

possible. This shall meet the following requirements:-

- 3.2.6.1 Be of robust construction
- 3.2.6.2 Not give rise to any additional risk
- 3.2.6.3 Not be easy to by pass or render non-operational
- 3.2.6.4 Be located at an adequate distance from danger zone
- 3.2.6.5 Cause minimum obstruction to the view of the production process.
- 3.2.6.6 Rigidly connected and not prone to rattling
- 3.2.6.7 Enable essential work to be carried out without the guard or protection device having to be dismantled
- 3.2.7 A load meter shall be provided to indicate the load on the machine. The meter shall have a suitable mark to indicate the maximum load the machine can take. **Full details of the above and other safety features indicating how each one functions must be explained in the offer.**

3.3 OPERATIONAL CONTROLS

- 3.3.1 The operation of the machine shall be by push buttons or levers. The basic rules for the direction of operation of controls and the corresponding direction of movements of the machine tools shall be as per IS:2987-1985.
- 3.3.2 The control devices shall be
 - 3.3.2.1 Clearly visible and identifiable.
 - 3.3.2.2 Ergonomically positioned for safe operation without hesitating or loss of time, and without ambiguity.

3.4 LIGHTING

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

3.5 MACHINE MAINTAINABILITY

- 3.5.1 The machine shall be so designed as to require minimum possible maintenance and to give trouble free service.
- 3.5.2 All assemblies/parts of the machine shall be easily accessible for maintenance.
- 3.5.3 The machine shall not require major dis-assembly for checking and replacement of a particular part, especially for parts requiring periodical check up and replacement.
- 3.5.4 The manufacturer must provide means of access e.g. stairs, ladders, cat walks etc. to allow access safely 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**

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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 :-

3.8.4.1 Specific location of points on the machine to be oiled lubricated/greased.

3.8.4.2 Periodicity of lubrication of these points.

3.8.4.3 Filter to be cleaned.

3.8.4.4 Periodicity of cleaning filters.

3.8.4.5 Periodicity of replenishing lubricating oil for the centralized system.

3.8.4.6 Any other similar relevant information.

3.8.5 Points where manual lubrication is needed shall be separately indicated. Frequency of lubrication shall be also clearly mentioned.

3.8.6 **Lubricating oils used in the machine shall be available in India. Successful tenderer will be required to indicate brand names of approved oils manufactured by various Indian Oil Companies.**

3.8.7 First fill of lubricating oils used in the machine shall be provided with the machine.

Details of lubricating system provided shall be indicated.

3.9 PNEUMATIC SYSTEM (WHERE APPLICABLE)

3.9.1 The compressed air supply will be provided by the customer at the machine within pressure range of 4.5-7.5 kg/cm² and a moisture content or 1000 ppm. The pneumatic system of the machine should be designed accordingly. An alarm

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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:

3.10.1.1 Pressure gauges at all place, where pressure has to be set up or inspected.

3.10.1.2 Safety valves for hydraulic circuit if relief valve does not fulfill this function.

3.10.1.3 Equipment for checking of temperature in the circuit or in the pump wherever necessary.

3.10.1.4 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.

3.10.1.5 Alarm for low oil level.

3.10.2 The sump aggregate shall have the following:

3.10.2.1 Oil level sight gauges or any other equipment showing the minimum and maximum oil levels in sump.

3.10.2.2 A drain plug at the lowest portion of the tank.

3.10.2.3 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.

