

**SPECIFICATION FOR DOUBLE GIRDER 10 TON ELECTRIC OVERHEAD TRAVELLING (EOT)
CRANE FOR SCRF PROCESSING BUILDING**

1. INTRODUCTION-

This crane will be installed in the newly constructed SRF building of Raja Ramanna Centre for Advanced Technology, Indore (MP). This Centre is situated at a distance of 14 km. from Indore Railway Station. The specifications of electric overhead traveling crane are as given in Annexure I. The end view of the high bay where the crane will be installed is as shown in annexure-II.

2. SCOPE OF SUPPLY

The Scope of supply shall include but not be limited to the following along with necessary fittings, fixtures and ancillaries.

- a. Bridge structure with platform and hand railing
- b. Track wheels for longitudinal and cross travel
- c. Traveling mechanism for longitudinal and cross travel
- d. Hoisting mechanism.
- e. Brake Mechanism separately for long travel, cross traverse and hoisting.
- f. Trolley
- g. Service Platform
- h. **Pendant Control and wireless remote operation for all movements.**
- i. Electrical motors, control gear and equipment.
- j. **AC variable frequency controls for all motions of the crane.**

3. DESIGN

The cranes shall be designed, manufactured, erected and tested in accordance with the following specifications:

- a. IS:3177-1999 (latest) - Indian Standard Code of Practice for electric overhead traveling cranes.
- b. IS:807- 2006 - Indian Standard Code of Practice for design, manufacture, erection and testing (structural portion) of cranes and hoists.

The crane should be designed for a minimum life of 30 years.

4. CAPABILITY

The crane should be capable of:

- a. Hoisting, i.e. lifting and lowering of all loads up to the maximum specified working and load at different specified speeds
- b. Traveling and traversing at specified speeds in both loaded and unloaded conditions.
- c. Working in the air conditioned clean building. The structure should not shed particles/ dust during operation.

5. **RIGIDITY, CONTROL & SAFETY**

- a. The crane should be rigid, robust and of sturdy construction
- b. Crane controls should be conveniently located. The various controls should be suitably interlocked to prevent accidental movement of the crane.
- c. Suitable limit switches, one each for long and cross travel and two for main hoists, should be provided to stop the crane and prevent over-travel of various moving parts of the crane.
- d. Suitable buffers should be provided to prevent over travel of the crane mechanism in both longitudinal and cross traverse directions.
- e. Suitable guards or enclosures should be provided on the crane to prevent inadvertent contact with down shop leads or any other exposed electrical conductors and cables.
- f. Suitable isolation switches and stop buttons should be provided to isolate the electric supply for maintenance or in the event of an emergency.
- g. A safety hand railing of tubular construction should be provided on bridge footwalls, end carriages, trolley and any other places where access has been provided. Railings should not be less than 1000 mm high with an intermediate member at a height of around 500mm.
- h. All sheaves should be provided with rigid guards to retain the ropes in the grooves. Guard should fit close to the flange and should have a clearance between the sheaves and inside the guard of not more than 3 mm or 1/4th the diameter of rope, whichever is less.
- i. The crane should comply with the relevant safety regulations under the Factories Act, Indian Electricity Rules and other statutory regulations as applicable.

6. **MAINTAINABILITY**

- a. Safe accesses of maintenance and removal of all mechanical, electrical and structural components must be ensured. All parts requiring replacement, inspection and lubrication should be easily accessible without the need of dismantling other equipment or structures. Arrangements for access to important components must **include a cradle for inspection and maintenance of DSL**, such cradle being conveniently accessible.
- b. All electrical cables should be so laid that they are not liable to damage and can be easily inspected and maintained.
- c. **Access walkways** (wherever required) of minimum 500mm clear inside width with hand railings **on both sides of girders for the full span length** for inspection and maintenance of the crane shall be provided. Walkways shall be of chequered plate or non-slip steel surface of minimum 6mm thick. Walkways shall be of rigid construction and designed to sustain a distributed live load of not less than 3 kN/m².
- d. Materials used for equipment and structural should be free from cracks, blow holes, laminations, pitting etc. *Except for areas where a superior grade of materials is required, steel class should be as per IS: 2062 (latest).*

- e. A **tool box** containing all tools required for the **maintenance** of the crane should be supplied with the crane.
- f. Fasteners for pedestal blocks, gear boxes, etc., should be easily removable from the top of the platform.

