



ISO 9001 Company

Heavy Engineering Corporation Limited

(A Govt. of India Enterprise)

Heavy Machine Building Plant

CRANE EXECUTION DIVISION

Tender Ref No: HMB/CED/PUR/99/03/09/001/LTE-002, Dtd 21.10.09

TENDER DOCUMENTS

SUPPLY OF

1 T CAPACITY JIB CRANES

**CRANE EXECUTION DIVISION
HEAVY MACHINE BUILDING PLANT
HEAVY ENGINEERING CORPORATION LIMITED
P.O.- DHURWA, RANCHI**

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CRANE EXECUTION DIVISION, 2nd FLOOR ADMINISTRATIVE BUILDING, HMBP
PHONE: 0651 2401200, 2401544 FAX: 0651 2401166, EMAIL: ashimkumar@hecltd.com



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INFORMATION

Tender is invited for supply of Jib Cranes as per technical specification of HEC.

Last date of submission of tender: --- 5th November' 09 up to 3 PM

Tender Opening date: --- 5th November'09 at 4 PM

SECTION – “A”

TECHNICAL SPECIFICATION

01.0 PREAMBLE:

This technical specification shall be read along with General Technical Specification (GTS) of IISCO, Burnpur. The scope of work, technical specification, parameters for the jib cranes are as under.

01.1 GENERAL

1.1.1 The following are the list of Jib cranes to be supplied.

SL. No.	Description	Qty.	Location	Remarks
1.	1.0t capacity jib crane for ladle repair, Radial Span – outreach 5.0m rail level = 7.0m, Duty class M5	1	H'J Bay	Pendant Operated
2.	1t capacity Jib crane for slide gate repair, Radial span-outreach 5.0m , rail level-7.0 m Duty class M5	2	KL Bay	Pendant Operated



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02.00 SCOPE OF WORK:

The scope of work of the tenderer shall consist of design, engineering, manufacture, assembly, shop testing, inspection, painting at manufacturer's shop as well as at site after erection, supply to the works of M/s HEC Ltd, Ranchi. The jib cranes shall be complete in all respect with mounted electrics and standard accessories and attachment as covered in this specification and as per the clearance diagrams enclosed. Supervision of erection, testing & commissioning of jib cranes shall be in the scope of supplier. Any other accessories and devices not specifically mentioned in the technical specification but are essential for proper installation, operation and maintenance of the system shall be deemed to be included in the scope of work.

03.00 Supply of jib cranes shall consist of the following:

- 03.01 Supply of Jib cranes complete with its structural, mechanical and electrical components and standard accessories mentioned in the clearance diagrams.
- 03.02 Supply of handling attachment as indicated in TS and corresponding clearance diagrams.
- 03.03 Supply of all commissioning spares required for commissioning of the Jib cranes as per clause no. 04.22(a).
- 03.04 The scope of supply shall cover the required quantity of initial fill of lubricants, hydraulic fluid, cleaning / flushing fluid including replenishment and other consumables necessary for erection, testing and commissioning of the Jib cranes.
- 03.05 The scope of supply shall cover the necessary tools and tackles required for maintenance or testing / inspection as per clause no. 04.09.
- 03.06 Supply of required quantity of paints for intermediate, final coat and retouching as per clause no. 04.21
- 03.07 Supply of drawings and documents as per General Technical Specification.
- 03.08 The power supply for jib crane is to be taken from the PDB (in bay).
- 03.09 Supply of incoming cable from PDB (in bay) to DB / control panel of jib crane for feeding power, erection accessories like cable trays, lugs, glands etc. The PDB shall be located at the middle of the bay. The supply of PDB is not in the scope of supply of the bidder..

04.0 GENERAL INSTRUCTIONS TO TENDERER:

- 04.1 Tenders shall be accompanied with general arrangement drawing for each jib crane and handling attachment (if any) showing to scale the elevation, side view and plan along with information such as clearances, construction of bridge structure, hook approaches, height of lift, wheel base, wheel loads, wheel diameters, over buffer dimensions, buffer height, LT & CT buffer compressions, motor ratings, hoist, CT & LT speeds, arrangement and disposition of all the drives and other equipment installed on the jib crane, speed torque characteristics for each motion etc. to enable the Purchaser to assess the important technical features of the equipment offered.
- 04.2 Tenders may be rejected if compliance with this clause is not ensured while tendering. The Tenderer shall also clearly specify any request for deviation from technical specification in the format enclosed in GTS. Deviation **indicated elsewhere other than enclosed format will not be considered**. Generalized statements like "the jib crane shall be manufactured as per IS standard, our specification" may result in rejection of Tenders.



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04.3 Following drawings shall be submitted in adequate number of copies as per General Technical Specification for each equipment to the Purchaser / his Consultant in stages for approval / reference within one month of issue of purchase order and prior to commencement of fabrication. The Purchaser/Consultant shall send his comments within 15 days of receipt of the drawings. However, approval of drawings by the Purchaser will not relieve the supplier of his responsibilities for correctness, adequacy of the design and completeness of his work as per the contract. All the drgs and documents will be in English Language. Drawings shall be complete in all respect with dimensions, item lists, etc.

- i The general arrangement drawing containing all information (for approval).
 - ii General layout drawing of the trolley (for approval).
 - iii Assembly drawing of individual drives likes hoists, long travel, cross travel etc. (for reference)
 - iv Structural calculations for girder (if applicable), end carriage and connection between the two. (For reference)
 - v Motor power & brake selection calculation. (For approval)
 - vi Lubrication arrangement for the equipment (for reference only)
 - vii
 - a) Power and control circuit diagram showing the wiring for all the panels for Jib crane including the speed torque characteristics of each motion.
 - b) Layout of Electrical equipment on jib crane, cable layout drawings and layout of earthing system for equipment installed on Jib cranes.
 - c) Inter-connection diagram and cable schedule.
 - d) Current collection arrangement for the jib crane and details of current collector.
 - e) Power supply arrangement (details) to the trolleys.
 - f) GA of all panels, junction boxes, and limit switches etc. with their technical details.
 - g) Bill of materials for each panel and terminal plan drawings for each and every panel and equipment.
 - h) Single Line Diagrams for various panels
 - l) Power supply system including down shop lead and festoon cable arrangement.
 - k) Voltage drop calculations for DSL
 - m) Power and control schemes with bill of materials and technical specification.
 - n) Motors and field devices
 - GA drawings/ Technical data sheet
 - viii Quality Assurance Plan for inspection QAP, inspection and testing of equipment shall be as per General Technical Specification.
 - ix In addition to the above, the Purchaser/ Consultant may ask for submission of other drawings, documents, structural, mechanical and electrical calculations of the jib crane and trolleys for scrutiny and reference, if required.
- 04.4 If the drawings and other particulars are returned by the Purchaser/ Consultant, because they are incomplete or incorrect, the Supplier shall not be given any extension of time on this account.
- 04.5 The supplier shall furnish adequate nos. of prints of all erection drawings as per General Technical Specification/ SBD showing the mark numbers with weights of the various items to be assembled at site, schedule of site bolts, rivets and special welding electrodes and welding techniques and



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- erection instructions.
- 04.6 The documents supplied prior to commissioning of the jib crane shall be as per General Technical Specification.
- 04.7 A tool box containing all necessary tools like torque wrench, portable hydraulic jacks (2 Nos. of Capacity ~ 1.5x Max Wheel load), hand grease gun, set of spanners, set of screw drivers, etc. required for the maintenance shall be supplied with each Jib crane.
A separate electrical engineers toolbox with insulated tools shall be provided for each Jib crane.
- 04.8 The supplier shall submit test certificates for all electrical equipment, cables and all parts used in handling as for instance wire ropes, chains, load hooks etc.
- 04.9 The supplier shall submit material test certificates for structural steel and mechanical components such as couplings, gear boxes, rope drums, pulleys, shafts, gears, hooks, wheels etc.
- 04.10 The supplier shall ensure that minimum amount of assembly at site is necessary for early commissioning of the jib crane after delivery. Site welding and riveting shall be avoided as far as possible. The Supplier, before proceeding with design details shall satisfy himself about the site conditions so as to avoid any difficulty in erection, arising out of design.
- 04.11 The Jib cranes shall be completely assembled and tested in the Supplier's works for full load and 25% over load on hoisting and cross traverse motion, in presence of Purchaser's representative in addition to other tests as specified in the latest revision of IS : 3177 as applicable.
- 04.12 The following test shall be carried out at manufacturer's works during inspection.
-High voltage test of panels.
-Contactor sequence test for all motions.
- 04.13 Dimension of all parts used on jib crane shall conform to metric standards.
- 04.14 All the electrical and mechanical equipment shall be of reputed make and proven quality with regard to their performance. The make shall be as per approved list of Purchaser/ Consultant.**
- 04.15 Some of the jib crane parts, if specified, shall have to be manufactured as per Purchaser's specifications and drgs. Purchaser's preferred make of equipment if any, shall be adhered to.
- 04.16 The jib crane shall be offered for inspection and testing during different stages of its manufacture, starting from raw materials till the completion of the jib crane by the Purchaser/his authorized representative at the Supplier's or his sub-supplier's works as per the inspection procedure mutually agreed between the Purchaser or his authorized representative and the Supplier. Inspection shall be regarded as a check up and shall be in no way binding on the Purchaser.
- 04.17 Documents for all electrical and mechanical equipment supplied with the jib crane shall be put up for inspection along with the equipment. After inspection, an endorsement would be made in the inspection certificate about the availability of the documents.
- 04.18 Initial requirement of lubricant, including replenishment during erection and commissioning work shall be supplied by the supplier.
- 04.19 Painting:
All jib cranes shall be painted as per specification prior to finalize. Necessary surface cleaning by mechanical power tools as well as blast cleaning of the surface required as per TS have to be done before painting. The equipment has to be painted with requisite grade of primer and intermediate paint prior to finalize. Necessary heat resistant, anti corrosive and special paints have to be applied as per requirement.



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The detail painting procedure to be followed by the successful Tenderer has been indicated in General Technical Specification (GTS). However following shall also be considered for painting of jib cranes:

- i) All parts of the jib crane shall be thoroughly cleaned of all mill scales, rust or foreign matters and then painted as specified. The surface cleaning shall conform to Indian Standard/ Swedish Standard/ DIN standard.
- ii) All parts of the jib crane (except motors, resistors, gears, thrusters etc.) shall be painted at shop with one primer coat of PVC copolymer alkyd resin with red oxide/ zinc chromate. For corrosive atmosphere all surfaces shall be coated with two (2) coats of Epoxy Zinc based on zinc dust.
- iii) Interior of all gear housing shall be painted with oil resistant paint.
- iv) All machine pads, bearing surfaces on structure or housing shall be painted with white lead.
- v) All parts inaccessible after assembly shall be painted before and assembled while paint is still wet.
- vi) After erection the damaged portion of the painted surfaces shall be retouched and then one intermediate coat of PVC copolymer alkyd resin shall be applied. The colour shall be as per choice of the Purchaser.
As the jib cranes is subjected to corrosive atmosphere, the intermediate coat of PVC copolymer alkyd resin with micaceous iron oxide (MIO) shall be applied.
- vii) Subsequently one final coat of PVC copolymer alkyd with weather resistant pigment (approved by Purchaser) and glossy finish shall be applied.
- viii) The detail of dry film thickness (DFT) of the different coats shall be as follows:

a) Primary coat	=	30-40 micron/coat
b) Intermediate coat	=	70-80 micron/coat
c) Final coat	=	40-50 micron/coat
- ix) For parts exposed to heat beyond 80⁰ C & upto 150⁰ C Zinc ethyl silicate primer shall be used followed by a coat of high build epoxy polyamide enamel.
- x) The buffer and hook block of the jib cranes shall be painted with yellow base and 100 mm wide black zebra strips at a gap of 100 mm at 30⁰ inclinations.
- xi) Colour scheme shall be as approved by the Purchaser.

04.20 Spares

a) Commissioning Spares

The Tenderer shall include in his tender all commissioning spares required for proper erection and commissioning of the equipment until final acceptance following demonstration of performance guarantee. A list of such spares should be furnished.

b) Spares for two years maintenance & operation:-

The recommended list of spares for two (2) years operation and maintenance along with item wise prices must be submitted with the offer. The list shall also include the items listed below. The prices for these spares must be valid till the execution of the contract.



