



An ISO 9001
Company

Bharat Heavy Electricals Limited

(High Pressure Boiler Plant)

Tiruchirapalli – 620014, TAMIL NADU, INDIA

MATERIALS MANAGEMENT / CAPITAL EQUIPMENT

ENQUIRY NOTICE INVITING TENDER	Phone: +91 431 257 7653 Fax : +91 431 252 0719 Email : skaruna@bheltry.co.in , Web : www.bhel.com
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TWO PART BID	Enquiry Number:	Enquiry Date:	Due date for submission of quotation
Tender to be submitted in Two Parts	2711300010	dt.29.03.2013	dt.30.04.2013

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

Item No.	Item Description	Quantity
10	Supply, Erection and commissioning 10 Ton Capacity , 28.5 Mtr Span Double Box Type Girder EOT Crane as per the Technical Specification, & Commercial Conditions applicable (to be downloaded from web site www.bhel.com or http://tenders.gov.in)	04 Nos.

Important Points to be taken care during the submission of offer:-

1. Bidder's Response Column in technical specification sheet to be duly filled in without fail. Additional details provided in the offer may be supported with documentary evidence.
2. Check list to be filled and enclosed along with the offer failing which, the offer will not be considered for evaluation.
3. The equipment shall be guaranteed for 18 months from the date of supply or 12 months from the date of commissioning whichever is earlier.
4. The delivery period required for equipment is 10 months.

BHEL's General guidelines /instructions including bank guarantee formats and list of consortium banks, commercial terms checklist 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) Tender Enquiry reference "2711300010"

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 / MM / Capital Equipment
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PART A**SECTION – I: QUALIFYING CRITERIA**

The BIDDER (OEM) has to compulsorily meet the following requirements to get qualified for consideration of the technical offer for the supply of EOT CRANE

S. No	PARTICULARS	VENDOR'S RESPONSE
1.0	<p>Only those Vendors (OEMs), who have supplied and commissioned at least ONE 10 Ton or higher capacity EOT CRANE of duty class-IV, with a span of 20 Meters or more in the past and such crane should be working satisfactorily for a minimum period of one year after commissioning, as on the date of opening of this Tender are eligible to quote.</p> <p><i>(However, if such crane is already supplied to BHEL, then that crane should be working satisfactorily for a minimum period of six months after commissioning, as on the date of opening of this Tender.)</i></p>	
2.0	The bidding FIRM should have 'in-house' or 'self-owned' facility for TESTING at 125 % of the rated capacity.	
3.0	The vendor should have minimum 10 years experience in the field of design and fabrication of EOT Cranes.	
4.0	Along with the Technical offer, the Vendor should enclose One Performance certificate from the customer regarding satisfactory performance of the crane supplied to them. For obtaining the Performance certificate from the customer, a suggestive format is provided in SECTION – IV .	
5.0	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.	

SECTION – II

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

S. No.	PARTICULARS	VENDOR'S RESPONSE
6.0	The Vendor shall specify the number of Years of experience (for the firm), in the field of design, manufacture, supply and Erection & commissioning of cranes	
7.0	Number of EOT Cranes supplied and commissioned till date	
8.0	Number of EOT Cranes supplied and commissioned till date in the QUOTED MODEL.	
9.0	Details on SERVICE-AFTER-SALES Set-Up in India including the Addresses of Agents / Service Centers in India / Asia.	
10.0	Any Additional Data to supplement the manufacturing capability of the BIDDER for the subject crane.	

SECTION – III

Bidder / Vendor to note:

S. No.	REQUIREMENTS	VENDOR'S RESPONSE
11.0	The BIDDER / VENDOR shall submit the offer in TWO PARTS. 1. Technical offer (with PART A & PART B) & Commercial offer. 2. Price Bid.	
12.0	The Offer shall contain a comparative statement of Technical Specifications demanded by BHEL and Offer Details submitted by the Bidder , against each clause. A just 'CONFIRMED' or 'COMPLIED' or 'YES' or 'NO-DEVIATION' or similar words in the technical comparative statement may lead to disqualification of the Technical Offer.	
13.0	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	
14.0	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	

SECTION – IV

The Performance certificate should be produced on Customers Letter head.

