



# Bharat Heavy Electricals Limited

(High Pressure Boiler Plant)

Tiruchirappalli – 620014, TAMIL NADU, INDIA

CAPITAL EQUIPMENT / MATERIALS MANAGEMENT

An ISO 9001  
Company

<b>ENQUIRY</b>	Phone: +91 431 257 79 38 Fax : +91 431 252 00 31 Email : <a href="mailto:tvenkat@bheltry.co.in">tvenkat@bheltry.co.in</a> Web : <a href="http://www.bhel.com">www.bhel.com</a>
<b>NOTICE INVITING TENDER</b>	

<b>TWO PART BID</b>	<b>Enquiry Number:</b>	<b>Enquiry Date:</b>	<b>Due date for submission of quotation:</b>
Tender to be submitted in two Parts	<b>2621300004</b>	<b>20.02.2013</b>	<b>22.03.2013</b>

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	<b>50 Ton EOT Crane</b> 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> )	<b>1.00 No</b>

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

1. Delivery required 8 months from the date of purchase order.
2. EMD for this Tender will be ( INR ) : 2,00,000.00
3. Checklist No. **TRY/IND/06** to be filled and enclosed along with the offer failing which, the offer will not be considered for evaluation.
4. All updates, amendments, corrigenda, etc., (if any), for each tender will be posted only on the above websites from time to time, as and when required, until each tender is opened. There will be no publication of such updates, amendments, corrigenda, etc., through newspapers or any other media.

BHEL's General guidelines / instructions (refer **MM / CE / GENL / 001 - EMD**) including bank guarantee formats and list of consortium banks, commercial terms check-list can be downloaded from BHEL web site <http://www.bhel.com> or from the Government tender website <http://tenders.gov.in> (public sector units > Bharat Heavy Electricals Limited page) under Enquiry reference "**2621300004**".

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 <b>BHARAT HEAVY ELECTRICALS LIMITED</b>  Sr. Manager / Capital Equipment / MM
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**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 EOT CRANE**

<b>S. No.</b>	<b>PARTICULARS</b>	<b>VENDOR'S RESPONSE</b>
<b>1.0</b>	Only those Bidder/vendor (OEM), who have supplied and commissioned at least ONE 50Ton or higher capacity EOT crane class-3 with minimum span 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. 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.	
<b>2.0</b>	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.	
<b>3.0</b>	The bidding FIRM should have 'in-house' or 'self-owned' facility for FABRICATION and TESTING at 125 % of the rated capacity	
<b>4.0</b>	The vendor should have minimum 10 years experience in design, fabrication and supply of EOT cranes.	

**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 50/10 TON 22.7M SPAN 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>	<ul style="list-style-type: none"> <li>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.</li> <li>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).</li> <li>c. The shop floor environment will be dust prone, humid, welding fume filled and ambient temperature going up to 45° C.</li> </ul>	
2.0.0	<b>SCOPE OF SUPPLY</b>	<ul style="list-style-type: none"> <li>a. Design as per Tender Specifications</li> <li>b. Detailed Design and Manufacture as per BHEL SPECIFICATIONS</li> <li>c. Assembly and Testing before Despatch</li> <li>d. Supply in Modules / Sub-Assemblies</li> <li>e. Unloading of the crane components at the erection site</li> <li>f. Erection/installation and wiring/cabling of the EOT crane</li> <li>g. Commissioning and Performance Prove-Out at BHEL Works</li> <li>h. Performance Guarantee for 12 months, from the date of commissioning.</li> </ul>	