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List of spares for two years of operation

i) Mechanical :

Sl. No.	Item	Qty
1.	L.T. wheel assembly (Driving)	1 No.
2	L.T. wheel assembly (Driven)	1 No.
3	C.T. wheel assembly (Driving)	1 No.
4	C.T. wheel assembly (Driven)	1 No.
5.	First reduction pinion shaft with bearing assly. For all drives.	1 no. each
6.	Brake drum for all drives	--do--
7.	Brake lining with rivets for all brakes	6 pairs each
8.	Rope sheaves with bearing assembly	1 no. of each size.

ii) Electrical:-

Sl. No.	Item	Qty.	%of total equipment
1.	Motors	1 no. of each rating.	
2	Controls		
a)	Power contactors Fixed and moving contacts for contactors of each type	1 no. of each rating. Minimum 1 set for each	25%
b)	Contact set for auxiliary Contactors	--do--	25%
c)	Coils for power contactors	Min. 2 nos. for each type	50%
d)	Coils for aux. contactors	Min. 1 no. for each type	25%
e)	Over load relay	Min. 1 no. for each type	100%
f)	Timers	Min. 2 nos.	15%
g)	Aux. Contactors	Min. 1 no. of each type	25%
3.	Master controller: Moving contacts & fixed contacts	25% each	25%
4.	Limit switches: Fixed & moving contacts	25% each for individual mechanism	25%
5.	Fuses		
a)	Power circuit fuses	Min.1no. of each rating	100%
b)	Power circuit base	Min.1 no. of each type	25%



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	c)	Control fuse	Min. 4 nos.	25%
		base		
	d)	Control fuse	Min. 1 no.	25%
		base		
6.	Indicating lamp holder	with	Min. 2 nos.	25%
7.	Push buttons		Min. 1 set	40%
	Contact element set for push buttons			
8.	IGBT module of each type		Min. 2 nos.	For jib cranes with VFD control 25%
9.	Semiconductor fuses			
10.	Resistors			
	Punched stainless steel		Min. 1 no. grid for each current rating	5%
11.	D.C. contactor magnet panel		Min. 1 no. for each type	25%
12.	Bridge rectifier for magnet		---do--	25%
13.	Coils / thruster unit for brakes of each type			100%

05.0 TECHNICAL SPECIFICATION

05.01 Mechanical (General)

(For Details refer General Technical Specification)

The following shall also be considered and included in your offer: -

1. For Cross and long travel motion of all jib cranes, OLEO make pneumatic buffers shall be provided.
2. All the auxiliary hoists shall have wire ropes in two pieces instead of single piece rope.
3. Graphite rod lubrication shall be provided for wheels of LT as well as CT.
4. All drum coupling shall be "MALMADIE" make only.
5. Brake-drum seat of drive-in shaft shall be parallel-seat.
6. Make of lubrication system shall be Lincoln-Helios / Lincoln.
7. All wheels shall be forged type and material shall confirm to EN-28M or equivalent. Hardness / surface hardness shall be as stipulated in the GTS. Selection of wheel shall be as per IPSS.
8. Provision (space and electrical power-supply arrangement) for one number welding machine shall be kept in all EOT crane.

05.02 MECHANICAL DETAILS

05.02.01 Rope drums

Rope of drums shall be of cast steel or fabricated out of rolled steel plates. Fabricated



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drums shall be stress relieved before machining. The grooves of the drum shall be smooth finished. Rope drum shall be flanged at both ends.

05.02.02 **Rope sheaves**

Rope sheaves shall be of cast steel or fabricated out of rolled steel plates.

05.02.03 **Wire ropes**

The ropes used shall be of galvanized type. Ropes shall be regular right hand lay as per IS: 2266-1989. The construction of the ropes shall be 6 x 37 upto 16 mm diameters and 6 x 36 above 16mm diameter.

05.02.04 **Hook**

Hook shall be as per IS:15560.

05.02.05 **Hook block**

The sheaves shall be fully encased in close fitting guards fabricated out of steel plates. Smooth opening shall be provided in the guards to allow the free movement of rope, and holes shall be provided for drainage of the oil.

05.02.06 **Gears & gear- boxes**

Straight and helical spur gearing shall be used for all motions. Worm & bevel gearing may be used in exceptional cases with the specifics approval of the Purchaser. All first reduction gears shall have helical teeth. All pinion shall be integral with the shaft. All gears shall be hardened and tempered alloy steel having metric module. Overhung gears shall not be used.

Surface hardness for pinion shall be 255 to 300 BHN and for gears it shall be 215 to 260 BHN. Difference in hardness of pinion and gear shall not be less than 20 BHN. All cast steel gear shall be tested by Gamma Ray. All gears shall be enclosed in oil tight gearboxes. Gearboxes shall be of high-grade cast iron/cast steel or fabricated and split at each shaft centre lines. Fabricated gearboxes shall be stress relieved before machining. For cross travel and long travel motion, vertical gearboxes with 'T' split may be used.

05.02.07 **Connection between rope drum & gear-box**

Fully flexible Barrel coupling of "MALMADIE" make only shall be used between the drum & gearbox .

05.02.08 **Wheels**

Crab/crane wheels shall be double flanged. Wheels shall be mounted in anti-friction roller bearing housed in 'L' shaped bearing brackets for easy removal during maintenance.

All wheels shall be forged types and material shall confirm to EN-28M or equivalent. Hardness / surface hardness shall be as stipulated in the GTS. Selection of wheel shall be as per IPSS.

05.02.09 **Coupling**

Motor shaft shall be connected to the gear-box input shaft through flexible gear coupling. Rotating parts shall be suitably covered by 3.15 mm thick sheet steel hinged covers for safety. In case of single motor central drive for long travel motion, output shaft of the gear-box shall be connected to the line shaft through half geared couplings. Intermediate lengths of the line shaft may be connected through solid flange couplings. Half geared



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couplings with floating shaft shall be provided between the wheel and the line shaft.

- 05.02.10 **Bearings & bearing housing**
Anti-friction bearings shall be used throughout except where required otherwise for technical reasons.
- 05.02.11 **Buffers**
OLEO make pneumatic buffers shall be provided on all the 4 corners of the bridge girders and the end carriages for cross and long travel motions respectively.
- 05.03.12 **Brakes**
The brakes shall be provided for all motions on the high-speed pinion shaft of the gear train.
- 05.03.13 **Lubrication**
Duel line hand operated grease lubrication system shall be used for all the bearings for class M7 and M8 duty cranes. Grouped lubrication system shall be used for class, M3 and M5 duty cranes. Lubrication of the gears and pinions in the gear-boxes shall be splash fed from the sump. In case of three reduction, vertical mounted gear-box (having limited motion), are used, an oil pump shall be fitted to ensure lubrication of all gears.

06.0 Electrical

06.01.01 SCOPE OF WORK:

The scope of work will be on turnkey basis and include all the works required for project implementation, but not limited to the followings.

1. For 1T jib crane for ladle repair (travel length- radial)

a)	DB at shop floor level	1 no/crane
b)	Junction box at gantry level	1 no./crane
c)	Incoming cables from DB to JB with cable trays and other accessories	1 set/Crane
d)	Crane Electrics	1 set/Crane

2. For 1T jib crane for ladle repair (travel length- radial)

a)	DB at shop floor level	1 no/crane
b)	Junction box at gantry level	1 set/crane
c)	Incoming cables from DB to JB with cable trays and other accessories	1 set/Crane
d)	Crane Electrics	1 set/Crane

The scope of work also includes sectionalizing Isolator (MCCB), all types of cables, complete DSL system including supporting insulator and compensation equipment along the complete length of DSL including its connection arrangement with multirun incoming cable at DSL end in the shop and main current collectors on the crane and all other electrical items beyond the main current collector on the crane, i.e. main current collector, power disconnecting switch on bridge platform, protective and control switch gear,



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motors , control and brake panels , resistors , brakes , limit switches , all power and control cables , cable trays , cable accessories , socket outlets , lighting distribution panel , lighting fixture with lamps , festoon cable system , master controllers , indicating lamps , push buttons , pendants, earthing materials etc

The Scope of work also includes complete assembly and wiring of cranes including load testing at site , earthing , erection and testing and commissioning of all electrical equipments , supply of all commissioning spares

All sundry erection materials required for installation and connecting up of electrical equipment with cable laying and fixing accessories shall be included in the scope of supply by the tenderer

Minor civil work like chipping, digging surface finishing etc required for completion of work will be in the tenderer's scope.

Any other work not foreseen at this stage, but may become necessary during erection, testing and commissioning of the equipment shall be included in the scope of supply by the tenderer.

06.01.02

Standards:

The design, manufacture, assembly and testing as well as performance of the equipment shall conform to the IPSS in respect of items for which IPSS have been issued; otherwise, to the relevant IS specifications (latest revision). In case the Tenderer is not in a position to comply fully with certain IPSS / BIS specifications, or in respect of certain items for which there are no IPSS / BIS specifications, the Tenderer may base his proposals on IEC recommendations or other reputed national or international standards subject to the approval of the Purchaser.

All equipment supplied and all work done including system design and detailed engineering shall also comply with the statutory requirements of the Government of India and the Government of West Bengal and with the Indian Electricity Rules.

06.01.03

Climatic conditions:

The ambient temperature conditions met within the different shops/ units of the steel works complex will be as follows:

Ladle bay	:	+60° C
Charging Bay	:	+60° C
Ladle Repair shop	:	+55°C
Casting bay	:	+55°C
Discharge bay	:	+55°C
Storage bay	:	+60°C
Despatch bay	:	+50°C
Electrical rooms (ventilated)	:	+45°C
Cable basements/tunnels (ventilated)	:	+45°C

For specific areas and shops, the ambient temperature conditions indicated above shall be taken into consideration and equipment suitably derated where necessary. For areas not covered above, equipment selection and derating shall generally be based on ambient temperature of +50°C.

The equipment offered shall be suitable for smooth, efficient and trouble free service in the



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tropical humid climate prevailing at IISCO Steel Plant, Burnpur and under the ambient temperature conditions indicated above for the different shops and areas. In hot areas of higher temperature conditions, the equipment shall be adequately protected against damage from radiant heat and hot air.

The equipment shall be designed to give efficient and reliable performance under heavy steel mill conditions and shall be such that the risks of accidental short-circuits due to animals, birds or vermin are obviated.

06.01.04

Power supply and standard voltage levels:

The following standardized voltage levels shall be adopted:

- a) LTAC : 415V, 3 phase, 50 Hz, 4 wire solidly earthed system. Other voltages shall be obtained by providing transformer/ transformer – rectifier unit with MCB's on both primary and secondary side and $\pm 5\%$ and $\pm 10\%$ taps on transformers secondary.
- b) AC control and signalling voltage : 240 V AC
- c) Socket outlets for Hand lamps : 24 V, single phase, 50 Hz, AC obtained through suitable transformers
- Hand tools : 240 V, 15A, 2 pin plus earth with plug interlocked switch
- d) Electro-magnetic brakes : 220 V, DC obtained through individual brake control panels.
- e) Monitoring and signaling in electronic installations, mimic panels : 24/ 48 V. DC
- f) Illumination/ lighting : 240 V, AC

The three phase symmetrical short-circuit ratings of the switch gear at 415 V shall be 50 kA for 1 second.

The system/ unit/ equipment shall be designed so as to be suitable for the following variations in voltage and frequency :

	Voltage	Frequency
Permissible variations with rated performance, rated current and control effectiveness maintained	+ 10%	+5% & -5% For LT system
Permissible variations for control and regulation equipment with rated performance and control quality maintained	+ 10%	+5% & - 5%

Voltage dip on the starting of largest LT motor shall be limited to 20% of the nominal voltage at the motor terminals.



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Total voltage drop on crane shall be limited to 2% on crane and 3% in DSL system.

06.01.05 Trolley Lines and Power Supply Arrangements for Jib cranes (DSL System):

01. Power Supply Arrangements for Cranes (DSL System)

Power to all the bays shall be fed from crane LTSS through PDB's installed in respective bays. Number of panels shall be decided as per requirement (to be indicated by the tenderer. Isolator (ACB / MCCB) for each feeding section will be provided in each bay. The tenderer shall provide bimetallic joints and cable lugs for termination of Purchaser's incoming cables.

All the PDB's shall have 02 incomers and 01 bus coupler. Normally both the incomers will be charged and bus coupler will be OFF. In case of power failure or any fault power will be fed from either of the incomers. Incomers, buscoupler and busbars shall be designed to take care of entire load of the cranes.

Crane trolley lines feeding cranes in major production units shall be sectionalized with two separate feeding points. Two fully rated MCCB / ACB shall be provided for each incomer feed point to crane DSL. Sectionalizer shall be provided between the two incoming ACBs with necessary padlocking arrangement.

In case of circuit breaker rating more than 630A, ACB's shall be provided. All the ACB's shall be installed in a PDB which shall in turn be installed in the bay / shop floor. In case of circuit breaker rating is 630A or less, than the MCCB (as isolator) with earth fault protection and magnetic over current release shall be mounted in the respective column of the feeding bay in a separate enclosure at man height level.