7. STRUCTURAL DETAILS

- a. The crane bridge should comprise of **double girders of plate box type**.
- b. In the main bridge girders, in addition to the required full length diaphragms, short diaphragms should be inserted wherever required to transmit the trolley wheel load to the web plates and to limit the maximum stress in the trolley rail to safe permissible limits. All diaphragms must bear against the top flange. Steel plates used for bridge girders and diaphragms should be as per IS:2062 (latest).
- c. **All fasteners should be hot dip galvanized.**
- d. The bridge girders should be connected to the end carriages by large gusset plates. **Ground tight fit bolts in reamed holes** should be used for bolted connections.
- e. The calculated strength of joints made by High Strength Friction Grip (HSFG) bolts should not be less than calculated net strength of the member. The calculated strength of other bolted joints in structural members should not be less than the net strength of the member plus 25%.
- f. **All butt welds** on structural members of bridge girders subject to **tension** should be **radio graphically tested**. All other welds should be subjected to Magna flux or Dye Penetration Test.
- g. The box girders should be so constructed as to eliminate any possibility of accumulation of water or oil inside them.

8. END CARRIAGES

- a. The crane bridge should be carried on end trolleys with **double flanged solid forged wheels**. The minimum end clearance on each side of the long travel wheels should be 10mm. The wheels should be mounted on fixed axle or suitable anti-friction spherical roller bearings which can be conveniently removed for maintenance.
- b. End carriages should be designed to be strong enough to resist all stresses likely to be imposed upon them under varied service conditions, including collision with stops. The length of the end carriages should be such that no other part of the crane is damaged in the event of a collision.
- c. End carriages should be fabricated from rolled steel sections or plates, welded together to form a box. Suitable stiffening diaphragms should be provided wherever required. The material used should be steel as per IS: 2062(latest).

- d. Suitable **jacking pads** should be provided on each end carriage for jacking up the crane while changing track wheels. These jacking pads should not interfere with replacement of track wheels.
- e. The end carriages should be fitted with suitable **safety stops** to prevent the crane from **falling more than 25mm** in the event of breakage of track wheel, bogie or axle. These safety stops should not interfere with the removal of track wheels.

9. **BRIDGE RAILS**

Bridge rails will be square bars of suitable size (to be supplied & installed by supplier)

10. **TROLLEY FRAME**

- a. The trolley frame should be welded rolled steel box section, designed to transmit the load to the bridge rails without undue deflection. It should be made rigid by providing suitable diaphragms. The material used should be steel as per IS: 2062 (latest)
- b. The drum bearings and supports for upper sheaves should be located so as to equalize the load on the trolley wheels as nearly as possible.
- c. The trolley wheels should be double flanged. The **axle bearings** should be of **spherical roller type**. The bearing housing should be designed for easy removal of wheels and bearings for maintenance. The wheel assembly should be fitted in **L-type housing**, for easy removal of wheel assembly.
- d. All the mechanical and electrical equipment should be placed above the trolley top plate as far as practicable. For any parts placed below the trolley top plate, access for maintenance, repairs and replacement should be provided. Where the clearance between bottom member of trolley frame and the CT rail is over 25mm, the **trolley should be fitted with substantial safety stops to prevent the trolley from falling more than 25mm** in the event of breakage of track wheel, bogie or axle. These safety stops should not interfere with the removal of wheel. Details of the arrangement should be explained in the offer.

11. **RAIL WHEELS**

- a. The rail wheels shall be double-flanged with straight tread.
- b. These wheels shall be manufactured from medium carbon alloy steels, and shall be solid forged and heat treated to have minimum hardness of 36HRC (341 BHN) on the tread and flanges to a depth of not less than 8mm.
- c. The wheels should be shrink-fit on the axles.

12. **ROPE DRUMS**

- a. The rope drum shall be designed to withstand the compressive stresses caused by the wound on rope and the bending stress due to beam action of the drum.

- b. Pipes will be an acceptable alternative. The steel used shall be to IS: 2062 -1984(or latest) quality. The rope drum shall be stress relieved after fabrication. T-joints shall be radio graphically checked.
- c. The drum shall be designed to take the entire length of the rope in a single layer. Free extra turns as specified in IS: 3177 shall also be provided. The drum shall be flanged at both ends.
- d. Cranes shall be designed with number of rope having 4 falls.

13. **WIRE ROPES**

Wire rope in the crane should be galvanized and of reputed make. Preferably “Hyflex” type wire ropes should be used. If it is conventional type then it will be **6 x 36 construction** made from best plough steel of tensile strength 180kg/mm².

14. **GEARING**

Only **helical gears** should be used. The gearing in all motions should be of suitable case carburizing low carbon alloy steels and should conform to relevant Indian/International standards. They shall generally be in accordance with IS: 4460-1967(or latest). **All gears should be hardened and profile ground for longer life and silent operation.** The minimum surface hardness of pinions and gears should be in the range of 55-60 HRC. The hardness of gears should be at least 2 - 3 HRC less than that of pinions.