S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR's TECHNICAL OFFER (With Complete Details)
<b>3.0.0</b>	<b>TECHNICAL SPECIFICATIONS</b>		
<b>3.1.0</b>	<b>CAPACITY</b>	Lifting Capacity	
<b>3.1.1</b>	Main Hoist	50 Metric Tonnes	
<b>3.1.2</b>	Auxiliary Hoist	10 Metric Tonnes	
<b>3.2.0</b>	<b>SPAN</b>	Wheel Centre to Wheel Centre Dimensions	
<b>3.2.1</b>	Long Travel (LT)	22,700 mm	
<b>3.2.2</b>	Cross Travel (CT)	4,100 mm	
<b>3.3.0</b>	Height of Lift	11,000 mm [Effective Height of Lift for both the HOISTS]	
<b>3.4.0</b>	<b>DUTY CYCLE</b>	Related to Drive Motor & Mechanisms	
<b>3.4.1</b>	Hoists	40 % E D	
<b>3.4.2</b>	Long Travel	40 % E D	
<b>3.4.1</b>	Cross Travel	40 % E D	
<b>3.5.0</b>	<b>SPEED</b>	Operating / Working Speed [Maximum]	
<b>3.5.1</b>	Main Hoist	6 mtrs./minute.	
<b>3.5.2</b>	Auxiliary Hoist	12.0 mtrs./minute.	
<b>3.5.3</b>	Cross Travel (CT)	30.0 mtrs./minute.	
<b>3.5.4</b>	Long Travel (LT)	60.0 mtrs./minute.	
<b>3.6.0</b>	<b>MOTOR RATINGS</b>	Electric Drive Motor Ratings & Frame Sizes	
<b>3.6.1</b>	Main Hoist	75 kW ; Frame Size – 315 S / 6 Pole	
<b>3.6.2</b>	Auxiliary Hoist	35 kW ; Frame Size – 250 M / 6 Pole	
<b>3.6.3</b>	Cross Travel (CT)	7.5 kW ; Frame Size – 160 L / 6 Pole	
<b>3.6.4</b>	Long Travel (LT)	2 x 23 kW ; Frame Size – 225 M/6 Pole	
<b>3.7.0</b>	<b>GEAR BOX</b>	Gear Box Size	
<b>3.7.1</b>	Main Hoist	HR 850	
<b>3.7.2</b>	Auxiliary Hoist	HR 650	
<b>3.7.3</b>	Cross Travel (CT)	VR 500	
<b>3.7.4</b>	Long Travel (LT)	HR 500	

S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR's TECHNICAL OFFER (With Complete Details)
<b>3.8.0</b>	<b>ACCELERATION</b>		
<b>3.8.1</b>	Cross Travel (CT)	300 mm / sec.sq.	
<b>3.8.2</b>	Long Travel (LT)	300 mm / sec. sq.	
<b>3.9.0</b>	<b>HOIST ROPE DETAILS</b>	Size and Number of Falls of Rope	
<b>3.9.1</b>	Main Hoist	Dia. 28 mm ; Falls - 8	
<b>3.9.2</b>	Auxiliary Hoist	Dia. 18 mm ; Falls - 4	
<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>		
<b>3.17.1</b>	Cross Travel (CT)	ISR 60 Lbs./ Yard	
<b>3.17.2</b>	Long Travel (LT)	C R 80	
<b>3.18.0</b>	<b>Wheel Size</b>		
<b>3.18.1</b>	Cross Travel (CT)	Dia. 500 mm(4 nos of wheels)	
<b>3.18.2</b>	Long Travel (LT)	Dia. 630 mm (8 nos of wheels)	
<b>3.19.0</b>	<b>Brake Drum Size</b>	Hoist Brake Drum Sizes	
<b>3.19.1</b>	Main Hoist	Dia. 610 mm	
<b>3.19.2</b>	Auxiliary Hoist	Dia. 300 mm	
<b>3.19.3</b>	Cross Travel (CT)	Dia. 160 mm	
<b>3.19.4</b>	Long Travel (LT)	Dia. 200mm	

S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR'S TECHNICAL OFFER (With Complete Details)
<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 [Refer to Drawing No. <b>M&amp;S:PD:07:119</b> ] – Drawing enclosed with the tender as <b>ANNEXURE-1</b> .	
<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	
<b>5.1.1</b>	Cross section of Girder	Min. Girder Height – 1800mm Min. Girder width – 600mm Min. Top flange plate thickness – 16 mm Min. Bottom flange plate thickness – 12 mm Min. Web plate thickness – 10 mm Min.	
<b>5.1.2</b>	End Carriage	Box type construction for the end carriages	
<b>5.1.3</b>	Cross section of End Carriage	Min. Height – 700 mm Min. width – 350mm Min. Top flange plate thickness – 12mm Min. Bottom flange plate thickness – 12 mm Min. Web plate thickness – 10 mm	
<b>5.1.4</b>	End Carriage Design	The End Carriage shall be of Bogie type with 8 nos of Long Travel Wheels and with Pin joint between the Bogies and End carriage and the wheel spacing shall be 2000mm in the bogie	