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- 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 wherever applicable :
- 4.2.1 Operational & Maintenance manual of the machine.
 - 4.2.2 Operational & Maintenance manual of the servo controlled voltage stabilizer.
 - 4.2.3 Operational & Maintenance manual of the ultra isolation transformer.
 - 4.2.4 Instruction & Maintenance manual for Hydraulic Oil Cooling Unit.
 - 4.2.5 User manual for Tool changer system (if provided).
 - 4.2.6 Technical & Maintenance manual for Hydraulic System
 - 4.2.7 Technical & Maintenance manual for Lubrication System.
 - 4.2.8 Operator Guide for CNC Control System (if provided).
 - 4.2.9 Programming Guide for CNC Control System (if provided).
 - 4.2.10 Diagnostic & Trouble shooting Guide for CNC Control System (if provided).
 - 4.2.11 Start-up Guide for CNC Control System (if provided).
 - 4.2.12 Machine Software Listing (if provided).
 - 4.2.13 Soft and hard copies of PLC Program in ladder form with cross reference listing and PLC project file.
 - 4.2.14 Drawings of tooling & fixtures, hard copies in A-2 size as well as soft copy in PDF format.
 - 4.2.15 Wiring diagram, in which length of wires must be mentioned, hard copies in A-3 size as well as soft copy in PDF format.
 - 4.2.16 Mechanical drawings (spindle assembly, table assembly, column assembly), hard copies in A-1 size as well as soft copy in PDF format.
 - 4.2.17 Spare part manual including part lists no., hard copies in A-4 size as well as in PDF format.
 - 4.2.18 Lay out drawings in A-1 size, which clearly shows the position of all type of electrical components in machine.

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

5.0 SPARES

- 5.1 Two lists of recommended perishable and non-perishable spares required for normal maintenance to cover complete range of mechanical, hydraulic and electrical equipments including controls on double shift working basis for two years should be furnished and quoted separately. The quantities should relate to, in case of 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. It may be noted that it is the responsibility of the bidder to ensure that exhaustive list of spares is quoted which will form part of evaluation. In case any spare other than those quoted or quantity of any spare more than that quoted in their bid is consumed, **double the cost of same will be**

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deducted from their pending bills. The WBG will be released only after clearance of the cost implication as above.

- 5.2 Spares shall be supplied along with the machine.

6.0 CONSUMABLES:

- 6.1 The list of consumable spares shall be furnished and quoted along with their unit rates.
- 6.2 Consumables shall be supplied along with the machine or as per agreed time table, if ordered.

7.0 SPECIAL FEATURES:

- 7.1 Special features incorporated in the machine, if any, shall be indicated separately in the bid clearly indicating the advantages.

8.0 DEVIATIONS:

- 8.1 The tenderer shall certify that the offered machine fully meets the specification. Various design features incorporated in the machine to fulfill different technical performance requirements shall be fully explained in the offer. However, minor deviations from these specifications which do not affect or in any way interfere with the stipulated performance standards or would result in improved safety/ reliability or would reduce recurring maintenance/operating cost of the machine, can be considered for acceptance.

8.2

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 and functional test like no load test and maximum Horse Power test must be carried out at the manufacturer's works. Rigidity of the machine shall be demonstrated to the satisfaction of appointed inspector or inspecting agency.
- 9.3 Manufacturers must have suitable facilities at their works for carrying out various performance tests on the sub-assembly/assembly/machine. The tenderer shall clearly confirm that all facilities exist and shall be made available to the inspecting authority.
- 9.4 A Sample Inspection Chart for inspecting the equipment shall be supplied along with the bid. The inspection chart should indicate all the tests that are carried out during the machine manufacture and also the tests to be offered to inspecting agency. The standard to which this inspection chart conforms should be clearly indicated. Against each test, acceptable limit/ range of values shall be indicated.

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10.

TRAINING:

10.1

Free training by the firm shall be imparted in operation and maintenance of the machine. The training to be imparted shall cover operation, troubleshooting and repair of all mechanical, hydraulic, electrical & electronics equipments (CNC Control & AC Drives) and CNC/PLC part programming. This training shall be provided to total 05 persons per consignee nominated by the consignee, for a period of two weeks free of cost at the manufacturer's premises. All charges pertaining to travel (by flight in economy class), boarding and lodging (in good quality 3 star rated hotel, food and sundry expenses) shall be borne by the supplier.

10.2

Subsequently, technical experts from the manufacturer will fully and adequately provide training to operators and maintenance staff nominated by the consignee at the time of commissioning of the machine at site.

10.3

The supplier will be responsible for co-coordinating with the consignee the travel plans of trainees to ensure that the training is imparted on the machine at its assembly and testing stage. The bidder shall also submit training schedule along with the offer.

Note:

All training should be imparted in English/Hindi only.

11.

