



An ISO 9001  
Company

**Bharat Heavy Electricals Limited**  
(High Pressure Boiler Plant)  
Tiruchirappalli – 620014, TAMIL NADU, INDIA  
CAPITAL EQUIPMENT / MATERIALS MANAGEMENT

<b>ENQUIRY</b>	Phone: +91 431 257 79 38 Fax : +91 431 252 07 19 Email : <a href="mailto:tvenkat@bheltry.co.in">tvenkat@bheltry.co.in</a> Web : <a href="http://www.bhel.com">www.bhel.com</a>
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	<b>Enquiry Number:</b> <b>2620800077</b>	<b>Enquiry Date:</b> <b>04.08.2008</b>	<b>Due date for submission of quotation:</b> <b>05.09.2008</b>
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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	Quantity	Delivery (Item required at BHEL on)
10	Vertical Rotary Surface Grinding Machine as per the technical specification & commercial conditions applicable (to be downloaded from web site <a href="http://www.bhel.com">www.bhel.com</a> or <a href="http://tenders.gov.in">http://tenders.gov.in</a> ) <b>Note: Offer should be CFR - Chennai Seaport basis.</b>	1 No.	30.06.2009
20	Vertical Rotary Surface Grinding Machine as per the technical specification & commercial conditions applicable (to be downloaded from web site <a href="http://www.bhel.com">www.bhel.com</a> or <a href="http://tenders.gov.in">http://tenders.gov.in</a> ) <b>Note: Offer should be CFR - Mumbai Seaport basis.</b>	1 No.	30.06.2009

**Note:**

**Item should be evaluated separately. Item wise CFR price should be quoted.**

BHEL commercial terms & conditions with Price Bid and Bank Guarantee formats along with technical specifications can be downloaded from BHEL web site <http://www.bhel.com> or from the Government tender website <http://tenders.gov.in> (public sector units > Bharat Heavy Electricals Limited page) under Enquiry reference "2620800077".

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  Manager / Capital Equipment / MM
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## **PART A**

### **VERTICAL ROTARY SURFACE GRINDING MACHINE**

#### **SECTION – I : QUALIFYING CRITERIA**

The BIDDER has to compulsorily meet the following requirements to get qualified for considering the technical offer for the VERTICAL ROTARY SURFACE GRINDING MACHINE.

S. No.	REQUIREMENTS	Vendor's Response
1	<p>Only those vendors (<b>OEMs</b>), who have supplied and commissioned at least one <b>Vertical Rotary Surface Grinding Machine</b> with</p> <p><b>1. Grinding Head Spindle power of 30KW or more and</b></p> <p><b>2. A rotary table of dia. 500 mm or more</b> in the past ten years and such machine should be working satisfactorily for a minimum period of one year after commissioning, as on the date of opening of this Tender are eligible to quote.</p> <p><i>(However, if such machine is already supplied to BHEL, then that machine should be working satisfactorily for a minimum period of six months after commissioning, as on the date of opening of this Tender.)</i></p>	
<b>The vendor should submit the following information where similar machine has been supplied, for qualification of this offer.</b>		
1.1	Name and postal address of the customer or company where similar machine is installed.	
1.2	Name and designation of the contact person of the customer.	
1.3	Phone, FAX no and email address of the contact person of the customer.	
1.4	Month and Year of commissioning of the machine.	
1.5	Parameters of machine supplied, viz. Table diameter, Spindle power and the application for which the machine is supplied.	

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<b>S. No.</b>	<b>REQUIREMENTS</b>	<b>Vendor's Response</b>
1.6	Along with the Technical offer, the Vendor should submit one Performance certificate from the customer for the satisfactory performance of the machine supplied to them. For obtaining the Performance certificate, a suggestive format is provided in <b>SECTION – IV</b> .	
2.0	BHEL reserves the right to verify the information provided by vendor. In case the information provided by vendor is found to be false/ incorrect, the offer shall be rejected.	

## **SECTION – I I**

The BIDDER / VENDOR is requested to provide the following information:

<b>S. No.</b>	<b>REQUIREMENTS</b>	<b>Vendor's Response</b>
3.0	The BIDDER/VENDOR to furnish Reference List of Customers, with full address, details of contact person, where Vertical Rotary Surface Grinding Machines have been supplied in the past.	
4.0	Details of Vertical Rotary Surface Grinding Machine supplied to other BHEL units, if any. (Year of commissioning, Wheel size, Grinding diameter range, Spindle power).	
5.0	Details on SERVICE-AFTER-SALES Set-Up in India including the Address of Agents / Service Centers in South India.	
6.0	Any Additional Data to supplement the manufacturing capability of the BIDDER for the subject equipment.	

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### SECTION – III

The BIDDER to note:

S. No.	PARTICULARS	Vendor's Response
7.0	The BIDDER / VENDOR shall submit the offer in TWO PARTS. 1. Technical Offer [with PART A & PART B] and Commercial offer. 2. Price Bid.	
8.0	The Technical Offer shall contain a comparative statement of Technical <b>Specifications demanded by BHEL</b> and <b>Offer Details submitted by the Bidder</b> , against each clause. A just 'CONFIRMED' or 'COMPLIED' or 'YES' or 'NO-DEVIATION' or similar words in the technical comparative statement may lead to disqualification of the Technical Offer.	
9.0	The Technical Offer shall be supported by product Catalogues & Data Sheets and also technical details of Bought-Out-Items with copies of Product Catalogue to the extent possible.	
10.0	The Commercial Offer (given with the Technical Offer) shall contain the Scope of Supply and the Un-Priced Part of the Price-Bid, for confirmation.	

