Annexure-A

Name of work: Retrofitting of Horizontal Borer Wotan Rapid-6 , Plan No.1/1-227 ,
NIT NO. : 20140005/WEX/CNC/RAPID6 Dated: 05/02/2015

Requirement:
Siemens 840D SL CNC controller + AC Servo Motors / Drives for X ,Y, Z, W,B,U, V + DC spindle drive+ new Wired Up Panels with switchgears + Field wiring of Machine with distributed controllers using profibus + field elements + Interfacing & Commissioning + Job Trials and Prove out for One component.

Existing set up of the machine.

Mains:	**415 V 3 phase AC**
DC Spindle motor:	**DC motor 90 KW ; Franz Kessler make**
Spindle :	**4 gear steps 2-1250 rpm**
DC Feed Motor:	**X- axis** 115 Nm 1800 rpm**, Y-axis** 115 Nm 1800 rpm**, U- axis** 115 Nm 1800 rpm (**Siemens 1HU3132-0AF01-Z)** **Z & W axis** 38 Nm 1200 rpm**,** (**Siemens 1HU3108-0AD01-Z**) **B-axis** 90 Nm 1000 rpm**,** **(Siemens 1HU3132-0AC01-Z**) **V axis (**Isoflux 541.3.40.0.1.0.0 DC motor**;** 2.5 Nm 2000 rpm approx**)**

Rapid Feed:	**X axis ,Y axis & U axis**	**10000mm/min**
	Z &W axis	**5000mm/min**
	V-axis	**300 mm/min**

CNC system : **Fanuc 12M**

Feed Back System : Heidenhain linear scale LB326 for X, Y,and U axis with respective lengths 22.0 M, 5.5 M & 3.0M

Heidenhain encoder ROD 456 250 ppr for Z & W axes
Heidenhain encoder ROD 800 36000 ppr B axis
Heidenhain encoder ROD 426 500 ppr V axis
Heidenhain encoder ROD 426 1024 ppr Spindle

1.0 Scope of Supply:

Sr No.	Item description	Qty	Vendor compliance	remark
1.1	CNC Controller **Siemens make 840D SL** with PLC, I/Os, MCP in suitable enclosure for **horizontal boring/milling** operations and to have all existing programming and operational features(or more) and adequate number of **Input/ Output modules with distributed I/O 's to cater to existing PLC Inputs and Outputs (240 Inputs and 160 outputs) .** Complete hardware viz. 3 phase Input Isolator/ Line filter/ AC reactors / motor modules/ SITOP DC power supplies, interconnecting cables etc to cater to feed drives and feed motors and spindle drive as described below in point No1. 2 to point no1.6. Besides above it should have • Milling configuration • An axis selectable one micron electronic hand wheel on operator panel as well as a hand held panel for all axes with 5 meter cable • USB port for data input/output and with all the required software preloaded. • S7 loaded in Hard disk .PLC program editable on CNC monitor. • **All the programming features given at 1.50.0** The details of the controller are as follows: a) **SINUMERIK 840D sl; NCU 720.3 PN with PLC 317-3 PN/DP of type / 1 GB DRAM; 1 MB NVSRAM: 6FC5372-0AA30-0AA1 with Numeric Control Extension Unit NX10 or NX15 of**	1 set	Yes/No	Vender to provide details & comply

	type 6SL3040-1NC00-0AA0 **b) SINUMERIK CNC System Software with SINUMERIK Operate and License for 8 Axis + Spindle, Bi-Directional Compensation, 3D Simulation, STEP 7 V5.5 on Screen, Measuring Cycles** **c) SIMATIC S7-300 : ET200S Based Distributed I/O Modules with PROFINET connectivity (Min 4 Stations)** d**) Operator Panel : OP15A of type 6FC5203-0AF05-0AB0 with full alpha numeric key board.** **e) Panel Control Unit : PCU 50.5-C / 1.8 GHZ; 4 GB RAM / WINDOWS 7 of type 6FC5210-0DF52-3AA0** **f) Machine Control Panel : MCP 483C PN of Type 6FC5303-0AF22-0AA2** **g) Handheld Unit : HT2 with Type 6FC5303-0AA00-2AA0 with Terminal module 6FC5303-0AA01-1AA0 with 10m spiral cable** **h) SITOP power supplies (separate units for CNC control and PLC I/Os), DC-UPS Module 15 with AKKU module for back-up of the PCU50.5 for Automatic unattended shutdown in the case of power failure or if machine switches OFF.**			
1.2	SINAMICS S120 – Drive with (All items to be Siemens make and of the same capacity as recommended by Siemens) a. **55 KW or more ALM , AIM , Basic Filter, VSM module 1 no. each** b. **45A SMM 4 Nos** **c. 30 A SMM 2 Nos** **d. 5 A SMM 1 No** **e. CSM Module 1 No**	1 set	Yes/No	Vender to provide details & comply
1.3	SIMOTICS S Servo Motor for following Type : **a. 1FT6136 – 115 NM / 2000 RPM – without brake for U and X axes, High Resolution Incremental Encoder / Drive CliQ 2 Nos** **b. 1FT6136 – 115 NM / 2000 RPM – with brake for Y axis, High Resolution Incremental Encoder / Drive CliQ 1 No** **c. 1FT6134 – 95 NM / 2000 RPM –with brake for B-axis , High Resolution Incremental Encoder / Drive CliQ 1 No** **d. 1FT6105 – 50 Nm / 2000 RPM – without brake for Z and W axes, High Resolution Incremental Encoder / Drive CliQ 2 Nos**	1 set	Yes/No	Vender to provide details & comply