FOUNDATION & RELATED DRAWINGS

11.1

SUBMISSION OF GA, FOUNDATION & RELATED DRAWINGS FOR APPROVAL:

11.1.1

For each machine, the supplier shall first submit 01 copy of foundation drawings with details of construction of foundations, complete layout of machine elements like bed, hydraulic tank, coolant tank, electrical panel, Servo Controlled Voltage Stabilizer etc. and other related diagrams (Mechanical, Hydraulic, Electrical & Electronics) along with machine weight, overall dimensions, electrical load with length of 3 phase, 415 V AC electric power cable for approval as per time schedule specified in Section-I to each consignee for approval and to enable the consignee for making necessary arrangements for Installation & Commissioning of Machine on receipt. After getting approval from consignee, the supplier shall supply directly to each consignee 6 copies of approved GA foundation drawings and related diagrams for each machine as per time schedule specified in Section-I from the date of approval of GA drawing for information only. This information should be furnished on the pattern indicated in detail in the following IS Specifications (Latest) or relevant international standards.

11.1.1.1

IS: 2974 (Pt.I Para 4.1) for reciprocating type machine.

11.1.1.2

IS: 2974 (Pt.III Para 3.1) for rotary type machine (medium & high frequency).

11.1.1.3

IS: 2974 (Pt.IV para 4.1) for rotary type machines of low frequency.

11.1.1.4

IS: 2974 (Pt.V para 3.1) for impact type machines other than hammers

11.2

APPROVAL OF GA, FOUNDATION & RELATED DRAWINGS:

11.2.1

General Arrangement Drawings will be sent by the 'Contractor' to the Consignee as per Time Schedule annexed in PO/LOA/AT. Consignee will 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, under advice to Stores-CCG/Western Railway, as per the Time Schedule in the PO/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 then LD will be levied **as per standard terms and conditions**. Thus the number of days delay in submission of GA drawing **plus** the number of days delay in supply of machine together will be taken as the delay in supply of machine, for the purpose of calculations of LD. However if the contractor supply the machine before original delivery period as per PO/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 as per requirements of the Consignee.
- 11.2.5 Where GA Drawing cannot be approved by consignee due to clear site not being available etc., the Consignee must inform Contractor and Stores CCG, explaining the exact delay contractor, except for special circumstances like change in location, review of arrangement etc. Thus, Contractors must take utmost care in ensuring completeness. However, initiative must be taken by Contractor to obtain such a certificate from Consignee. Contractor must bring any difficulty/dispute to the notice of Railways (PCMM/Stores Deptt-Churchgate) immediately.
- 11.2.6 In their own interest, contractor must maintain a log of events in this respect with clear dates and regularly inform consignee and PCMM/Stores deptt-Churchgate to avoid wrong levy of LD. Consignees must cooperate with Contractors by providing all assistance, including clear information about any expected delays in site availability, promptly and in writing.
- 11.2.7 If an order has been placed on the firm, the firm will have to advise the consignee well in advance regarding requirement of road permit and assistance required from the consignee, if any, so that delay on this account is avoided. Firm should also visit the site before dispatch of machine to assess the condition of path to be used for movement of trailer.
- 11.3 DISPATCH OF THE MACHINE FROM MANUFACTURER WORKS:**
- 11.3.1 The supplier should normally dispatch the machine only after the foundation is ready for installation and commissioning of the machine on arrival.
- 11.3.2 In case of delay on part of consignee in providing the clear site for construction of foundation or any other facility as specified in the contract to the supplier, the supplier will report the matter to (PCMM/Stores Deptt-Churchgate) and consignee. In case of delay in readiness of site on part of consignee, (PCMM/Stores Deptt-Churchgate) shall take up the matter with concerned Railway/ PU, and advise supplier accordingly.
- 11.3.3

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The firm will prove out the components at consignee subject to the availability.

