

**BHARAT HEAVY ELECTRICALS LTD.**  
**CENTRAL FOUNDRY FORGE PLANT**  
RANIPUR, HARDWAR  
MAINTENANCE & SERVICES DEPARTMENT  
**MAINTENANCE-MACHINE SHOP**

CFFP/M&S-MS/VTB/BW/WC/NIT/01

Dt. 09/04/2019

**TENDER NOTICE – OPEN TENDER**

Two part Tenders in Sealed Envelopes are invited from technically and financially capable parties, having experience in work similar to- and interested in- the under mentioned works. The tender documents are available at website [www.bhel.com](http://www.bhel.com) and [www.bhelhwr.co.in](http://www.bhelhwr.co.in) in Tender Notification Section which can be downloaded. Tender cost, as mentioned in the Tender Documents is to be deposited along with the tender itself. The tender should reach the Tender Room, CFFP, BHEL, Hardwar on or before **01/05/2019** at **1:45PM**, which will be opened on the same day in the Tender Room, CFFP, BHEL, Hardwar at **2:00 PM** in presence of the bidders who wish to be present.

Bidders are strongly recommended to inspect the site/machines before quoting their rates. Bidders are also advised to go through the Special Instructions attached to this notice. (Placed at attachment-A)

BHEL reserves the right to reject any or all of the tenders without assigning any reason thereto.

<b>Tender No. &amp; Date</b>	<b>Description of Work</b>	<b>Earnest Money</b>	<b>Total Time of completion</b>	<b>Tender Cost (Rs.)</b>
CFFP/M&S- MS/VTB/BW/WC/NIT/01  Dt. 09/04/2019	Carrying out balance of work of CNC vertical boring machine, supplied by M/s CFHI, China	Rs.1,40,800/-	10 Weeks	500/-

(Abhishek Kumar Garg)  
Sr. Engineer/M&S  
CFFP, BHEL  
Ranipur, Haridwar-249403  
(Uttarakhand)  
Contact No. 01334-284507  
E-mail ID: [akgarg@bhel.in](mailto:akgarg@bhel.in)

Copy To. :Sr.DGM (works) : for deputing finance representative for tender opening.

**SPECIAL INSTRUCTIONS**

1. Kindly read this set of Special Instructions carefully before filling up the tender form.
2. **Pre Qualification Requirements placed at Annexure C must be fulfilled by the vendor to participate in the tender and submitted along with Techno-Commercial Bid.**
3. Kindly read carefully FF07005/S/BW, Annexure-A and B which form the “Scope of Work”, “Special Terms & Conditions”& “T&C for RA”.
4. The bidders are to submit the tender form along with all Annexures as well as this set of Special Instructions (Attachment-A); all pages duly signed.
5. The tender is to be submitted in two parts, viz.: i) Techno Commercial Bid and ii) Price Bid. Documents related with Pre-Qualification Requirements i.e. Annexure-C must be submitted along with Techno-Commercial Bid.
6. Both the Techno Commercial Bid and Price Bid are to be sealed separately in separate envelopes super-scribed with **“Techno Commercial Bid for Tender no. : “CFFP/M&S-MS/VTB/BW/WC/NIT/01”** and **“Price Bid for Tender no. : “CFFP/M&S-MS/VTB/BW/WC/NIT/01”** respectively and then placed in a common envelope super-scribed with **“Tender for Tender No.: “CFFP/M&S-MS/VTB/BW/WC/NIT/01”**. The Techno Commercial Bid must also contain an un-priced copy of Price Bid.
7. Vendors have to submit clause wise confirmation of FF07005/S/BW (Scope of Work), Annexure A, B & C.
8. Only the Techno Commercial bid will be opened on the day of tender opening. The Priced Bid will be opened only if Techno Commercial Bid(s) are found Technically Suitable & Acceptable. Date of opening of Price Bid will be intimated to all technically suitable and acceptable bidders at a suitable time.
9. **It is strongly recommended to all potential bidders to visit the site and the machine under consideration. Any presumption by the bidders in this regard will not be entertained after opening of the tender.**
10. No accommodation facilities will be provided by BHEL to any of the staff of the contractors
11. Apart from the “Special Terms & Conditions”, placed at Annexure-A, the contractor will have to comply with other Terms & Conditions including “General Terms & Conditions” & “Safety Norms” as stipulated in BHEL’s Works Policy as modified from time to time and Government rules.
12. Once Price Bids are opened and accepted by BHEL, the same cannot be withdrawn by the bidder for whatsoever reasons. In case a bidder withdraws his/her/their tender, suitable action may be taken by BHEL as deemed fit. This may include black listing of bidder or legal action.
13. If there is a difference found in the figures & words of the offered price. The price given in the words will be considered.

**(Issuing Officer)**

**BHARAT HEAVY ELECTRICALS LTD.**  
**CENTRAL FOUNDRY FORGE PLANT**  
**RANIPUR, HARDWAR**  
 MAINTENANCE & SERVICES DEPARTMENT  
 MAINTENANCE-MACHINE SHOP  
TENDER FORM FOR “CARRYING OUT BALANCE OF WORK OF CNC VERTICAL BORING  
 MACHINE, SUPPLIED BY M/S CFHI CHINA”

**(PRICE BID)**

**PRICED/UNPRICED**

(PRICED PRICE BID TO BE SEALED IN SEPARATE ENVELOP)

Name & Address of Bidder	:	
Tender Notice No.	:	CFFP/M&S-MS/VTB/BW/WC/NIT/01 Dt. 09/04/19
Last Date & Time for receipt of Tender	:	13:45 hrs on 01/05/2019
Date & Time for opening of Tenders	:	14:00 hrs on 01/05/2019
Place for opening of Tenders	:	Tender Room, CFFP, BHEL, Hardwar
Nature of Contract	:	Carrying out balance of work of CNC vertical boring machine, supplied by M/s CFHI, China
Period of Contract	:	10 Weeks

Description of Work

“ <b>Electrical Retrofitting of Lathe Machine SR2000A in Machine Shop</b> ” consisting of :	Period of Contract	Cost excluding Duties & Taxes (To be quoted by the Contractor) Decision of price competitiveness will be based on Price of Item along with loading as applicable.	
	Weeks	Figure	Words
Carrying out balance of work of CNC vertical boring machine, supplied by M/s CFHI, China			
Total			

Enclosures:

1. FF07005/S/BW: Scope of Work
2. Annexure-A (CNC\_VTL) : Special Terms & Conditions
3. Annexure-B (CNC\_VTL) : T&C for RA
4. Annexure-C (CNC\_VTL) : Pre-Qualification Requirements
5. Annexure-1 (CNC\_VTL) : Accuracy Chart

Signature of Issuing Officer

Signature of Bidder/Tenderer

**Declaration by Bidder**

I/We hereby confirm that I/we have carefully read and understood “Special Instructions”, , “Scope of Work”, “Special Terms & Conditions”, “T&C for RA” and “Pre-Qualification Requirement”, placed at Attachment-A to the Tender Notice and FF07005/S/BW, Annexure-A (CNC\_VTL), B(CNC\_VTL), C(CNC\_VTL) respectively and have complied/will comply with the same.

Signature of Bidder/Tenderer

(Accounts Officer)

(Opening Officer)

(Issuing Officer)

