



Bharat Heavy Electricals Limited

(High Pressure Boiler Plant)

Tiruchirappalli – 620014, TAMIL NADU, INDIA

CAPITAL EQUIPMENT / MATERIALS MANAGEMENT

ENQUIRY	Phone: +91 431 257 76 53 Fax : +91 431 252 00 31 Email : skaruna@bheltry.co.in Web : www.bhel.com
NOTICE INVITING TENDER	

TWO PART BID Tender to be submitted in two Parts	Enquiry Number: 2731400001	Enquiry Date: 08.01.2014	Due date for submission of quotation: 24.02.2014
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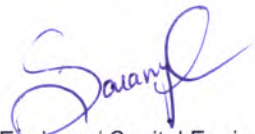
You are requested to quote the Enquiry number date and due date in all your correspondence. This is only a request for quotation and not an order.
Please note that under any circumstances both delayed offer and late offers will not be considered. Hence vendors are requested to ensure that the offer is reaching physically our office before 14.00 hrs on the Date of tender opening.

Item	Description	Quantity	Delivery Required	Delivery Terms Required
10	5 Ton EOT Crane as per the technical specification & commercial conditions applicable (to be downloaded from web site www.bhel.com or http://tenders.gov.in)	01 No.	6 months from the date of Purchase Order	F.O.R, BHEL Stores, Trichy

Important points to be taken care during submission of offer:-

- The rate of EMD for this Tender will be (INR): 40,000/-.
- The Compliance Form for Commercial Terms & Conditions to be filled and enclosed along with the offer failing which, the offer will not be considered for evaluation.
- 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 above Enquiry reference.

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  Engineer/ Capital Equipment / MM
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5T EOT CRANE – Technical Specification

PART A – QUALIFYING CRITERIA

SECTION-I:

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**

S. No.	PARTICULARS	VENDOR'S RESPONSE
1.0	Only those Bidder/vendor (OEM), who have supplied and commissioned at least TWO 5T or higher capacity EOT crane class-3 with minimum span of 15.0 Mtr or higher, fitted with frequency converter drive, in the past five years and such crane is working satisfactorily for more than one year after commissioning (on the date of opening of Tender), should quote. Copies of Purchase Order with detailed specification and Annexures and corresponding Commissioning certificates shall be submitted along with the offer.	
2.0	Only those Bidder/vendor (OEM), who have supplied and commissioned at least one EOT crane for clean room application of Controlled environment ISO Class-8 or higher as per ISO 14644-1, should quote. Corresponding Purchase Order copy with detailed specification and Performance certificate from customer shall be submitted along with the offer.	
3.0	Vendor to submit Performance certificates along with their offer from minimum two of their customers for satisfactory performance of 5T EOT cranes of class-3 with minimum span of 15m or higher, fitted with frequency converter drive, supplied to them and are working satisfactorily for more than one year after commissioning (as on the date of opening of tender). Suggestive format is given in the annexure.	
4.0	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.	
5.0	The bidding FIRM should have 'in-house' or 'self-owned' facility for FABRICATION and TESTING at 125 % of the rated capacity	
6.0	The vendor should have minimum 5 years' experience in design, fabrication and supply of EOT cranes.	
7.0	DELIVERY - The bidder shall quote the best possible delivery. However the delivery shall not exceed 6 months. The delivery period shall be reckoned from date of purchase order to despatch from the vendor works.	

5T EOT CRANE – Technical Specification
PART A – QUALIFYING CRITERIA

SECTION - II

Bidder / Vendor (OEM) to note the following

S.No.	REQUIREMENTS	VENDOR'S RESPONSE
8.0	The BIDDER / VENDOR shall submit the offer in TWO PARTS - Technical [with PART A & PART B] & Commercial and Price Bid.	
9.0	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.	
10.0	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	
11.0	The Commercial Offer (given with the Technical Offer) shall contain the Scope of Supply and the Un-Priced Part of the Price-Bid, for confirmation	
12.0	BIDDER has to indicate the Country of Origin for the supply of equipment.	

