiring diagram, in which length of wires must be mentioned, hard copies in A-3 size as well as soft copy in PDF format.
  - Spare part manual including part lists no., hard copies in A-4 size as well as in PDF format.
  - assembly drawings of major assemblies

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

#### **5.0 SPARES**

##### **5.1 Spares**

- 5.1.1 Two lists of recommended perishable and non-perishable spares required for normal maintenance to cover complete range of mechanical, hydraulic and electrical equipments including controls on double shift working basis should be furnished and quoted separately. The quantities should relate to, in case of non-perishable spares, to two years normal maintenance. And in case of perishable spares to the duration of its shelf life or two years whichever is less. Shelf life should be indicated with the quotation for spares.

- 5.1.2. The following spares shall be quoted along with the offer:

(i)	Jack Nut	1 no.
(ii)	Safety Nut	1 nos.
(iii)	Screw Rod	1 no.
(iv)	Rollers for carriage	4 nos.
(v)	Set of bearings	1 set *
(vi)	Set of oil seals	3 sets *
(vii)	Limit switches	1 set *
(viii)	Set of contactors	1 set *
(ix)	Set of fuses (all ratings)	2 sets *
(x)	Indication lamps	2 nos
(xi)	Magnetic starter	1 no.
(xii)	Control Transformer	2 nos.
(xiii)	Starter contact repair kit	1 set *
(xiv)	Motor with brake	1 set *
(xv)	Control Panel complete	1 no.

**(\* one set shall consist of one no. of each type and size used in the jack)**

(i)	Set of contactors	2 sets *
(ii)	Set of fuses (all ratings)	2 sets *
(iii)	Indication lamps	2 nos

(iv)	Magnetic starter	1 no.
(v)	Cables for connecting the jacks	2 sets *

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

**6.0 CONSUMABLES:**

6.1 Consumable spares (if any) shall be specifically quoted along with their unit rate.

6.2 Consumable spares 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 as per the following format:

8.2 All Deviations shall be clearly indicated in the deviation statement as per the format of submission of technical bid Annexure-A.

**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-I shall be submitted along with the bid. The bidder must submit the exhaustive QAP incorporating the tests as given in Annexure-I along with other tests/stage inspection as followed by them.

9.2 A load test must be carried out at the manufacturer's works. Rigidity of the jacks must be demonstrated to the satisfaction of the appointed inspector/inspecting agency.

9.3 Manufacturers must have suitable facilities at their works for carrying out various performance tests on the sub-assembly/assembly/machine. The tenderer shall clearly confirm that all facilities exist and shall be made available to the inspecting authority.

9.4 A Sample Inspection Chart for inspecting the equipment shall be supplied along with the bid. The inspection chart should indicate all the tests that are carried out during the machine manufacture and also the tests to be offered to inspecting agency. The standard to which this inspection chart conforms should be clearly indicated. Against each test, acceptable limit/ range of values shall be indicated.

**9.5 The tenderer shall submit Quality Assurance Plan being followed at the manufacturer's works for ensuring quality of the products offered. In case the firm is ISO certified, a copy of valid certificate may also be enclosed with the offer.**

**10. TRAINING:**

- 10.1** 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. This training shall be free of cost.
- 11. FOUNDATION & RELATED DRAWINGS (Not applicable)**
- 11.1 SUBMISSION OF GA, FOUNDATION & RELATED DRAWINGS FOR APPROVAL:**  
Not applicable
- 11.1.1** The successful bidder shall send general arrangement drawings of electrically operated screw jacks to each consignee separately as per time schedule specified in clause 6 DELIVERY SCHEDULE CHART of section IV.
- 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 of section-IV and following stipulations.  
**The jacks supplied by the firm shall conform to said approved drawings.**
- 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 bid document**. Thus the number of days delay in submission of GA drawing plus the number of days delay in supply of machine together will be taken as the delay in supply of machine, together will be taken as the delay in supply of machine for the purpose of calculations of LD as per bid document. However if the contractor supply the machine before original delivery period as per AT 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 clarification 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, 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 Consignee 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 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 site 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 or any other facility as specified in the contract to the supplier, the supplier will report the matter to consignee. In case of delay in readiness of site on part of consignee, the same will be advised supplier accordingly.

