



An ISO 9001  
Company

**Bharat Heavy Electricals Limited**  
(High Pressure Boiler Plant)  
Tiruchirappalli – 620014, TAMIL NADU, INDIA  
**MATERIALS MANAGEMENT / CAPITAL EQUIPMENT**

## ENQUIRY

Phone: +91 431 257 70 49  
Fax : +91 431 252 07 19  
Email : [csguna@bheltry.co.in](mailto:csguna@bheltry.co.in)  
Web : [www.bhel.com](http://www.bhel.com)

Enquiry Number:	Enquiry Date:	Due date for submission of quotation:
2620800076	28.07.2008	30.08.2008

You 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 (Item required at BHEL on)
10	Shot Blasting Station – 2 Ton as per the technical specification & commercial conditions applicable (to be downloaded from web site <a href="http://www.bhel.com">www.bhel.com</a> or <a href="http://tenders.gov.in">http://tenders.gov.in</a> )	1 No.	30.06.2009

**Note:** 1) Offer should be CFR - Mumbai Seaport basis in case of foreign vendors.  
2) The item to be delivered at the following address at Goindwal in case of Indigenous vendors.  
**Industrial Valves Plant**  
**433, Industrial Complex**  
**Goindwal – 143423**  
**District: Tarn Taran, Punjab, India.**

**BHEL commercial terms & conditions with Price Bid and Bank Guarantee formats along with technical specifications 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 “2620800076”.**

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: SHOT BLASTING STATION – 2 Ton****SECTION – I: QUALIFYING CRITERIA**

The BIDDER (**OEM**) has to compulsorily meet the following requirements to get qualified for consideration of the technical offer for the supply of SHOT BLASTING STATION- 2 Ton

<b>S. No</b>	<b>PARTICULARS</b>	<b>VENDOR'S RESPONSE</b>
<b>1.0</b>	Only those Vendors ( <b>OEMs</b> ), who have supplied and commissioned at least ONE custom built <b>SHOT BLASTING STATION</b> with overhead Job handling system of minimum 2 Ton capacity in the past and such shot blasting station should be working satisfactorily for a minimum period of one year after commissioning, as on the date of opening of this Tender are eligible to quote. <i>(However, if such shot blasting station is already supplied to BHEL, then that station should be working satisfactorily for a minimum period of six months after commissioning, as on the date of opening of this Tender.)</i>	
<b>2.0</b>	The Vendor (BIDDING FIRM / COMPANY) shall have minimum 5 Years of Continuous Experience in Design, Manufacture, Supply, Erection & Commissioning of custom built shot blasting stations.	
<b>3.0</b>	Along with the Technical offer, the Vendor should enclose <b>One Performance certificate</b> from the customer regarding satisfactory performance of the Blasting station supplied to them. For obtaining the Performance certificate from the customer, a suggestive format is provided in <b>SECTION – IV</b> .	
<b>4.0</b>	BHEL reserves the right to verify the information provided by vendor. In case the provided information is found to be false or incorrect, the offer shall be rejected.	

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**SECTION – II**

The Bidder / Vendor is requested to provide the following information.

<b>S. No.</b>	<b>PARTICULARS</b>	<b>VENDOR'S RESPONSE</b>
<b>5.0</b>	Number of Years of experience the bidding company has, in the field of design, manufacture, supply and Erection & commissioning of shot blasting stations.	
<b>6.0</b>	Approximate Number of shot blasting stations supplied and commissioned till date with overhead Job handling system.	
<b>7.0</b>	Reference List of few Customers of the Vendor, with full address and details of contact person where such custom built shot blasting stations have been supplied in the past.	
<b>8.0</b>	Details on SERVICE-AFTER-SALES Set-Up in India including the Addresses of Agents / Service Centers in India / Asia.	
<b>9.0</b>	Any Additional Data to supplement the manufacturing capability of the BIDDER for the subject equipment.	