5T EOT CRANE – Technical Specification
PART A - QUALIFYING CRITERIA

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 :
(Strike off whichever is not applicable)

- Satisfactory /
- Good /
- Average /
- Not Satisfactory

7. Any other remarks:

Date:

Signature & Seal of the Authority
Issuing the Performance Certificate

5T EOT CRANE – Technical Specification – PART B

(TECHNICAL SPECIFICATIONS FOR 5 T ELECTRICALLY OPERATED OVER-HEAD TRAVELLING [E O T] CRANE WITH DOUBLE GIRDERS)

S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR'S OFFER
1.0.0	APPLICATION	a. The crane operation environment will be a ISO Class-8 Clean room designed and constructed as per ISO 14644-1. b. The subject crane is meant for the purpose of handling small to medium (within the lifting capacity of the crane) components, in a heavy and large Titanium fabrication facility. c. 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).	
2.0.0	SCOPE OF SUPPLY	a. Design as per Tender Specifications b. Detailed Design, Manufacture, Assembly and Testing before Despatch c. Supply in Modules / Sub-Assemblies d. Erection, Commissioning and Performance Prove-Out at BHEL Works e. Performance Guarantee for 24 months, from the date of commissioning. A. Supply 1. EOT crane 5 Ton 15.170 M span 8 Mtr height of lift ----- 1 No. 2. Shrouded conductor 4 line ----- 20 Mtrs. 3. Current collector----- 4 Nos. B. Service 1. Erection / installation, cabling / wiring and commissioning of 5 Ton EOT crane ---1 No. 2. Installation and commissioning of shrouded conductor ----- 20 Mtrs.	
3.0.0	TECHNICAL SPECIFICATIONS		
3.1.0	CAPACITY	Lifting Capacity	
3.1.1	Main Hoist	5 Metric Tonnes	
3.1.2	Auxiliary Hoist	NO AUX HOIST	
3.2.0	SPAN	Wheel Centre to Wheel Centre Dimensions	
3.2.1	Long Travel (LT)	15170mm	
3.2.2	Cross Travel (CT)	1,600 mm	
3.3.0	Height of Lift	8,000 mm	

5T EOT CRANE – Technical Specification - PART B

(TECHNICAL SPECIFICATIONS FOR 5 T ELECTRICALLY OPERATED OVER-HEAD TRAVELLING [E O T] CRANE WITH DOUBLE GIRDERS)

S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR'S OFFER
3.4.0	DUTY CYCLE	Related to Drive Motor & Mechanisms	
3.4.1	Hoists	40 % CDF	
3.4.2	Long Travel	40 % CDF	
3.4.3	Cross Travel	40 % CDF	
3.5.0	SPEED	Operating / Working Speed [Maximum]	
3.5.1	Main Hoist	5 mtrs./minute.	
3.5.2	Cross Travel (CT)	15.0 mtrs./minute.	
3.5.3	Long Travel (LT)	30.0 mtrs./minute.	
3.6.0	MOTOR RATINGS	Electric Motor Ratings & Frame Sizes shall be as per IS-325 and IS-1231 and also suitable for 300 starts per hour.	
3.6.1	Main Hoist	Min 6.7 kW - Frame size - 160 M/6 Pole	
3.6.2	Cross Travel (CT)	Min 2.6 kW - Frame size - 132 M/6 Pole	
3.6.3	Long Travel (LT)	Min 2.6 kW x 2 - Frame size - 132 M/6 Pole	
3.7.0	GEAR BOX	Gear Box Size	
3.7.1	Main Hoist	HR 525 mm	
3.7.2	Cross Travel (CT)	VR 275 mm	
3.7.3	Long Travel (LT)	HR 300 mm	
3.8.0	ACCELERATION		
3.8.1	Cross Travel (CT)	300 mm / sec.sq.	
3.8.2	Long Travel (LT)	300 mm / sec. sq.	
3.9.0	HOIST ROPE DETAILS	Size and Number of Falls of Rope	
3.9.1	Main Hoist	Dia. 12 mm ; Falls - 4	
3.9.2	Rope Lubrication	Self-Lubricating type.	
3.10.0	CONTROL	Remote Control	
3.11.0	Type of Control	Radio Remote Control	
3.12.0	Control Voltage	110 V AC	
3.13.0	Input Power Supply	415 V with \pm 10% fluctuation , 50HZ with \pm 3% fluctuation, 3 Phase- AC	
3.14.0	Duty Class	Class - 3 [Indoor Service]	