### **12.0 INSTALLATION, COMMISSIONING AND PROVING TESTS:**

- 12.1 **Joint Check** – The contractor or his agent would be required to carry out a joint check at consignee's end, along with the consignee, before unpacking is done, to avoid subsequent complaints regarding short shipment/transit damages. It is necessary that this joint receipt inspection be done immediately on receipt of the machine by consignee & bidder's representative to avoid commissioning delays due to shortages/transit damages. After receipt of the machine as above a Joint Receipt Inspection note (JRI) as per Annexure-C of Section-VI 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. Clear covered space for storage of material/equipment on receipt and during installation & commissioning of the machine etc.
- ii. Electricity, water and compressed air for installation and commissioning of machine shall be provided free of cost.
- iii. In case 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.
- iv. The consignee shall arrange the rolling stock for prove out at their end within 3 days of the installation of the jacks

#### **The bidder shall be responsible for-**

- i. Provision of all tools and equipment, technical and unskilled manpower, material handling accessories/ equipment and material for installation and commissioning.
  - ii. The bidder should ensure the proper earthing for the machine and its peripherals/accessories.
  - iii. Commissioning and prove out of machine
- 12.3 Consignee will provide only 415 V+10%-20%, 3 phase 50 Hz $\pm$ 3% AC supply at a

single point (mains). All types of cables, connections, circuit breakers etc. required for connecting power supply point to different parts of the machine/control cabinets, shall be the responsibility of the bidder. Requirement of grounding/earthing with required material shall also be incorporated by the bidder.

Electrical work like laying of power/electrical cables & earthing wires from mains to machine control panel (up to 20 meters) as well as within the machines, with supply of all materials shall also be carried out by supplier.

- 12.4 The supplier shall demonstrate machine performance and prove out the claimed capability for successful commissioning at the consignee's works as per clause 2.2 of Section-IV. The M&P shall be deemed to be "commissioned" at consignee premises on the date when it is tested and meets with the specified capabilities/functions according to the technical specifications. Any delay in providing the input for proving out shall not be logged on supplier's account.

A Joint Commissioning Note (JCN) to this effect shall be made as per the format at Annexure-D of Section-VI. After issue of JCN the performance shall be watched for a period of one month, after which the PTC shall be issued. The issue of PTC can not be delayed by more than 60 days from the issue of JCN. If some minor breakdowns are noticed after the issue of JCN, these shall be attended as per warranty obligations and suitable extension of the warranty period, 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 with the consignee.

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

- 12.6 The performance appraisal report as per the Annexure-E of the AT immediately on completion of warranty period should be prepared by the consignee and given to the firm. Copies of this performance appraisal report should also be sent to CME. On getting the performance appraisal report, the firm will request Consignee 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.

### **13.0 SERVICE FACILITY IN INDIA AND TECHNICAL SUPPORT**

- 13.1 The tenderer will clearly spell out in the offer the facilities available with him or his agent for providing adequate after-sales service in India during warranty period in the appropriate section of Annexure 'A' of Bid Document. 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 20 years from the date of delivery of the machine at the ultimate destination to safeguard against obsolescence.

- 13.3 Tenderer who are OEM, shall undertake to supply spare parts for a period of



expected life of machine. Other tenderers shall submit undertaking from OEM for supply of spare parts for a period of expected life of the machine.

- 13.4 During warranty period, the supplier or his authorized agent shall attend for break down as soon as possible, but in no case later than 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.

#### **15.0 COLOUR**

- 15.1 The jacks and its accessories shall be painted **by high quality paint in yellow as applicable in material handling equipments.**
- 15.2 All surfaces shall be cleaned, **shot blasted** so as to be free of rust and then **painted (DFT 100  $\mu$ M)**, except mechanical mating surfaces, with two coats, red-oxide zinc-chromate primer as per IS:2074. The painted surfaces of bought out items shall not be disturbed.

#### **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 shall be guaranteed for 5 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 3405 of Bid Documents.
- 16.3 The tenderer shall ensure that in case a failure is reported by a consignee qualified service engineers shall visit the site within two days from the date of complaint on calendar day's basis. The period of three days (excluding date of complaint) after the failure reported shall be treated as grace period, which will not count towards breakdown time for up to one failure per month and a maximum of 3 failures per quarter. In case the number of failures exceeds one failure per month or three during any quarter of warranty, grace period of only 1 day will be permissible for such additional failure. Complaints shall be lodged by consignee by fax phone, e-mail or per bearer at address given by the tenderer.
- 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., the purchaser would be entitled to encash Bank guarantee towards warranty. To ensure this a record of breakdown in hours on quarterly basis should be maintained by the consignee. At the end of first and second year of warranty, these details of breakdown hours during warranty period should be advised and firm as per performance appraisal report as per for Annexure-E of section VI and the breakdown details mentioned above. If these details are not received in time, penal action for encashment of WBG as per the reliability clause should be initiated by Stores. Besides, forfeiture of warranty guarantee, the adverse performance of the supplier would be noted for deciding future tenders.

