

bell shall be provided to caution to the workers in cabin operated cranes. A continuous ringing bell shall be provided for all motions of the crane. In case of pendant operated crane, alarm shall be provided for any of the motions operated from the pendant. Details of alarm system provided shall be explained in the offer (DG).

2.21.1.1 In case of single girder crane, alarm shall be operated through separate push button from pendant. Details of alarm system provided shall be explained in the offer (SG).

2.22 FEATURES OF AC DRIVE (APPLICABLE FOR VVVF DRIVE CRANES)

2.22.1 Inverter offered should be suitable for crane application for all motion.

2.22.2 Inverter rated O/P current should be at 45 degree centigrade ambient and maximum over temperature shall be 55 degree centigrade.

2.22.3 Drive sizing should be done accurately after considering the ambient temperature, type of panel, environment condition, etc. and deration on any account viz temperature / carrier frequency, or other factors should be considered and should not exceed 15 % of rated O/P current of inverter offered.

2.22.4 The drive should be capable of taking 125 % overload for one minute at the creep speed of 20 % and at full speed as per crane IS standard for crane.

2.22.5 Inverter offered should have slip compensation feature in both up/down motions (even during regeneration).

2.22.6 Inverter offered should be with built in modes of control strategies viz standard V/F, OPEN LOOP VECTOR (REAL SENSORLESS VECTOR) AND MAGNETIC FLUX VECTOR so that the same inverter is used for all motions selecting the control mode. This should minimize spares inventory and training costs. However for hoisting the drive should be operated in Magnetic flux vector control and open loop brake sequence system. Brake release should be through torque base sensing.

2.22.7 Inverter offered should be provided with accurate brake coordination signals.

In addition to above crane specific features the inverter shall offer for the following.

2.22.7.1 Overload current capacity	150% of rated output current for one minute.
2.22.7.2 Maximum output voltage	3 phase, 380/400/440/460V (Proportional to input voltage)
2.22.7.3 Maximum O/P frequency	400 Hz (programmable)
2.22.7.4 Rated input voltage and frequency	3 Phase, 380 to 460V, 50/60 Hz.
2.22.7.5 Allowable voltage fluctuation	+10% to -15%
2.22.7.6 Allowable frequency fluctuation	+5% to -5%
2.22.7.7 Control Method	High carried freq. (low noise) sine wave PWM technique.
2.22.7.8 Starting torque	150% below 1 Hz. (150% at 0 RPM with PG)
2.22.7.9 Speed control range	100:1 (1000:1 with PG)
2.22.7.10 Speed control accuracy	+/-0.2% (+/-0.02% with PG)
2.22.7.11 Speed response	20 to 30 rad. per sec.
2.22.7.12 Torque limit	Settable through programme (parameter)
2.22.7.13 Output freq. Resolution	0.01 Hz.
2.22.7.14 Freq. Setting signal	+10 to -10 V, 0 to 10 , 4-20 mA, INC/DCR through PB (Programmable).
2.22.7.15 Acceleration/deceleration time	1.1to 6000 sec. (Can be set independently). Four rates should be possible.
2.22.7.16 Braking torque	Approx. 20% (approx 125% when using braking resistor)
2.22.7.17 Main control functions	Auto tuning Drop control DC injection braking Slip compensation S-curves Speed search Excess torque detection

Torque limit

Full range auto torque boost

Multi step speed operation

Accl/Decl time changeover operational 3 wire
sequence Speed/torque control switch
operation Fault log.

2.22.7.18 Protective functions

Motor overload

Instantaneous over current

Fuse protection

Over voltage

Under voltage

Power loss ride through FIN overheat

O/P short circuit protection

I/P & O/P open circuit protection

Stall prevention

Ground fault

2.22.7.19 Type of Enclosure IP:21 or better

2.23 RADIO REMOTE CONTROL (RADIO REMOTE CONTROL SPECIFIED UNDER ITEM 8 OF SCHEDULE -I)

2.23.1. For Radio Remote Control operated EOT crane tenderers should quote in accordance with the following parameters :-

2.23.1.1 The wireless control facility shall incorporate control of movements in all directions, with speeds identical to those provided for the cabin/pendant control. The facilities shall be provided in the set for Radio Frequency adjustments within 335-336 M Hz or 865-866 M Hz range which are to be advised to the supplier by consignee on allotment of such frequency by the Department of Communications.

