



An ISO 9001
Company

Bharat Heavy Electricals Limited

(High Pressure Boiler Plant)

Tiruchirappalli – 620014, TAMIL NADU, INDIA

MATERIALS MANAGEMENT / CAPITAL EQUIPMENT

ENQUIRY – Corrigendum 1	Phone: +91 431 257 70 49 Fax : +91 431 252 07 19 Email : csguna@bheltry.co.in Web : www.bhel.com
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NIT No. 5247	Enquiry Number: 2710800002	Enquiry Date: 16.09.2008	Due date for submission of quotation: 14.11.2008
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You are requested to quote the Enquiry number date and due date in all your correspondences. This is only a request for quotation and not an order

Item Description: SRM Roll Grooving Machine

Details of Corrigendum

The final technical specification (Part A & Part B) arrived based on the Pre-Bid meeting held on 30th September & 1st October 2008 for SRM Roll Grooving Machine has been posted in www.bhel.com or <http://tenders.gov.in> web sites which may please be used for submission of offer.

“All interested Vendors are requested to go thro this attached scope of supply (Part A & Part B) only and make their offer in Two Part Bid System.”

All other terms and conditions as published in the NIT 5247 remain unaltered.

Confirmation of acceptance for BHEL commercial terms & conditions and Price Bid formats have been posted in BHEL Corporate web site www.bhel.com or from the Government tender website <http://tenders.gov.in> (public sector units > Bharat Heavy Electricals Limited page) under Enquiry reference “2710800002”.

Tenders should reach us before 14:00 hours on the due date
Tenders will be opened at 14:30 hours on the due date
Tenders would be opened in presence of the tenderers who have submitted their offers and who may like to be present

Yours faithfully,
For **BHARAT HEAVY ELECTRICALS LIMITED**

Sr.Manager / MM / Capital Equipment

PART – A

SECTION-I

QUALIFYING CRITERIA FOR SUPPLY OF SPECIAL PURPOSE CNC ROLL GROOVING MACHINE.

S. No.	PARTICULARS	VENDOR RESPONSE
1.0	a. 1. Vendor must be an Original Equipment Manufacturer (OEM) of ROLL GROOVING MACHINE (RGM). (or) 2. Vendor must be an Original Equipment Manufacturer (OEM) of SEAMLESS STEEL TUBE MILLS and installed the above ROLL GROOVING MACHINE (RGN), as a part of Seamless Steel Tube Manufacturing Mills supplied by them. b. Above OEM Vendor must have supplied and commissioned at least THREE RGMs for machining of SRM Roll-stands in a Seamless Steel Tube Manufacturing Mill. c. Above RGMs should be presently working satisfactorily for at least Two years after commissioning (on the date of opening of Tender).	
1.1	Following information should be submitted by the vendor about the Companies, where similar machines have been supplied, with specific reference to supplies made to any Customer in INDIA, for qualification of their Offer.	
1.1.1	a. Name of the Customer / Company where similar Machine installed.	
	b. Complete Postal Address of the Customer	
	c. Month and Year of commissioning	
	d. Application for which the Machine supplied.	
	e. Name, Designation , Phone, FAX, Email of the contact person of the Customer.	
	f. Performance Certificate from the Customer regarding satisfactory performance of supplied Machine.	

ROLL GROOVING MACHINE

S. No.	PARTICULARS	VENDOR RESPONSE
2.0	Offers of those Vendors, who meet the above Qualifying Criteria (1.0 and 1.1) shall only be considered for further evaluation	
3.0	BHEL reserves the right to verify the information provided by Vendor. In case, any information provided by Vendor is found to be false / incorrect, Offer shall be rejected.	

ROLL GROOVING MACHINE

SECTION – II

Vendors are requested to provide the following details

S. No.	PARTICULARS	VENDOR RESPONSE
1.0	Number of Years of Experience of the BIDDER/ VENDOR in the field of Design, Manufacture, Supply, Erection & Commissioning of RGMs / Seamless Steel Tube Mills..	
2.0	Number of RGMs supplied, installed and commissioned till date	
3.0	Number of RGMs supplied, installed and commissioned till date in the QUOTED MODEL	
4.0	Details of : a. SERVICE-AFTER-SALES set-up in India b. Address of Agents / Service Centre in India c. Address of Agents / Service Centre in Asian Region.	
5.0	Any Additional Data to supplement the manufacturing capability of the BIDDER for the Roll Grooving Machine.	