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5.2.0	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 form part of the documentation.	
5.3.0	<b>Welded Joints</b>	To be followed for Girder Fabrication	
5.3.1	Number of weld Joints allowed in Girder	Two joints in girder web and flange plates.	
5.3.2	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.	
5.3.3	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.	
5.4.0	Splice Joints	NO SPLICE JOINT IS ALLOWED IN GIRDER FABRICATION [Girder has to be of SINGLE PIECE only].	
5.5.0	Platform on Girders	The Platforms provided on both the Girders shall be fixed through BOLTED JOINTS only.	
5.6.0	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 -2</b> ].	
5.7.0	Heat Treatment & NDT Examination	The Trolleys shall be Stress Relieved if necessary after welding and NDT examinations. All weldings shall be tested by	

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		NDT means [MPI, LPI & RT] after Stress Relieving operation.	
5.8.0	Machining Operation	All mechanical mating surfaces and wheel seating areas are to be machined to the required finish and protected	
5.9.0	Surface Cleaning	Both the Girders and the Trolleys are to be 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 <ul style="list-style-type: none"> <li>a. Touch-up painting of Primer wherever necessary</li> <li>b. Two coats of Enamel Paint (Color – Tractor Orange) each with a DFT of 25 microns and intermittent curing of minimum 16 hours.</li> <li>c. Required quantities of paints are the scope of the supplier.</li> </ul>	
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	

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		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 drum coupling. c. Between Gear Box and Wheels half gear couplings 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 (Makes acceptable to BHEL) shall be supplied along with the crane	
6.11.1	List of Tools	1. 3T chain block 3 M lift -one no 2. 50 T Hydraulic Jack -one no (Remote controlled type) 3. Grease gun (5 kg capacity) -one no	

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<b>7.0.0</b>	<b>ELECTRICAL ELEMENTS</b>		
<b>7.1.0</b>	Operational Controls	The Crane shall be provided with the following controls : a. Cabin Control [Master Control] b. Radio Remote Control [Microprocessor based Two Step Push Button Type]	
<b>7.2.0</b>	Control Voltage	110 V AC	
<b>7.3.0</b>	Type of Brakes	a. Main Hoist - DC Brake b. Auxiliary Hoist - DC Brake c. Cross Travel - Thruster Brake d. Long Travel - Thruster Brake	
<b>7.4.0</b>	Protection	All Panels, Limit-Switches and Motors shall have IP 54 protection.	
<b>7.5.0</b>	Electric Motors	All Electric Motors shall be as per IS-325 and IS-1231 and also suitable for <b>300</b> starts per hour.	
<b>7.6.0</b>	Electric Contactors	All Panels shall have only SIEMENS/L&T Contactors and shall be suitable for AC3 Duty Class.	
<b>7.7.0</b>	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.	
<b>7.8.0</b>	Long Travel Motion	A Dual Drive Mechanism shall be provided for LT (Long Travel) Motion.	
<b>7.9.0</b>	Illumination	a. Four numbers of 500 Watts Halogen Lamps shall be provided for under Bridge lighting. b. All Electric Panels shall be provided with suitable illumination for visibility and trouble shooting.	

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7.10.0	Controller Steps	A 5-Step Controller has to be provided for a. Main Hoist b. Auxiliary Hoist c. Long Travel d. Cross Travel Note: Cam discs 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 pulley. b. The display shall be of 100 mm size (JUMBO)	
7.14.0	Crab Wiring	Junction box shall be avoided for wiring of crab and in bridge end.	
	Cables	All cables shall be flexible copper only.	
7.15.0	Hoist limit	Each hoist shall be provided with both rotary and counter weight limits	
7.16.0	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.	
7.17.0	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	

