



# Bharat Heavy Electricals Limited

(High Pressure Boiler Plant)

Tiruchirappalli – 620014, TAMIL NADU, INDIA

MATERIALS MANAGEMENT / CAPITAL EQUIPMENT

An ISO 9001  
Company

## ENQUIRY

### NOTICE INVITING TENDER

Phone: +91 431 257 76 53

Fax : +91 431 252 00 31

Email : [skaruna@bheltry.co.in](mailto:skaruna@bheltry.co.in)

Web : [www.bhel.com](http://www.bhel.com)

	Enquiry Number: 2731300008	Enquiry Date: 21.05.2013	Due date for submission of quotation: 21.06.2013
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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.

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.

Sl. No	Description	Quantity
1	15 Ton EOT Crane as per the technical specification, general guidelines instructions & 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> )	01 No.

#### Important points to be taken care during submission of offer

1. Checklist to be filled and enclosed along with the offer failing which, the offer will not be considered for evaluation.
2. Bidder's response column in the document Part A and Part B shall be duly filled by the bidder.
3. Whenever additional detail requested shall be provided with document evidence.
4. Third Party inspection by BHEL Engineers.
5. The EMD Amount for this Tender will be ( INR ) : 1,00,000.00
6. Delivery required 10 months from the date of purchase order.
7. All updates, amendments, corrigenda etc (if any) will be posted only on the above websites from time to time, as and when required, until tender is opened. There will be no publication of such updates, amendments corrigenda etc. through newspapers or any other media.

BHEL commercial terms & conditions with Price Bid and Bank Guarantee formats 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 above .

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

**S. KARUNANIDHY**  
Senior Manager  
MM / Capital Equipment  
BHEL, TRICHY - 620 014

**PART A****SECTION-I: -QUALIFING CRITERIA**

**The BIDDER/VENDOR (OEM) has to compulsorily meet the following requirements to get qualified for consideration of the technical offer for the SUPPLY of Flushing Stand System**

S. No.	PARTICULARS	VENDOR'S RESPONSE
1.0	<p>Only those Bidder/vendor (OEM), who have supplied and commissioned at least ONE 15Ton or higher capacity EOT crane class-3 with minimum of 22.7 Mtr or higher span and should have supplied frequency converter drive for similar capacity crane in the past five years and such crane is presently working satisfactorily for more than one year after commissioning (on the date of opening of Tender), should quote.</p> <p>Performance certificate from the customers (minimum 2) regarding satisfactory performance of machine supplied to them in attached format should be enclosed along with technical offer.</p>	
2.0	<p>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.</p>	
3.0	<p>The bidding FIRM should have 'in-house' or 'self-owned' facility for FABRICATION and TESTING at 125 % of the rated capacity</p>	
4.0	<p>The vendor should have minimum 10 years experience in design, fabrication and supply of EOT cranes.</p>	
5.0	<p><b>DELIVERY</b> - The bidder shall quote the best possible delivery. However the delivery shall not exceed 10 months with an additional grace period of 2 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 – II**

The vendors are requested to provide the following details

<b>S. No.</b>	<b>PARTICULARS</b>	<b>VENDOR'S RESPONSE</b>
<b>6.0</b>	Number of Years of Experience of the BIDDER/ VENDOR (OEM) in the field of design, manufacture, supply, erection & commissioning of cranes	
<b>7.0</b>	Number of cranes supplied, installed and commissioned till date	
<b>8.0</b>	Number of cranes supplied, installed and commissioned till date in the QUOTED MODEL	
<b>9.0</b>	Number of cranes supplied, installed and commissioned till date for the following category of CUSTOMERS a) Power Utility Boiler Manufacturer b) Equipment Supplier for Process Industries [Heavy Engineering Companies] c) Research Establishments	
<b>10.0</b>	Details on SERVICE-AFTER-SALES Set-Up in India including the Addresses of Agents / Service Centre in India and Asia	
<b>11.0</b>	Any Additional Data to supplement the manufacturing capability of the BIDDER for the subject equipment.	

**SECTION – III**

Bidder / Vendor (OEM) to note the following

<b>S.No.</b>	<b>REQUIREMENTS</b>	<b>VENDOR'S RESPONSE</b>
<b>12.0</b>	The BIDDER / VENDOR shall submit the offer in TWO PARTS - Technical [ <b>with PART A &amp; PART B</b> ] & Commercial and Price Bid.	
<b>13.0</b>	The Offer shall contain a comparative statement of Technical Specifications given by BHEL and the Offer Details submitted by the Bidder, against each clause. Where details are required, a mere 'CONFIRMED' or 'COMPLIES' or 'YES' or 'NO-DEVIATION' or similar words in the technical comparative statement may lead to disqualification of the Technical Offer.	
<b>14.0</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>15.0</b>	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	
<b>16.0</b>	BIDDER has to indicate the Country of Origin for the supply of equipment.	