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ROLL GROOVING MACHINE

SECTION – III

Vendor has to comply with the following:

S. No.	REQUIREMENTS	VENDOR COMPLIANCE
1.0	BIDDER / VENDOR shall submit the offer in TWO PARTS – 1. Part-I .. Technical (Part – A & Part – B), Commercial and Un-Priced Price Bid 2. Part II .. Price Bid	
2.0	Offer shall contain a comparative statement of Technical Specifications given by BHEL and the Offer Details submitted by the Bidder, against each clause. Where details are required, a mere ‘CONFIRMED’ or ‘COMPLIES’ or ‘YES’ or ‘NO-DEVIATION’ or similar words in the Technical Comparative Statement may lead to disqualification of the Technical Offer.	
3.0	BIDDER / VENDOR shall assure continuous support for SPARES and SERVICE for TEN Years, from the date of commissioning of the equipment at BHEL Works.	
4.0	Technical Offer shall be supported by Product Catalogue and Data Sheets in ORIGINAL and complete technical details of ‘Bought-Out-Items’ with copies of Product Catalogue and Selection Criteria	
5.0	Commercial Offer (to be submitted along with the Technical Offer) shall contain the Scope of Supply and the Un-Priced Part of the Price-Bid, for confirmation	
6.0	BIDDER has to indicate the Country of Origin for the supply of equipment.	
7.0	Reference List of Customers shall be accompanied with the details (Phone Number /E-Mail ID) of the CONTACT PERSON for cross reference by BHEL if required.	

ROLL GROOVING MACHINE

PART - B

TECHNICAL SPECIFICATION FOR SUPPLY OF SPECIAL PURPOSE CNC ROLL-GROOVING MACHINE

S. No.	PARTICULARS	BHEL SPECIFICATIONS	BIDDER'S OFFER [With Complete Technical Details]
1.0	PREAMBLE		
1.0.1	SSTP/BHEL/TRICHY Seamless Steel Tube Plant (SSTP) is manufacturing Seamless Steel Tubes and Pipes – both Hot Finished and Cold Drawn in Carbon and Low Alloy Steel grades in a wide range of sizes. It is catering to the need of Boiler Tubing and Piping, Petrochemical, Oil & Gas and many more industrial segments.		
1.0.2	HOT MILL/SSTP Hot mill uses classic Push Bench process with Rotary Hearth Furnace, Vertical Piercing Press, Elongator and Push Bench - to make shell out of billet. Down stream, we have Reeler & Extractor to loosen and to remove Mandrel from the Shell and further closed end of the shell is cut in Hot Saw. Further it is reheated to around 930-1000 Deg. C and rolled in Stretch Reducing Mill (SRM) to make Hollows and Hot Finished Tubes & Pipes.		
1.0.3	SSTP now proposes to install a Special Purpose CNC Roll Grooving Machine to meet the new caliber machining requirements..		

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ROLL GROOVING MACHINE

S. No.	PARTICULARS	BHEL SPECIFICATIONS	BIDDER'S OFFER [With Complete Technical Details]
2.0	PURPOSE:		
2.0.1	Special Purpose CNC Machine shall groove/machine, by using ceramic / carbide tipped tools, to the required profile of the three Rolls assembled at 120 Deg. apart, in a rectangular type Roll-Stands. These Roll Stands are used in Stretch Reducing Mill (SRM) for manufacture of Seamless Steel Tubes.		
2.1.	Product Range(of SRM):		
2.1.1	Outside Diameter -- Min.	31.80 mm.	
2.1.2	Outside Diameter -- Max.	133.00 mm.	
2.1.3	Wall Thickness – Min.	3.20 mm.	
2.1.4	Wall Thickness – Max.	14.00 mm.	
3.0	MACHINE SPECIFICATION		
3.01.	Roll Material to be machined :: 1. SG Iron Rolls (44 HRC) and/or 2. Steel Rolls (52 to 54 HRC)	Vendor to confirm	
3.02.	Type of Caliber (Profile) to be machined: 1. Round, 2. Oval, 3. Round with Tangential (free form groove design) 4. Round with Parabolic (free form groove design) <u>To facilitate for all 4 above :</u> 1. Side Relief 2. Flat Groove 3. Edge Rounding.	Vendor to confirm	
3.03.	Caliber to be grooved in 300mm Nominal diameter Rolls (3 Rolls assembled in stands 120 deg. apart.).	31.80 mm - 100.00 mm.	