**17.0 ANNUAL MAINTENANCE CONTRACT**

17.1 Tenderers are required to quote for a comprehensive Annual Maintenance Contract for each set of jack supplied against this specification for a period of five 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 of five years vide clause 16.1 as stipulated in 'warranty obligations' requirement.

17.2 AMC shall be operated, managed and paid by the consignees indicated under clause 3 of Section IV. The consignee shall indicate the bill payment authority & custodian of the AMC BG.

17.3 AMC is not part of scope of supply being an optional requirement and not included in commercial evaluation criteria vide clause 5 of section-IV. Therefore, the option to award AMC shall remain with the consignee after completion of warranty period. In case consignee wants to exercise the option of entering into AMC after warranty, then the bidder will be bound to enter into AMC .....

- (i) at the offered rates  
or
- (ii) at the negotiated rates lower than offered rates  
or
- (iii) shall participate with valid offer if the fresh tender for AMC is floated by the consignee.

Failing which Consignee shall encash the Warranty Bank Guarantee of the bidder

The detailed terms and conditions of AMC shall be as given in following clauses.

17.3.1 The duration of AMC shall be 5 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 AMC should include complete responsibility for the bought out sub-assemblies and components like CNC system, diesel engine, AC unit etc.

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	ITEMS TO BE CHECKED	ITEMS OF REPL	EXPECTED PLANT DOWN TIME
--------	-----------------------------	-------------	---------------------	---------------	--------------------------

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 The tenderer shall ensure that in case a failure is reported by a consignee, qualified service engineers visit the site within 3 days from the date of complaint on calendar days' basis. This period of 3 days (excluding date of complaint) after the failure report shall be treated as grace period, which will not count towards plant down time for upto one failure per quarter and a maximum of 4 failures per annum. Incase, the number of failures exceed one during any quarter or four during any year of AMC, grace period of only 2 days will be permissible for such additional failures. 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 Incase preventive maintenance is carried out along with 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 quarterly payment period.

S.N	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 there of) reduction in availability of plant below 80%.

17.3.8. A Bank Guarantee equal to  $\frac{1}{4}$  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 5 years 6 months. The bidder can submit multiple BG for lesser duration to cover the period of 5 year 6 months ensuring the uninterrupted validity of the AMC BG for 5 year 6 months. The confirmation for the submission of this BG will be returned on completion of AMC period. Incase, the tenderer fails to provide AMC services successfully, the AMC BG will be forfeited. This will be in addition to penalty as 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 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 in compliance of clause 5.1.2 or any other valid document. 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<sup>th</sup> 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:
- a. Consignee's certificate for work done as per Annexure-G of Section-VI with calculation of down time and penalty applicable.
  - b. A certificate by consignee that no spare part is due with the tenderer as per clause 17.3.10 above.
  - c. Bills submitted by the tenderer & accepted by consignee.
  - d. Attested photocopy of the AMC BG.
- 17.3.12 The AMC contract can be terminated in following ways:
- i. 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 IRS Condition of Contract.

**SCHEDULE – IA**  
**(For 35 T Jack)**

**NOTE:** No deviation will be permitted against item 1.1, 1.2, 1.3. Other parameters are approximate and minor variations can be permitted.

**1. LEADING PARAMETER**

**Major Parameters**

1.1	Duty classification	:	Heavy Duty
1.2	Load capacity of each jack	:	35 T
1.3	Total lift of claw (Min.)	:	1760 mm

**Other Parameters**

1.4	Maximum height of lifting head from ground level	:	2655 mm
1.5	Minimum height of lifting head from ground level	:	895 mm
1.6	Dimension of lifting head	:	280 x 200 mm(Approx.)
1.7	Ground clearance when resting on wheel	:	20 mm (min.)
1.8	Hoisting speed (min.)	:	200 mm/ min.
1.9	No. of jacks required	:	1 set consisting of 4 nos. + 1 no. spare ( Total 5 nos.)