15. **GEAR BOXES**

- a. All gear boxes shall be of completely enclosed splash lubricated type. **All gear boxes shall be oil tight and sealed with neoprene ‘O’ rings of suitable section.** All gear shafts shall be supported in bearings mounted in the gear boxes. Gear boxes shall be made of graded C.I/M.S fabricated. All gear boxes shall be stress relieved and the method of doing so shall be explained in detail in the offer. Gear boxes shall be provided with breather vents, easily accessible drain plugs, and a suitable oil level indicator such as a dip stick. Adequate radial clearances between the gear box inner surface and outside diameter of the gears shall be ensured and clearance proposed to be provided shall be indicated in the offer. The facial clearance between the inner surface of the gear box and the face of the nearest gear/pinions shall be at least 10mm.
- b. ***All gear boxes should have drip pans to avoid oil falling on shop floor.***
- c. LT/CT gear boxes-- These should be of a modular, integral design. Motors may be either flange-mounted or foot mounted, or a combination of the two.

16. **DRIVES**

- a. The wheels of each end carriage should be driven by independent synchronized drive motors mounted near each end carriage.

- b. A separate cross traverse motor should be used for cross traverse drive through a suitable gear box.

17. **BRAKES**

- a. The hoisting motion shall be provided with **fail-safe D.C. Disc brakes** of reputed make.
- b. The maximum braking torque to arrest long travel and cross traverse motions should not less than 100% of full load torque for each brake. **For hoist motion, two brakes should be used** and the braking torque for each brake should not be less than 125% of full load torque. One of the two hoist brakes shall be applied with a time lag of 3 seconds in relation to the first.
- c. **For L T & C T motions brake should be DC disc brakes.**

18. **ROPE SHEAVES**

All sheaves should be of cast/forged steel. They should be identical, with the exception of the equalizer sheave. The equalizer sheave should be mounted above the trolley floor and should be easily accessible and removable from the trolley floor level. Sheave grooves should be smooth finished for getting increased rope life. The supplier should further ensure that wire ropes are parallel with each other.

19. **BEARINGS**

- a. Ball and roller anti-friction bearings shall be of reputed make. The acceptable makes will be NBC, SKF, FAG, NORMA, NRB, NTN and KOYO.
- b. For long and cross traverse wheels, spherical roller bearings shall be used. **Bush bearings should not be used at any location.**

20. **LIFTING HOOK**

Standard plain shank type trapezoidal section hooks should be used. These hooks should conform to the relevant Indian Standard Specifications IS: 3815(latest) and IS: 8610 (latest)

21. **BUFFERS**

Spring loaded or other suitable buffers should be fitted on the four corners of the crane also at the four ends of the bridge girders. Buffers should be rigidly bolted in place, preferably along the centre line of the crane rail or trolley rail as the case may be. All buffers should have sufficient energy absorbing capacity to stop the bridge or trolley in either direction when traveling at a speed of least 40% full load rated speed. Bridge buffers should have a contact surface of not less than 125mm diameter.

22. **LUBRICATION**

- a. All gears and bearings enclosed inside gear boxes should be splash lubricated. Bottom blocks and pedestal bearings should have independent greasing points.
- b. A lubricating chart should be provided in the manual, indicating all lubrication points, the type of lubricants required and the recommended frequency of lubrication. These details should be repeated, and amplified if necessary, in the **Maintenance Manual** to be supplied along with **the crane minimum two nos. of hard copies.**

23. **SCOPE OF SUPPLY FOR ELECTRICAL COMPONENTS**

All accessories and auxiliary electrical equipment including drive motors, electrically operated brakes, controllers, AC variable frequency controls, conductors, protective devices, operating devices, cables, conduits etc. necessary for the safe and satisfactory operation and maintenance of the crane shall be included in the Vendor's scope of supply. **Electrical equipment shall be adequately rated to permit simultaneous operation of any combination of motions of the crane for its duty service.**

The scope of supply relating to electrical portion shall cover :-

- a. Shrouded down shop leads.
- b. Main current Collectors (one in forward and another in rear)**
- c. Power disconnecting switch on the crane bridge walk way, to be provided, immediately after the main current collection gears.
- d. Motors (ABB/Siemens/Crompton Greeves/BBL/Kirloskar/LHP make with IP 55 protections).
- e. Protective Switch gears
- f. Motor control panels.
- g. Squirrel cage motors with variable frequency drive for all LT, CT & hoist motion.**
- h. DC disc brakes for all motions
- i. Limit Switches
- j. Socket outlets
- k. Power and control cables CT motion cables should run in cable drag chain.**
- l. Drag link cable system of reputed make like IGUS.
- m. Indicating lamps
- n. Double step push buttons on Telemechanique make pendent and wireless remote control.**
- o. Only MCBs should be used in the crane in lieu of HRC fuses.**
- p. Earth wire on crane portion.

