



An ISO 9001  
Company

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

<b>ENQUIRY</b>	Phone: +91 431 257 75 75 Fax : +91 431 252 07 19 Email : <a href="mailto:rrmanohar@bheltry.co.in">rrmanohar@bheltry.co.in</a> Web : <a href="http://www.bhel.com">www.bhel.com</a>
----------------	---

	<b>Enquiry Number:</b>	<b>Enquiry Date:</b>	<b>Due date for submission of quotation:</b>
	<b>2620600026</b>	<b>20.05.2006</b>	<b>01.07.2006</b>

Your are requested to quote the Enquiry number date and due date in all your correspondences. This is only a request for quotation and not an order

Item	Description	Quantity	Delivery Schedule
10	20 Ton EOT Crane with radio remote control as per the technical specification & commercial conditions applicable (to be downloaded from web site <a href="http://www.bhel.com">www.bhel.com</a> )	8 Nos.	24.04.2007

**Note:**

- (1) The detailed Technical Specification along with technical point-by-point confirmation, Commercial Terms & Conditions applicable for this Enquiry, Confirmation of acceptance for BHEL commercial terms & conditions and Price Bid formats have been posted in BHEL Corporate web site [www.bhel.com](http://www.bhel.com) under Enquiry reference “2620600026”. Your offer should be based on all the above documents.
- (2) Also, you are requested to fill in the Supplier Registration formats available in [www.bhel.com](http://www.bhel.com) (under Advancement – Supplier Registration) and send it along with your offer.

Tenders should reach us before 14:00 hours on the due date Tenders will be opened at 14:30 hours on the due date Tenders would be opened in presence of the tenderers who have submitted their offers and who may like to be present	Yours faithfully, For BHARAT HEAVY ELECTRICALS LIMITED  Dy. Genl. Manager / Capital Purchase / MM / Manufacturing
--	---

**PART A.****QUALIFYING CRITERIA FOR THE SUPPLY OF EOT CRANES****SECTION – I**

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

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

<b>S.No.</b>	<b>PARTICULARS</b>	<b>VENDOR's RESPONSE</b>
<b>1.0</b>	Number of Years of Experience of the BIDDER / VENDOR in the CRANES Field [Design, Manufacture & Supply]	
<b>2.0</b>	Number of Cranes supplied, erected & commissioned till date in the following category (Classification based on CAPACITY, SPAN and LIFT) : a) E O T Cranes b) Gantry Cranes c) Semi-Gantry Cranes	
<b>3.0</b>	Number of Cranes supplied, erected & commissioned till date for the following category of CUSTOMERS : a) Central Government Organisations b) Public Sector Enterprises c) Private Sector Companies [Large Scale Industries]	
<b>4.0</b>	Number of Cranes supplied, erected & commissioned till date in the following category (Classification based on Class of Duty) : a) Class III Duty b) Class II Duty c) Class I Duty d) Steel Plant Duty	
<b>5.0</b>	Details of Design Set-Up	
<b>6.0</b>	Details on International & Indian Standards or Codes followed in Design	
<b>7.0</b>	Details of Manufacturing Facilities for Crane Structures and Components : a) Fabrication Facilities b) Machining Facilities c) Crane Assembly & Testing Facilities	
<b>8.0</b>	Details on Heat-Treatment Facilities	

<b>S.No.</b>	<b>PARTICULARS</b>	<b>VENDOR's RESPONSE</b>
<b>9.0</b>	Details on Shopfloor / Outer-Yard Handling Facilities of the VENDOR	
<b>10.0</b>	Comprehensive Details on Load Testing - - SWL & O/L (Safe Working Load & Over Load @ 25%) Facilities	
<b>11.0</b>	Details of Quality System followed	
<b>12.0</b>	Details on Stages of Internal Inspection and Inspection by External Agencies [other than Customer Inspection]	
<b>13.0</b>	Details of NDT Facilities – like X Ray, MPI and Ultrasonic Testing	
<b>14.0</b>	Details of Electrical Panel Manufacturing and Testing Facilities	
<b>15.0</b>	The Areas of Sub-Contracting Works and the Percentage of Sub-Contracting Works	
<b>16.0</b>	Type of Quality Audit and Routine Inspection Procedures for jobs loaded on the Sub-Contractors	
<b>17.0</b>	Number of Cranes Designed , Supplied and Commissioned – which have THYRISTOR controlled system for all motions, with capacity of lifting & span	
<b>18.0</b>	Number of Cranes Designed , Supplied and Commissioned – which have FREQUENCY CONVERTOR system for all motions, with capacity of lifting & span	
<b>19.0</b>	Details on AFTER-SALES-SERVICE Set-Up	
<b>20.0</b>	Any Additional Data to supplement the manufacturing capability of the BIDDER	