Signal lamps (LED cluster type) shall be provided just below the trolley lines at 60m intervals as well as at the beginning and end of each section/repair section to indicate whether the trolley lines are energized or not.

Insulation air gap between two sections of a sectionalised trolley line shall be minimum 50 mm for voltage levels upto 500V, but in no case should be greater than the length of the current collector on the crane.

Power supply to hoists control panel shall be fed through isolator panel located near the hoist from tenderer's PDB in bay.

02. Trolley power conductors

The Power conductors or down shop lead (DSL) shall have 4 conductors, 3 phase, 4 trolley line system (3 power + 1 earth).

Following sections of DSL shall be used for different crane / hoists capacity:-

Upto 10 t capacity	:	50 x 50x 6 mm MS angles.
Above 10t upto 100 t	:	75 x 75 x 6-mm MS angles.
Above 100 t	:	rail size of 75 lb.

Trolley power conductors shall be of mild steel angle section / rails. The section shall be straight, unbranded and smooth on the running surface. The power conductors shall be made from standard rolling length. The jointing of standard lengths shall be made by 100% butt welding and top surface finished smooth by grinding to get free movement of the current collectors. The conductors shall be painted with anticorrosive paint, except for contact surface. Parallel aluminum buses shall be provided as specified. The maximum continuous length of power conductor section shall not exceed 30 m without an expansion joint in between. Expansion and section gaps shall be provided in rails at every 30m. The gaps shall be cut at an angle of 30 degree to the rail and shall be 50mm wide. The gaps shall be provided with flexible joints.



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The conductors shall be supported at 3000 mm intervals by insulators mounted on brackets welded to crane girders. Typical drawings indicating details of trolley line power conductors, supporting insulators, brackets, expansion joints, parallel aluminum bus, signal lamp assemblies etc. shall be furnished to successful Tenderer.

In order to provide electrical continuity across the expansion joints the power conductors on both sides of the joints shall be connected by stranded aluminum conductor jumper, fitted with steel Aluminum strap and lugs suitable for the steel angle sections.

Looping cables shall be used in parallel with the conductor rails and aluminum equalising strips shall be provided, wherever necessary, for limiting the voltage drops. However, aluminum equalising strips shall not be used in the hot areas like slag / liquid steel / slab / slab yard etc. In such areas, copper cable looping shall be used.

The sizes of conductors shall be selected to suit the total current requirements of EOT cranes keeping the voltage drop in the crane DSL system upto the crane power collecting point on DSL within 3% of the declared voltage under worst operating condition.

The power supply feeder and trolley line conductors/looping cables shall be selected so as to limit the voltage drop to within 15% of the rated voltage at the crane motor terminals for the short time peak current corresponding to the starting of the largest capacity motor and the maximum continuous operating current of the rest on the system.

Maintenance Bay

When two or more cranes are fed from the same trolley line, maintenance bays (repair sections) shall be provided with sectionalizing isolator so that repair or maintenance of any crane can be carried out without disturbing the operation of the other cranes. Necessary DSL arrangement for repair section shall be provided by Tenderer.

Isolator panels (ACB / MCCB panels including cables) shall be provided for each repair section for maintenance. Dead zones shall be provided with isolator arrangements to prevent collision between cranes and momentary paralleling to two incomer supplies. Incomer ACB's shall be provided with earth fault protection and magnetic over current release. The DB,s shall be located suitably on the shop floor.

For end zones, minimum length of maintenance bay shall be 2 m plus the crane width. For middle zone, the length of maintenance bay shall be 4 m plus the width of crane.

Repair section shall be provided with red lamp steady/flashing fixtures at four corners. These fixtures shall be located at crane gantry with manual ON/OFF provision.

Boarding or access platform shall be arranged within the limits of each repair section for approach to the crane.

03. Insulators and trolley line holders:

The insulators used for the manufacture of trolley line holders shall be preferably steatite, tufnol or porcelain insulation material having substantial mechanical strength specifically against blows and vibrations. They shall be capable of withstanding the impact and shocks resulting from operation of the machine. The creep age distance of the insulators shall not be less than 80 mm. The insulators used in the LT/AC system shall have flash over values and mechanical strength not less than the following:

Dry flashover voltage	:	25 kV
Wet flashover voltage	:	12 kV
Ultimate mechanical strength	:	1000 kg.

The trolley line holders shall generally conform to the design shown in the drawing to be furnished to the successful Tenderer. All sharp edges shall be ground smooth. The porcelain insulators shall be manufactured and tested as per IS: 1445 –1997.



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04. Supporting brackets:

The trolley line conductors shall be mounted on holders. The holders shall be bolted on to brackets which in turn shall be welded on to crane girder at stiffeners at regular intervals. In normal run, intermediate type of brackets shall be used, but when sectionalizing gaps or expansion joints are provided, sectionalizing type of brackets shall be provided.

05. Steel to Aluminum straps:

These are meant for connecting parallel aluminum bus, at expansion joints, power supply cables from load break switch. They shall be complete with MS cadmium coated bolt nuts, spring washers, lugs etc.

06. Signal lamp assembly:

Signal lamp assembly shall be LED Cluster type . It shall be industrial, heavy duty dust tight and water proof in construction suitable for indoor or outdoor locations. 4 Nos. cluster LED type red warning lights shall be installed at the four corners of the crane to indicate that the crane is down undergoing repairs.

07. Aluminum parallel bus:

These buses shall be of EC grade aluminum. They shall be free from any deformity in profiles.

06.01.06 **Current Collectors:**

2 nos. per trolley line shall be provided. The collector shoe will be of heavy duty design and chamfered at both ends, each rated for 100% of total crane rating. Double collectors on each earth trolley line shall be provided and these shall be different from those on power trolley line. Collector shall be multi hinged for self – aligning. Collector will be designed in such a way that load is transmitted not on the insulators but on the insulator stud to avoid damage to insulators.

06.01.07 **Power distribution on crane:**

One adequately rated load break manual isolator (MCCB/ACB) with locking facility shall be provided immediately after current collectors on incoming line on the crane. The isolator shall be capable of carrying current of two largest motors. Power from the isolator shall be taken to the air circuit breaker to be provided in operator's cabin. In case of pendant operated cranes, this circuit breaker shall be located in protective panel located at bridge platform.

The breaker shall be provided with under voltage, over load and short circuit releases. The breaker shall also be with earth fault protection. The breaker can be closed only when:

- All master controller handles are in neutral position.
- None of the stator or directional contactors are in closed positions.
- Emergency corner switches not operated.

- Door/Gate switch are not actuated and gravity limit switch for hoist motion not operated. Power for lighting and magnet circuits shall be tapped from the incoming side of isolators near current collectors.

06.01.08 **Power supply for CT. motion:**

Flexible trailing cable systems mounted on retracting support system shall be used. The system shall consist of insulated multi-conductor or several single conductor cables with permanent termination on the bridge and on the trolley. The flexible trailing cables shall have ample length and shall be supported by means of properly designed movable clamps. These clamps shall be fitted with rollers and shall run freely on a guide rail allowing relative movement of bridge and trolley without undue stress or wear on the suspended cable. Provision later stage in case of necessity. The flexible cable shall be butyl rubber or EPR insulated CSP sheathed type.

For rotating trolley cranes, power supply shall be through festoon cable arrangement, slip ring or cable basket. Cable reeling drum or cable basket shall be used for power supply to



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the magnet from the trolley. Two spare turns of cable provided on cable reeling drum. The cable reeling drum shall be directly driven by hoist mechanism, a clutch shall also be provided to disconnect the drum from hoist mechanism.

Flexible cables system mounted on latest PVC linked chain system in normal area & metallic chain systems in hot area shall be provided .

06.02.09

Meters:

Ammeter and voltmeter with selector switches shall be provided on the incoming line in operator's cabin.

Ammeter and voltmeter shall be provided on DC side for Electromagnets.

06.02.10

Control features:

All controls shall be fully magnetic, operated through master controllers. All travel motions shall be provided with plain rotor resistance control with plugging. For long travel drives, the electrical control shall be grouped for the individual pair of motors separately in case of four motor drive and each pair of motors shall be able to drive the crane at reduced acceleration and speed. As an anti-skewing measure, out of a pair of motors for LT., if one drive motor trips, the other drive motor shall be switched off. For pendant control, plugging shall be avoided for travel motion.

Brakes shall not be used for speed control.

Synchronization of separate drives where required shall be done with the use of solid state thyristor control.

For all hoist motions, except where creep speed is required, plain rotor resistance control shall be provided on all master controller notches in the hoisting direction. The rotor resistance shall be cut out gradually when moving from lower to higher notches such that current peak of 2 times the rated current is not exceeded. In the lowering direction of the motion, controlled lowering direction shall be provided using one / two plugging notches. For obtaining creep speed, conventional methods like planetary gear system, DC injection (where requirement calls for creep speed in lowering direction only) etc. may be offered.

Hoist control circuit shall also be provided with anti-drop feature i.e. whenever the master controller is brought back to zero position from higher notches from both directions, the motor shall automatically be connected to hoisting direction for some time (time adjustable through timers) to avoid the downward drift of the load. Brakes shall be clamped in the zero position of the master controller.

06.02.11

Panels

There will be separate panels for each motion in addition to the protective panels and resistance panels.

All panels shall be of free-standing floor-mounting construction, suitable to withstand vibrations encountered on crane. Hinged doors shall be provided for closed type panels. Panels shall be front wired. Front wired live points of bottom most equipment shall be mounted at least 350 mm above the bottom cover of the panel. Panel shall be fabricated from 2.0 mm thick steel sheet.

Power and control terminals shall be segregated. 10% spare terminals shall be provided in each panel.

Equipment in the panel shall be so mounted that their removal or replacement from the front is easy.

Separate control panel for each motion shall be provided.

Panels shall be of closed type when mounted on bridge platform. The panels shall be mounted along the girder facing the hand railing. Sufficient clearances shall be provided between the panels. A minimum clearance shall be provided in front of the panels for walkway and approach as per I.E. Rules. The panels shall be supported in the back from



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the girder to avoid vibrations.

Inside each panel, there shall be item designation tags for each item. These shall be placed at a convenient place near irremovable portion of the panel as well as on the body of the item. Equipment designation tags on the fixed portion shall be on Acrylic plate and names shall be embossed. On the item body, the designation tags shall be on printed stickers.

06.02.12

Switchgears and contactors :

Each mechanism motor shall be provided with MCCB, contactors, over load relays. MCCB current rating shall be 150% of the nominal current rating of the motor. All the circuit breakers shall operate at ambient temperature mentioned in TS.

MCB shall be provided in the control circuit of each motion.

Each brake circuit shall be provided with a suitable contactor. Rating of contactor selected for any mechanism shall be at least 150% of the respective motor full load current (nameplate current) for the mechanism at 40% duty cycle. The minimum rating of the contactor used shall be 32A and the life of each contactor shall not be less than 10,000 hrs. of operation. Reversible directional contactors shall be inter locked both mechanically and electrically.

Temperature de-rating (above the designed temperature of 40 deg. C) shall be considered as per IS / IEC while selecting the circuit breaker.

06.02.13

Motors:

Heavy duty reversible crane service, totally enclosed fan cooled, foot mounted, wound rotor motor conforming to latest edition of IS:325-1996 shall be used for various drives . Class of insulation shall be F/F (Stator/Rotor) Pullout torque to be not less than 225% and 275% of full load torque corresponding to 40% CDF for class M3 & M5 and class M7 & M8 duty cranes respectively.

Motor selection shall be done as per IS : 3177 – 1999.

The motor shall have following speed ranges:

a) Class M3 & M5 duty cranes:

Main & auxiliary hoist	750 rpm
Long & cross travel	1000 rpm

b) Class M7 & M8 duty cranes:

Main & auxiliary hoist	600 rpm
Long & cross travel	750 - 1000 rpm

All motors shall have the terminal box at top. Frame sizes shall conform to IEC Standards. Horizontal foot mounted and with tapered shaft extension.

While selecting the motor rating following shall also be taken into consideration:

-Duty type S4 & S5 as per mechanism application.

-Cyclic duty factor

-Number of switchings per hours

-Type of controls used

-Inertia of the motor and mechanism

-Ambient correction factor

-Service factor

-Wind pressure

Maximum permissible operating speed shall be 250% of synchronous speed or 2000 rpm



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whichever is less. Over load capacity 150% of full load current for 2 minutes without damage or permanent deformation.

06.02.14

Brakes:

Brakes shall be D.C. electromagnetic type conforming to AISE Standard. The brake coils shall be made of copper and of insulation class 'F'.

Brakes shall be designed to fail safe whenever the current is interrupted either intentionally or by failure of the main supply.