	e. 1FT6044 motor without break to be retrofitted in D'Andrea Utronic head UT5-400-S (V axis) 1 No **f. Siemens preassembled Power and signal cables of suitable type and length to interface above motors**			
1.4	a. SMC30 suitable for TTL Feedback **5 Nos** b. DMC20 (CLiQ Switch) 2 Nos c. Heidenhain make Adapter cable / EXE-Unit to convert from 11 uA to TTL signal for X, Y, U axes position feedback . (***Heidenhain Linear Scales with 11 uA Signal, which is to be retained***). d. Heidenhain make Adapter cable / EXE-Unit to convert from 11 uA to TTL signal for B- axis position feedback (***Heidenhain rotary encoder with 11 uA Signal, is to be retained***) **e**. Preassembled cables of suitable lengths and accessories for interfacing existing Heidenhain linear feedback system for X,Y,U axes, rotary encoder for B-axis, and Spindle with the new CNC System. **(For Axes V, Z & W – Only motor built-in encoder to be used)**	1 set	Yes/No	Vender to provide details & comply
1.5	DC Digital spindle drive SINAMICS DCM 6RA80 4Q DC / OUTPUT: DC 420V, 280A and necessary hardware required to interface this drive with the CNC control including set point and analog techo-generator voltage. (existing DC Motor and anolog techo-generator are to be retained)	1 Set	Yes / No	Vender to provide details & comply
1.6	Bosch Rexroth make proportional valve and its controller of suitable capacity (at least equal or more that the present one) for ram compensation.	1 Set	Yes / no	Vender to provide details & comply
1.7	VFD Drive for Coolant pump and motor Min 4 KW, 440V	1 Set	Yes / no	Vender to provide details & comply
1.8	**Electrical Panels:** Electrical panels Rittal make fitted with door mounted AC of Advance make 1500 W as per details and located at positions as per point no. 2.3 of scope of work fitted with proper illumination, 5 amp socket, containing all electrical items viz. transformers, DC power supplies, contactors, overloads, switchgears, AC/DC relays ,fuses, MPCB's etc. required for the work. *The switchgear (MCBs, Overloads, Contactors, Relays etc) should be of Siemens/ Schneider/ Telemecanique or ABB make. All solenoid, contactor, lamp etc Outputs are to be routed through Phonix channel relay boards.*	1 set	Yes/No	Vender to provide details & comply

1.9	**CNC control Panel :** A new ergonomically designed free standing swiveling type **CNC control panel** fitted with AC of adequate capacity (containing operator panel, CNC and machine controls, display etc.) is to be mounted at the existing location**. Design of control panel is to be approved prior to manufacturing.**. It should be having at least the following switches either on MCP 483C or through PB / SS/ Indication lamps. Handles to rotate by hand on the sides. Rear door should be on hinges with lock not to be screw mounted and 5 Amp service socket. • Axes selection keys (Separate for each axis.) • Directional keys + & - for axis movement in jog (Separate for each axis.) • Rapid traverse key. • Emergency stop. • Reset key. • Single block switch. • Dry run switch.(Dry run freely executable during program run in automatic) • Coolant ON / OFF switch/key & regulator (coolant should be switched on/off during Auto/Jog mode irrespective of the definition in the part program). • spindle continuous/inch selector switch • spindle Forward/Reverse selector switch • Spindle orientation switch • A pushbutton/soft key should be provided on the MCP for activating "Delete distance to go". • chip conveyer forward/reverse push button • mode selector switch • Feed override switch • Spindle override switch • Spindle gear selector switches with light. • Machine illumination switch • Feed release switch • Tower lamp with Green, Yellow & Red lights for machine status.	1 set	Yes/No	Vender to provide details & comply
1.10	**<u>Drag chains: (Kabel schlepp/IGUS make)</u>**	1 set	Yes / No	Vender to provide details & comply