**PERFORMANCE CERTIFICATE**  
(On Customer's Letter Head)

1. Supplier of the Equipment :
  
2. Make & Model of the Equipment :
  
3. Month & Year of Commissioning :
  
4. Application :
  
5.
  - a) Crane Type:
  
  - b) Crane Capacity (Metric Tonnes):
  
  - c) Crane span :
  
  - d) Mechanism class :
  
6. Performance of the Equipment : Satisfactory /  
(Strike off whichever is not applicable) Good /  
Average /  
Not Satisfactory
  
7. Any other remarks:

Date:

Signature & Seal of the Authority  
Issuing the Performance Certificate

**PART B. : TECHNICAL SPECIFICATIONS FOR 15 TON 22.7M ELECTRICALLY OPERATED OVER-HEAD TRAVELLING [E O T] CRANE WITH DOUBLE GIRDERS**

S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR's TECHNICAL OFFER (With Complete Details)
1.0.0	<b>APPLICATION</b>	a. The subject crane is meant for the purpose of handling small to large (within the lifting capacity of the crane) components, in a heavy and large steel fabrication shop floor. b. The crane will be put to use for continuous duty with CT, LT and Hoist movements, which may occur simultaneously (within the operating parameters specified under Clause Nos. – 3.1.0, 3.4.0 and 3.5.0). c. The shop floor environment will be dust prone, humid, welding fume filled and ambient temperature going upto 45° C. , due to pre-heating of jobs.	
2.0.0	<b>SCOPE OF SUPPLY</b>	a. Design as per Tender Specifications b. Detailed Design and Manufacture as per BHEL Specifications c. Assembly and Testing before Dispatch d. Supply in Modules / Sub-Assemblies e. Unloading, erection/ installation, wiring / cabling & painting after erection. f. Commissioning and Performance Prove-Out at BHEL Works g. Performance Guarantee for 24 months, from the date of commissioning.	
3.0.0	<b>TECHNICAL SPECIFICATIONS</b>		
3.1.0	<b>CAPACITY</b>	Lifting Capacity of Main hoist (one hoist only) : 15 Metric Tonnes	
3.2.0	<b>SPAN</b>	Wheel Centre to Wheel Centre Dimensions	
3.2.1	Long Travel (LT)	22,700 mm	
3.2.2	Cross Travel (CT)	2500 mm	
3.3.0	Effective Height of Lift	11,000 mm	

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S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR's TECHNICAL OFFER (With Complete Details)
<b>3.4.0</b>	<b>DUTY CYCLE</b>	Related to Drive Motor & Mechanisms	
3.4.1	Hoist	40 % E D	
3.4.2	Long Travel	40 % E D	
3.4.3	Cross Travel	40 % E D	
<b>3.5.0</b>	<b>SPEED</b>	Operating / Working Speed [Maximum]	
3.5.1	Main Hoist	7.5 mtrs./minute.	
3.5.2	Cross Travel (CT)	30.0 mtrs./minute.	
3.5.3	Long Travel (LT)	60.0 mtrs./minute.	
<b>3.6.0</b>	<b>MOTOR RATINGS</b>	Electric Drive Motor Ratings & Frame Sizes	
3.6.1	Main Hoist	Min 35 kW ; Frame Size – 250 M / 6 Pole	
3.6.2	Cross Travel (CT)	Min 7.5 kW ; Frame Size – 160 L / 6 Pole	
3.6.3	Long Travel (LT)	Min 2 x 18.5 kW ; Frame Size – 180 M / 6 Pole	
<b>3.7.0</b>	<b>GEAR BOX</b>	Gear Box Size	
3.7.1	Main Hoist	HR 650	
3.7.2	Cross Travel (CT)	VR 400	
3.7.3	Long Travel (LT)	HR 400	
<b>3.8.0</b>	<b>ACCELERATION</b>		
3.8.1	Cross Travel (CT)	300 mm / sec.sq.	
3.8.2	Long Travel (LT)	300 mm / sec. sq.	
<b>3.9.0</b>	<b>HOIST ROPE DETAILS</b>	Main Hoist : Dia. 16 mm ; Falls - 8	
<b>3.10.0</b>	<b>CONTROL</b>	Cabin Operation and Remote Control	
<b>3.11.0</b>	Type of Control	Master Control and Radio Remote Control	
<b>3.12.0</b>	Control Voltage	110 V AC	
<b>3.13.0</b>	Input Power Supply	415 ± 10% Volts , 50 ± 3% Hz, 3 Phase- AC	
<b>3.14.0</b>	Duty Class	Class – 3 [Indoor Service]	
<b>3.15.0</b>	Mechanism Group Classification	M 6	
<b>3.16.0</b>	<b>DESIGN STANDARD</b>	IS – 807 & 3177 / 1999	
<b>3.17.0</b>	<b>Runway Rail Size</b>		
3.17.1	Cross Travel (CT)	ISR 60 Lbs./Yard	