Brake circuit forcing shall be provided for D.C. brakes. D.C brake circuit shall be switched off on D.C. circuit for quick operation of brake.

A separate set of parking brake for L.T. motion shall be provided for each out door crane. Power supply for these brakes shall be obtained from protective panel.

06.02.15

Limit switches:

Roller lever operated, resetting limit switches shall be provided for all travel motions. For each hoist motion, a rotary cam type over hoist and over lower, self resetting limit switch shall be provided. This limit switch shall have independently adjustable cams for hoisting and lowering motion. The cams shall have adjustability such that end limit can be set to within 100 mm of the hoisting or lowering motion. In addition to this, a back up ultimate limit switch of shunt gravity type shall be provided to prevent over hoist. The later shall be of manual reset type. In case of cranes handling hot metal, the gravity limit switch shall preferably be of series type. Provision shall be made to bridge the gravity type limit switch contact by push button/ switch or any other means to lower the load. An indication shall be provided to the operator whenever this limit switch has operated. Suitable limit switch shall be provided for slack rope, gate/door opening, slew mechanism, grab closing/ opening etc. wherever necessary. Protection class of the limit switch shall be minimum IP 65.

06.02.16

Anti- Collision Devices:

In cranes where two or more cranes are operating in the same bay (at same or different level) all cranes shall be provided with suitable Anti- collision system. Anti-collision device shall be **electronic type**.

A sound signal shall be provided to the crane operator when they are at certain safe distance apart (distance to be adjusted as a function of speed at site) and crane shall stop. After few seconds, it shall be possible to run the cranes towards each other (or only one crane can move towards the other) till buffers of the cranes meet by providing "by pass" in the operators cabin.

Anti-collision shall also be provided on trolley for twin trolley cranes along with suitable by pass arrangement.

06.02.17

Resistances:

Air cooled, robust, heavy duty, corrosion resistant fechral edge wound resistance. Resistance shall be in single phase execution. In a particular box the rating of resistances shall be the same. Resistance shall have vibration proof only.

Rated for 10 minutes duty.

Maximum temperature rise of resistor element over the ambient temperature shall be limited to 275 deg C at desired duty. Suitable tapping points shall be provided.

Resistance boxes shall be mounted in racks that permit independent removal of any selected box.



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06.02.18 **Master controller**

Cam type master controller with joy stick type lever shall be used.

Separate master controllers for hoist, LT & CT shall be provided.

Dual master controller operated with single handle shall not be used.

Master controller for each motion controls shall have four / five notches in each direction.

Master controller shall have three positions i.e Lift - Off - Drop. It shall have spring return from drop position to Off position. It shall be possible to use step-less control for all VFD.

06.02.19 **Lighting, socket outlets, bells etc.**

Lighting shall be provided in operator's cabin, staircases, platforms and working areas.

Minimum 4 nos. 400 watts high pressure sodium vapour flood lights equally spaced (under crane girders) about the crane span shall be provided along with shock absorbing and anti-swing suspension arrangements. More numbers of fittings shall be provided if required for cranes with longer span and/or longer height of lift.

Fluorescent lamps with necessary fittings shall be used for operator's cabin, staircases, platforms etc.

Adequate number of hand lamp socket outlets (2 Pin, 10A, 24V) and power socket outlets (3 Pin, 20A, 240V) shall be provided along with switches socket & switch shall be interlocked suitably. A hand lamp (160W SLS lamp with enclosed type battery and wire guard) along with sufficient length (15m) of cable with a plug shall also be provided for each crane.

An alarm bell shall be provided on each crane.

06.02.20 **Equipment in operator's cabin or on pendant unit**

a) In case of pendant controlled crane following shall be included on the pendant unit:

Push button for	:	Hoist slow, hoist fast, lower slow, lower fast, left cross traverse, right cross traverse, forward long travel, backward long travel, emergency stop conditions.
Switch for	:	Lights and bells
Lamps for	:	Power 'ON' indication and emergency corner switch operation.

b) In case of cabin operated cranes:

The operator's cabin shall contain the following:

- Master controllers for all the motions and magnet (wherever applicable).
- Emergency stop push button.
- Foot switch for alarm or bell.
- Switches for all lighting equipment on crane.
- Switches for air conditioner, exhaust fan and for cabin fan.
- A fire extinguisher.
- Insulating mat and operator's chair.
- Cabin light.



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Annunciation panel with indication lamps for power 'ON' control 'ON' emergency corner switch operated, ammeter and voltmeter with selector switches.

06.02.21

Enclosure Class

- a) For indoor operations
 - Resistance boxes : IP : 11
 - Motors : IP : 55
 - All other electric equipment : IP : 54
- b) For outdoor operations
 - Resistance boxes : IP : 33 with canopy
 - Motors & panel : IP : 55 with canopy
 - All other electrical equipment : IP : 65 with canopy

06.02.22

Cables:

Cable selection shall be taken into consideration the ambient temperature specified for different areas as mentioned above, group rating, duty factor of the drive and the voltage drop on the crane upto the motor terminal which shall not exceed 3 % with the largest drive motor / mechanism starting and second largest motor / mechanism running.

Power cable suitable for 3 Phase, 4 wire, AC power supply system.

Cables for the DSL system shall be with stranded aluminium conductors. Cables with copper conductors shall be provided on the cranes.

Control wiring shall be with 2.5 mm² copper; minimum size of power cable shall be 6.0 mm². Fixed wiring on cranes shall be carried out with HRPVC insulated HRPVC sheathed armoured cable or EPR insulated CSP sheathed cable or better.

All flexible cables (i.e. cables for magnet, trolley, feed, pendant unit etc.) shall have copper conductor, EPR insulation and CSP sheathing or better.

All cable shall be suitably de-rated for grouping and higher ambient temperature.

All cables shall be of 1100 Volts grade.

All accessories like cable glands, clamps, pipes, wire and terminal marks etc. shall also be provided.

Cable laying and terminations shall be such that the chances of cables getting damaged is remote.

In all passages and on trolley the cable shall be laid in trays and shall be covered by similar trays and properly clamped & fixed.

a) LT Power Cable

1.1 kV, heavy duty power cable, 4/3.5 core with stranded sector shaped (sm) or with compact circular stranded (rm/V) or circular stranded (rm) Aluminium / Copper conductors as applicable, HRPVC insulated as per IS:5831-1984, core stranded together provided with a common covering of HRPVC inner sheath, galvanized round steel wire armoured and HRPVC outer sheathed, multi core conforming to IS:1554 (Part-I – 1988) Type TWY.

b) Control Cables

1.1 kV, circular stranded (rm), annealed copper conductor, HRPVC insulated as per IS:5831-1984, cores stranded together provided with a common covering of HRPVC inner sheath, galvanized round steel wire armoured and HRPVC outer sheathed, multi-core similar to IS:1554- (Part-I)-1988, Type YWY.

c) Flexible Trailing Cable

1.1 kV grade, heavy duty type with tinned annealed high conductivity flexible copper conductors, ethylene propylene (EPR) insulated and chlorosulphorated polyethylene (CSP) sheathed conforming to IS:8130-1984, IS:6380-1984 and IS:9968 (Part-I)-1988.



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06.02.23

Earthing

A ring earthing system shall be provided on the crane. Each and every electrical equipment shall be connected to this earthing at least at two points. However the electronic circuit insulated earth wire shall run in panel and terminate at main earth connection only at one point. The earthing shall be connected to the fourth trolley line in DSL system through 2 nos of current collector. Additionally current collectors shall also be provided on crane rails for earthing on crane. All these collectors shall be connected to earthing ring. From the fourth trolley line, earthing strip (to be laid through every alternate columns) shall be connected to main earthing ring.

An earth core shall be provided in trolley feed cable and the magnet. The cable reeling drum shall have a separate slipping for earthing purpose.

It shall conform to general specification for earthing.

Rubber mattings shall be provided in front of the protective and control panels.

All bonds between earth conductors and crane parts shall be welded if possible, or rivetted and soldered. Where screwed bonds are made, care shall be taken that there is satisfactory contact surface and nuts shall be locked to prevent their loosening. Earth connections to equipment shall be made by means of multi strand flexible conductor to adequate section.

The earth ring on the crane/ machine shall be connected to the plant earthing system through to gantry rails. Each end of each gantry rail shall be bonded to the plant earthing system.

In addition, intermediate earthing bond shall also be provided on the rails at every 60 m in case of longer tracks.

Flexible copper bonds shall be provided across any gap in the running gantry rail.

For mobile equipment with flexible cables, one separate copper conductor of adequate size shall be provided for earthing.

06.02.24

Colour code for electrical equipment

Sl. No.	Description of equipment	Colour	Paint shade No. as per	
			IS : 5-1991	Equivalent RAL Code
I	MOTOR			
1.	LT AC Motors (415v or below)	Brilliant Green	221	6010
II	Mounted Electrics			
1.	Equipment installed on or alongwith motor (Viz Tacho-generators, brake etc.)	Same as that or motor		



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2.	Equipment installed on mechanism but separate from motor (Viz. Limit switches, pull cords, speed switches, load calls, photo elec. relays etc.	Light Gray	631	7042
III	Switchgear of substation			
1.	415 switch gear (Substation equipment)	Brilliant Green	221	6010
IV.	Control Gear			
1.	All control panels (MCCs, PDBs, thyristor panels etc.)	Light Admiralty Gear	697	7001
2.	Light distribution board	Brilliant Green	221	6010
3.	Fire fighting panel	Post Office Red	538	3002
4.	Local control box	Light Gray	631	7042
5.	Control desk	Light Gray	631	7042
6.	Pulpit equipment	Light Gray	631	7042
V.	Miscellaneous Equipment			
1.	Junction boxes		631	7042
2.	Conduit pull boxes		631	7042
3.	Light fittings		631	7042
4.	Welding sockets/ power sockets - 415 V - 230 V	Green Light Orange	221 557	6010 2000
5.	110 V and 24 V transformer, sockets, lamp sets etc.	Canary yellow	309	1016



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6.	Earthing strip	Black		
7.	Battery charger	Brilliant Green	221	6010
8.	DC DB	Oriental Blue	174	5018
9.	Battery charger cum DC DB	Brilliant Green	221	6010

07.0 PERFORMANCE & GUARANTEE:

After erection and commissioning of equipment, performance tests shall be carried out to prove the performance of the system and equipment.

These tests shall be binding on both the parties of the contract determine compliance of the equipment /system with the performance guarantee.

All the equipment, tools and tackles required for successful completion of the performance tests shall be supplied by the successful Tenderer.

All the instruments for the performance tests, as required, shall be supplied by the successful Tenderer and shall retained by him till the satisfactory conclusion of all tests at site. All costs associated with the supply, calibration, installation and return of test equipment shall be included in the scope of supply. All test instruments shall be as per standards approved by the Purchaser.

If the successful Tenderer fails to achieve the guarantee and performance parameters, he shall investigate the causes and shall rectify and/or replace, free of cost to the Purchaser the defects of the equipment/system within a period of 1 (one) month from the date of commencement of performance and guarantee tests and again prove the guarantees. In such cases, the cost of modifications including labour, materials, and cost of additional testing etc. shall be borne by successful Tenderer.

If even after necessary alteration and modifications are affected, the performance guarantees are not fulfilled, the Purchaser reserves the right to reject the equipment. In the event of exercising this right, the successful Tenderer shall replace the defective equipment/ system with the equipment / system that meet the performance guarantee parameters. The cost of replacement inclusive of labour, materials and repeat testing to prove compliance with the performance guarantees shall be borne by the successful Tenderer.

07.01 The cranes after erection shall be tested for all parameters as per IS, failing which the crane shall be rejected unless and until it is rectified.