	a) **new Drag chain for transporting cables / pipes for U/ B axis (length 3.5m)** **b)new Drag chain for transporting cables / pipes in the head stock (length 3m)**			
1.11	**Complete electrical wiring** and cabling for the whole machine including all power, control & signal cables (with pre-assembled connectors wherever required), TBs, JBs required for the commissioning of the above package. The cables and wiring is required to be of reputed make ie Lapp, Finolex etc. *Cables passing through the drag chain are required to be inside abrasion proof flexible metallic hoses*.	1set	Yes/No	Vender to provide details & comply
1.12	All the actuating, sensing elements like **pressure switches / flow switches/float/ solenoid valves** etc. of the machine are to be replaced with **new digital type switches**. (Rexroth /hydac /parker / IFM /Euchner/Baluff). All limit switches/proximity switches are to be replaced with new switches. *(IFM /Euchner/Baluff make.)*	1 set	Yes/No	Vender to provide details & comply
1.13	Hard and soft copies of electrical circuit diagram, PLC program with cross reference, CNC operation, programming, and installation & maintenance manuals will be provided with complete backup stored on it. (details at Documentation 5.1 to 5.9)	1 set	Yes/No	Vender to provide details & comply
1.14	All the Mechanical & Electrical fittings, Flanges, pulleys, belts, Brackets etc. required for the retrofitting work .	1 set	Yes/No	Vender to provide details & comply
1.15	Ultra isolation transformer for complete machine of Neel / Servomax / Aplab make with 250 KVA , 415V± 5% 50Hz . **3phase/3wire system without neutral is available at machine.**	1 set	Yes/No	Vender to provide details & comply
1.16	Geared motor of suitable capacity for existing Chip conveyer.	1 set	Yes/no	Vender to provide details & comply
1.17	Geared motors of suitable capacity for operator platform lift (For up/down and forward/backward movement)	1set		Vender to provide details & comply
1.18	a) Machine illumination light (150W metal halide / equivalent LED) mounted at the top of column for the full illumination on the working area. Reputed make and well-guarded from chips and coolant. b) Portable machine lamp with magnetic base operating at 24V DC , 35Watts minimum with 3 meter cable with conduit to be supplied.	1 set	Yes/no	Vender to provide details & comply
1.19	Contactors, cables and pushbutton to retrofit the existing Jib crane model Damag Electric chain hoist	1 Set	Yes/no	Vender to provide

	PK10 with 3 phase induction motor 380V 50Hz, 1.5/0.35 KW, 3.5/1A			details & comply
1.20	Power disconnector of min 400A with rotary handle to disconnect mains supply. Disconnector to be mounted in with a cut in the door so that door could be opened without touching the disconnector.		Yes/No	Vender to provide details & comply
1.21	Spares: a) 55 KW ALM , 1 No. same as at point. no. 1.2 of SOS b) 45A SMM, 1 No. " do " c) 30 A SMM 1 No. " do " d) Spare hard / flash disk 1 No. same as used in controller at point 1.1 of SOS e) NCU 720.3 PN with PLC 317-3 PN/DP 1 No. same as at point 1.1 of SOS f) PCU 50.5C 1 No. same as at point 1.1 of SOS g) ET 200 I/O modules 1 No. each type. same as at point 1.1 of SOS h) Numeric Control Extension Unit NX10 or NX15 same as at point 1.1 of SOS	1 set	Yes/No	Vender to comply
1.22	Communication software, hardware and cables required for communication / programming with drives , I/O's and CNC via USB port for BHEL supplied Laptop.	1 set	Yes/No	Vender to provide details & comply
1.23	Testing and Measuring instruments for maintenance a) AC/Dc true RMS clamp meter, FLUKE model 325 1 No. b) True RMS Multimeter, FLUKE model 179 1 No. c) Set of Taparia make torx , allen keys and screw drivers. 1 No. each	1 set	Yes/No	Vender to comply

Note: Vender has to supply all the material stated above in clause 1.1 to 1.23, even if it is not required in vender's scheme for retrofitting. Any other material required for retrofitting of the machine and not covered here has to be supplied by vender without any cost to BHEL.