5T EOT CRANE – Technical Specification – PART B

(TECHNICAL SPECIFICATIONS FOR 5 T ELECTRICALLY OPERATED OVER-HEAD TRAVELLING [E O T] CRANE WITH DOUBLE GIRDERS)

S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR'S OFFER
3.15.0	Mechanism Group Classification	M 6	
3.16.0	DESIGN STANDARD	IS - 807 & 3177 / 2006	
3.17.0	Runway Rail Size		
3.17.1	Cross Travel (CT)	ISR 60 Lbs./Yard	
3.17.2	Long Travel (LT)	CR 80	
3.18.0	Wheel Size		
3.18.1	Cross Travel (CT)	250 mm	
3.18.2	Long Travel (LT)	400 mm	
3.19.0	Brake Drum Size	Hoist Brake Drum Sizes	
3.19.1	Main Hoist	200 mm	
3.19.2	Cross Travel (CT)	160 mm	
3.19.3	Long Travel (LT)	160 mm	
4.0.0	MAIN FEATURES	Crane Operational Features	
4.1.0	Control System	Frequency Converter type for all motions	
4.2.0	Remote Control	Radio Remote Control for all motions	
4.3.0	End Clearance	End Clearances to be fixed to suit the workshop building clearances [Refer Drawing no. M&S:PD:13:247 – Drawing enclosed with tender as Annexure-1]	
4.4.0	Crane Operation	Through Radio Remote Control.	
5.0.0	STRUCTURAL FABRICATION	Crane Structure Constructional Details	
5.1.0	Bridge / Girder & End carriages of LT & CT	PLATE FORMED Box type Construction for Girders, End carriages of LT & CT.	
5.1.1	Bridge girder section	The minimum size shall be as follows	
5.1.1.1	Cross section of Girder	Min. Girder Height- 750mm Min. Girder width- 300mm Top flange plate thickness - 10 mm Bottom flange plate thickness - 8 mm	

5T EOT CRANE – Technical Specification – PART B

(TECHNICAL SPECIFICATIONS FOR 5 T ELECTRICALLY OPERATED OVER-HEAD TRAVELLING [E O T] CRANE WITH DOUBLE GIRDERS)

S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR'S OFFER
5.1.2	End Carriage	Web plate thickness – 8 mm	
5.1.2.1	Cross section of End Carriage	Box type construction for the end carriages Min. Height- 400 mm Min. width- 330mm Top Flange plate thickness – 10mm Bottom flange plate thickness – 10 mm Web plate thickness – 8 mm	
5.2.0	Raw Material	IS: 2062 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	Welded Joints	To be followed for Bridge/leg Fabrication	
5.3.1	Number of weld Joints allowed	Two joints only in flange and web plate of bridge girder. (Joint at the center of the span shall be avoided)	
5.3.2	Welding between web plate and flanges	Full welding shall be done on the outside between web plates and the flanges. On the inside, equal stitch welding of 100mm to be done between web plate and top flange.	
5.3.3	Welding of vertical diaphragms	The vertical diaphragms shall be equal stitch welded to the top flange and both the web plates. The length of stitch welding shall be 100mm.	
5.3.4	Welding Electrodes	a. For all Horizontal Welding E 7018 / ER70S-6 (MIG) Electrode only should be used. b. For all Vertical Welding E 7048 / ER70S-6 (MIG) Electrode only should be used.	
5.3.5	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 verification 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 using fit bolt only.	