12.0 **INSTALLATION, COMMISSIONING AND PROVING TESTS: (ON TURNKEY BASIS)**

12.1 **Joint Check** – The contractor or his agent would be required to carry out a joint check at consignee's end, along with the consignee, before unpacking is done, to avoid subsequent complaints regarding short shipment/transit damages. It is necessary that this joint receipt inspection be done immediately on receipt of the machine by consignee & bidder's representative to avoid commissioning delays due to shortages/transit damages. After receipt of the machine as above a Joint Receipt Inspection note (JRI) as per Annexure-C of Section-III shall be prepared by the consignee and the firms representative indicating the tentative time schedule for various activities of installation and commissioning. 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-

- 12.2.1.1 Provision of a clear covered (except where shed is in the scope of contract) site for construction of foundation as per the schedule to ensure its readiness before arrival of machine at site.
- 12.2.1.2 Electricity, water and compressed air for installation and commissioning of machine shall be provided free of cost, if available.
- 12.2.1.3 Whenever a road mobile crane has to be arranged by the supplier for material handling, a clear approach for it up to the site has to be provided.
- 12.2.1.4 Clear covered space for storage of material/equipment required for working/ construction of foundation and installation of the machine etc.
- 12.2.1.5 The consignee shall arrange the raw material for prove out at their end within 30 days of the dry run of the machine (installation, power connection, auxiliary connection like air, water connection) failing which such components will be deemed to have been proved out. The components supplied by the consignee in time will be required to be proved out within 30 days thereafter.

12.2.2 The bidder shall be responsible for-

- 12.2.2.1 Design of foundation as well as flooring (if required) of sufficient thickness, suiting local soil conditions at the site.
- 12.2.2.2 Advise consignee in time regarding schedule for requirement of clear site for construction of foundation and other infrastructure, resources & facilities required.
- 12.2.2.3 Construction of foundation as well as flooring (if required) of sufficient thickness suiting local soil conditions, for machine shall be completed by the bidder at the site provided by the consignee before receipt of the machine at their premises.
- 12.2.2.4 Provision of all tools and equipment, technical and unskilled manpower, material handling accessories/ equipment and material for installation and commissioning.
- 12.2.2.5 Unloading of the machine on receipt (both imported and indigenous machine) and its movement to the site of installation including provision of road mobile crane.
- 12.2.2.6 The bidder should ensure the proper earthing for the machine and its peripherals/accessories.

12.3 Consignee will provide only 415 V+10%-20%, 3 phase 50 Hz+3% AC supply at a single point (mains). All types of cables, connections, circuit breakers etc. required for connecting power supply point to different parts of the machine/control cabinets, shall be the responsibility of the bidder. Requirement of grounding/earthing with required material shall also be incorporated by the bidder during construction of foundation.

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

12.4 The supplier shall demonstrate machine performance and prove out the claimed capability for successful commissioning at the consignee's works as per clause 2.3 & 2.4 of Section-I. The M&P shall be deemed to be "commissioned" at consignee premises on the date when it is tested and meets with the specified capabilities/functions according to the technical specifications. In addition to above, in case of tooled-up M&P, the M&P shall be deemed to be "Commissioned" at consignee premises on the date when "prove out" components specified as per the relevant clause of technical specification have been successfully proved out meeting the productivity requirements of Technical specification. The consignee shall arrange the raw material for prove out at their end within 30 days of dry run of the machine (installation, power connection, auxiliary connections like air, water etc.) failing which such components will be deemed proved out. The components supplied by consignee in time will be required to be proved out within 30 days thereafter. Any delay in providing the "rawmaterial or any other input" for proving out shall not be logged on supplier's account.

A Joint Commissioning Note (JCN) to this effect shall be made as per the format at Annexure-D of Section-III. After issue of JCN the performance shall be watched for a period of one month, after which the PTC shall be issued. The issue of PTC can not be delayed by more than 60 days from the issue of JCN. If some minor breakdowns are noticed after the issue of JCN, these shall be attended as per warranty obligations and suitable extension of the warranty period, under intimation to PCMM-Churchgate. *If no intimation is given to PCMM-Churchgate and the PTC is not issued till the expiry of 60 days from the issue of JCN, then the issue will be discussed in a meeting between (PCMM/Stores Deptt-Churchgate) and the consignee. Based on this, decision to issue PTC will be taken by (PCMM/Stores Deptt-Churchgate), the concerned technical officer.*

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

13.0 SERVICE FACILITY IN INDIA AND TECHNICAL SUPPORT

13.1 The tenderer will clearly spell out in the offer the facilities available with him or his agent for providing adequate after-sales service in India during warranty period in the appropriate section of Tender. Annexure 'A' of section III. The complete details such as organization for after sales service, availability of technically competent engineers and warehousing facilities for spares should be clearly indicated. Bidders not offering complete servicing/repair facilities in India to ensure quick response to maintenance/ servicing calls are not likely to be