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ROLL GROOVING MACHINE

S. No.	PARTICULARS	BHEL SPECIFICATIONS	BIDDER'S OFFER [With Complete Technical Details]
3.04.	Caliber to be grooved in 380mm Nominal diameter Rolls (3 Rolls assembled in stands 120 deg. apart.).	100.00 mm - 143.00 mm.	
3.05	Tolerance on Caliber (Roll Pass Ø) – for both 300 and 380 stands.	+/- 0.04 mm.	
3.06.	Roll Diameter deviation within three Rolls of the Stand.	Max. 0.20 mm.	
3.07	Roll Speed range	60 rpm to 400 rpm	
3.08	Cutting Speed range	90 m/min to 180 m/min	
3.09	Feed Rate	0 to 0.5 mm/rev.	
3.10	Rapid Travel of Tool Carriage	Max. 10 m/min.	
3.11	Depth of Cut	0.2 mm to 2.00 mm.	
3.12.	Maximum weight of Stand loaded on the Machine for machining.	900 Kg.	
3.13	Surface Finish of Roll after grooving	Ra 1.6 microns.	
3.14	Rating and Control System of electric Motors for Main Drive.	Vendor to specify	
3.15	Auxiliary Drive and Control System, if any, with details	Vendor to confirm	
3.16	Control System for three axis motion	Vendor to specify	
3.17	Machine shall have provision for aligning the Roll-Stand in all axis..	Vendor to Confirm	
3.18	Machine shall have provision for Hydraulic Clamping of Roll-Stand.	Vendor to Confirm	
3.19	Tool Arbors suitable for holding three tips of each of Diameter 12.7mm / 19.05 mm – to cover entire range of product-mix. (Annexure-I).	Vendor to specify	

ROLL GROOVING MACHINE

S. No.	PARTICULARS	BHEL SPECIFICATIONS	BIDDER'S OFFER [With Complete Technical Details]
3.20	Provision for simultaneous loading, unloading and machining of Roll-Stands (at any point of time :: 1. One Roll-Stand shall be in loading/unloading condition 2. One Roll-Stand shall be under machining process.)	Vendor to confirm	
3.21	4-Position Tool Turret size	Vendor to specify.	
3.22	Suitable Chip Conveyor	Vendor to specify	
3.23	Pendent Operator Panel-Unit (with complete details) for : 1. Job Setting 2. Operational Purposes.	Vendor to specify	
4.0	MACHINE LIGHTS:		
4.1	Machine Lights (CFL) with sufficient illumination covering complete working area should be provided for clear visibility.	Vendor to Confirm	
5.0	UPS FOR CNC SYSTEM:		
5.1	UPS of 30 minutes rating for CNC system with :: 1. In-built Cooling 2. Charge Status Display.	Vendor to Specify	
6.0	SUB SYSTEM OF THE MACHINE		
6.1	HYDRAULICS		
6.1.1	Hydraulic system should be centralized and separate from the machine. Hydraulic Tank shall preferably be located at floor level. All hydraulic pipelines to be neatly laid out	Vendor to Confirm	

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ROLL GROOVING MACHINE

S. No.	PARTICULARS	BHEL SPECIFICATIONS	BIDDER'S OFFER [With Complete Technical Details]
6.1.2	Brand/Make of products. Preferable makes :: 1. Bosch Rexroth 2. Vickers Sperry / 3. Denison / 4. Parker Hannfin (For other makes, complete details to be furnished)	Vendor to specify	
6.1.3	Hydraulic Hose end-fittings shall be of suitable material with female swivel nut and 24 deg cones. Hoses shall preferably be of GATES make. (For other makes, complete details to be furnished).	Vendor to specify	
6.1.4	Hydraulic Circuits shall be designed with minimum number of control valves and to suit oil of ISO VG 68 only. Also minimum number of check-points to be provided, wherever pressure is required to be read for setting and trouble-shooting. MINIMESS Pressure Gauge - 1 No with Connecting Hose to be provided.	Vendor to confirm	
6.1.5	Solenoids shall be provided with Indication Lamp / LED. Control voltage for all solenoid operated valves.	24 V DC	
6.1.6	Filtration System.	Vendor to specify	
6.1.7	Hydraulic Failure indication	Vendor to specify	
6.1.8	Hydraulic Pump capacity (flow / pressure)	Vendor to specify	
6.1.9	Pump Motor Power in kW	Vendor to specify	
6.1.10	Hydraulic Tank Capacity	Vendor to specify	
6.1.11	Each Pump shall have an independent Motor. .	Vendor to specify	

