



An ISO 9001
Company

Bharat Heavy Electricals Limited

(High Pressure Boiler Plant)

Tiruchirappalli – 620014, TAMIL NADU, INDIA

CAPITAL EQUIPMENT / MATERIALS MANAGEMENT

ENQUIRY	Phone: +91 431 257 76 53 Fax : +91 431 252 00 31 Email : skaruna@bheltry.co.in Web : www.bhel.com
NOTICE INVITING TENDER	

TWO PART BID Tender to be submitted in two Parts	Enquiry Number: 2621300025	Enquiry Date: 17.09.2013	Due date for submission of quotation: 19.10.2013
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You are requested to quote the Enquiry number date and due date in all your correspondence. This is only a request for quotation and not an order.

Please note that under any circumstances both delayed offer and late offers will not be considered. Hence vendors are requested to ensure that the offer is reaching physically our office before 14.00 hrs on the Date of tender opening.

Item	Description	Quantity
10	Travelling Column Radial Drilling Station with two drilling heads on a common bed as per the technical specification & commercial conditions applicable (to be downloaded from web site www.bhel.com or http://tenders.gov.in)	01 Set.

Important points to be taken care during submission of offer:-

- The rate of EMD for this Tender will be (INR) : 2,00,000/-
- The Vendor shall offer against the following requirement of BHEL :-

Delivery Period for Supply Portion	12 months
Duration for Completion of Erection & Commissioning (i.e. Delivery for Service Portion)	1 month

In case of deviation the offer will be commercially loaded as indicated in the checklist.

- The Checklist for Acceptance of Commercial Terms & Conditions to be filled and enclosed along with the offer failing which, the offer will not be considered for evaluation.
- All updates, amendments, corrigenda, etc., (if any), for each tender will be posted only on the above websites from time to time, as and when required, until each tender is opened. There will be no publication of such updates, amendments, corrigenda, etc., through newspapers or any other media.

BHEL's General guidelines / instructions (refer [MM/CE/GENL/001-EMD](#)) including bank guarantee formats and list of consortium banks, commercial terms check-list 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 above Enquiry reference.

Tenders should reach us before 14:00 hours on the due date Tenders will be opened at 14:30 hours on the due date Tenders would be opened in presence of the tenderers who have submitted their offers and who may like to be present	Yours faithfully, For BHARAT HEAVY ELECTRICALS LIMITED Sr. Manager / Capital Equipment / MM
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**TRAVELLING COLUMN RADIAL DRILLING STATION
WITH TWO DRILLING HEADS ON COMMON BED**

PART-A

Sl.No.	PARTICULARS	VENDOR'S RESPONSE
1.0	QUALIFYING CRITERIA	
1.1	The BIDDER / VENDOR (OEM) BIDDER shall have a minimum of TEN Years of Continuous Experience in the Field of Design, Manufacture & Supply of travelling column radial drilling station with two drilling heads on a common bed.	
1.2	<p>Only those vendors (OEMs), who have manufactured, supplied and commissioned at least one TRAVELLING COLUMN RADIAL DRILLING MACHINE in the last ten years having all the following features:</p> <ul style="list-style-type: none"> a. Spindle power not less than 15.0 kW Continuous duty 11.0 kW. b. Drilling capacity of minimum 80mm on steel. c. Drilling spindle axis of 3500mm or more from column face <p>Such supplied machine should presently be working satisfactorily for at least one year after its commissioning (as on the date of opening of this Tender). The name and contact addresses of the customers to whom the machine has been supplied has to be furnished with details.</p>	
1.3	Vendor has to submit at least ONE Performance Certificate from their customers, for satisfactory performance of Travelling Column Radial Drilling Machine as given under clause 1.2 above, for a minimum period of one year (as on date of opening tender). For obtaining the Performance certificate, a suggestive format is provided.	
1.4	BHEL reserves the right to verify the information provided by vendor. In case, it is found to be false/ incorrect, the offer shall get rejected.	
2.0	INFORMATION TO BE PROVIDED BY VENDOR	
2.1	The BIDDER / VENDOR to furnish Reference List of Customers, with complete address, details of contact person, where Travelling Column Radial Drilling Machines were supplied in the past.	
2.2	Specify details of Travelling Column Radial Drilling Machines supplied to other units of BHEL, if any (Year of commissioning, Drilling Capacity, Arm Travel & Column travel etc.)	
2.3	Details on SERVICE-AFTER-SALES Set-up in India including the Address of Agents / Service Centres in India.	
2.4	Any Additional data to supplement the manufacturing capability of the BIDDER for the subject equipment.	