## SECTION – II

The BIDDER / VENDOR has to compulsorily meet the following requirements to get qualified for submitting an offer for the CRANES :

<b>S.No.</b>	<b>REQUIREMENTS</b>	<b>VENDOR's COMMENTS</b>
<b>21.0</b>	The BIDDER / VENDOR shall have a minimum of TEN Years of Continuous Experience of in the CRANES Field [Design, Manufacture & Supply]	
<b>22.0</b>	The BIDDER / VENDOR might have supplied at least one number 30 Ton EOT Crane with a SPAN not less than 28 Mtrs in the last FIVE Years	
<b>23.0</b>	The bidding FIRM should have 'in-house' or 'self-owned' facility for FABRICATION and TESTING at 125 % of the rated capacity	

<b>S.No.</b>	<b>REQUIREMENTS</b>	<b>VENDOR's COMMENTS</b>
<b>24.0</b>	Reference List of Customers and Performance Certificate from CUSTOMERS (minimum 2 to 3 Customers) with details of CONTACT PERSON, for whom EOT CRANES of Capacity 20 Tons and above have been supplied	
<b>25.0</b>	The BIDDER / VENDOR should have sound financial position and should furnish the Finance Statements (Summary of P & L Statement and Balance Sheet) for the immediate past three years.	
<b>26.0</b>	In case of short listing by the Purchaser, the BIDDER / VENDOR has to co-ordinate for the visit of Assessing Team, to the WORKS of the BIDDER / VENDOR with a notice period of 10 Days.	

### SECTION – III

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

<b>S.No.</b>	<b>REQUIREMENTS</b>	<b>VENDOR's COMPLIANCE</b>
<b>27.0</b>	The BIDDER / VENDOR shall submit the offer in TWO PARTS - Technical & Commercial and Price Bid. The Technical Offer shall be in line with the BHEL Technical Specifications and the Guidelines or Annexures mentioned, wherever applicable.	
<b>28.0</b>	The Technical Offer shall contain a comparative statement of Technical Specifications given by BHEL and the Offer Details submitted by the Bidder, against each clause of the specifications.	
<b>29.0</b>	A just '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>30.0</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>31.0</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>32.0</b>	The reference List of Customers shall be accompanied with the details (Phone Number/E-Mail ID) of the CONTACT PERSON for cross reference	

**PART B.**

**TECHNICAL SPECIFICATIONS FOR ELECTRICALLY OPERATED  
OVER-HEAD TRAVELLING [ 20/10 Ton-E O T] CRANE WITH DOUBLE GIRDERS**

S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR's TECHNICAL OFFER (With Complete Details)
1.0.0	APPLICATION	<p>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 shopfloor.</p> <p>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).</p> <p>c. The shopfloor environment will be dust prone, humid, welding fume filled and ambient temperature going upto 60 to 65 ° C. , due to pre-heating of jobs.</p>	
2.0.0	SCOPE OF SUPPLY	<p>a. Design as per Tender Specifications</p> <p>b. Detailed Design and Manufacture as per BHEL GENERAL SPECIFICATIONS, given as <b>ANNEXURE-3</b>.</p> <p>c. Assembly and Testing before Despatch</p> <p>d. Supply in Modules / Sub-Assemblies</p> <p>e. Commissioning and Performance Prove-Out at BHEL Works</p> <p>f. Performance Guarantee for 12 months, from the date of commissioning.</p>	

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>	CAPACITY	Lifting Capacity	
<b>3.1.1</b>	<b>Main Hoist</b>	<b>20 Metric Tonnes</b>	
<b>3.1.2</b>	<b>Auxiliary Hoist</b>	<b>10 Metric Tonnes</b>	
<b>3.2.0</b>	SPAN	Wheel Centre to Wheel Centre Dimensions	
<b>3.2.1</b>	<b>Long Travel (LT)</b>	<b>28,650 mm</b>	
<b>3.2.2</b>	Cross Travel (CT)	3,500 mm	
<b>3.3.0</b>	Height of Lift	8,000 mm [Effective Height of Lift for both the HOISTS]	
<b>3.4.0</b>	DUTY CYCLE	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>	SPEED	Operating / Working Speed [Maximum]	
<b>3.5.1</b>	Main Hoist	7.5 mtrs./minute.	
<b>3.5.2</b>	Auxiliary Hoist	15.0 mtrs./minute.	
<b>3.5.3</b>	Cross Travel (CT)	30.0 mtrs./minute.	
<b>3.5.4</b>	Long Travel (LT)	70.0 mtrs./minute.	
<b>3.6.0</b>	MOTOR RATINGS	Electric Drive Motor Ratings & Frame Sizes	
<b>3.6.1</b>	Main Hoist	33.6 kW ; Frame Size – 225 M / 6 Pole	
<b>3.6.2</b>	Auxiliary Hoist	33.6 kW ; Frame Size – 225 M / 6 Pole	
<b>3.6.3</b>	Cross Travel (CT)	5.5 kW ; Frame Size – 132 M / 6 Pole	
<b>3.6.4</b>	Long Travel (LT)	2 x 17 kW ; Frame Size – 225 L / 6 Pole	
<b>3.7.0</b>	GEAR BOX	Gear Box Size	
<b>3.7.1</b>	Main Hoist	HR 650	
<b>3.7.2</b>	Auxiliary Hoist	HR 650	
<b>3.7.3</b>	Cross Travel (CT)	VR 400	
<b>3.7.4</b>	Long Travel (LT)	HR 400	