07.02 The crane shall be guaranteed as per relevant clauses of the SBD of SAIL/IISCO.



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08.0 LIST OF DRAWINGS ENCLOSED

Sl. No.	Drawing No.	Description
1	3200.57.710 / 3200.57.730	1T capacity Jib Cranes for Ladle repair & Slide Gate repair (H'J & KL Bay)

09.0 AMENDMENT SHEET

Sl. No.	Amendment No/ Sheet No.	Letter Ref. No. & Date



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Section [B]

COMMERCIAL TERMS AND CONDITIONS

INSTRUCTIONS TO TENDERER (ITT)

1. SUBMISSION OF TENDER

- 1.1 Tender shall be prepared and submitted in separate SEALED ENVELOPES superscribing the TENDER ENQUIRY NO, PART NO. by 3 PM of 19.11.09 in the office of Sr. DGM/ Purchase & Outsourcing/ CED/ HMBP, Room no. 72, HMBP ADM Building, HEC Ltd Ranchi. - 4

Envelope 1 : PART – I - This part will comprise TECHNICAL BID & COMMERCIAL BID along with the Blank Price Schedule. This tender will also mention that earnest money (EM) enclosed or not in Part II of the bid. The value of the EM is not to be mentioned. **THIS PART IS TO BE SUBMITTED IN DUPLICATE.:**

The Bid to be submitted, comprising of :

- i) Power of Attorney/Authorisation with the seal of the company of person signing the Tender document.
- ii) Letter of Tenderer submitting the Tender in the form as stipulated in forms of Tender enclosed at **Annexure-“B”**.
- iii) Technical offer along with technical specifications of the equipment / items know how offered, drawings, pamphlets etc. strictly in terms of tender enquiry.
- iv) Commercial Terms & Conditions and Other Conditions of the tender duly signed on each page as a token of acceptance of all the Commercial Terms and Conditions mentioned therein which will be cross checked by Check List for Acceptance / Confirmation of Commercial Terms & Conditions enclosed at **Annexure- ‘D’**.
- v) Reference list of similar supplies.
- vi) Bar chart Schedule indicating all activities in details.
- vii) Any other technical information the Tenderer wishes to furnish.
- viii) Income tax/Sales tax clearance certificate
- ix) Deviation to the Technical Specification & Commercial terms, if any, to be spelt out separately as per format indicated at Annexure- ‘C’
- x) Blank Price Format as per **Annexure ‘A1’** blanking the prices but with all other details.



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Envelope-2: PART - II: PRICE BID - (IN DUPLICATE)

Price part should indicate the detailed break up of price of each item as per the format enclosed Annexure-‘A1’ and the bank DD of the earnest money in favour of Heavy Engineering Corporation Ltd. The Bank DD should preferably be of State Bank of India, payable at Hatia or Bank guarantee in HEC’s Format as **enclosed at Annexure ‘ E ’**

Both the offer i.e Part I & II shall be in separate sealed cover. The relevant part no. shall be clearly super scribed on the top of each envelope with tender reference no. and date of opening of tender.

Both the envelopes of the tender i.e. part I & II shall be enclosed in one envelope. This envelop shall also be super scribed on the top with the tender reference no. and date of opening of the enquiry indicating that both the parts (Part I & Part II) are enclosed in the envelope.

The tender document can also be down loaded from the website www.hecltd.com and can be submitted along with the tender fee and EMD deposit.

TENDERER IS REQUESTED TO QUOTE THEIR BEST LOWEST PRICE AS ONLY TECHNO-COMMERCIALY ACCEPTABLE LOWEST (L1) TENDERER SHALL BE CONSIDERED FOR POST TENDER PRICE NEGOTIATION.

- 1.2 Incomplete Tender or Tenders not submitted as per requirement indicated in the Tender Enquiry shall be considered as Non-responsive and liable to be rejected.

2.0 PERIOD OF VALIDITY OF TENDER

Unless otherwise specified, the Tenderer shall keep his tender valid initially for a period of one hundred and twenty (120) days from the due date of opening of the tender.

- 3.0 **LANGUAGE** - The Tender shall be submitted in English language.

4.0 NO CLAIM OR COMPENSATION FOR SUBMISSION OF TENDER

The Tenderer whose Tender is not accepted shall not be entitled to claim any costs, charges, expenses of and incidental to or incurred by him through or in connection with his submission of Tenders, even though HEC Ltd may decide to withdraw the Invitation of Tender.



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5.0 CONFIDENTIALITY

Tenderer shall note that all data/drawings/specifications enclosed with Tender document is **confidential**. Tenderer shall keep all data/drawings in strict confidence and shall not copy or pass on any of the Tender papers etc. to any third party. Tenderer shall return the Tender documents alongwith the Tender.

6.0 NOTICE ON BEHALF OF HEC LTD

Notice and Certificate on behalf of HEC LTD in connection with the Purchase Order may be given by duly authorised officers of HEC LTD. Any modification which may become necessary in the interim period will be intimated to you as soon as possible.

ENCLOSURE - I

COMMERCIAL TERMS AND CONDITIONS

DEFINITIONS :

CONSULTANT	MECON
PURCHASER	Heavy Engineering Corporation Limited
SUPPLIER	Successful Bidder
ITT	Invitation to Tender

1.0 SCOPE OF SUPPLY / WORK & SERVICES :

1.1 The scope of supply is to manufacture and deliver the total equipment / items in full and good condition as given in Technical specification (Section 1) FOR - HMBP HEC Ltd Ranchi (Jharkhand)

The scope includes, inter alia, all auxiliary and ancillary related activities such as procurement of all inputs, raw materials, bought-out components and consumables including testing and inspection, painting, safe & secure packing,



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- handling and transportation of finished equipment duly inspected and accepted by PURCHASER/representative of Consultant till safe delivery in Purchaser's Store.
- 1.2 Supervision of Erection, Testing & Commissioning of the items at end user shall be in the scope of the supplier.
- 1.3 Any scope of supplies which is not specifically mentioned in this order but materially required for the completion of the supplies and/or for safe, trouble free normal operation shall be supplied free of cost to the Purchaser unless, expressly excluded in this order.
- 1.4 The approval by the Purchaser at any stage for any supplies by the supplier/supplier's sub-suppliers shall not relieve the supplier of his obligations under this order.

2.0 PRICE

2.1 FOR SUPPLIES :

Prices quoted must be firm till completion of work defined under the scope of supplier. The prices must be quoted as indicated in **Annexure-A** enclosed herewith.

2.2 SUPERVISION OF ERECTION, TESTING & COMMISSIONING :

- i) Prices should be quoted on the per man rate basis and inclusive of all applicable taxes, duties, levies, expenses towards various statutory and regulatory body and insurance coverage.
- ii) Service Tax for supervision of erection and commissioning if applicable shall be re-imbursed against documentary evidence by PURCHASER. The price also includes all charges towards to and fro travel, boarding, local transportation, medical etc.
- iii) Price shall remain firm and binding and shall not be subject to any variation whatsoever on any account except for statutory variation on taxes and duties.
- iv) Purchaser will not entertain any additional visit charges under following circumstances :
 - a) In case of delay in erection/commissioning due to delay by supplier's engineer.
 - b) Due to lack of proper documents / knowledge to be possessed by supplier's engineer.
 - c) In case of additional visit necessitated due to fault / repair in the supplier's supplied equipment, because of design / manufacturing / workmanship fault.
 - d) In case of delays / loss of time beyond purchaser's control.
 - e) In case of short supplies by the supplier.

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3.0 TAXES & DUTIES

3.1 FOR SUPPLY :

- a) Excise Duty (ED) and Sales Tax / Jharkhand Sales Tax on finished items shall be included in the purchase order price. Excise Duty & Sales Tax on finished items shall be paid at the rates prevailing at the time of delivery period or purchase order delivery period, whichever is earlier and will be limited to taxes and duties actually paid by the Supplier subject to a max. value declared in his Bid. Excise Duty and Sales Tax shall not be paid on the intermediate products, components, assemblies, raw materials etc. purchased by the Supplier.
- b) Any revised imposition of taxes/duties on the finished items within the purchase order delivery period will be reimbursed by PURCHASER against documentary evidence. Similarly, if any of existing taxes, duties, are reduced or abolished, PURCHASER shall be entitled to get the resultant benefit in full.
- c) Original copy of the Excise Invoice as duty paying document (i.e., Buyer's Copy of Excise Invoice) shall be furnished by Supplier for claiming excise duty on the finished items. In addition to the above, the Supplier shall furnish a certificate to the effect that no refund of excise duty has been obtained or claimed except credit under CENVAT scheme. In case any refund is obtained in future by the Supplier, the same shall be immediately passed on to PURCHASER in full.
- d) Duplicate copy of the Excise Invoice (i.e., Transporter's Copy) shall be sent along with Transporter and it should be ensured that the transporter's copy of excise invoice is handed over to Site/Stores of EMPLOYER/PURCHASER, along with the consignment. Documentary evidence shall be furnished by the Supplier regarding receipt of Transporter Copy of excise invoice at site stores of EMPLOYER/PURCHASER.
- e) Excise Invoice should be Drawn in favour of Purchaser as per the details indicated in the despatch instructions enabling purchaser to avail CENVAT CREDIT. PURCHASER shall not reimburse Excise Duty in case Excise Invoice is not drawn as stated in the despatch instruction. In case PURCHASER can not avail the CENVAT benefit due to improper documents from Supplier (Suppliers), then purchaser shall not pay ED & corresponding CST/JST to supplier.
- f) Excise Invoice should contain all the particulars as per Latest Excise Notification issued by Central Board of Excise and Customs / other concerned authorities.



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- g) The Supplier shall be required to submit Form "E-1/E-2" to PURCHASER within 30 days of receipt of Sales Tax Declaration Form "C" from PURCHASER. Additional tax liability to be borne by PURCHASER for the Suppliers on furnishing of "E-1/E-2" Form, same shall be recovered from your bills. At the close of each financial year or if the despatches are completed against a particular purchase order within a particular financial year, the Supplier shall write to PURCHASER for issue of "C" Form with details like PO No., Bill No., date, amount, LR No., etc. to Sr. DGM (Purchase), NINL Project Division, Ranchi. PURCHASER shall issue one Form "C" at the end of every financial year covering all the despatches made in the year. In case delivery of equipment earlier than the completion of financial year, "C" Form will be issued by PURCHASER earlier on getting a request from the Supplier.
- h) Custom duty shall be paid at the rate prevailing at the time of delivery on documentary evidence. No statutory variation is allowed.

3.2 Way Bills/ RoadPermit :

No consignment from outside the state of Jharkhand shall be despatched by the Supplier without a valid way bill / Road Permit , to be issued by PURCHASER.

3.3 FOR SUPERVISION OF ERECTION & COMMISSIONING

All applicable taxes and other charges legally levied on the supplier in connection with this work order are included in the purchase order price and shall be borne and paid by the supplier. The service tax shall be re-imbursed against documentary evidence as applicable.

The supplier shall certify, if required by PURCHASER that due taxes have been paid by him on this order and produce evidence of tax paid which is legally due and payable on this order PURCHASER shall bear no liability in respect of any taxes, duties, levies etc. whatsoever.

Any Indian Income Tax which PURCHASER may be required to deduct by law or statute shall be deducted at source and the same shall be paid to Income Tax / Sales Tax Authorities on account of Supplier. Supplier shall indicate their Permanent Account No. with the relevant Income Tax Authority for this purpose to PURCHASER.

PURCHASER's liability in respect of taxes and duties shall be limited to statutory variations, if any, from date of your final offer submission of documentary evidence.

The Supplier shall produce documentary evidence as may be called for by PURCHASER in respect of taxes, duties etc. paid by the Supplier.



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4.0 FIRM PRICE

Prices will remain firm till the execution of order in full. No escalation will be admissible and granted under any circumstances.

5.0 INSPECTION

As per Approved Quality Assurance Plan (QAP). Inspection will be done by QCA / HMBP or MECON or authorized representative.

6.0 DELIVERY

The delivery of the jib crane shall be 3 months from the date of issue of PO. Delivery date will be reckoned from the date of approval of drawings. Only complete equipment shall be permitted for despatch and billing.

7.0 TERMS OF PAYMENT

Subject to any deduction, which PURCHASER may be authorized to make under the Purchase order, the Purchase order Price shall be payable as follows:

FOR SUPPLY

- A) 5% of the basic amount will be released on completion of the Design & Engineering of the crane. The same can be released on submission of the proforma invoice in triplicate along with the certificate of completion of D&E from RPD/HMBP.
- B) 80% of the price including packing & forwarding charges together with excise duty and sales tax for the items despatched as per approved billing schedule shall be payable against submission of following complete and correct documents in eight (8) Sets at HEC, Ranchi after receipt of items at PURCHASER.
 - a) Copies of Receipted Lorry Consignment Note.
 - b) Pre-receipted Invoice.
 - c) Copies of Packing List & Delivery Challan including originals.
 - d) Copies of Inspection Certificate including originals.
 - e) Despatch clearance issued by PURCHASER .
 - f) Original copy i.e. Buyer's copy of Excise Invoice
 - g) Documentary evidence regarding handing over of Transporter copy of Excise Invoice to the Site /Stores of PURCHASER.
 - h) Material Test Certificate.
 - i) Certificate from the supplier that the contents in each case are not less



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than those entered in the invoice and packing list and the quality of goods are guaranteed as new and as per the relevant technical specification.

- k) Copy of intimation to Insurance Company for Transit Insurance.

The above payments shall be released on receipt of complete and correct documents as listed above at HEC, Ranchi **within 60 days**, provided you ensure that despatches are made and Invoices are raised strictly as per the order.