<b>CFFP/BHEL HARDWAR</b>		
		<b>FF07005/S/BW</b>
		<b>18-Mar-19</b>
<b>CNC VTL Model: CXK5250X36/100, supplied by M/s CFHI, China</b>		
<b>SNO</b>	<b>CFFP/BHEL,HARDWAR REQUIREMENT</b>	<b>Vendor's Remarks</b>
<b>A</b>	<b>Machine Broad Description:</b>	<b>Vendor to note</b>
<b>1.0</b>	<b>Purpose:</b>	
1.1	Turning, Boring, Facing, Taper Turning, Profile Machining	
1.2	The Machine is for machining of Steel Castings and Forgings (in black condition). Machine is suitably designed to withstand toughest conditions as our castings & forgings generally have black spots, hard spots, sand inclusion, bend, cracks, etc. Machine will be utilized for bulk material removal. Intermittent cutting will also be there.	
1.3	<b>Work Piece Material:</b> The components to be machined will be mainly high temperature & creep resistant alloy steel castings and forgings of Mat. grade 17CrMoV511, X22CrMoV121 having tensile strength 40-95 Kg/mm <sup>2</sup> , %Elongation 15-22% & Hardness up to 350BHN.	
<b>2.0</b>	<b>Specification:</b>	
2.1	Maximum Job Height for turning & facing: 3600mm	
2.2	Table Diameter: 4500mm	
2.3	Turning Diameter: 5000mm	
2.4	Max. Weight of job: 100MT	
2.5	Table Speed: 0.32 to 32 rpm	
2.6	No. of speed range: step1: 0.2-8 rpm; step2: 8-32 rpm	
2.7	Details of main Table motor: Type No. 1PH8288-1DB13 (103 KW, 400rpm) Siemens make Spindle Motor	
2.8	Details of main Table Drive: Siemens make ALM, AIM & SMM suitable for above mentioned motor (Type no. 6SL3320-1 TE32-6AA3)	
2.9	No. of Jaws - 04	
2.10	Maximum External Clamping Diameter: 4410mm	
2.11	Minimum External Clamping Diameter: 1870mm	
2.12	Maximum Internal Clamping Diameter: 4010mm	
2.13	Minimum Internal Clamping Diameter: 1470mm	
2.14	Clamping Force of each Jaw: 250kN	
2.15	Cutting Force: 50kN	
2.16	Torque: 200kNm	
2.17	RPM at which Max. Torque is available : 2.5 RPM	
2.18	Cross rail: vertical travel: 3200mm	
2.19	Cross rail: Cross traverse rate: 350mm/min	
2.20	Cross rail: No. of Positions: 16	
2.21	Cross rail: Distance between each Position: 200mm	
2.22	Distance of lowest Step from Table Top: 900mm	
2.23	Distance of highest Step from Table Top: 4100mm	

## SCOPE OF WORK

SNO	CFFP/BHEL,HARDWAR REQUIREMENT	Vendor's Remarks
2.24	Maximum Height of Cross Rail bottom from Table Top: 3800mm	
2.25	Minimum Height of Cross Rail bottom from Table Top: 500mm	
2.26	Movement of Cross Rail & clamping system: Double screw to control the elevation of the crossrail. Mechanism for clamping: Mechanical & unclamping: hydraulic	
2.27	Machine Reference Point is at Ram Reference Point and it is updated automatically with movement of Cross Rail	
2.28	Movement of cross rail: Double screw to control the elevation of cross rail	
2.29	Clamping system: Mechanical & Hydraulic	
2.30	Detail of cross rail movement: Driven by AC motor with twin shafts extend left and right elevating boxes are mounted on top of gantry frame to move crossrail up and down via gear pair and worm rack.	
2.31	No. of columns: 02	
2.32	No. of Rams : 02	
2.33	Vertical milling head: 01 no.; attachment on Lead Head. Power is 38KW, 1000	
2.34	Minimum Diameter of bore using RAM: 510mm	
2.35	Cross Section of RAM: 320X320mm	
2.36	Mechanism of Taper Machining: Manual Operation -15° to 30°	
2.37	Mechanism for contour/profile machining: CNC programming.	
2.38	Clamping details for mounting Turning Tool Holders/Attachments on ram: Manual Clamping	
2.39	Clamping Force Available for clamping of Turning Tool Holders/ Attachments:	
2.40	Maximum cutting force of Right Head & Left Head: 50kN & 40kN respectively.	
2.41	Main Traverse: Vertical Travel of Ram (Z-axis)-2200mm; Horizontal travel of RAM (X-axis) -20 to 2765mm.	
2.42	Horizontal Travel of Ram beyond Center of the Table ( -ve X - Axis ): 20mm	
2.43	Maximum Distance between Table Top and Standard Turning Tool Holder with Tool: 3620mm	
2.44	Minimum Distance between Table Top and Standard Turning Tool Holder with Tool: 420mm	
2.45	Maximum Distance between Table Top and Vertical Milling Head with Cutter: 3000mm	
2.46	Minimum Distance between Table Top and Vertical Milling Head with Cutter:	
2.47	Width of Cross Rail guideways:1250mm	
2.48	Width of column guideways:800mm	
2.49	Details of X & Z guideways: X & Z are fully hydrostatic guideways	
2.50	Table Rotary Guideways: Hydrostatic	
2.51	Cutting feed in X-axis & Z-axis: 0.04-350mm/min	
2.52	Rapid feed in X-axis & Z-axis: 0.1-1000mm/min	
2.53	X-axis & Z-axis drive & motor details: Dia of the ball screw is 100mm, Pitch is 16mm. Siemens make servo motor type:1FT7108-5AC71, 50Nm, 2000r/min(with brake); Siemens make Drive: 6L3120-1TE23	
2.54	Maximum cutting force permissible on Ram and at what extension: 4400mm	
2.55	Maximum permissible Cutting Force at Maximum Ram extension: 8kN	
2.56	Operator's Platform, Operator' Panel, Siemens make Hand Held unit (2nos.), Main Control Desk & chiller unit are fitted on the machine.	

SNO	CFFP/BHEL,HARDWAR REQUIREMENT	Vendor's Remarks
2.57	Air Conditioners are fitted on the Electrical Panel	
2.58	Hydraulic System, Lubrication system & Interlocking of Table lubrication & Table drive is available on the machine	
2.59	415V +10% / -10%, 50HZ +/- 3 HZ, 3 Phase AC (3 wire system without neutral) Power Supply Source provided to the machine which is further routed through Ultra Isolation Transformer & Servo Voltage Stabilizer to provide power to the Electrical Panel of the Machine.	
2.60	Pneumatic system for cleaning of Heidenhain make Linear scales & scanning Heads is available on the Machine.	
2.61	Siemens make CNC 840 DSL system fitted on the machine.	
2.62	Heidenhain make Linear scales & scanning Heads are installed for measuring system along with Siemens motor encoders.	
	<b>Work: Erection &amp; commissioning of CNC vertical Borer machine (CNC VTL Model: CXK5250X36/100) which is partly erected by OEM (M/s CFHI, China)</b>	
<b>B</b>	<b>Vendor's Scope of Work:</b>	<b>Vendor to confirm</b>
<b>3.0</b>	<b>Erection &amp; Commisioning</b>	
3.1	Vendor to take full responsibility for carrying out the start up, testing of machine, it's control & all types of other supplied equipment, machining of test pieces etc. Service requirement like power, air & water shall be provided by BHEL. Other requirements like crane and helping personnel shall also be provided by BHEL. Details of these requirements should be informed by vendor in advance	
3.2	Successful proving of BHEL components by the vendor shall be considered as part of commissioning. All tests, as mentioned at <b>Clause no.6</b> (Machine Acceptance) shall form part of the commissioning activity.	
3.3	Commissioning spares, required for commissioning of the machine within stipulated time, shall be brought by the vendor on returnable basis.	
3.4	Schedule of Commissioning shall be submitted with the offer.	
3.5	Study of Machine's present condition including all electrical & mechanical data of the machine.	
3.6	Checking of present foundation of the machine & check the leveling of machine. If the machine require re-leveling the same will be carried out by the vendor.	
3.7	Tracing of present electrical wiring, checking of continuity & proper re-routing (if required) of cables from field elements to electrical panel will be in Vendor's scope.	
3.8	Machine PLC/CNC logic & software will be re-written & all interlocks will be cross checked by the vendor.	
3.9	Checking & Re-tuning of all the axes parameters of the machine with its Mechanical Parameters will be in Vendor Scope.	