1.50.0 PROGRAMMING FEATURES of the CNC controller to be supplied as per cl 1.1:

1. ISO code (G&M mode type) programming.
2. Absolute/incremental programming.
3. Decimal point programming.
4. Linear, circular, helical and spline interpolation.
5. Programmable dwell.
6. Scaling, Mirroring, rotation & work offset transformation

7. Variable parametric programming with mathematical functions including trigonometric & logic functions.
8. Programmable software limits.
9. Arc-programming with radius & end-point.
10. Conditional & unconditional jump.
11. Programmable tool offset.
12. Programmable zero offset.
13. Programmable additive zero offsets.
14. Subroutine nesting up to 3 levels.
15. Programmable skip.
16. Facility of inclusion of message in the part programme.
17. Corner rounding & chamfering. (e.g. RND, CHF and ANG).
18. Canned cycles for:
    a. Drilling, deep drilling, Boring and Tapping (both solid and flexible) cycles
    b. Pocket milling (rectangular and circular)
    c. Thread whirling
    d. Thread Milling
19. Cutter radius compensation G41, G42
20. Coolant on/off with program.
21. Programming of primary, auxiliary & existing functions through M, S, T codes.
22. A cycle/program for determining work offset at any rotation of table angle with respect to a defined work offset on the job for machining of angular details on the job.
23. Axis replacement with GEOAX command.
24. On screen graphic simulation.
25. Programming with polar coordinates.
26. Co-ordinate system rotation and transformation.
27. Look ahead of 70 blocks
28. Block search with / without calculations
29. Background editing
30. Tool management
31. Graphic simulation- Single sided 2D view, dynamic

Note: CNC controller supplied as per Point 1.1 of SOS must have all the programming / machining features required for milling operation even if not covered in point 1.50.0.

2.0 SCOPE OF WORK

S.No.	Activities	Vender compliance (Yes/No)	Remarks
2.1	Dismantling and removal of old Electrical panels, CNC control panel, operator panel switch gear ,CNC,PLC, feed motors, Drives , encoders and field devices along with old cabling and wirings.	Yes/no	Vender to comply
2.2	Cleaning of complete machine at its accessories.	Yes /No	Vender to comply
2.3	Installation of new electrical panel(s) along with the CNC ,PLC , Drive controller and switchgear.. Locations of Electrical panels are as below a) Main panel at the existing position incorporating drives, switch gear for table control , machine hydrostatic and hydraulic etc with door mounted ACs of adequate capacity. b) At the column platform incorporating switch gear for column, operator platform movement etc. c) At headstock incorporating switch gear for tool clamp/ unclamp, head clamp / unclamp, gear shifting etc.	Yes/no	Vender to comply
2.4	Installation of new operator panel.	Yes/no	Vender to comply
2.5	Dismantling of old chip conveyer motor and operator platform lift , up down , forward backward motor and installation of new motors respectively in their place.		
2.6	a) Mounting and installation of feed motors. b) Design, Modification / re-engineering, manufacturing of feed motor couplings and flanges as per requirement.	Yes/no	Vender to omply
2.7	Cabling and wiring of CNC, PLC, Drive system, control panels, feedback system and field devices.. Laying and routing of new conduits, cables from electrical panel to machine and operator console through new conduits. Refurbishment and rewiring of all the terminal boards, Junction Boxes as per requirement.	Yes/no	Vender to comply

	Existing position feedback cables for all the axes and spindle are to be replaced with new preassembled cables through conduits.		
2.8	Machine wiring will consist of AC Servo motors, hydraulic system, hydrostatic system, Lubrication system, Coolant system, AAC, Machine lamp, Safety switches, Limit switches, operator panels, column, table, head stock, field devices etc.	Yes/no	Vender to comply
2.9	Installation of new ultra isolation transformer and interfacing with machine and mains.	Yes/no	Vender to comply
2.10	Interfacing & commissioning of the CNC, PLC, Position feedback, , spindle & Feed drives systems, coolant drive and ultra-isolation transformer	Yes/no	Vender to comply
2.11	Development of PLC program as per the new CNC controller and implementation on machine.	Yes/no	Vender to comply
2.12	Laser calibration of axes and generation of compensation data for pitch error and backlash from a reputed agency. Generation of ram sag compensation data and incorporation of the same in proportional valve controller.	Yes/no	Vender to comply
2.13	Checking of slide lubrication and minor rectification where ever required.	Yes /no	Vender to comply
2.14	Prove-out of the main functions (axes & spindle),prove-out and demonstration of all programming features of new CNC System . Prove-out of the auxiliary functions (, Coolant system, hydraulics, hydrostatics, chip conveyer etc.).	Yes/no	Vender to comply
2.15	Prove-out of the AAC functions (Face plate, Boring heads, Angular Head , D'andrea Head load / unload from and to pick up station.). Party will implement all the existing functions and features associated with the attachments present on the machine (Automatic updation of limits for axes and spindle rpm as well as attachment data depending on attachment loaded) and also any additional features if possible.. BHEL will ensure that the Attachments are in working condition.	Yes/no	Vender to comply
2.16	Any abnormality on the machine should be indicated by indicating lamp, PLC alarms & message prompts. (PLC alarms & messages should include the device number and/or the operand).	Yes/no	Vender to comply
2.17	Prove out & demonstration of Manual Control of Machine independent of MDI/ CNC Part Program: Presently, following operations can be performed manually independent of MDI/ CNC Part Program. Same status is to be	Yes/no	Vender to comply