2.23.1.2 The facilities to be provided shall incorporate but need not be limited to the operations features listed below :

- i. Emergency stop.
- ii. Emergency Alarm.
- iii. Normal ON / OFF control.
- iv. Micro / Normal speed switches.
- v. Directional movement control switches.
- vi. Radio / Normal control selection switch.
- vii. Overall weight of equipment to be carried by operator not to exceed 2.5 kgs.

The system shall be so designed that in the event of its mal functioning it should be possible for the user to switch over to conventional cabin/pendant control through suitable bypass switch facility.

2.23.1.3 The general scope of supply of Radio Remote Control equipment shall be as per clause 2.23.2. The leading parameters of the crane are as per relevant Annexure.

2.23.1.4 The equipment should incorporate all necessary interlocks to ensure safety under all conceivable operating conditions, including safeguards against independent operation while in tandem mode and vice-versa.

2.23.1.5 The supplier shall undertake to coordinate with Department of Communications for allotment of required radio frequencies, duly getting all actual user applications etc. filled in by the consignee and conducting all necessary liaison with (other than Railways) agencies for this purpose.

2.23.2 SCOPE OF RADIO REMOTE CONTROL

2.23.2.1 Scope includes supply and installation of Radio Remote Control system suitable to operate EOT crane as per particulars given in relevant schedule.

2.23.2.2 The scope of supply shall consist of

- (i) Radio Remote Control
- (ii) 1 no. Transmitter-Joy stick type or Push button type.
- (iii) 1 no. Receiver.
- (iv) 1 no. Antenna and cable.

Signature Not
Verified

Digitally signed by
LALIT KUMAR
SAHOO
Date: 2026.01.08
18:54:45 IST
Reason: IREPS-CRIS
Location: New Delhi

अभियंता (क.च.स्टा.) बिलासपुर
SSE / TRS / Bilaspur

ए.वि.इजी. (क.च.स्टा.) बिलासपुर
DEE / TRS Bilaspur

- (v) Two sets of Ni-Ah rechargeable batteries
- 2.23.2.3. 1 no. Battery Charger (suitable to charge one set of batteries at a time).
- 2.23.2.4. The remote control UNITS shall have following features for following motion :-
- | | | |
|-------|-----------------|------------------|
| (i) | MAIN POWER | ON / OFF |
| (ii) | MAIN HOIST | ONE SET |
| (iii) | AUXILIARY HOIST | ONE SET |
| (iv) | LONG TRAVEL | ONE SET |
| (v) | CROSS TRAVEL | ONE SET |
| (vi) | EMERGENCY STOP | ON / OFF CONTROL |
| (vii) | BUZZER | ON / OFF CONTROL |
- 2.23.2.5. Each transmitter shall not weigh more than 2.5 kg and shall be provided with a shoulder belt and shall be in IP65 enclosure.
- 2.23.2.6. The system shall be microprocessor based.
- 2.23.2.7. The system shall have self-diagnostic feature with LED display.
- 2.23.2.8. For ease of maintenance the cards should be easily replaceable type.
- 2.23.2.9. The transmitter shall have indication for low battery. The battery should not be get discharged, have longer life and before reaching discharge level it should give visual indication.
- 2.23.2.10. The system shall be suitable for operation of 335-336 M Hz or 865-866 M Hz frequency range with a provision of fine adjustment.
- 2.23.2.11. The range of operation should be adjustable from 0 to 100 meters.
- 2.23.2.12. Frequency of operation of the Remote Control Units shall be indicated in the offer.
- 2.23.2.13. Tenderer shall ensure adequate supply of spares and availability of maintenance support within country.
- 2.23.2.14. The tenderer shall be responsible for commissioning the above system.
- 2.23.2.15. Equipment supplied should be certified by internationally recognized international inspection agency.
- 2.23.2.16. **LOAD GAUGE :** Each crane must be provided with load gauge / digital weight indicator system for each hoist. i.e. 02 nos. of Load Gauge / Weighing system for each crane. Load Gauge / Digital weight indicator system should be able to do the measurement of load lifted in Main Hoist and Aux. Hoist. One gauge for Main hoist and second gauge for Aux. Hoist. The digit of weighing machine should be minimum 12 inch height. It should give the reading in Ton with an accurate up to one digit after point. The digit should be red in colour with dual side display (both side) and should be placed near the operator cabin for easy readability. A separate buzzer and light system must be provided to indicate over load by audio visual system.
- 2.23.2.17. All the safety features must be displayed in a Screen fitted in the cabin of the operator cabin. The screen should give the information about the proper working of all the limit switch, all Brake (Thruster) condition , All Motor condition , All VVVF drive condition should be displayed in the screen. The colour screen should be minimum 12 inch. Suitable Sensor for the same must be provided for the same

