An ISO 9001 Company

Bharat Heavy Electricals Limited

(High Pressure Boiler Plant**)**
Tiruchirappalli – 620014, TAMIL NADU, INDIA
CAPITAL PURCHASE / MATERIALS MANAGEMENT / MANUFACTURING

ENQUIRY	Phone: +91 431 257 75 75 Fax : +91 431 252 07 19 Email : rrmanohar@bheltry.co.in Web : www.bhel.com

	Enquiry Number:	**Enquiry Date:**	**Due date for submission of quotation:**
	2620600047	**15.07.2006**	**16.08.2006**
Your are requested to quote the Enquiry number date and due date in all your correspondences. This is only a request for quotation and not an order			

Item	**Description**	**Quantity**	**Delivery Schedule**
10	Roto Blast Station with Handling facility for tubes. Detailed technical specification & commercial conditions applicable (to be downloaded from web site **www.bhel.com**)	1 No.	15.05.2007

Note:

(1) The detailed Technical Specification along with technical point-by-point confirmation, Commercial Terms & Conditions applicable for this Enquiry, Confirmation of acceptance for BHEL commercial terms & conditions and Price Bid formats have been posted in BHEL Corporate web site www.bhel.com under Enquiry reference "2620600047". Your offer should be based on all the above documents.

(2) Also, you are requested to fill in the Supplier Registration formats available in www.bhel.com (under Advancement – Supplier Registration) and send it along with your offer.

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 Dy. Genl. Manager / Capital Purchase / MM / Manufacturing

PART A

QUALIFYING CRITERIA FOR THE SUPPLY OF *ROTO-BLAST TYPE TUBE SURACE CLEANING MACHINE*

SECTION – I

The BIDDER / VENDOR has to necessarily provide the following details, for making an assessment of the firm's capability and competency to effect the supply:

[The BIDDER is expected to give complete details against each clause in the table given below and wherever necessary an additional sheet may be attached (giving clear reference number) to cover the required details]

S. No.	PARTICULARS	VENDOR's RESPONSE
1.0	Number of Years of Experience of the BIDDER/ VENDOR in the field of design, manufacture and supply of 'Shot / Grit Blasting Machines'	
2.0	Number of 'Shot Blasting Machines' supplied, installed and commissioned till date, for surface cleaning of raw materials in the form of rolled sections, tubes and pipes, steel plates, etc.	
3.0	Technical Details like Number of Blast Wheels, Job Handling System, Dust Extraction Unit, Shot Recycling Unit, Blast Chamber Construction (forming part of the Blasting Machine), Control Station, etc. of the already supplied Shot Blasting Machines are to be furnished	
4.0	Details of Design Set-Up and Technology Back-Up assured for the PRINCIPAL Equipment Maker	
5.0	Details on International Standards / Process Codes followed (if any) in the Design of the Equipment. [Copy of the English Version of relevant portion of the Standards / Codes followed, to be furnished with the Technical Offer]	
6.0	Details of Quality System followed [Furnish the salient aspects of the Quality Assurance System followed] for the machine building / manufacture	

S. No.	PARTICULARS	VENDOR's RESPONSE
7.0	Details on the Facilities available for Machine Building / Fabrication and Performance Testing at the BIDDER's Works and Sources of OUTSOURCING / SUB-CONTRACTING	
8.0	BIDDER to list down the Sub-Vendors from whom Bought-Out Items, Accessories, Attachments, Infeed / Outfeed or such Material Handling Units are likely to be sourced for the subject machine.	
9.0	Comprehensive Details on Performance Testing - of the Equipment quoted, to be given with the Technical Offer	
10.0	Details on the SERVICE-AFTER-SALES Set-Up [including the Contact Address & Phone Number of Service Agents] are to be furnished .	
11.0	Any Additional Data to supplement the manufacturing capability of the BIDDER for the subject equipment.	

SECTION – II

The BIDDER / VENDOR has to compulsorily meet the following requirements to get qualified for submitting an offer for the SHOT BLASTING MACHINE.