- q. The control pendant should have separate movement in CT direction independently from trolley.
- r. Shrouded bus bar GI conductor along with Isolator switch at the ground level. Cabling from the Isolator to the shrouded bus bar should be in vendor's scope.
- s. **Lighting fixtures with HPMV lamps 250W x 4 nos. under arm type operable from pendant as well as from the wireless remote control.**

All sundry erection material required for installation and connecting up of electrical equipment with cable laying and fixing accessories shall be included in the price of the crane.

24. **POWER SUPPLY CONDITIONS**

Power shall be available at $415 \pm 10\%$ volts, 3 phase, $50 \pm 3\%$ Hz

25. **SPECIFICATION FOR SHROUDED BUS BAR CONDUCTOR**

Shrouded Bus Bar Conductor shall be of M/s. STROMAG make or safe track brand of M/s. Sushil Engg. Corporation Mumbai and shall conform to the following:

- a. The conductor system shall be finger safe to IP-21 with necessary supporting technical evidence of same and the conductor and material shall be of suitable metal (**Galvanized Iron**) insulated by a high impact gloss finish VR 935/2 PVC compound which shall have a step/groove shrouded all along its length for effective molding of the conductor system.
- b. The conductor shall be in minimum 4 mtrs. length to be jointed with molded joint of the same material as the conductor and these
- c. conductors shall be supported by way of a single piece molding, four pole hangers with single bolt fixing.
- d. The current collector arm should be aluminum die cast totally insulated and the connection cable shall be fully enclosed and double insulated within the collector arm with a proven performance. **Two sets of current collectors should be used, one in forward and another on rear, on DSL.**

26. **MOTORS**

All crane motors shall be totally enclosed fan cooled squirrel cage type.

27. **CRANE CONTROL**

- a. **Pendant push button control and wireless remote control for long travel, cross travel and hoist motions.** For switching ON and OFF the motor of a particular motion, the supply voltage to the pendant control shall be 24V AC/DC which shall be obtained through a suitable transformer. Necessary flexible multi core cable with

sufficient length shall be supplied to enable the crane to be operated from floor level. Pendant shall be moving type and the **movement of pendant will be independent of trolley via a separate track along girder length.** On all the motions the circuit shall be so designed that brakes come into operation immediately in the event of tripping of motor main circuit breaker.

- b. The pendant control shall be capable of withstanding rough handling without being damaged. The cover shall be firmly secured.
- c. The mass of the pendant shall be supported independently of the electric cable by means of wire rope/chain. The pendant should be Telemecanique make and the push buttons should be double step type.
- d. On all pendant cranes safety means shall be provided to prevent inadvertent operation from floor while maintenance work is being carried out on the crane.
- e. Adequate guards shall be provided to prevent accidental contact of pendant ropes or holding wire rope/chain with cross traverse.
- f. Wireless remote control should also be offered for LT, CT and hoist motion of a reputed make, along with the push button pendant.
- g. **Wireless remote control should have two transmitters and one receiver. The wireless remote control transmitter should be impact resistant.**
- i. **Selector switch on pendant for pendant operation or remote control operation.**

AC variable frequency controls

AC variable frequency control of adequate capacity for all the motions of L&T make shall be used. Independent AC variable frequency control for main hoist, CT & LT shall be used by using independent variable voltage variable frequency drives. However common controller for both the motors of LT may be used. **Tenderer shall submit necessary technical details of the offered model.**

Brake release should be dependant on motor torque. The brake should be released only if 100% torque is developed in the motor.

28. **CONTACTORS**

- a. All contactors shall be of AC 4 Class of duty with rating sufficiently higher than the full load current of the respective motors at the specified duty cycle. The directional contactors of all motions shall be suitably interlocked for correct sequence of operation.
- b. The contactors shall have high contact reliability.
- c. All contactors shall be of ABB, Siemens, L&T and Cutler Hammer make.

29. **CIRCUIT PROTECTIVE SWITCH GEAR**

- a. In the crane push button operated contactor shall be provided for circuit protection.
- b. Each control circuit branch to every contactor panel shall be provided with facility for isolation and protection against short circuits and sustained high overloads by means of appropriately rated miniature circuit breaker.