**1.10 Other Requirements**

- 1.11 The lifting head shall be movable type, the dimensions for movement shall be got approved from the consignee at the time of GA drawing approval. (refer clause 1.2.2.8, 11.1 & 11.2 of technical specs)
- 1.12 The dimensions of lifting head projection from face of column should be got approved from consignee at the time of GA drawing approval (refer clause 11.1 & 11.2), based on require

SL No.	Description	Value
1	Lifting Capacity of each jack (one set consist of 4 nos.+01 nos. as spare = Total 05 nos.)	35 Tonne
2	Total lift of claw (minimum)	1760 mm
3	Maximum claw height from ground level	2655 mm
4	Minimum claw height from ground level	895 mm
5	Dimensions of lifting head	280 x 200 mm (Approx.)
6	Ground clearance when resting on wheels	20 mm
7	Hoisting speed approx.	200 mm/minute

**Note:**

- A) This dimension may vary due to design. The offered jacks, therefore, should be so designed that body of the jack should be clear of all parts of bogie to enable running out of bogie when under frame is lifted without having to dismantle any bogie component or fitting.
- B) The dimensions of lifting head projection from face of column should be got approved from consignee at the time of GA drawing approval (refer clause 11.2), based on requirement.
- C) The bidders offering the jacks, if so required, can visit the site at consignee's end before submitting the offer.

## Schedule-II

1. **Information to be supplied by tenderer**
  - 1.1 Motor power (KW)
  - 1.2 Net weight of each jack
  - 1.3 PVC cable, make, type of insulation & rating
  - 1.4 Overall dimensions
  - 1.5 Effective length of electric cable from master control of jacks
- 1.6 Screw rod:
  - i) Helix angle
    - ii) Pitch
    - iii) Major diameter
    - iv) Minor diameter
    - v) Pitch diameter
    - vi) Type of thread
    - vii) Thread angle
    - viii) Flank angle (inclination of flank)
    - ix) Material specification
  - 1.7 Nut
    - i) Height of nut
    - ii) Major diameter
    - iii) Minor diameter
    - iv) Pitch diameter
    - v) Material specification
  - 1.8 Gear box
    - i) Number of stages of reduction
    - ii) Type of gears in each stage
    - iii) Reduction per stage
    - iv) Total reduction
    - v) Input speed
    - vi) Output speed
    - vii) Material specification of gears
  - 1.9 Weight of lifting head
  - 1.9 Chain/V Belt Drive
    - i) Reduction ratio
  - 1.10 Efficiencies
    - i) Screw/nut
    - ii) Gear Box including efficiency of different stages, if there is more than 1 stage efficiency of each stage should be indicated separately as also the combined efficiency of all the stages.
    - iii) Chain/V Belt drive
    - iv) Thrust bearing
    - v) Motor

### Schedule-III

Following shall be the tools to be supplied along with each set of coach lifting **jack** for the maintenance of electrical and mechanical parts.

#### **I. Tool set for maintenance of electrical parts**

- a. Double ended open jaw spanners made of Chrome Vanadium Steel and chrome plated conforming to IS:2028-1981 or latest. One number each in sizes 6x7, 8x9, 10x11, 12x13, 14x15, 16x17, 18x19 and 20x22mm.
- b. Tubular box spanners made of steel tubing and zinc plated with Tommy bar in the sizes indicated above (clause a).
- c. Combination side cutting pliers made of Chrome Vanadium Steel and chrome plated conforming to IS:3650 -1981 or latest with insulated handle of size 200mm – 1 no.
- d. Adjustable wrench, made of Chrome Vanadium Steel and chrome plated conforming to IS:6149 -1971 or latest of size 200mm – 1 no.
- e. Screw drivers suitable for use by electrician with insulated blade, handle made of high impact insulated material and blade made of suitable steel of sizes (mm) – 1 no. each.

Blade size : 3x50	4x125	5x200
Holder size : 18x75	18x75	22x90
Tip size : 0.5x3	0.4x4	0.8x5
- f. Long nose pliers made of carbon steel size 150mm conforming to IS:658-1970-1 no.
- g. Allen head wrench made of Chrome Vanadium Steel and burnished finish conforming to IS: 3082-1988 in sizes of 2, 2.5, 3,4, 5, 6, 7, 8, 0 and 10mm -1 each.
- h. Any other tool as considered necessary for maintenance of electrical parts.