ROLL GROOVING MACHINE

S. No.	PARTICULARS	BHEL SPECIFICATIONS	BIDDER'S OFFER [With Complete Technical Details]
6.1.12	All Hydraulic Pumps for the Power Pack should be loaded only during requirement and should run unloaded during idle running.	Vendor to Confirm	
6.1.13	Heat Exchanger to be provided for cooling the Hydraulic Oil.	Vendor to specify	
6.1.14	Oil High Temperature Alarm and safety interlock	Vendor to Confirm	
6.1.15	Oil Low Level Alarm and safety interlock	Vendor to Confirm	
6.2	PNEUMATIC SYSTEM:		
6.2.1	Pneumatic operated elements of the machine shall work efficiently with BHEL Compressed Air supply at a pressure of 4 to 6 Kg / cm²	Vendor to confirm	
6.2.2	BHEL will provide compressed air. Vendor shall provide suitable 1. Filter-Regulator-Lubrication (FRL) unit 2. Drier.	Vendor to confirm	
6.2.3	Volume (flow) of Compressed Air required for the machine	Vendor to Specify	
6.3	LUBRICATION :		
6.3.1.	Oil Lubrication and Grease Lubrication arrangement shall be provided for all rotating and moving components.	Vendor to Confirm	
6.4	ELECTRICAL:		
6.4.1.	BHEL shall provide power supply : 415V +/-10% 50Hz +/- 3% 3 Phase AC (3 wire system without neutral)	Vendor to note.	
6.4.2	Control Voltage :: 230V AC from separate Isolation Control Transformer of suitable capacity with MCB protection	Vendor to confirm.	
6.4.3	All Solenoids and PLC system :: 24V DC – Two separate sources shall be used for Solenoid and PLC.	Vendor to confirm	

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ROLL GROOVING MACHINE

S. No.	PARTICULARS	BHEL SPECIFICATIONS	BIDDER's OFFER [With Complete Technical Details]
6.4.4	Interposing relays shall be provided between PLC Output and field elements. Rating : 24V DC, 2A.	Vendor to confirm	
6.4.5	Tropicalization: All electrical / electronic equipment shall be tropicalized.	Vendor to confirm	
6.4.6.	All electrical & electronic control cabinets & panels shall be :: 1. Dust proof 2. Vermin proof	Vendor to confirm	
6.4.7.	All electrical components in the cabinets shall be mounted on DIN Rail	Vendor to confirm	
6.4.8	All electrical and electronic panels including operator panels shall be provided with :: 1. Fluorescent Lamps for sufficient illumination 2. Power Receptacles of 230Volts, 5 / 15 Amp AC. 3. All adapters /receptacles should have compatibility with Indian equivalents.	Vendor to confirm	
6.4.9	Motors & other electrical components shall conform to IEC or Indian Standards	Vendor to confirm	
6.4.10	All Electric enclosures shall have IP 43 protection	Vendor to confirm	
6.4.11	Motors : Siemens / ABB make or such reputed makes only conforming to IS / IEC Standards (Vendor shall indicate make and type in the Offer)	Vendor to confirm	
6.4.12	Drives : Siemens / Allen Bradley / ABB make or such reputed makes only conforming to IS / IEC Standards (Vendor shall indicate make and type in the Offer)	Vendor to Confirm	

ROLL GROOVING MACHINE

S. No.	PARTICULARS	BHEL SPECIFICATIONS	BIDDER'S OFFER [With Complete Technical Details]
6.4.13	CNC : Fanuc / Siemens make or such reputed makes only conforming to IS / IEC Standards (Vendor shall indicate make and type in the offer)	Vendor to Confirm	
6.4.14	PLC : Siemens / Fanuc / Allen Bradley / ABB make or such reputed makes only conforming to IS / IEC Standards (Vendor shall indicate make and type in the offer)		
7.0	FAULT DIAGNOSTIC SYSTEM :		
7.1	Diagnostic system with required hardware and software shall be supplied and installed on the equipments. This shall include customized auto-diagnostic system with supporting hardware and software, which shall indicate detailed cause & remedy for the faults related to mechanical and electrical maintenance.	Vendor to confirm	
8.0	SAFETY ARRANGEMENTS:		
8.1	Following safety features in addition to other standard safety features should be provided on the equipments.	Vendor to confirm	
8.2	Equipments shall have adequate and reliable safety interlocks / devices to avoid damage to the equipment, work piece and the operator due to malfunctioning or mistakes. Equipments functions should be continuously monitored and alarm / warning indications through lights/ alarm number with messages shall be made available.	Vendor to specify	
8.3	All the pipes, cables etc. on the equipment shall be well supported and protected, which shall not create any hindrance to movement of equipment operators.	Vendor to Confirm	

