



An ISO 9001
Company

Bharat Heavy Electricals Limited

(High Pressure Boiler Plant)

Tiruchirappalli – 620014, TAMIL NADU, INDIA

CAPITAL EQUIPMENT/ MATERIALS MANAGEMENT

ENQUIRY

NOTICE INVITING TENDER

Phone: +91 431 257 70 49

Fax : +91 431 252 07 19

Email : csguna@bheltry.co.in

Web : www.bhel.com

TWO PART BID

Tender to be submitted in two parts.

**Enquiry
Number:**

2620900186

**Enquiry
Date:**

15.09.2009

**Due date for submission
of quotation:**

26.10.2009

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	Tube Rotoblast Station with Handling facility as per the technical specification, general guidelines instructions & commercial conditions applicable (to be downloaded from web site www.bhel.com or http://tenders.gov.in)	1 No.

Important points to be taken care during submission of offer

1. Delivery required 9 months from the date of purchase order.
2. Grace period of 3 months beyond the above delivery period will be considered.
3. Checklist to be filled and enclosed along with the offer failing which, the offer will not be considered for evaluation.

BHEL's General guidelines / instructions (refer MM/CE/GT/001) 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 Enquiry reference "2620900186".

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 / MM / Capital Equipment

PART A
TUBE ROTOBLAST STATION WITH HANDLING FACILITY

SECTION – I : QUALIFYING CRITERIA

The BIDDER has to compulsorily meet the following requirements to get qualified for considering the technical offer :

S. No.	REQUIREMENTS	VENDOR'S RESPONSE
1	<p>Only those vendors (OEMs), who have supplied and commissioned at least ONE CUSTOM BUILT AIRLESS SHOT BLASTING MACHINE IN THE PAST TEN YEARS (on the date of opening of Tender) and such machine is presently working satisfactorily for more than one year after commissioning (on the date of opening of Tender) should quote.</p> <p>However, if such machine had already been supplied to BHEL, then that machine should be presently working satisfactorily for more than six months after its commissioning and acceptance (on the date of opening of Tender).</p>	
<p>The vendor should submit following information where similar machine has been supplied for qualification of their offer.</p>		
1.1	Name and postal address of the customer or company where similar machine is installed.	
1.2	Name and designation of the contact person of the customer.	
1.3	Phone, FAX no and email address of the contact person of the customer.	
1.4	Month and Year of commissioning of the machine.	
1.5	Application for which the machine is supplied	
1.6	One Performance certificate from the customer regarding satisfactory performance of equipment supplied to them. For obtaining the performance certificate from the customer, a suggestive format is provided in SECTION - IV .	
1.7	BHEL reserves the right to verify the information provided by vendor. In case the information provided by vendor is found to be false/ incorrect, the offer shall be rejected.	
2.0	<p>DELIVERY - The bidder shall quote the best possible delivery. However the delivery shall not exceed 9 months with an additional grace period of 3 months. The additional grace period will attract a penalty which is explained in the commercial terms of the enquiry. The delivery period shall be reckoned from date of purchase order to despatch from the vendor works.</p>	

SECTION – I I

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

S. No.	REQUIREMENTS	VENDOR's RESPONSE
3.0	The BIDDER/VENDOR to furnish Reference List of Customers, with full address, details of contact person, where such shot blasting equipments have been supplied in the past.	
4.0	Specify details of such shot blasting equipments supplied to other units of BHEL, if any. (Year of commissioning, application of shot blasting, No. of blast wheels, etc.)	
5.0	Details on SERVICE-AFTER-SALES Set-Up in India including the Address of Agents / Service Centers in South India.	
6.0	Any Additional Data to supplement the manufacturing capability of the BIDDER for the subject equipment.	

SECTION – III

The BIDDER to note:

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

SECTION – IV

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

PERFORMANCE CERTIFICATE

1. Supplier of the machine		
2. Make & Model of the M/C		
3. Month & Year of Commissioning		
4. Application for which M/C is used		
5	a) No. of Blast wheels b) Blast Chamber Size (L X W X H)	
6. Performance of the Machine (Strike off whichever is not applicable)		Satisfactory Good Average Not Satisfactory
7. Any Other remarks		
Date:		Signature & Seal of the Authority Issuing the Performance Certificate

PART B

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

The tube rotoblast station is intended for surface cleaning of the seamless tubes of various diameters, (OD)ranging from 31.8 to 76.1.