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## SECTION – IV

The performance certificate should be produced **on Customer's Letter Head.**

### **PERFORMANCE CERTIFICATE**

1. Supplier of the machine			
2. Make & Model of the M/C			
3. Month & Year of Commissioning			
4. Application for which M/C is used			
5	a) Spindle Power  b) Rotary Table diameter		
6. Performance of the Equipment (Tick whichever is <b>applicable</b> )		<b>Best in the market</b>	
		<b>Satisfactory</b>	
		<b>Good</b>	
		<b>Average</b>	
		<b>Not Satisfactory</b>	
7. Any Other remarks			
<div style="display: flex; justify-content: space-between;"> <div>Date:</div> <div>Signature &amp; Seal of the Authority Issuing the Performance Certificate</div> </div>			

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## PART- B

### TECHNICAL SPECIFICATION FOR VERTICAL ROTARY SURFACE GRINDING MACHINE

Qty. 2 Nos. (1 Machine For TIRUCHY & 1 Machine For IVP GOINDWAL)

Clause	PARTICULARS AND BHEL SPECIFICATION		Bidder's offer with Technical Details
1.0	<b>Purpose and Operation:</b> <ol style="list-style-type: none"><li>1. The machine is intended to grind the seat area of Discs of conventional valves.</li><li>2. The surface to be ground may be horizontal or inclined. If the surface is inclined then a taper base will be used to make it horizontal.</li><li>3. Prior to grinding the surface will have a finish Ra 3.2 µm. After grinding, the surface finish shall be Ra 0.8 µm.</li><li>4. Approximate configuration of the machine is shown in <b>Annexure – 1</b>.</li></ol>		
1.1	<b>Work piece material:</b> The Work piece surface material shall be either Stellite 6 or Stainless steel E 410 with a Hardness range of 350 to 425 BHN. The surface to be ground is non magnetic <b>Annexures – 2 and 3</b> show typical Work pieces with dimensions / range of dimensions.		

Clause	PARTICULARS AND BHEL SPECIFICATION		Bidder's offer with Technical Details
<b>2.0</b>	<b>MACHINE CONSTRUCTION &amp; SPECIFICATION:</b>		
<b>2.1</b>	<b>CONSTRUCTION:</b>		
2.1.1	Vendor has to furnish construction details of the machine, with explanatory drawings of various components / assemblies like column, wheel head, spindle, machine enclosure, rotary table, etc. The rotary table shall have a linear travel to bring the table away from the wheel head for easy loading and unloading of jobs.	Vendor to furnish	
2.1.2	Video images on CD including hard copy explaining the technical features / Literature with photographs, drawings explaining the technical features should be enclosed with the offer.	Vendor to furnish	
2.1.3	Machine should be Metric execution.	Vendor to confirm	
<b>2.2</b>	<b>SPECIFICATION:</b>		
2.2.1	Max. Admit between table and grinding wheel: <b>500mm</b>	Vendor to confirm	
2.2.2	Grinding Diameter range	Vendor to specify	
<b>2.3.</b>	<b>Grinding wheel head.</b>		
2.3.1	Segment Wheel diameter:	Vendor to specify	
2.3.2	No.of segments:	Vendor to specify	
2.3.3	Quick Clamping mechanism of wheel segments:	Vendor to specify	
2.3.4	Wheel rotation speed (RPM):	Vendor to specify	
2.3.5	Down feed of wheel head: <b>0 to 2 mm/min</b> (infinitely variable)	Vendor to specify	
2.3.6	Incremental down feed of wheel: 0.01 mm	Vendor to specify	
2.3.7	Rapid down feed rate	Vendor to specify	
2.3.8	Auto retract after spark out	Vendor to specify	

Clause	PARTICULARS AND BHEL SPECIFICATION		Bidder's offer with Technical Details
2.3.9	Spindle drive power (AC Continuous Rating - S1): <b>around 55 KW</b>	Vendor to specify	
2.3.10	Make & Model No. Of drive motor	Vendor to specify	
<b>2.4</b>	<b>Rotary Table:</b>		
2.4.1	Electromagnetic chuck type rotary table	Vendor to Confirm	
2.4.2	Auto demagnetizer if any: Can be quoted as <b>optional</b> .	Vendor to Confirm	
2.4.3	Diameter of rotary table: <b>1050mm min.</b>	Vendor to specify	
2.4.4	Weight Carrying Capacity: <b>2000 Kg</b>	Vendor to specify	
2.4.5	Table longitudinal travel (powered):	Vendor to specify	
2.4.6	Control of table magnetism:	Vendor to specify	
2.4.7	Table speed (infinitely variable): <b>0 to 50 RPM</b>	Vendor to specify	
2.4.8	Make, Model No. & Rating of table rotation motor:	Vendor to specify	
<b>2.5</b>	<b>MACHINE GUIDEWAYS:</b>		
2.5.1	Details of Guide ways for Wheel Head and Table traverse and bearing details of Spindle are to be submitted with offer. The vendor shall specify hardness of guide ways.	Vendor to specify	
2.5.2	Telescopic Covers of rust resistant material with wipers are to be provided for all guide ways.	Vendor to confirm	