PERFORMANCE CERTIFICATE – [SAMPLE FORMAT]
(On Customer’s Letter Head with Additional Sheet – if necessary)

1. Supplier of the Equipment/Machine :
2. Make & Model of the Equipment :
3. Month & Year of Commissioning :
4. Application for which Machine is used :
5. Equipment details
 - a) Equipment Serial Number :
 - b) Spindle Motor Power in Horse Power/kW :
 - c) Drilling Capacity in Steel in millimeters :
 - d) Drilling Head Traverse in millimeters :
 - e) Vertical Stroke of Radial Arm in millimeters :
 - f) Machine Column Traverse in X-axis in meters :
6. Performance of the Machine : Satisfactory /
Good /
Average /
Not Satisfactory
7. Feedback on “After Sales Service” by the Supplier :
8. Remarks / Reasons for Recommendations to BHEL :

Date:

Signature & Seal of the Authority
Issuing the Performance Certificate

TECHNICAL SPECIFICATION FOR TRAVELLING COLUMN RADIAL DRILLING STATION WITH TWO DRILLING HEADS ON A COMMON BED

PART-B

Note:-

1. The Column "**Vendor's offer with Technical details & Remarks**" of this format shall be filled in by the Vendor and submitted along with the offer. Inadequate / incomplete, ambiguous or unsustainable information against any of the clauses of the specifications / requirements shall be treated as non-compliance.
2. The offer and all documents enclosed with offer should be in **English language** only.

Name & Address of the Supplier:	Name & Address of the Indian agent:
Telephone no.:	Telephone no.:
Fax no.:	Fax no.:
e-mail:	e-mail:

Scope: - Supply, Erection & Commissioning of TRAVELLING COLUMN RADIAL DRILLING STATION WITH TWO DRILLING HEADS ON A COMMON BED for BHEL complying with the specification as below.

Sl.No	PARTICULARS	VENDOR's OFFER
1.0	<p>PURPOSE: These heavy-duty radial drilling machines are meant for drilling and boring of holes in pipes and cylindrical shells (viz., Header Pipes) used in Utility and Industrial Boilers. And also drilling of holes on hemi-spherical dished end covers. These machines shall be capable of drilling in curved shells of solid steel with thickness up to 120 mm. The drilling machines will also be used for machining of free ends (oxy-acetylene flame cut ends) of nozzles/stubs welded to shells or pipes to form weld edge after the hydro testing. In this machine job will be placed on Fitter's Bar (with slots for clamping) running throughout the length of the work-center. These machines will be operated on three-shift basis.</p>	

SI.No	PARTICULARS	SPECIFICATIONS	VENDOR's OFFER
2.0	QUANTITY & MACHINE CONFIGURATION: The tender is for TWO radial arm drilling machines in one Work Station. Two machines will have to be mounted on the same slide-way built-up by adding suitable number of machine beds, to form an effective machine traverse of 21000 mm.		
3.0	JOB DESCRIPTION: 1) Job Description: Header Pipes 2) Length of Job: 1m to 24m 3) Job Diameter: 219mm to 914mm 4) Pipe Wall thickness: 20mm to 120mm 5) Weight of Job: 1 Ton to 40 Tons	Vendor to Confirm	
4.0	JOB MATERIAL: a) Steel with tensile strength of 60 kg / mm ² (SA106Gr.B/C, SA299, SA515/516Gr.60/70asper ASTM Standards) b) Cast- Iron with tensile strength of 25 kg / mm ² . c) Alloy Steel and Stainless Steel (martensitic) for Header pipes only (SA 335 Gr.P11/P12/P22/P91/P92 & Super 304 H as per ASTM Standards)	Vendor to Confirm	
5.0	TYPE OF DRILLS USED: Standard 118° lip angle HSS drills without web thinning. Drills with replaceable/HSS inserts.	Vendor to Confirm	
6.0	EDGE PREPARATION: Edge Preparation of drilled holes (asymmetrical cutting by two cutting tool bits mounted in the same tool holder, taking cut simultaneously.	Vendor to Confirm	
7.0	DESCRIPTION OF JOBS [FOR TYPICAL JOB CONFIGURATION]: Annexure – 1 & 2, enclosed with this specification, give the cross-sectional view of typical Header shell with stub holes.	Vendor to Confirm	