Number & distribution of above noted despatch documents including original LR are indicated in our Despatch Instructions.

In order to avoid detention/ seizure of goods at check post during transit, the Supplier shall send the following documents along with the equipment :

- 1) Sales Tax Registration Certificate Nos. of PURCHASER
- 2) Delivery Challan.
- 3) Packing List
- 4) Consignment note/Lorry Receipt (LR)
- 5) Way Bill
- 6) Transporter copy of Excise Invoice.

In the event of any detention/seizure of goods, the Supplier shall depute his personnel, dealing with sales tax to take up the matter with appropriate authorities to get the goods released. Without prejudice to any other rights as provided in the purchase order, the supplier shall keep PURCHASER harmless and be responsible for any loss/damage/delay etc.

C) Payment on Completion

- (i) 10% of the Purchase order price shall be paid to Supplier within 60 days on completion of the work defined under the scope of work and successful completion of Trial run and submission Performance Bank Guarantee and the following documents in six (6) sets to PURCHASER, Ranchi directly. i.e. Pre received Invoice along with Trial Run Certificate issued by PURCHASER.
- (ii) Balance 5% of the Purchase order price shall be made to the Supplier within 60 days on completion of the Performance Guarantee Tests and acceptance of the Works by the PURCHASER and submission of the following documents in eight sets to PURCHASER, Ranchi directly.
 - a) Pre-Received Invoice.
 - b) Completion Certificate issued by PURCHASER's site engineer.
 - c) No claim Certificate by the SUPPLIER.

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PHONE: 0651 2401200, 2401544 FAX: 0651 2401166, EMAIL: ashimkumar@hecltd.com



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- d) Statement of reconciliation of all the payments and recoveries made in the progress bills
- e) Test Certificates for items and materials where applicable.
- f) Copies of other statutory documents as required by PURCHASER.
- g) Performance Guarantee Test and acceptance of the Works certificate issued by PURCHASER.
- h) PURCHASER's certificate regarding submission of all drawings & documents as per P.O.

FOR SUPERVISION OF ERECTION AND COMMISSIONING

100% payment worked out for the actual deployment of Engineer/Expert on the basis of man day rate shall be made upon receipt of the following documents:-

- a) Pre-receipted Invoice along with the actual period of deployment of Engineer/Expert duly signed by SUPPLIER and certified by PURCHASER's site engineer.
- b) Supervision completion certificate duly signed by PURCHASER

8.0 **GUARANTEE :**

The equipment/materials must carry a guarantee against faulty materials, faulty design, defective and bad workmanship for a period of 12 months from the date of Performance and Guarantee Test. Any defects noticed during the guarantee period will have to be replaced by you free of cost and replacement of parts/materials will also have a similar guarantee. A Guarantee Certificate must be provided at the time of delivery.

9.0 **ACCEPTANCE OF TENDER**

Tender may be accepted for full or for part quantity. Any incomplete tender in any respect is liable to be rejected.

The company is having right to reject any tender without assigning any reason for which no question can be asked anywhere.

There is no obligation on our part to accept delayed / late tender received after the due date of opening of tender and these are liable to be summarily rejected.



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10.0 EARNEST MONEY

The earnest money to the extent of 2% of the total value to be deposited by demand draft on the State bank of India, Hatia Branch in favour of Heavy Engineering Corporation Limited, Ranchi 4 or Bank Guarantee in HEC's format at enclosed at Annexure 'E'. The validity of the earnest money shall be 6 months. In case of delay in finalization of the order the validity may be got extended.

11.0 SECURITY DEPOSIT

In the event of the contract materializing, successful tenderer will have to deposit security deposit equal to 5% of the value of the contract within the desired period. Failing this the contract will be cancelled and the stores will be procured at the Risk and expenses of the tenderer. This will be in addition to other remedies available to the purchaser for the successful completion of the contract as provided in general terms & conditions of the corporation. The validity of the security deposit shall be up to the receipt of the last consignment.

12.0 REFUND OF SECURITY DEPOSIT

The security deposit will be refunded within 30 days after successful completion of the Work Order.

13.0 LIQUIDATED DAMAGES (LD) - Shall be applicable @ 0.5% per week subject to maximum 10% of the contract price for delay in delivery against the schedule given to the successful tenderer.

14.0 PERFORMANCE BANK GUARANTEE

The successful tenderer will have to submit performance bank guarantee amounting 10% of the basic price of the contract for 12 months from the date of commissioning of the equipment at the end customers site in HEC's format as enclosed at Annexure 'F'.

15.0 GENERAL TERMS & CONDITIONS OF THE CONTRACT

The contract will be governed by General conditions of contract of purchase of HEC Ltd., which is available in the website of the HEC.



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16.0 ARBITRATION

In case of any dispute in execution of this order, the same will be mutually settled by arbitrator appointed / nominated by Chairman Cum Managing director of HEC Ltd. The decision given by such arbitrator shall be final and binding on both the parties i.e. HEC Ltd and the Supplier.

17.0 JURISDICTION OF COURT

The issue shall be under the jurisdiction of Ranchi High Court.

18.0 Information to be submitted with the offer/tenders.

- 18.10 Experience of similar work executed during the last three years. Details with value, name of the clients etc are to be mentioned enclosing documentary evidence.
- 18.20 Registration with HEC/ or any other Govt./semi Govt. organization. Copy of the same are to be attached with the offer.
- 18.30 Documentary evidence of adequate financial standing is to be submitted with the offer.
- 18.40 All tenderer shall submit along with their tender an income tax clearance certificate duly counter signed by the income tax officer of the circle concerned under the seal of the office. Copy of PAN No. of IT department in the name of the firm and service tax regd. No./VAT regd.no.
- 18.50 Constitution and legal status of the tenderer (individual, partnership, co-operative, registered firm etc), existence of joint ventures or other tie up for technology, equipment, financial backing and /or project management etc to be clearly mentioned with copy of supporting documents along with the offer.
- 18.60 Details of necessary equipment / facility for the job under this tender to be deployed for the project and proof of its availability , equipment proposed to be purchased or hired are to be attached with this offer.
- 18.70 Availability of key personnel for supervision and management of the work to be indicated.
- 18.80 Information regarding project in hand, current litigation, orders regarding execution / expulsion or black listing if any to be furnished.
- 18.90 Capacity of the tenderer to take up a new work / project under consideration in addition to his present commitment .

19.0 TRANSIT INSURANCE

Will be arranged by HEC Ltd., against their open general policy. The policy No. and detail address of the Insurance Company will be intimated to you before



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despatch. You shall have to furnish full despatch details to the Insurance Company with the copy to this office immediately after despatching the materials.

20.0 MODE OF DESPATCH

By road to the consignee at Sr Manager, Stores, HMBP, HEC Ltd, Ranchi. For the consignments to be despatched by Road, the supplier shall ensure that the following are observed by them:

- i) All despatches must be effected only on receipt of written despatch clearance from PURCHASER.
- ii) You shall despatch all the materials consigned to Sr Manager, Stores, HMBP, HEC Ltd, Ranchi
- iii) Identify and obtain the correct type of trucks/trailers, keeping in view the nature of consignments to be despatched.
- iv) Care shall be taken to avoid damages during transit to ensure that all packages are firmly secured.
- v) All consignments despatched by truck/trailor shall be consigned on door delivery basis (Full or part lorry load). No. transshipment is allowed.
- vi) The transporter must be approved by Bank Association.
- vii) In case any other mode of transport has to be restored other than that mentioned in the Purchase Order, the same should be done only after obtaining prior approval in writing from the Purchaser. By allowing such transportation no increase in freight charges shall be allowed and in case there is decrease, the actual shall be payable to the supplier

21.0 PACKING, FORWARDING AND SHIPMENT

- a) The Supplier, wherever applicable, shall after proper painting, pack and crate all equipment in such a manner as to protect them from deterioration and damage during rail and road transportation to the site and storage at the site till the time of erection. The Supplier shall be held responsible for all damages due to improper packing. The supplier shall be liable to deliver the material at the destination as per specification. Any damage during transit shall be sole responsibility of the supplier. In case of damage, the material shall be liable to be rejected and supplier shall replace the same and lift the rejected material within time at their risk and cost.
- b) The Supplier shall notify the Purchaser of the date of each shipment from his works, and the expected date of arrival at the site for the information.
- c) The Supplier shall also give all shipping information concerning the weight, size and content of each packing including any other information the Purchaser may require.

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PHONE: 0651 2401200, 2401544 FAX: 0651 2401166, EMAIL: ashimkumar@hecltd.com



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- d) The Supplier shall prepare detailed packing list of all packages and containers, bundles and loose material forming each and every consignment despatched to site. The Supplier shall further be responsible for making all necessary arrangements for loading, unloading and other handling right from his works upto the safe delivery at site store,

22.0 DEMURRAGE, WHARF-AGE, ETC.

All demurrage, wharf-age and other expenses incurred due to delayed clearance of the material or any other reason shall be to the account of the Supplier.

23.0 FORCE MAJEURE

- A) Force majeure is herein defined as any cause which is beyond the control of the Supplier or Purchaser as the case may be which they could not foresee or with a reasonable amount of diligence could not have foreseen and which substantially affect the performance of the purchase order, such as:

- (a) natural phenomena, including but not limited to floods, draughts, earthquakes and epidemics;
- (b) acts of any government, including but not limited to war, declared or undeclared, priorities, quarantines, embargoes,
- Provided either party shall within fifteen (15) days from the occurrence of such a cause notify the other in writing of such causes.

- B) The bidding document will clearly state that

- (a) The Supplier will advise, in the event of his having resort to this clause by a registered letter duly certified by the local chamber of commerce or statutory authorities, the beginning and end of the clause of delay, within fifteen days of the occurrence and cessation of such force majeure condition. In the event of delay lasting over two months, it arising out of force majeure, the purchase order may be terminated at the discretion of the company.
- (b) For delays arising out of Force Majeure, the Supplier will not claim extension in completion date for a period exceeding the period of delay attributed to causes of Force Majeure and neither PURCHASER nor the Supplier shall be liable to pay extra costs (like increase in rates, remobilization advance, idle charges for labour, machinery etc.)



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provided it is mutually established that the Force Majeure conditions did actually exist.

- (c) If any of the Force Majeure conditions exists in the place of operation of the Supplier even at the time of submission of the bid he will categorically specify them in the bid and state whether they have been taken into consideration in their quotations.
- C) The Supplier or the Purchaser shall not be liable for delays in performing his obligations resulting from any force majeure cause as referred to and/or defined above. The date of completion will, subject to hereinafter provided, be extended by a reasonable time even though such cause may occur after Supplier's performance of his obligations has been delayed for other causes.

24.0 LONG TERM AVAILABILITY OF SPARES

24.1 The Supplier shall guarantee the long term availability of spares to the Employer for the full life of the equipments covered under the purchase order. The Supplier shall guarantee that before going out of production of spare parts of the equipment covered under the purchase order, he shall give the Employer at least twelve (12) months advance notice so that the later may order his bulk requirement of spares, if he so desires. The same provision will also be applicable to sub-Supplier. Further, in case of discontinuance of manufacture of any spares by the Supplier or his sub-Suppliers, the Supplier will provide the Employer two years in advance, with full manufacturing drawings, material specifications and technical information required by the Employer for the purpose of manufacture of such items.

24.2 Further, in case of discontinuance of supply of spares by the Supplier or his sub-Suppliers, the Supplier will provide the Employer with full information for replacement of such spares with other equivalent makes, if so required by the Owner.

24.3 The Supplier shall provide the Employer with a "directory" of his sub-Suppliers giving the addresses and other particulars of his sub-Suppliers. The Employer, if he so desires, shall have the right to procure the spares directly from sub-Suppliers.

24.4 Notwithstanding anything stated elsewhere in the bid documents, the prices of all spares which may be procured to cover long term requirements beyond the 2 years' maintenance and operational requirements, will be generally in accordance with the mutually agreed prices.



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24.5 In case of emergency requirements of spares, the Supplier would make every effort to expedite the manufacture and delivery of such spares on the basis of mutually agreed time schedule.

25.0 MARKING OF EQUIPMENT :

The materials must be marked/stenciled of Equipment No. The word ----- should be engraved on supplied materials.

26.0 NOTIFICATION OF DESPATCH :

Each and every despatch should be notified immediately after despatch giving the relevant particulars like Truck No., Challan No. with date, C/Note No., Name of the transporter with their full address, date of despatch etc. to the person who signatures the order through fax / e-mail :

27.0 PROGRESS REPORT:

Progress of delivery/inspection must be given to the officer who has signed the purchase order, on the 15th and 30th of each month during currency of delivery period. Where delivery period is crossed by the supplier, he has to take approval of buyer in writing before despatch.