Clause	PARTICULARS AND BHEL SPECIFICATION		Bidder's offer with Technical Details
<b>2.6</b>	<b>OPERATION AND CONTROL SYSTEM:</b>		
<b>2.6.1</b>	<b>OPERATOR'S PANEL:</b>		
2.6.1.1	Operator's panel having complete machine control knobs / buttons / keys shall be provided ergonomically at a suitable location. All switches on the Operator's panel including that for table magnetism should be within reach of operator of average height for convenient, efficient & safe operation. All displays / indications should also be conveniently placed accordingly. Layout showing complete details of the panel should be submitted.	Vendor to confirm Vendor to furnish	
2.6.2	Digital Read Out for vertical & cross movements	Vendor to confirm	
2.6.3	Electronic hand wheel for vertical & cross movements.	Vendor to confirm	
<b>2.7</b>	<b>MACHINE LIGHTS:</b>		
2.7.1	Machine Lights for sufficient illumination of complete working area on all sides of operator's location should be provided for clear visibility.	Vendor to confirm	
2.7.2	A magnetic base portable spotlight with sufficiently long cable should also be provided.	Vendor to confirm	
2.7.3	All light fittings, consumables, adapters/receptacles should have compatibility with Indian equivalents	Vendor to confirm	
<b>2.8</b>	<b>COOLANT SYSTEM:</b>		
2.8.1	Coolant System with all accessories shall be provided. Selection shall be through push buttons provided on the Operator's panel.	Vendor to Specify	
2.8.2	Type: Re-circulating Type Flood Coolant System with nozzles at the Wheel Head.	Vendor to confirm	

Clause	PARTICULARS AND BHEL SPECIFICATION		Bidder's offer with Technical Details
2.8.3	Coolant flow rate	Vendor to Specify	
2.8.4	Coolant pressure	Vendor to Specify	
2.8.5	Coolant collection and re-circulation system should be leak proof to avoid any spillage on shop floor.	Vendor to confirm	
2.8.6	Coolant Filtration System: Re-circulating type with suitable filtration unit. Vendor shall give details of offered filtration unit.	Vendor to specify	
2.8.7	Coolant Flow Diagram showing filters, pumps, valves, tanks etc. to be submitted.	Vendor to furnish	
<b>2.9</b>	<b>ELECTRICAL SYSTEM:</b>		
2.9.1	415V $\pm 10\%$ , 50HZ $\pm 3$ HZ, 3 Phase AC (3 wire system with out neutral) Power Supply Source will be provided by BHEL at a single point near the machine, as per layout recommended by Vendor. All types of cables, connections, circuit breakers etc. required for connecting BHEL's power supply point to different parts of the machine/control cabinets, shall be the responsibility of vendor. Requirement of grounding/earthing with required material details is to be informed by vendor well in advance so that it could be incorporated during construction of foundation.	Vendor to confirm	
2.9.2	<b>Tropicalization:</b> All electrical / electronic equipment shall be tropicalized.	Vendor to confirm	
2.9.3	All electrical & electronic control cabinets & panels should be dust and vermin proof. And shall have IP54 protection.	Vendor to confirm	
2.9.4	All electrical components in the cabinets should be mounted on DIN Rail	Vendor to confirm	

Clause	PARTICULARS AND BHEL SPECIFICATION		Bidder's offer with Technical Details
2.9.5	All electrical and electronic panels including operator's panel should be provided with fluorescent lamps for sufficient illumination and power receptacles of 220Volts, 5/15 Amp AC. All adapters/receptacles should have compatibility with Indian equivalents.	Vendor to confirm	
2.9.6	Motors shall conform to IEC or Indian Standards.	Vendor to specify	
2.9.7	Vendor should ensure proper earthing for the machine and its peripherals.	Vendor to confirm	
2.10	<b>Splash Guard:</b> The splashguard shall be of sufficient height to avoid splash of coolant and mist from the machine.	Vendor to confirm & furnish arrangement	
2.11	<b>SAFETY ARRANGEMENTS:</b> Following safety features in addition to other standard safety features should be provided on the machine: 1.Machine should have adequate and reliable safety interlocks / devices to avoid damage to the machine, work piece and the operator due to the malfunctioning or mistakes. 2.All the pipes, cables etc. on the machine should be well supported, protected and properly routed. 3.All the rotating parts used on machine should be guarded properly and statically & dynamically balanced to avoid undue vibrations. 4.Emergency Switches at suitable locations as per International Norms are to be provided 5.Oil & coolant pipelines should not run with electrical cable in the same tray / trench.	Vendor to confirm	

Clause	PARTICULARS AND BHEL SPECIFICATION	Bidder's offer with Technical Details
2.12	<b>ENVIRONMENTAL PERFORMANCE OF THE MACHINE:</b> The Machine shall conform to following factors related to environment: 1. Noise level shall not exceed 85 dB (A) at normal load condition, 1 M away from the machine 2. There shall not be any emissions from the machine. 3. No hazardous chemicals shall be used in the machine. 4. If any safety / environmental protection enclosure is required it should be built in the machine by the vendor. 5. Paint of the machine should be oil / coolant resistant and should not peel off and mix up with coolant.	Vendor to confirm
3.0	<b>LEVELING &amp; ANCHORING SYSTEM</b>	
3.1	Complete anchoring system including foundation-bolts, anchoring materials, fixators, leveling shoes etc shall be supplied for the Machine.	Vendor to confirm
4.0	<b>TOOLS FOR OPERATION &amp; MAINTENANCE:</b>	
4.1	Necessary tools like Torque Wrench, Spanners, Keys, grease guns etc. for operation and maintenance of the machine should be supplied. List of such tools should be submitted with offer	Vendor to confirm
5.0	<b>SPARES:</b>	
5.1	The Vendor shall recommend and submit list of spares required for the machine for two years of trouble free operation on three shifts /day basis under two headings as: <b>a) Mechanical spares:</b>	Vendor to specify