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S. No.	PARTICULARS	BHEL SPECIFICATIONS	BIDDER'S OFFER [With Complete Technical Details]
8.4	All the rotating parts used on equipments shall be Statically & Dynamically balanced to avoid undue vibrations and suitably guarded.	Vendor to Confirm	
8.5	Emergency Switches at suitable locations shall be provided as per International Norms.	Vendor to Confirm	
8.6	All lubricated parts shall have provision for collecting the used Lubrication Oil from equipments and preventing them from spilling over on to the ground.	Vendor to Confirm	
8.7	Pressure relief valve in hydraulic circuit	Vendor to Confirm	
9.0	ENVIRONMENTAL PERFORMANCE OF THE EQUIPMENT: Equipment shall conform to following factors related to environment:		
9.1	Maximum noise level shall be 85 dB (A) at normal load condition, one meter away from the equipment with correction factor for background noise. This will be measured as per International Standards like DIN 45635-16. Vendor to demonstrate compliance to noise level, if required.	Vendor to Confirm	
9.2	If any other safety / environmental protection enclosure are required, same shall be provided in the equipment.	Vendor to confirm	
10.0	PRODUCTION TOOLING:		
10.1	List of tools required for normal operation of machine for one year to be provided (with the detailed Drawings) for machining the profile to cover entire range of SSTP product-mix. (Unit-Rate for each item to be indicated in the Price Bid – optional for ordering).	Vendor to Specify	
10.2	Expected Life of each tool to be indicated.	Vendor to specify.	

ROLL GROOVING MACHINE

S. No.	PARTICULARS	BHEL SPECIFICATIONS	BIDDER'S OFFER [With Complete Technical Details]
11.0	TOOLS FOR ERECTION, OPERATION & MAINTENANCE:		
11.1	Vendor shall bring Special Tools and Equipments required for erection of the proposed equipments. List of such Tools to be furnished along with the Offer.	Vendor to confirm	
11.2	Vendor shall bring Any Test equipments required for checking & alignment of the equipments, components etc.	Vendor to confirm.	
11.3	Vendor shall bring Laser and optical equipments, if required, for checking, aligning and positioning.	Vendor to Specify	
11.4	Vendor shall furnish a List of Tools required for normal Operation & Maintenance of the proposed equipments.	Vendor to Specify	
12.0	SPARES:		
12.1	Recommended & Mandatory Spares of Mechanical, Hydraulic, Electrical and Electronic items required for 2 years of trouble free operation on three shifts basis. (Unit Rate of each item of spare to be indicated in Price Bid – optional for ordering)	Vendor to specify	

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S. No.	PARTICULARS	BHEL SPECIFICATIONS	BIDDER'S OFFER [With Complete Technical Details]
12.2	Items other than Recommended / Mandatory Spares. Vendor to specify Technical details (along with details of Recommended Vendors) for the following: a) Mechanical & Hydraulic Spares: All types of Pumps, Valves, Pressure Switches, Transducers, Flow Switches, Filters, Seals, O-rings, Hydraulic Hoses, etc. b) Electrical /Electronic Spares: All types of Relays, Contactors, Proximity Switches, Push Buttons, Indicating Lamps, Semiconductor Fuses, Special Fuses, Circuit Breakers, Encoders, Optical Sensors, Spares for PLC (I/O card, Digital to Analog card, CPU card, Power Supply Board, etc.), Display unit, HMI , Servo Motors for Feed Drives, Power Module & Control Cards for Main Drive as well as Feed Drives, etc.	Vendor to Specify	
12.3	Vendor to confirm that Spares for Equipment and Accessories shall be made available for at least ten years after commissioning of the Equipments. If any Part and/or Control is likely to become obsolete during the above 10 year period, vendor shall inform BHEL sufficiently in advance and provide all necessary Technical Details and Drawings of parts / details of spares & Source of Vendors, to enable BHEL to procure these in advance, if required	Vendor to confirm	
12.4	Vendor to provide complete List of Spares, along with Item Part No. / Detailed Specification / Type / Model, Name & Address of the Sub-Vendors.	Vendor to confirm	

