

DOUBLE GIRDER GANTRY CRANE FOR OUTDOOR APPLICATION AS PER BELOW SPECIFICATION

S.No.	PARTICULARS	BHEL SPECIFICATIONS	BHEL requirement	Vendor's Offer	Deviation (if any)	Reason for Deviation
1.0.0	APPLICATION	a. The subject crane is meant for the purpose of handling small to large (within the lifting capacity of the crane) components, bundles of steel sections and sheets & plates [13 Mtr. long] in a large steel storage yard. b. The crane will be put to use for continuous duty with CT, LT and Hoist movements, which may occur simultaneously (within the operating parameters specified under Clause Nos. – 3.1.0, 3.4.0 and 3.5.0). c. The storage yard environment will be open out door area and ambient temperature going upto 45° C.	Vendor to Confirm			
2.0.0	SCOPE OF SUPPLY	a. Design as per Tender Specifications b. Assembly and Testing before Despatch c. Supply in Modules / Sub-Assemblies d. Commissioning and Performance Prove-Out at BHEL Works	Vendor to Confirm			
3.0.0	TECHNICAL SPECIFICATIONS					
3.1.0	CAPACITY	Lifting Capacity				
3.1.1	Hoist	20 Metric Tonnes	Vendor to Confirm			
3.2.0	Length of the Bay	192,000 mm	Vendor to Confirm			
3.2.1	SPAN (Wheel Centre to Wheel Centre Dimensions)	20,000 mm	Vendor to Confirm			
3.2.2	Bay Width (Max.)	24,000 mm	Vendor to Confirm			
3.3.0	Height of Lift (Effective Height of Lift from finished floor)	10,000 mm	Vendor to Confirm			
3.4.0	DUTY CYCLE	Related to Drive Motor & Mechanisms				

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3.4.1	Hoist	40 % E D	Vendor to Confirm		
3.4.2	Long Travel	40 % E D	Vendor to Confirm		
3.4.1	Cross Travel	40 % E D	Vendor to Confirm		
3.5.0	SPEED	Operating / Working Speed [Maximum]			
3.5.1	Hoist	7.5 mtrs./minute.	Vendor to Confirm		
3.5.2	Cross Travel (CT)	30.0 mtrs./minute.	Vendor to Confirm		
3.5.3	Long Travel (LT)	70.0 mtrs./minute.	Vendor to Confirm		
3.6.0	MOTOR RATINGS	Electric VVVF Drive Motor Ratings & Frame Sizes			
3.6.1	Hoist	33.6 kW or more; Frame Size – 225 M / 6 Pole	Vendor to Confirm		
3.6.2	Cross Travel (CT)	5.5 kW ; Frame Size – 132 M / 6 Pole	Vendor to Confirm		
3.6.3	Long Travel (LT)	Vendor to specify in kW; Frame Size – 225 M / 6 Pole	Vendor to Specify/Confirm		
3.7.0	GEAR BOX	Gear Box Size			
3.7.1	Hoist	HR 650	Vendor to Confirm		
3.7.2	Cross Travel (CT)	VR 400	Vendor to Confirm		
3.7.3	Long Travel (LT)	VR 650	Vendor to Confirm		
3.8.0	ACCELERATION				
3.8.1	Cross Travel (CT)	300 mm / sec.sq.	Vendor to Confirm		
3.8.2	Long Travel (LT)	300 mm / sec. sq.	Vendor to Confirm		
3.9.0	HOIST ROPE DETAILS	Size and Number of Falls of Rope			
3.9.1	Hoist	Dia. 18 mm ; Falls - 8	Vendor to Confirm		
3.10.0	CONTROL	Cabin Operation and Remote Control			
3.11.0	Type of Control	Master Control and Radio Remote Control	Vendor to Confirm		
3.12.0	Control Voltage	110 V AC	Vendor to Confirm		
3.13.0	Input Power Supply	415 ± 10% Volts , 50 ± 3% Hz, 3 Phase-AC	Vendor to Confirm		
3.14.0	Duty Class	Class – 3 [Outdoor Service]	Vendor to Confirm		
3.15.0	Mechanism Group Classification	M 6	Vendor to Confirm		
3.16.0	DESIGN STANDARD	IS – 807 & 3177 / 1999	Vendor to Confirm		