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- 13.2 After the warranty period and AMC period, if any, the manufacturer or his agent shall agree to provide service supports for trouble shooting and obtaining spare parts. The manufacturer shall be obliged to provide spare parts required by the Purchasers for a period of 15 years from the date of delivery of the machine at the ultimate destination to safeguard against obsolescence.
- 13.3 Tenderer who are OEM, shall undertake to supply spare parts for a period of expected life of machine. Other tenderers shall submit undertaking from OEM for supply of spare parts for a period of expected life of the machine.
- 13.4 During warranty period, the supplier or his authorized agent shall attend for break down as soon as possible, but in no case later than 72 hours of receipt of intimation of the breakdown.

14.0 BOUGHT OUT ITEMS

- 14.1 The bidder shall furnish along with the offer a list of all critical items/ sub-assemblies which are bought out by the bidder and proposed to be used, along with the manufacturer's name, brand model etc. The successful bidder may be required to produce invoices to ensure genuineness of such products / verification by the Inspecting agency.
- 14.2 The bidder should clearly indicate that in case of components/sub assemblies taken from reputed companies such as Vickers, Rexroth, RITTAL, THK, and Shenburger etc., the parent company has already entered into contract with their Indian units/affiliates for undertakings repairs/after sales service during warranty and post warranty.

| S.No. | Sub-assembly | Make |
|-------|---|---|
| 1. | CNC & Drive Controller | SIEMENS/FANUC/Heidenhain / Mitsubishi/HMT NUM |
| 2. | Hydraulic system | Rexroth/Vickers/Yuken/Atos/Parker |
| 3. | Feed back Devices | Heidenhain/Ballerf/Fagor/Sony/Siemens/ Fanuc |
| 4. | Ball screws | THK/INA/Rexroth/Star/Shenberger/NTN/ Tsubaki/ Gamfier |
| 5. | Air conditioner for Control cabinet | RITTAL/Warner Finley/Kelvin |
| 6. | Spindle Bearings | FAG/SKG/Timken/NTN/KOYO/ SKF |
| 7. | Centralised lubrication system | Vogel/Cenlub/Rexroth |
| 8. | Electrical Control Cabinet | RITTAL/ Siemens or of other reputed make with IP55 Protection level |
| 9. | Servo Controlled Voltage Stabilizer | Neel/Unity /Servomax/Consul/ Aplab/ Neelkanth |
| 10. | Ultra Isolation Transformer | Neel/Unity /Servomax/Consul/ Aplab/ Neelkanth |
| 11. | Ball bearing, roller bearing & main thrust bearings | SKF/FAG/NBC/Timken/NTN |
| 12. | Electromagnetic clutch | Vortex |
| 13. | Toolings | Sandvik/Kennametal-Widia/Taegu-Tec/scar |
| 14. | A.C. Motors | NGEF/BBL/ABB/KEC/Crompton/ Siemens/ Allen Bradley |
| 15. | Brake motors | Siemens/KEC/Crompton/NGEF/BBL |
| 16. | Proximity Switch | Elap/Schneider/Omron/Scanner |
| 17. | Contactors | Siemens/BCH/ABB/Schneider/L&T |
| 18. | Limit switches | BCH/Siemens/L&T/Teknic/Euchener/Honeywell, U SA |
| 19. | Push button | Teknic/Siemens/ Schneider/BCH |