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**SECTION – III**

Bidder / Vendor to note:

<b>S. No.</b>	<b>REQUIREMENTS</b>	<b>VENDOR'S RESPONSE</b>
<b>10.0</b>	The BIDDER / VENDOR shall submit the offer in TWO PARTS. 1. Technical offer <b>Part A, Part B</b> and <b>Commercial offer</b> . 2. <b>Price Bid</b> .	
<b>11.0</b>	The Technical Offer shall contain a comparative statement of Specifications demanded <b>by BHEL</b> and Offer Details submitted <b>by the Bidder</b> , against each clause. General words like ' <b>confirmed</b> ' or ' <b>complied</b> ' or ' <b>yes</b> ' or ' <b>no-deviation</b> ' in the technical comparative statement may lead to disqualification of the Technical Offer.	
<b>12.0</b>	The Technical Offer shall be supported by Product Catalogue and Data Sheets in original and complete technical details of 'Bought-Out-Items' with copies of Product Catalogue and Selection Criteria	
<b>13.0</b>	The Commercial Offer submitted with the Technical Offer shall contain the Scope of Supply and the Un-Priced Part of the Price-Bid, for confirmation	

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**SECTION – IV**

The Performance certificate should be produced on Customers Letter head.

**PERFORMANCE CERTIFICATE**

<b>1</b>	Supplier of the Equipment		
<b>2</b>	Make & Model of the Equipment		
<b>3</b>	Month & Year of Commissioning		
<b>4</b>	Application		
<b>5</b>	a. Type of Equipment		
	b. Capacity of overhead Job handling system in Tons		
	c. Size of Blast chamber		
	d. Number of Blast wheels		
<b>6</b>	Performance of the Equipment ( <b>Tick</b> whichever is <b>applicable</b> )	Best in the market	
		Satisfactory	
		Good	
		Average	
		Not Satisfactory	
<b>7</b>	Any other remarks		
<div style="text-align: right;">Signature &amp; Seal of the Authority Issuing the Performance Certificate</div> <div>Date:</div>			

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## **PART B**

### **TECHNICAL SPECIFICATION FOR SHOT BLASTING STATION – 2 Ton**

#### **AA: JOB DESCRIPTION / APPLICATION:**

Various sizes of Valve bodies (Castings and forgings) are to be shot blast. The Shot Blasting Station is intended for removing rust and scales from external and internal surfaces of hollow valve castings at room temperature.

There shall be hinged twin doors on both inlet and outlet sides of the blast chamber. One or few jobs at a time shall be fed into the blast chamber by an electric monorail over-head job handling system. The shot blasting operation shall be carried out on the internal and external surfaces of the job automatically by centrifugal blast wheels mounted suitably in the blast chamber. The blast wheels shall be adjustable to direct the shot stream at appropriate angle towards the job to cover the job envelope. The job has to be rotated slowly for complete blasting of all the exposed surfaces. After shot blasting the job / jobs shall pass through the outlet door for unloading. There shall be two hoists one on the inlet side and the other on the outlet side of the blast chamber. The two hoists shall have similar arrangements suitable for shot blasting from both the directions using any one of the hoists at a time.

Typical plan view of the blast chamber and monorail track with hoists I & II is shown in ANNEXURE – 1. The shot blasting station shall be designed at optimum levels for effective space utilization.

After shot blasting the Surface finish should be **SA 2.5** as per Swedish Standards.

**BB: JOB / WORK PIECE DETAILS:**

**Various sizes of Valve bodies (Castings and forgings) are the jobs for shot Blasting**

**Maximum Height of job : 1500 mm**

**Maximum Length of job : 1500 mm**

**Maximum Width of job : 1500 mm**

**Maximum Weight of job: 2 Tons**

**Casting - Property**

Description	ASTM Specification	Hardness
Carbon Steel	A216 WCB, WCC A352 LCB, LCC	185 BHN 225 BHN
Alloy Steel	A 217 WC5, WC6, WC9, C12A	210 BHN
Stainless Steel	A351 CF3M, CF8, CF8C and CF8M	230 BHN

**Forging - Property**

Description	ASTM Specification	Hardness
Carbon Steel	SA 105	185 BHN
Alloy Steel	SA 182 F22 Class 3 SA 182 F91	210 BHN 225 BHN