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3.17.0	RAIL LENGTH	192000 each side i.e. Total=384000mm (in vendors scope). Grouting of RAILS shall be done by BHEL. Other than RAILS, all the necessary bolts, etc required for Foundation shall be in Vendor's Scope	Vendor to Confirm		
3.17.1	Runway Rail Size				
	Cross Travel (CT)	ISR 60 Lbs./Yard	Vendor to Confirm		
	Long Travel (LT)	ISR 105 Lbs/Yard	Vendor to Confirm		
3.18.0	Wheel Size				
3.18.1	Cross Travel (CT)	Dia. 320 mm	Vendor to Confirm		
3.18.2	Long Travel (LT)	Dia. 630 mm	Vendor to Confirm		
3.19.0	Brake Drum Size/Disc Brake	Hoist Brake Drum Sizes/Disc Brakes			
3.19.1	Hoist	Dia. 300 mm	Vendor to Confirm		
3.19.3	Cross Travel (CT)	Dia. 200 mm	Vendor to Confirm		
3.19.4	Long Travel (LT)	Dia. 300 mm	Vendor to Confirm		
3.19.5	Parking brake	Dia. 300 mm	Vendor to Confirm		
4.0.0	MAIN FEATURES	Crane Operational Features			
4.1.0	Control System	Conventional master control for all motions	Vendor to Confirm		
4.2.0	Remote Control	Radio Remote Control for all motions	Vendor to Confirm		
4.3.0	Crane Operation	Through Cabin Control and Radio Remote Control with option for control selection	Vendor to Confirm		
4.4.0	Operator Cabin	Totally enclosed out door type cabin located on one end of the crane	Vendor to Confirm		
5.0.0	STRUCTURAL FABRICATION	Crane Structure Constructional Details			
5.0.1	Type of Crane	Double girder double column gantry crane as per IS 3177 - 1999 / ISO -FEM for outdoor use			
5.1.0	Bridge / Leg	Box type Construction	Vendor to Confirm		
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.	Vendor to Confirm		

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5.3.0	Welded Joints	To be followed for Bridge/leg Fabrication	Vendor to Confirm			
5.3.1	Number of Joints allowed	For Span upto 23 mtrs.- Two joints For Span 23 mtrs. to 32 mtrs. - Three joints	Vendor to Confirm			
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.	Vendor to Confirm			
5.3.3	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.	Vendor to Confirm			
5.4.0	Splice Joints	NO SPLICE JOINT IS ALLOWED IN GIRDER FABRICATION [Girder has to be of SINGLE PIECE only].	Vendor to Confirm			
5.5.0	Leg connection	Leg to bridge connection shall be designed for double shear.	Vendor to Confirm			
5.6.0	Platform on Girders	The Platforms provided on both the Girders shall be fixed through BOLTED JOINTS using fit bolt only.	Vendor to Confirm			
5.7.0	Wheel Assembly	The Wheel Assembly coming for Cross Travel (CT) & Long Travel (LT) shall be of LIVE AXLE SYSTEM with L-Type Bearings.	Vendor to Confirm			
5.8.0	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.	Vendor to Confirm			
5.9.0	Machining Operation	All mechanical mating surfaces and wheel seating areas are to be machined to the required finish and protected	Vendor to Confirm			

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5.10.0	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.	Vendor to Confirm			
5.11.0	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.	Vendor to Confirm			
6.0.0	MECHANICAL ELEMENTS					
6.1.0	Gears	Gears in all the Stages shall be helical in design and to be of machined & ground and hardened.	Vendor to Confirm			
6.2.0	Gear Box Casing	Shall be of fabricated type and stress relieved by thermal heat-treatment process, prior to machining.	Vendor to Confirm			
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.	Vendor to Confirm			
6.4.0	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	Vendor to Confirm			
6.5.0	Wheels	The Wheels shall be of Die-Forged and Wheel Tread hardened to 300/350 BHN. Wheels shall be fitted with L-Type Bearings	Vendor to Confirm			
6.6.0	Mechanical Joints	Fit Bolts as per IS 3640-1982 for all joints coming in main members and platform with reamed holes	Vendor to Confirm			
6.7.0	Pulley Dimension	Rope Pulley diameter shall be 23 times that of Rope diameter	Vendor to Confirm			