5T EOT CRANE – Technical Specification – PART B

(TECHNICAL SPECIFICATIONS FOR 5 T ELECTRICALLY OPERATED OVER-HEAD TRAVELLING [E O T] CRANE WITH DOUBLE GIRDERS)

S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR'S OFFER
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. 3-M-02R-0011993. [Drawing is enclosed and given as Annexure-II].	
5.7.0	Heat Treatment & NDT Examination	The Trolley shall be Stress Relieved if required after welding and NDT examinations. All weldings shall be tested by NDT means [MPI, LPI & RT].	
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, end-carriages and the Trolley 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	Prior to painting, the crane structure shall be sanded and cleaned to remove all rust and dust. 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. Then, prior to dispatch, the crane shall be painted with 2 coats of epoxy enamel paint (colour - Tractor orange) each with a DFT of 25µ and intermittent curing of 16 hours.	
6.0.0	MECHANICAL ELEMENTS		
6.1.0	Gears	Gears in all the Stages shall be helical in design and to be of machined, lapped/ground and hardened.	
6.2.0	Gear Box Casing	Shall be of fabricated type and stress relieved by thermal heat-treatment process, prior to machining.	
6.2.1	Oil level indicator	Glass window with minimum level indication shall be provided for all gearboxes.	
6.2.2	Leakage protection	Oil seals shall be provided for all the bearing covers and wherever required. Additional measures shall be taken to make the gearboxes leakage proof.	
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. Or seamless pipe to suit the	

ST EOT CRANE – Technical Specification - PART B

(TECHNICAL SPECIFICATIONS FOR 5 T ELECTRICALLY OPERATED OVER-HEAD TRAVELLING [E O T] CRANE WITH DOUBLE GIRDERS)

S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR'S OFFER
6.3.0	Type of Coupling	<p>requirement.</p> <p>Only GEARED COUPLING to be used</p> <p>a. Between Electric Motor and Gear Box – Full gear coupling.</p> <p>b. Between Gear Box and Rope Drum- suitable rope drum coupling.</p> <p>c. Between Gear Box and Wheels- Half gear coupling with floating shaft.</p>	
6.4.0	Wheels	The Wheels shall be of Forged and Wheel Tread hardened to 300/350 BHN. Wheels shall be fitted with L-Type Bearings	
6.5.0	Mechanical Joints	Fit Bolts as per IS 3640-1982 for all joints coming in main members and platform with reamed holes	
6.6.0	Pulley Dimension	Rope Pulley diameter shall be 23 times that of Rope diameter	
6.7.0	Hook	Hook latch shall be provided for the hooks	
6.8.0	Buffer	Spring loaded buffers shall be provided for Grab and End carriages	
7.0.0	ELECTRICAL ELEMENTS		
7.2.0	Control Voltage	110 V AC	
7.3.0	Type of Brakes	<p>a. Main Hoist - DCEM Brake</p> <p>b. Cross Travel - EH Thruster Brake</p> <p>c. Long Travel - EH Thruster Brake</p>	
7.4.0	Protection	All Panels, Limit-Switches and Motors shall have IP 54 protection.	
7.4.1	Electric Motors	All Electric Motors shall be as per IS-325 and IS-1231 and also suitable for 300 starts per hour.	
7.5.0	Electric Contactors	All Panels shall have only SIEMENS / L&T Contactors and shall be suitable for AC3 Duty Class.	
7.6.0	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.	
7.7.0	Long Travel Motion	A Dual Drive Mechanism shall be provided for LT (Long Travel) Motion.	
7.8.0	Illumination	a. Two numbers of 500 Watts Halogen Lamps shall be provided under the Bridge	

5T EOT CRANE – Technical Specification - PART B**(TECHNICAL SPECIFICATIONS FOR 5 T ELECTRICALLY OPERATED OVER-HEAD TRAVELLING [EOT] CRANE WITH DOUBLE GIRDERS)**