S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR's TECHNICAL OFFER (With Complete Details)
<b>3.8.0</b>	ACCELERATION		
<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>	HOIST ROPE DETAILS	Size and Number of Falls of Rope	
<b>3.9.1</b>	Main Hoist	Dia. 18 mm ; Falls - 8	
<b>3.9.2</b>	Auxiliary Hoist	Dia. 18 mm ; Falls - 4	
<b>3.10.0</b>	CONTROL	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 $\pm$ 10% Volts , 50 $\pm$ 3% Hz, 3 Phase- AC	
<b>3.14.0</b>	Duty Class	<b>Class – 3 [Indoor Service]</b>	
<b>3.15.0</b>	Mechanism Group Classification	<b>M 6</b>	
<b>3.16.0</b>	DESIGN STANDARD	IS – 807 & 3177 / 1999	
<b>3.17.0</b>	Runway Rail Size		
<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>	Wheel Size		
<b>3.18.1</b>	Cross Travel (CT)	Dia. 320 mm	
<b>3.18.2</b>	Long Travel (LT)	Dia. 630 mm	
<b>3.19.0</b>	Brake Drum Size	Hoist Brake Drum Sizes	
<b>3.19.1</b>	Main Hoist	Dia. 300 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. 200 mm	

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:06:024</b> ] – Drawing enclosed with the tender as <b>ANNEXURE-1</b> .	Bidder to give the Clearance Dimensions with the Technical Offer, as per the style in the drawing mentioned.
<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>5.2.0</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 form part of the documentation.	
<b>5.3.0</b>	Welded Joints	To be followed for Girder Fabrication	
<b>5.3.1</b>	Number of Joints allowed	For Span upto 23 mtrs. - Two joints For Span 23 mtrs. to 32 mtrs. - Three joints	
<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 (both 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.	



S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR's TECHNICAL OFFER (With Complete Details)
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. [Refer to 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 by thermal heat-treatment process after welding and NDT examinations. All weldings shall be tested by 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 shot blasted or chemically treated for surface cleaning, after completion of all operations but prior to painting.	
5.10.0	Painting	The crane parts are to be painted as follows : a. One coat of Primer with 25 microns of DFT (Dry Film Thickness) and 48 hours of compulsory curing after painting. b. Two coats of Enamel Paint (Colour – Tractor Orange) each with a DFT of 25 microns and intermittent curing of minimum 16 hours.	

S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR's OFFER (With Complete Details)
<b>6.0.0</b>	<b>MECHANICAL ELEMENTS</b>		
<b>6.1.0</b>	Gears	Gears in all the Stages shall be helical in design and to be of machined & ground and hardened.	
<b>6.2.0</b>	Gear Box Casing	Shall be of fabricated type and stress relived by thermal heat-treatment process, prior to machining.	
<b>6.3.0</b>	Rope Drum	Shall be of fabricated type and stress relieved. The circumferential weld joints shall be tested by 100 % X-Ray for quality assurance.	
<b>6.4.0</b>	Type of Coupling	Only GEARED COUPLING to be used a. between Electric Motor and Gear Box b. between Gear Box and Rope Drum c. between Gear Box and Trolley Wheels	
<b>6.5.0</b>	Wheels	The Wheels shall be of Die-Forged and Wheel Tread hardened to 300/350 BHN. Wheels shall be fitted with L-Type Bearings	
<b>6.6.0</b>	Mechanical Joints	Fit Bolts as per IS 3640-1982 for all joints coming in main members	
<b>6.7.0</b>	Pulley Dimension	Rope Pulley diameter shall be 23 times that of Rope diameter	
<b>6.8.0</b>	Hook	Hook latch shall be provided for both hooks	
<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 [Push Button Type]	
<b>7.2.0</b>	Control Voltage	110 V AC	
<b>7.3.0</b>	Protection	All Panels, Limit-Switches and Motors shall have IP 54 protection.	