3. GENERAL CHARACTERISTIC: Covered under para-1 above.

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) Colour 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 of the Crane .
- Instruction & Maintenance manual for Hydraulic Oil Cooling Unit.
- Technical & Maintenance manual for Lubrication System.
- Electric Circuit diagram, in which length of wires must be mentioned, hard colour copies in A-II size as well as soft copy in PDF format. (which clearly shows the position**

of all type of electrical components in Crane).

- v. Mechanical drawings, hard copies in A-1 size as well as soft copy in PDF format.
- vi. Spare part manual including part lists no., hard colour copies in A-4 size as well as in PDF format.
- vii. Repair and troubleshooting guide.

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

5.0 SPARES & MAINTENANCE TOOLS

- 5.1 Maintenance spares as per Schedule IV.
- 5.2 Maintenance Tools as per schedule-V

6.0 CONSUMABLES: Not Applicable.

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. INSPECTION AND TESTING AT MANUFACTURER'S WORKS:

- 9.1 The crane shall be inspected and tested during different stages of its manufacture, starting from raw-materials till the completion of the crane, by the Purchaser or his authorized representative at the supplier's or his sub-supplier's works. The Quality Assurance Programme will be as per Annexure-I. However, the purchaser or his authorized representative is free to institute any further checks also, if he so desires, and shall be in no way binding on the Purchaser.
- 9.2 All electrical and mechanical equipment shall be tested in accordance with the appropriate Indian Standard at either the crane maker's or equipment manufacturer's works and test certificates provided if required by the Purchaser or his representative.
- 9.3 SECR reserves the right for surveillance inspection of firm after placement of order to assess the ongoing process of manufacturing and facilities available with them. In case the inspection team observes the deficiencies/ deterioration in infrastructure/manufacturing capability at the firm's premises, the action can be initiated as considered appropriate on merit.
- 9.4 The complete machine shall be inspected at manufacturer's premises as per approved GA drawing. Inspecting authority shall not carry out the final inspection in case the consignee does not approve GA Drawing.
- 9.5 The Manufacturer shall produce invoices of bought out items/sub-assemblies to ensure genuineness of such products / verification by the Inspecting agency.

10. TRAINING:

- 10.1 Technical experts from manufacturer will fully and adequately provide training to operation and maintenance staff nominated by consignee at the time of commissioning of crane. Minimum 10 man days of training at consignee premises will be provided to minimum of 10 staff. This training shall include crane architecture, systematic methods for quick diagnosis of problems and quicker methods to solve them, domain knowledge, Crane Operation and safety procedures to be followed while working with crane. Separate Certificate should be issued by the firm for training to each trainee.

11. GENERAL ARRANGEMENT & RELATED DRAWINGS

11.1 SUBMISSION OF GENERAL ARRANGEMENT & RELATED DRAWINGS FOR APPROVAL:

- 11.1.1 The contractor shall depute their engineer to take accurate measurement of span and other fixed dimensions of gantry at site jointly with consignee before submission of GA drawing and incorporate the dimensions measured at site in the GA drawing to be submitted to consignee for approval.