Clause	PARTICULARS AND BHEL SPECIFICATION		Bidder's offer with Technical Details
5.1 contd.	<p><b>b) Electrical &amp; electronic spares:</b> The list may generally include all types of Relays, Contactors, Proximity Switches, Push Buttons, Indicating Lamps, Semiconductor Fuses, Special Fuses, Circuit Breakers, Main Power Switch, Encoders, Scanning Heads for Linear Scales, spares for DRO, Operator's panel with Display Unit, I/O Cards for PLC, Power Module &amp; Control Cards for Main Drive as well as Feed Drives etc.</p> <p><b>c) Un-priced list</b> of spares with quantities, specified in <b>a &amp; b</b> above, should be submitted with this technical offer.</p> <p><b>d) Unit Price</b> of each item figuring in <b>c</b> shall be submitted in a sealed cover with the price bid.</p>	Vendor to specify	
5.2	All types of spares for total machine and accessories should be available for at least ten years after supply of the machine. If machine or control is likely to become obsolete in this period, the vendor should inform BHEL sufficiently in advance and provide drawings of parts / details of spares & suppliers to enable BHEL to procure these in advance, if required	Vendor to confirm	
5.3	Vendor to confirm that complete list of spares for machine and accessories, along with specification / type / model, and name & address of the spare supplier shall be furnished along with documentation to be supplied with the machine	Vendor to confirm	

Clause	PARTICULARS AND BHEL SPECIFICATION		Bidder's offer with Technical Details
<b>6.0</b>	<b>ACCESSORIES:</b>		
6.1	Grinding wheel segments (equivalent to 4 wheels) Built in wheel dressing unit (1 No) Diamond dresser (1 No)	Vendor to confirm	
6.2	One base plate for holding 1:20 taper discs One base plate for holding 4.5 deg discs One self centering 3 jaw chuck (for holding zero degree discs) A representative sketch of the taper base plate is shown in <b>Annexure - 4</b>	Vendor to confirm	
6.3	Automatic gap sensor to sense and stop the rapid downward movement of the grinding wheel before it touches the work piece. Vendor to furnish details of the system considered, with the offer ( <b>OPTIONAL</b> )	Vendor to confirm and furnish	
<b>7.0</b>	<b>DOCUMENTATION:</b> Three sets of following documents (Hard copies) in English language should be supplied along with the machine.	Vendor to confirm	
7.1	Operating manuals of Machine.	Vendor to confirm	
7.2	Detailed Maintenance manual of machine with all drawings of machine assemblies/sub-assemblies/parts including Electrical / Pneumatic/ Coolant circuit diagrams. All Assembly/ Sub Assembly Drawings shall be supplied with the part list also	Vendor to confirm	
7.3	Catalogues, O&M Manuals of all bought out items including drawings, wherever applicable.	Vendor to confirm	
7.4	Specification of the grinding wheel segments – Abrasive spec, segment dimensions, Mounting details	Vendor to specify	

Clause	PARTICULARS AND BHEL SPECIFICATION		Bidder's offer with Technical Details
7.5	Detailed specification of all rubber items and lube fittings	Vendor to specify	
7.6	<b>Bearings:</b> Make, Specification and Bearing number for all bearings used in the machine.	Vendor to specify	
7.7	The vendor shall submit complete Master List of parts used in the machine.	Vendor to confirm	
7.8	One additional set of all the above documentation on CD ROM, wherever possible.	Vendor to confirm	
<b>8.0</b>	<b>TRAINING:</b>		
8.1	The Vendor shall train Two BHEL Engineers in Operation and Maintenance (Mechanical, Electrical/ Electronics System) of the Machine at Vendor's works for a period not exceeding 5 working days.	Vendor to confirm	
8.2	Airfare, boarding & lodging for the trainees shall be borne by BHEL.	Vendor to confirm	
	The Vendor shall impart training to BHEL's Machine Operators and Maintenance crew in Operation and Maintenance after the commissioning of the Machine at BHEL works for not less than 6 working days	Vendor to confirm	
8.3	Competent, English speaking experts shall be arranged by the vendor	Vendor to confirm	

Clause	PARTICULARS AND BHEL SPECIFICATION		Bidder's offer with Technical Details
8.4	Vendor to quote on the basis of per man per Day for training at vendor's work	Vendor to confirm	
<b>9.0</b>	<b>FOUNDATION:</b>		
9.1	Vendor shall submit the preliminary layout drawing for getting BHEL's approval within one month from the date of Letter of Intent (LOI). Vendor shall submit complete foundation details including static and dynamic loads within three months after getting BHEL's approval. The layout should consist of all requirements pertaining to complete machine, & any other accessories. BHEL shall construct complete foundation for the machine. The vendor shall also indicate detailed specifications of grouting compound and grouting procedure etc. for foundation bolts of the machine.	Vendor to confirm	
<b>10.0</b>	<b>ERECTION &amp; COMMISSIONING</b>		
10.1	<p>1. Supplier to take full responsibility for supervision of erection. Start-up, testing of the machine its control system and all types of other supplied equipment and machining the test pieces is the responsibility of the supplier.</p> <p>2. Service requirement like power, air &amp; water shall be provided by BHEL at only one point to be indicated by supplier in their foundation/layout drawings.</p> <p>3. Other requirements like crane and helping personnel shall also be provided by BHEL, free of cost.</p>	Vendor to confirm	