TRAVELLING COLUMN RADIAL DRILLING STATION

Part-B

SI.No	PARTICULARS	SPECIFICATIONS	VENDOR's OFFER
8.0	MACHINE CONFIGURATION: The machine shall consist of a vertical column mounted on the base plate. The horizontal arm moves up and down the column and can be locked at any position. Also the arm shall be manually swiveled about the column center and lock at any position. The drilling Head moves horizontally on the horizontal arm and can be locked at any position. The spindle is housed in the drilling head and can be moved up and down. In a work center two machines will be mounted on the same slide-way built-up by adding suitable number of machine beds to form a machine traverse of 21,000 mm for drilling as per requirement of the job.	Vendor to confirm	
9.0	DRILLING HEAD		
9.1	Drilling capacity in steel (TS 60 kg/sq.mm) – Direct drilling diameter – minimum 80 mm	Vendor to specify	
9.2	Threading capacity in steel(TS 60 kg/sq.mm) : M 64 x 6	Vendor to specify	
9.3	Boring capacity in solid steel (in steps) : 170 mm	Vendor to specify	
9.4	Taping capacity in solid cast iron : M 64 x 6	Vendor to specify	
9.5	Power of spindle motor : Not less than 15.0 kW Continuous duty 11.0 kW	Vendor to specify	
9.6	Taper in spindle : MT 6	Vendor to specify	
9.7	Spindle stroke : Minimum 475 mm	Vendor to specify	
9.8	Spindle diameter in front bearing min 120 mm is preferable	Vendor to specify	
9.9	Number of spindle speeds - 30 steps . / Step less speed by VFD with servo spindle motor is preferable	Vendor to specify	
9.10	Spindle speed range - 10-1000 rpm / Step less speed by VFD with servo spindle motor is preferable	Vendor to specify	
9.11	No of feeds - Not less than 16	Vendor to specify	
9.12	Spindle feed range minimum - 0.035-2.8 mm/rev	Vendor to specify	
9.13	Auto depth control mechanism for spindle stroke.	Vendor to specify	
9.14	Quill diameter	Vendor to specify	
9.15	Maximum drilling thrust	Vendor to specify	
9.16	Maximum torque on spindle	Vendor to specify	
9.17	Mode of pre selection of feed and speed	Vendor to specify	
9.18	Drill head traverse speed for a motorized drill head traversing system	Vendor to specify	
9.19	Drill head locking mechanism	Vendor to specify & give technical details	

TRAVELLING COLUMN RADIAL DRILLING STATION

Part-B

Sl.No	PARTICULARS	SPECIFICATIONS	VENDOR's OFFER
10.0	RADIAL ARM		
10.1	Maximum vertical distance between spindle nose to base of the machine shall be around 2900mm.	Vendor to specify	
10.2	Minimum vertical distance between Spindle nose to base of the machine, when the Radial Arm is at the lowest level on the Machine Column. Shall be around 940 mm.	Vendor to specify	
10.3	Maximum distance from the axis of the spindle to the guide ways on the Machine Column to suit the drilling application mentioned above. Shall be around 4000 mm	Vendor to specify	
10.4	Minimum distance from the axis of the spindle to the guide ways of column. Shall be around 500mm	Vendor to specify	
10.5	Drilling Head Traverse Stroke available along the Radial Arm to suit the drilling application mentioned above Shall be around 3500mm	Vendor to specify	
10.6	Vertical Travel Stroke of the Radial Arm on the Machine Column Shall be around 1530 mm	Vendor to specify	
10.7	Arm up / down speed	Vendor to specify	
10.8	Swing of the arm around the column 0 to 180 deg	Vendor to specify	
10.9	Arm dimensions	Vendor to specify	
10.10	Hydraulic / Electrical powered clamping mechanism of arm on the machine column. (With indicator)	Vendor to submit details	
11.0	MACHINE COLUMN & BASE		
11.1	Distance between the centerline of two machine columns when the two machines are taken to the extreme end of the slide ways. Shall not be less than 21000 mm.	Vendor to specify.	
11.2	Overall length of machine base for the above traverse in Clause Sl.No 11.1	Vendor to specify	
11.3	Minimum distance between the centerline of two columns of two machines, when they are brought together (With telescopic cover).	Vendor to specify	
11.4	Column traverses speed. (The speed shall be continuously variable and shall be controllable through a potentiometer & Minimum motor capacity should be around 10 kW). [BHEL prefers to have the range of 0.0 to 6000 mm/min.]	Vendor to specify	
11.5	Column dimensions	Vendor to specify	
11.6	Max distance traverse of single machine on the bed.	Vendor to specify	