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S. No.	PARTICULARS	BHEL SPECIFICATIONS	BIDDER'S OFFER [With Complete Technical Details]
13.0	DOCUMENTATION:		
13.1	Vendor to furnish Documentation, as listed below (13.1 to 13.13) :: a. <u>Along with Equipments :</u> One set (Hard copy) in English language. b. <u>After completion of Erection and Commissioning :</u> 1. Three sets of as-built-Drawings and Updated Manuals (Hard Copy) shall be supplied - including Bought-out items. 2. One set of above Documents in Soft-copy. 3. Licensed software for PLC Programming. 4. Programme UPLOAD/DOWNLOAD device for PLC/CNC is to be provided.	Vendor to confirm	
13.2	Operating Manuals of Equipment	Vendor to confirm	
13.3	Programming Manuals of Equipment	Vendor to confirm	
13.4	Detailed Maintenance Manuals of equipment with all Drawings of equipment / Tool-assemblies / Sub-assemblies / Parts, including Electrical / Pneumatic/ Hydraulic circuit-diagrams. All Assembly/ Sub Assembly Drawings shall also be supplied with the part list.	Vendor to confirm	
13.5	Maintenance, Interface & commissioning manuals for CNC system, & Feed Drives.	Vendor to confirm	
13.6	Catalogues, O&M Manuals of all bought-out items including drawings, wherever applicable.	Vendor to confirm	

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S. No.	PARTICULARS	BHEL SPECIFICATIONS	BIDDER'S OFFER [With Complete Technical Details]
13.7	Detailed specification of all :: 1. Rubber items 2. Hydraulic items 3. Lubrication fittings	Vendor to confirm	
13.8	PLC program printouts with comments in English (after commissioning the equipments).	Vendor to confirm	
13.9	1. CNC data on CD / Flash Memory 2. PLC program on CD / Flash Memory 3. PLC data on CD / Flash Memory	Vendor to confirm	
13.10	Vendor shall submit complete Master List of parts used in the machine.	Vendor to confirm	
13.11	All the above documentation on CD	Vendor to confirm	
13.12	General arrangement Drawing & foundation drawing – 3 Copies	Vendor to confirm	
13.13	Drawings for Tools (Hard copy and soft copy)	Vendor to Confirm	
14.0	TRAINING:		
14.1	BHEL shall depute two of its Engineers for inspection and training at Vendor works. Vendor shall train BHEL Engineers in Operation / Maintenance (Mechanical, Electrical/ Electronics system and CNC system) of the machine for a period of 10 days. (Total 20 man-days).	Vendor to confirm	
14.2	Vendor shall impart training to BHEL Machine Operators and Maintenance crew in Operation and Maintenance (Mechanical, Electrical/ Electronics and CNC System) after the commissioning of the Machine at BHEL works for not less than 10 working days.	Vendor to confirm	

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ROLL GROOVING MACHINE

S. No.	PARTICULARS	BHEL SPECIFICATIONS	BIDDER'S OFFER [With Complete Technical Details]
14.3	The training shall include specialized coaching in 1. Safety 2. Setting and Operation of the Equipments 3. Trouble-Shooting, 4. Software Application 5. All special features of the equipment 6. Electrical / Mechanical / Electronics systems 7. CNC Programming machine operation 8. PLC Programming	Vendor to Confirm	
14.4	Airfare, Boarding & Lodging for the Trainees (deputed to Vendor Works) shall be borne by BHEL.	Vendor to note	
14.5	Vendor shall arrange Competent English speaking experts, during training for satisfactory & effective training of BHEL personnel	Vendor to Confirm	
15.0	FOUNDATION:		
15.1	Vendor shall submit the Preliminary Layout Drawing for BHEL approval, within one month from the date of Letter of Intent (LOI), taking into consideration of other existing Equipments / Layout at SSTP.	Vendor to Confirm	
15.2	Vendor shall submit Foundation details, viz. Static / Dynamic Load details, etc. and Final Layout Drawings, within three months after BHEL approval of Preliminary Layout Drawings.		