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S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR's TECHNICAL OFFER (With Complete Details)
3.17.2	Long Travel (LT)	C R 80	
<b>3.18.0</b>	<b>Wheel Size</b>		
3.18.1	Cross Travel (CT)	Dia. 320 mm	
3.18.2	Long Travel (LT)	Dia. 500 mm	
<b>3.19.0</b>	<b>Brake Drum Size</b>	Hoist Brake Drum Sizes	
3.19.1	Main Hoist	Dia. 300 mm	
3.19.2	Cross Travel (CT)	Dia. 160 mm	
3.19.3	Long Travel (LT)	Dia. 200 mm	
<b>4.0.0</b>	<b>MAIN FEATURES</b>	Crane Operational Features	
<b>4.1.0</b>	Control System	Frequency Converter type for all motions	
<b>4.2.0</b>	Remote Control	Radio Remote Control for all motions	
<b>4.3.0</b>	End Clearance	End Clearances to be fixed to suit the workshop building clearances.	
<b>4.4.0</b>	Crane Operation	Through Cabin Control and Radio Remote Control with option for control selection	
<b>5.0.0</b>	<b>STRUCTURAL FABRICATION</b>	Crane Structure Constructional Details	
<b>5.1.0</b>	Bridge / Girder	Box type Construction for Girders	
5.1.1	Cross section of Girder	Min. Girder Height – 1500mm Min. Girder width – 500mm Min. Top flange plate thickness – 12 mm Min. Bottom flange plate thickness – 12 mm Min. Web plate thickness – 8 mm	
5.1.2	End Carriage	Box type construction for the end carriages	
5.1.3	Cross section of End Carriage	Min. Height – 500 mm. Min. width – 330mm Min. Top flange plate thickness – 16mm Min. Bottom flange plate thickness – 16 mm Min. Web plate thickness – 10 mm	
<b>5.2.0</b>	Raw Material	Only steel plates tested and certified for quality by reputed inspection authorities, shall be used. Test Certificates to be produced for BHEL verification and	

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S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR's TECHNICAL OFFER (With Complete Details)
		form part of the documentation.	
<b>5.3.0</b>	<b>Welded Joints</b>	To be followed for Girder Fabrication	
<b>5.3.1</b>	Number of weld Joints allowed	Two joints only in web and flange plates of girder.	
<b>5.3.2</b>	Welding Electrodes	a. For all Horizontal Welding E 7018 Electrode only should be used. b. For all Vertical Welding E 7048 Electrode only should be used.	
<b>5.3.3</b>	Welded Joint Testing	All Butt Welded Joints (compression / tension and flanges / web joints) shall be subjected to 100% X-Ray Testing and X-Ray Films to be produced for BHEL evaluation and form part of the documentation.	
<b>5.4.0</b>	Splice Joints	NO SPLICE JOINT IS ALLOWED IN GIRDER FABRICATION[Girder has to be of <b>SINGLE PIECE</b> only].	
<b>5.5.0</b>	Platform on Girders	The Platforms provided on both the Girders shall be fixed through BOLTED JOINTS only.	
<b>5.6.0</b>	Wheel Assembly	The Wheel Assembly coming for Cross Travel (CT) & Long Travel (LT) shall be of LIVE AXLE SYSTEM with L-Type Bearings and as per BHEL Drawing No. <b>3-M-02R-0011993</b> . [Drawing is enclosed and given as <b>ANNEXURE -1</b> ].	
<b>5.7.0</b>	Heat Treatment & NDT Examination	The Trolleys shall be Stress Relieved if necessary after welding and NDT examinations. All weldings shall be tested by NDT means [MPI, LPI & RT] after Stress Relieving operation.	
<b>5.8.0</b>	Machining Operation	All mechanical mating surfaces and wheel seating areas are to be machined to the required finish and protected	
<b>5.9.0</b>	Surface Cleaning	Both the Girders and the Trolleys are to be	