TRAVELLING COLUMN RADIAL DRILLING STATION

Part-B

Sl.No	PARTICULARS	SPECIFICATIONS	VENDOR's OFFER
12.0	MACHINE GUIDE WAYS		
12.1	Width of Arm guide ways	Vendor to specify	
12.2	Width of column guide ways	Vendor to specify	
12.3	Hardness of guide ways [preferred values are 200-220 BHN for soft guide-ways and around 400 BHN for hardened cast iron slides]	Vendor to specify	
12.4	Sliding Surfaces on guide ways [BHEL preferred combinations] a. Head-Stock / Radial Arm - Cast Iron/Cast Iron. b. Radial Arm / Column – Cast Iron / Hardened Cast Iron, c. Saddle / Bed - Turcite / Hardened Cast Iron	Vendor to submit details	
13.0	CONSTRUCTION:		
13.1	Vendor to furnish details of material, hardness & constructional details, including explanatory drawings of various components / assemblies like Column, Bed, Arm, Drilling Head, Spindle, etc. of the machine.	Vendor to furnish	
13.2	Machine configuration shall be such that drilling head; arm, column and base shall be sturdy enough to withstand all types of reactionary forces developed during drilling with drilling head at farther most point on the radial arm.	Vendor to specify	
13.3	Both longitudinal and cross alignments of machine bed guide ways shall be accurate enough to ensure smooth travel of machine on either side from the mid point of the bases.	Vendor to specify	
13.4	Selecting guide way profile and spacing of guide ways shall ensure jerk free travel and provide sufficient seating area for column base for vibration-free drilling.	Vendor to specify	
13.5	Column travel – if it is of rack and pinion type should be Helical.	Vendor to specify	
13.6	Column drive gear shall be sturdy with proper mounting with the base without over-hanging. Standard gearboxes of make like Radicon / Elecon / Allryod / SEW / Bonfiglioli preferred.	Vendor to specify	
13.7	For arm up and down travel, metal spiral cover and bottom support to be provided if it is screw rod / nut arrangement.	Vendor to specify	
13.8	The bed guide ways shall be covered by carton steel walk on type telescopic cover and the min. and max. distance between the two machine columns mentioned in clause sl nos 11.1 & 11.3 are to be considered in selecting the telescopic cover.	Vendor to specify	

TRAVELLING COLUMN RADIAL DRILLING STATION

Part-B

SI.No	PARTICULARS	SPECIFICATIONS	VENDOR's OFFER
13.9	The cables, hoses (hydraulic, coolant) going to each machine column shall be routed through separate metallic, closed type cable drag chain. The covers of the drag chain shall be of aluminium material and of removable type. The make of the drag chain shall be of KABELSCHLEPP/IGUS.	Vendor to specify	
13.10	Locking mechanism for provisions referred in Clause SI.Nos. 9.19 and 10.10 are to be spelt out with details.	Vendor to give Technical Details	
13.11	Graduated Dials on headstock shall be of Stainless Steel / Chromium plated.	Vendor to confirm	
13.12	For each machine, it's Column Up / down & longitudinal movements shall be controllable either from their headstock or from their control panel located at machine bed level.	Vendor to confirm	
13.13	Vendor to provide Power & Speed rating for the following Motors: a) Spindle, b) Arm Up / down, c) Drill Head Traverse on Arm, d) Column Longitudinal Travel and e) Coolant Pumps. BHEL prefers to have a speed of 1500 rpm for these Electric Motors. Spindle motor must be Energy efficient EFF1.	Vendor to furnish	
14.0	Lubrication and coolant system		
14.1	Flexible metal hose for coolant is preferable at headstock.	Vendor to specify	
14.2	Centralised Lubrication System and all lubrication lines to be protected with metallic covers to protect from drilling chips.	Vendor to provide details	
14.3	Details of flood coolant system [Each Machine shall have a coolant discharge arrangement of 30 LPM – liters/minute, at 3 bar pressure at discharge end of the Coolant Pump. The Coolant Pump Motor speed shall be 1500 rpm. The work center (Motor pump assemblies) should have a common frame & to be placed over the sump for collection & re-circulation, with two independent coolant supply system with suitable valve arrangements]	Vendor to provide details	
15.0	MACHINE LIGHTS:		
15.1	A machine lamp is to be provided at Headstock to give sufficient illumination over the complete working area. The lamp orientation shall be adjustable and the lamp shall be of LED type with operating voltage of 24V AC. The lamp shall conform to Indian standards and shall be easily available in India.	Vendor to confirm	
15.2	A magnetic base 24-volt portable spotlight with sufficiently long cable should also be provided.	Vendor to confirm	
15.3	All light fittings, consumables, adapters/receptacles should have compatibility with Indian equivalents	Vendor to confirm	
SI.No	PARTICULARS	SPECIFICATIONS	VENDOR's OFFER