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ROLL GROOVING MACHINE

S. No.	PARTICULARS	BHEL SPECIFICATIONS	BIDDER'S OFFER [With Complete Technical Details]
15.3	Layout shall consist of all requirements pertaining to complete equipment, including space requirement for any other accessories. BHEL shall design and construct complete Foundation for the equipments as per the recommendation of Vendor. Vendor shall also indicate detailed specifications of Grouting Compounds, Grouting Procedure, etc., for Foundation Bolts of the equipments.		
15.4	List of Foundation / Anchorage material.	Vendor to specify	
16.0	ERECTION & COMMISSIONING		
16.1	Vendor to take full responsibility for Supervision of the Erection, Start up, Testing and Commissioning of Equipments, along with accessories. BHEL shall provide Service requirements, like Power, Air & Water, Crane and Personnel for helping	Vendor to confirm	
16.2	Vendor to prove out the specified products (Ref: 19.4), as per the Tender Specification on :: 1. rate of production 2. product quality.	Vendor to confirm	
16.3	Vendor shall bring Tools, Test Mandrels, Instruments and other necessary Equipment, including Laser / Optical equipments, required to carry out all Erection and Commissioning activities.	Vendor to confirm	
16.4	Vendor shall bring (on returnable basis) Spares / Tools required for commissioning of the equipment within stipulated time..	Vendor to confirm	
16.5	Vendor shall furnish a Schedule of Erection and Commissioning along with offer.	Vendor to confirm	
16.6	Vendor shall furnish Charges, Duration, Terms & Conditions for Erection & Commissioning (with break-up details), along with offer.	Vendor to confirm	

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S. No.	PARTICULARS	BHEL SPECIFICATIONS	BIDDER's OFFER [With Complete Technical Details]
17.0	ACCURACY TESTS		
17.1	GEOMETRICAL ACCURACY		
17.1.1	Geometrical Accuracy Tests shall be in accordance with applicable standard recommended by the Vendor.	Vendor to confirm	
	Vendor shall submit Detailed Test Charts for the same, clearly showing the accuracies to be achieved on the machine, along with the offer.		
17.1.2	All other accuracies shall conform to Vendors Test chart.	Vendor to confirm	
17.1.3	Vendor shall demonstrate all the above accuracies to BHEL during :: 1. Pre-acceptance at Vendors works 2. Erection & Commissioning at BHEL Works.	Vendor to confirm	
17.2	POSITIONING ACCURACY & REPEATABILITY:		
17.2.1	Positioning accuracy	±0.016 mm	
17.2.2	Repeatability	± 0.008 mm	
17.3	Vendor shall demonstrate all the above accuracies to BHEL during :: 1. Pre-acceptance at Vendors works 2. Erection & Commissioning at BHEL Works.	Vendor to confirm	

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ROLL GROOVING MACHINE

S. No.	PARTICULARS	BHEL SPECIFICATIONS	BIDDER'S OFFER [With Complete Technical Details]
18.0	AMBIENT CONDITIONS & THERMAL STABILITY:		
18.1	Total equipment(s) shall work trouble-free and efficiently under following operating conditions and shall deliver specified accuracies. <u>Power Supply:</u> Voltage: 415 V +/- 10%, Frequency: 50 Hz +/- 3%, No. of phases : 3 <u>Equipments shall be suitable for ::</u> Ambient Temperature :: 45 ° C Relative Humidity :: 90 % (However, both do not occur simultaneously). Weather conditions are tropical, Atmosphere is dust laden.	Vendor to confirm	
18.2	Vendor to ensure trouble free operation and Thermal Stability of the equipments, keeping in view of the specified ambient conditions and accuracy requirements of BHEL.	Vendor to confirm	
18.3	Equipments, including attachments and accessories, shall be suitable for continuous operation to its full capacity for 24 x 7x 365.	Vendor to confirm	
19.0	PROVE-OUT OF BHEL COMPONENTS:		
19.1	Prove-out/ Performance trial shall be conducted at BHEL for assessing the Productivity, Accuracy, Surface Finish, etc.	Vendor to confirm	
19.2	For conducting the prove-out/Performance trial, Vendor shall provide :: 1. RAAN 120700 (Dia 12.70 mm) - 30 Nos. 2. RAAN 190700 (Dia 19.05 mm) - 30 Nos. Above shall be provided with suitable holders and cartridges to match all range of roll-passes.	Vendor to confirm	