- 11.1.2 The Contactor will be required to submit the following drawings in 2 copies to Sr. DEE/TRS/BSP/

SECR as per time schedule specified in clause 7 of section-IV

- i) The general arrangement drawings containing all information as described at item 24 of Schedule -II.
- ii) General lay out drawing of the trolley. (DG) and Hoist (SG).
- iii) Assembly drawings of individual drives like hoists, long travel, cross travel.
- iv) Sub assembly drawings for wheels, Hook blocks and hoist drum. In case of Ramshorn hook (wherever specified under schedule-I) for Main Hoist, the contractor shall collect the Drawing of lifting DS to be used with crane from consignee and the Ramshorn hook shall be compatible to the lifting tackle.
- v) Wiring diagram showing the wiring for the complete crane including the following:
 - a) Electrical equipment layout drawings along with rating of items used.
 - b) Current collection arrangement for the crane.
 - c) Power supply arrangement to the trolley and attachments.
- vi) Lubrication system for the complete crane.
- vii) In addition to the above, the contractor will submit detailed calculations for selection of Motor, Reducer, Brake coupling, Bridge girder, End carriage and their connection to Sr. DEE/TRS/BSP/SECR with their detailed drawings.

The drawings mentioned at (i), (ii) and (iv) shall be got approved by the contractor from the consignee and cranes supplied by them shall conform to said approved drawings. The drawings should be legible and is minimum A3 size.

- 11.1.3 The supplier shall furnish to the consignee five prints of all erection drawings showing the marked numbers with weights of various items to be assembled at site, schedule of site bolts, rivets and special welding electrodes, welding techniques and erection instructions.
- 11.1.4 Supplier shall give to the consignees the breakup of weights of different consignments of crane for the purpose of unloading at site.

11.2 APPROVAL OF GA DRAWING

To be governed by Time Schedule in clause 7 of section-IV and following stipulations.

- 11.2.1 General Arrangement Drawings will be sent by the 'Contractor' to the Consignee as per Time Schedule annexed in LOA/AT/Contract/PO. Consignee will download the copy of LOA/AT/PO/Contract from IREPS website and take necessary action for approval of GA drawings. 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/PO/Contract/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 NIT. Thus the number of days delay in submission of GA drawing plus the number of days delay in supply of machine together will be taken as the delay in supply of machine, for the purpose of calculations of LD as per NIT. 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 clarifications to the firm together at one time only instead of piecemeal multiple reference.
- 11.2.4 A repeat back reference(s) by Consignee to Contractor pointing out further defects/deficiencies in the Drawings, will be considered a delay on account of the contractor, 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 as per requirements of the Consignee.
- 11.2.5 Where GA Drawing cannot be prepared due to clear site not being available etc., the Consignee must inform Contractor and Sr. DEE/TRS/BSP/SECR, explaining the exact delay. In both cases, however, initiative must be taken by Contractor to obtain such a certificate from Consignee. Contractor must bring any difficulty/dispute to the notice of Sr. DEE/TRS/BSP/SECR immediately.
- 11.2.6 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.

- 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 crane to assess the condition of path to be used for movement of trailer.

11.3 DISPATCH OF CRANE FROM MANUFACTURER'S WORKS

- 11.3.1 The supplier and consignee will ensure that facilities as defined in AT necessary at site for commissioning of crane e.g. clear site with gantry, electrical power from mains to DSL are ready before dispatch of crane. The crane shall be dispatched by the supplier only after all the on-site requirements from supplier side as well as consignee side, for commissioning the crane on arrival, have been made ready. The supplier and consignee shall record a joint note certifying this. This joint note shall accompany receipt note and the bill for 80% payment.
- 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 Sr. DEE/TRS/BSP/SECR and Store
- 11.3.3 The packing of crane components shall be as stipulated in NIT. However structural parts viz box girder, platform, crab chassis, and carriages and maintenance cabin being voluminous in sizes may be supplied without packing. While all other mechanical and electrical parts should be supplied suitably packed.