TRAVELLING COLUMN RADIAL DRILLING STATION

Part-B

16.0	ELECTRICAL SYSTEM:		
16.1	415V + 10% / -10%, 50HZ +/-1.5 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.	Vendor to confirm	
16.2	All electrical equipment shall be Tropicalized	Vendor to confirm	
16.3	All electrical control cabinets & panels should be dust and vermin proof	Vendor to confirm	
16.4	All electrical components in the cabinets should be mounted on DIN Rail	Vendor to confirm	
16.5	All electrical panels should be provided with CFL 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	
16.6	Motors shall be from M/s Siemens / ABB / Crompton Greaves or other reputed make conforming to IEC and acceptable to BHEL	Vendor to confirm	
16.7	For the traversing groups the cables/hoses shall be routed through metallic cable drag chain. Except for the column longitudinal travel, it shall be of open type. BHEL prefers to have Cable drag chain of KABELSCHLEPP/IGUS make.	Vendor to provide details.	
16.8	Vendor should ensure the proper earthing for the machine and its accessories.	Vendor to confirm	
17.0	OPERATION AND CONTROL SYSTEM:		
17.1	OPERATOR'S PANEL The control of radial arm & drilling head shall be grouped together and it shall be provided on the drilling head. All switches, indications, controls in it shall be within the reach of the operator for convenient, efficient & safe operation. Accordingly each drilling head will have its own operator panel. The control panel for the machine shall be preferably on the right side of the hand wheel on the drilling head. The design of the electrical system shall be such that the operation of one radial arm & drilling head is independent of the operation of the other radial arm & drilling head and breakdown of one radial arm & drilling head should not affect the operation of the other.	Vendor to provide details.	
17.2	All machine movements shall be operable through inching mode also.	Vendor to confirm	
18.0	SAFETY ARRANGEMENTS:		
18.1	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.	Vendor to specify the interlocks provided.	
18.2	A detailed list of all alarms / indications provided on machine shall be submitted by the Vendor.	Vendor to confirm	

TRAVELLING COLUMN RADIAL DRILLING STATION

Part-B

Sl.No	PARTICULARS	SPECIFICATIONS	VENDOR's OFFER
18.3	All the pipes, cables etc. on the machine should be well supported and protected.	Vendor to confirm	
18.4	All the rotating parts used on machine should be statically & dynamically balanced to avoid undue vibrations and suitable covers to be provided.	Vendor to confirm	
18.5	Limits shall be provided at extreme end of the base and in between two machines to prevent over travel of the machine and collision of the machine respectively.	Vendor to provide details	
18.6	Emergency Switches at suitable locations as per International norms are to be provided.	Vendor to confirm	
18.7	Oil & water pipe lines should not run with electrical cable in the same tray / trench.	Vendor to confirm	
18.8	Projection of operating levers / Hand wheel on the drill head if any shall not be hindrance to operator safety. Hand wheels used if any for any adjustments, shall have necessary provisions (in the form of knurling) for easy gripping by the operator. All the controls, adjustments provided on the drilling head shall be suitable for Right hand operation of the operator.	Vendor to confirm	
19.0	ENVIRONMENTAL PERFORMANCE OF THE MACHINE: [The Machine shall conform to following factors related to environment]		
19.1	Maximum noise level shall be 85 dB (A) at normal load condition, 1 m away from the machine with correction factor for back ground noise, if necessary. Vendor to demonstrate compliance to noise level, if so required.	Vendor to confirm	
19.2	If any safety / environmental protection enclosure is required it should be built in the machine by the vendor.	Vendor to confirm	
19.3	Paint of the machine should be oil / coolant resistant and should not peel off and mix up with coolant.	Vendor to confirm	
19.4	Vibration level of Machine Head Stock during drilling operations	Vendor to furnish details	
20.0	TOOLINGS		
20.1	Reduction sleeves MT6-5, 6-4, 4-3 & 4-2 , both long & short series for each drilling station.	Vendor to confirm	
20.2	Extension sleeves MT6/6, MT5/5, MT4/4, and MT3/3 for each drilling station.	Vendor to confirm	
20.3	Tapping Tools with suitable Attachments for carrying out Tapping for the range of M 48 x 5 to M 64 x 6 , in steps with full set of collets. Weight of tapping attachment should not be more than 10kgs.	Vendor shall furnish list and details	
21.0	LEVELING & ANCHORING SYSTEM		
21.1	Complete anchoring system including foundation bolts, anchoring materials, fixtures, leveling shoes, etc. shall be supplied for the Machine.	Vendor to confirm	