S. No.	REQUIREMENTS	VENDOR's COMMENTS
12.0	The BIDDER / VENDOR shall have a minimum of TEN Years of Continuous Experience in the Design, Manufacture & Supply of Shot/Grit Blasting Machine with associated Material Handling Systems.	
13.0	The BIDDER / VENDOR shall have supplied at least one number of Shot Blasting Machine of the CAPACITY and CONFIGURATION [more or less similar to the configuration as given under PART B] in the recent past, say in the last five years.	
14.0	Reference List of Customers and Performance Certificate from CUSTOMERS (minimum two Customers) with full contact details of CONTACT PERSON, for the proof of capability for machine building and servicing of Custom Built Shot Blasting Machines .	

S. No.	PARTICULARS	VENDOR's RESPONSE
15.0	BIDDER has to highlight the technical details of the Design, Construction and Functional Features (of the offered equipment) which will assure that the equipment will meet the requirements of ISO-14000 and ISO-18000	
16.0	BIDDER has to co-ordinate for the visit of BHEL Team (at BHEL Cost) to the BIDDER's Customer Works, to witness the capability and performance of an existing Shot Blasting Machine, if warranted.	

SECTION – III

The BIDDER / VENDOR has to comply with the following, for accepting the Technical Offer for scrutiny by the Purchaser :

S.No.	REQUIREMENTS	VENDOR's COMPLIANCE
17.0	The BIDDER shall submit the offer in TWO PARTS - Technical **[with PART A & PART B]** & Commercial and Price Bid	
18.0	The Offer shall contain a comparative statement of Technical Specifications given by BHEL and the Offer Details submitted by the Bidder, against each clause. A just 'CONFIRMED' or 'YES' or 'COMPLIES' or 'NO-DEVIATION' in the technical comparative statement may lead to disqualification of the OFFER.	
19.0	The BIDDER / VENDOR shall assure a continuous support for SPARES and SERVICE for TEN Years, from the date of commissioning of the equipment .	
20.0	The Technical Offer shall be supported by Product Catalogue and Data Sheets in ORIGINAL and complete technical details of 'Bought-Out-Items' with Catalogues and their Selection Criteria	
21.0	The Commercial Offer (given with the Technical Offer) shall contain the Scope of Supply and the Un-Priced Part of the Price-Bid, for confirmation	
22.0	BIDDER has to indicate the Country of Origin for the supply of the EQUIPMENT	
23.0	The reference List of Customers shall be accompanied with the details (Phone Number /E-Mail ID) of the CONTACT PERSON for cross reference by BHEL	

PART B

TECHNICAL SPECIFICATIONS FOR HEAVY DUTY ROTO-BLAST TYPE TUBE SURFACE CLEANING MACHINE

S.No.	PARTICULARS	SPECIFICATION / DESCRIPTION	BIDDER's OFFER WITH COMPLETE TECHNICAL DETAILS
1.0.0	APPLICATION	a. The proposed machine is intended for removing the rust & scales from the outside surfaces of seamless steel tubes used in High Pressure Boiler Manufacture. b. The shot blasting operation shall be carried out automatically by centrifugal blast wheel(s) mounted inside the blasting chamber. c. The Machine shall have an integrated facility for dust extraction and shots recycling. d. Surface finish required is equivalent to SA 2½ as per Swedish Standards e. The Basic Machine with all the Sub-Systems, Accessories & Attachments are to be designed for working in three shifts (8 hour shift) a day and all the 365 Days in a year.	
2.0.0	PRODUCTIVITY	The machine is expected to have a surface cleaning capacity of 6000 pass meters in total (for dia. 88.9 mm tubes, with in-feed of four tubes at a time), on an average - in a shift of eight hours.	