	maintained after retrofitting also: a. Start (CW/CCW) & Stop of spindle rotation b. Inching (CW&CCW) of spindle rotation c. Regulation & Indication of spindle speed d. Start, Stop, Regulation & Indication of feed, fast traverse, inching in X, Y,Z,W,U,V & B e. Select direction of cut in any of available machining axes (+ or -) through separate keys provided on operator's panel. f. Start feed by single pressing of feed on key (i.e. without continuously holding the key pressed) for cutting without CNC Program. g. Siemens expert intervention will be ensured by the party where ever party itself is not able to meet the requirement.		
2.18	Successful demonstration of different machining features (boring , drilling, milling, tapping, threading, facing etc) on a test piece / component provided by BHEL using CNC part program developed by BHEL.	Yes/no	Vender to comply
2.19	Provision of switching from linear scale feedback to motor encoder back shall be provided for axes with linear scales. Reference point return shall be modified accordingly so that both the reference positions (ie with linear scale as well as motor encoder) are nearly at the same position.	Yes/no	Vender to comply
2.20	Interlocks as in the present scheme for lubrication, Aerostatics, hydrostatics for pressure/flow will be will be implemented and physically verified to ensure that they are working as intended. In this regard minor mechanical modification works is in the scope of vender.	Yes/no	Vender to comply
2.21	Development of Alarm and Massages support with remedial action through help guide loaded on the system for user defined alarms.	Yes /No	Vender to comply
2.22	Design and development of any mechanical/ electrical / electronic modifications wherever / if required to execute the above work.	Yes/ no	Vender to comply
	Note : Any work not covered in the scope of work but later found necessary for the completion of the project shall be executed by vender without any additional charges.	Yes/no	Vender to comply

3.	**DOCUMENTATION:**		**Vendor compliance (Yes /No)**	**Remarks**
	Following documents shall be supplied with above supply	Qty.		Vender to comply

	Documents consisting of □ Electrical circuit diagram □ PLC printout in ladder form with symbols & comments in English □ O&M manuals (hard copy) for CNC, PLC, Drives, Measuring systems & BOI . □ Programming manual (hard copy) for CNC system (soft copy on pen drive as well as on DVD) . □ Machine data (NC, PLC, Setting & Alarm texts), Ghost back up , Drives data , PLC program , Electrical circuit diagram & BOI (**soft copy on pen drive as well as on DVD**) □ Details of all mechanical modifications & fittings with drawings .	 3 sets. 3 sets. 1 set. 1 sets. 1 set 3 sets.		
4.	**<u>WARRANTY</u>:**		Yes /no	Vender to comply
	Party shall stand warranty for all the supplied material and work for a period of one year from the date of successful commissioning of the material and final acceptance (cl –6)			
5.	**<u>TRAINING:</u>**		Yes/No	Vender to comply
	Party shall impart training to BHEL staff for a) Application programming to 1 Person for 1 weak at Vender/Manufacturers works. b) System and drive maintenance and interfacing to 2 Persons for 1 weak at system manufacturers works c) Operations of machine to 3 no. of operators for 3 days each at venders works. ***Expenses for boarding & lodging of BHEL personal during training shall be borne by BHEL.***			
6.	**<u>FINAL ACCEPTANCE:</u>**		Yes / no	Vender to comply
	Final Acceptance shall be at HEEP, BHEL, Haridwar after: a) Upon completion of the scope of supply and scope of work at BHEL as in clause1 and 2 above . b) Final acceptance shall include clearance of all pending issues related to the work contract. c) Successful Commissioning & Demonstration of various cycles and control functions as envisaged in the technical scope. *After settlement of all pending issues related to work and supply, a certificate for Completion of works*			