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| 20. | O' Rings & rubber seals | Merlin/Parker/Busak/Hunger/Merkel/Soloseal/Walkersolo/Halite |
| 21. | Hydraulic pumps & valve | Yuken/Rexroth/Vickers/Mico Bosch/ Parker / Atos/Voith |
| 22. | Pneumatic Control Equipment | Festo/Shavo Norgen/Shradder Scovil/Electro Pneumatics/Parker/SMC Pneumatics |
| 23. | Control gears | L&T/Siemens/BCH/ABB/Schneider |
| 24. | Filters | Hydac/Hydroline/Parker/Rexroth/EPE, Germany/ Vickers/Purolator |
| 25. | Belts | Fenner/Hilton/Dunlop |
| 26. | Cable/wire | Siemens/Indramat/ Hubershner/ Finolex/Havells |
| 27. | Gear reducer | Elecon/Greaves/Shanthi/ZF/New Allenbury/ Bongfilivali |
| 28. | Chains | T.I. Diamond/Rollon |
| 29. | Sprocket | Rollon/T.I. Diamond |
| 30. | Voltage stabilizer & ultra isolation transformer | Neel/Unity /Servomax/Consul/ Aplab/ Neelkanth |
| 31. | AC Drive | Fanuc/Siemens/ABB/Allen Bradley /Schneider/Delta |
| 32. | AC servo motor | Fanuc/Siemens/ABB/Allen Bradley /Schneider |
| 33. | PLC | Siemens/Messung/Hitachi/Mitsubishi/ ABB/Allenbradley/Fanuc/Schneider |
| 34. | Couplings | Fenner/Love Joy Inc., USA |
| 35. | Hour Meter | L&T/ Havells |
| 36. | Ammeter & Voltmeter | AE/ Mecro |
| 37. | Rubber sheets | Rubber Products Ltd. |
| 38. | Air circuit breaker | Siemens/L&T |
| 39. | Connectors | Harting/Kontakt/L&T/Omron |
| 40. | Hydraulic oil air cooler type heat exchanger | Rittal/Werner finley/Pfamenberg |
| 41. | Chiller type heat Exchanger | WARKIN/ADVANCE COOLING/SPAN ASSOCIATES/FREEZTECH |
| 42. | Hydraulic Oil | IOCL/BPCL/HPCL/Castrol/ESSO |
| 47. | Hydraulic seamless tubes | Parker/Maharashtra seamless/Indian seamless |
| 48. | MCCB | Schneider/ABB/Siemens/L&T |

Note: In case any other reputed make is offered, satisfactory justification for the same will have to be given in the offer

- 15.0 **COLOUR:** The machine and its accessories shall be painted in Apple Green Colour No.281 to IS:5-1978,(if any specific colour code standardized by BIS is available, the same be given). The machine can also be painted in equivalent RAL/DIN/other International Standards. If there is a standard color scheme of the manufacturer, the same may also be considered if specified.
- 16.0 **WARRANTY OBLIGATION** –The following conditions regarding Maintenance and reliability shall also apply:
- 16.1 The machine shall be designed for a life of 15 years with regular maintenance and all the structural members of the machine and the foundation shall be guaranteed for 15 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 standard conditions of contract.

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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 failure 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

The details of preventive maintenance shall be provided by the tenderer giving details of type of preventive schedule, periodicity of items to be checked, items to be replaced as per format given in clause 10 of bid document part-III, for information of consignee.

SSE

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SECTION -III

ANNEXURE-A

FORMAT FOR SUBMISSION OF TECHNICAL BID

1. 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 main features and description of tender requirements in section I & technical specification Section-II and we also confirm all the schedules given in the Delivery Schedule at para 7 of **Section-I**.

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

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

Note2: We offer internationally accepted alternative specifications as per clause 1.7 of section I, complete details of alternative specification, apart from filling above deviation statement, are enclosed (if applicable).

2. We further certify that we are meeting the reference clause given in special conditions of tender:

- (A) We are the regular manufacturer of this type of machine.
 (B) We have made the following past supplies of similar machines as per special conditions of tender during last 10 years:-

| 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 | Minimum cutting thickness : i.by plasma torch ii.by gas/oxyfuel torch | Drilling capacity : Minimum Dia, in mm | No. Of cutting torches |
|-------|---------------------------------------|---|---|---|---|---|------------------------|
| | | | | | | | |

- (C) We are submitting following performance certificate from past users as per special conditions of tender:-

| S.N. | User Name | Date Supplied | Date of issue of certificate | Application / Use | Minimum cutting thickness: i.by plasma torch ii.by gas/oxyfuel torch | Drilling capacity : Minimum Dia, in mm | Performance |
|------|-----------|---------------|------------------------------|-------------------|--|---|-------------|
| | | | | | | | |

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

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

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

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

5. We have quoted for following recommended perishable and non-perishable spares required for two years 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 Rs.) | Shelf Life (in Months) |
|--------|---------------------------|-------------|--------------------|---------------|------------------------|
| | | | | | |

Non perishable spares:

| Sr No. | Description of the spares | Part number | Quantity (In Nos.) | Rate (In Rs.) |
|--------|---------------------------|-------------|--------------------|---------------|
| | | | | |

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

OR

*We hereby confirm that we are not the OEM, but are submitting undertaking from OEM for supply of spare parts for a period of expected life of the machine to provide maintenance spares (as and when ordered) after the expiry of the Warranty for 2 years (life of machine minus 2yrs) including the maintenance spares required for the bought out sub-assemblies and parts.