Clause	PARTICULARS AND BHEL SPECIFICATION		Bidder's offer with Technical Details
10.2	Successful proving of BHEL components by the supplier shall be considered as part of commissioning. All tests under clause <b>(Machine Acceptance)</b> shall form part of the commissioning activity.	Vendor to confirm	
10.3	The vendor should bring Tools, Tackles, instruments and other necessary equipment that are required to carry out all the above activities.	Vendor to confirm	
10.4	The supplier shall arrange commissioning spares required for commissioning of the machine	Vendor to confirm	
10.5	Cover Plates required for the machine and its peripherals including pits, if any, shall be supplied and installed by the vendor.	Vendor to confirm	
10.6	Portion, if any, of the machine, accessories and other supplied items where paint has rubbed off or peeled during transit or erection should be repainted and merged with the original surrounding paint by the vendor. For this purpose, the vendor should supply sufficient quantity of touch-up paint of various colors of paint used.	Vendor to confirm	
10.7	Schedule of Erection and Commissioning shall be submitted with the offer.	Vendor to confirm	
10.8	Duration, terms & conditions for E&C should be furnished with this technical offer in detail.  Charges for the same shall be submitted with the price bid.	Vendor to confirm	

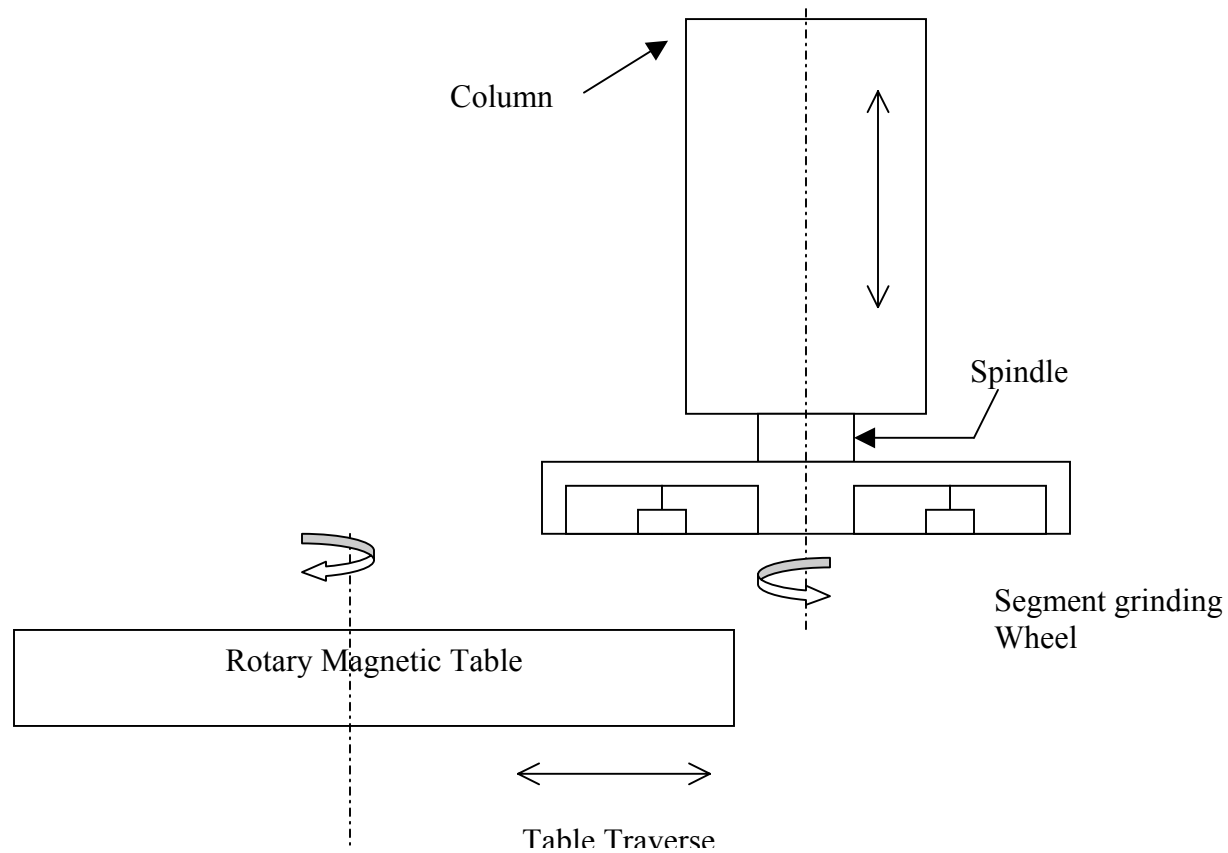
Clause	PARTICULARS AND BHEL SPECIFICATION		Bidder's offer with Technical Details
11.0	<b>ACCURACY TESTS:</b>		
11.1	<b>GEOMETRICAL ACCURACIES:</b>		
11.1.1	Geometrical Accuracy Tests shall be as per supplier's standard. Detailed Test Charts for the same, clearly showing the accuracies to be achieved on the machine, shall be submitted with the offer.	Vendor to furnish	
11.1.2	All the above accuracies to be demonstrated to BHEL engineers during pre-acceptance tests at Suppliers works and during Erection & Commissioning at BHEL Works.	Vendor to confirm	
12.0	<b>AMBIENT CONDITIONS &amp; THERMAL STABILITY:</b>		
12.1	Power Supply : AC 415 V $\pm$ 10% Frequency : 50 Hz $\pm$ 3HZ Phases : 3 phase 3 wire system Compressed air supply: 60-70 psi Ambient Temperature: max 45 °C Relative Humidity = 85% Vendor to confirm that machine is suitable for above conditions	Vendor to confirm	
12.2	Weather conditions are tropical. Atmosphere may be dust laden during some part of the year. Machine will be installed in the normal shop floor condition. Vendor to confirm that machine is suitable for above.	Vendor to confirm	