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6.8.0	Hook	Hook latch shall be provided for both hooks	Vendor to Confirm			
6.9.0	Wind Clamp	Wind clamp shall be provided in all four corners	Vendor to Confirm			
6.10.0	Roof Covering	Single Roof cover shall be provided for trolley and long travel mechanisms	Vendor to Confirm			
7.0.0	ELECTRICAL ELEMENTS					
7.0.1	DSL shall be in vendor's Scope	Copper Scrouded Bus Bar (suitable for Outdoor Operation) Length: 192,000 mm	Vendor to Confirm			
7.0.2	DSL Mounting	BHEL shall provide supports for DSL mounting at suitable height on one side of the bay. Vendor to provide the details of such mounting arrangement. DSL to be erected & commissioned by vendor.	Vendor to Confirm			
7.1.0	Operational Controls	The Crane shall be provided with the following controls : a. Cabin Control [Master Control] b. Radio Remote Control [Push Button Type]	Vendor to Confirm Vendor to Confirm			
7.2.0	Control Voltage	110 V AC	Vendor to Confirm			
7.3.0	Type of Brakes	a. Hoist - DC Brake/Disc Brakes b. Cross Travel - Thruster Brake/Disc Brakes c. Long Travel - Thruster Brake/Disc Brakes d. Parking brake - DC brake/Disc Brakes	Vendor to Confirm Vendor to Confirm Vendor to Confirm Vendor to Confirm			
7.4.0	Protection	All Panels, Limit-Switches and Motors shall have IP 55 protection. (OUTDOOR SERVICE)	Vendor to Confirm			
7.5.0	Electric Motors	All Electric Motors shall be as per IS-325 and IS-1231 and also suitable for 300 starts per hour and 40 % CDF.	Vendor to Confirm			
7.6.0	Electric Contactors	All Panels shall have only SIEMENS Contactors and shall be suitable for AC3 Duty Class.	Vendor to Confirm			

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7.6.1	Spare Electrical Switch	An additional 64 Amp. MCCB shall be provided in the Electrical Control Panel of the Crane.	Vendor to Confirm			
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.	Vendor to Confirm			
7.8.0	Resistance	Stainless steel punched grid resistance continuous rating	Vendor to Confirm			
7.9.0	Long Travel Motion	A dual Drive Mechanism shall be provided for Long Travel Motion.	Vendor to Confirm			
7.10.0	Illumination	a. Four numbers of 500 Watts Halogen Lamps shall be provided under the Bridge	Vendor to Confirm			
		b. All Electric Panels shall be provided with suitable illumination for visibility and trouble shooting.	Vendor to Confirm			
7.11.0	Controller Steps	A 5-Step Controller (from Cabin) has to be provided for				
		a. Main Hoist	Vendor to Confirm			
		b. Long Travel	Vendor to Confirm			
		c. Cross Travel	Vendor to Confirm			
7.12.0	Load Cell for Main Hoist	a. Load Weighing System with LOAD CELL to be fixed / provided at the equalizer pulley.	Vendor to Confirm			
		b. The display shall be of 100 mm size (JUMBO)	Vendor to Confirm			
7.13.0	Crab Wiring	The CRAB shall be fully wired with junction box.	Vendor to Confirm			
7.14.0	Hoist Limit	Each hoist shall be provided with both rotary and counter weight limits	Vendor to Confirm			
7.15.0	Cabin	Electric Light, Fan, Exhaust-Fan, Warning Bell and Emergency Stop Push Button shall be provided in the Operator Cabin	Vendor to Confirm			

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8.0.0	SELECTION of BOI and COMPONENTS	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	Vendor to Confirm		
8.2.0	Wire Rope	USHA MARTIN / FORT WILLIAM / RA WIRE ROPE	Vendor to Confirm		
8.3.0	Electric Motors	GEC / BHARAT BIJLEE / SIEMENS / KEC / CROMPTON	Vendor to Confirm		
8.4.0	DC Brake Unit	Only BCH make	Vendor to Confirm		
8.5.0	Radio Remote Control	Only SNT make	Vendor to Confirm		
8.6.0	Thruster Brake Unit	ELECTROMAG / SPEED-O-CONTROL / OMEGA	Vendor to Confirm		
8.7.0	Limit Switch (Gravity Type)	SIEMENS / INDUSTRIAL SYNDICATE / BCH / SKC / SOC	Vendor to Confirm		
8.8.0	Contactors	Only SIEMENS make	Vendor to Confirm		
8.9.0	Over-Load-Relay	SIEMENS (THERMAL TYPE)	Vendor to Confirm		
8.10.0	HRC Fuses	ENGLISH ELECTRIC / L&T / SIEMENS	Vendor to Confirm		
8.11.0	Rotary limit switch	SIEMENS / OMEGA / SOC / INDUSTRIAL SYNDICATE	Vendor to Confirm		
8.12.0	Switch fuse unit	ENGLISH ELECTRIC / SIEMENS / GEC	Vendor to Confirm		
8.13.0	Moulded case C.B	SIEMENS / L&T	Vendor to Confirm		
8.14.0	Pneumatic Time Delay	Only BCH make	Vendor to Confirm		
8.15.0	Push - Buttons	SIEMENS / L&T / AIRON	Vendor to Confirm		
8.16.0	Connectors	Only ELMAX make	Vendor to Confirm		
8.17.0	Couplings	WMI / FENNER / ALFEX	Vendor to Confirm		
8.18.0	Bearings	SKF / NBC / ZKL	Vendor to Confirm		
8.19.0	Cables	Reputed Makes & ISI Approved	Vendor to Confirm		
8.20.0	Bridge Light Fittings	PHILIPS / GE / CROMPTON	Vendor to Confirm		
8.21.0	Load Cell	Only IPA make	Vendor to Confirm		
8.22.0	Resistance box	OHMARK / BCH	Vendor to Confirm		
9.0.0	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.			