PERFORMANCE CERTIFICATE

1	Supplier of the Crane	
2	Make & Model of the Crane	
3	Month & Year of Commissioning	
4	Application	
5	a. Crane Type	
	b. Crane Capacity (Metric Tons)	
	c. Crane span	
	d. Duty class	
	e.. Mechanism Group	
6	Performance of the Crane (Tick whichever is applicable)	Best in the market
		Satisfactory
		Good
		Average
		Not Satisfactory
7	Any other remarks	
Date:		Signature & Seal of the Authority Issuing the Performance Certificate

PART B.**TECHNICAL SPECIFICATIONS FOR 10 TON CAPACITY, 28.5 MTR SPAN
DOUBLE BOX TYPE GIRDER EOT CRANE****QTY:4 No.**

S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR's TECHNICAL OFFER (With Complete Details)
1.0	APPLICATION	a. The subject crane is meant for the purpose of handling (within the lifting capacity of the crane) components, bar / round stocks (bloom), tubes & pipes in closed shed. b. The crane will be put to use for 365 Days continuous duty with CT, LT and Hoist movements, which may occur simultaneously (within the operating parameters specified under Clause Nos. – 3.1, 3.4 and 3.5). c. The storage yard environment will be in ambient temperature going up to 45° C. d. Double Girder Box Type Construction.	
2.0	SCOPE OF SUPPLY	a. Crane as per the Tender Specifications given under this PART-B. (Reference Sketch CMM 102) Quantity :4 Nos (2 nos Cold mill finishing bay,1 in IC bay, 1 in Hot mill AB bay) (2 cranes with extended spring type end buffer to avoid parking of 2 crane in cold mill on 16m concrete girder) others 2 nos normal spring buffer type. b. Assembly and Testing before Dispatch c. Supply in major Sub-Assemblies d. Erection ,Commissioning and Performance	

S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR's TECHNICAL OFFER (With Complete Details)
		Prove-Out at BHEL Works e. Performance Guarantee for 12 months, from the date of commissioning.	
3.0	TECHNICAL SPECIFICATIONS		
3.1	CAPACITY	Lifting Capacity	
3.1.1	Main Hoist	10 Metric Tons (5T+5T) SINGLE TROLLY	
3.2	SPAN	Wheel Centre to Wheel Centre Dimensions	
3.2.1	Long Travel (LT)	28,500 mm	
3.2.2	Cross Travel (CT)	2,500 mm	
3.3	Height of Lift	9,000 mm	
3.4	DUTY CYCLE	Related to Drive Motor & Mechanisms	
3.4.1	Hoists	40 % E D	
3.4.2	Long Travel	40 % E D	
3.4.3	Cross Travel	40 % E D	
3.5.	SPEED	Operating / Working Speed [Maximum]	
3.5.1	Hoist	10 mtrs. / minute.	
3.5.2	Cross Travel (CT)	30 mtrs. / minute.	
3.5.3	Long Travel (LT)	60 mtrs. / minute.	
3.6	MOTOR RATINGS - MIN	Electric Drive Motor Ratings	
3.6.1	Main Hoist	30 KW, 225S, 6 Pole	
3.6.2	Cross Travel (CT)	5.5 KW, 132S, 6 Pole	
3.6.3	Long Travel (LT)	11 KW, 160L, 6 Pole	
3.7	GEAR BOX	Gear Box Size	
3.7.1	Main Hoist	HR 650	
3.7.2	Cross Travel (CT)	VR 400	
3.7.3	Long Travel (LT)	VR 650	
3.8	ACCELERATION		