#### **II. Tool Set for Maintenance Mechanical Parts**

- a. Double ended open jaw spanners made of Chrome Vanadium Steel and chrome plated conforming to IS 2028 – 1981 or latest. One number each in sizes 6x7, 8x9, 10x11, 12x13, 14x15, 16x17, 18x19, 20x22, 21x23, 24x26, 25x28 and 27x32mm – 1 no. each.
- b. Bi hexagon ring spanners shallow offset made of Chrome Vanadium Steel and chrome plated conforming to IS 2029-1981 or latest. One number each in sizes indicated above (clause a).
- c. Long nose pliers made of carbon steel size 200mm conforming to IS:5658-1970 -1 no.
- d. Allen head wrench made of Chrome Vanadium Steel and burnished finish conforming to IS:3082 -1988 in sizes of 2, 2.5, 3, 4, 5, 6, 7, 8, 9, 10,12 and 14mm – 1 each.
- e. Adjustable wrench, made of Chrome Vanadium Steel and chrome plated conforming to IS:6149-1971 or latest of size 300mm – 1 no.
- f. Screw drivers suitable for mechanical work, handle made of high impact insulated material and blade made of suitable steel of sizes (mm) – 1 no. each

Blade size : 6x75	8x150	10x250
Holder size : 22x90	29x110	33x125
Tip size : 0.6x6	1.2x8	1.6x10
- g. Grease gun with adopter to suit the grease nipples provided on the jack - 1 no & Oil can - 1 no.
- h. Ball peen hammer of weight 500 gms. with handle conforming to IS: 841-1983 - 1 no.
- i. Any other tool as considered necessary for maintenance of mechanical parts.



## SECTION VI

### ANNEXURE-A

#### **FORMAT FOR SUBMISSION OF TECHNICAL BID**

- We, M/s.----- offer our ----- machine, model no----- as per the description given in Schedule of Requirements. We further state that, except for the following, for which clause wise brief description and justification for deviation has been indicated, our machine fully complies with all the clauses as given in technical specification Section-V and we also confirm all the schedules given in the Delivery of **Section-IV**. :

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

**Note1:** In case there is a contradiction in any information provided (some parametric values given in the specification and those given in the brochure or some other document enclosed by the tenderer), unless specifically mentioned in the deviation cum confirmation statement under Annexure A of Section VI, the values as given in the specification shall be taken as confirmed by the tenderer and offer evaluated accordingly.

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

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

(B) We have made the following past supplies of similar machines as per clause 1.2 of special conditions of tender.

S No.	Name of purchaser with postal address	Name of contact person with designation	Phone/ fax /e-mail nos. of contact person	Year and date of commissioning of the machine	Capacity	Lift of claw

- (C) We are submitting following performance certificate from past users as per clause 1.3 & 1.4 of special conditions of tender.

S.N.	User Name	Date Supplied	Date of issue of certificate	Application / Use	Capacity	Lift of claw	Performance

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

- After sales service centers:
- Availability of technically competent engineers;
- Warehousing facilities for spares:

- We have quoted for the following optional accessories as indicated under clause 4.3 of section IV

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

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

Perishable Spares

Sr No.	Description of the spares	Part number	Quantity (In Nos.)	Rate (In Rest.)	Shelf Life (in Months)

Non perishable spares

Sr No.	Description of the spares	Part number	Quantity (In Nos.)	Rate (In Rest.)

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

**OR**

\*We hereby confirm that we are not the OEM, but are submitting undertaking from OEM for supply of spare parts for a period of expected life of the machine to provide maintenance spares (as and when ordered) after the expiry of the Warranty/AMC for 18 years including the maintenance spares required for the bought out sub-assemblies and parts.

(\* Strike out whichever is not applicable)

7. We have quoted consumables required as per clause 6.1 of Section V of Bid document, in the format give below

Sr No.	Description of the consumable spares	Qty	Unit	Rate

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

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

Sr No.	Description	Item no.1	Item no. 2	Item no. 3
1.	Brief description of item			
2.	Model no.			
3.	Make			
4.	Quantity/machine			
5.	Manufacturer's name and complete address			
6.	Whether imported or indigenous			
7.	Country of origin			

10. We further submit the following information about the offered machine as per the technical specification section VI and Important Features of the tender section IV. We understand that any omission of any of the below mentioned information will render our offer incomplete to that extent.