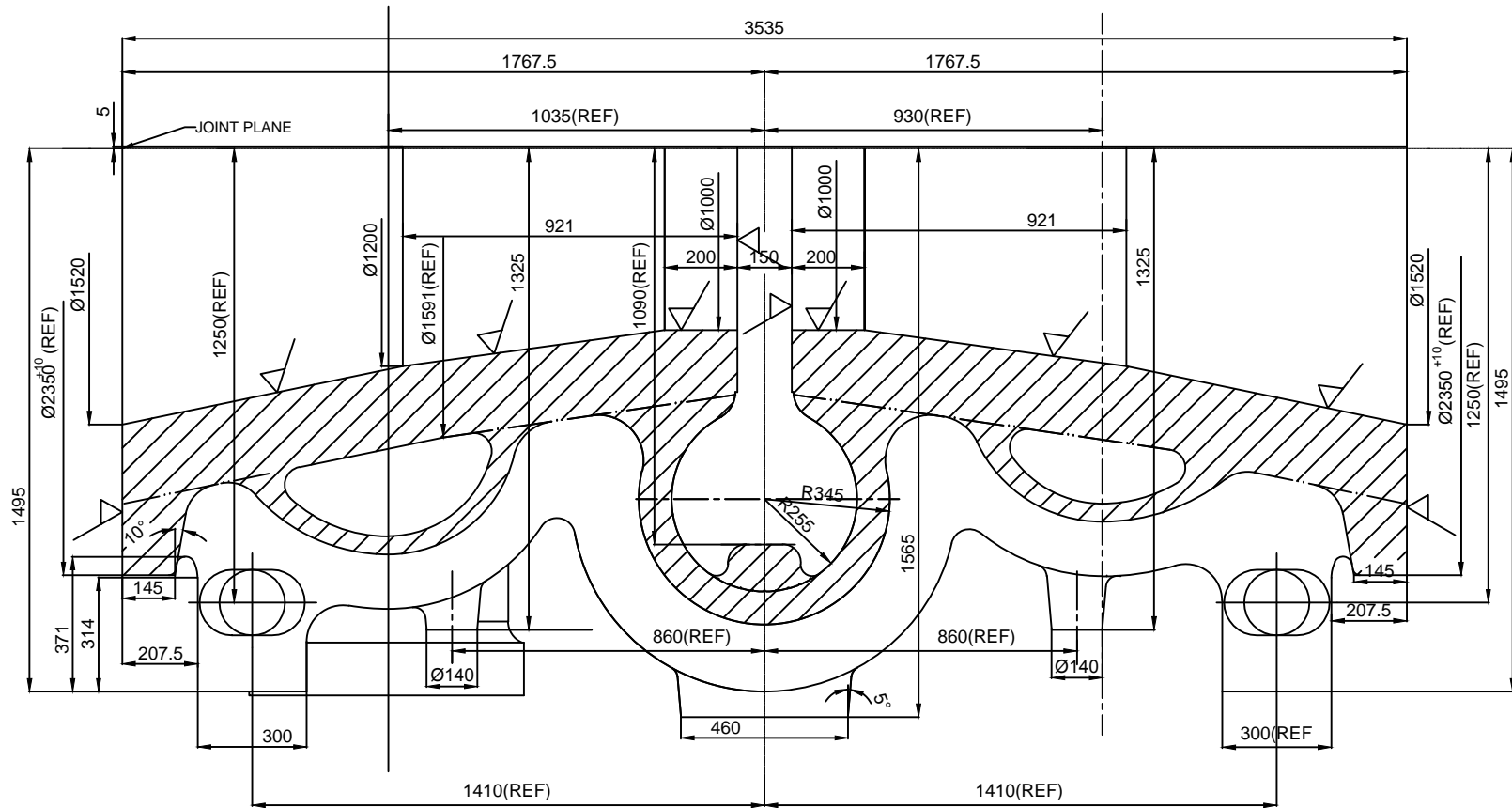
**SCOPE OF WORK**

SNO	CFFP/BHEL,HARDWAR REQUIREMENT	Vendor's Remarks
3.10	Drawing and Supply of 4 Sets (3 Hard Copies and One Soft Copy in External Hard Disc 1TB) of All the relevant drawings including but not limited to: a. Complete PLC/CNC Program (new) in Ladder/STL Format including Process Logic, Input/Output/Flag Lists, Cross References etc. with comments. b. Complete modified Wiring Diagram, including Termination Details, Cable Identification Details, Cable/Wire Lengths & Locations and Cable/Wire Route etc. (if any modification). c. List of Parameters for each drive, individually, d. Back-up of CNC system in suitable media.	
3.11	Tools, Tackels, Test Mandrels, instruments and other necessary equipment required to carry out all above activities should be brought by the Vendor.	
3.12	All Cover Plates required for the machine and its peripherals including pits, if any, shall be supplied and installed by the vendor.	
3.13	A magnetic base portable spot light with sufficiently long cable should also be supplied by the vendor.	
3.14	All wire should be in conduit & same should be metallic & strong enough to withstand any damage due to hot & sharp metallic chips. Conduit required if any, to be supplied by vendor.	
	<b>4.0 MACHINE ACCURACIES :</b>	
4.1	GEOMETRICAL ACCURACIES :	
4.1.1	Geometrical Accuracy Tests shall be in accordance with the attached chart (Annexure-1) for accuracies and shall comply the specified geometrcial accuracies.	
4.1.2	All the accuracies mentioned in attached chart should be demonstrated to BHEL engineers during commissioning	
4.1.3	All the calibration tools like Graphite Square, Straight Edges etc. will have to be arranged by the Vendor.	
4.1.4	Correction required during Geometrical accuracies test will be in vendor's scope.	
4.2	POSITIONING ACCURACIES :	
4.2.1	Laser Calibration of Machine will be in vendor scope. Vendor to submit report of Laser Calibration.	
	<b>5.0 PROVEOUT OF BHEL COMPONENTS :</b>	
5.1	Likely jobs which shall be machined on this machine are as per drawings enclosed i.e. 04-VTB-01, 04-VTB-02, 04-VTB-03 & 04-VTB-04. Out of these, two components shall be likely proveout component. Job setting plan, Machining process plan & Requirement of Tools etc. for machining of proveout components shall be discussed and mutually agreed with vendor. Complete machining of prove out components shall be done by Vendor at BHEL works to the specified design accuracy and surface finish, using cutting tools & necessary setting, clamping & machining aids to be provided by the vendor to prove the machine after complete commissioning, tests & test piece machining etc.	

**SCOPE OF WORK**

<b>SNO</b>	<b>CFFP/BHEL,HARDWAR REQUIREMENT</b>	<b>Vendor's Remarks</b>
5.2	Vendor shall be fully responsible for machining of proveout components as per drawing and other requirements specified by BHEL to the full satisfaction of BHEL. Clarifications, if any required by vendor, regarding accuracy requirements of the proveout components, whether specified or not, should be discussed and cleared by vendor during initial technical discussions. Party to ensure deviation free machining within specified time limit.	
<b>6.0</b>	<b>MACHINE ACCEPTANCE: (Tests/Activities should be Performed by Vendor)</b>	
6.1	Geometrical accuracies	
6.2	Positioning accuracies	
6.3	TURNING POWER TEST : Full load test to demonstrate the maximum power & cutting capacity of the machine.	
6.4	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.	
6.5	Demonstration of all features of the machine, control system, all supplied attachments & accessories to their full capacity and to the satisfaction of BHEL for efficient and effective use of the machine	
6.6	Machining test piece as per VDI standard or any other equivalent standard . Vendor to arrange Test pieces and tooling for it's machining.	
6.7	Proveout machining.	
6.8	Two weeks supervision of independent operation of machine by BHEL after job proveout	
6.9	Training of BHEL machine operators in operation of complete machine & accessories etc by the supplier's experts / engineers during their stay at BHEL	
<b>7.0</b>	<b>GUARANTEE/ WARRANTY :</b>	
7.10	Warranty for the above scope of work (Cl. No. 3 to 6) of 24 months will have to be provided by the vendor.	

SNO	CFFP/BHEL,HARDWAR REQUIREMENT	Vendor's Remarks
	<p><b>IMPORTANT NOTES:</b></p> <ol style="list-style-type: none"><li>1. Subjected Machine is supplied by M/s CFHI, China. They have completed the installation &amp; erection work of the machine. During commissioning of the machine, some noise was observed during cross rail movement. Meanwhile, M/s CFHI informed that they had gone bankrupt. CFFP needs this machine to be fully commissioned &amp; put to use by the vendor.</li><li>2. Since, the machine was supplied by M/s CFHI, China &amp; not by the bidders. Therefore, if any inherent problem is noticed in the machine &amp; the bidder is not able to demonstrate accuracies, particular functioning i.e. same to be elaborated &amp; recorded. Same shall be considered by the BHEL suitably.</li><li>3. Apart from above input if any information/input is desired, then vendor may visit in-person rather CFFP recommends that bidder should visit on-site for the real assessment of the machine &amp; scope.</li><li>4. It is strongly recommended to all the potential bidders to visit the CFFP Plant &amp; the Machine before bidding. Any presumption by the bidder regarding the condition of the machine, its components etc. shall not be entertained by the BHEL once the bid has been submitted.</li><li>5. Clause no. 1 &amp; 2 are for the major information of the Machine.</li><li>6. Clause no. 3 to 7 are in vendor's scope.</li><li>7. Any work not covered in the scope of work but later found necessary for the completion of the project shall be executed by vendor without any additional charges.</li></ol>	



NOTE:

1. Surface Finish 3.2 microns on machined surfaces.
2. Tolerance : Outside Dimensions +0.5, -0  
InsideDimensions +0, -0.5
3. Runout of all diameters to be within 0.1mm.
4. Perpendicularity of surfaces to be within 0.1mm.