S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR's TECHNICAL OFFER (With Complete Details)
3.8.1	Cross Travel (CT)	300 mm / sec. sq.	
3.8.2	Long Travel (LT)	300 mm / sec. sq.	
3.9	HOIST ROPE DETAILS	Size and Number of Falls of Rope	
3.9.1	Main Hoist	Dia. 18 mm; Falls - 4	
3.10	CONTROL	Cabin Operation and Remote Control	
3.11	Type of Control	Master Control and Radio Remote Control	
3.12	Control Voltage	230 V AC	
3.13	Input Power Supply	415 ± 10% Volts, 50 ± 3% Hz, 3 Phase- AC	
3.14	Duty Class	Class – IV [Heavy Duty]	
3.15	Mechanism Group Classification	M 6	
3.16	DESIGN STANDARD	IS – 807 & 3177	
3.17	Runway Rail Size		
3.17.1	Cross Travel (CT)	ISR 60 Lbs./Yard - Rail by vendor	
3.17.2	Long Travel (LT)	ISR 90 Lbs./Yard (For reference only) - Rail by BHEL	
3.18	Wheel Size		
3.18.1	Cross Travel (CT)	Dia. 320 mm – 4 Nos	
3.18.2	Long Travel (LT)	Dia. 630 mm - 4 Nos	
3.19	Brake Drum Size	Brake Drum Sizes	
3.19.1	Hoist	Dia. 400 mm (BCH)	
3.19.2	Cross Travel (CT)	Dia. 200 mm (BCH)	
3.19.3	Long Travel (LT)	Dia. 250 mm (BCH)	
4.0	MAIN FEATURES	Crane Operational Features	
4.1	Control System	Smooth Start & Stop through variable speed drives	
4.1.1		conventional master control for all motions	
4.2	Remote Control	Radio Remote Control for all motions (Microprocessor based)	

S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR's TECHNICAL OFFER (With Complete Details)
4.3	Crane Operation	Through Cabin Control and Radio Remote Control with option for control selection	
4.4	Operator Cabin	Enclosed type cabin with proper ventilation. Cabin fitted with fan, light and exhaust fan located on one end of the crane	
5.0	STRUCTURAL FABRICATION	Crane Structure Constructional Details	
5.1	Bridge, Leg	Plate formed box type Construction	
5.1.1	LT and CT wheel carriages	Plate formed box type Construction	
5.2	Raw Material	Steel plates used shall have test certificates. Test Certificates to be produced for BHEL verification and form part of the documentation.	
5.3	Welded Joints for bridge / leg fabrication		
5.3.1	Number of Joints allowed	Only one weld joint is permitted in flange and web plates of bridge girder. Splice joint is not permitted.	
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 verification and form part of the documentation.	

S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR's TECHNICAL OFFER (With Complete Details)
5.4	Bridge connection	Bridge to girder connection shall be designed for double shear with fit bolt as per IS-3640 .	
5.5	Platform on Girders	The Platforms provided on both the Girders shall be fixed through BOLTED JOINTS with fit bolt as per IS-3640 only.	
5.6	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. 3-M-02R-0011993. Drawing is enclosed and given as ANNEXURE -1]. Bogie type assembly shall be for LT wheels.	
5.7	Heat Treatment & NDT Examination	The Trolleys shall be Stress Relieved after welding and NDT examinations. All welding shall be tested by NDT means [MPI, LPI & RT] after Stress Relieving operation.	
5.8	Machining Operation	All mechanical mating surfaces and wheel seating areas are to be machined to the required finish	
5.9	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	Painting	The crane parts are to be painted as follows: a. One coat primer. b. Two coats of Enamel Paint –Color- Golden Yellow	
6.0	MECHANICAL ELEMENTS		