S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR'S OFFER
7.8.1	Frequency Converter	b. All Electric Panels shall be provided with suitable illumination for visibility and trouble shooting.	
7.8.2	Anti-Collision Device	The VVVF Drive shall be supplied with suitable DBR for all motions. 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.	
7.8.3	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 (UMBO)	
7.8.4	Wiring	The crane shall be fully wired without junction box.	
7.8.5	Cables	All cables shall be flexible copper only.	
7.9.0	Hoist limit	Hoist shall be provided with both rotary and counter weight limits.	
7.9.1	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	Spares set	The following spares shall be included in the offer. 1. Hoist Gearbox - 1 No. 2. LT Gearbox - 1 No. 3. CT Gearbox - 1 No. 4. LT Wheel bearing - 2 Nos. 5. CT Wheel Bearing - 2 Nos. 6. Hoist Brake shoe with lining - 2 Nos. 7. LT Brake shoe with lining - 2 Nos. 8. CT Brake shoe with lining - 2 Nos. 9. LT Brake Thruster - 1 No. 10. CT Brake Thruster - 1 No. 10. Hoist Rotary limit switch - 1 No.	
9.0.0	SELECTION of BOI and COMPONENTS	The makes of Components or Bought-Out-Items shall be strictly as per the list given below.	
9.1.0	Hoist Hooks	HERMAN MOHTTA / HERCULES / SILPA UDYOG / SMIRTI FORGINGS /	

5T EOT CRANE - Technical Specification - PART B

(TECHNICAL SPECIFICATIONS FOR 5 T ELECTRICALLY OPERATED OVER-HEAD TRAVELLING [E O T] CRANE WITH DOUBLE GIRDERS)

S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR'S OFFER
9.2.0	Wire Rope	KARACHIWALA USHA MARTIN / FORT WILLIAM / RA WIRE ROPE	
9.3.0	Electric Motors	GEC / BHARAT BIJLEE / SIEMENS / KEC/ ALSTHOM	
9.3.1	Gear Boxes	RADICON / ELECON / SHANTI GEARS / CROMPTON GREAVES.	
9.3.2	DC Brake Unit with rectifier panel.	Only BCH make	
9.3.2	Radio Remote Control	Tele crane make (F24-10D) Itowa make (winner)	
9.4.0	Thruster Brake Unit	Only GALVI make.	
9.5.0	Limit Switch (Gravity Type)	SIEMENS / INDUSTRIAL SYNDICATE / BCH / SKC / SOC	
9.6.0	Contactors	SIEMENS / L&T	
9.7.0	Over-Load-Relay	SIEMENS / L&T (THERMAL TYPE)	
9.8.0	HRC Fuses	GE / L&T / SIEMENS	
9.8.1	MCB	L&T/SIEMENS	
9.9.0	Rotary limit switch	SIEMENS / OMEGA / SOC / INDUSTRIAL SYNDICATE	
9.10.0	Switch fuse unit	L&T / SIEMENS / GEC	
9.11.0	Moulded case CB	SIEMENS / L&T	
9.12.0	Pneumatic Time Delay	Only BCH make	
9.13.0	Push - Buttons	SIEMENS / L&T / AIRON	
9.14.0	Connectors	ELMAX make or reputed make with IS approved with acceptable BHEL	
9.15.0	Couplings	JAURE / BIBBY / MALMEDIE / KOP-FLEX	
9.16.0	Bearings	SKF / NBC / ZKL / TIMKEN	
9.17.0	Cables	Reputed Makes & ISI Approved acceptable by BHEL.	
9.17.1	Bridge Light Fittings	PHILIPS / GE / CROMPTON	
9.17.2	Load Cell	IPA make or reputed make with IS approved and acceptable to BHEL.	
9.18.0	VVVF Drives	L&T / MITSUBISHI / FUJI	

5T EOT CRANE – Technical Specification – PART B

(TECHNICAL SPECIFICATIONS FOR 5 T ELECTRICALLY OPERATED OVER-HEAD TRAVELLING [E O T] CRANE WITH DOUBLE GIRDERS)

S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR'S OFFER
10.0.0	DOCUMENTS/ DETAILS for 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	Set I: a. Calculations for Selection of Electric Motors, Gear Reducers, Brakes, Couplings, etc. b. Calculations for Bridge Girder, Legs, Crab, End - Carriage and their connections. c. GA Drawing of the Crane. d. GA Drawing of Trolley e. GA Drawing of Individual Mechanisms.	
10.1.1	Drawings and Documents	Set II: a. Drawings of Bridge, Legs, 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 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.	
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 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	INSPECTION	The following Schedule of Stage Inspections is to be strictly adhered to, prior to dispatch from the Supplier's Works	
11.1.0	STAGE - I	a. Verification of Test Certificate for Raw Materials used for Girders, legs, End-Carriages, Trolley, Gear Box Casings, etc.	