## SHOT BLASTING STATION CONFIGURATION AND DETAILED SPECIFICATION:

**1. STATION CONFIGURATION:** The blasting station shall have the following.

**a. Job Handling system:**

1. The monorail system shall be designed as per **IS: 807** and **IS: 3938**
2. The monorail track shall have minimum possible bend radius.
3. The span between the columns supporting the monorail shall be minimum 2.5 Meters as shown in the sketch.
4. The pitch of column supports along the monorail track shall be minimum 2.5 meters to allow forklift usage for pickup/drop of jobs. The columns should be designed to withstand job load of 2 tons. Monorail supporting structure Drawings shall be submitted after receipt of LOI / P.O.
5. Hoist controls shall be as a separate unit and attached to the machine control panel. It should have sufficiently long cables and be detachable when required.
6. Both the hoists should travel forward and reverse for the full length of the monorail.
7. Hoist limit shall be adjustable to maintain the height of sprocket wheel at the same level as that of the endless chain running at the roof of the blast chamber for slowly rotating the job while shot blasting is on.
8. Hoist shall be provided with lower limit also.
9. Rope drum shall be provided with proper rope guide.
10. The Hoist make shall be INDEF.

**b. Blasting Equipment:**

The blasting equipment shall be complete with all accessories and attachments. The design and construction shall be suitable for valve bodies and shall meet all statutory requirements.

**c. Shots Recycling Unit:**

This unit has to be self reliant to the needs of the blasting process, carry the shots to blast wheels, maintain the shots in the cleaned up and de-dusted state using in-built filters, supply the shots to the blasting wheels in appropriate quantity and finally recycle the shots and minimise the wastage of shots. The consumption of shots has to be made up by addition of suitable quantity of fresh shots manually at a defined location.

**d. Dust Extraction Unit:**

The blasting chamber shall have an associated dust extraction & disposal system, including chimney and other in-built safety features, so that the total installation meets the regulations of EMS and OSHAS as per ISO 14001 and ISO 18001 Standards.



**2. DETAILED SPECIFICATION**

S.No.	PARTICULARS AND BHEL SPECIFICATION		BIDDER'S OFFER (with Technical Details)
1.0.0	<b>CAPABILITY:</b> The shot blasting facility shall be capable of achieving the specified surface finish of <b>SA 2.5</b> as per Swedish Standards		
2.0.0	<b>SHOT BLASTING CHAMBER:</b>		
2.1.0	Chamber Dimensions	Bidder to specify to suit the job.	
2.2.0	Chamber Wall thickness and material	Minimum 10 mm thickness Mild Steel with suitable structural reinforcement	
2.3.0	Inside Lining thickness and material	Minimum 6 mm thickness The chamber walls shall be lined with 11 to 14% Austenitic Manganese Steel.	
2.4.0	Replaceable Liner thickness and material	Minimum 12 mm thickness – made of 11 to 14% Austenitic Manganese Steel / Nihard (in the zone of direct blast area of the blasting wheels)	
2.5.0	Lining Mounting Arrangement	Bidder to specify the arrangements for mounting of inside lining materials (which shall be of easily replaceable type)	
2.6.0	Doors	The inlet side and outlet side of the chamber will have Hinged twin doors. Doors shall be lined with 11 to 14% Mn steel plates of minimum 6 mm thickness.	
2.7.0	Floor Design	The floor shall be provided with steel gratings, 11 to 14% Manganese steel cover plates to protect the screw conveyor.	
2.8.0	Illumination	One 24 V hand lamp with industrial socket shall be provided for maintenance purpose. The socket shall be provided on the outer surface of the chamber wall with cables of sufficient length so that the lamp can reach the entire blast chamber through the door.	