The rotoblast station shall be suitable for blasting multiple tubes in one pass. With Tube dia 76.1, it shall be possible to blast 4 tubes in one pass. The number of tube shall be more with reduced tube diameters.

The equipment design should ensure near nil shot leakage from any part of the shot blasting system / sub-system.

SSA

IKK

SKN

HRN

SPV

S.No.	PARTICULARS	SPECIFICATION / DESCRIPTION	BIDDER'S OFFER WITH COMPLETE TECHNICAL DETAILS
1.0.0	APPLICATION	<p>a. The proposed machine is intended for removing the rust & scales from the outside surfaces of seamless steel tubes used in High Pressure Boiler components Manufacture.</p> <p>b. The shot blasting operation shall be carried out automatically by blowing steel shots (S-230 , S330 , S280) through centrifugal blast wheel(s) mounted inside the blasting chamber.</p> <p>c. The Machine shall have an integrated facility for tube in feed and out feed, Tubes rotation, shots loading , dust extraction and shots recovery and shots recycling.</p> <p>d. Surface finish required is equivalent to SA 2½ as per Swedish Standard SIS 0559 00-1967</p> <p>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.</p>	
2.0.0	PRODUCTIVITY	The machine is expected to have a surface cleaning capacity of 6000 pass meters in total (for dia. 76.1 mm tubes, with in-feed of four tubes at a time), on an average - in a shift of eight hours.	
3.0.0	JOB / TUBE DETAILS		
3.1.0	Tube Outer Diameter Range	Tube Sizes : 31.8 to 76.1 mm	
3.2.0	Tube max. thickness	12.5 mm	
3.3.0	Tube Material	Carbon Steel and Alloy Steel	
3.4.0	Tube Length	Minimum : 5000 mm Maximum : 14000 mm	

SSA

IKK

SKN

HRN

SPV

S.No.	PARTICULARS	SPECIFICATION / DESCRIPTION	BIDDER'S OFFER WITH COMPLETE TECHNICAL DETAILS
4.0.0	MACHINE CONFIGURATION		
4.1.0	Basic Elements	<p>The machine has to be configured with the following sub-systems, integrated in total to give the desired results :</p> <ul style="list-style-type: none"> a. Tube Storage Rack & Kick-Off System at in-feed side b. Tube In-feed Conveyor system. c. Inlet vestibule chamber d. Blasting chamber with blasting wheels. e. Outlet vestibule chamber. f. Tube out-feed conveyor system. g. Finished tube collection rack with kick off facility at out feed side. h. Iron shots loading ,feeding, recovery and recycling system. i. Dust extraction system with integrated chimney. j. Centralized control unit for controlling the above systems 	
4.2.0	Blasting Chamber		
4.2.1	Material	Mild Steel with structural reinforcement	
4.2.2	Chamber Wall Thickness	6 mm (minimum)	
4.2.3	Inside back plate Lining	11 to 14% Austenitic Manganese Steel	
4.2.4	Lining Thickness	8 mm (minimum)	
4.2.5	Replaceable Liners (for the entire chamber)	Shall be of Austenitic Manganese Steel (Minimum 10 mm thickness)	
4.2.6	Chamber Dimensions	Bidder to furnish, to meet the productivity level specified	