(*Strike out which ever is not applicable)

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

| S. No. | Description of the consumable | Qty | Unit | Rate |
|--------|-------------------------------|-----|------|------|
| | | | | |

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

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

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

10. We have quoted for comprehensive Annual Maintenance Contract as optional as per clause 17 of Section- II. Details of preventive maintenance services including cleaning of machine to be provided under Warranty & AMC is given in the following format.

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

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

| S.N. | Information required | As per Clause No. | Value /Write up/ Brochure |
|------|---|--|---------------------------------------|
| 1. | Leading Parameters 1. Major Parameters 2. Other Parameters | 2.2.1 2.2.2 of section I | Values |
| 2. | Technical Details/Particulars of Motors, Control Gears, Voltage Stabilizer & Isolation Transformer | 2.0 of section- V & 4.2.3 of section-I | Write-Up/brochure/details/para-meters |
| 2.1 | A.C. Motors and Control Gears AC MOTOR <ul style="list-style-type: none"> Manufacturer's Name Type of enclosure Type of duty (Ref. IS- 325) (Latest) Rating-Continuous/intermittent Output (KW/BHP) AC voltage across phases, number of phases & frequency. Speed in RPM Class of insulation Normal full load current Starting current Maximum current at the time of change over from lower speed to higher speed Type of motor-Squirrel cage/slipring (wound rotor) Temperature rise of windings and other parts allowed above an ambient temperature of 50 degree C. Frame size of motor End use of motor CONOTROL GEARS | | Write-Up/brochure/details/para-meters |

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

| | | | |
|-------|---|----------------------|--------------------------------------|
| 2.3 | <p>Voltage Stabilizer & Ultra Isolation Transformer</p> <p>VOLTAGE STABILISER</p> <ul style="list-style-type: none"> • Manufacturer's Name • Type of voltage stabilizer : <ol style="list-style-type: none"> a) DC servo motor type b) AC servo motor type c) Solid state • Rated capacity in KVA • Nos. of phases & frequency • Type of input supply unbalanced • Input voltage • Output voltage • Rate of correction • Class of insulation & winding (only copper wound is acceptable) • Type of control circuitry • Class of duty • Type of cooling • Indicating instruments and their ranges • Safety features <p>ULTRA ISOLATION TRANSFORMER</p> <ul style="list-style-type: none"> • Manufacturer's Name • Rated capacity • Ratio of input/output voltage • Class of insulation • Arrangement for suppression of power line surges, spikes, transients and noises • Type for cooling. | | Write-up/brochure/details/parameters |
| 3. | Process sheet with timings and other details | 2.4.1 of Section-I | Write-up (tabular sheet) |
| 4.(a) | <p>The tenderer should also furnish cutting and consumption tables showing cutting speed, pressure and gas consumption for full range of thickness 5 mm to 63 mm. However, the cutting speeds for following thickness of MS plates (as per IS: 2062) should be specifically given for demonstration of cutting quality cuts.</p> <ol style="list-style-type: none"> (i) 10.00mm thick MS plate (ii) 20.00mm thick MS plate (iii) 30.00mm thick MS plate (iv) 50.00mm thick MS plate (vi) 63.00mmthick MS plate | 2.4.1 of section - I | Write-up (tabular sheet) |
| (b) | <p>The tenderer should also furnish drilling tables showing drilling speed, feed and consumption of consumables for full range of thickness 5 mm to 125 mm. However, the drilling speeds for following thickness of MS plates (as per IS: 2062) should be specifically given for demonstration of drilling quality with the provision of drilling to maximum diameter and plate thickness.</p> | 2.4.1 of section - I | Write-up (tabular sheet) |