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S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR's TECHNICAL OFFER (With Complete Details)
		thoroughly cleaned after completion of all operations but prior to painting.	
5.10.0	Painting	The crane parts are to be painted as follows :	
5.10.1	At supplier site	During Stage-II inspection, the crane shall be painted with One coat of Primer with 25 microns of DFT (Dry Film Thickness) and 48 hours of compulsory curing after painting. The crane shall be dispatched with one coat of Primer only.	
5.10.2	At Erection Site	After the crane erection is complete, the crane has to be painted as follows a. Touch-up painting of Primer wherever necessary b. Two coats of Enamel Paint (Colour – Tractor Orange) each with a DFT of 25 microns and intermittent curing of minimum 16 hours. c. Total required quantity of paints shall be the scope of the supplier.	
6.0.0	<b>MECHANICAL ELEMENTS</b>		
6.1.0	Gears	Gears in all the Stages shall be helical in design and to be of machined & lapped and hardened if necessary.	
6.2.0	Gear Box Casing	Shall be of fabricated type and stress relived by thermal heat-treatment process, prior to machining.	
6.3.0	Rope Drum	Shall be of fabricated type and stress relieved. The circumferential weld joints shall be tested by 100 % X-Ray for quality assurance.	
6.4.0	Type of Coupling	Only GEARED COUPLING to be used a. Between Electric Motor and Gear Box- Full gear coupling. b. Between Gear Box and Rope Drum- Suitable rope	

**PART B. : TECHNICAL SPECIFICATIONS FOR 15 TON 22.7M ELECTRICALLY OPERATED OVER-HEAD TRAVELLING [E O T] CRANE WITH DOUBLE GIRDERS**

S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR's TECHNICAL OFFER (With Complete Details)
		drum coupling. c. Between Gear Box and Wheels- Half gear coupling with floating shaft.	
6.5.0	Wheels	The Wheels shall be of Forged and Wheel Tread hardened to 300/350 BHN. Wheels shall be fitted with L-Type Bearing Housings	
6.6.0	Mechanical Joints	Fit Bolts as per IS 3640-1982 for all joints coming in main members platform supports.	
6.7.0	Pulley Dimension	Rope Pulley diameter shall be 23 times that of Rope diameter	
6.8.0	Hook	Hook latch shall be provided for both hooks	
6.9.0	Gear & Thruster oil	Required grade oil for the required quantity should be supplied	
6.10.0	Buffer	Spring loaded buffers shall be provided for Crab and End carriage/bogies	
6.11.0	Tools	The following tools of makes acceptable to BHEL shall be supplied along with each crane Vendor to clearly specify the makes of each items in the offer	
6.11.1	List of Tools	<ol style="list-style-type: none"> <li>1. 3T chain block 3M lift – one no</li> <li>2. 20 T Hydraulic Jack - one no (Remote Control type)</li> <li>3. Grease gun (5 kg capacity) -one no</li> </ol>	
7.0.0	<b>ELECTRICAL ELEMENTS</b>		
7.1.0	Operational Controls	The Crane shall be provided with the following controls : <ol style="list-style-type: none"> <li>a. Cabin Control [Master Control]</li> <li>b. Radio Remote Control [Micro processor based</li> </ol>	

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S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR's TECHNICAL OFFER (With Complete Details)
		Two Step Push Button Type]	
7.2.0	Control Voltage	110 V AC	
7.3.0	Type of Brakes	a. Main Hoist -DC Brake b. Cross Travel -Thruster Brake c. Long Travel -Thruster Brake	
7.4.0	Protection	All Panels, Limit-Switches and Motors shall have IP 54 protection.	
7.5.0	Electric Motors	All Electric Motors shall be as per IS-325 and IS-1231 and also suitable for <b>300</b> starts per hour.	
7.6.0	Electric Contactors	All Panels shall have only SIEMENS/L&T Contactors and shall be suitable for AC3 Duty Class.	
7.7.0	Contactors Rating	The rating of all Contactors shall be atleast 50% higher than the respective electric motor full load current, at the specified duty cycle.	
7.8.0	Long Travel Motion	A Dual Drive Mechanism shall be provided for LT (Long Travel) Motion.	
7.9.0	Illumination	a. Four numbers of 500 Watts Halogen Lamps shall be provided under the Bridge b. All Electric Panels shall be provided with suitable illumination for visibility and trouble shooting.	
7.10.0	Controller Steps	A 5-Step Controller has to be provided for a. Main Hoist b. Long Travel c. Cross Travel (Note-Cam Disc should be made of metal or Bakelite only).	
7.11.0	Frequency Converter	The VVVF Drive shall be supplied with suitable DBR for all motions.	
7.12.0	Anti-Collision Device	An Anti-Collision Device of infra-red type shall be provided on both sides of the crane. The operating range shall be 3.0 metres to 10.0 metres.	
7.13.0	Load Cell	a. Load Weighing System with LOAD CELL (shear pin type) to be fixed / provided at the equalizer	