S.No.	PARTICULARS AND BHEL SPECIFICATION		BIDDER'S OFFER (with Technical Details)
2.9.0	Roof sealing	As the job for shot blasting is handled by an electric monorail over-head system, the roof of the chamber should have suitable slitting to allow Rod/sling to pass through. This opening should be properly sealed to arrest shots from coming out of the chamber.	
<b>3.0.0</b>	<b>BLAST WHEEL UNIT</b>		
3.1.0	Number of Blast Wheel units	Bidder to specify and justify for the job requirements	
3.2.0	Type	Centrifugal [Centre Fed Impeller]	
3.3.0	Shot Velocity	About 80 Mtrs. / Sec.	
3.4.0	Number of Blades per blast wheel unit	8	
3.5.0	Blade Design	Shall be of Wear Resistant, Easily Replaceable type. Bidder to mention blade material in the Offer.	
3.6.0	Blast Wheel Blade Life	Bidder to specify in operating hours.	
3.7.0	Motor Power per Unit	Bidder to specify	
3.8.0	Wheel Speed	Bidder to specify	
3.9.0	Wheel Diameter	Bidder to specify	
3.10.0	Positional Adjustment	Easily adjustable arrangement to target the blast stream in the desired direction.	
3.11.0	Shot Feed Control	Clock Dial type control cage to control shot feed	
3.12.0	Shot Through-put	Bidder to specify in kgs. /minute/ wheel	
3.13.0	Wheel Housing Design	The wheel housing shall be completely lined with suitable thickness wear plates of 11 – 14% Mn steel to prevent wear and abrasive leakage. Bidder to furnish technical details with the Offer.	
3.14.0	Wheel Elements	Blast wheel components shall be of wear and abrasive resistant material and dynamically balanced.	

S.No.	PARTICULARS AND BHEL SPECIFICATION		BIDDER'S OFFER (with Technical Details)
3.15.0	Wheel Selection	Provision shall be made to selectively switch off the desired shot blasting wheels and close corresponding shot feeding valve.	
3.16.0	Noise Level	Bidder to confirm that Noise Level shall not exceed 85 dBA at one Meter distance from the Shot Blasting equipment.	
<b>4.0.0</b>	<b>SHOT RECOVERY &amp; RECYCLING SYSTEM:</b>		
4.1.0	Bidder to explain the arrangements of shot recovery and recycling system. The offered system should work in automatic mode in conjunction with the Blast Chamber Operations.		
<b>4.2.0</b>	<b>HOPPER &amp; SCREW CONVEYORS</b>		
4.2.1	Design Features	<ul style="list-style-type: none"> <li>a. Mild steel gravity fed hopper beneath the blast chamber</li> <li>b. Screw conveyors to convey steel shots to the elevator boot section</li> </ul> <p>The MS hopper in the Blast chamber should be lined with wear resistant rubber liners.</p>	
4.2.2	Design Parameters	<p>Bidder to specify the following:</p> <ul style="list-style-type: none"> <li>a. Dia and length of Screw Conveyors.-</li> <li>b. Screw Conveyor Motor Rating.</li> <li>c. Make of the gearbox for screw conveyor. (Shall be of reputed make &amp; standard size)</li> </ul>	
<b>5.0.0</b>	<b>BELT TYPE BUCKET ELEVATOR:</b>		
5.1.0	Design Features	<ul style="list-style-type: none"> <li>a. Easily adjustable provision to compensate for belt slackness.</li> <li>b. Backstop arrangement to prevent the belt from slipping down during sudden stoppage.</li> <li>c. Bucket elevator to be housed in a steel casing with inspection and maintenance doors.</li> </ul>	

S.No.	PARTICULARS AND BHEL SPECIFICATION		BIDDER'S OFFER (with Technical Details)
5.2.0	Design Parameters	Bidder to specify the following: a. Bucket Size and Material. b. Belt Material and Thickness. c. Elevator Motor Rating d. Make of the gearbox for bucket elevator. (Shall be of reputed make & standard size)	
<b>6.0.0</b>	<b>ABRASIVE (SHOT) SEPARATOR</b>		
6.1.0	Design Features	a. Type: Counter Flow Air Wash Separator b. Removable screen for trapping coarse particles c. Refuse hopper for fines with non-return valves for discharge of fines. d. Integral storage hopper for reclaimed abrasives	
6.2.0	Design Parameters	Bidder to specify the following: a. Overall Arrangement Details. b. Capacity.	
<b>7.0.0</b>	<b>ABRASIVE FEEDING UNIT:</b>		
7.1.0	Design Parameters	Bidder to specify the following: a. Overall Arrangement Details b. Type of Control Valve used	
7.2.0	Design Features	a. Abrasive feeding from storage hopper to blast wheels by means of wear resistant feed pipes. b. Abrasive control valve to control the flow of shots to the blast-wheel unit. c. Manual shut-off valve for cutting-off shot feed to the blast-wheel unit during maintenance.	
<b>8.0.0</b>	<b>DUST EXTRACTION / COLLECTOR UNIT:</b>		
8.1.0	Type	Continuous & automatic	
8.2.0	Filter Media	Standard Cartridge filters	
8.3.0	Cleaning of Filters	By reverse air flow	
8.4.0	Cleaning Cycles	Timer controlled	