S.No.	PARTICULARS	SPECIFICATION / DESCRIPTION	BIDDER's OFFER WITH COMPLETE TECHNICAL DETAILS
3.0.0	**JOB / TUBE DETAILS**		
3.1.0	Tube Outer Diameter	Tube Sizes : 31.8 , 38.1, 44.5, 51.0, 54.0, 57.0, 60.3, 63.5, 76.1 and 88.9 mm	
3.2.0	Tube Material	Carbon Steel and Alloy Steel	
3.3.0	Tube Length	Minimum : 5000 mm Maximum : 14000 mm	
4.0.0	**MACHINE CONFIGURATION**		
4.1.0	**Basic Elements**	The machine has to be configured with the following sub-systems, integrated in total to give the desired results : a. Blasting Chamber b. Tube Storage Rack & Kick-Off System at INLET side c. Tube In-feed & Out-feed Conveyors d. Finished Tube Storage / Collection Rack at OUTLET side e. Steel Shots Feeding , Collection, Recycling System f. Dust extraction Unit with Chimney g. Centralised Control Unit with Data Logging System.	
4.2.0	**Blasting Chamber**		
4.2.1	Material	Mild Steel with reinforcement	
4.2.2	Chamber Wall Thickness	6 mm (minimum)	
4.2.3	Inside Lining	11 to 14% Austenitic Manganese Steel	
4.2.4	Lining Thickness	12 mm (minimum)	
4.2.5	Replaceable Liners (for the direct blast area)	Shall be of Austenitic Manganese Steel (Minimum 10 mm thickness)	

S.No.	PARTICULARS	SPECIFICATION / DESCRIPTION	BIDDER's OFFER WITH COMPLETE TECHNICAL DETAILS
4.2.6	Chamber Dimensions	Bidder to furnish, to meet the productivity level specified	
4.2.7	Service Doors for Inspection & Maintenance	To be provided with locking arrangement with interlock for safety trip	
4.3.0	**Inlet & Outlet Vestibules**		
4.3.1	Material	Mild Steel with reinforcement	
4.3.2	Vestibule Wall Thickness	6 mm (minimum)	
4.3.3	Vestibule Dimensions	Bidder to specify, subject to the approval of BHEL for accommodating the length and breadth	
4.3.4	End Seals	a. Rubber seals to prevent leakage of rebounding shots to the outside while permitting easy passage of work piece b. Bidder to describe arrangement. [The thickness and the quality of rubber proposed are subjected to approval of BHEL.]	
4.4.0	**Blast Wheel Unit**		
4.4.1	Number of Blast Wheel Unit	Bidder to Furnish details	
4.4.2	Type	Centrifugal	
4.4.3	Shot Velocity	Bidder to furnish details [preferred in the level of 80 m/sec.]	
4.4.4	No of Blades	Bidder to furnish details [with a minimum of 8 per blast wheel]	
4.4.5	Shot Through-Put in kg./min	Bidder to furnish details	
4.4.6	Motor Power	Bidder to furnish details	
4.4.7	Wheel Speed	Bidder to furnish details	
4.4.8	Blasting Surface Area	Bidder to furnish details	

S.No.	PARTICULARS	SPECIFICATION / DESCRIPTION	BIDDER's OFFER WITH COMPLETE TECHNICAL DETAILS
4.4.9	Constructional Features	a. Centre fed impeller [Bidder to furnish details] b. Angle adjustment with reference to surface finish of the control cage arrangement on outside the chamber c. Clock dial type control cage to control shot feed . Should be easy & should not involve removal / shifting of any other item to gain access d. Wear resistant, forward curved blades – easily replaceable Bidder to mention blade material] e. Heavy steel plate wheel housing completely lined with wear plates assembled to overlap one another and prevent wear and abrasive leakage f. Impeller blade life cycle shall be reasonably long – of the order of 4000 hrs. [Bidder to specify the life cycle of offered blades]	
4.5.0	**Abrasive Recovery & Recycling System**		
4.6.0	HOPPER & SCREW CONVEYOR		
4.6.1	Location	Beneath the Blasting Chamber	