	in all respect shall be released within 15 days by Production and Maintenance personnel of BHEL which will be the referred document for Final Acceptance and final payment to the vendor.		
7.0	**DELIVERY:** (IF DELIVERY PERIOD IS NOT OFFERED/ ACCEPTABLE, OFFER WILL NOT BE CONSIDERED FOR FURTHER PROCESSING)	Yes / No	Vender to comply
7.1	**Material:** Max. 6 months from the date of award of contract. Early delivery shall be acceptable subject to approval by BHEL.		
7.2	**Work :** Within 60 days from the date of release of machine for work.		
8.0	**LATE DELIVERY PENALTY (LD) CLAUSE:-**	Yes /No	Vender to comply
8.1	Late delivery @ ½% per week subject to a maximum of 10% of the material cost including spare parts shall be applicable for delay in deliveries		
8.2	In case of delays in commissioning after handing over the machine as per clause 7.2 penalty @ 2% per week subject to a max. of 10% of the Commissioning Charges shall be applicable for delay beyond scheduled completion of work for reasons attributed to the party. Net delay for the purpose of calculating late commissioning will be considered as the delay in work completion.		
8.3	However total LD on account of clause 8.1 & 8.2 will be limited to 10% of work contract award value.		
8.4	The time period from invitation date for Pre dispatch inspection from vendor to the date of arrival of pre dispatch team to vendor's works and any other reasons attributed to BHEL will not be accounted in delivery period. This period will be excluded for the purpose of calculating LD. Vender should intimate regarding PDI, at least 7 days in advance.		
9.0	**PRE-DISPATCH INSPECTION**	Yes /No	Vender to comply
9.1	Pre-dispatch inspection of all the items covered under Scope of Supply clause 1 shall be carried out by BHEL at party's works.		
9.2	Supplier shall invite BHEL for carrying out pre- dispatch inspection.		
9.3	**Before inviting BHEL for pre dispatch inspection vender will submit Bill of material for material under SOS with at least 7 days prior notice. Copy of electrical drawing/ schematic of machine to BHEL.**		

9.3	Deputed BHEL persons shall do pre acceptance at vendor works and give despatch clearance.		
9.4	Expenses of Boarding and lodging of BHEL personnel during PDI shall be borne by BHEL.		
10.0.	**EARNEST MONEY DEPOSIT (EMD):**	Yes / No	Vender to comply
10.1	Vendors have to deposit Rs **2,00,000/-** as the EMD. EMD may be deposited in cash (as permissible under Income tax Act), through pay order or demand draft in favor of **Account officer, HEEP, BHEL, Hardwar payable at Haridwar** only.		
10.2	EMD shall be converted to security deposit if the work is awarded.		
10.3	EMD of unsuccessful venders shall be refunded back normally within fifteen days of acceptance of award of work by the successful vender.		
10.4	EMD shall not carry any interest.		
10.5.0	**EMD by vender will be forfeited as per tender document, if**		
10.5.1	After opening the tender, the tenderer revokes his tender within the validity period or increases his earlier quoted rates		
10.5.2	The tenderer does not commence the work within the period as per LOI/contract.		
10.6	**Offers without EMD will be rejected and will not be considered for evaluation. However valid NSIC certificate may be considered subject to receipt of notarized copy / copy attested by gazetted officer & verification.**		
11.0	**SECURITY DEPOSIT (SD):-**	Yes /No	Vender to comply
11.1	Successful vendor shall deposit security. The rate of security deposit will be as below:		
	• For work Up to Rs 10 Lakhs : 10% of work order value		
	• Above Rs 10 Lakhs upto Rs 50 Lakhs : Rs 1 Lakh + 7.5% amount exceeding Rs 10 Lakhs		
	• Above Rs 50 Lakhs: Rs 4 Lakhs + 5% amount exceeding Rs 50 Lakhs		
11.2	The security deposit should be submitted before the start of work in the following forms:		
	i) Cash (As permissible under the Income Tax Act)		
	ii) Pay Order / Demand Draft in favour of **Account officer, HEEP, BHEL, Hardwar payable at Haridwar**		
	iii) Local cheques of Scheduled Banks, subject to realization.		
	iv) Bank Guarantee from Scheduled Banks/Public Financial Institution as defined in the companies Act. The Bank guarantee format should have the approval of BHEL.		