S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR's TECHNICAL OFFER (With Complete Details)
6.1	Gears	Gears in all the Stages shall be helical in design and to be of machined, lapped and hardened.	
6.2	Gear Box Casing	Shall be of fabricated type and stress relived by thermal heat-treatment process, prior to machining.	
6.3	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	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	
6.5	Wheels	The Wheels shall be of Forged and Wheel Tread hardened to 300/350 BHN. Wheels shall be fitted with L-Type Bearings	
6.6	Mechanical Joints	Fit Bolts as per IS 3640- for all joints coming in main members and platform with reamed holes	
6.7	Pulley Dimension	Rope Pulley diameter shall be 23 times that of Rope diameter	
6.8	Hook	Hook with Hook latch shall be provided.	
6.9	Lifting Hook	Lifting Hook for handling the components of the cross trolley in hoist and Long travel mechanisms	
6.10	Limit switches	Hoist shall be provided with rotary and counter weight limit switches	
7.0	ELECTRICAL ELEMENTS		
7.1	Operational Controls	The Crane shall be provided with the following controls: a. Cabin Control [Master Control] b. Radio Remote Control	

S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR's TECHNICAL OFFER (With Complete Details)
7.2	Motor Control	Through Variable Frequency Drives. Capacity of the drive shall be one frame above the motor capacity and suitable for crane application. The drives must be having internal or external Dynamic Braking Unit connected to a Dynamic Braking Resistor (DBR).	
7.3	Control Voltage	230 V AC	
7.4	Type of Brakes	a. Main Hoist - DC Electromagnetic Brake (BCH) b. Cross Travel - DC Electromagnetic Brake (BCH) c. Long Travel - DC Electromagnetic Brake (BCH)	
7.5	Protection	All Panels, Limit-Switches and Motors shall have IP 55 protection.	
7.6	Electric Motors	Squirrel Cage Induction motor conforming to new IS12615:2011 standards, High Energy Efficient (IE2), S4 Duty, Index of Protection-IP55, Cooling-IC411(TEFC), Insulation Class-F, 300 Starts/hour, Foot Mount (B3)	
7.7	Electric Contactors	All Contactors shall be suitable for AC3 Duty Class. The rating of all Contactors shall be at least 50% higher than the respective electric motor full load current, at the specified duty cycle.	
7.8	Resistance (DBR)	Stainless steel punched grid resistance 40 % duty cycle or as recommended by the drive manufacturer whichever is higher.	
7.9	Long Travel Motion	Dual Drive Mechanism shall be provided for Long Travel Motion.	
7.10	Digital Weight indicator	Digital Weight indicator with appropriate transducers for indicating the actual weight being carried. Must be installed in the position where both the operator and rigger can see the Weight	

S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR's TECHNICAL OFFER (With Complete Details)
		indicated.	
7.11	Illumination	a. Four numbers of 250 Watts Metal Halide lamp shall be provided under the Bridge b. All Electric Panels shall be provided with suitable illumination for visibility and troubleshooting.	
7.12	Master Controller Steps	Sheet Steel Housing Master controllers having 7 cams with joystick handle for 4 notches for the following operations. a. Hoist 1 b. Hoist 2 c. Tandem d. Long Travel e. Cross Travel	
7.13	Radio remote control	Remote operation through hand held transmitter capable and Receiver control panel mounted on crane shall be used. Separate interposing relay shall be used for connecting to the motion control panels. Range of the radio remote shall be less than 50 m.	
7.14	Cables	All cables for power and control circuit must be of copper only. List of cables must be provided along with the drawing. All necessary cable glands, conduits, conduit glands, copper lugs for panels and motors must also be supplied.	
7.15	Wiring	Cable Drag Chain System of IGUS make along with cables.	
7.16	Hoist Limit	Hoist-Counter weight with manual reset type. Hoist-Rotary Geared Type with up and down limits.	