S.No.	PARTICULARS	SPECIFICATION / DESCRIPTION	BIDDER's OFFER WITH COMPLETE TECHNICAL DETAILS
4.6.2	Basic Construction	a) Bottom screw conveyor to convey steel shots to the elevator boot section b) Screw conveyor's plate thickness should be NOT less than 10 mm c) The conveyor support within the chamber is with sealed dust proof bush bearing and approaching the conveyor from outside for maintenance for replacing bearing and replacing conveyor d) Chamber with a long rubber beaded door for inspection and opening e) Screw conveyor motor rating shall be suitable for the application mentioned under **Clause Sl. No. 1.0.0.** [Bidder has to specify the motor rating]	
4.7.0	BELT TYPE BUCKET ELEVATOR		
4.7.1	Basic Design Features	a. Belt material & thickness such that the conveyor fixed shall never exert load on the belt b. Provision to compensate for belt slackness outside the chamber c. Back-stop arrangement to prevent the belt from slipping down during sudden stoppage d. Bucket elevator to be housed in a ventilated dust-tight fabricated steel casing provided with inspection doors e. The boot section of the bucket elevator shall be at floor level	

S.No.	PARTICULARS	SPECIFICATION / DESCRIPTION	BIDDER's OFFER WITH COMPLETE TECHNICAL DETAILS
4.7.2	Design Parameters	Bidder to specify a. Bucket material and thickness b. Elevator motor rating	
4.8.0	ABRASIVE SEPARATOR UNIT		
4.8.1	Minimum Constituents	The offered Abrasive Separator shall have : a. Counter flow air wash separator b. Removable screen for trapping out coarse particles c. Refuse hopper for fines with non-return valves for discharge of fines d. Integral storage hopper for reclaimed abrasives [Bidder has to specify the hopper capacity] e. Abrasive level indicator	
4.9.0	ABRASIVE FEEDING UNIT		
4.9.1	Basic Functional Features	a. By means of feed pipes connecting storage hopper and blast wheel unit b. Solenoid operated, pneumatic cylinder actuated control valve for feeding shots to the blast-wheel unit c. Manual shut-off valve for cutting-off shot feed to the blast-wheel unit during maintenance	

S.No.	PARTICULARS	SPECIFICATION / DESCRIPTION	BIDDER's OFFER WITH COMPLETE TECHNICAL DETAILS
4.10.0	**DUST COLLECTOR**		
4.10.1	Basic Design Features	a. Type - Continuous automatic b. Filter media – by Cartridge filters c. Cleaning of Filters shall be by reverse air flow d. Cleaning cycles shall be Timer controlled / programmable e. Differential Pressure Sensing to initiate cleaning cycle f. Dust hopper with manual slide gate for dust removal g. Should include supporting structures for floor mounting h. Particulate emission at outlet shall be not more than 30mg/Nm^3 for particle size greater than or equal to 5 micron i. Suction Duct work from shot blasting chamber to the dust collector - For a separation distance of maximum six (6) mtrs	
4.10.2	Basic Design Parameters	Bidder to specify a. Dust Collector Model & Make b. Capacity c. No of filter cartridges d. Filter area e. Capacity of Exhaust Fan suitable to purge the entire system f. Exhaust Fan motor rating & speed g. Ducting details from the Dust Collector to Exhaust Fan	

S.No.	PARTICULARS	SPECIFICATION / DESCRIPTION	BIDDER's OFFER WITH COMPLETE TECHNICAL DETAILS
4.11.0	**TUBE FEEDING CONVEYOR UNIT**		
4.11.1	Basic Configuration	1. The tube should rotate on it's axis as it moves through the blast chamber for exposing the surface easily to the blast media. 2. The tube feeding rollers should be supported outside the blasting chamber (with suitably projecting out) by the sealed bearing such that stray shots will not affect or clog the rollers. 3. Tube Feeding Rollers should be supported on either side of the chamber. 4. Rollers within the blast cabinet shall be of 14% austenitic manganese steel 5. Number of rollers shall suit the length of tubes or pipes handled 6. Rollers are to be positioned at a span of 300 mm and the roller outer diameter shall not be less than 100 mm 7. Roller plate thickness shall not be less than 6 mm 8. Cabin Roller Drive belt shall be provided with tension adjustener.	
4.11.2	Conveyor Type	Skew – Roll Drive type Conveyor	
4.11.3	Line Speed (Tube Feed Rate)	Variable up to 4 mtrs. / min. [approx.] - to match the expected productivity level]	
4.11.4	Line Drive	Infinitely Variable Speed	