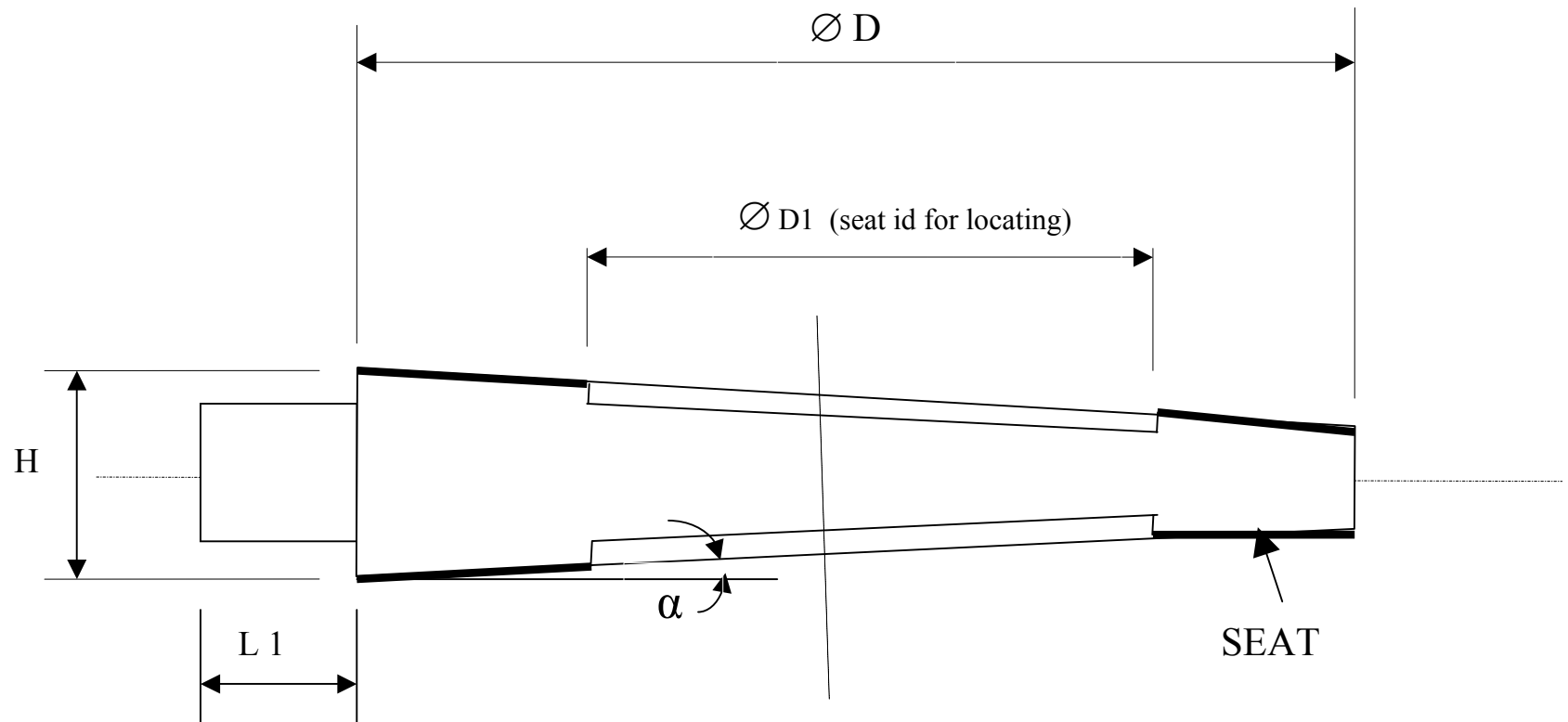
Clause	PARTICULARS AND BHEL SPECIFICATION		Bidder's offer with Technical Details
12.3	Thermal Stability of the machine shall be good enough to withstand the specified ambient conditions in order to meet the accuracy requirements of BHEL components. Vendor to confirm for trouble-free operation of the machine.	Vendor to confirm	
12.4	The Vendor should confirm that the machine and its accessories is suitable for continuous operation at its full capacity for 24 hours a day and 7 days a week through out.	Vendor to confirm	
<b>13.0</b>	<b>PROVEOUT OF BHEL COMPONENTS:</b>		
13.1	<p><b>1.</b> Material for the prove-out components will be provided by BHEL. Two components from <b>Annexure 2</b> (For Tiruchy machine) and Two components from <b>Annexure 3</b> (For Goindwal machine) will be identified.</p> <p>(Final prove out component drawing number may change, however, the machining features of the changed components shall be in line with the original component drawing.)</p> <p><b>2.</b> Vendor at BHEL works shall carry out grinding of prove-out components to the specified design accuracy and surface finish.</p> <p><b>3.</b> The vendor shall supply all tools like segment grinding wheels, Taper base plates, locators between job and taper base / table, etc. necessary for grinding of prove-out components.</p>	Vendor to confirm	

Clause	PARTICULARS AND BHEL SPECIFICATION		Bidder's offer with Technical Details
13.1 contd.	4. Vendor shall submit grinding time estimate for the prove- out components to be identified by BHEL after receipt of Order.	Vendor to confirm	
<b>14.0</b>	<b>MACHINE ACCEPTANCE:</b> (Tests/Activities TO be Performed by Vendor)		
<b>14.1</b>	<b>Tests/Activities should be carried out at supplier's works on the machine before dispatch:</b>	Vendor to confirm	
14.1.1	Geometrical Accuracy Tests as per test chart.	Vendor to confirm	
14.1.2	The machine should be tested for continuous running of 48 hrs. If any break down occurs during this test, the test should be repeated for 48 hrs from that time.	Vendor to confirm	
14.1.3	The vendor should arrange a test specimen for demonstrating the achievement of Ra 0. 8 µm of Grinding finish. Drawing of the test specimen indicating the diameter, thickness, material, hardness, finish prior to grinding shall be furnished with the offer.	Vendor to confirm and furnish drawing.	
14.1.4	Demonstration of all features of the machine and all Accessories.	Vendor to confirm	
<b>14.2</b>	<b>Test to be carried out at BHEL works while commissioning the machine:</b>		
14.2.1	Geometrical Accuracy Tests as per test chart	Vendor to confirm	
14.2.2	The machine should be tested for continuous running of 48 hrs. If any break down occurs during this test, the test should be repeated for 48 hrs from that time.	Vendor to confirm	