12. 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 RESPONSIBILITY OF CONSIGNEE AND BIDDER

- 12.2.1 **Consignee's obligation with regard to erection & commissioning will be limited to the following:**

- i) Supplying following free of cost at the site of work.
 - a) Electricity required for the purpose of erection/ lighting.
 - b) Test loads with slings and tackles for performing the load tests.
 - c) The provision of stepladder at gantry end, for going up the gantry rails.
 - d) Supply and erection of cables from mains to DSL (Down shop leads) shall be provided by consignee.
- e) The inspection of foundation, structures etc. and installation of the machine shall be done by authorized representative of the consignee (wherever applicable).

12.2.2 Following items of work shall be performed by the Contractor

- i) Unloading and transporting materials free of cost from the manufacturer premises to the work site.
- ii) Checking of alignment of gantry railat site. Any rectification required, however, will be done by the purchaser
- iii) Installing of the crane structure and associated machinery in position.
- iv) Complete fitting and wiring of all electrical items.
- v) Fixing of down shop leads wherever required.
- vi) Safe storing of the material supplied by manufacturer until commissioning of machine.
- vi) Commissioning of the equipment. The crane performance shall be demonstrated after successful commissioning.
- vi) Design & Construction of foundation, flooring of sufficient thickness, civil works (in line with scope of supply) suiting local soil conditions at the site as required.

- 12.3 The contractor shall arrange erection and commissioning of the cranes. Adequate number of teams of technical experts will be made available so that erection and commissioning delays are eliminated. Such personnel will be required to be present immediately as soon as the crane has been received.

- 12.4 The contractor or his agent shall commission and prove out the crane as per time schedule.
- 12.5 In the interest of early commissioning, the supplier shall ensure that minimum amount of assembly is necessary at site. Site welding and riveting shall be avoided as far as possible. The supplier, before proceeding with design details, shall satisfy himself about the site conditions so as to avoid any difficulty at the time of erection and also check the span of gantry rails.
- 12.5.1 The bidder shall be responsible for meeting all the criteria set by State Pollution Control Board and Central Pollution Control Board, wherever applicable, with respect to air, water, noise, land etc. The bidder shall be responsible for obtaining clearance/certificate for installation/commissioning/operation of the machine/system supplied. The consignee will provide the administrative help, wherever required, for establishment of communication with the Pollution Control Board.
- 12.5.2 Tenderer shall ensure that weights offered shall be as per information submitted vide schedule II. The bidder shall also ensure in its offer that range of variation in the total actual weight of the crane and quoted value in schedule II will be within + 5 %. Purchaser reserves the right to verify the total weight of the crane offered by the bidder against information submitted under schedule II.
- 12.6 Consignee shall maintain a log book for the individual activities (wherever applicable), for the machine(s) supplied against LOA/Contract/Purchase Order/Contract, commencing from the date of submission of GA drawing to issue of PTC and further breakdown records of the machine during warranty period. The log book shall contain the information viz :
- (i) Date of submission of GA drawing(s) and date of its approval.
 - (ii) Date of request received from supplier for issue of trial component(s) for prove out at firm's premises (wherever applicable), Date of advice for BG amount (for trial components) by Railways to supplier, Date of submission of BG and date of handing over of trial component(s) by Railways to supplier.
 - (iii) Date of handing over of clear site to the supplier for construction of foundation/ turn key works etc.
 - (iv) Date of availability of utilities Electricity, Air, and Water for foundation/ installation work.
 - (v) Date of readiness of foundation/ turnkey works.
 - (vi) Date of provision of Electricity, water, gas, air etc for machine operation.
 - (vii) Date of supply of Machine.
 - (viii) Date of Joint receipt inspection.
 - (ix) Date of call to supplier for commissioning of machine.
 - (x) Day to day activities of installation & commissioning of machines (including prove out trials), PTC and details of team deputed by supplier.
 - (xi) Date of request by supplier for provisions of component(s) for prove out at consignee's premises and date of issue of prove out component(s) by Railways.
 - (xii) Clear date of Commissioning of machine and issue of PTC.
 - (xiii) Breakdown details during warranty period/ Compliance of PMC Schedules (if PMC applicable during warranty period) and AMC during post warranty period (wherever applicable).
As far as possible, the log book shall be signed jointly by representatives of consignee & supplier. Where joint signature is not feasible, communication done with supplier shall be linked and recorded in the register.
- 12.7 Test on Purchaser's Premises.
- 12.7.1 Start up and trial Operations Test (Commissioning Test)
- 12.7.1.1 The contractor shall carry out the start up and trial operation tests (commissioning test) on receipt of authorization from the Purchaser. In addition to tests indicated in IS:3177-2020(latest), the following shall also be shown:
- i) The earthing of the crane and control equipment, to be tested as per Indian Electricity Rules.
 - ii) The operation of brakes on long travel, cross traverse and hoisting motions.
 - iii) Inching control and creep speed as called for in technical specification.
 - iv) There is no skewness in crane during long travel and cross travel motions, presence of vibrations and unusual noise in operation.
- 12.7.1.2 The trials shall be carried out initially under no load conditions and on satisfactory completion of these, trials shall be repeated for various loads until the full rated load and operating range are covered.
- 12.7.1.3 During the trial operation, all necessary adjustments shall be made so as to ensure compliance with the operating characteristics for the complete equipment as stipulated in the technical specifications.