28.0 SUBLETTING AND ASSIGNMENT :

The supplier shall not, have without the previous consent in writing of the purchasers, sublet, transfer or assign the purchase order or any part thereof or interest therein or benefit or advantage thereof in any manner whatsoever. Provided nevertheless that any such consent shall not relieve the supplier from any obligation, duty or responsibility under the purchase order.

29.0 CHANGE IN A FIRM :

Where the supplier is a partnership firm, a new partner shall not be introduced in the firm except with the previous consent in writing of the purchaser (which may be granted only as an exception) of a written undertaking by the new partner to perform the purchase order and accept all liabilities incurred by the firm under the



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purchase order prior to the date of such undertaking.

On the death or retirement of any partner of the supplier's firm before complete performance of the purchase order, the purchaser may at this option cancel the purchase order. In such case the supplier shall have no claim whatsoever to compensation against the purchaser.

If the purchase order is not determined as provided above notwithstanding the retirement of a partner from the firm he shall continue to be liable under Section 32 of the Partnership Act has been sent by him to the purchaser by registered post acknowledgement due.

30.0 CONSEQUENCE OF BREACH :

Should the supplier or a partner in the supplier firm commit breach of either of the clauses (21) and (22) of this commercial terms and conditions, it shall be lawful for the purchaser to cancel the purchase order and purchase or authorize the purchase of the stores at the risk and cost of the supplier firm and that even the provisions of Clause (10) shall, as far as applicable, apply.

The decision of Heavy Engineering Corporation Limited as to any matter or thing concerning or arising out of this clause or any question whether the supplier or any partner of the supplier firm has committed a breach of any of the conditions in this clause contained shall be final and binding on the supplier.

32.0 CONSIGNEE :

Sr Manager Stores HMBP/ HEC Ltd / Ranchi JHARKHAND
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31.0 **FIRST FILL OF CONSUMABLES, OILS AND LUBRICANTS :**

Shall be provided by you at no extra cost as per Technical Specification.

32.0 **TRAINING OF PERSONNEL :**

You shall provide free of cost training of personnel from PURCHASER for 1 (one) man month at your works. However, boarding, lodging and fare etc shall be borne by the purchaser/our ultimate customer.

33.0 **Q.A. PLAN**

Approved QAP and inspection procedure by HEC/ MECON shall apply.

34.0 **WEIGHT OF EQUIPMENT**

Weight of each equipment must be intimated to the purchaser before effecting delivery.

35.0 **COMMISSIONING SPARES:**

List of commissioning spares to be furnished separately in technical bid.

36.0 **FORMAT AND NAME PLATE**

All the drawings should be prepared in the format and nameplates with drawing No. out of allotted drawing Nos. to be given to you at the time of placement of order.

37.0 **DRAWING, DOCUMENTS & MANUALS**

Will be furnished as per Technical Specification.

38.0 **ONE YEAR OPERATIONAL SPARES AND TOOL & TACKLES**

Rates, terms & conditions of your quotation will be valid for 12 months from the date of issue of this order.



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39.0 **UNIT RATES**

Unit rates of various supply item which may be required during execution of this package will remain firm till execution of the order.

40.0 **BOUGHT-OUT ITEMS:**

Un-priced purchase order of your bought-out items will be submitted to us within a week after issue of your order.

41.0 **PAINTING**

Painting will be done as per Technical Speciation.

42.0 **REJECTION**

If the stores supplied are not to specifications/samples or in accordance with order and are rejected, the same will be removed by you at your own risk and cost within 21 days of the date of intimation of rejection by Inspection Deptt/Stores Deptt/Purchase Deptt. If no instruction are received from you with regard to mode of despatch back to you, we shall be free and reserve the right to return the rejected materials at your risk and cost and to recover entire freight and other incidentals incurred by PURCHASER. Such rejected stores will be kept in our go down/site for 21 days from the date of intimation to you and thereafter they remain at your risk and cost. The purchaser shall also be entitled to recover ground rent/demurrage charges on the rejected stores after expiry of free time mentioned above.

43.0 **SPECIAL INSTRUCTION (DESPATCH MARK/ INDENTIFICATION MARK)**

The following markings are to be done on each package

a)	From	
b)	For	



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c)	Case No.	The case no. shall be written in the form of a fraction the numerator of which shall be serial number of the case and the denominator representing the total number of cases.
d)	Order No.	
e)	Net Weight	
f)	Gross Weight	

44.0 LEGALITY AND DISPUTE SETTLEMENT :

- a) This order/purchase order shall be governed by and interpreted according to the relevant laws of India with jurisdiction of courts at Ranchi.
- b) Any dispute that may arise between the parties out of or in-connection with this order/purchase order or for the breach thereof, shall be settled amicably and in good faith by negotiations between the designated executives of the parties, at the first instance.
- c) In the event, the parties fail to resolve the disputes or differences arising out of or in connection with the order/purchase order or execution thereof through amicable settlement, the same shall be referred to settlement through “adjudication” of the same by the Sole Arbitrator appointed by PURCHASER. Such arbitration shall proceed as per the provisions of Arbitration and Conciliation Act, 1996 and /or amended from time to time.
- d) The arbitration shall be governed by and in accordance with the Arbitration and Conciliation Act, 1996 for adjudication of the disputes and differences including claims and counter-claims of the parties. The award rendered shall be final and binding upon both the parties.
- e) The cost of the arbitration proceedings shall be borne by the parties on pro-rata to this purchase order value.
- f) The venue of arbitration shall be normally at Ranchi only, unless and until agreed otherwise by the parties.
- g) The Jharkhand High Court shall have the exclusive jurisdiction in respect of the order/purchase order.



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47.0 OTHER TERMS AND CONDITIONS

Other terms and conditions which are not mentioned above shall be as per General Terms and Conditions of Contract of the Corporation which can be downloaded from our website(www.hecltd.com).

Enclosures:

1. Format for Price Schedule (Annexure-‘A1, A2 & A3’)
2. Forms of Tender(Annexure-‘B’)
3. Format for deviation to the technical specification & Commercial terms (Annexure ‘C’)
4. Check List for Acceptance/Confirmation of Commercial Terms & Conditions (Annexure-‘D’)
5. Pro forma for BG for EMD (Annexure ‘E’)
6. Pro forma for BG for Performance Guarantee (Annexure ‘F’)

Note :

- (i) Price should be quoted in words and numeral without any cutting and overwriting. The price appearing in words will be binding on both the parties.
- (ii) If the price is inclusive of Excise Duty, the current rate and amount included in price must be indicated. If the firm is exempted from paying Excise Duty, the same must be confirmed with the valid documentary evidence.
- (iii) Itemised price of Mandatory and Recommended Spares also to be quoted Separately.



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Heavy Engineering Corporation Limited

(A Govt. of India Enterprise)

Heavy Machine Building Plant CRANE EXECUTION DIVISION

Annexure A1
Format of Price Bid for supply items

To,

Sr. DGM/ Purchase & Out Sourcing
Crane Execution Division
HMBP / Heavy Engineering Corporation Ltd.,
Ranchi – 834 004(Jharkhand)

Dear Sir,

I am pleased to submit my best offer without any deviation or rebate which is as follows:-

Sl No.	Description	BAY	Qty/ nos.	Unit Rate (in Rs / Set) Ex Works	Total Price Ex Works	P & F Charges	Freight inclusive of service tax (in Rs)	Transit Insurance (in Rs)	Excise Duty	Cess on Excise Duty	CST / VAT	Grand Total (in Rs)
1	1T capacity jib crane for ladle repair	H'J Bay	1									
2	1T capacity Jib crane for slide gate repair	KL Bay	2									
	Total											

Note: - * The value of total of the grand total price of sl no 1 to 2 is to be given in figures and words as well.

In case of any discrepancy the value given in words shall prevail.

- The firm to indicate the percentage used for ED, CESS on ED, CST/VAT etc.
- The above rate consist of all items to be supplied as per enquiry except the prices of 2 year operational spares.
- Item wise price of commissioning spares and tools and tackles is to be furnished separately



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Heavy Machine Building Plant

CRANE EXECUTION DIVISION

Annexure A2

Format of Price Bid for supply of 2 year operational spares

Sl No.	Description	Qty/ nos.	Total Price Ex Works	P & F Charges	Freight inclusive of service tax (in Rs)	Transit Insurance (in Rs)	Excise Duty	Cess on Excise Duty	CST / VAT	Grand Total (in Rs)
i)	MECHANICAL									
1.	L.T. wheel assembly(Driving)	1 No.								
2.	L.T. wheel assembly (Driven)	1 No.								
3.	C.T. wheel assembly (Driving)	1 No.								
4.	C.T. wheel assembly (Driven)	1 No.								
5.	First reduction pinion shaft with bearing assly. For all drives.	1 no. each								
6.	Brake drum for all drives	--do--								
7.	Brake lining with rivets for all brakes	6 pairs each								
8.	Rope sheaves with bearing assembly	1 no. of each size.								
	Total (i)									
ii)	Electrical:-									
Sl. No.	Item	%of total equipment								
1.	Motors									
2.	Controls									
a)	Power contactors Fixed and moving contacts for contactors of each type	25%								
b).	Contact set for auxiliary Contactors	25%								
c).	Coils for power contactors	50%								
d).	Coils for aux. contactors	25%								
e).	Over load relay	100%								
f).	Timers	15%								
g).	Aux. Contactors	25%								
3.	Master controller: Moving contacts & fixed contacts	25%								
4.	Limit switches: Fixed & moving contacts	25%								
5.	Fuses									
a)	Power circuit fuses	100%								
b)	Power circuit base	25%								
c)	Control fuse base	25%								
d)	Control fuse base	25%								
6.	Indicating lamp with holder	25%								
7.	Push buttons Contact element set for push buttons	40%								
8.	IGBT module of each type	For cranes with VFD control								
9.	Semiconductor fuses	25%								
10.	Resistors									
	Punched stainless steel	5%								
11.	D.C. contactor magnet panel	25%								
12.	Bridge rectifier for magnet	25%								
13.	Coils / thruster unit for brakes of each type	100%								
	Total (ii)									
	G. Total (i + ii)									

Note: - * The value of total of the grand total price of sl no 1 to 2 is to be given in figures and words as well. In case of any discrepancy the value given in words shall prevail.

P

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Heavy Machine Building Plant

CRANE EXECUTION DIVISION

Annexure- 'A3'

Format of Price for Erection & Commissioning for all three Jib cranes

To,

Sr. DGM/ Purchase & Out Sourcing
Crane Execution Division
HMBP / Heavy Engineering Corporation Ltd.,
Ranchi – 834 004 (Jharkhand)

Dear Sir,

I am pleased to submit my best offer without any deviation or rebate which is as follows:-

Sl No	Description	Total Price for all three Crane in RS
1a	Erection Charges	
1b	Service Tax on Erection charges	
2a	Commissioning Charges	
2b	Service Tax on Commissioning Charges	
3	Any other charge	
	Total:	



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Heavy Machine Building Plant

CRANE EXECUTION DIVISION

Annexure-B

FORMS OF TENDER

Sub : TENDER for the Work _____

To,

Sr. DGM/ Purchase
N P Division
Room No. 72, 2nd Floor .
HMBP Adminstrative Building
Heavy Engineering Corporation Ltd.,
Ranchi – 834 004(Jharkhand)

Dear Sir,

We offer to execute the Works described above in accordance with the Conditions of Contract accompanying the Tender Document issued to us.

This tender and your written acceptance of it shall constitute a bending contract between us. We understand that you are not bound to accept the lowest or any tender you received.

We hereby confirm that this tender complies with the tender validity and tender security required by the tender documents.

Yours faithfully

Authorised Signature :

Name and Title of the Signatory :

Name of Tenderer :

Address:

Date:

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CRANE EXECUTION DIVISION, 2nd FLOOR ADMINISTRATIVE BUILDING, HMBP
PHONE: 0651 2401200, 2401544 FAX: 0651 2401166, EMAIL: ashimkumar@hecltd.com



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Heavy Engineering Corporation Limited

(A Govt. of India Enterprise)

Heavy Machine Building Plant
CRANE EXECUTION DIVISION

Annexure 'C'

Date :

To,

Sr. DGM/ Purchase
N P Division
Room No. 72, 2nd Floor .
HMBP Adminstrative Building
Heavy Engineering Corporation Ltd.,
Ranchi – 834 004(Jharkhand)

Dear Sir,

I have gone through the contents of the Tender Document and the following clause of the document are not acceptable to me and needs to be amended as below :-

Sl.No.	Clause No.	Amendment proposes
-----	-----	-----

(Signature of Tenderer)

With official Seal

Note :

If any new clause is to be incorporated then that may be mentioned in this schedule. If no amendment is proposed or new clause be incorporated then the tenderer should write nil.