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S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR's TECHNICAL OFFER (With Complete Details)
		pulley. b. The display shall be of 100 mm size (JUMBO)	
7.14.0	Wiring	Junction box shall be avoided for wiring.	
7.15.0	Cables	All cables shall be flexible copper only.	
7.16.0	Hoist limit	Each hoist shall be provided with both rotary and counter weight limits	
7.17.0	Cabin	Operator chair, Light, fan, warning bell and emergency pushbutton shall be provided in the cabin. A rubber mat shall be provided at the floor of the cabin.	
7.18.0	CT Cabling	Either Trailing cable system or Drag chain with cable system can be used for CT motion. In case of Drag chain the make and specification to be submitted with offer with specific details of prevention of wear of chain due to chain sliding	
8.0.0	<b>SELECTION of BOI and COMPONENTS</b>	The makes of Components or Bought-Out-Items shall be strictly as per the list given below.	
8.1.0	Hoist Hook	HERMAN MOHTTA / HERCULES / SILPA UDYOG / SMRITI FORGINGS / KARACHIWALA	
8.2.0	Wire Rope	USHA MARTIN / FORT WILLIAM / RA WIRE ROPE	
8.3.0	Electric Motors	GEC / BHARAT BIJLEE / SIEMENS / KEC	
8.4.0	DC Brake Unit	Only BCH make	
8.5.0	Radio Remote Control	Tele crane make(F24-10D) Ittowa make (winner)	
8.6.0	Thruster Brake Unit	ELECTROMAG / SPEED-O-CONTROL / OMEGA	
8.7.0	Limit Switch (Gravity Type)	SIEMENS / INDUSTRIAL SYNDICATE / BCH / SKC / SOC	
8.8.0	Contactors	SIEMENS / L&T	
8.9.0	Over-Load-Relay	SIEMENS (THERMAL TYPE)	
8.10.0	HRC Fuses	ENGLISH ELECTRIC / L&T /SIEMENS	
8.11.0	MCB	L&T/SIEMENS	
8.12.0	Rotary limit switch	SIEMENS / OMEGA / SOC /	

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S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR's TECHNICAL OFFER (With Complete Details)
		INDUSTRIAL SYNDICATE	
8.13.0	Switch fuse unit	ENGLISH ELECTRIC / SIEMENS / GEC	
8.14.0	Moulded case C.B	SIEMENS / L&T	
8.15.0	Pneumatic Time Delay	Only BCH make	
8.16.0	Push - Buttons	SIEMENS / L&T / AIRON	
8.17.0	Connectors	Only ELMAX make	
8.18.0	Couplings	WMI / FENNER / ALFEX	
8.19.0	Bearings	SKF / NBC / ZKL	
8.20.0	Cables	Reputed Makes & ISI Approved	
8.21.0	Bridge Light Fittings	PHILIPS / GE / CROMPTON	
8.22.0	Load Cell	IPA make or reputed make with IS approved and acceptable to BHEL	
8.23.0	VVVF Drives	YASKAWA/MITSUBISHI/SIEMENS	
9.0.0	<b>DOCUMENTS/DETAILS for APPROVAL</b>	The following documents and details are to be submitted for BHEL Approval, prior to taking up the manufacture of the crane.	

**PART B. : TECHNICAL SPECIFICATIONS FOR 15 TON 22.7M ELECTRICALLY OPERATED OVER-HEAD TRAVELLING [E O T] CRANE WITH DOUBLE GIRDERS**

S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR's TECHNICAL OFFER (With Complete Details)
9.1.0	<p><b><u>Drawings and Documents:</u></b>  <b><u>Set I:</u></b>            a. Calculations for Selection of Electric Motors, Gear Reducers, Brakes, Couplings, etc.            b. Calculations for Bridge Girder, Crab, End - Carriage and their connections.            c. GA Drawing of the Crane.            d. GA Drawing of Trolley            e. GA Drawing of Individual Mechanisms.  <b><u>Set II:</u></b>            a. Drawings of Bridge, End-Carriage bogies and their connection.            b. Sub-Assembly Drawing for Wheels, Hook Blocks, Gear Boxes, Hoist rope drums and all brake Drums.            c. Wiring Diagram with Logic Circuits.            d. Cable Selection based on Current Rating.            e. Cable schedule            Initially Set I drawings to be submitted in one lot and approval to be obtained from BHEL. Based on this, set II drawings to be submitted for approval.</p>		
9.2.0	<p><b><u>Technical Details:</u></b>            a. Total Weight of the Crane including all Electrical Equipment            b. Total Weight of Trolley including all Electrical Equipment            c. Weight of each Bridge assembled and ready for erection with and without Mechanical and Electrical Equipment.            d. Weight of each End - Carriage assembled and ready for erection            e. Total Weight of Structural, Mechanical and Electrical Equipment and indicated Separately also.            f. Weight of Operator's Cabin together with all Equipment mounted in it.</p>		
10.0.0	<b>INSPECTION :</b> The following Schedule of Stage Inspections is to be strictly		