SSA

IKK

SKN

HRN

SPV

S.No.	PARTICULARS	SPECIFICATION / DESCRIPTION	BIDDER'S OFFER WITH COMPLETE TECHNICAL DETAILS
4.2.7	Service Doors for Inspection & Maintenance	To be provided with suitable safety interlock to stop machine when doors are open.	
4.2.8	Suitable air vents and exhaust boxes shall be provided.	Vendor to confirm & provide details	
4.3.0	Inlet & Outlet Vestibules		
4.3.1	Material	Mild Steel with Structural reinforcement	
4.3.2	Vestibule Wall Thickness	6 mm (minimum)	
4.3.3	Chamber lining	High wear resistant 3mm thick vulcanised rubber with 16 Gauge spring steel inserts.	
4.3.4	Vestibule Dimensions	Bidder to specify, subject to the approval of BHEL for accommodating the length and breadth	
4.3.5	End Seals	a. High wear resistant Polyurethane flexible curtains of 6 mm thick with 40-45 shore hardness to prevent leakage of shots past the inlet and exit tube passage. Details of arrangement to be furnished with the offer.	
4.4.0	Blast Wheel Unit		
4.4.1	Number of Blast Wheel Unit	Min. Two. Bidder to specify	
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	

SSA

IKK

SKN

HRN

SPV

S.No.	PARTICULARS	SPECIFICATION / DESCRIPTION	BIDDER'S OFFER WITH COMPLETE TECHNICAL DETAILS
4.4.8	Blasting Surface Area	Bidder to furnish details	
4.4.9	Constructional Features	<ul style="list-style-type: none"> 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 & easily replaceable blades. 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. Bidder to specify the life of offered blades 	
4.5.0	Abrasive Recovery & Recycling System		
4.6.0	HOPPER & SCREW CONVEYOR		
4.6.1	Construction	<ul style="list-style-type: none"> a.) 6mm thick gravity fed hopper supported on base frame beneath blast chamber b.) Helicoids' Conveyor with guard of suitable capacity. c.) To convey spent steel shots and dusts from various chambers to the elevator boot section. d.) Helicoid plate thickness should be 6 mm (min) with hard facing on the periphery. 	

SSA

IKK

SKN

HRN

SPV

S.No.	PARTICULARS	SPECIFICATION / DESCRIPTION	BIDDER'S OFFER WITH COMPLETE TECHNICAL DETAILS
4.6.1 (Cont)		e.) The conveyor support within the chamber shall be with sealed dust proof bearing system and easy approach from outside for easy maintenance . f.) Chamber with a long rubber beaded door for inspection and opening	
4.6.2	Conveyor motor rating	Supplier to specify	
4.7.0	BELT TYPE BUCKET ELEVATOR		
4.7.1	Features	a. To convey spent abrasives from lower conveyor to the abrasive separator system. 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	
4.7.2	Bucket material	Cast Iron – Vendor to confirm	
4.7.3	Belt material : cotton fabric 6 ply , 15mm thick	Vendor to confirm	
4.7.4	Elevator motor rating	Vendor to specify.	
4.7.5	Design Parameters	Bidder to specify a. Bucket material and thickness b. Elevator motor rating	

SSA

IKK

SKN

HRN

SPV

S.No.	PARTICULARS	SPECIFICATION / DESCRIPTION	BIDDER'S OFFER WITH COMPLETE TECHNICAL DETAILS
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 coarse particles	
4.8.1 (Cont.)		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	
4.8.2	Abrasive loading	Shall be designed at floor level for easy manual loading	
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	
4.10.0	DUST COLLECTOR		
4.10.1	Basic Design Features	a. Type - Continuous automatic Pulse jet b. Filter media – by Cartridge filters c. Cleaning of Filters shall be by reverse air flow d. Cleaning cycles shall be Timer controlled /	

SSA

IKK

SKN

HRN

SPV

S.No.	PARTICULARS	SPECIFICATION / DESCRIPTION	BIDDER'S OFFER WITH COMPLETE TECHNICAL DETAILS
4.10.1 (contd)		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. Chamber shall be of water proof to avoid mixing with dust and for paste during rainy seasons. i. Particulate emission at outlet shall be not more than 100mg/Nm ³ for particle size greater than or equal to 5 micron j. 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	