Clause	PARTICULARS AND BHEL SPECIFICATION		Bidder's offer with Technical Details
14.2.3	Demonstration of all features of the machine & all accessories to the satisfaction of BHEL for their efficient and effective use.	Vendor to confirm	
14.2.4	Demonstration by actual use of all supplied attachments and accessories to their full capacity.	Vendor to confirm	
14.2.5	Job prove-out.	Vendor to confirm	
<b>15.0</b>	<b>PACKAGING:</b>		
15.1	Sea worthy & rigid packing for all items of complete machine, all Accessories and other supplied items to avoid any damage/loss in transit. When machine is dispatched in containers, all small loose items shall be suitably packed in boxes	Vendor to confirm	
<b>16.0</b>	<b>GUARANTEE:</b>		
16.1	24 months from the date of acceptance of machine at BHEL	Vendor to confirm	
<b>17.0</b>	<b>GENERAL:</b> The vendor should submit the following information:	Vendor to confirm	
17.1	Machine Model	Vendor to specify	
17.2	Total connected load (KVA):	Vendor to specify	
17.3	Floor area required (Length, Width, Height) for complete machine & accessories	Vendor to specify	
17.4	Painting of Machine/ Electrical Panels: RAL 6011 Apple Green (Polyurethane Paint)	Vendor to confirm	
17.5	Total weight of the machine	Vendor to specify	

Clause	PARTICULARS AND BHEL SPECIFICATION		Bidder's offer with Technical Details
17.6	Weight of heaviest part of machine	Vendor to specify	
17.7	Weight of the heaviest assembly/ subassembly of the Machine	Vendor to specify	
17.8	Dimensions of largest part/ subassembly/ assembly of the machine	Vendor to specify	

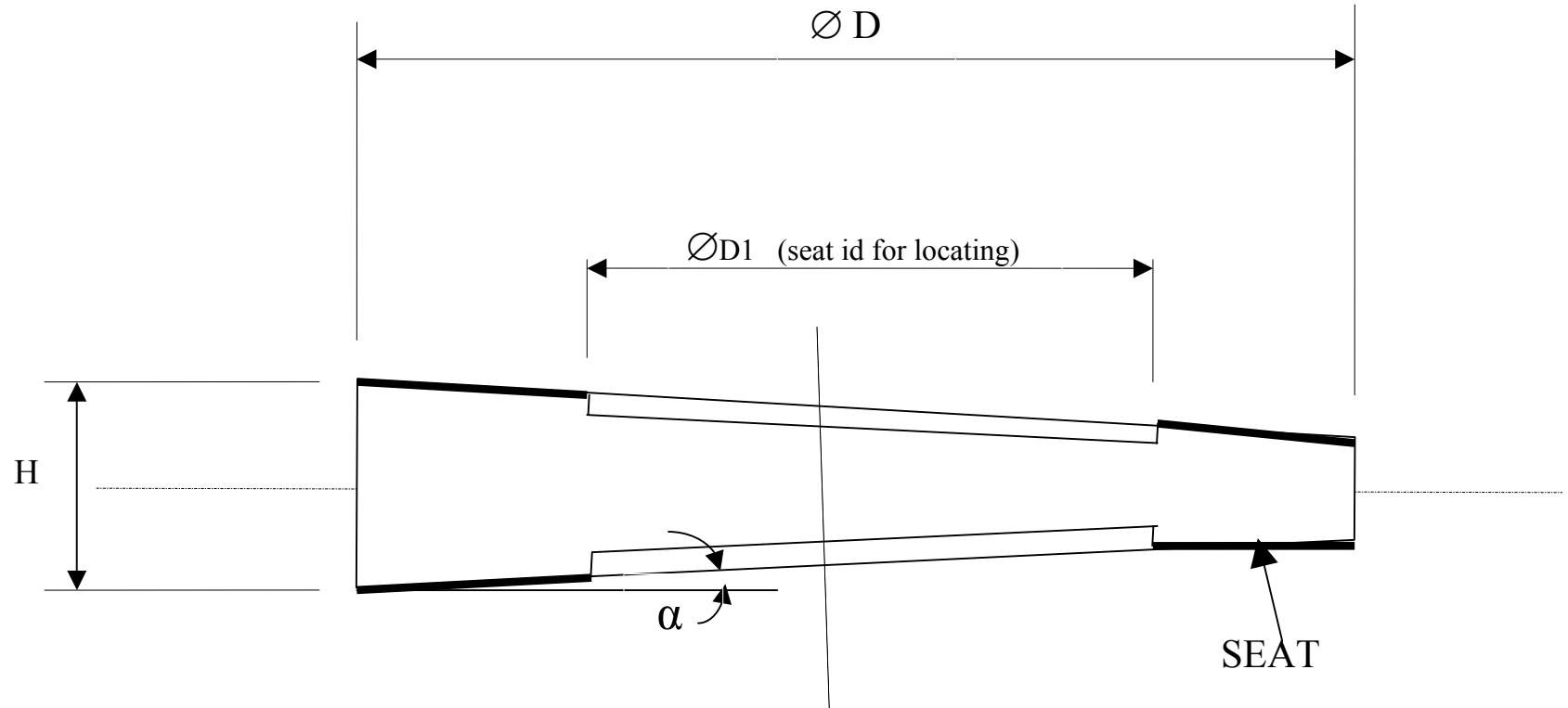
**ANNEXURE – I: Approx. configuration of Vertical Rotary Surface Grinder**