(To be filled by the tenderer)

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CRANE EXECUTION DIVISION, 2nd FLOOR ADMINISTRATIVE BUILDING, HMBP
PHONE: 0651 2401200, 2401544 FAX: 0651 2401166, EMAIL: ashimkumar@hecltd.com



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Heavy Engineering Corporation Limited

(A Govt. of India Enterprise)

Heavy Machine Building Plant

CRANE EXECUTION DIVISION

ANNEXURE – D

CHECK LIST FOR ACCEPTANCE / CONFIRMATION OF COMMERCIAL TERMS & CONDITIONS

Please confirm your acceptance of following Clauses of Commercial Terms & Conditions :-

CLAUSE No.	PARTICULARS	ACCEPTANCE / CONFIRMATION OF TENDERER (YES / NO)	REMARKS
1.0	SCOPE OF SUPPLY / WORK & SERVICES		
2.0	PRICE		
3.0	TAXES & DUTIES		
4.0	FIRM PRICE		
5.0	INSPECTION		
6.0	DELIVERY		
7.0	TERMS OF PAYMENT		
8.0	GUARANTEE		
9.0	A) EARNEST MONEY DEPOSIT		
	B) SECURITY DEPOSIT		
	C) SUBMISSION OF PERFORMANCE BANK GUARANTEE		
10.0	LIQUIDATED DAMAGES FOR DELAY IN COMPLETION		
11.0	TRANSIT INSURANCE		
12.0	MODE OF DESPATCH		
13.0	PACKING, FORWARDING AND SHIPMENT		
14.0	DEMURRAGE, WHARFAGE, ETC.		
15.0	FORCE MAJEURE		
17.0	MARKING OF EQUIPMENT		
18.0	NOTIFICATION OF DESPATCH		
9.0	PAYING AUTHORITY		
20.0	PROGRESS REPORT		
21.0	SUBLETTING AND ASSIGNMENT		
22.0	CHANGE IN A FIRM		
23.0	CONSEQUENCE OF BREACH		

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CRANE EXECUTION DIVISION, 2nd FLOOR ADMINISTRATIVE BUILDING, HMBP
PHONE: 0651 2401200, 2401544 FAX: 0651 2401166, EMAIL: ashimkumar@hecltd.com



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Heavy Machine Building Plant

CRANE EXECUTION DIVISION

24.0	CONSIGNEE		
25.0	FIRST FILL OF CONSUMABLES, OILS AND LUBRICANTS		
26.0	TRAINING OF PERSONNEL		
27.0	Q.A. PLAN		
28.0	WEIGHT OF EQUIPMENT		
29.0	COMMISSIONING SPARES		
30.0	FORMAT AND NAME PLATE		
31.0	DRAWING, DOCUMENTS & MANUALS		
32.0	COMMISSIONING SPARES		
	TWO YEAR OPERATIONAL SPARES		
	TOOL & TACKLES		
33.0	UNIT RATES		
34.0	BOUGHT-OUT ITEMS		
35.0	PAINTING		
36.0	REJECTION		
37.0	SPECIAL INSTRUCTION (DESPATCH MARK/ IDENTIFICATION MARK)		
38.0	LEGALITY AND DISPUTE SETTLEMENT		
39.0	OTHER TERMS AND CONDITIONS		



ISO 9001 Company

Heavy Engineering Corporation Limited

(A Govt. of India Enterprise)

Heavy Machine Building Plant

CRANE EXECUTION DIVISION

Annexure 'E'

FORMAT OF BANK GURANTEE FOR EARNEST MONEY DEPOSIT

(TO BE STAMPED IN ACCORDANCE WITH STAMP ACT & TO BE ISSUED BY ANY NATIONALISED /SCHEDULED BANK AUTHORISED BY RBI TO ISSUE A BANK GUARANTEE)

NO.

Dated:

TO

HEAVY ENGINEERING CORPORATION LTD.
RANCHI-834004, JHARKHAND
INDIA

Dear Sirs,

In consideration of your agreeing to accept the Earnest money deposit of Rs.----
------(Rs-----) furnishable to you by M/s-----

------(Hereinafter Referred to As Contractor) In terms of the Enquiry No. -

Dtd. ----- for Supply of ----- (Hereinafter Referred to as the Contract) in the form of a Bank Guarantee in the Manner hereinafter contained we -----, having registered office at -----do hereby covenant and agree with you as follows.

1. We hereby undertake to indemnify you up to a sum of Rs. ----- (Rs. ----- only) against any loss or damage caused to or suffered by you or that may be caused to or suffered by you by reason of any breach or breaches on the part of the contractor of any of the terms and conditions contained in the said contract and in the event the Contractor shall make any default or defaults in carrying out any of the works under the said contract or otherwise in the observance and performance of any of the terms and conditions relating thereto in accordance with the true intent and meaning thereof, we shall forthwith on demand and without any protest or demur pay to you such sum or sums not exceeding in total the said sum of Rs.----- - (Rs. -----only) as may be claimed by you as your losses and/or damages, costs, charges or expenses by reason of such default or defaults on the part of the contractor.



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Heavy Machine Building Plant

CRANE EXECUTION DIVISION

2. Notwithstanding anything to the contrary contained in this guarantee your decision as to whether the contractor has made any such default or defaults and the amount or amounts to which you are entitled by reasons thereof will be binding on us and we shall not be entitled to ask you to establish your claim or claims or damages or losses suffered by you but will pay the amount demanded by you under this guarantee forthwith without any protest or demur.

3. This guarantee shall continue and hold good until it is released by you on the application by the contractor after expiry of the related warranty period of the said contract and after the contractor have discharged all their obligations under the said contract and produced a certificate of due completion of the work under the said contract and submitted a "NO Demand Certificate" provided always that this guarantee shall in no event remain in force after the date of----- without prejudice to your claim or claims arisen and demanded from or otherwise notified to us in writing before the expiry of six months from the said date which will be enforceable against us notwithstanding that the same is or are enforced after the said date.

4. We-----, further undertake to extend the validity of this beyond the period prescribed in clause 3 or as extended from time to time for such further period as may be required in writing before the Expiry of this and upon such extension(s), all terms and conditions of this shall remain in full force till the expiry of this extended period(s).

5. You will have the fullest liberty without affecting this guarantee from time to time to vary any of the terms and conditions of the said contract or extend the time of performance of the contractor or to postpone for any time or from time to time any of your rights or powers against the contractor and either to enforce or forbear to enforce any of the terms and conditions of the said contract and we shall not be released from our liability under this guarantee by the exercise of your liberty with reference to matters aforesaid or by reason of any time being given to the contractor or any other forbearance, act or omission on your part or any indulgence by you to the contractor or by any other variation or modification of the said contract or any other act, matter or things whatsoever, which, under the law relating to sureties, would but for the provisions hereof, have the effect of so releasing us from our liability hereunder provided always that nothing herein contained will enlarge our liability hereunder beyond the limit of Rs. ----- (Rs.-----) as aforesaid or extend the period of the guarantee beyond the said Date of ----- unless expressly agreed to by us in writing in terms of clause 4 hereof.

6. This guarantee shall not in any way be affected by your taking or varying or giving up any securities from the contractor or any other person, firm or



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company on its behalf or by the winding up, dissolution, insolvency or death as the case may be of the contractor.

7. In order to give full effect to the guarantee herein contained, you shall be entitled to act as if we are your principal debtors in respect of all your claims against the contractor hereby guaranteed by us as aforesaid and we hereby expressly waive all our rights of suretyship and other rights, if any, which are in any ways inconsistent with any of the provisions of this guarantee.

8. Subject to the maximum limit of our liability as aforesaid this guarantee will cover all your claim or claims against the contractor from time to time arising out of or in relation to the said contract and in respect of which your claim in writing is lodged on us before expiry of six months from the date of expiry of this guarantee.

9. Any notice by way of demand or otherwise hereunder shall be in writing and may be sent by registered post or Telefax to us at our Local Address as aforesaid.

10. This guarantee and the powers & provisions herein contained are in addition to and not by way of limitation or substitution for any other guarantee or guarantees heretofore given to you by us whether jointly with others or alone and now existing uncancelled and that this guarantee is not intended to and shall not revoke or limit such guarantee or guarantees.

11. This guarantee shall not be affected by any change in the constitution of the contractor or us nor shall it be affected by any change in your constitution or by any Amalgamation or absorption thereof or therewith but will ensure for the benefit or and be available to and enforceable by the absorbing or amalgamated company or concern.

12. This guarantee is irrevocable during the period of its currency and shall not be revoked without your previous consent in writing.

13. We further agree and undertake to pay you the amount demanded by you in writing irrespective of any dispute or controversy between you and the contractor or any reference to arbitration of the said dispute/controversy pending or a civil suit filed by the contractor in respect of the dispute or controversy.

14. Notwithstanding anything contained herein above our liability under this guarantee is restricted to Rs.----- (Rs. -----
-----only) and this guarantee shall remain in force until -----unless



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(A Govt. of India Enterprise)

Heavy Machine Building Plant

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a written claim is lodged on us for payment under this guarantee within six months from the date of expiry of this guarantee . i.e. On or before-----
---all your rights under this guarantee shall be forfeited and we shall be deemed to have released and discharged from all liabilities there under, irrespective of whether or not the original guarantee is returned to us.

15. We have power to issue this guarantee in your favour under the memorandum and articles of association of the bank and the undersigned has full power to execute this guarantee under the power of Attorney Granted to us by the Bank.

FOR AND ON BEHALF OF



ISO 9001 Company

Heavy Engineering Corporation Limited

(A Govt. of India Enterprise)

Heavy Machine Building Plant

CRANE EXECUTION DIVISION

ANNEXURE-‘F’

FORMAT OF PERFORMANCE BANK GURANTEE

(TO BE STAMPED IN ACCORDANCE WITH STAMP ACT & TO BE ISSUED BY ANY NATIONALISED /SCHEDULED BANK AUTHORISED BY RBI TO ISSUE A BANK GUARANTEE)

Name of Equipment: ----- Gurantee NO-----
Purchase Order No.:----- dated: ----- Date:-----
Validity -----
Claim period-----

To:
M/s Heavy Engineering Corporation Ltd.
Heavy Machine Building Plant
Ranchi-834004 Jharkhand

In consideration of your having placed an order bearing Purchase Order No.-----
-----dated:----- with-----

------(hereinafter referred to as Supplier) for the supply of-----
------(hereinafter referred to as the-----

We ----- do hereby agree with you irrevocably that, should the machinery and equipment fail to give the guarantee performance and achieve the efficiency as stipulated in the Purchase Order within the period of guarantee or should the material and/or workmanship of the machinery and equipment supplied or any part thereof be found defective and/or fully, as per the purchase order, we undertake to pay without any demur merely on demand a sum of Rs. -----
-----being 10% of the value of Rs. -----
-----for the supply of -----

Your decision whether the supplier have made any such defaults and the amount to which you are entitled by reasons thereof shall be conclusive and bind on us, subject to maximum of Rs. -----
----- as aforesaid.

We-----further guarantee that the machinery and equipment manufactured and supplied by the supplier shall be new, of good quality materials and of the first class



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workmanship as specified in the Purchase order and should the machinery and equipment supplied or any part thereof be found defective and that should the defect as pointed out in inspection note be not made good and/or in case of failure within guarantee period same shall be replaced on free of cost or repaired on free of cost to the entire satisfaction of Heavy Engineering Corporation Ltd..

We -----agree that the guarantee herein contained shall remain in full force and effect till the machinery and equipment give the desired performance and it shall continue to be enforceable till your dues have been fully paid and claims satisfied or discharged subject to a period not later than-----
In the event of any extension granted for commissioning/dispatch suitable extension shall be given on your request.

We-----, further agree that any neglect, omission or forbearance or indulgence in enforcing any claim as per the terms and conditions of your purchase order or performance guarantee or any of them or any extension of the time granted for the performance or payment of penalty under the guarantee or any dispute between the supplier and yourselves as regard performance of machinery and equipment supplied or issued related to your Purchase order, shall not effect in any way our liability under this guarantee until the full payment, but in any case, shall not extend beyond-----
-----.

This guarantee is in addition and not substitution for guarantee given to you by the seller or by their bankers on their behalf.

We----- lastly undertake not to revoke this bank guarantee during its currency except with the previous consent of the corporation in writing.

Notwithstanding anything to contrary stated above, our liability under this guarantee will be restricted to Rs.----- and shall remain in force up to -----, unless a demand or claim under this guarantee is made from the date i.e. on or before-----all your rights under the said guarantee shall be forfeited and we shall be released and discharged from all liabilities thereunder.

Dated at ----- day of -----

Seal of the Bank