SSA

IKK

SKN

HRN

SPV

S.No.	PARTICULARS	SPECIFICATION / DESCRIPTION	BIDDER'S OFFER WITH COMPLETE TECHNICAL DETAILS
4.10.3	Chimney	<p>Height of Chimney shall be 25 Mtrs. Traverse ports shall be provided at two elevations. One at 5 mtrs. Elevation and the other at 2/3 rd the height of chimney, from floor level. Suitable cowl at the top to be provided.</p> <p>At each elevation there shall be four ports provided 90 degrees apart. Each port hole shall be dia. 100 mm. At each port hole a standard pipe, 100mm long shall be welded. The other end of the pipe shall be provided with a bolted dummy flange.</p>	
4.10.3 (Cont.)	Chimney	<p>Platform shall be provided around the chimney, 1 mtr. below each traverse plane, with hand rails, toe guard and approach ladder A weather protection cowl should be provided at the top. The chimney drawings indicating the traverse ports shall be furnished to BHEL upon receipt of purchase order</p>	

SSA

IKK

SKN

HRN

SPV

S.No.	PARTICULARS	SPECIFICATION / DESCRIPTION	BIDDER'S OFFER WITH COMPLETE TECHNICAL DETAILS
4.11.0	TUBE FEEDING CONVEYOR UNIT		
4.11.1	Basic Configuration	<ol style="list-style-type: none"> 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 11% - 14% austenitic manganese steel 5. Number of rollers shall suit the length of tubes 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. Roller Drive belt shall be provided with tension adjuster, for the entire length of roller conveyor so as to maintain roller & tube contact always, to maintain the feed rate. 	
4.11.2	Conveyor Type	Skew – Roll Drive type Conveyor	
4.11.3	Line Speed (Tube Feed Rate)	Steplessly Variable up to 5 mtrs. / min. [approx.] - to match the expected productivity level	

SSA

IKK

SKN

HRN

SPV

S.No.	PARTICULARS	SPECIFICATION / DESCRIPTION	BIDDER'S OFFER WITH COMPLETE TECHNICAL DETAILS
4.11.4	Line Drive	Infinitely Variable Speed	
4.11.5	Design Parameters	<ol style="list-style-type: none"> 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. 3. Movement of loaded tubes in and out of the chambers should be uniform and not to roll over on each other. 	
4.12.0	TUBE FEED-IN & FEED-OUT RACKS (Pl. Refer to suggestive sketchn in Annexure – I)		
4.12.1	Tube Handling System for the In-Feed Side Rack	<ol style="list-style-type: none"> 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 infeed stand shall be lined with Teflon / nylon so that noise generated when tubes roll over is minimum 8. The tube kick-off facility integrated with the system shall be suitable for feeding multiple tubes (e.g.: four tubes in case 76.1 mm diameter tubes) in a single feed. 	

SSA

IKK

SKN

HRN

SPV

S.No.	PARTICULARS	SPECIFICATION / DESCRIPTION	BIDDER'S OFFER WITH COMPLETE TECHNICAL DETAILS
4.12.2	Tube Handling System for the Out-Feed Side	<ol style="list-style-type: none"> 1. The shot blasted tubes shall be smoothly kicked-out onto a outfeed stand. 2. The outfeed stand shall have a width to hold 120 tubes of dia. 63.5. 3. The Outfeed stand shall be lined with Teflon / nylon so that noise generated when tubes roll over is minimum 4. The outfeed stand shall have a stopper arrangement to hold the tubes as they are spread out on the stand 5. The tubes from the outfeed stand shall roll over smoothly into the storage stand, when the stopper is released. 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 	

SSA

IKK

SKN

HRN

SPV

S.No.	PARTICULARS	SPECIFICATION / DESCRIPTION	BIDDER'S OFFER WITH COMPLETE TECHNICAL DETAILS
4.12.3	Constructional Details	<ol style="list-style-type: none"> 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 & from the machine out feed conveyor to the outfeed stand shall be by means of suitable kick-in & kick-out arrangement (spanned at maximum 500 mm intervals). 3. The minimum thickness of sections and plates used for the structure construction should be NOT less than 7.5 mm. 4. The infeed stand, outfeed stand, storage dump should be lined with heat resistant Teflon/nylon to reduce noise due to tube striking on the members of these stands. 	
4.12.3 (Cont)		<ol style="list-style-type: none"> 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. 	

SSA

IKK

SKN

HRN

SPV

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 85%. 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 . Manual operation of sub-systems, with safety interlocks, should be provided for trouble shooting. b. The control station shall be kept at a convenient location for setting the cycles and for operation.	
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.	