S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR's TECHNICAL OFFER (With Complete Details)
		C.T-Lever Type fitted in the trolley.	
7.17	Operator Cabin	Control on/off Push Button station, Master controllers, Industrial Gang Bell with Footswitch, Fan, light and exhaust fan must be provided in the cabin.	
7.18	Corner Switches	4 Corner switches with enclosures must be provided at 4 corners of the crane.	
7.19	Earthing	All the bodies of electrical equipments like motor, power & control panel, resistor panel, brake panel, master controller etc. are to be effectively earthed. Separate earth cable shall be run for the trolley.	
8.0	SELECTION OF COMPONENTS	The make of Components or Bought-Out-Items shall be strictly as per the list given below.	
8.1	Hoist Hooks	HERMAN MOHTTA / HERCULES / SILPA UDYOG / SMRITI FORGINGS / KARACHIWALA	
8.2	Wire Rope	USHA MARTIN / FORT WILLIAM / RA WIRE ROPE	
8.3	Variable Frequency Drive	ABB- ACS 800 / TOSHIBA- VF-AS1 / SCHNEIDER- ALTIVAR 71 / DANFOSS- FC302	
8.4	Electric Motors	SIEMENS / ABB	
8.5	DC Brake Unit	Only BCH make	
8.6	Cable Drag Chain	IGUS	
8.7	Radio Remote Control	SNT- CC-403 / ACROPOLIS- F24-10D	
8.8	Contactors	SIEMENS / SCHNEIDER / ABB	
8.9	Over-Load-Relay	SIEMENS / SCHNEIDER / ABB	

S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR's TECHNICAL OFFER (With Complete Details)
8.10	HRC Fuses	SIEMENS / SCHNEIDER / ABB	
8.11	Switch fuse unit	SIEMENS / SCHNEIDER / ABB	
8.12	Molded case C.B	SIEMENS / SCHNEIDER / ABB	
8.13	ON Delay Timer	SIEMENS/GEC/AREVA	
8.14	Push - Buttons	SIEMENS / SCHNEIDER / ABB	
8.15	Connectors	ELMEX / CONNECTWELL	
8.16	Couplings	WMI / FENNER / ALFEX	
8.17	Bearings	SKF / NBC / ZKL	
8.18	Cables	Reputed Makes & ISI Approved	
8.19	Bridge Light Fittings	PHILIPS / GE / CROMPTON	
8.20	Load Cell	IPA or reputed make acceptable to BHEL	
8.21	Resistance box	OHMARK / ELECTROMAG	
8.22	Other Elements	Vendor to specify items & makes	
9.0	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.	

S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR's TECHNICAL OFFER (With Complete Details)
9.1	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, leg and their connections. e. Sub-Assembly Drawing for Wheels, Hook Blocks, Gear Boxes & Hoist Drums. f. Calculations for Selection of Electric Motors, Gear Reducers, Brakes, Couplings, etc. g. Calculations for Bridge Girder, Crab, End - Carriage and their connections. h. Control panel GA drawing. i. Wiring Diagram with Logic Circuits. j. Complete Bill of Material k. Cable Selection and schedule based on current rating.	

S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR's TECHNICAL OFFER (With Complete Details)
9.2	Technical Details	<ul style="list-style-type: none"> 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 are indicated separately also. f. Weight of Operator's Cabin together with all Equipment mounted in it. 	

S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR's TECHNICAL OFFER (With Complete Details)
10.0	INSPECTION	The following Schedule of Stage Inspections is to be strictly adhered to, prior to dispatch from the Supplier's Works	
10.1	STAGE – I	<ul style="list-style-type: none"> 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 and legs Fabrication 	
10.2	STAGE – II	<ul style="list-style-type: none"> 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	STAGE – III [Final Inspection]	<ul style="list-style-type: none"> 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. 	