**CASTING**

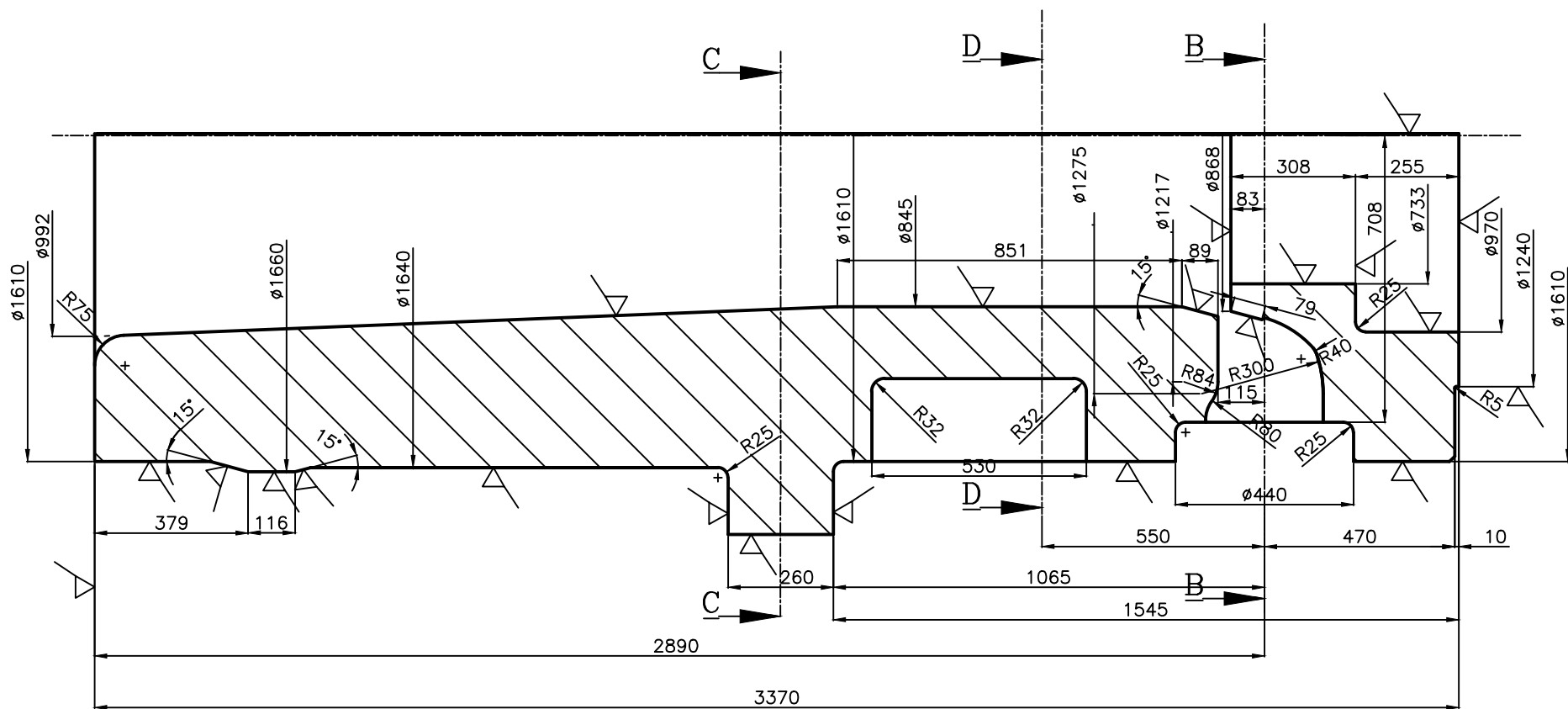
BEFORE MACHINING WT.: 34600 KG

AFTER MACHINING WT.: 33150 KG

**DRG. NO: 04-VTB-01**

SHEET NO:

NO. OF SHEETS



Section A-A

NOTE:

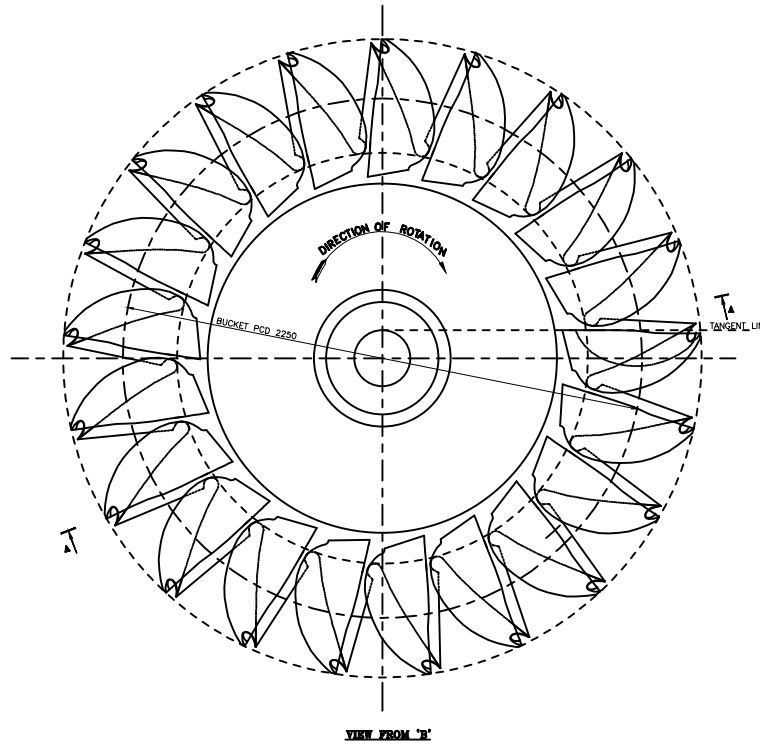
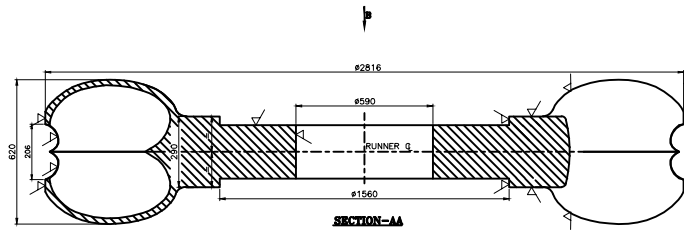
1. Surface Finish 3.2 microns on machined surfaces.
2. Tolerance : Outside Dimensions +0.5, -0  
InsideDimensions +0, -0.5
3. Runout of all diameters to be within 0.1mm.
4. Perpendicularity of surfaces to be within 0.1mm.

CASTING	BEFORE M/C WT.:20750KG AFTER M/C WT.:19400KG	
	DRG. NO: 04-VTB-02	
	SHEET NO:	NO. OF SHEETS



FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN mm)

DRAWING NO. sheet 1/1



NOTE:

1. Surface Finish 3.2 microns on machined surfaces.
2. Tolerance : Outside Dimensions  $+0.5, -0$   
InsideDimensions  $+0, -0.5$
3. Runout of all diameters to be within 0.1mm.
4. Perpendicularity of surfaces to be within 0.1mm.

CASTING

BEFORE MACHINING WT. = 9100 Kgs.

AFTER MACHINING WT. = 7500 Kgs.

DRG. NO: 04-VTB-04

SHEET NO:

NO. OF SHEETS

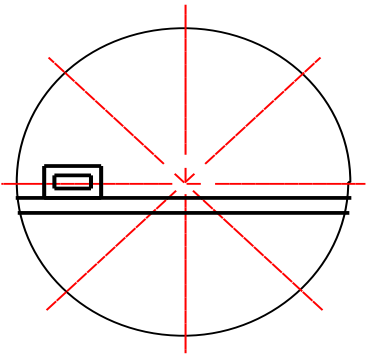
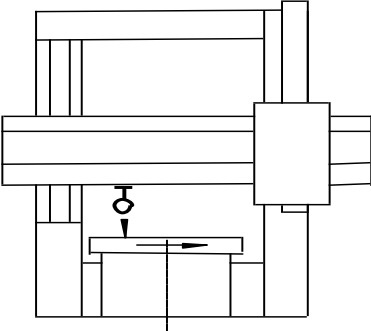
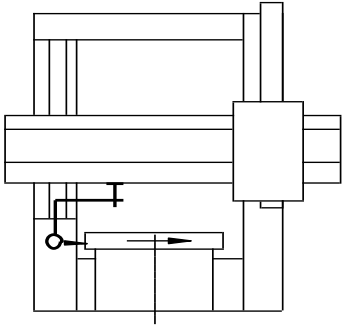
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# Accuracy Chart