Sl.No	PARTICULARS	SPECIFICATIONS	VENDOR's OFFER
22.0	TOOLS FOR ERECTION, OPERATION & MAINTENANCE		

TRAVELLING COLUMN RADIAL DRILLING STATION

Part-B

22.1	The vendor shall bring special tools and equipment required for erection of the machine. Necessary tools like Torque Wrench, Spanners, Keys, grease guns etc.for operation & maintenance of the machine should be supplied. List of such tools shall be submitted with offer	Vendor to confirm	
22.2	Test Mandrel for checking spindle run-out & alignment shall form the part of the scope of supply	Vendor to confirm	
23.0	SPARES:		
23.1	Item wise breakup of mechanical, hydraulic, electrical spares used on the machine in sufficient quantity as per recommendation of Vendor for 2 years of trouble free operation on three shifts continuous running basis should be offered by vendor. The list to include following, in addition to other recommended spares: (Unit Price of each item of spare should be offered)	Vendor to furnish	
23.2	Mechanical & Hydraulic Spares: One spindle, Bearings, clutches, gears and all types of pumps, Valves, pressure switches / transducers, filters, seals, 'O' rings, Hydraulic Hoses, etc.	Vendor to furnish	
23.3	Electrical: All types of Relays, Contactors, Proximity Switches, Push Buttons, Indicating Lamps, Semiconductor Fuses, Special Fuses, Circuit Breakers, Main Power Switch, Limit switches, Electro-mechanical clutches, Variable frequency drives.	Vendor to furnish	
23.4	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 & Vendors to enable BHEL to procure these in advance, if required.	Vendor to furnish	
23.5	Vendor to confirm that complete list of spares for machine and accessories, along with specification / type / model, and name & address of the spare Vendor shall be furnished along with documentation to be supplied with the machine.	Vendor to furnish	
24.0	GENERAL POINTS		
24.1	The offer shall clearly indicate the list of standard accessories that will be supplied along with the machine	Vendor to confirm and enlist	
24.2	All hydraulic elements shall be of Vickers/Rexroth make	Vendor to confirm and enlist	
24.3	All electrical devices like contactors, relays and limit switches, push buttons etc. shall be from Siemens / L&T / Cuttler Hammer / Telemecanique. All wires shall be of PVC insulated, flexible, multi strand copper cable and of make LAPP/IGUS or equivalent.	Vendor to confirm and enlist	
24.4	All components/devices/terminals are to be incorporated with ferrules. (Numbered)	Vendor to confirm	
SI.No.	PARTICULARS	SPECIFICATIONS	VENDOR's OFFER
25.0	DOCUMENTATION		

TRAVELLING COLUMN RADIAL DRILLING STATION

Part-B

25.1	THREE sets of following documents (Hard copies) in English language should be supplied along with the machine	Vendor to confirm	
25.2	Detailed Operation and Maintenance manual of machine with all drawings of machine assemblies/sub-assemblies/parts including Electrical / Pneumatic/ Coolant / Hydraulic circuit diagrams. All Assembly/ Sub Assembly Drawings shall be supplied with the part list / Bill Of Materials also	Vendor to confirm	
25.3	Catalogues, O&M Manuals and drawings of all bought out items, bearings wherever applicable. And VFD's Programming & Parameter manual.	Vendor to confirm	
25.4	Electronic and electrical interconnecting drawings (i.e. between machine, control panel and drives). Hard Copy in Original: 3 Nos.	Vendor to confirm	
25.5	Specification with drawings of clutch plates & brake plates.	Vendor to confirm	
25.6	Hydraulic, coolant, lubrication and Electrical circuits with BOM	Vendor to confirm	
25.7	Detailed specification of all rubber items and hydraulic/lube fittings	Vendor to confirm	
25.8	The vendor shall submit complete Master List of parts used in the machine.	Vendor to confirm	
25.9	One additional set of all the above documentation on CD ROM, wherever possible.	Vendor to confirm	
25.10	Component Manufacturing Drawing shall be provided for all the wearing-out parts with material specifications.		
26.0	FOUNDATION:		
26.1	BHEL shall construct complete foundation for the machine. Vendor shall furnish the foundation details.	Vendor to confirm	
27.0	ERECTION & COMMISSIONING		
27.1	Vendor to provide supervision for carrying out the erection, start up, testing of machine, it's control system & all types of other supplied equipment, drilling / tapping of test pieces etc. Service requirement like power, air & water shall be provided by BHEL at only one point to be indicated by Vendor in their foundation/layout drawings.	Vendor to confirm	
27.2	Successful proving of BHEL components by the Vendor shall be considered as part of commissioning. All tests, as mentioned at Clause Nos. 31.0 shall form part of the commissioning activity.	Vendor to confirm	
27.3	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	