S.No.	PARTICULARS AND BHEL SPECIFICATION		BIDDER'S OFFER (with Technical Details)
8.5.0	Clog indication	Differential pressure gauge with alarm indication and manometer also to be provided	
8.6.0	Cleaning Cycle Sensing	Sensing to initiate cleaning cycle by Differential Pressure	
8.7.0	Respirable Particulate Matter (RPM or RSPM) Emission at Chimney Outlet	Should not exceed 100 mg / Nm <sup>3</sup> for particle size less than 5 microns.	
8.8.0	Chimney	<ol style="list-style-type: none"> <li>1. Height of Chimney shall be 20 meters. Suitable cowl is to be provided at the top of the chimney.</li> <li>2. Two set of Traverse ports, one at 5 Meter Elevation and the other at 2/3 rd of chimney height from floor level shall be provided for inspection / checking,</li> <li>3. Four portholes of 100 mm dia shall be provided 90 degrees apart at each elevation. 100mm long standard pipes shall be welded to each porthole .The other end of the pipes shall be bolted with a dummy flange.</li> <li>4. Platforms shall be provided around the chimney, 1 meter below each set of ports, with handrails, toe guard and approach ladder.</li> <li>5. The chimney drawing indicating the traverse ports and chimney supporting structures shall be furnished to BHEL upon receipt of purchase order</li> </ol>	
8.9.0	Exhaust Fan	Shall be of suitable capacity. Vendor shall submit calculations	

S.No.	PARTICULARS AND BHEL SPECIFICATION		BIDDER'S OFFER (with Technical Details)
8.10.0	Scope of Supply	To include the following: a. Dust hopper with arrangement for dust removal. b. Suction ducting from shot blasting chamber to dust collector. c. Ducting from dust collector to exhaust fan. d. Suitable bellows to be provided to prevent vibration. e. Chimney as per clause 8.8.0 with Supporting Structures. f. Roof for protection of dust collector and fan. g. Supporting structures wherever necessary.	
8.11.0	Design Parameters	Bidder to specify the following: a. Dust Collector Model & Make. b. Capacity & Filter Area. c. Number of Filter Cartridges. d. Motor Rating & Speed of Exhaust Fan.	
<b>9.0.0</b>	<b>SYSTEM INTER LOCKS:</b>		
9.1.0	<b>Inter-Lock Provisions</b> a. Doors on the inlet side and outlet side shall be interlocked with blast wheel unit such that the blast wheel unit cannot be started unless these doors are fully closed. Door opening and closing shall be by pneumatic system. The doors shall be leak proof to avoid escape of shots while blasting. b. Blast wheel units to operate only when elevators, screw conveyors & dust collectors are in operation. c. When the chamber doors are closed for shot Blasting, any one of the hoists staying inside the chamber should not travel. At the same time the other hoist shall be usable outside the chamber for handling the jobs. d. The vendor shall specify, if any other interlocks required between the shot blasting system and job-handling system for operational safety.		

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S.No.	PARTICULARS AND BHEL SPECIFICATION		BIDDER'S OFFER (with Technical Details)
<b>10.0.0</b>	<b>OPERATION AND CONTROL SYSTEM - OPERATOR'S PANEL:</b>		
10.1.0	a. PLC controls shall be offered. The make of PLC shall be Messung/ Mitsubishi/ Allen Bradely / Siemens. b. One Main Panel for the total equipment, the controller side shall have complete machine control system with required configuration. c. All switches shall be within reach of the Operator. All displays / indications shall also be conveniently located (Schematic Layout with details to be submitted with the offer).		
<b>11.0.0</b>	<b>SAFETY ARRANGEMENTS:</b>		
11.1.0	The equipment should have adequate and reliable safety features or devices to avoid damage to the machine, work piece and the operator.	Vendor to confirm	
11.2.0	All the pipes, cables etc. of the equipment should be well supported, protected and properly routed. These should not create any hindrance to operator's movement.	Vendor to confirm	
11.3.0	All rotating parts of the equipment should be guarded properly and statically & dynamically balanced to avoid undue vibrations.	Vendor to confirm	
11.4.0	Emergency Switches should be provided at suitable locations.	Vendor to confirm	
<b>12.0.0</b>	<b>FIRST FILL OF OIL, GREASE &amp; SHOTS:</b>		
12.1.0	<b>First filling of all required Oils &amp; Grease etc.</b> Should be supplied by vendor. <b>Oil grade:</b> ISO VG46 or 68 <b>Grease:</b> Servo gem grade 2 (preferred.) Indigenous (Indian) source or Indian equivalent and specifications of oils/ greases are also to be provided by the vendor.	Vendor to confirm & specify	