5T EOT CRANE – Technical Specification – PART B

(TECHNICAL SPECIFICATIONS FOR 5 T ELECTRICALLY OPERATED OVER-HEAD TRAVELLING [E O T] CRANE WITH DOUBLE GIRDERS)

S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR'S OFFER
11.2.0	STAGE – II [Final Inspection]	<ul style="list-style-type: none"> 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 before closing of the Bottom Flanges 	
12.0.0	CRANE ERECTION & COMMISSIONING	<ul style="list-style-type: none"> a. Inspection of Bridges, legs, End-Carriages and platform fabrication. b. Verification of Span & Diagonal Dimensions, Checking of Wheel Alignment, Mechanical Assemblies and Total Alignment. c. Free running of all the Mechanisms. d. Measurement of CAMBER in the Bridges. e. Full / Rated Load Test for bridges and trolley and Deflection Test f. Deflection and Permanent Set Measurement. g. 25% OVER-LOAD Lifting Ability Check 	
12.1.0	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.	
12.2.0	Crane Erection & Cabling	Complete crane erection/installation, writing/cabling of the various components at BHEL shall be the scope of the supplier.	
12.3.0	Crane Commissioning	Commissioning of the Crane and Performance Prove -Out for 125% of Crane's Capacity and Smooth Functioning of the Crane (at BHEL Works) shall be the RESPONSIBILITY of the supplier.	
13.0.0	O & M MANUALS	<p>Each Crane shall be provided with the following</p> <ol style="list-style-type: none"> 1. VFD Programming & Maintenance manual and Technical Information catalogue 2. Data Sheet containing the Program data loaded in the VFD units, 	

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(TECHNICAL SPECIFICATIONS FOR 5 T ELECTRICALLY OPERATED OVER-HEAD TRAVELLING [EOT] CRANE WITH DOUBLE GIRDERS)

S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR'S OFFER
13.1.0	Drawings & Details	3. Manual for the Load cell calibration and trouble shooting THREE Copies of Erection, Operation & Maintenance Manual hard copy and soft copy in CD, containing the following technical details	
14.0.0	PERFORMANCE GUARANTEE	a. Crane GA Drawing b. Crab Assembly Drawing c. Total Crane Wiring Schematics d. Detailed Wiring Diagrams for Sub-Systems / Panels e. Wheel Assembly Drawings f. Bottom Block Assembly Drawing g. Gear Box Assembly Drawings h. Coupling Drawing and Details i. Specifications/Ratings of All Bought-Out-Items j. Warranty / Guarantee Card for all Bought-Out-Items k. Trouble Shooting Chart for Main and all Sub-Systems	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.
Specification for 4-Line DSL shrouded conductor system required for EOT crane.			
S1.0	CONDUCTOR		
S1.1	Total length of shrouded conductor required	20 mtrs.	
S1.2	Quantity in each	Red color insulated conductor = 20 Mtr Yellow color insulated conductor = 20 Mtr Blue color insulated conductor = 20 Mtr Green color insulated conductor = 20 Mtr	

5T EOT CRANE - Technical Specification - PART B

(TECHNICAL SPECIFICATIONS FOR 5 T ELECTRICALLY OPERATED OVER-HEAD TRAVELLING [E O T] CRANE WITH DOUBLE GIRDERS)