**ANNEXURE – 2: JOB DETAILS (for TIRUCHY machine)**



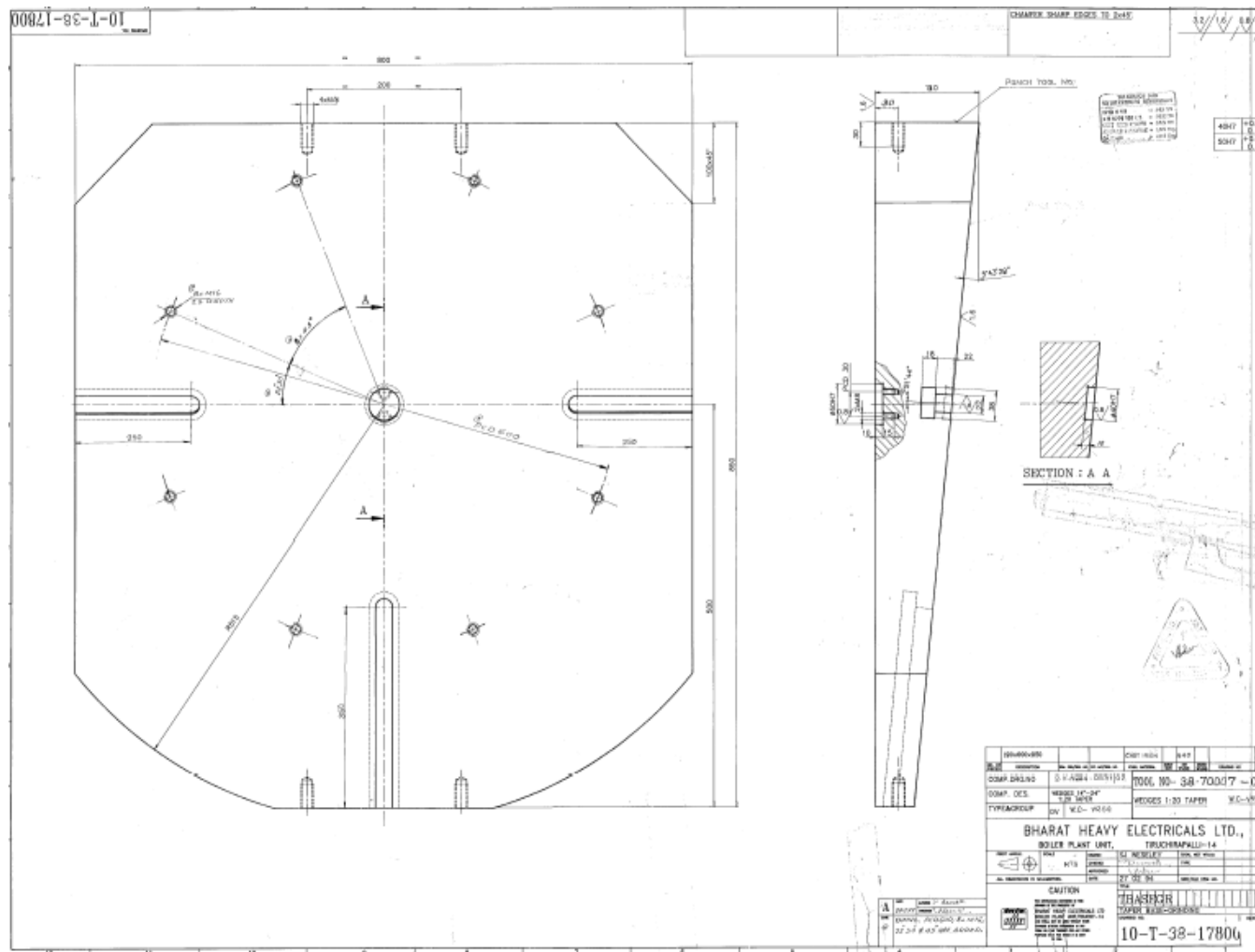
**ANNEXURE – 2: JOB DETAILS Contd.**

Sl. No.	Description	D	D1	H	L1	Angle $\alpha$
1	GV 2 1/2 3500	70	44	61	55	4.5
2	GV 2 1/2 1500	82	50	57	40	4.5
3	GV 2 1/2 2500	67	42	55	40	4.5
4	GV 8 2500	167	116	148	38	4.5
5	GV 14 2500	299	221	254	62	4.5
6	GV 18 1500	402	297	243	112	4.5
7	GV 20 2850	368	263	270	131	4.5
8	GV 32 150	842	750	255	10	1:20
9	GV 32 600	800	719	337	131	1:20
10	FV 14 2500	260	228	202	0	0
11	FV 18 2500	334	288	284	0	0
12	FV 8 2500	158	133	120	0	0
13	QCNRV 3 900	92	72	59	0	0
14	QCNRV 32 150	834	784	252	0	0

**ANNEXURE – 3: RANGE OF COMPONENTS (for GOINDWAL machine)**

$\varnothing D$		$\varnothing D1$		H		Angle $\alpha$ (Deg)
Min.	Max.	Min.	Max.	Min.	Max.	
221 mm	340 mm	190 mm	299 mm	124 mm	175 mm	1:10
271 mm	640 mm	231 mm	590 mm	116 mm	180 mm	1:20

#### ANNEXURE – 4: REPRESENTATIVE SKETCH OF TAPER BASE



PSG

TVN

GCS

KPL

SSP

AVC

RDR

SPVK