S.N.	Information required	As per Clause No.	Value /Write up/ Brochure
1.	Leading Parameters	2.1 (section-IV)	values
2.	Technical Details/Particulars of Motors, Control Gears, Voltage Stabilizer & Isolation Transformer		
2.1	A.C. Motors and Control Gears <b>AC MOTOR</b>		Values/write up

	<ul style="list-style-type: none"> <li>• Manufacturer's Name</li> <li>• Type of enclosure</li> <li>• Type of duty (Ref. IS: 325) (Latest)</li> <li>• Rating-Continuous/intermittent</li> <li>• Output (KW/BHP)</li> <li>• AC voltage across phases, number of phases &amp; frequency.</li> <li>• Speed in RPM</li> <li>• Class of insulation</li> <li>• Normal full load current</li> <li>• Starting current</li> <li>• Maximum current at the time of change over from lower speed to higher speed</li> <li>• Type of motor-Squirrel cage/slipring (wound rotor)</li> <li>• Temperature rise of windings and other parts allowed above an ambient temperature of 50 degree C.</li> </ul> <ul style="list-style-type: none"> <li>• Frame size of motor</li> <li>• End use of motor</li> </ul> <p><b>CONOTROL GEARS</b></p> <ul style="list-style-type: none"> <li>▪ Manufacturer's Name</li> <li>▪ Type of control gear (Direct on line/Star Delta/Auto- transformer etc.)</li> <li>▪ Rating of starting gear in KW &amp; amps.</li> <li>▪ Short circuit protection (y/n)</li> <li>▪ No volt trip (y/n)</li> <li>▪ Overload trip (y/n)</li> <li>▪ Delayed action current sensitive single phasing preventor (y/n)</li> <li>▪ Standard specifications to which the motor control gear and its ancillary offered conform to</li> </ul>		
2.2	<p><b>D.C. Motors and Control Gears</b></p> <p><b>DC MOTOR</b></p> <ul style="list-style-type: none"> <li>• Manufacturer's Name</li> <li>• Type of enclosure</li> <li>• Type of duty (Ref. IS: 4722) (Latest)</li> <li>• Rating-Continuous/intermittent</li> <li>• Output (KW/BHP)</li> <li>• DC voltage across phases, number of phases &amp; frequency</li> <li>• Method of excitation whether shunt, series, compound or separately excited, if separately excited state excitation voltage.</li> <li>• Speed in RPM</li> <li>• Class of insulation</li> <li>• Normal full load current in amps.</li> <li>• Starting current</li> <li>• Temperature rise of windings and other parts allowed above an ambient temperature of 50 degree C.</li> <li>• Frame size of motor</li> <li>• End use of motor</li> </ul> <p><b>CONTROL GEARS</b></p> <ul style="list-style-type: none"> <li>• Manufacturer's Name</li> <li>• Type of control gear (Direct on line/Resistance type/Thyristor type)</li> <li>• Rating of starting gear in KW &amp; amps.</li> <li>• Short circuit protection (Y/N)</li> <li>• No volt trip (y/n)</li> </ul>		Values/writeup

	<ul style="list-style-type: none"> <li>Overload trip (y/n)</li> <li>Standard specifications to which the motor control gear and its ancillary offered conform to</li> </ul> Standard specification to which control gear conforms to		
2.3	<b>Voltage Stabiliser &amp; Ultra Isolation Transformer</b>  <b>VOLTAGE STABILISER</b> <ul style="list-style-type: none"> <li>Manufacturer's Name</li> <li>Type of voltage stabilizer : <ul style="list-style-type: none"> <li>a) DC servo motor type</li> <li>b) AC servo motor type</li> <li>c) Solid state</li> </ul> </li> <li>Rated capacity in KVA</li> <li>Nos. of phases &amp; frequency</li> <li>Type of input supply unbalanced</li> <li>Input voltage</li> <li>Output voltage</li> <li>Rate of correction</li> <li>Class of insulation &amp; winding (only copper wound is acceptable)</li> <li>Type of control circuitry</li> <li>Class of duty</li> <li>Type of cooling</li> <li>Indicating instruments and their ranges</li> <li>Safety features</li> </ul> <b>ULTRA ISOLATION TRANSFORMER</b> <ul style="list-style-type: none"> <li>Manufacturer's Name</li> <li>Rated capacity</li> <li>Ratio of input/output voltage</li> <li>Class of insulation</li> <li>Arrangement for suppression of power line surges, spikes, transients and noises</li> </ul> Type for cooling.		Value/write up
3.	Information against schedule-III	Schedule-III	Value
4	First fill of lubricating oil and grease, make, brand and quantity.	Clause 4.2.1.1 of section-IV	Value
5	Make and size of cables	Clause 4.2.1.2 of section-IV	Value
6	List of maintenance tools	Clause 4.2.1.3 (section-IV)	Details
7	Details and drawings of load screw, connection between load screw and worm wheel, lifting head design	Clause 1.1.8 (section-V)	Write up /Drawing