SSA

IKK

SKN

HRN

SPV

S.No.	PARTICULARS	SPECIFICATION / DESCRIPTION	BIDDER'S OFFER WITH COMPLETE TECHNICAL DETAILS
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 (4 th Wire for Protective Earthing). No neutral conductor. b. BHEL will provide 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	Gear boxes	Make shall be from Elecon , shanthi gears, Crompton greaves, bonfiglioli etc., or reputed make acceptable to BHEL.	
5.6.0	Pneumatic elements	Make shall be from among Festo, Norgren, Janatics or any other reputed make acceptable to BHEL.	
5.7.0	Electric Motors	All Electric Motors shall be of any of the following makes : SIEMENS / ABB / KEC / BBL / MAKEs conforming to IEC Standards	
5.8.0	Electrical drives system	VFD shall be from ABB, L&T, Danfoss, Seimens, Eurotherm (SSD) or reputed make acceptable to BHEL..	
5.9.0	Control system type	PLC of Messung, Mitshubishi, seimens, ABB, AB ,L&T or reputed make acceptable to BHEL..	

SSA

IKK

SKN

HRN

SPV

S.No.	PARTICULARS	SPECIFICATION / DESCRIPTION	BIDDER'S OFFER WITH COMPLETE TECHNICAL DETAILS
5.10.0	Fault diagnosis system	To display with alarm and detailed cause and remedy for the fault related to mechanical and electrical ,pneumatic systems	
5.11.0	Control Voltage	The Control Circuit Voltage shall be 24 V DC	
5.12.0	Electrical Wiring	a. All electrical motors, limit switches etc, on the machine shall be wired using PVC sheathed copper 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	
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.	

SSA

IKK

SKN

HRN

SPV

S.No.	PARTICULARS	SPECIFICATION / DESCRIPTION	BIDDER'S OFFER WITH COMPLETE TECHNICAL DETAILS
5.9.0 (Cont)		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 4.5 to 5 bar . 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, during its running, shall not exceed the level of 85 dB(A).	
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. 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 c. Two coats of Paint (Colour – Reseda Green – RAL 6011)	
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.	

SSA

IKK

SKN

HRN

SPV

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. Blasting Blades – 4 Sets 2. Buckets – 8 Nos.	
6.3.0	The vendor shall supply the first fill of shots	Vendor to confirm	
6.4.0	Vendor shall supply the first fill of oil for gear boxes.	Vendor to confirm	
7.0.0	MACHINE INSPECTION & ACCEPTANCE		
7.1.0	Machine Inspection and Acceptance at Supplier's works.	In case the Shot Blasting Station cannot be inspected in the assembled condition at supplier's works, the supplier has to offer the complete quantum of materials, semi-finished/finished machine components, sub-assemblies, bought-out items, spares, consumables, etc. required to build the shot blasting station in total, along with one set of O&M documentation for inspection, at the supplier's works, by BHEL Engineers prior to despatch from the supplier's works.	
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.	

SSA

IKK

SKN

HRN

SPV

S.No.	PARTICULARS	SPECIFICATION / DESCRIPTION	BIDDER'S OFFER WITH COMPLETE TECHNICAL DETAILS
8.3.0	Performance Prove-Out at BHEL	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 SI.No. 2.0.0	
9.0.0	MACHINE DOCUMENTATION		
9.1.0	O & M Manuals	<ul style="list-style-type: none"> a. Three Copies of the Operation & Maintenance Manual with preventive maintenance checklist 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 SI. No. 9.2.0] shall form part of the Operation & Maintenance Manual 	
9.2.0	Documents and Technical Details	<ul style="list-style-type: none"> 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 	