**Annexure-1**

**This is a Chinese standard – equivalent to ISO Standard**

序号 code number	检 验 项 目 testing items	检验示意图 testing diagram	精 度 (mm) precision
G1	工作台面的平面度 flatness of table		<p style="text-align: center;">Table diameter:0.065 (flat or concave) (平或凹)</p> <p style="text-align: center;">局部公差在任意 300 测量长度上为 0.01 0.01 in any 300 mm measuring length</p>
G2	工作台面的端面跳动 Face run out of table		0.045
G3	工作台的径向跳动 Radial run out of table		0.045

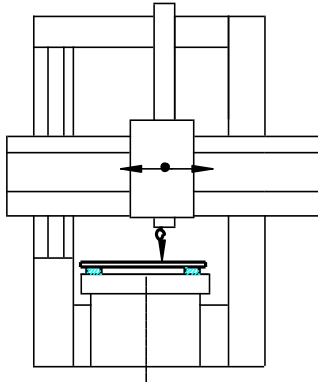
## Accuracy Chart

## Annexure-1

序号 code number	检 验 项 目 testing items	检验示意图 testing diagram	精 度 (mm) precision
G4	<p>横梁垂直移动对工作台面的垂直度： perpendicularity of vertical travel of crossrail to table surface</p> <p>在垂直于横梁的平面内；in the flat normal to crossrail</p> <p>在平行于横梁的平面内。In the flat parallel to crossrail</p>		<p>a、 在 1000 测量长度上为：in any 1000mm measuring length:</p> <p>0.04 (车刀架) Turning railhead</p> <p>0.03 (铣刀架) Milling railhead</p> <p>a 、 in any 1000mm measuring length.is</p> <p>0.04</p> <p>b、 在 1000 测量长度上为： 0.025 in any 1000mm measuring length is</p> <p>0.025</p>

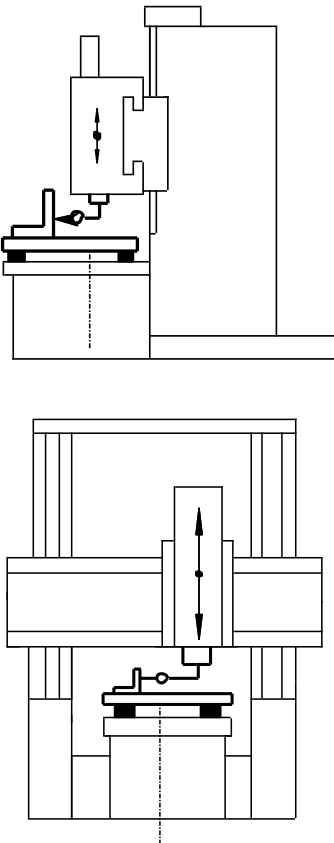
# Accuracy Chart

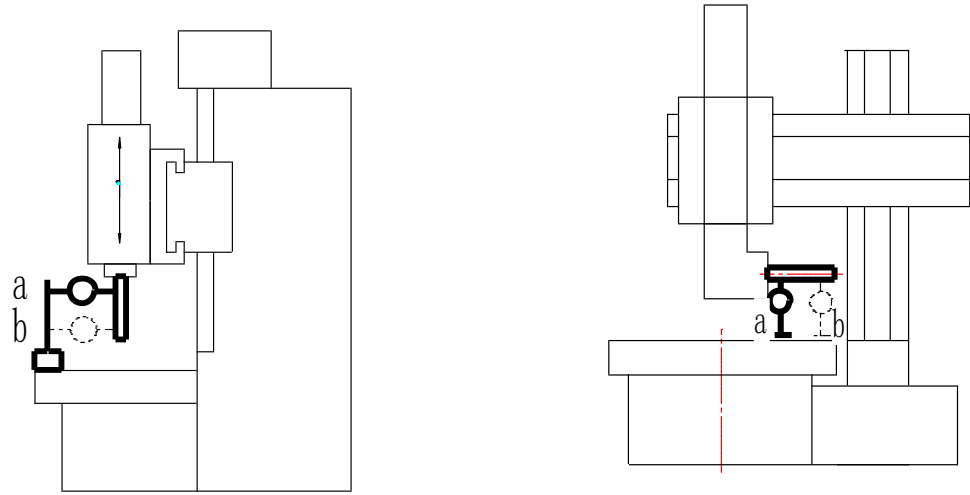
# Annexure-1

G5	垂直刀架移动对工作台面的平行度 Parallelism between motion of railhead and table surface		在任意 1000 测量长度上为: 0.02 In any 1000mm measuring length is 0.02
序号 code number	检验项目 testing items	检验示意图 testing diagram	精度 (mm) precision

# Accuracy Chart

# Annexure-1

G6	<p>垂直刀架滑枕移动 对工作台面的垂直 度:</p> <p>Verticality between ram movement of railhead and table surface</p> <p>a) 在垂直于横 梁的平面内; in the flat normal to crossrail</p> <p>b) 在平行于横 梁的平面内。In the flat parallel to crossrail</p>		<p>a. 在 1000 测量长度上 为: in any 1000mm measuring length</p> <p>0.04 (车刀架) Turning railhead</p> <p>0.03 (铣刀架) Milling railhead</p> <p>a、On 1000 gage length is 0.04</p> <p>b、在 1000 测量长度上 为 0.02 in any 1000mm measuring length is 0.02</p>
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<p>G7</p> 		
序号 code number	检 验 项 目 testing items	检验示意图 testing diagram

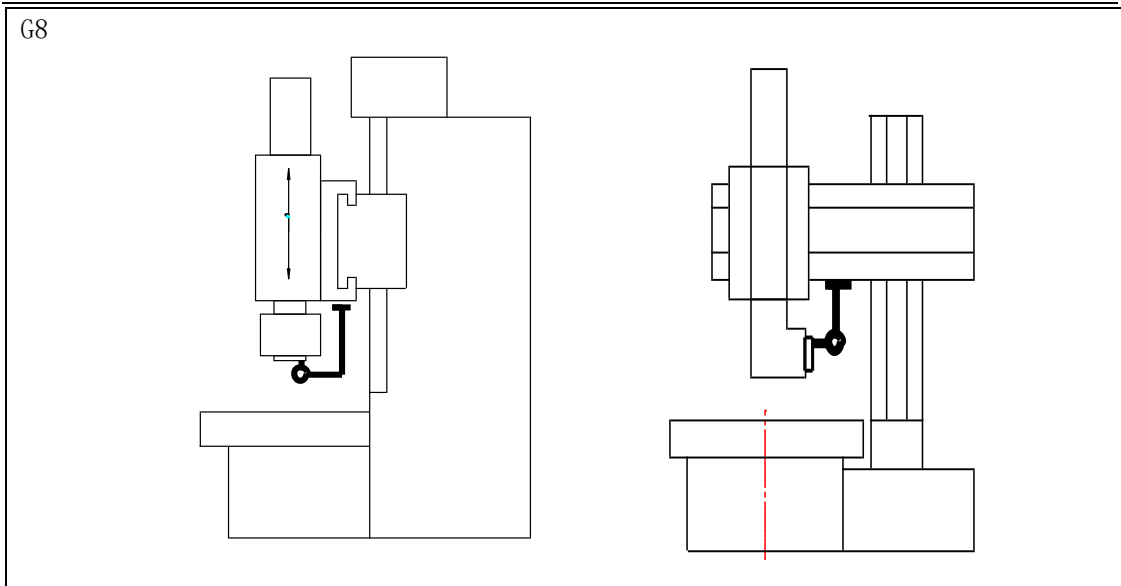
## Accuracy Chart

## Annexure-1

<p>刀具主轴锥孔轴线的 径向跳动</p> <p>Radial runout of tool spindle taper axis</p> <p>1. 直 铣 头 right-angle milling head</p> <p>a. 靠近主轴端面 next to spindle face</p> <p>b. 距主轴端面 300mm 处 location 300mm from spindle face</p>	<p>在主轴锥孔中插入检验棒，固定 指示器，使其测头触及检验棒的表面：</p> <p>Insert the test bar into the spindle taper and fix the indicator made it touch the surface of the test bar</p> <p>a. 靠近主轴端面 Close to the spindle</p> <p>b. 靠近主轴端面 300mm 处，旋 转主轴检验。</p> <p>300mm to the spindle and swing the test bar</p> <p>拔出检验棒，相对主轴旋转 90 度，重新插入主轴锥孔中，依次重复 检验三次。Pull out test bars and opposite to the spindle rotates 90 degrees, reinsert the spindle taper hole, repeating test three times</p> <p>a、b 的误差分别计算，误差以 四次测量结果的平均 值计。</p> <p>A, B errors were calculated separately, the average value of error of four-time measurement is the final result.</p>	<p>a. 0.01</p> <p>b. 0.02</p>
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# Accuracy Chart