- 12.7.1.4 Dead Load of 18.75 Ton should be arranged by the Firm during the trial Test for main hoist and Dead Load of 3.75 Ton should be arranged by the firm during the trial Test for Aux. hoist. [It is the complete responsibility of the firm to arrange dead weight , during the trial test.].
- 12.7.1.5 Statutory testing certificate should be provided by the firm as per Industrial Health and Safety, Government of Chhattisgarh, through authorized competent person of Industrial Health and Safety, Government of Chhattisgarh.
- 12.7.1.6 Testing to be done in the presence of competent person authorized by Industrial Health and Safety, Government of Chhattisgarh at Electric loco Shed, Bilaspur, Chhattisgarh.
- 12.7.1.7 During testing the deflection of the grinder should be within the permissible limit as per latest ISO/IS standard mentioned for crane. If the Crane fails in the deflection Test , the complete crane will be completely rejected and the complete crane will be dis-assembled immediately by the Firm.
- 12.8 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, under intimation to Sr. DEE/TRS/BSP/SECR.
- 12.9 If an assembly/sub-assembly requires to be taken back to the manufacturer's premises for repair/replacement either before commissioning or during warranty, the manufacturer or his agent would be required to submit BG of suitable amount. In case the entire machine has to be taken back, a Bank Guarantee for the cost of the machine would have to be submitted. The bank guarantee should be of adequate value so as to cover the cost of the assembly/sub-assembly/paid up cost of the machine.

13. 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 Part-II (Section IV, Section V & Section VI). The complete details such as organization for after sales service, availability of technically competent engineers and warehousing facilities for spares should be clearly indicated. Bidders not offering complete servicing/repair facilities in India to ensure quick response to maintenance/ servicing calls are not likely to be considered.
- 13.2 After the warranty period and AMC period, if any, the manufacturer or his agent shall agree to provide service supports for trouble shooting and obtaining spare parts. The manufacturer shall be obliged to provide spare parts required by the Purchasers for a period of 15 years from the date of delivery of the machine at the ultimate destination to safeguard against obsolescence.
- 13.3 Tenderer who are OEM, shall undertake to supply spare parts for a period of expected life of machine. Other tenderers shall submit undertaking from OEM for supply of spare parts for a period of expected life of the machine.
- 13.4 During warranty period, the supplier or his authorized agent shall attend for break down adhering to stipulation of clause 16.4 of section-V.