S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR's OFFER (With Complete Details)
7.4.0	Type of Brakes	a. Main Hoist - DC Brake b. Auxiliary Hoist - DC Brake c. Cross Travel - Thruster Brake d. Long Travel - Thruster Brake	
7.5.0	Electric Motors	All Electric Motors shall be as per IS-325 and IS-1231 and also suitable for 500 starts per hour.	
7.6.0	Electric Contactors	All Panels shall have only SIEMENS 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. Auxiliary Hoist c. Long Travel d. Cross Travel	
7.11.0	Frequency Converter	The VVVF Drive shall be supplied with suitable DBR for all motions and program feeder.	
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 to 10.0 metres.	

S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR's TECHNICAL OFFER (With Complete Details)
7.13.0	Load Cell	a. Load Weighing System with LOAD CELL to be fixed / provided at the equalizer pulley. b. The display shall be of 100 mm size (JUMBO)	
7.14.0	Crab Wiring	The CRAB shall be fully wired with junction box.	
7.15.0	Hoist limit	Each hoist shall be provided with both rotary and counter weight limits	
7.16.0	Cabin	Light, fan, warning bell and emergency push pushbutton shall be provided in the cabin	
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 Hooks	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	Only SNT make	
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	Only SIEMENS make	
8.9.0	Over-Load-Relay	SIEMENS (THERMAL TYPE)	
8.10.0	HRC Fuses	ENGLISH ELECTRIC / L&T /SIEMENS	
8.11.0	Switch fuse unit	ENGLISH ELECTRIC / SIEMENS / GEC	

S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR's OFFER (With Complete Details)
8.12.0	Rotary limit switch	SIEMENS / OMEGA / SOC / INDUSTRIAL SYNDICATE	
8.13.0	Moulded case C.B	SIEMENS / L&T	
8.14.0	Pneumatic Time Delay	Only BCH make	
8.15.0	Push - Buttons	SIEMENS / L&T / AIRON	
8.16.0	Connectors	Only ELMAX make	
8.17.0	Couplings	WMI / FENNER / ALFEX	
8.18.0	Bearings	SKF / NBC / ZKL	
8.19.0	Cables	Reputed Makes & ISI Approved	
8.20.0	Bridge Light Fittings	PHILIPS / GE / CROMPTON	
8.21.0	Load Cell	Only IPA make	
8.22.0	VVVF Drives	ABB / SIEMENS / L&T	

S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR's OFFER
9.0.0	INSPECTION	The following Schedule of Stage Inspections is to be strictly adhered to, prior to dispatch from the Supplier's Works	
9.1.0	STAGE – I	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	

S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR's OFFER
9.2.0	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.	
9.3.0	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.	
10.0.0	DOCUMENTS for BHEL APPROVAL	The following documents and details are to be submitted for BHEL Approval, prior to taking up the manufacture of the crane.	
10.1.0	Drawings and Documents	a. GA Drawing of the Crane. b. GA Drawing of Crab with Trolley c. GA Drawing of Individual Mechanisms. d. Drawings of Bridge, End-Carriage and their connection. e. Sub-Assembly Drawing for Wheels, Hook Blocks, Gear Boxes & Hoist Drums. f. Calculations for Selection of Electric Motors, Gear Reducers, Brakes, Couplings g. Calculations for Bridge Girder, Crab, End - Carriage and their connections. h. Wiring Diagram with Logic Circuits. i. Cable Selection based on Current Rating.	

S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR's OFFER
10.2.0	Technical Details	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.	
11.0.0	<b>CRANE ERECTION &amp; COMMISSIONING</b>		
11.1.0	Mechanical Erection	Erection of the Crane will be done by BHEL, as per the guidelines furnished in the Erection Manual given by the Supplier	
11.2.0	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.	

S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR's OFFER
12.0.0	O & M MANUALS	Each Crane shall be provided with complete set of tools required for maintenance, THREE Copies of Erection, Operation & Maintenance Manual hard copy and soft copy in CD, containing the following technical details	
12.1.0	Drawings & Details	a. Crane GA Drawing b. Crab Assembly Drawing c. Total Crane Wiring Schematics d. Detailed Wiring Diagrams for Sub-Systems / Panels e. VVVF Drive's Logic Circuits f. Wheel Assembly Drawings g. Bottom Block Assembly Drawing h. Gear Box Assembly Drawings 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	PERFORMANCE GUARANTEE	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.	

#### REFERENCE DOCUMENTS :

- 1) TENDER SPECIFICATIONS – PART A
- 2) ANNEXURE – 1 [CLEARANCE DRAWING]
- 3) ANNEXURE – 2 [CRANE WHEEL ASSEMBLY DETAILS]
- 4) ANNEXURE – 3 [CRANE CONSRTUCTION – GENERAL CONDITIONS]