**Annexure-1**



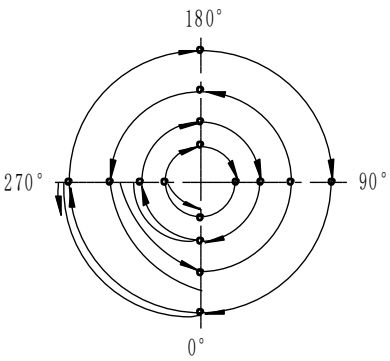
序号 code number	检 验 项 目 testing items	检验示意图 testing diagram
刀具主轴锥孔的端面跳动 Facial run-out of spindle taper hole of tool 1、直 铣 头 right-angle milling head	固定指示器使其测头触及检 验端面旋转主轴 Insert the test bar into the spindle taper and fix the indicator made it touch the surface of the test bar	0.015

序号 code number	检 验 项 目 testing items	允 差 (mm) tolerance	
		X 轴 x axis	Z 轴 Z axis

## Accuracy Chart

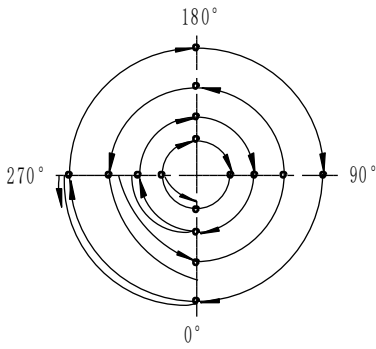
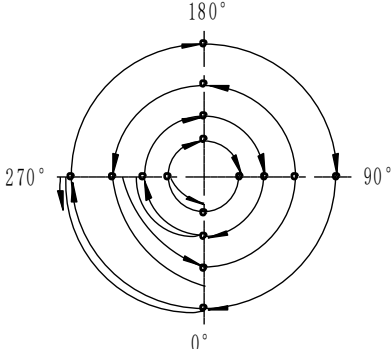
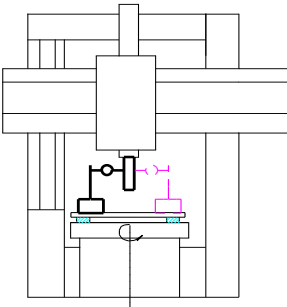
## Annexure-1

G9	A、定位精度 positioning accuracy B、重复定位精度 repeating accuracy C、反向偏差 reversal deviation	在任意 1000 测量长度上: on optional 1000 gage length a、0. 030 b、0. 015 c、0. 010	在任意 1000 测量长度上: a、0. 030 b、0. 015 c、0. 010
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序号 code number	检验项目 testing items	检验示意图 testing diagram	精度 (mm) precision
G10	数控回转工作 台的定位精度 Positioning accuracy of table		±10"

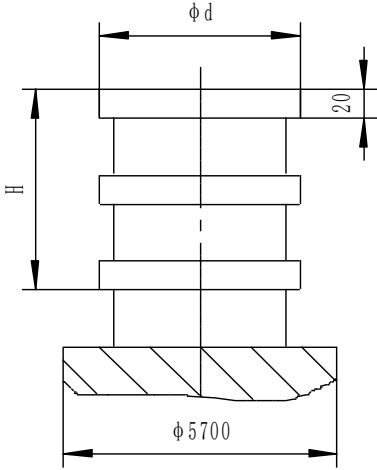
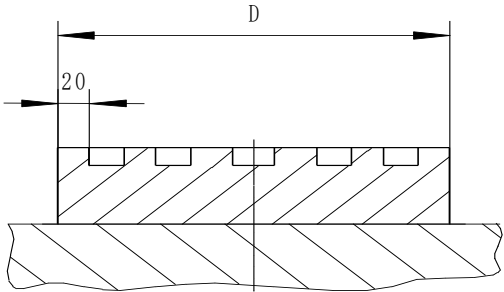
# Accuracy Chart

# Annexure-1

G11	数控回转工作 台的重复定位精 度  repeating accuracy of table		±6"
G12	数控回转工作 台的反向差值  reversal deviation of table		±5"
G13	工具孔轴线与工 作台旋转轴线的 重合度  Coincidence of axis of table and tool hole		±0.05

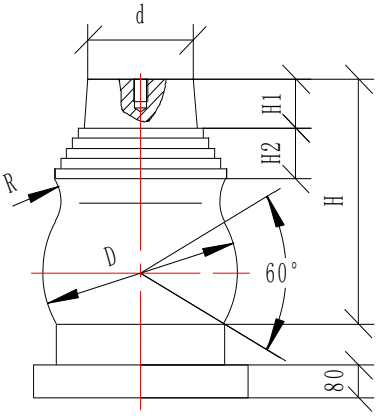
# Accuracy Chart

# Annexure-1

序号 code number	检验项 目 testing items	检验示意图 testing diagram	精度 (mm) precision
P1	<p>a、圆度 roundness (按 GB/T 1182-1996)</p> <p>b.在纵截面内 直径尺寸一致 性 homogeneity of radial dimension in longitudinal section</p>	 <p style="text-align: center;">H=3/4 滑枕行程 ram travel (<math>H_{max}=1000mm</math>) <math>d=H/2</math> 材料: 铸铁 material: cast iron</p>	<p>a、0.015</p> <p>b、在 300 测量长度上为 0.02 on 300 gage length is 0.02</p>
P2	<p>平面度 flatness</p>	 <p style="text-align: center;"><math>D=1500mm</math> 材料: 铸铁 material: cast iron</p>	0.04

# Accuracy Chart

# Annexure-1

序号 code number	检验项目 testing items	检验示意图 testing diagram	精度 (mm) precision
P3	<p>a、各圆柱面直径各阶面高度与指令值之差 Deviation between each cylindrical diameter or step</p> <p>b、表面粗糙度平面、圆柱面圆锥面、圆弧面 Roughness of plane, cylinder surface, taper face and arc face.</p>	 <p style="text-align: center;">材料：铸铁 material: cast iron</p>	<p>a、±0.02</p> <p>b、平面、圆柱面 flat, cylindrical face</p> <p>Ra=1.6 μm</p> <p>圆弧面 arc surface</p> <p>Ra=3.2 μm</p>

## SPECIAL TERMS & CONDITIONS

This section details Special Terms & Conditions under which the contract is to be executed. These Terms & Conditions are in addition to the General, Safety and Other Terms & Conditions of BHEL, applicable to the Works Contracts, as per BHEL Works Policy 2016. The Special Terms and Conditions applicable are as below:

A. For acceptance of the tender submitted by BHEL:

- a. All the bidders are strongly recommended to visit the plant (CFFP) for a first hand appraisal of the machines. Any presumption regarding the condition of the machine, by the bidder, shall not be entertained at a later stage.
- b. It is necessary for all the bidders to submit their bids in two parts viz. i. Techno-Commercial bid and, ii. Price Bid.
- c. All the bidders have to specify the execution period (including E&C, Accuracy Test & Prove-out) in the technical bid. Normally accepted Execution period will be 10 Weeks from the date of issue of work order. Any deviation will attract loading as specified in clause J of this annexure.

B. Earnest money deposit (EMD):

- a. Vendors have to submit EMD as mentioned in tender notice. EMD may be deposited only in following forms:
  - i. Cash deposit as permissible under Income tax Act (before Tender opening)
  - ii. Electronic Fund Transfer credited in to SBI BANK A/C NO – 10667995469, IFSC: SBIN0000586, A/C Name CFFP/BHEL, RANIPUR, HARIDWAR with proper remarks containing purpose & name of depositor (before Tender opening)
  - iii. Banker's Cheque/ Pay order/ Demand Draft, in favour of Account officer, CFFP, BHEL, Haridwar payable at Haridwar (along with offer).
- b. EMD shall be converted to security deposit if the work is awarded.
- c. EMD of unsuccessful vendors shall be refunded back normally within fifteen days of acceptance of award of work by the successful vendor.
- d. EMD shall not carry any interest.
- e. **EMD by vendor will be forfeited as per tender document, if**
  - i. After opening the tender and within the offer validity period, the tenderer revokes his tender or makes any modification in his tender which is not acceptable to BHEL.
  - ii. The contractor fails to deposit the required Security Deposit or commence the work within the period as per LOI/contract.