S.No.	PARTICULARS	SPECIFICATION / DESCRIPTION	BIDDER's OFFER WITH COMPLETE TECHNICAL DETAILS
4.11.5	Design Parameters	1. Bidder to furnish a schematic sketch of the Roller and Drive Arrangements 2. Bidder to specify the Speed and Rating of Electric Motors and details of the Drives selected.	
4.12.0	**TUBE FEED-IN & FEED-OUT RACKS**		
4.12.1	Tube Handling System for the In-Feed Side Rack	1. Tubes will be loaded to the storage rack in the form of bundles. 2. Each tube bundle size will be equivalent to that formed by 60 tubes of OD 63.5 mm. 3. At a time, maximum two bundles may be loaded in the storage rack. 4. Storage Rack shall have Bundle Stops to hold the tubes in bundle form. 5. Release of Bundle Stop shall spread the bundled tubes (single layer of tubes) on the stand, without causing damage to the tubes and the storage system. 6. Bundle stops to be operated by a motor and gear mechanism. 7. The tube kick-off facility integrated with the system shall be suitable for feeding multiple tubes (e.g.: four tubes in case 88.9 mm diameter tubes) in a single feed.	

S.No.	PARTICULARS	SPECIFICATION / DESCRIPTION	BIDDER's OFFER WITH COMPLETE TECHNICAL DETAILS
4.12.2	Tube Handling System for the Out-Feed Side	1. The shot blasted tubes shall be smoothly rolled onto a storage dump . 2. The storage dump shall have capacity to hold 120 tubes of OD 63.5 mm 3. The storage dump shall be so designed that the loose tubes (60 Nos. of ϕ 63.5 mm tubes) can be bundled to one lot	
4.12.3	Constructional Details	1. In-Feed side rack shall be made of stands & supports, including bundle stops with proper design so that no damage occurs with the style of impact loading and rough handling of tubes. 2. The transfer of tubes from the Tube Storage Rack to the Machine in-feed conveyor shall be by means of suitable roller feeding arrangement (spanned at maximum 500 mm intervals) and synchronized with work conveyor speed 3. The minimum thickness of sections and plates used for the structure construction should be NOT less than 7.5 mm and that for the rollers shall be minimum 10 mm. 4. A schematic diagram shall be furnished with the offer for the In-Feed and Out-Feed Tube Feeding System. 5. Bidder has to specify the power rating and speed of electric motors and drives used in the tube handling system.	

S.No.	PARTICULARS	SPECIFICATION / DESCRIPTION	BIDDER's OFFER WITH COMPLETE TECHNICAL DETAILS
4.13.0	**SYSTEM INTERLOCKS**	1. All necessary interlocks to ensure safety of equipment, & personnel operating the equipment 2. Service doors to be interlocked with blast wheel unit to shut it off if service door is opened, during the blasting operation. 3. Service doors to be interlocked with blast wheel unit such that the blast wheel unit cannot be started unless service door is fully shut.	
5.0.0	**MACHINE CONSTRUCTION**		
5.1.0	Ambient Atmospheric Conditions	a. The ROTO-BLAST Machine with all Sub-Systems shall be suitable for operation in an ambient temperature of 25 to 50°C and with a Relative Humidity of 90% (both higher values do not occur simultaneously). b. The ENTIRE EQUIPMENT shall be TROPICALISED in Design and CONSTRUCTION.	
5.2.0	Machine Operation	a. The entire cycle of tube shot blasting operation shall be controlled automatically through suitable control system . b. The control station shall be kept at a convenient location for setting the cycles and for operation.	