14. INFRASTRUCTURE FACILITIES AND BOUGHT OUT ITEMS

- 14.1 The bidder should have minimum infrastructure and manufacturing facilities detailed at Annexure-F of Schedule VI and shall provide information on infrastructure available with them.
- 14.2 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.

S.No.	ITEM	MAKE
1	Motors	ABB / BBL / SIEMENS / KIRLOSKAR / MARATHON
2	Cables	KEI/LAPP /SIEMENS / POLYCAB /FINOLEX / UNIVERSAL/ ICC/KabelSchlepp
3	Contactors	L&T / SCHNEIDER / C&S / SIEMENS / BCH
4	Time relays	SIEMENS / BCH / L&T / SCHNEIDER / C&S
5	Limit Switches	SPEED-O-CONTROL /CCE / ELECTROMAG / C&S / ANAND SYSTEM
6	Master controller	SPEED-O-CONTROL /CCE / ELECTROMAG /C&S / ANAND SYSTEM
7	Overload relays	SIEMENS / BCH / L&T / SCHNEIDER / C&S
8	Moulded case	L&T / SCHNEIDER / C&S/SIEMENS / HAVELLS / BCH / ABB

	circuit breakers	
9	Resistors	SPEED-O-CONTROL / ELECTROMAG /CCE / C&S / ANAND SYSTEM
10	Drag Link Chain system	IGUS / RS COMPONENTS & CONTROL / SILVERLINE / CKS
11	Safe shrouded DSL conductors wherever applicable	INSUL-8 / SAFE TRACK / SAFE LINES / SILVER LINE / SAFE LINK
12	Thrustor brakes	SPEED-O-CONTROL / CCE / ELECTROMAG / GALVI / KATEEL / ANAND SYSTEM
13	Electrical isolators	SIEMENS / L&T / BCH / C&S
14	VVVF Drive	ABB / L&T / YASKAWA / SCHNEIDER / MITSUBISHI ELECTRIC / DANFOSS / FUJI ELECTRICS / TOSHIBA INDIA / GREAVES / SIEMENS / ALLEN BRADLEY
15	Bearings	NBC / SKF / FAG / NORMA / NRB / NTN / KOYO/TIMKEN
16	Wire Rope	USHA MARTIN / BOMBAY WIRE ROPE / MAHADEV
17	Light	PHILIPS or EATON or Lithonia
18	Nut/Hexagonal Bolt /Allen key bolt/ Washer	TVS/LPS/UNBRAKO

14.3 Test certificates of motors, wire ropes, hooks, lifting tackles etc. should be provided by the supplier with proper identification.

14.4 All the Hexagonal Bolt should be of minimum Grade : 10.9 and Allen key bolt should be of minimum grade 12.9 only.

15 PAINTING AND COLOUR:

15.1 All parts of the crane shall be thoroughly cleaned of all loose mill scales, rust or foreign matter.

15.2 All parts inaccessible after assembly shall be painted before assembly.

15.3 All parts except motors, gears, thrustors etc. shall be painted with :

i] Two coats of red oxide zinc chromate primer to IS:2074 and over the second primer coat, two coats of paint finishing Golden yellow with black strips (Ready mixed oil based paints as per the relevant IS code) shall be given before dispatch by the firm.

ii] The contractor shall give touch-up paint wherever required, after erection and testing of crane at site.

15.4 The interior of all gear box housing shall be painted with two coats of oil resistant enamel paint.

15.5 All machined pads and bearings surfaces on structures or housing shall be painted with white lead.

16.0 COMPREHENSIVE WARRANTY

16.1 The machine shall be designed for a life of 36 years with regular maintenance and all the structural members of the machine and the foundation shall be guaranteed for 7 years against cracks breakages and etc. during the course of normal operations. Tenderer would submit suitable undertaking.

16.2 Foreign suppliers who do not have registered office / maintenance facilities in India may authorize an Indian agent, who shall be responsible for maintenance and break down support. In such case, Indian agent should have experience of maintaining any type of five machines after commissioning. The tenderer should submit documentary evidence towards the experience of the Indian agent in maintaining the machines in India, along with the offer. The Indian agent should submit the details of infrastructure and manpower available with them in the bid.