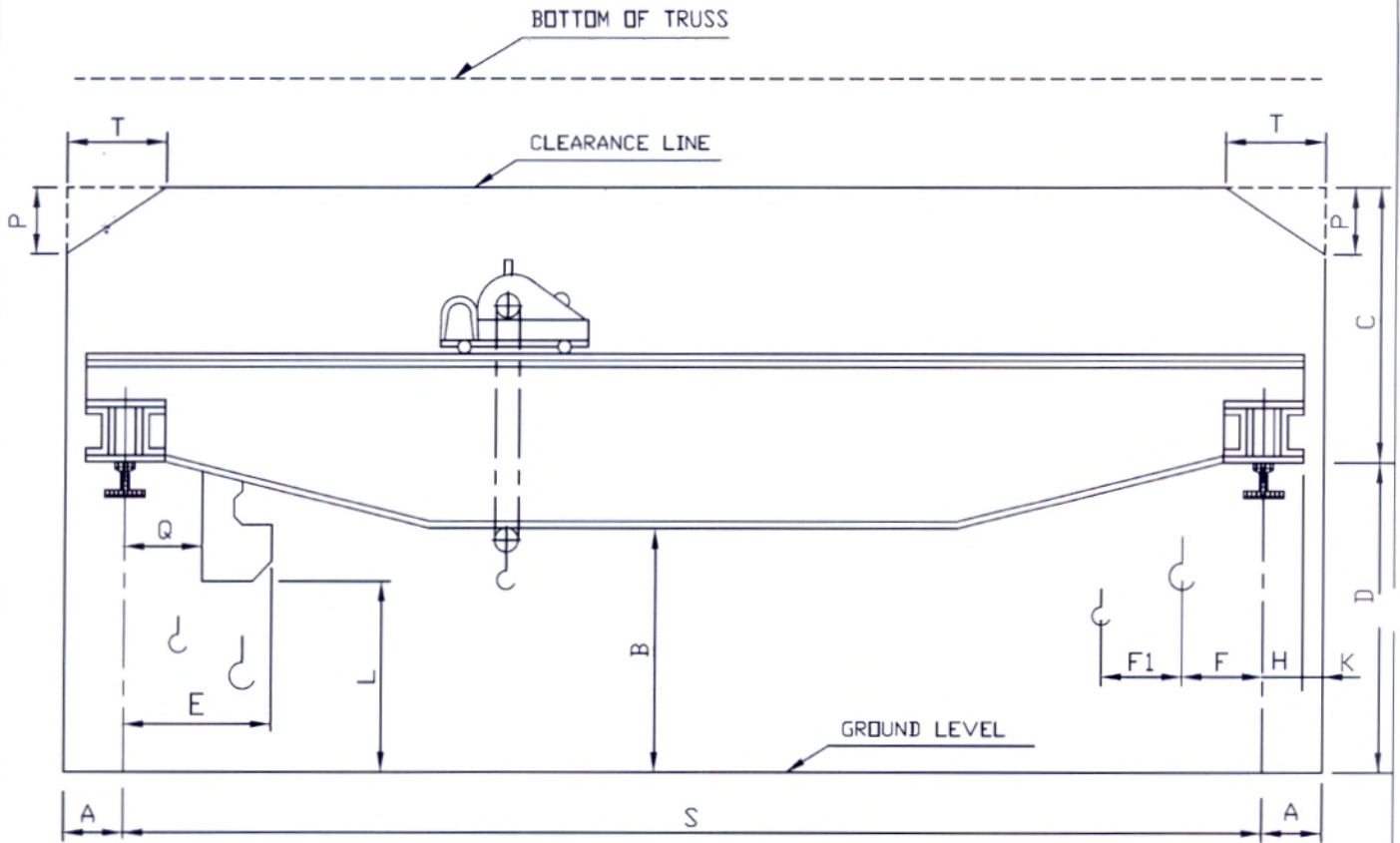
S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR'S OFFER
S1.3	Current rating of conductor / Material	125 Amps / Copper	
S1.4	Standard length of each conductor	4.5Mtr (Appx.)	
S1.5	Cross sectional area of conductor	Shall be adequate for the current rating.	
S1.6	Insulation cover	Red, Yellow, Blue & Green.	
S1.7	Support pitch	Minimum distance between support brackets - 1000 MM	
S1.8	Hanger clamp	4 pole with double bolted arrangement.	
S1.9	Location of power feeding	Center feeding	
S1.10	Minimum Pitch between conductors	40 mm	
S1.11	Conductor joint type	4 bolted (2+2 each side) joint	
S1.12	System voltage	415V AC	
S1.13	Insulation	PVC	
S1.14	Protection	IP21	
S1.15	Ambient tem.	Suitable for 50°C Ambient Temperature rise.	
S1.16	Installation	Indoor.	
S2.0	CURRENT COLLECTOR		
S2.1	Rating of current collector	125 A	
	Material	sintered copper	
S2.2	Type	Sliding contact with sufficient contact pressure while on movement	
S2.3	Tolerance in collector movement	Horizontal +/- 200 mm Vertical +/- 60 mm	
S2.4	Current collector assembly	Shall be suitable to take vertical and horizontal misalignment during long travel motion of the EOT cranes.	
S2.5	Anchoring	Anchoring clamps shall be provided to avoid conductor longitudinal	