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		of prevention of wear of chain due to chain sliding	
<b>8.0.0</b>	<b>SELECTION of BOI and COMPONENTS</b>	The makes of Components or Bought-Out-Items shall be strictly as per the list given below.	
<b>8.1.0</b>	Hoist Hooks	HERMAN MOHTTA / HERCULES / SILPA UDYOG / SMRITI FORGINGS / KARACHIWALA	
<b>8.2.0</b>	Wire Rope	USHA MARTIN / FORT WILLIAM / RA WIRE ROPE	
<b>8.3.0</b>	Electric Motors	GEC / BHARAT BIJLEE / SIEMENS / KEC	
<b>8.4.0</b>	DC Brake Unit	Only BCH make	
<b>8.5.0</b>	Radio Remote Control	Tele crane make(F24-10D) Ittowa make (winner)	
<b>8.6.0</b>	Thruster Brake Unit	ELECTROMAG / SPEED-O-CONTROL / OMEGA	
<b>8.7.0</b>	Limit Switch (Gravity Type)	SIEMENS / INDUSTRIAL SYNDICATE / BCH / SKC / SOC	
<b>8.8.0</b>	Contactors	SIEMENS / L&T	
<b>8.9.0</b>	Over-Load-Relay	SIEMENS (THERMAL TYPE)	
<b>8.10.0</b>	HRC Fuses	ENGLISH ELECTRIC / L&T /SIEMENS	
<b>8.11.0</b>	MCB	L&T/SIEMENS	
<b>8.12.0</b>	Rotary limit switch	SIEMENS / OMEGA / SOC / INDUSTRIAL SYNDICATE	
<b>8.13.0</b>	Switch fuse unit	ENGLISH ELECTRIC / SIEMENS / GEC	
<b>8.14.0</b>	Moulded case C.B	SIEMENS / L&T	
<b>8.15.0</b>	Pneumatic Time Delay	Only BCH make	
<b>8.16.0</b>	Push - Buttons	SIEMENS / L&T /AIRON	
<b>8.17.0</b>	Connectors	Only ELMAX make	
<b>8.18.0</b>	Couplings	WMI / FENNER / ALFEX	

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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.	
9.1.0	Drawings and Documents	<p><u>Set I:</u></p> <ol style="list-style-type: none"> <li>Calculations for Selection of Electric Motors, Gear Reducers, Brakes, Couplings, etc.</li> <li>Calculations for Bridge Girder, Crab, End - Carriage and their connections.</li> <li>GA Drawing of the Crane.</li> <li>GA Drawing of Trolley.</li> <li>GA Drawing of Individual Mechanisms.</li> </ol> <p><u>Set II:</u></p> <ol style="list-style-type: none"> <li>Drawings of Bridge, End-Carriage bogies and their connection.</li> <li>Sub-Assembly Drawing for Wheels, Hook Blocks, Gear Boxes, Hoist rope drums and all brake Drums.</li> <li>Wiring Diagram with Logic Circuits.</li> <li>Cable Selection based on Current Rating.</li> <li>Cable schedule</li> </ol> <p>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</p>	

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		submitted for approval.	
9.2.0	Technical Details	<ul style="list-style-type: none"> <li>a. Total Weight of the Crane including all Electrical Equipment</li> <li>b. Total Weight of Trolley including all Electrical Equipment</li> <li>c. Weight of each Bridge assembled and ready for erection with and without Mechanical and Electrical Equipment.</li> <li>d. Weight of each End – Carriage assembled and ready for erection</li> <li>e. Total Weight of Structural, Mechanical and Electrical Equipment and indicated separately also.</li> <li>f. Weight of Operator's Cabin together with all Equipment mounted in it.</li> </ul>	
10.0.0	<b>INSPECTION</b>	The following Schedule of Stage Inspections is to be strictly adhered to, prior to dispatch from the Supplier's Works	
10.1.0	STAGE – I	<ul style="list-style-type: none"> <li>a. Verification of Test Certificate for Raw Materials used for Girders, End-Carriages, Trolleys, Gear Box Casings, etc.</li> <li>b. Verification of X-Ray Report of Butt-Joints coming in the Girders and Random Testing on the Welds, by physical examination.</li> <li>c. Box Girder setting before closing of the Bottom Flanges – for inspecting the quality of welding and presence of waviness</li> </ul>	

S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR'S TECHNICAL OFFER (With Complete Details)
		d. Trolley Frame Fabrication before setting the Mechanisms e. End – Carriage Fabrication	
10.2.0	STAGE – II	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	STAGE – III [Final Inspection]	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.	
11.2.1	BHEL Supply for Crane Erection	The following items shall be supplied by BHEL free of cost for the Crane Erection activities 1. Dead weight for load testing	