S.No.	PARTICULARS AND BHEL SPECIFICATION		BIDDER'S OFFER (with Technical Details)
12.2.0	First fill of shots should be supplied by the vendor	Vendor to confirm	
12.3.0	Specification of shots, Quantity and Mix etc.	Vendor to specify	
<b>13.0.0</b>	<b>ELECTRICAL INSTALLATION:</b>		
13.1.0	AC 415V $\pm$ 10%, 50HZ $\pm$ 3 Hz, 3 Phase- 3 wire (no neutral) power supply will be provided by BHEL at one point near the machine, as per layout recommended by the Vendor.	Vendor to confirm	
13.2.0	<b>Tropicalization:</b> All electrical / electronic equipment shall be tropicalized.	Vendor to confirm	
13.3.0	All electrical/electronic control cabinets & panels shall be dust & vermin proof and shall have IP 54 protection.	Vendor to confirm	
13.4.0	a. All electrical and electronic panels including operator's panel should be provided with fluorescent lamps for sufficient illumination and power receptacles of 220 Volts, 5/15 Amp. AC. b. All adapters /receptacles should have compatibility with Indian equivalents.	Vendor to confirm	
13.5.0	Control circuit voltage shall be 110 V AC	Vendor to confirm	
13.6.0	All motors shall be energy efficient and shall be any of the following make: M/S Siemens / Crompton Greaves / KEC / ABB or other makes conforming to IEC standards.	Vendor to confirm	
13.7.0	<b>Wiring:</b> All electrical motors, limit switches etc, on the machine shall be wired using PVC sheathed cable running in conduits to common terminal block	Vendor to confirm	
13.8.0	External wiring from / to control panel, control desk, exhaust fan etc shall be by means of armoured multi-core copper cables	Vendor to confirm	
13.9.0	Vendor shall ensure proper earthing for the machine and its peripherals.	Vendor to confirm	



S.No.	PARTICULARS AND BHEL SPECIFICATION		BIDDER'S OFFER (with Technical Details)
<b>14.0.0</b>	<b>PNEUMATIC CIRCUITS:</b>		
14.1.0	All pneumatic components including cylinders shall be of FESTO or any other make acceptable to BHEL.	Vendor to confirm	
14.2.0	BHEL will terminate the shop compressed air supply at the hand wheel valve to be provided by the supplier. – The compressed air will be at a pressure of 60 to 70 psi only. All pneumatic systems on the machine, dust collector etc shall be designed to operate efficiently at this air pressure. Refrigerated air drier for removing moisture of the pneumatic air to be provided by the vendor.	Vendor to confirm	
<b>15.0.0</b>	<b>SPARES:</b>		
15.1.0	<p>The Vendor shall recommend and submit list of spares required for the machine for two years of trouble free operation on two-shifts/day basis under two headings as</p> <p>a) <b>Mechanical spares</b> and</p> <p>b) <b>Electrical &amp; electronic spares.</b></p> <p>The list shall generally include the following items.</p> <p><b>a) Mechanical Spares:</b> Wheel blades, Impellers, control cage adaptors, buckets, Liners etc.</p> <p><b>b) Electrical &amp; Electronic Spares:</b> All types of Relays, Contactors, Proximity Switches, Push Buttons, Indicating Lamps, Semiconductor Fuses, Special Fuses, Circuit Breakers, Main Power Switch, Operator's panel with Display Unit, I/O Cards for PLC etc.</p> <p><b>c)</b> Unit Price of each item of spares shall be submitted with the price bid.</p> <p><b>d)</b> Un-priced list should be submitted with technical offer.</p>	Vendor to confirm	