## **SPECIAL TERMS & CONDITIONS**

- f. **Offers without EMD will be rejected and will not be considered for evaluation. However, any valid document in line with BHEL Work policy 2016 may be considered.**

C. At the award of contract:

- a. The successful bidder will have to submit a security deposit as per BHEL Works Policy 2016, within 15 days of award of work. The total amount of Security Deposit will be 5% of the contract value.
- b. Full amount of Security Deposit, including EMD must have to be submitted before start of the work.
- c. Security Deposit is to be made in the form of Cash (as permissible under the extant Income Tax act) or Local Cheques of Scheduled Banks (subjected to realization)/ Pay order/ Demand Draft/ Electronic Fund Transfer in favour of CFFP, BHEL, Haridwar, payable at Haridwar or Bank Guarantee/ Fixed Deposit Receipt issued by Scheduled Bank/ Public Financial Institution as defined in the company act. Bank Guarantee format should have the approval of BHEL and FDR should be in the name of the contractor, A/C BHEL, duly discharged on the back or in the form of Securities available from Indian Post Offices such as National Saving Certificates, Kisan Vikas Patras etc. (held in the name of Contractor furnishing the security & duly endorsed/ hypothecated/ pledged, as applicable, in favour of BHEL).
- d. EMD of the successful tenderer can be converted and adjusted against the security deposit.
- e. If vendor fails to submit the Security Deposit with in specified time frame the Work Order may be treated as cancelled.
- f. The security deposit shall not carry any interest.
- g. The work can be started only after deposit of the Security Deposit as mentioned above.

D. For the purpose of execution of work at BHEL:

- a. All the bidders have to ensure that all their workmen, proposed to be engaged for the work within BHEL Premises are covered under PF & ESI for the duration for which work is to be carried out or the Vendor must have to submit a notarized affidavit to the effect that by virtue of no. of employees being less (less than 20 for PF & less than 10 for ESI) exemption from PF and/or ESI is applicable. In such a case, the vendor will not be allowed to deploy employees, in number, more than the numbers as applicable at any point of time during the execution of the work in BHEL Premises and Vendor will also ascertain the same in the same affidavit. **While execution of the work all the labor laws will be followed by the vendor.**

## **SPECIAL TERMS & CONDITIONS**

- b. BHEL, for the works being carried out within BHEL factory premises, will provide only following facilities to the contractor, free of cost:
  - i. EOT Crane along with crane operator, as per requirement and availability,
  - ii. Electricity & Water
  - iii. Welding Machine, Maximum one no., subject to availability,Welders will have to be arranged by the contractor at their own cost.
- c. While working within BHEL factory area, the contractor will use their own tools, tackles and safety equipment except EOT Crane and Welding Machine.
- d. Contract shall be governed by the works policy 2016, fraud prevention policy and the same shall be made available to the vendor in case of requirement expressed by the vendor. The Bidder along with its associate/collaborators/sub-contractors/sub-vendors/consultants/service providers shall strictly adhere to BHEL Fraud Prevention Policy displayed on BHEL website and shall immediately bring to the notice of BHEL Management about any fraud or suspected fraud as soon as it comes to their notice.

### E. Payment Terms:

- a. 100% payment will be paid within 30 days of completion of commissioning work & acceptance of machine by BHEL (Also refer Clause G below) and submission of Performance Bank (PBG) Guarantee of 10% of contract value. If vendor fails to provide the PBG for the required value, the payment will be made deducting the PBG amount.
- b. All the payments shall be made through e-payment after submission of following documents along with bill.
  - i. E-payment form duly filled (Form will be provided by BHEL)
  - ii. GST undertaking form duly filled (Form will be provided by BHEL)
  - iii. In case there is a change in the tax structure in future, the same shall be complied with retrospectively.
- c. No advance payment will be made by BHEL.

### F. Penalty Clause:

- a. A delay in handing over the machine to BHEL, by the contractor, beyond scheduled date as specified in the Work Order or otherwise shall attract a penalty of 0.5% per week or part of that, subject to a maximum of 10% of contract value. Penalty will be calculated based on total time period taken by the contractor for

## **SPECIAL TERMS & CONDITIONS**

execution of the commissioning & Prove out. The total period of execution will be calculated from issue of work order to acceptance of the machine by BHEL less any time taken by BHEL for handing over the machine to contractor for commissioning.

### G. Guarantee/Warranty:

- a. The contractor will provide a guarantee/warranty of minimum 24 months from date of commissioning for the work performed by the vendor as per Tech. Specs.: FF07005/S/BW Dtd. 18-03-19. Any deviation from the specified period will attract loading as detailed in clause J of this annexure. In any case, guarantee/warranty less than 12 months will not be acceptable. The guarantee/warranty will be supported by submission of a Performance Bank Guarantee of 10% of contract value. The guarantee/warranty period will start immediately after the acceptance of machine by BHEL.
- b. If breakdown of the machine is not responded within 3 working days during the guarantee/warranty period, the guarantee/warranty period will stand extended for double the corresponding period.
- c. Breakdowns not attended during the guarantee/warranty period will lead to forfeiting of PBG.

### H. Reverse Auction (RA):

- a. BHEL reserves the right to go for Reverse Auction (RA) (guidelines as available on [www.bhel.com](http://www.bhel.com)) instead of opening the sealed envelope price bid, submitted by the bidder. This will be decided after techno-commercial evaluation. Bidders to give their acceptance with the offer for participation in RA. Non-acceptance to participate in RA may result in non-consideration of their bids, in case BHEL decides to go for RA.
- b. Those bidders who have given their acceptance to participate in reverse auction will have to necessarily submit 'Process Compliance Form' (to the designated service provider) as well as 'online sealed bid' in the Reverse Auction. Non-submission of 'Process Compliance Form' or 'online sealed bid' by the agreed bidder(s) will be considered as tampering of the tender process and will invite action by BHEL as per extant guidelines for suspension of business dealings with suppliers/contractors (as available on [www.bhel.com](http://www.bhel.com)).
- c. The bidders have to necessarily submit online sealed bid less than or equal to their envelope sealed price bid already submitted to BHEL along with the offer. The envelope sealed price bid of successful L1 bidder in RA, if conducted, shall also be opened after RA and the order will be placed on lower of the two bids (RA closing price & envelope sealed price) thus obtained. The bidder having submitted this offer specifically agrees to this condition and undertakes to execute the contract on thus awarded rates.

## **SPECIAL TERMS & CONDITIONS**

- d. If it is found that L1 bidder has quoted higher in online sealed bid in comparison to envelope sealed bid for any item(s), the bidder will be issued a warning letter to this effect. However, if the same bidder again defaults on this count in any subsequent tender in the unit, it will be considered as fraud and will invite action by BHEL as per extant guidelines for suspension of business dealings with suppliers/ contractors (as available on [www.bhel.com](http://www.bhel.com)).
- e. As a reminder to the bidders, system will flash following message (in red color) during the course of 'online sealed bid': "Bidders to submit online sealed bid less than or equal to their envelope sealed bid already submitted to BHEL"
- f. For reference Terms & Conditions of Reverse Auction are given in Annexure-B.

### I. Risk Purchase:

- a. In case of non-fulfillment of any other terms & conditions given in the work order the purchaser may cancel the work order in full or part thereof and may also make the purchase of the service from elsewhere / alternative source at the risk and cost of Vendor.

If vendor does not agree to above clause, their offer is liable to be rejected. In case any vendor accepts risk purchase clause initially and subsequently declines to honor the term in the eventuality of RISK PURCHASE, they may be banned for business with BHEL.

### J. Deviations and Loading:

- a. Loading will be calculated on the total price offered by the bidder and the total loaded price will be used for identifying the L-1 bidder.
- b. In case, after loading, two bidders are found to be at exactly same price, the actual offered price will be considered for comparison.
- c. The loaded price will be used only for comparison purposes. Loading will not affect the work order price which will be the quoted price or the negotiated price whichever less is.
- d. Deviations other than those mentioned below will not be accepted by BHEL.
- e. Loading against various deviations will be as detailed below, the total loading will be sum of all the two loading factors:

**SPECIAL TERMS & CONDITIONS**

Sl. No.	Clause No.	Deviation allowed with Loading	Rate of Loading	Remarks
1.	A.c	Bidder may offer Execution period of more than 10 weeks for work part but in no case more than 14 weeks	@1.50% per week (or part thereof) above 10 weeks	Execution period more than 14 weeks will not be acceptable in any case & such bids may be ignored.
2.	G.a	Bidder may offer a guarantee/ warrantee period of less than 24 months but in no case less than 12 months from the date of acceptance of machine by BHEL.	@0.5% per month (or part thereof) below 24 months	Guarantee/Warrantee of less than 12months from the date of acceptance of machine by BHEL will not be acceptable in any case & such bids may be ignored.