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ROLL GROOVING MACHINE

S. No.	PARTICULARS	BHEL SPECIFICATIONS	BIDDER'S OFFER [With Complete Technical Details]
19.3	Vendor shall establish an output of at least 6 stands in 8 hour shift. (Machining of stand means - machining a stand from one caliber to another, say diameter 42.4 mm to diameter 48.3 mm. Caliber sizes are enclosed in Annexure - II)	Vendor to confirm	
19.4	Following sizes shall be proved by conducting performance trials: a. 31.8 mm b. 44.5 mm c. 51.0 mm d. 63.5 mm e. 88.9 mm f. 114.0 mm g. 127.0 mm	Vendor to confirm	
20.0	MACHINE ACCEPTANCE:		
20.1	Tests/Activities to be carried out on the machine at Vendor Works in presence of BHEL Engineers before dispatch of Roll Grooving Machine:		
20.1.1	Geometrical Accuracies as per applicable Standard Test Chart recommended by the Vendor	Vendor to confirm	
20.1.2	Positioning Accuracy and Repeatability as per specification	Vendor to confirm	
20.1.3	Demonstration of all features of the Machine, Control system & Accessories	Vendor to confirm	
20.2	Tests / Activities to be carried out at BHEL works while commissioning the machine:		
20.2.1	Geometrical accuracies as per applicable Standard Test Chart recommended by the Vendor	Vendor to confirm	
20.2.2	Positioning accuracy and Repeatability as per specification	Vendor to confirm	
20.2.3	Full Load Test to demonstrate the maximum capacity of the machine.	Vendor to confirm	

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ROLL GROOVING MACHINE

S. No.	PARTICULARS	BHEL SPECIFICATIONS	BIDDER's OFFER [With Complete Technical Details]
20.2.4	Demonstration of all features of the Machine, Control System & Accessories to the satisfaction of BHEL for efficient and effective use of the Machine	Vendor to confirm	
20.2.5	Demonstration by actual use of all supplied attachments and accessories to their full capacity.	Vendor to confirm	
20.2.6	Prove-out trials as per Clause 19.0	Vendor to confirm	
20.2.7	After Prove-out, one week supervision by Vendor for independent operation of Machine by BHEL.	Vendor to confirm	
	(to run concurrently with training at BHEL)		
21.0	PACKING:		
21.1	Vendor shall arrange to provide Sea worthy, rigid, pest & vermin proof and phyto-treated/certified packing for all items / complete equipments, all accessories, to avoid any damage / loss in transit.	Vendor to confirm	
	When equipments are dispatched in containers, all small / loose items shall be suitably packed in boxes and put inside the Containers.		
22.0	GUARANTEE:		
22.1	12 months from the date of Commissioning of the machine at BHEL Works or 18 months from the date of shipment, whichever is earlier..	Vendor to confirm	
23.0	GENERAL:		
23.1	Machine Model No.	Vendor to specify	
23.2	Total Connected Load (KVA):	Vendor to specify	
23.3	Floor area required (Length, Width, Height) for complete Machine & Accessories	Vendor to specify	

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ROLL GROOVING MACHINE

S. No.	PARTICULARS	BHEL SPECIFICATIONS	BIDDER'S OFFER [With Complete Technical Details]
23.4	Machine Lubrication Automatic Centralized Lubrication System.	Vendor to specify	
23.5	Painting of Machine / Electrical Panels: RAL 6011 Apple Green (Polyurethane Paint)	Vendor to specify	
23.6	Total weight of the Machine	Vendor to specify	
23.7	Weight of heaviest part of Machine	Vendor to specify	
23.8	Weight of the heaviest assembly / sub-assembly of the Machine	Vendor to specify	
23.9	Dimensions of largest part/ sub-assembly/ assembly of the machine	Vendor to specify	
23.10	Vendor to furnish Detailed Catalogues, Sketch / Photographs of the Machine and accessories / attachments, along with the Offer.	Vendor to confirm	
23.11	Hydraulic, Pneumatic & Oil Piping should be preferably metallic, except places where flexible piping is essential. All the pipes required for the same shall be included in the standard scope of the machine.	Vendor to confirm	
23.12	All feedback systems & field sensors, limit switches, proximity switches, pressure switches, temperature controllers, should be for heavy duty application and wired up with flexible PVC insulated screened cables. All field elements shall have easy accessibility for maintenance.	Vendor to confirm	
23.13	Vendor shall furnish clear and legible General arrangement drawing showing the machine & associated systems with salient dimensions.	Vendor to Confirm	
23.14	The supplier should describe in the offer any additional optional accessories that are likely to enhance the productivity of the machine.	Vendor to Specify	

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Price schedule

S. No.	PARTICULARS	PRICE
1	ROLL GROOVING MACHINE	
2	Set of Tools required for the product range indicated in Annexeure - I (Item-wise breakup of each Tool is to be furnished)	
3	Set of Maintenance Spares for two-years trouble-free operation (Item-wise breakup price to be furnished)	
4	OPTIONAL : Any other accessories, which shall enhance Performance / Productivity of the Machine.	