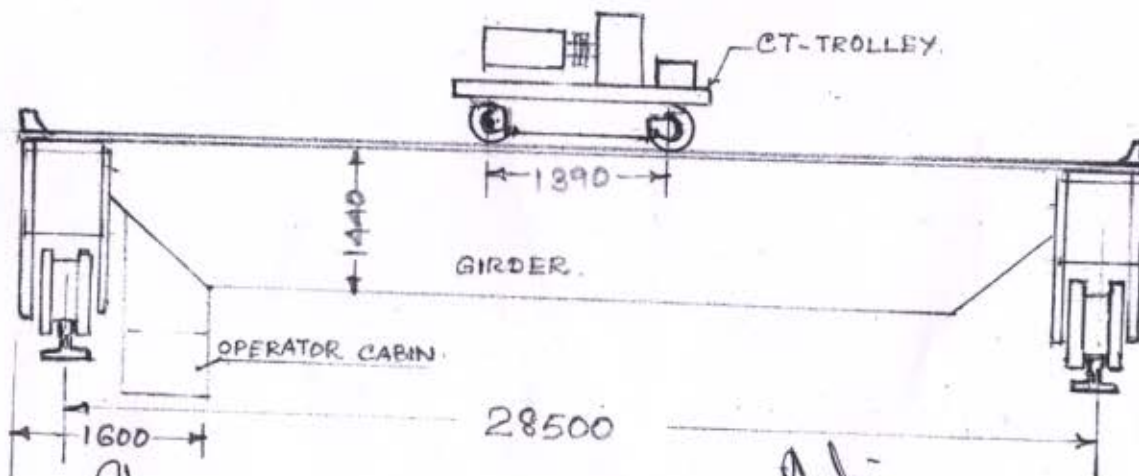
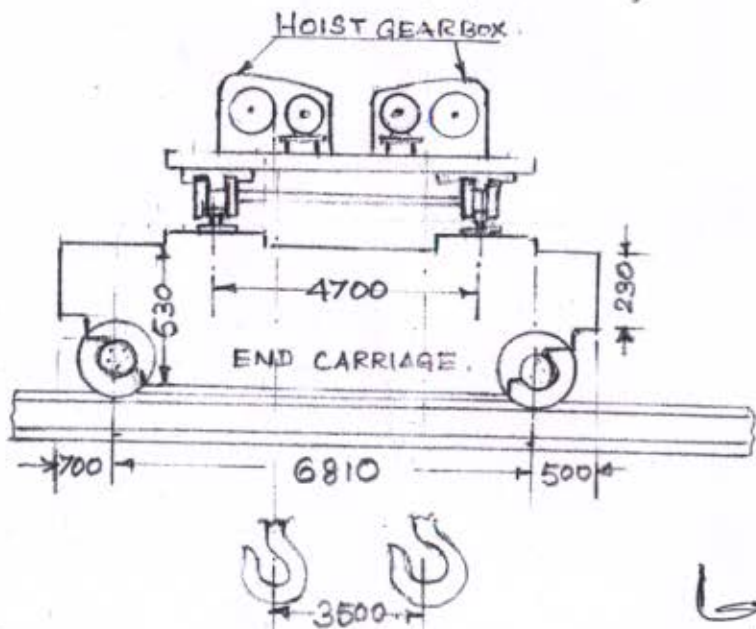
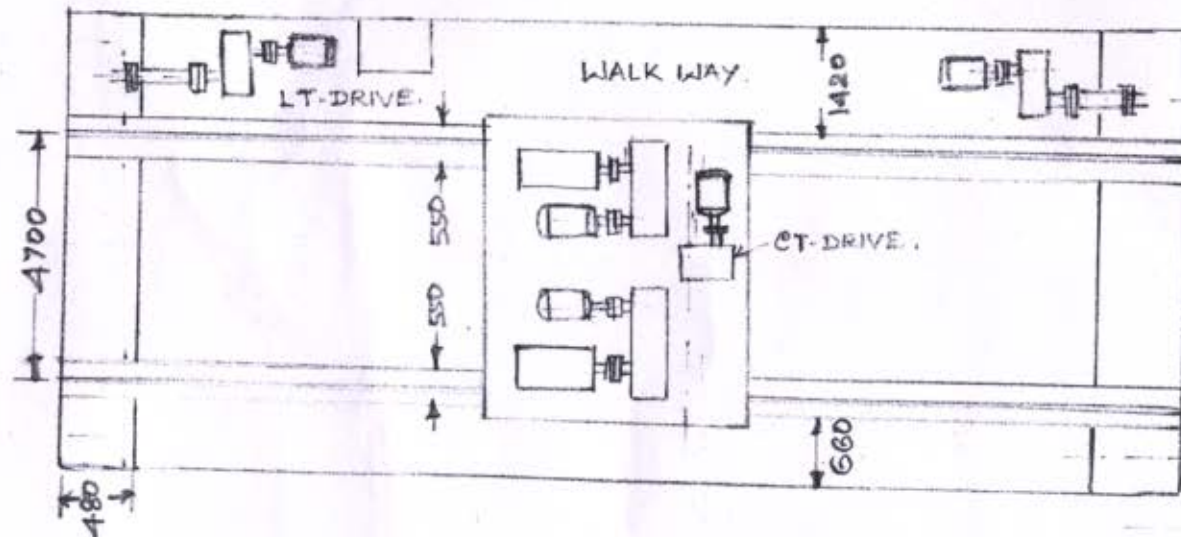
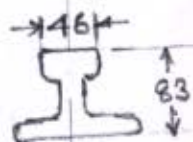
S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR's TECHNICAL OFFER (With Complete Details)
11.0	CRANE ERECTION & COMMISSIONING		
11.1	Mechanical Erection	Erection of the Crane to be done by the supplier,	
11.2	Crane Commissioning	Commissioning of the Crane and Performance Prove –Out for the Crane's Capacity and Smooth Functioning of the Crane (at BHEL Works) shall be the RESPONSIBILITY of the supplier.	
12.0	O & M MANUALS	Crane shall be provided with THREE Copies of Erection, Operation & Maintenance Manual hard copy as well as soft copy in CD, containing the following technical details	
12.1	Drawings & Details	<ul style="list-style-type: none"> 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 k. Trouble Shooting Chart for Main and all Sub-Systems 	
13.0	PERFORMANCE GUARANTEE	The Performance of the Total Crane and 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.	