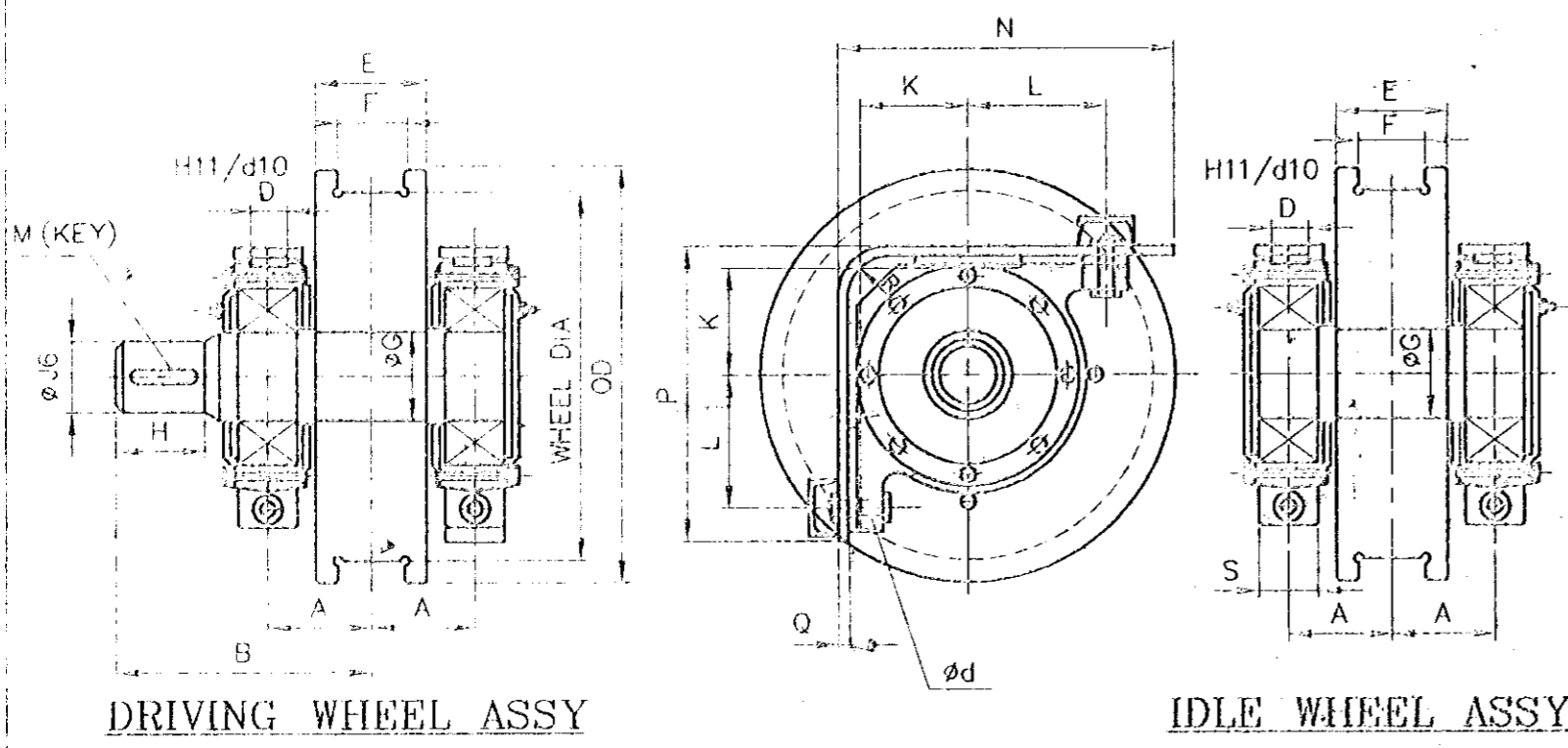
S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR'S TECHNICAL OFFER (With Complete Details)
		2. Power supply. 3. Any steel items like angles, channels etc required for scaffolding or other miscellaneous erection works.	
11.3.0	Crane Commissioning	Commissioning of the Crane and Performance Prove –Out for the Crane's Capacity and Smooth Functioning of the Crane (at BHEL Works) shall be the RESPONSIBILITY of the supplier.	
12.0.0	<b>O &amp; M MANUALS</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	Drawings & Details	<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> </ol>	

S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR'S TECHNICAL OFFER (With Complete Details)
		i. Coupling Drawing and Details j. Specifications/Ratings of All Bought-Out-Items k. Warranty/Guarantee Card for all Bought Out-items l. Trouble Shooting Chart for all Systems	
13.0.0	<b>PERFORMANCE GUARANTEE</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.	