SSA

IKK

SKN

HRN

SPV

S.No.	PARTICULARS	SPECIFICATION / DESCRIPTION	BIDDER'S OFFER WITH COMPLETE TECHNICAL DETAILS
9.2.0 (cont)		<ul style="list-style-type: none"> h. Warranty / Guarantee Card for all Bought-Out-Items i. Technical specification of the total equipment. j. safety instructions k. Test certificates for all bought out items as applicable. l. Trouble Shooting Chart for Main and all Sub-Systems m. Steel Shots – Quantity, Mix, selection & specification n. Name and address of suppliers for rollers, liner plates, rubber items. o. Total weight of the Machine & Sub-Systems p. PLC software CD , q. PLC programme both soft and hard copy., r. Programming manual in PDF format 	
10.0.0	TRAINING	<ul style="list-style-type: none"> a. The Supplier shall train three BHEL Engineers in the Operation, Trouble Shooting and Maintenance of the ROTO-BLAST Machine at the Supplier's Works for a minimum period of 5 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 10 Working Days, after the SUCCESSFUL COMMISSIONING of the Equipment, at BHEL Works. 	

SSA

IKK

SKN

HRN

SPV

S.No.	PARTICULARS	SPECIFICATION / DESCRIPTION	BIDDER'S OFFER WITH COMPLETE TECHNICAL DETAILS
11.0.0	TECHNCIAL OFFER	<p>The Technical Offer shall contain the following :</p> <ul style="list-style-type: none"> 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 	
12.0.0	PERFORMANCE GUARANTEE	<p>The Performance of the Total Equipment and/or the Components / Sub-Assemblies / Bought-Out-Items shall be guaranteed for a minimum period of 12 months from the date of performance acceptance at BHEL Works OR 18 Months from despatch.</p>	