S.No.	PARTICULARS	SPECIFICATION / DESCRIPTION	BIDDER's OFFER WITH COMPLETE TECHNICAL DETAILS
5.3.0	Machine Maintenance	The machine configuration and element arrangement should have easy accessibility, higher rigidity, self-aligning /fitting, locking & piloting arrangement of machine components and modules, to ensure a 'maintenance free' concept.	
5.4.0	Electrical Power Input	a. The electrical power input shall be 415 ± 10 % V, 50 ± 2 % Hz, 3 Phase AC supply through a 3 Wire System (4th Wire for Protective Earthing). No neutral conductor. b. BHEL provide this supply at one point only and the supplier has to take care of all other electrical distribution network required for the ROTO-BLAST Station.	
5.5.0	Electric Motors	All Electric Motors shall be of any of the following makes : SIEMENS / ABB / KEC / BBL / MAKEs conforming to IEC Standards	
5.6.0	Control Voltage	The Control Circuit Voltage shall not exceed 110 V .	
5.7.0	Electrical Wiring	a. All electrical motors, limit switches etc, on the machine shall be wired using PVC sheathed cable running in conduits and converging to common terminal block b. External wiring from / to control panel, control desk, external motors etc shall be by means of screened multi-core cables	

S.No.	PARTICULARS	SPECIFICATION / DESCRIPTION	BIDDER's OFFER WITH COMPLETE TECHNICAL DETAILS
5.8.0	Power Requirement	Bidder has to indicate the total tentative power requirement (including that for all the accessories and attachments) in kVA with the offer.	
5.9.0	Pneumatic Circuits	a. Pneumatics forming part of the machine and associated equipment shall be connected by nylon reinforced synthetic rubber and / or steel tubes. b. Pneumatic Circuit to originate from a common point on the Machine and provided with a suitable Filter / Regulator / Lubricator Unit and in addition a hand wheel valve. c. Bidder to give details on the Air Compressor, Refrigerant Air Dryer and Elements forming part of the pneumatic circuitry. d. BHEL will terminate the shop compressed air supply at a single point with a hand wheel valve . The compressed air will be at a pressure of 60 PSI to 70 PSI . All pneumatic systems on the machine, dust collector etc shall be designed to operate efficiently at this air pressure	
5.10.0	Noise Level	The noise generated out of the machine and sub-systems, due its running, shall not exceed the level of 85 dB(A) at any cause.	

S.No.	PARTICULARS	SPECIFICATION / DESCRIPTION	BIDDER's OFFER WITH COMPLETE TECHNICAL DETAILS
5.11.0	Safety Guards	The Roto-Blasting Machine to have Safety Guards / Sliding Doors for protection against the splash/stray flying shots for the Machine Operators. Safety Doors to have visible glasses for clear vision also. Bidder to submit details on this arrangement .	
5.12.0	Painting	a. The heavier machine parts are to be heat-treated after fabrication and shot blasted for surface preparation prior to painting. b. One coat of Primer with 25 μ of DFT (Dry Film Thickness) and 48 hours of compulsory curing after painting. c. Two coats of Polyurethane Paint (Colour – Apple Green – RAL 6011) each with 25 μ of DFT and intermittent curing of minimum 16 hrs.	
6.0.0	**MACHINE SPARES**		
6.1.0	OPERATING SPARE PARTS	a. The Supplier shall LIST DOWN with the OFFER, the complete set of replaceable parts / items / components coming in the Machine and other Sub-Systems / Accessories / Attachments and shall QUOTE the Unit Price for each item. b. BHEL will procure almost all parts listed under the above category with the Roto Blast Machine.	