8	Factor of safety	Clause 1.1.10 (section-V)	Value
9	Cross sectional drawing of various stiffeners	Clause 1.2.1.2 (section-V)	Drawing
10	The surface finish and hardness of upright column	Clause 1.2.1.4 of section-V	Values
11	Material and Hardness of carriage rollers	Clause 1.2.2.2 & 1.2.2.3 (section-V)	Write up/values
12	The arrangement of lifting arm and set of rollers	Clause 1.2.2.5 of section-V	Drawing
13	The details of moving claw	Clause 1.2.2.8 of section-V	Drawing

14	Material, hardness and type of threads of load screw	Clause 1.2.3 (section-V)	Values/write up
15	The arrangement to prevent rotation of the safety nut with respect to the load nut, and its wear compensation.	Clause 1.2.3.6 (section-V)	Write and drawing
16	Make of gear box	Clause 1.2.4.2 of section-V	Detail
17	Motor power calculations of motor	Clause 1.2.4.5 of section-V	Write up
18	Calculations for screw rod, nut diameter, nut stress calculations and information on permissible stress of material used.	Clause 1.2.4.6 of section-V	Write up
19	The details on maneuverability of jacks	Clause 1.2.6.5 (section-V)	Drawing
20	The details of arrangement to monitor the wear of lifting nut	Clause 1.2.6.6 (section-V)	Write up
21	The details of lubrication system	Clause 1.2.7.1 (section-V)	Write up

**Signature of the authorized representative of  
the bidder with company stamp**

## ANNEXURE-B

### FORMAT FOR INDEMNITY BOND

This deed of Indemnity executed by M/s. ----- hereinafter referred to as Indemnifier' which expression shall, unless repugnant to the context or meaning thereof, include its successors, administrators, representative and assignees in favour of ELS/ED. hereinafter referred to as the 'Indemnified' which expression shall unless repugnant to the context or meaning thereof, include its successors and assignees witnesses as to.

Whereas the Indemnifier herein had participated in a global tender for the supply of ----  
----- (machine name) which is opened on ----- (date) on terms and conditions set out interalia in the Tender Document.

And whereas, clause of the above mentioned tender document described that the machine shall be designed for a life of 20 years with regular maintenance and all the structural members of the machine should be guaranteed for 5 years against cracks, breakages etc. during the course of normal operations from the date of commissioning whichever is earlier of the stores supplied by the Indemnifier to the indemnified.

The indemnifier hereby irrevocably agrees to indemnify the indemnified that in the event of the said machine not achieving the life guarantee, the indemnifier shall as may be deemed necessary repair the defective machine at site, free of cost, within a reasonable time specified by the indemnified or reimburse the pro-rata cost of the machine to the extent a life not achieved as per the guarantee, or supply a spare stores for the defective portion only free of cost at site.

Bidder's authorized signatory  
With seal

Station:

Date:

Witness: 1. -----  
(Signature with Name, Designation & Address)

2. -----  
(Signature with Name, Designation & Address)

**ANNEXURE-C**

**JOINT RECEIPT INSPECTION NOTE**

Date.....

Sub: Receipt of consignment for machine.....

Ref: Contract No.....

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

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.	<b>Status of readiness of foundation:</b>	
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	
7.	Likely date for switch-on the machine	
8.	Likely date of completion of commissioning of the machine	

Representative of firm  
Designation

Representative of consignee  
Designation  
(Minimum Gazetted level)

**ANNEXURE –D**

**JOINT COMMISSIONING NOTE**

Date:.....

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

**Ref:** PO No.....

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

6. All the parameters of the machine are found okay. The proving test on the machine was conducted from ..... to..... and machine is working satisfactorily.
7. Machine has finally been commissioned on..... The machine has been handed over for regular use and kept under one month observation to watch its performance.
8. Following minor deficiencies (if any) found during joint observation trials are to be attended/rectified by the firm during one month observation and before issuing the PTC for the machine:
  - a.
  - b.
  - c.

Representative of firm  
Designation

Representative of consignee  
Designation  
(Minimum Gazetted level)



**ANNEXURE –E**

**PERFORMANCE APPRAISAL FORM**

**APPRAISAL ON COMPLETION OF \_\_\_\_\_ YEAR of WARRANTY PERIOD**

**To, M/s. ....**

**Dated .....**

1.	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.	<b>Performance during warranty period:</b>	
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, of the machine with mandatory PMC during warranty period, following details of breakdown hours for preceding eight quarters must also be furnished.