### **Terms & Conditions of Reverse Auction**

Against this enquiry for the subject item/ system with detailed scope of supply as per enquiry specifications, BHEL is going for REVERSE AUCTION PROCEDURE i.e., ON LINE BIDDING (THROUGH A SERVICE PROVIDER). The philosophy followed for reverse auction shall be English Reverse (No ties).

1. For the proposed reverse auction, technically and commercially acceptable bidders only shall be eligible to participate.

2. Those bidders who have given their acceptance for Reverse Auction (quoted against this tender enquiry) will have to necessarily submit 'online sealed bid' in the Reverse Auction. Non-submission of 'online sealed bid' by the bidder for any of the eligible items for which techno-commercially qualified, will be considered as tampering of the tender process and will invite action by BHEL as per extant guidelines in vogue.

3. BHEL will engage the services of a service provider who will provide all necessary training and assistance before commencement of on line bidding on internet.

4. Business rules like event date, time, bid decrement, extension etc. also will be communicated through service provider for compliance.

**5. Bidders have to email / fax the Compliance form (annexure II) before start of Reverse auction. Without this, the bidder will not be eligible to participate in the event.**

6. In line with the NIT terms, BHEL will provide the calculation sheet (e.g., EXCEL sheet) which will help to arrive at "Total Cost to BHEL" like Packing & forwarding charges, Taxes and Duties, Freight charges, Insurance, Service Tax for Services and loading factors (for non-compliance to BHEL standard Commercial terms & conditions) for each of the bidder to enable them to fill-in the price and keep it ready for keying in during the Auction.

7. Reverse auction will be conducted on scheduled date & time.

8. At the end of Reverse Auction event, the lowest bidder value will be known on auction portal.

9. The lowest bidder has to fax/e-mail the duly signed and filled-in prescribed format for price breakup including that of line items, if required, (Annexure III) as provided on case-to-case basis to Service provider within two working days of Auction without fail.

10. In case BHEL decides not to go for Reverse Auction procedure for this tender enquiry, the Price bids and price impacts, if any, already submitted and available with BHEL shall be opened as per BHEL's standard practice.

11. Bidders shall be required to read the “Terms and Conditions” section of the auctions site of Service provider, using the Login IDs and passwords given to them by the service provider before reverse auction event. Bidders should acquaint themselves of the ‘Business Rules of Reverse Auction’, which will be communicated before the Reverse Auction.

12. If the Bidder or any of his representatives are found to be involved in Price manipulation / cartel formation of any kind, directly or indirectly by communicating with other bidders, action as *per extant BHEL guidelines*, shall be initiated by BHEL and the results of the RA scrapped / aborted.

13. The Bidder shall not divulge either his Bids or any other exclusive details of BHEL to any other party.

**14. BHEL reserves the right not to allow the H1 bidder(s) (whose quote is highest in online sealed bid) to participate in further RA process.**

## **PRE-QUALIFYING CRITERIA**

This section details minimum requirement on part of the bidder for the Erection & commissioning of CNC vertical Borer machine (CNC VTL Model: CXX5250X36/100) which is partly erected by OEM (M/s CFHI, China) in Machine Shop. In general, the bidder must satisfy following criteria:

1. **General Profile:** The bidder must have a working experience in any of the fields listed at 1.1,1.2 and 1.3, consist of any of the following CNC machine tools:

- a) CNC Vertical Boring Machine of Table dia. 2500 mm or higher size
- b) CNC Horizontal Boring Machine of Spindle dia. 160 mm or higher size
- c) CNC Lathe Machine of bed length 5000 mm or higher
- d) CNC Plano Miller/ Gantry Milling Machine/ VMC/ HMC of stroke 3000 mm or higher

1.1. Erection and Commissioning of CNC Machine Tools

1.2. Electrical & Mechanical Retrofitting/ Reconditioning of CNC Machine Tools

1.3. Modernization or Commissioning of any CNC Machine Tool.

2. **Turnover and Financial Position:**

2.1. Average annual financial turnover for the last 3 financial years ending 31st March (i.e. for the financial years 2016-17, 2017-18 and 2018-19), must be not less than Rs. 21.12 Lacs.

2.2. Bidder must submit proof of having carried out successfully work of similar nature (refer field listed at 1.1, 1.2, 1.3) during last 7 years ending last date of the month previous to the one in which NIT for this work is issued. Thyristor Drive, PLC & CNC system must be part of above work.

2.3. The value of such works must be:

Not less than Rs. 28.16 Lacs for each of minimum three similar completed works with any organization of repute but not the bidders own organization

OR

Not less than Rs. 35.2 Lacs for each of minimum two similar completed works with any organization of repute but not the bidders own organization

OR

Not less than Rs. 56.32 Lacs for each of minimum one similar completed works with any organization of repute but not the bidders own organization

**Completion/ Performance certificate(s) from the original customer(s) must be submitted. Any work supporting or facilitating to above work will not be considered.**

BHEL reserves the right to verify the information provided by the vendor. In case the information provided by vendor is found to be false/incorrect, the offer shall be rejected.

In addition to above following details also to be filled by bidder:

S/N	Description	Detail to be filled by bidder
1	Name of the customer/ company where referred machine is installed.	
2	Complete postal address of the customer	
3	Month & Year of the work completed	
4	Parameters of the referred CNC Machine Tool	
5	Name and designation of the contact person of the customer	
6	Phone and e-mail address of the contact person of the customer	

3. **Compliance to Govt. Rules:** The bidder must have proper registration for PF, ESI, Income Tax, Service Tax, Labour license etc. as per Govt. Rule. The bidder shall also have to comply with the Government as well as BHEL rules and regulations. Bidder has to fill & submit the enclosed Performa.
4. Documents supporting the aforementioned qualifying criteria **MUST** be submitted by the bidders along with the Techno-Commercial Bid. **If it is found at any time that the particulars submitted by the contractor are false, suitable action will be taken. This may lead to cancellation of contract/registration from all the BHEL units & forfeiting of Earnest Money Deposit (EMD) /Security Deposit (SD).**
5. Bidder's acceptance for opening price bid through reverse auction process must be submitted. However, BHEL may opt to decide L-1 through Reverse Auctioning or by opening the price bid.
6. **As per SOP of Risk & Cost, OEM i.e. M/s CFHI, China & its Indian representative M/s Maco Corporation India Pvt. Ltd., Kolkata shall not be eligible to quote in this Tender.**
7. Bidder must submit Earnest Money Deposit (EMD) along with Techno-Commercial offer. In case the EMD is not submitted with techno-commercial offer or less than that specified in NIT, tender will be rejected without any prior notice and any amount deposited will be forfeited. However, MSMED Act 2006 certificate will be considered along with a certificate by Chartered Accountant on Letter head with following matter:

**Certificate by Chartered Accountant on letter head**

This is to Certify that M/S.....  
(Hereinafter referred to as 'company') having its registered office at  
.....is registered under MSMED Act 2006, (Entrepreneur  
Memorandum No (Part-11 ..... dated: .....  
Category: ..... (Micro/Small) (Copy enclosed).

Further verified from the Books of Accounts that the investment of the company as on date  
..... as per MSMED Act 2006 is as follows:

1. For Manufacturing Enterprises: Investment in plant and machinery (i.e. original cost excluding land and building and the items specified by the Ministry of Small Scale Industries vide its notification No.S.O.I722(E) dated October 5, 2006 : Rs. ....Lacs

2. For Service Enterprises: Investment in equipment (original cost excluding land and building and furniture, fittings and other items not directly related to the service rendered or as may be notified under the MSMED Act, 2006:

Rs .....Lacs

The above investment of Rs .....Lacs is within permissible limit of RS.  
.....Lacs for .....Micro/Small (Strike off which is not  
applicable) Category under MSMED Act 2006.

Date:

(Signature)

Name –

Membership number –

Seal of Chartered Accountant

## 8. Following checklist to be filled by the bidder.

Sl. No.	Required Data	To be filled by the bidder	Remarks of Bidder for supporting documents (Enclosed/Not Enclosed)
1.	PF Registration No		
2.	GST No.		
3.	PAN No.		
4.	ESI Registration No		
5.	Documents as per clause 1		
6.	Average Turnover of last three years 2016-17 2017-18 2018-19		
7.	Value & Year of Similar Contract/s Work Order as per clause 2		
9.	Earnest Money Details		
10.	Tender Fee Details		
11.	Acceptance for Reverse Auctioning		