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ALL DIMENSIONS ARE IN MM

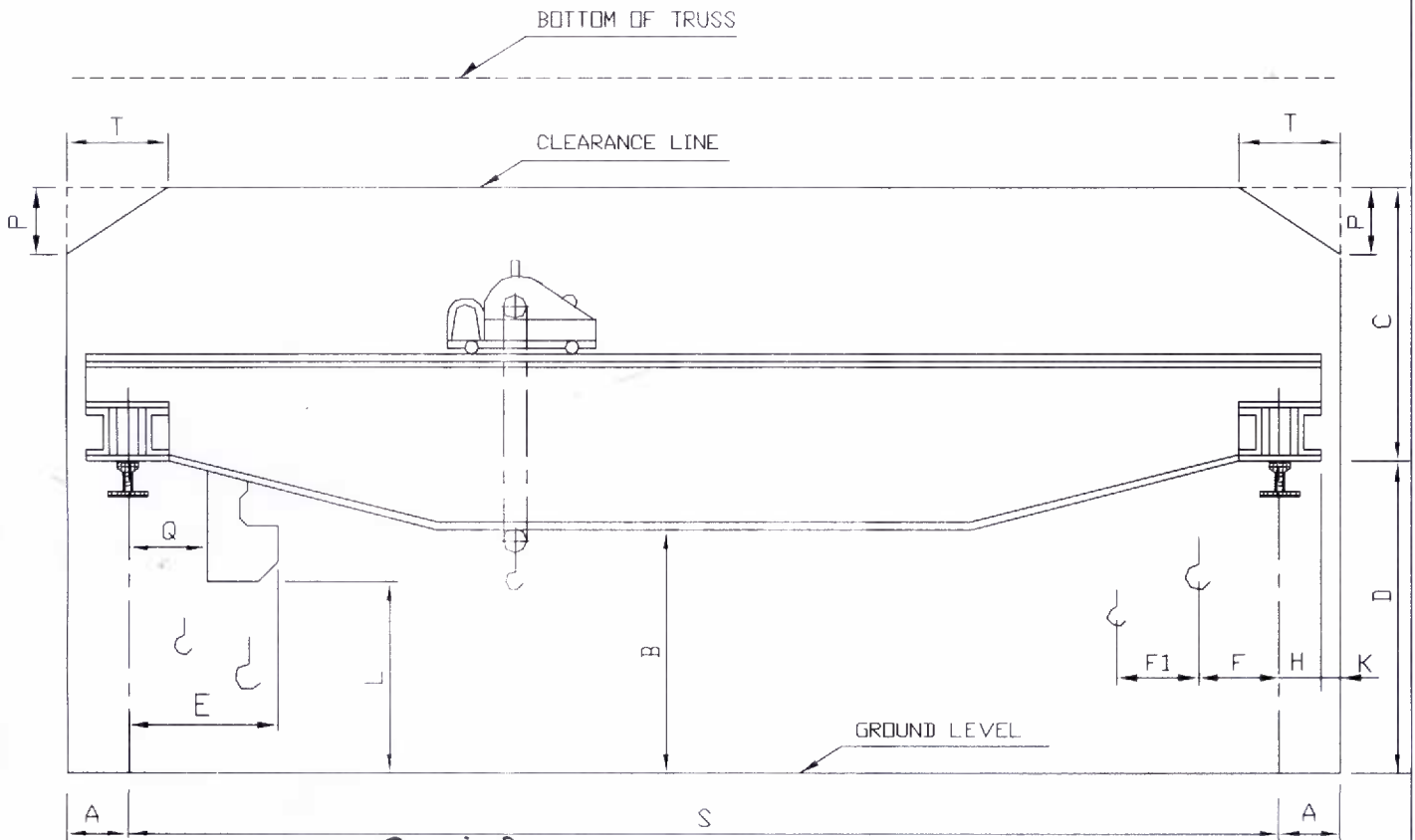
SL. No.	W.D. (WHEEL DIA) IN MM	RAIL SIZE	A	B	D	E	F	ØG	H	ØJ	K	L	Ød	M (KEY)	N	P	Q	S	R	COUPLING No.	SKF BRG No. & BRG. SIZE	TOTAL WEIGHT IN Kg. FOR DRIVE & IDLE
16	800/850	CR-100 CR-120	190	450	80	210	150	152	140	130	212	255	32	32x18x130	687	588	20	150	80	107	22330 150x320x108	870.00 845.00
15		CR-80	168	420	80	180	110	152	125	110	212	255	32	28x16x115	687	588	20	150	80	106	22330 150x320x108	796.00 775.00
14		CR-100 CR-120	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	710/750	CR-100 CR-120	180	420	71	210	150	132	125	110	180	224	32	28x16x115	607	517	20	130	80	106	22326 130x280x93	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	22326 130x280x93	653.00 636.00
11	630/680	CR-80/CR-100 & CR-120	180	420	71	210	150	132	125	110	180	224	32	28x16x115	567	517	20	130	80	106	22326 130x280x93	629.00 611.50
10		90-105 Lbs/Yd CR-80	150	365	60	180	105	111	110	90	160	190	26	25x14x100	547	462	20	120	60	105	22322 110x240x80	448.00 434.50
9		CR-80 CR-100	160	375	60	180	125	111	110	90	160	190	26	22x14x100	482	462	20	120	60	105	22322 110x240x80	253.00 245.50
8	500/550	CR-80	150	360	50	180	125	91	105	80	125	160	26	22x14x90	445	395	20	100	50	104	22318 90x190x64	389.00 378.00
7		60/75/90 & 105 Lbs/Yd	150	360	50	180	105	91	105	80	125	160	26	22x14x90	445	395	20	100	50	104	22318 90x190x64	301.00 294.00