11.3	Security Deposit shall not carry any interest.		
11.4	EMD of successful tenderer can be converted and adjusted against the Security Deposit.		
11.5	100% of the Security Deposit amount shall be refunded to the vendor after final acceptance of the machine. **SD shall be released after the submission of Performance Bank Guarantee(PBG) by the vendor**		
12.0	**Performance Bank Guarantee (PBG):**	Yes / No	Vender to comply
12.1	Vendor shall be required to submit a performance bank guarantee (PBG) for 10% of the total work order value which shall be valid for a period of 12 months from the date of Final acceptance of machine.		
12.2	The PBG shall be submitted on a non-judicial stamp paper of value not less than Rs.100/- issued by any one of the nationalised banks.		
13.0.	**PAYMENT TERMS:** **(Note : No advance payment shall be made to the vendor.)**	Yes /No	Vender to comply
13.1.0	Part payment will be made after completion of following milestones		
13.1.1	First payment of 80% of material cost along with 100% taxes & duties (Excise duty, CST/VAT as applicable) shall be payable after receipt of material at HEEP, BHEL, Hardwar. Vendor to ensure that all relevant documents are submitted.		
13.1.2	Final payment of balance 20% of material cost, 100% of commissioning cost including service taxes as applicable amount and refund of 100% of the Security Deposit amount will be made after final acceptance, subject to submission of PBG as per point '12.0'		
13.2.0	All the payments shall be made through e-payment after submission of following documents along with first bill		
13.2.1	E-payment form duly filled (Form will be provided by BHEL)		
13.2.2	Income tax exemption letter(if applicable)		
13.3	Excise duty & CST/VAT will be paid on material cost and service tax will be paid on commissioning charges at actual. Related original documents to be submitted for availing MODVAT credit by BHEL.		
13.4	Timely submission of CENVATABLE invoices along with necessary documents to enable availment of CENVAT (Excise duty, Service Tax & VAT) credit by BHEL. Note: Wherever CENVAT credit cannot be availed within given time limit due to delay in submission of invoices or for any other reasons attributed to vendor, loss of such CENVAT credit will be recovered from		

	such vendor.		
14.0	**Risk Purchase Clause :** In case of delays in supplies / defective supplies or 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 material / service from elsewhere / alternative source at the risk and cost of supplier. 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.	Yes / No	Vender to comply
15.0.	**VENDOR'S OBLIGATION:**	Yes/no	Vender to comply
	The vendor shall bring all types of hand tools including pneumatic/electrical drill machines, Laser equipment's, and grinders along with general purpose measuring instruments and testing equipment with them for successful commissioning of the machine & supplied system.		

16.0	**Commercial Terms:**	Yes/ No	Vender to comply)
16.1	Prices shall be quoted on "Firm Price" basis only. **The prices should only on F.O.R BHEL, Haridwar basis inclusive of Packing, Forwarding charges, freight & insurance**. Installation & Commissioning Charges, applicable % of ED, VAT , Sales Tax, Service tax should be clearly indicated in attached price bid format as per annexure-B.		
16.2	Validity of offer shall be for a minimum period of 120 days from the date of Tender Opening.		
16.3	The material will be dispatched to Central Plant Stores, HEEP, BHEL, Haridwar, with instructions to forward the same to Engineer (WEX/CNC LAB), HEEP, BHEL, Haridwar.		

17.0	**BHEL'S OBLIGATION:**	Yes / No	Vender to comply
17.1	Existing electrical schematic of the machine shall be provided by BHEL to the vendor.		
17.2	Crane facility and lifting tackles like slings, rope, D-Shackles shall be made available while working in BHEL premises only.		
17.3	Facilities of minor welding, brazing , minor machining facility required for rectification/fitting of supplied material, subject to the extent available in BHEL, shall be provided in BHEL premises only.		

17.4	Any civil work required for the erection of panel shall be done by BHEL.		
17.5	Electricity, water & air shall be provided by BHEL at one point only.		
17.6	The above requirements should be informed by the vendor in advance.		
17.7	Consumables like lubricants, kerosene oil, cotton waste etc. will be supplied free of cost by BHEL during execution of works inside BHEL premises.		
18.0	**GENERAL CONDITIONS:**	Yes / No	Vender to comply
18.1	A point wise compliance statement shall be submitted by the party with reference to the above scope of supply against each clause/ sub-clause with relevant details & comments. Non-compliance to any of the clauses & quoting inadequate quantity can lead to dis-qualification of the offer.		
18.2	The Vendor is advised to inspect the machine prior to quoting to ascertain all the relevant details required for successful completion of the work.		
18.3	The offers of the bidders who are on the banned list as also the offer of the bidders, who engage the services of the banned firms, shall be rejected. The list of banned firms is available on BHEL web site www.bhel.com		
18.4	**The award of works will be made on basis of the total of Material cost, Commissioning charges and all taxes, duties as applicable i.e. Cost to BHEL.**		
18.5	The Vendor should submit their best price at this stage itself and they will not be allowed to revise the price. Any revision / discount given by the vendor subsequently will be ignored.		
18.6	RULES AND REGULATIONS OF THE CENTRAL/STATE GOVERNMENT: In the event of award of any contract, vendor will have to comply and abide by all the laws/enactment of state and central government. Documents regarding registration with Sales Tax and Excise authorities may also to be forwarded along with income tax clearance.		
18.7	BHEL reserves the right to reject the lowest or any tender or accept any tender in full or in part without assigning any reasons whatsoever.		
18.8	If any information/documents submitted by the vender are found false/fake at any stage, the tender submitted by the vender will be cancelled and earnest money deposited shall be forfeited debarring from the future participation in tenders.		
18.9	In case more than one contractor quotes equal L-1 rates, lottery shall be drawn among L-1 parties to decide one L-1 party.		