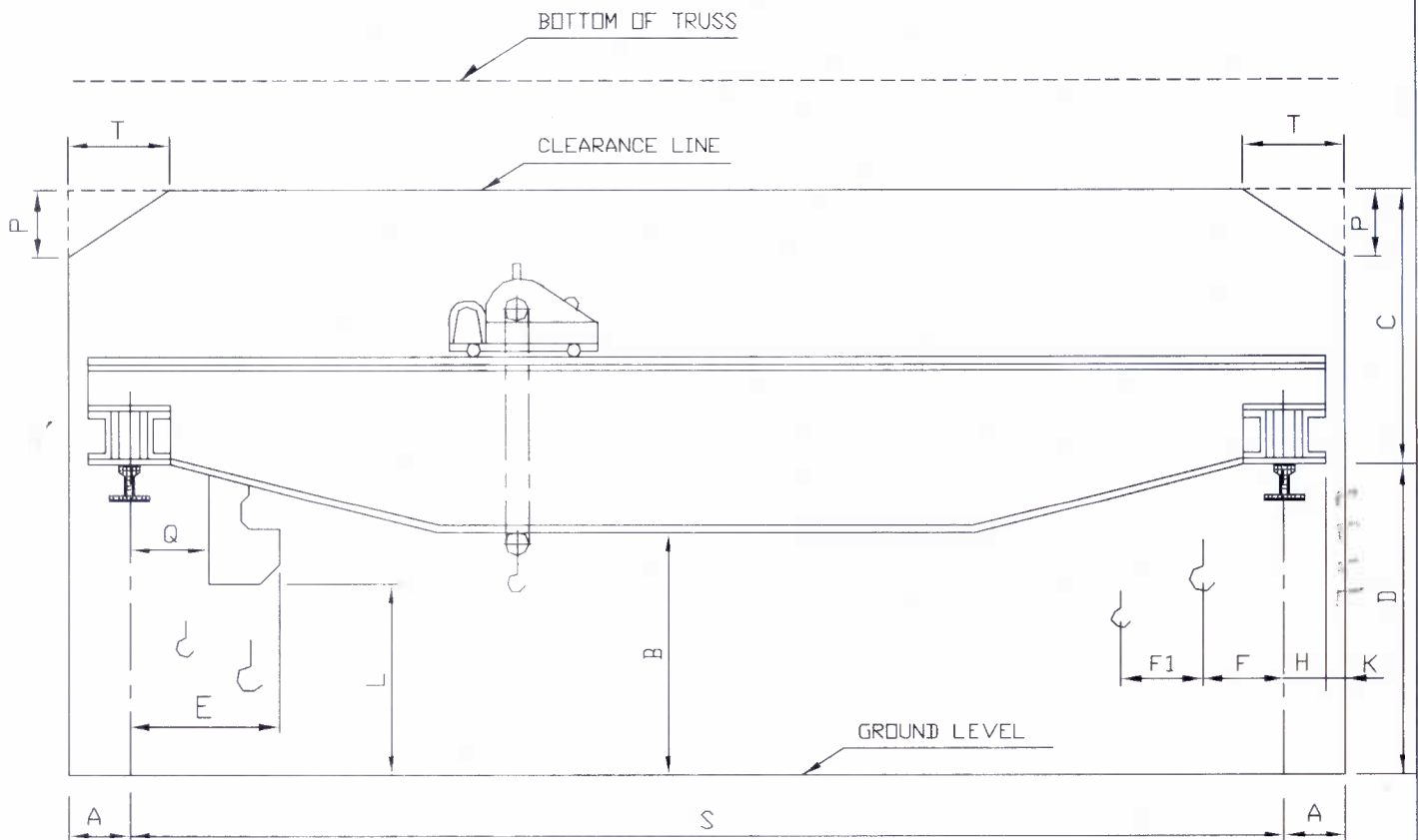
**PART B. : TECHNICAL SPECIFICATIONS FOR 15 TON 22.7M ELECTRICALLY OPERATED OVER-HEAD TRAVELLING [E O T] CRANE WITH DOUBLE GIRDERS**

S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR's TECHNICAL OFFER (With Complete Details)
		adhered to, prior to dispatch from the Supplier's Works	
10.1.0	<b><u>STAGE – I</u></b> a. Verification of Test Certificate for Raw Materials used for Girders, End-Carriages, Trolleys, Gear Box Casings, etc. b. Verification of X-Ray Report of Butt-Joints coming in the Girders and Random Testing on the Welds, by physical examination. c. Box Girder setting before closing of the Bottom Flanges – for inspecting the quality of welding and presence of waviness d. Trolley Frame Fabrication before setting the Mechanisms e. End – Carriage Fabrication		
10.2.0	<b><u>STAGE – II:</u></b> a. Inspection of Bridges and End – Carriages with Wheel Assembly and Alignment checking. b. Verification of Span & Diagonal Dimensions, Checking of Wheel Alignment, Mechanical Assemblies and Total Alignment. c. Free running of the all the Mechanisms.		
10.3.0	<b><u>STAGE – III [Final Inspection] :</u></b> a. Measurement of CAMBER in the Bridges. b. Full / Rated Load Test and Deflection Test. c. Deflection and Permanent Set Measurement. d. 25% OVER-LOAD Lifting Ability Check.		
11.0.0		<b>CRANE ERECTION &amp; COMMISSIONING</b>	
11.1.0	Unloading of all crane parts (like Girders, end carriage, CT assembly, LT Mechanism etc)	Unloading of all crane components shall be the scope of the supplier. Required mobile crane, manpower, lifting tackles etc. shall be the scope of supplier.	
11.2.0	Crane Erection & Cabling	Complete crane erection/installation, wiring/cabling of the various components at BHEL shall be the scope of the supplier.	