SSA

IKK

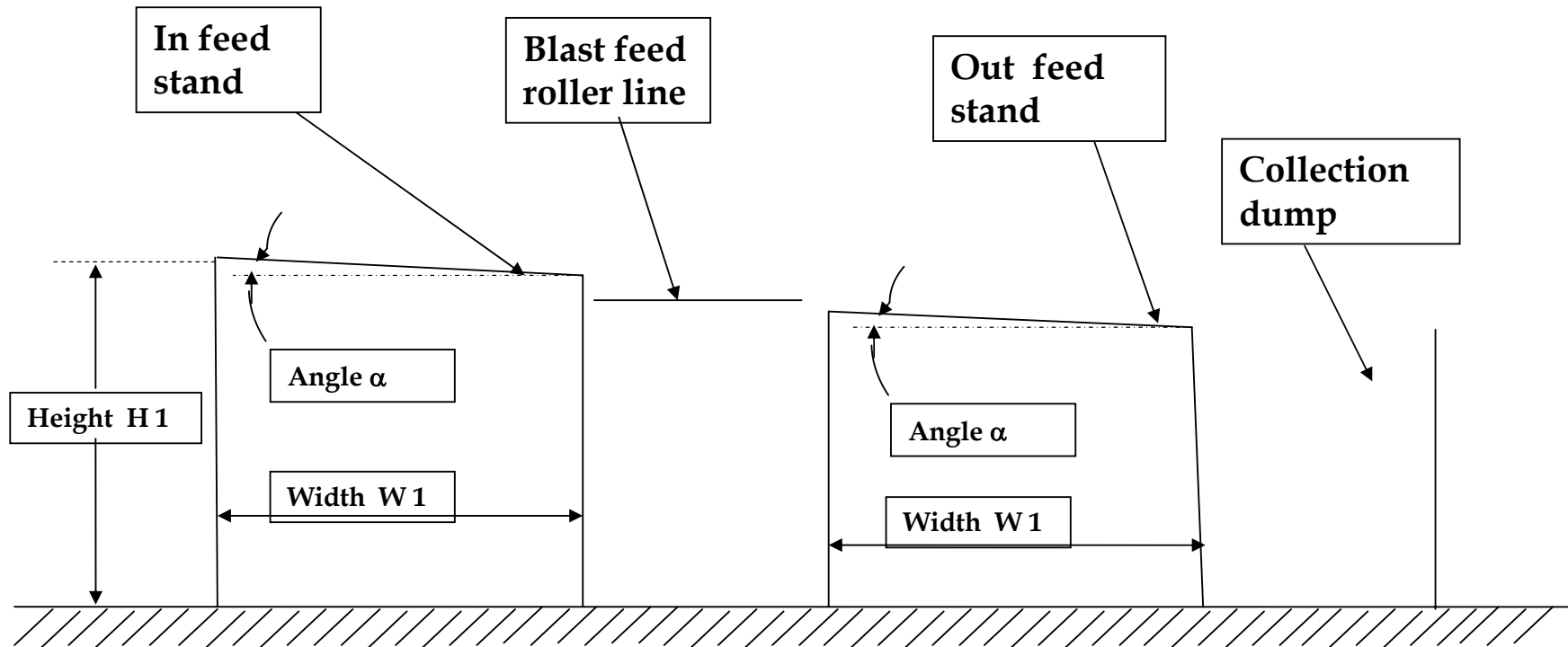
SKN

HRN

SPV

ANNEXURE - I

TUBE HANDLING STAND ARRANGEMENT - SUGGESTIVE SKETCH



I) The **Height H 1** shall be around 1500 mm

II) The **Angle α** shall be such that when tube bundles are opened out the tubes shall not roll one over the other. Suggested angle is around 2 to 3 degrees. Vendor to decide suitably.

III) **Width W 1** shall be sufficient to accommodate two bundles of dia. 63.5 tubes. Each bundle will consist of about 60 tubes.

SSA

IKK

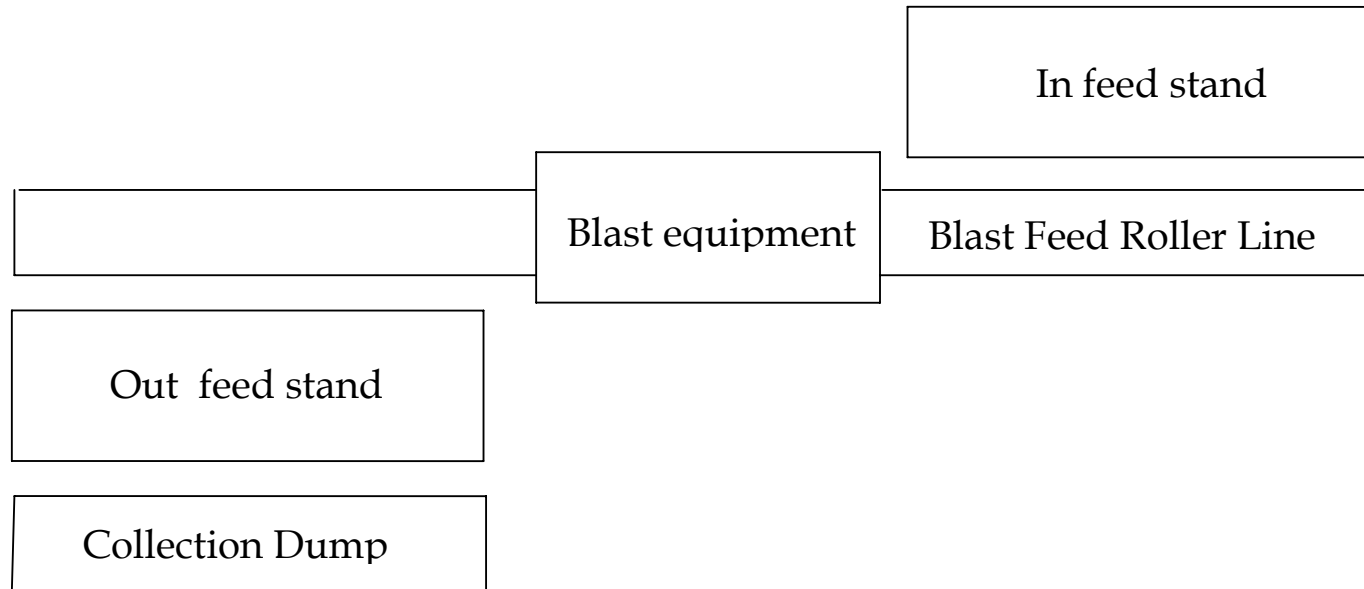
SKN

HRN

SPV

ANNEXURE - I

TUBE HANDLING STAND ARRANGEMENT - SUGGESTIVE SKETCH



SSA

IKK

SKN

HRN

SPV