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S.No.	PARTICULARS AND BHEL SPECIFICATION		BIDDER'S OFFER (with Technical Details)
15.2.0	All types of spares for total station and accessories should be available for at least ten years after supply of the equipment. If equipment / 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 & suppliers to enable BHEL to procure these in advance, if required	Vendor to confirm	
<b>16.0.0</b>	<b>ENVIRONMENTAL PERFORMANCE OF THE MACHINE</b>		
16.1.0	<p>The Blasting Station should confirm to following factors related to environment:</p> <ol style="list-style-type: none"> <li>Noise level shall not exceed 85 dB(A) at normal load condition, 1 meter away from the Equipment.</li> <li>If any safety / environmental protection is required it should be built in the machine by the vendor, to meet ISO 14001 and ISO 18001 Standards.</li> <li>Paint applied on various elements/components of the station shall be anti-corrosive &amp; weather resistant, shall not peel off and mix up with dust or fumes emitted.</li> <li>The machine shall be suitable for an ambient Temperature of +45 ° C and relative humidity of 85% respectively, but both do not occur simultaneously.</li> </ol>	Vendor to Confirm	
<b>17.0.0</b>	<b>TOOLS FOR OPERATION &amp; MAINTENANCE:</b>		
17.1.0	Necessary tools like Torque Wrench, Spanners, Keys, grease guns etc. for operation and maintenance of the machine shall be supplied by the vendor. List of such tools shall be submitted with offer	Vendor to confirm	

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S.No.	PARTICULARS AND BHEL SPECIFICATION		BIDDER'S OFFER (with Technical Details)
<b>18.0.0</b>	<b>DOCUMENTATION:</b>		
18.1.0	Three sets of following documents (3 Hard copies) in English Language should be supplied along with the machine	Vendor to confirm	
18.2.0	Operating Manuals of Equipments forming part of the Blasting Station.	Vendor to confirm	
18.3.0	Detailed Maintenance manual of machine with all drawings of machine assemblies/sub-assemblies/parts including Electrical / Pneumatic/ Hydraulic Circuit Diagrams [with BOM – Bill of Materials]. All Assembly/ Sub Assembly Drawings shall be supplied with the Part List also.	Vendor to confirm	
18.4.0	Catalogues, O&M Manuals of all bought out items including drawings, wherever applicable.	Vendor to confirm	
18.5.0	Detailed specification of all rubber items and pneumatic / lube oil fittings	Vendor to confirm	
18.6.0	Operating Manuals, Maintenance Manuals & Catalogues for all supplied Accessories.	Vendor to confirm	
18.7.0	The vendor shall submit complete Master List of Parts used in the Blasting Station.	Vendor to confirm	
18.8.0	Vendor to confirm that complete list of spares for equipment and accessories, along with item part no / specification / type / model, and name & address of the spare supplier shall be furnished along with documentation to be supplied with the machine	Vendor to confirm	
18.9.0	Component drawings with material specification for all wearing components like bushes, liners, impeller blades, etc.	Vendor to confirm	
18.10.0	One additional set of all the above documentation in CD as SOFT COPY	Vendor to confirm	

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S.No.	PARTICULARS AND BHEL SPECIFICATION		BIDDER'S OFFER (with Technical Details)
18.11.0	The supplier has to present one set of the [O & M] Manuals – DOCUMENTATION, at the time of inspection.	Vendor to confirm	
<b>19.0.0</b>	<b>EQUIPMENT INSPECTION:</b>		
19.1.0	Since the Shot Blasting Station cannot be inspected in the assembled condition, 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 to BHEL Engineers, at supplier's works, prior to despatch.	Vendor to confirm.	
<b>20.0.0</b>	<b>CIVIL WORKS – for Machine Foundation</b>		
20.1.0	Vendor shall submit the preliminary layout drawing for getting BHEL's approval within one month from the date of Letter of Intent (LOI). Vendor shall submit complete foundation details including static and dynamic loads within three months after getting BHEL's approval. The layout should consist of all requirements pertaining to complete equipment including space requirement for any other accessories. BHEL shall construct complete foundation for the equipment.	Vendor to confirm.	
20.2.0	The Vendor shall indicate detailed specifications of grouting compound and Grouting procedure etc. for foundation bolts of the machine.		