**PART B. : TECHNICAL SPECIFICATIONS FOR 15 TON 22.7M ELECTRICALLY OPERATED OVER-HEAD TRAVELLING [E O T] CRANE WITH DOUBLE GIRDERS**

S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR's TECHNICAL OFFER (With Complete Details)
11.3.0	<b>Crane Commissioning</b>	Commissioning of the Crane and Performance Prove –Out for the Crane's Capacity and Smooth Functioning of the Crane (at BHEL Works) shall be the RESPONSIBILITY of the supplier.	
12.0.0	<b><u>O &amp; M MANUALS :</u></b> Each Crane shall be provided with the following <ol style="list-style-type: none"> <li>1. VFD Programming &amp; Maintenance manual and Technical Information catalogue</li> <li>2. Data Sheet containing the Program data loaded in the VFD units.</li> <li>3. Manual for the Load cell calibration and trouble shooting</li> <li>4. THREE Copies of Erection, Operation &amp; Maintenance Manual hard copy and soft copy in CD, containing the following technical details</li> </ol>		
12.1.0	<b><u>Drawings &amp; Details :</u></b> <ol style="list-style-type: none"> <li>a. Crane GA Drawing</li> <li>b. Crab Assembly Drawing</li> <li>c. Total Crane Wiring Schematics</li> <li>d. Detailed Wiring Diagrams for Sub-Systems /Panels</li> <li>e. VVVF Drive's Logic Circuits</li> <li>f. Wheel Assembly Drawings</li> <li>g. Bottom Block Assembly Drawing</li> <li>h. Gear Box Assembly Drawings</li> <li>i. Coupling Drawing and Details</li> <li>j. Specifications/Ratings of All Bought-Out-Items</li> <li>k. Warranty/Guarantee Card for all Bought Out-items</li> <li>l. Trouble Shooting Chart for all Systems</li> </ol>		
13.0.0	<b><u>PERFORMANCE GUARANTEE :</u></b> The Performance of the Total Crane and/or the Components / Sub-Assemblies / Bought-Out-Items shall be guaranteed for a minimum period of twelve months from the date of performance acceptance at BHEL Works.		

# CLEARANCE DIAGRAM FOR E.O.T. CRANE



	50/15Tx22700 11 M. LIFT			
S	22700			
D	11000			
C	3300 MAX.			
A	350			
K	100 MIN.			
T	1550			
P	1000			
B				
L				
Q				
F				
F1				
H	250 MAX.			
E				

	DRAWN: G.G.R	DATE: 03/08/07	
TITLE:			M&S: PD: 07: 119
CLEARANCE DIAGRAM FOR E.O.T. CRANE			

Gardner
Murgum
Swiss
Abelthumer

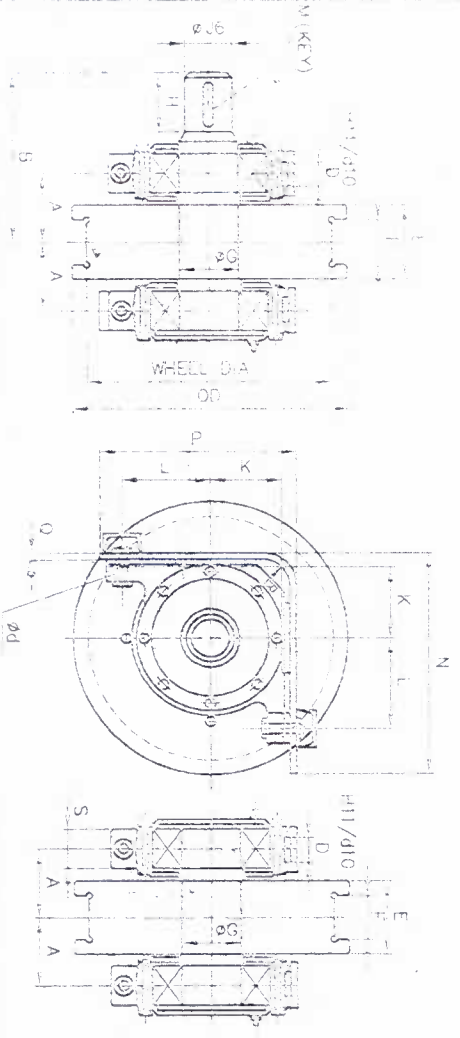
THIS DRAWING IS THE SOLE PROPERTY AND SHOULD NOT BE USED IN ANY FORM FOR ANY PURPOSES WITHOUT THE WRITTEN PERMISSION OF SHARAT HEAVY ELECTRICALS LIMITED, RICHHAPPALE - 582 014.