S.No.	PARTICULARS	SPECIFICATION / DESCRIPTION	BIDDER's OFFER WITH COMPLETE TECHNICAL DETAILS
6.2.0	COMMISSIONING SPARES	Bidder has to COMPULSORILY quote for the spares of the following items with the OFFER : 1. In-Feed Roller & Out-Feed Rollers and Cabin Rollers - 10 Nos. each. 2. Screw Conveyor - 2 Nos. each 3. Blasting Blades – 4 Sets 4. Conveyor Belts – 2 Sets 5. Vertical Guiding Rollers- 10 Nos. 6. Buckets – 10 Nos.	
7.0.0	**MACHINE INSPECTION & ACCEPTANCE**		
7.1.0	Machine Performance Testing and Acceptance	The Roto Blasting Machine & Accessories shall be tested for its performance prove-out as per BHEL Specifications, at the Supplier's Works prior to despatch.	
8.0.0	**ERECTION & COMMISSIONING**		
8.1.0	Mechanical Erection	Erection of the Equipment shall be done by the SUPPLIER's SERVICE ENGINEER & Erection Crew	
8.2.0	Commissioning	Commissioning of the Equipment and Smooth Functioning of all the Sub-Systems (at BHEL Works) shall be ensured and will be the SOLE RESPONSIBILITY of the Supplier.	

S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR's OFFER
8.3.0	Performance Prove-Out	After the successful commissioning of the machine and sub-systems, the COMMISSIONING ENGINEER of the Supplier have to establish the Performance Prove–Out for the Machine's Capability and the Production Rate from the Machine, as given under the Specification **Clause Sl.No. 2.0.0**	
9.0.0	**MACHINE DOCUMENTATION**		
9.1.0	O & M Manuals	a. Three Copies of the Operation & Maintenance Manual to be given in Hard Bound Paper Copies with one copy in CD form (SOFT COPY) b. One Hard Copy of O & M Manual shall be submitted at the time of INSPECTION of the Blasting Machine by BHEL Officials, at the Supplier's Works . c. The following documents and details [given under the **Clause Sl. No. 9.2.0**] shall form part of the Operation & Maintenance Manual	
9.2.0	Documents and Technical Details	a. GA Drawing of the Roto Blasting Station. b. GA Drawing of Individual Mechanisms. c. Sub-Assembly Drawings (without dimensions) for sub-systems for maintenance purpose.. d. Electrical Wiring Drawings–Power & Control Circuits e. Complete Printed Circuit Board Schematics indicating check points (Test Points) for Electronic Controls f. Pneumatic Circuit Diagram (if any) g. Specifications/Ratings of All Bought-Out-Items h. Warranty / Guarantee Card for all Bought-Out-Items i. Trouble Shooting Chart for Main and all Sub-Systems j. Steel Shots – Quantity, Mix, selection & specification k. Total weight of the Machine & Sub-Systems	

S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR's OFFER
10.0.0	**TRAINING**	a. The Supplier shall train BHEL Engineers in the Operation, Trouble Shooting and Maintenance of the ROTO-BLAST Machine at the Supplier's Works for a minimum period of 10 Working Days, after the INSPECTION of the Equipment. b. The Supplier's Service/Application Engineer shall train of BHEL Engineers in the Operation, Trouble Shooting and Maintenance of the ROTO-BLAST Machine at BHEL Works for a minimum period of 15 Working Days, after the SUCCESSFUL COMMISSIONING of the Equipment, at BHEL Works.	
11.0.0	**TECHNCIAL OFFER**	The Technical Offer shall contain the following : a. Complete Scope of Supply, including Main Equipment, Job Handling Unit, All Accessories and Attachments, etc. b. List of Operating Spares, Commissioning Spares, Foundation / Anchoring Materials c. Erection, Commissioning and Performance Prove-Out Details. d. Complete description of all systems & sub-systems forming part of the Roto-Blast Station e. A schematic diagram showing the layout of the machine & associated systems with salient dimensions f. The operating sequence of the machine with broad outline of various operations involved	

S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR's OFFER
12.0.0	**PERFORMANCE GUARANTEE**	The Performance of the Total Equipment and/or the Components / Sub-Assemblies / Bought-Out-Items shall be guaranteed for a minimum period of twenty- four [24] months from the date of performance acceptance at BHEL Works.	

NOTE : PLEASE REFER TO *PART A* FOR QUALIFYING CRITERIA