| | | | |
|-----|--|--|--|
| | (i) 10.00mm thick MS plate (ii) 20.00mm thick MS plate (iii) 30.00mm thick MS plate (iv) 50.00mm thick MS plate (v) 75.00mmthick MS plate (vi) 100.00mmthick MS plate (vii) 125.00mmthick MS plate | | |
| 5. | Complete details of cutting torches and torch holders | 4.1.2, 4.2.9 of section -I & 1.2.4.1 of section-II | Write-up/details |
| 6. | Complete details of cutting table/working table | 4.2.10 of section -I & 1.2.3.5 of section-II | Write-up/details |
| 7. | Details of fume extraction and dust collection system | 4.3.1 of section -I | Write-up/details |
| 8. | Details of optional accessories | 3.5.3 of section -I | Write-Up/brochure |
| 9. | Safety features <ul style="list-style-type: none"> Nos. & location of emergency switches Nos. of hardware limit switches Nos. of interlock switches & overloads Any other safety feature | 1.2.1 & 3.2 of section -II | Value Value Value Write-up |
| 10. | Machine Light <ul style="list-style-type: none"> Nos. of lamps with wattage Illumination level in lux Operating Voltage | 3.4 of section -II | Value Value Value |
| 11. | Details of linear motion guides | 1.2.2.3 & 1.2.2.8 section -II | Write-up |
| 12. | Ball screw details of different types <ul style="list-style-type: none"> diameter, pitch, accuracy class, Value of pre-loading Make. Country of origin | 1.2.4.2, 1.2.4.5, 1.2.3.3 & 1.2.3.4 of section -II | Write Up Value Value Value Value Write Up Write Up |
| 13. | Details of rack & pinion <ul style="list-style-type: none"> Material composition with grade & standard Hardness Surface finish | 1.2.3.3, 1.2.4.2 & 1.2.3.4 of section -II | Write Up Value Value |
| 14. | AC Servo Drives details <ul style="list-style-type: none"> Make Type Part No. | 1.2.3.3 of section -II | Write-up Details Value |
| 15. | Detail of MMC, NCK, PLC etc of CNC system | 1.2.8 & 2.0 of section -II | Write Up & Brochure |
| 16. | Service facility in India | 13 of section -II | Write Up/details |
| 17. | Full details of CNC System and high lights | 1.2.8 of section -II | Write-Up |

| | | | |
|-----|---|--------------------------|---|
| 18. | Technical details of motors and control gear | 2.3 & 2.4 of section -II | Values & write-up |
| 19. | Technical details of voltage stabilizer and isolation transformer | 2.13.1 of section -II | Values & write-up |
| 20. | Details of holding device for Oxy and DA cylinder | 1.2.3.6 of Section- II | Write up/details |
| 21. | Details of Gears & Spindle <ul style="list-style-type: none"> • Material composition • Hardness • Heat treatment process | 1.2.4.10 of section-II | Write-up Value Value |
| 22. | Details of Gas Economizer | 1.2.5.3 of section-II | Write-up |
| 23. | Catalogue of the machine | 4.0 of section-II | Brochure |
| 24. | Sample Inspection Chart of Machine/Equipment | 9.3 of section-II | Write-up |
| 25. | Quality Assurance Plan & ISO certificate | 9.4 of section-II | Write-up |
| 26. | Details of UPS | 4.2.8 of section-I | Brochure/details/ Values |
| 27. | Details of gas manifold system | 1.2.5.1 of Section- II | Write-up |
| 28. | Training Schedule | 10.3 of section-II | Write-up/Values |
| 29. | Machine details: <ul style="list-style-type: none"> • Machine model • Machine dimensional specification • Total connected electrical load & its breakup • Machine overall length/track length • Machine overall width • Track span/gauge • Height of longitudinal travel rail above floor level • Total working area • Total floor area required for installation and commissioning • Total weight of the machine | | Values & write-up write-up Values Values Values Values Values Values Values Values Values |
| 30. | Dimensions (lxbxh) & weight of the major sub-assemblies: | Misc | Values |
| 31. | Clause wise compliance against Sections I & II (which are not covered above in this table) | | Write-up/values/ brochures |

Signature of the
authorized representative of the bidder
with company stamp