ALL DIMENSIONS ARE IN MM

Sl. No.	Code	RAIL	A	B	C	D	E	F	FG	H	I	J	K	L	M (KEY)	N	P	Q	R	Coupling No.	SKE DRG No.	BRG. SIZE	TOTAL WEIGHT IN KG.
16	800/R50	CR-100 CR-120	190	450	80	210	150	152	140	140	130	212	255	32	32x18x130	687	588	20	150	80	107	22330 150x320x108	870.00 845.00
15		CR-80	184	420	80	180	110	152	125	110	212	255	32	28x16x115	687	588	20	150	80	106	22330 150x320x109	796.00 775.00	
14		CR-150 CR-175	190	450	80	210	150	152	140	130	212	255	32	32x18x130	642	588	20	150	80	107	22330 150x320x108	808.00 784.00	
13	110/750	CR-100 CR-120	180	420	71	210	150	132	125	110	180	224	32	28x16x115	607	517	20	130	80	106	22336 150x280x93	728.50 711.50	
12		CR-80	180	400	71	180	110	132	125	110	180	224	32	28x16x115	607	517	20	130	80	106	22336 150x280x93	653.00 636.00	
11	550/580	CR-80/CR-100 CR-120	180	420	71	210	150	132	125	110	180	224	32	28x16x115	567	517	20	130	80	106	22332 130x280x93	434.50 418.00	
10		CR-80	150	365	60	180	105	111	110	90	160	190	26	25x14x100	547	462	20	120	60	105	22332 110x240x80	253.00 245.50	
9		CR-90 CR-100 CR-120	180	375	60	180	125	111	110	90	160	190	26	22x14x100	482	462	20	120	60	105	22318 90x190x64	389.00 378.00	
8	300/450	CR-80	150	360	50	180	125	91	105	80	125	150	26	22x14x90	445	395	20	100	50	104	22318 90x190x64	301.00 294.00	
7		CR-75/CR-80 CR-90	150	360	50	180	105	91	105	80	125	150	26	22x14x90	445	395	20	100	50	104	22318 90x190x64	253.00 245.50	
6	400/450	CR-80 CR-90	150	360	50	180	125	91	105	80	125	150	26	22x14x90	395	395	20	100	50	104	22318 90x190x64	197.00 192.00	
5		CR-75/CR-80 CR-90	145	315	40	180	105	76	85	70	112	140	22	20x12x75	375	345	16	90	50	103	22315 75x150x55	162.00 157.00	
4	420/570	CR-80 CR-90	145	315	40	180	105	76	85	70	112	140	22	20x12x75	345	345	16	90	50	103	22315 75x150x55	118.50 118.00	
3		CR-80/CR-90 CR-100	112.5	260	40	125	85	61	65	55	85	112	17	16x10x55	312	287	16	80	50	102	22312 60x130x46	66.00 63.00	
2	250/280	CR-80/CR-90 CR-100	105	250	32	125	85	61	65	55	75	100	17	16x10x55	254	249	12	60	40	102	22212 60x110x28	51.00 50.00	
1	200/230	CR-80/CR-90 CR-100	95	220	32	100	67	46	55	40	71	95	17	12x8x45	239	232	12	65	40	101	22309 45x100x36		

DIMENSIONS

MATERIAL: SMART - 45CB/15-12A%  
WHEEL - 55CB/15-15A%  
HEAD PORTION WHEEL HARDNESS 500 TO 550 (HRN)



DRIVING WHEEL ASSY

IDLE WHEEL ASSY

NO.	REV.	DATE	BY	CHKD	DESCRIPTION
1	00	20-10-2000			STANDARD
2	01				NET WT IN KGS
3	02				EQUIPMENT CODE
4	03				DATE
5	04				STG
6	05				INCH

**DESCRIPTION:** STANDARD CRANE WHEEL ASSY  
**SCALE:** 1:1  
**CHECKED:** [Signature]  
**APPROVED:** [Signature]  
**DATE:** 20-10-2000  
**TITLE:** STANDARD CRANE WHEEL ASSY  
**TYPE:** GENERAL  
**DRAWING No:** 3-M-02R-11993  
**REV.:** 00

*Handwritten notes:* "Banana", "Hanna", "Suresh", "A. Subramanian"