16.3 In addition to warranty obligations/servicing facilities prescribed under NIT, the warranty period would also cover comprehensive preventive maintenance, which will be inclusive of all spares, material and labour cost. All maintenance consumables like lubricants and grease except hydraulic oil / plant coolants shall form part of the scope of the preventive maintenance during the warranty.

16.4 The firm shall ensure that in case a failure is reported by a consignee qualified service engineer of the contractor shall visit the site within the prescribed response time from the date and time of complaint for the machine. This response time shall be 12 hours, for up-to 06 cases in entire 02

years (or extended warranty period) & Nil thereafter. 24 hours' response time shall be permitted only if 2 successive failures are staggered 3 months apart. Complaints shall be lodged by consignee by fax, phone, e-mail, whatsapp or per bearer at address given by the tenderer.

- 16.5 The details of preventive maintenance to be provided during warranty period shall be indicated by the tenderer giving details of type of preventive schedule, periodicity on items to be checked, items to be replaced and expected plant down time. Preventive maintenance schedules shall be conducted on weekends as far as possible or any other day through mutual agreement with consignees. Total breakdown hours shall be calculated after discounting response time and preventive maintenance period.
- 16.6 The breakdown period (duly signed by shop incharge) in hours should be maintained by the consignee and joint report with the contractor shall be made for each breakdown attention. At the end of second year of warranty, these details of breakdown hours during warranty period should be advised to firm & Sr. DEE/TRS/BSP/SECR as per performance appraisal report given in Annexure – E of section –VI. The firm will then request Finance for release of WBG annexing the performance appraisal report as per Annexure-E of Section-VI and the breakdown details mentioned above.

Penalty will be levied on the contractor for breakdown period on hours' basis (including holidays) after discounting for the response time. Penalty will be calculated with full/partial deduction of amount of WBG, which shall be deducted from the WBG deposited with the SECR:

Breakdown period	Applicable penalty
Up to 250 hours in entire duration of warranty of 02 years (plus extended warranty period, if any)	Nil
Exceeding 250 hours to 500 hours in entire duration of warranty of 02 years (plus extended warranty period, if any)	5% of WBG amount
Exceeding 500 hours to 1200 hours in entire duration of warranty of 02 years (plus extended warranty period, if any)	25% of WBG amount
Exceeding 1200 hours to 2100 hours in entire duration of warranty of 02 years (plus extended warranty period, if any)	50% of WBG amount
Exceeding 2100 hours in entire duration of warranty of 02 years (plus extended warranty period, if any)	Full encashment of Warranty Bank Guarantee besides other action like noting adverse performance of the bidder and/or agent for future tenders and their offer in the subsequent tenders will not be considered for placement of any order for next 02 years.

- 16.7 In case the contractor fails to carry out the preventive maintenance schedule during warranty period and there is no complaint/ breakdown of the machine during warranty period, Sr. DEE/TRS/BSP/SECR reserves the right to extend the warranty period for the total duration of the number of PMC schedules not carried out e.g. the preventive maintenance schedule is quarterly and 3 PMCs have not been carried out then the warranty period will be extended by 9 months.

17.0 COMPREHENSIVE ANNUAL MAINTENANCE CONTRACT (CAMC) : OPTIONAL

The contractor shall be required to take CAMC of the entire machine supplied under the scope of contract.

- 17.1 Tenderers are required to quote for a comprehensive Annual Maintenance Contract for the various scope of work supplied post warranty 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 CAMC excluding Diesel/Fuel, lubricating oils or coolant.
- 17.2 CAMC shall be operated, managed and paid by the respective consignees. The consignee shall indicate the bill payment authority & custodian of the CAMC BG. No further agreement is required for operating CAMC at consignee end.
- 17.3 CAMC is a part of scope of supply, if included in commercial evaluation criteria vide clause 5 of