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S.No.	PARTICULARS AND BHEL SPECIFICATION		BIDDER'S OFFER (with Technical Details)
<b>21.0.0</b>	<b>ERECTION &amp; COMMISSIONING:</b>		
21.1.0	a. Vendor to take full responsibility for the erection & commissioning including workmen, testing of the machine. b. 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. c. Crane help will be provided by BHEL, free of cost.	Details of these requirements should be informed by Vendor in advance	
21.2.0	The Vendor should bring tools, Tackles, instruments and other necessary equipments that are required to carry out all the above activities-	Vendor to confirm	
21.3.0	The supplier shall arrange commissioning spares required for commissioning of the machine	Vendor to confirm	
21.4.0	If the paint has peeled off or rubbed off during transit or erection of the equipment and its accessories, that has to be repainted and merged with the original paint by the vendor. Vendor to supply the required paint for this purpose.	Vendor to confirm	
21.5.0	Schedule of Erection and Commissioning shall be submitted with offer.	Vendor to confirm	
21.6.0	Duration, terms & conditions for E&C should be furnished with this technical offer in detail. Charges for the same shall be submitted with the price bid.	Vendor to confirm	
<b>22.0.0</b>	<b>LEVELING &amp; ANCHORING SYSTEM</b>		
22.1.0	Complete anchoring system including foundation bolts, anchoring materials, fixators, leveling shoes. etc should be supplied.	Vendor to confirm	

S.No.	PARTICULARS AND BHEL SPECIFICATION		BIDDER'S OFFER (with Technical Details)
<b>23.0.0</b>	<b>PERFROMANCE PROVE-OUT:</b>		
23.1.0	The trouble free operation of all the sub-systems forming part of the total blasting station, at the rated operating parameters, shall be demonstrated successfully after the commissioning activity.	Vendor to confirm	
23.2.0	The supplier should carry out the performance prove-out of three jobs in three separate cycles, with the BHEL supplied components (within the job envelope indicated) after commissioning of the shot blasting equipment to the specified surface finish.	Vendor to confirm	
<b>24.0.0</b>	<b>TRAINING</b>		
24.1.0	The supplier has to impart comprehensive training to BHEL Staff - on the OPERATION, TROUBLE SHOOTING and MAINTENANCE of the Shot Blasting Station - for a minimum period of 6 Working Days after the successful completion of the commissioning and performance prove-out of the shot blasting station.	Vendor to confirm	
<b>25.0.0</b>	<b>PERFORMANCE GUARANTEE</b>		
25.1.0	Performance Guarantee for a minimum period of 24 months (for the machine, including sub-systems and bought-out items) from the date of acceptance.	Vendor to confirm	
<b>26.0.0</b>	<b>GENERAL POINTS:</b>		
<b>26.1.0</b>	Total Connected Load (in kVA)	Vendor to Indicate	
<b>26.2.0</b>	All bearings to be suitably protected against dust ingress	Vendor to confirm	
<b>26.3.0</b>	All Gearboxes should be of Radicon / Elecon / Shanthi Gears or any other reputed make acceptable to BHEL.	Vendor to Indicate	
<b>26.4.0</b>	Floor area required (Length, Width, Height) for complete equipment & accessories	Vendor to Indicate	
<b>26.5.0</b>	Depth of any pit below floor level shall be restricted to a max. of 2m.	Vendor to confirm	

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S.No.	PARTICULARS AND BHEL SPECIFICATION		BIDDER'S OFFER (with Technical Details)
26.6.0	Maintenance platform, wherever required, shall be provided along with handrails, access ladder, etc.	Vendor to confirm	
26.7.0	Painting of Equipment / Electrical Panels using RAL 6011 Apple Green Colour (Polyurethane Paint)	Vendor to confirm	
26.8.0	Total weight of the individual systems of equipment	Vendor to specify	
26.9.0	Weight of heaviest part of machine	Vendor to specify	
26.10.0	Weight of the heaviest part or assembly of the equipment	Vendor to specify	
26.11.0	Dimensions of largest part/ sub-assembly/ assembly of the Equipment.	Vendor to specify	

**ANNEXURE –1 Typical Sketch of the shot blasting Chamber with Monorail**