5T EOT CRANE – Technical Specification - PART B


(TECHNICAL SPECIFICATIONS FOR 5 T ELECTRICALLY OPERATED OVER-HEAD TRAVELLING [E O T] CRANE WITH DOUBLE GIRDERS)

S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR'S OFFER
		movement.	
S2.6	Insulated covers shall be provided	At all conductor joints, at all center power feed, anchoring point and at all ends.	
S2.7	No. of current collector assembly required	4 nos .	
S2.8	Indicator lamps Red, Yellow, Blue & Green	Shall be provided at the center feed location.	
S2.9	Current collector holding brackets required.	For 1 no. EOT crane.	

CLEARANCE DIAGRAM FOR E.O.T. CRANE



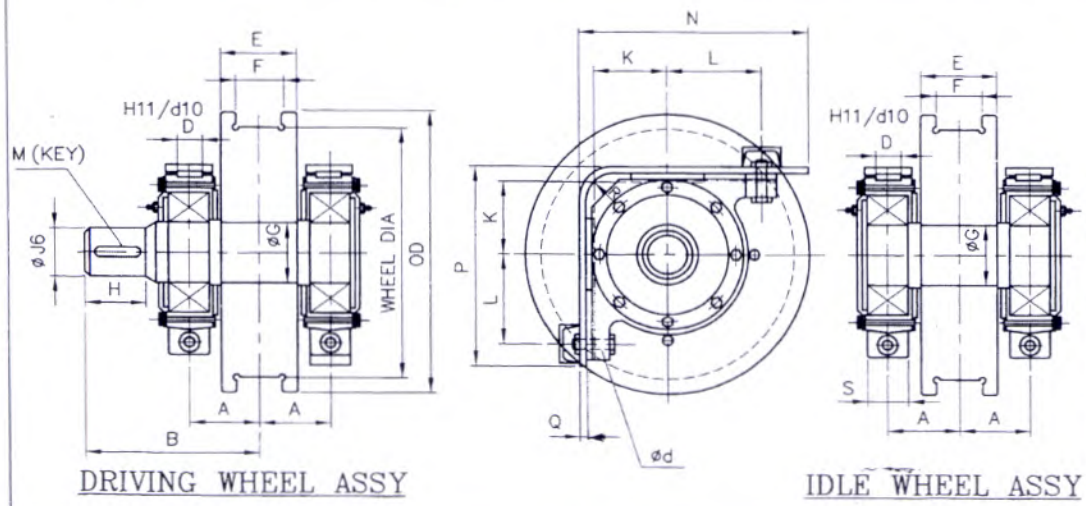
	5T×15170 8 M. LIFT
S	15170
D	8000
C	1800
A	300
K	100
T	600
P	600
B	
L	
Q	
F	
F1	
H	
E	

	DRAWN: G.G.R	DATE: 22/07/13	M&S: PD: 13: 247
	TITLE: CLEARANCE DIAGRAM FOR E.O.T. CRANE		

CAUTION: THIS DRAWING IS OUR SOLE PROPERTY AND SHOULD NOT BE USED IN ANY FORM FOR ANY PURPOSE WITHOUT THE WRITTEN PERMISSION OF BHARAT HEAVY ELECTRICALS LIMITED TRICHYAPALLI - 620 014.

ALL DIMENSIONS ARE IN MM

SL. No.	O.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	710/750	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		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	630/680	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		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	500/550	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	400/450	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		50/75/90 & 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	320/370	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	250/280	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	200/230	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		30 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:7283.
 WHEEL - 55CB/IS:5517.
 FORGED.
 TREAD 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	DCN REF	DATE
				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:		