18.10	Conditional tender is likely to be rejected.		
18.11	The risk of delay/loss by post/courier rest with the bidder.		
19.0	**OFFER :-** The offer should be submitted in two parts and in following manner.	Yes / No	Vender to comply
19.1	**Techno-commercial Bid** :		
19.1.1	The envelop shall contain the Techno-commercial Bid (ANNEXURE 'A') with technical details and commercial terms & conditions along with Unpriced priced bid as per ANNEXURE 'B' with clear undertaking that no deviation from BHEL's price bid format , relevant documents like copies of ESI, PF code, PAN No., Service Tax Reg. No., TIN No., CST No., Experience Certificates, Audited Balance Sheet of last 3 years, Tender fees, EMD and all the documents related to clause 21 (Demand draft for tender document cost shall also be accompanied in case tender documents are down loaded from BHEL website. Offers without the EMD and Tender fee will not be considered except having valid NSIC certificate).		
19.1.2	The envelop shall be super scribed with "Techno-Commercial Bid", Name of work, NIT No. and Date of opening.		
19.1.3	Point-wise compliance of this scope of supply and work is to be given by vendors while submitting their techno-commercial offer in the format provided by BHEL. Each page of the compliance list has to be ink signed & stamped by the vendor.		
19.1.4	The vendor must note that no prices are to be quoted/ mentioned in the techno-commercial offer.		
19.2	**Price Bid :**		
19.2.1	The second envelope shall contain only the price bid with separate price for material and work & applicable taxes & duties on Price Bid Format only as per **ANNEXURE 'B'**.		
19.2.2	Any other information in the price bid shall not be considered and the quotation is likely to be rejected. Price bid document shall be ink signed & stamped by the bidder at the bottom of the page.		
19.2.3	The envelope shall be sealed and super scribed with "Price Bid", Name of work & NIT No.		
19.2.4	Price bids of techno commercially accepted vendors shall be opened (In presence of available vendors at the time of opening).		
19.2.5	Both the envelopes shall be kept in another sealed cover. The cover shall be super-scribed with "Tender for (name of work), NIT No. & due date" and shall be submitted in the **"Tender Box, placed at Tender Room, at IVth Floor, Main Administrative Building, HEEP, BHEL, Haridwar -249403,**		

	Uttarakhand" and it should also contain the Bidder's name and contact address.		
20.0	**Packing:**		
	Supplier shall arrange for adequate protection and packing of the consignment so as to avoid loss and damage during transit and also take appropriate measures to prevent metal parts from rusting and corrosion during transit. Handling instructions shall be clearly printed /painted on the packages. Each package should carry a detailed packing slip. Supplier shall be responsible for any loss/damage during transit due to defective/inadequate packing		
21.0	**PRE QUALIFYING CONDITIONS:** ***Offer only from the venders meeting the following conditions will be processed further.***	Yes / No	Vender to comply
21.1	Average Annual financial turnover during the last 3 years, ending 31st March 2014, should be at least **₹ 41.0 Lacs.** Vendor should submit Audited balance sheets for the last three years.		
21.2	The Vendor must have successfully completed the similar projects during last seven years ending 31st December 2014 and these projects should fulfill either of the following: a. Three similar projects with each project costing not less than ₹55.0 Lacs. or b. Two similar projects with each project costing not less than ₹ 68.0 Lacs. or c. One similar project with project costing not less than ₹ 110.0 Lacs. **Similar project means** retrofitting/reconditioning of a CNC Horizontal Borer with table/ HMC with Siemens CNC control system and servo drives.		
21.3	The above retrofitted machines should be running satisfactorily for at least 6 months prior to 31st December 2014. Vendor to provide P.O./ W.O copies and commissioning / performance certificates / relevant MOM for satisfactory operation of the above retrofitted systems along with name, address & contact details of their customer. BHEL reserves the right to verify the information provided.		

Annexure -B

Price Bid format

Name of Work: **Retrofitting of Horizontal Borer Wotan Rapid-6 , Plan No.1/1-227 , NIT No.**
NIT NO. : **20140005/WEX/CNC/RAPID6** **Dated: 05/02/15**

Vender details:

Sl. No.	Description of item	Unit	Qty	Basic Rate (in Rs.)	Excise Duty (in %)	VAT/CST (In %) (VAT with FORM-17 or CST with C-FORM)	Service Tax (In %)	Value (in Rs.)
1	Material	Set	01		%	%		Rs.
2	Installation & Commissioning	Set	01					Rs.
	TOTAL COST							Rs.

Signature & Seal of Vendor