9.0.1	Foundation Details	BHEL shall construct the foundation for Rails as per details of Loads e.g. Static & Dynamic Loads etc given by vendor. Vetting of detailed foundation drawings for rails and DSL mounting arrangement shall be done by vendor. Vendor shall ensure that the rail do not sag or column alignment is maintained in continuous operation for next ten years	Vendor to Confirm			
9.1.0	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, etc. g. Calculations for Bridge Girder, Crab, End - Carriage and their connections. h. Wiring Diagram with Logic Circuits. i. Cable Selection based on Current Rating.	Vendor to Confirm			
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9.2.0	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	Vendor to Specify			

		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.	Vendor to Specify			
10.0.0	INSPECTION	The following Schedule of Stage Inspections is to be strictly adhered to, prior to dispatch from the Supplier's Works	Vendor to Specify			
10.1.0	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	Vendor to Confirm			
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.	Vendor to Confirm			
10.3.0	STAGE – III [Final Inspection]	a. Measurement of CAMBER in the Bridges. b. Full / Rated Load Test and Deflection Test.	Vendor to Confirm			

		c. Deflection and Permanent Set Measurement.	Vendor to Confirm			
		d. 25% OVER-LOAD Lifting Ability Check.	Vendor to Confirm			
10.4.0	SPARES	Vendor to provide List of Spares for two (02) years normal operation of Crane	Vendor to Confirm			
10.4.1	Erection Spares	Vendor to provide List of Spares for Erection and Commissioning of Crane and List of Consumable Spares	Vendor to Confirm			
11.0.0	CRANE ERECTION & COMMISSIONING					
11.1.0	Mechanical Erection	Erection of the Crane will be done by Supplier.	Vendor to Confirm			
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. BHEL shall provide the required load for Testing.	Vendor to Confirm			
12.0.0	O & M MANUALS	Each 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	Vendor to Confirm			
12.1.0	Drawings & Details	a. Crane GA Drawing	Vendor to Confirm			
		b. Crab Assembly Drawing	Vendor to Confirm			
		c. Total Crane Wiring Schematics	Vendor to Confirm			
		d. Detailed Wiring Diagrams for Sub-Systems / Panels	Vendor to Confirm			
		e. VVVF Drive's Logic Circuits	Vendor to Confirm			
		f. Wheel Assembly Drawings	Vendor to Confirm			
		g. Bottom Block Assembly Drawing	Vendor to Confirm			
		h. Gear Box Assembly Drawings	Vendor to Confirm			
		i. Coupling Drawing and Details	Vendor to Confirm			

		j. Specifications/Ratings of All Bought-Out-Items	Vendor to Confirm			
		k. Warranty / Guarantee Card for all Bought-Out-Items	Vendor to Confirm			
		l. Trouble Shooting Chart for Main and all Sub-Systems	Vendor to Confirm			
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 twenty four (24) months from the date of performance acceptance at BHEL Works.	Vendor to Confirm			
14.0.0	QUALIFYING CRITERIA					
14.1.0		Only those vendors, who have supplied and commissioned at least ONE GANTRY CRANE of Rated capacity (i.e. of 20T with span 20M or more) or more in the past five years and such crane is presently working satisfactorily for more than one year after its commissioning (on the date of opening of Tender), should quote.	Vendor to Confirm			
14.2.0		Performance certificate from the customers regarding satisfactory performance of Gantry Crane Supplied to them should be sent along with technical details.	Vendor to Confirm			