S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR's TECHNICAL OFFER (With Complete Details)
14.0	VENDER TO INDICATE FOLLOWING INFORMATION IN THEIR OFFER		
14.1		Weight of each bridge (2 Nos.)	
14.2		Weight of each carriage.(2 Nos.)	
14.3		Weight of complete trolley(1 No.)	
14.4		Weight of complete assembled crane	
14.5		No. of wheels on LT & CT, Wheel diameter and material specification.	
14.6		Wheel Load on each wheel.	
14.7		Horse Power of various motors, their duty cycles, rating, make etc.	
14.8		Make Type, size of thrusters and E.M. Brakes.	
14.9		Make of all electrical items like relays, contactors, resistance, timer, limit switches etc.	
14.10		Size of Brake drum for each motion.	
14.11		Complete specification of wire rope	
14.12		Number of falls of wire rope in main hoist	
14.13		Erection & commissioning charges to be quoted separately.	

SKETCH: CMM: 102 dt 20/05/2011

F3-CRANE.

CT RAIL 30LB/YD.



N. Gurunathan
N. GURUNATHAN
Maintenance Engineer
Cold Mill Mech. Maintenance
SSTP, BHEL, TRICHY-14

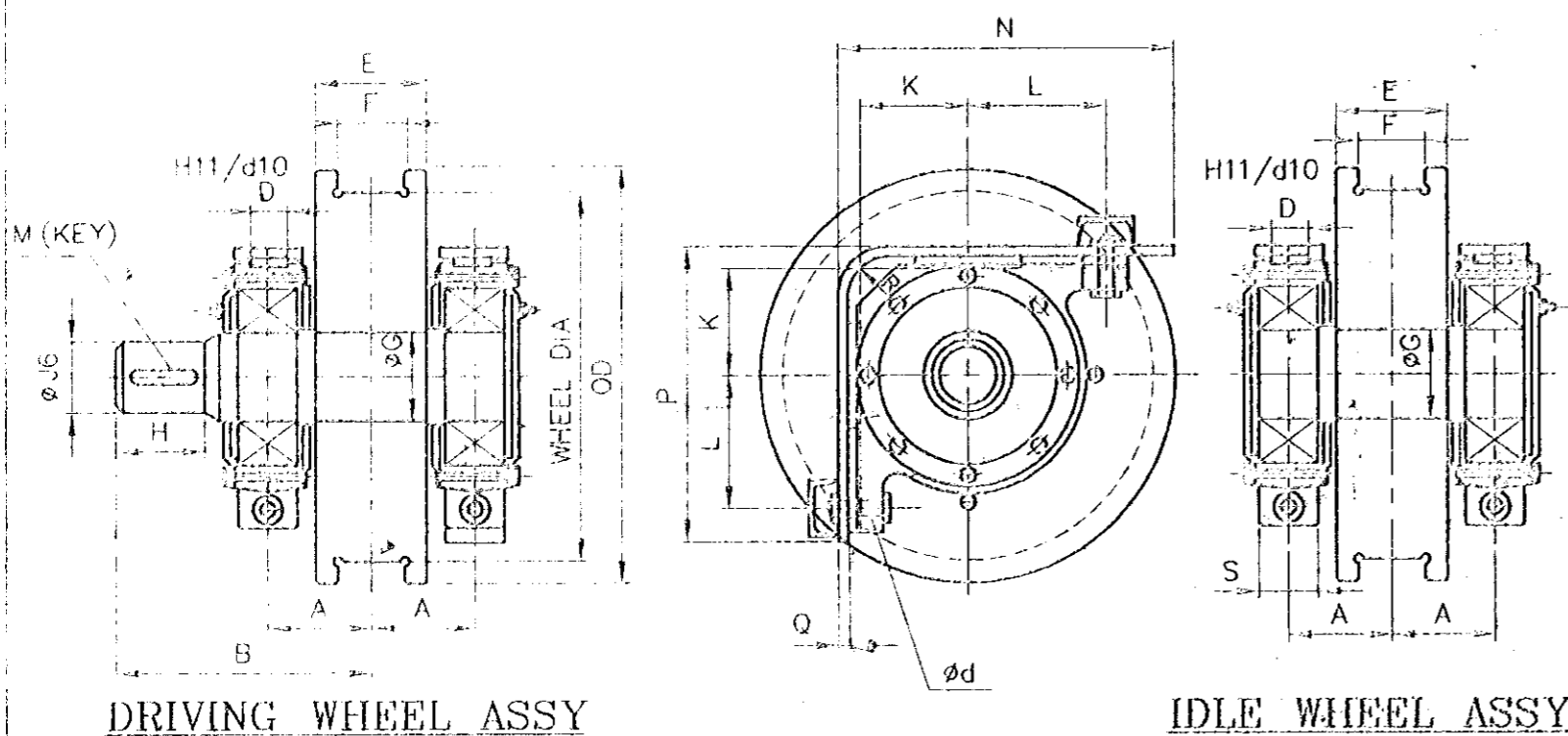
R. Kalaiselvan
R. KALAISELVAN
MANAGER
Cold Mill Mech. Maintenance
SSTP BHEL TRICHY-14

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 TRICHIRAPPALLI - 620 014.

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	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		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	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		50 Lbs/Yd 50 SQ.BAR 80 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

DIMENSIONS



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		
No. of Sheets				Sheet No.		