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

**Signature-----**  
**Name-----**

**Designation: /Sr.DEE**  
**Office Stamp**

**Note:**

- i.) This appraisal may please be sent immediately on completion of first and second year of warranty period. If any extension of warranty period required, may please also be mentioned with details.
- ii) Sr.Scale Officer having independent charge is also authorised to sign.

**ANNEXURE-F**

**LIST OF COMPONENTS TO BE LOADED ON THE MACHINE**

S.No.	Component	Drawing No.	Part/PL. No.	Machining Operations to be carried out
	NOT APPLICABLE			

**ANNEXURE-G**

**Consignee's Certificate for Quarterly Work Done Under AMC**

1. Name of Plant: \_\_\_\_\_
2. Consignee \_\_\_\_\_
3. PO No. \_\_\_\_\_
4. Name of Contractor \_\_\_\_\_
5. Quarterly charges for AMC(Standard): Rs. \_\_\_\_\_  
As per PO No. \_\_\_\_\_ dt. \_\_\_\_\_
6. Quarter for which bills are preferred: \_\_\_\_\_  
From: \_\_\_\_\_ To: \_\_\_\_\_
7. No. of Breakdowns during the quarter: \_\_\_\_\_
8. **Calculation of Penalty and Net AMC charges payable to Contractor for the quarter:**
  - i. Total Plant Down Time (in days): \_\_\_\_\_
  - ii. Standard down days for preventive maintenance (in days/quarter): \_\_\_\_\_
  - iii. Total grace period for break down: \_\_\_\_\_
  - iv. Net down time for the plant [= (i)-{(ii)+(iii)}] : \_\_\_\_\_
  - v. 100% Availability for the quarter (in days) : \_\_\_\_\_
  - vi. Actual availability [= (v)-(iv)] : \_\_\_\_\_  
Actual availability in %age [= {(vi) / (v)}x 100]: \_\_\_\_\_
  - vii. Calculation of penalty:
    - a. %age availability below 90% to 80%: \_\_\_\_\_
    - b. %age availability below 80%: \_\_\_\_\_
    - c. Penalty[={ (vii a)x(5)x0.005 +(vii b)x(5)x0.01}]: \_\_\_\_\_
  - viii. Net amount payable as AMC charges to [= (5)-(vii c)] \_\_\_\_\_

It is certified that all spares borrowed by the contractor for the previous quarter have been returned in good condition.

**Signature of authorized representative of consignee**

## SPECIAL CONDITIONS OF TENDER

### 1 REFERENCE CLAUSE:

- 1.1 The tenderer should provide satisfactory evidence acceptable to the purchaser, to show that he is a regular manufacturer and has adequate plant and manufacturing capacity and a "Quality Assurance Programme". The information as per Annexure -2 under bid document may please be furnished. The manufacturer should have acquired and have valid ISO:9001 certificate at the time of opening of tender.
- 1.2 To qualify for placement of orders for 35 T jacks, the bidder must have supplied at least two sets (one set consisting of minimum four jacks) of Electrically Operated synchronized Screw Jacks of 35 T or higher capacity having lift of lifting head not less than 1.5 meters during the last ten years. Such bidders shall qualify for 35 T jacks and Purchase order number along with copies of purchase orders, quantity supplied, date of supply, date of commissioning and their performance certificate must be submitted. Details of parameters/specification of the supplied jacks should be indicated by the tenderer to prove same/similarity aspect of the machine.
- 1.3 Performance certificate of at least one such set of jacks (which are counted for qualifying purpose) having lift of lifting head not less than 1.5 meters supplied during the last ten years and working satisfactorily for at least one year from the date of commissioning shall be enclosed with clear signature and address of the purchaser/firm using the machine. The certificate shall preferably not be older than one year from the date of opening of tender.
- 1.4 All necessary information/ documents required for establishing reference requirement as per clauses above should be submitted by the bidder along with original offer itself. No clarification/ correspondence will be sought/ entertained in this regard. In case no information or incomplete information is furnished by the bidder, their offer will be summarily rejected.
- 1.5 OTHER ITEMS TO BE QUOTED

The following items will need to be quoted additionally though will not be part of commercial evaluation:

- (i) Optional Accessories with breakup of individual items as specified in clause 4.3 of section IV
- (ii) Spares with break up of individual items as per clause 5 of section V
- (iii) Consumables as per clause 6 of section V with break up of individual items as applicable.
- (iv) Rate of the AMC for the next 5 years

THOTTUPURATH  
H SANKARAN  
UNNIKRISHNAN  
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SANKARAN  
UNNIKRISHNAN  
Date: 2026.04.18  
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