Sl.No.	PARTICULARS	SPECIFICATIONS	VENDOR's OFFER
28.0	ACCURACY TESTS		

TRAVELLING COLUMN RADIAL DRILLING STATION

Part-B

28.1	GEOMETRICAL ACCURACIES		
28.2	Geometrical Accuracy Tests shall be as per international standards [as per ISO 2423/1974]. Detailed Test Charts for the same, clearly showing the accuracies to be achieved on the machine, shall also be submitted with the offer.	Vendor to confirm	
28.3	All the above accuracies to be demonstrated to BHEL engineers during pre-acceptance tests at Vendors works and during Erection & Commissioning at BHEL Works.	Vendor to confirm	
29.0	FINISH REQUIREMENTS		
29.1	Reamed holes with H7 tolerance and 1.6 microns surface finish with reaming shall be demonstrated at the maximum drilling diameter.	Vendor to confirm dia 50H7, Ra 1.6, in GG25 material	
30.0	AMBIENT CONDITIONS & THERMAL STABILITY		
30.1	Total machine and all supplied items should work trouble free and efficiently under following operating conditions and should give specified accuracies. Ambient Conditions: Temp: 25 to 50 Degree Celsius Relative Humidity: 95% maximum.	Vendor to confirm	
30.2	Weather conditions are tropical, Atmosphere may be dust laden during some part of the year. Machine shall be kept in the normal shop floor condition. Max. Temperature variation is up to 25 deg Celsius in 24 hours.	Vendor to confirm	
30.3	The machine, including attachments and accessories, should be suitable for 24 hrs. Continuous operation to its full capacity for 24 hour a day and 7 days a week throughout. Vendor to ensure and confirm the same.	Vendor to confirm	
31.0	MACHINE INSPECTION and ACCEPTANCE:	Should be accepted & confirmed by Vendor	
	Tests/Activities to be carried out at Vendor's Works	Vendor to confirm	
31.1	Geometrical Accuracy Tests as per test chart.	Vendor to confirm	
31.2	Full load test to demonstrate the maximum power & drilling capacity of the machine.	Vendor to confirm	
	PROVE-OUT OF MACHINE CAPACITY Tests to be carried out at BHEL Works	Vendor to confirm	
31.3	Geometrical Accuracy Tests as per test chart.	Vendor to confirm	
31.4	Full load test to demonstrate the maximum power & drilling capacity of the machine. Drilling / Boring / Tapping Tools will be provided by BHEL.	Vendor to confirm	
31.5	Training of BHEL machine operators in operation and maintenance of complete machine & accessories etc. by the Vendor's experts/engineers during their stay at BHEL works	Vendor to confirm	

SI.No.	PARTICULARS	SPECIFICATIONS	VENDOR's OFFER
32.0	PACKING		
32.1	Sea worthy & rigid packing for all items of complete machine, all Accessories & other supplied items to avoid	Vendor to Confirm	

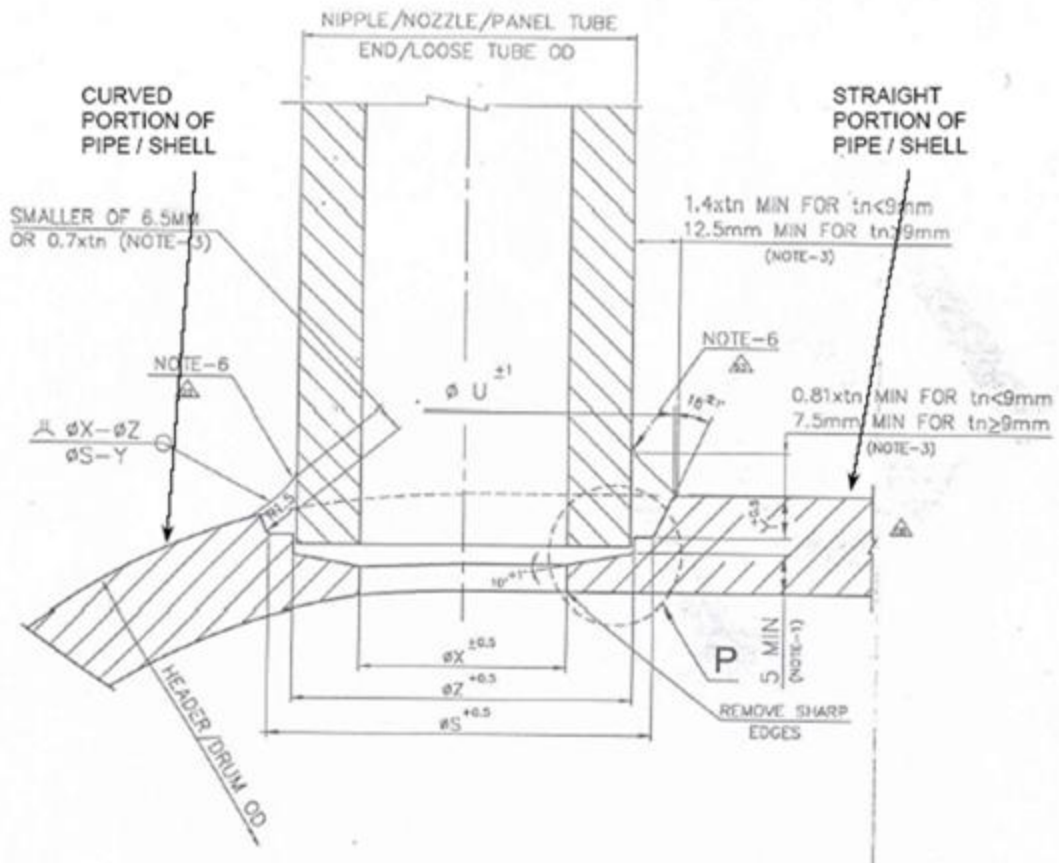
TRAVELLING COLUMN RADIAL DRILLING STATION