6	400/450	CR-80 CR-100	150	360	50	180	125	91	105	80	125	160	26	22x14x90	395	395	20	100	50	104	22318 90x190x64	253.00 245.50
5		90 Lbs/Yd 105 Lbs/Yd	145	315	40	180	105	76	85	70	112	140	22	20x12x75	375	345	16	90	50	103	22315 75x160x55	197.00 192.00
4	320/370	75 / 90 & 105 Lbs/Yd CR-80	145	315	40	180	105	76	85	70	112	140	22	20x12x75	345	345	16	90	50	103	22315 75x160x55	162.00 157.00
3		50 SQ.BAR 60 Lbs/Yd 75 Lbs/Yd	112.5	260	40	125	85	61	65	55	85	112	17	16x10x55	312	287	16	80	50	102	22312 60x130x46	118.50 118.00
2	250/280	50 SQ.BAR 60 / 90 & 105 Lbs/Yd	105	250	32	125	85	61	65	55	76	100	17	16x10x55	254	249	12	60	40	102	22212 60x110x28	66.00 63.00
1	200/230	50 Lbs/Yd 50 SQ.BAR 60 Lbs/Yd	95	220	32	100	67	46	55	40	71	95	17	12x8x45	239	232	12	65	40	101	22309 45x100x36	51.00 50.00



MATERIAL :- SHAFT - 45CB/IS:4283.  
WHEEL - 55CB/IS:5517.  
FORGED.  
THREAD PORTION WHEEL HARDNESS 300 TO 350 (BHN)

No. of Pieces		DESCRIPTION	MATERIAL	STANDARD	NET.WT.IN KGS.	DRAWING No.	ITEM No.
REFERENCE				COMPONENT CODE: 29	EQUIPMENT CODE: 00		
SCALE		DRAWN	CHECKED	APPROVED	DATE	ALTERATIONS	DCN. REF
					20-10-2000		
MACHINE: CRANE WHEEL ASSY				TYPE: GENERAL			
TITLE: STANDARD CRANE WHEEL ASSY				DRAWING No. 3-M-02R-11993		REV.	
No. of Sheets				Sheet No.			

# CLEARANCE DIAGRAM FOR E.O.T. CRANE



*Q. width*

	50/10T x 22700 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: CLEARANCE DIAGRAM FOR E.O.T. CRANE		M&S: PD: 07: 119

Gandhi
Durgas
Smith
Rathakumar