Part-B

	any damage in transit. When machine is dispatched in containers, all small loose items shall be suitably packed in boxes		
33.0	GUARANTEE		
33.1	12 months from the date of commissioning and acceptance of the machine at BHEL Works	Vendor to Confirm	
34.0	SPECIAL NOTES : The vendor should submit the following information:		
34.1	Machine Model	Vendor to specify	
34.2	Total connected load in kVA	Vendor to specify	
34.3	Floor area required (Length, Width, Height) for complete machine & accessories	Vendor to specify	
34.4	Painting of Machine/ Electrical Panels: RAL 6019 Pastel Green (Polyurethane Paint)	Vendor to specify	

ANNEXURE - 1

TYPICAL DRILLING & EDGE PREPARATION STYLE



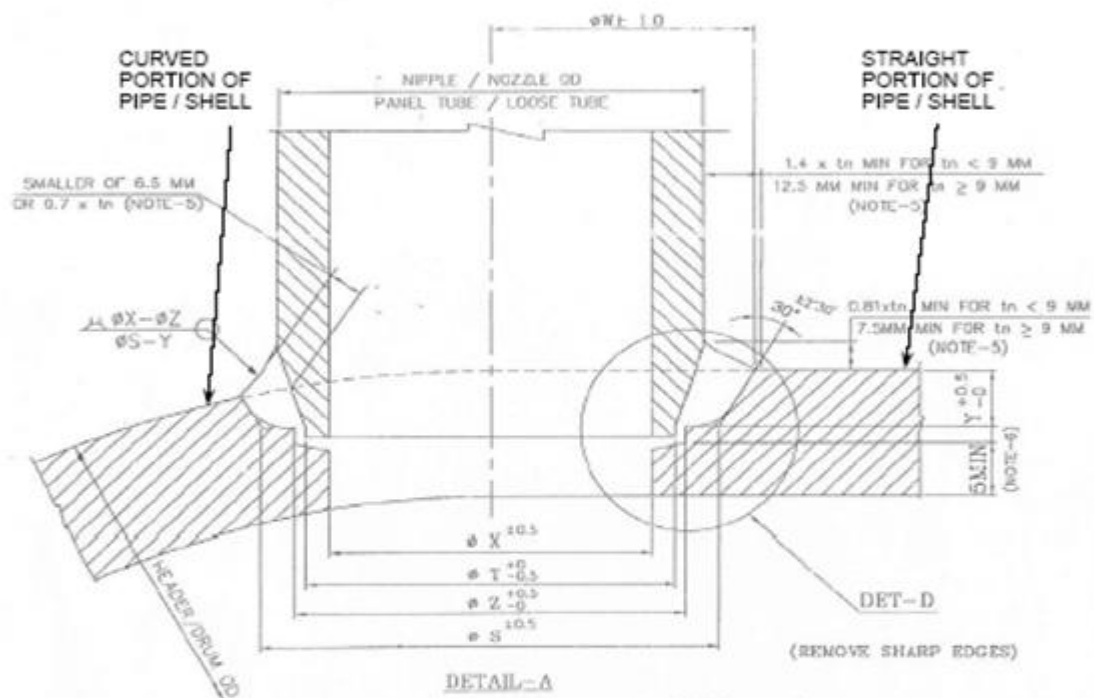
Variable	Min ϕ in mm	Max ϕ in mm
X	19	100
Z	33	160
S	43	170
U	47	180.5

Y varies from 6.5 to 16.5 mm

All dimensions are in 'mm'

ANNEXURE - 2

TYPICAL DRILLING & EDGE PREPARATION STYLE



Variable	Min ϕ in mm	Max ϕ in mm
X	21	100
T	34	142.5
Z	35	143.5
S	55	162.5
W	68.5	182.5

All dimensions are in 'mm'

Y varies from 9 to 21 mm