30. **LIMIT SWITCHES & LOCKS**

- a. All hoist motions shall be provided with limit switches to prevent crane from over hoisting and over lowering. Two limit switches shall be provided for proper back up protection. The first limit switch shall act in the event of over hoisting and over lowering shall be of snap action/pin type self resetting feature and incorporated in the control circuit of respective drive motor.
- b. Any other limit switch viz. for slewing, skewing of crane etc. shall be provided if required.
- c. Limit switch for hoist cross and long travel motion shall be supplied installed and wired by the manufacturer.
- d. **Audio & Visual Alarm for all the limit switches should be provided.**
- e. Safety latch and swiveling lock should be provided for hook.

31. **EMERGENCY STOP PUSH BUTTONS**

Safety switches of sustained contact type shall be provided at each end of Crane Bridge so that under any emergency conditions, by operating anyone of the switches, the incoming circuit breaker is tripped thus cutting power to all motions. One no. of emergency stop push button should also be provided on pendant.

32. **CONTROL PANEL (IP 55 class protection)**

- a. All power and aux. contactors shall be mounted in sheet steel cubical with lockable hinged doors. The door hinges shall be of such type that during the repair works inside the panel the entire door can be lifted out and placed away enabling better access inside the panel. Each motion shall have its individual Panel. However, common panel with separate compartment for each motion shall be acceptable. **Interiors of panel shall be dust and vermin proof.**
- b. Panels shall be front wired with readily accessible terminal blocks for making connections in the external equipment. Panels shall be pre wired into terminal strip. **Single core, copper conductor shall be used for control circuit wiring in the panel.**
- c. All contactors etc. shall be mounted securely in a vertical arrangement with the consideration of the vibrations encountered in the operation of cranes. The bottom most row of the equipment mounted inside the panel except terminals strips shall be at least 150 mm above the panel bottom cover to facilitate inspection and repairs.

- d. All the equipments shall be so mounted in panel as to enable its easy removal/replacement from the front.
- e. The terminal strips shall be fixed inside the panel preferably in a horizontal manner leaving enough space underneath the strip for termination of cables in a convenient manner. Power and control terminals shall be segregated. Power terminals blocks shall be separated from each other by means of replaceable insulated spacers. Terminal block shall have adequate clearance to avoid tracking. A minimum of 20% spare terminals block shall be provided in terminals strips.
- f. All equipments inside the panel shall have permanent identification labels in accordance with circuit diagram as also the power and control terminals. Terminal blocks shall be of robust and of such construction as to preclude possibility of cable connections getting loose during vibration on crane.
- g. Sheet steel used for fabrication of panels shall have a minimum thickness of 2.0 mm. Panels shall be mounted such that bottom of panel is at least 150mm above the floor.
- h. Contactor panels shall be well braced to the crane structure and each panel shall be provided with adequate number of lifting lugs.

33. **CABLING**

- a. All wiring for power control circuit shall be carried out with **1.1 KV grade Flame Retardant Low Smoke (FRLS) PVC insulated copper cables** as per IS 694 and IS 1554 Pt. I with smoke index and typical index corresponding to ASTM-2843 & IEC332-I.
- b. Minimum size of power & control cables shall be 4 mm², 2 & 2.5 mm² respectively.
- c. **All cables shall be systematically laid on G.I. trays or in cable drags of suitable type.**
- d. All cables shall be of reputed make and approved ISI brands.
- e. **CT cables of the crane shall run on cable drag chain.**

34. **IDENTIFICATION OF CIRCUIT CABLES ETC.**

Labels of permanent nature shall be provided on supports of all switches, fuses, contactors, relays etc, to facilitate identification of circuits and replacement. All panels, controllers etc. shall be properly marked for each motion. All power control cable and other cables shall be ferruled at both end as per cables numbers indicated in the supplier's drawing. All equipment terminals shall also to be marked likewise.

35. **EARTHING**

Earthing to the crane shall be effected through track rails crane structure. As such, all the electrical equipments mounted on crane shall be connected to the crane structure by means of earthing links. Equipments fed by flexible cables shall be earthed by means of spare core provided in the flexible cable.

36. **SPARES**

To be quoted separately for two years of maintenance

37. **ERECTION, COMMISSIONING AND PROVING TESTS**

- a. The contractor shall arrange erection and commissioning of the cranes. Adequate number of teams of technical experts will be made available so that erection and commissioning delays are eliminated. Such personnel will be required to be present immediately as soon as we call upon for erection after receipt of crane at our site and site preparedness.
- b. The contractor or his agent shall commission the crane within 60 days from the date of intimation by the consignee in respect of readiness of site/gantry etc.
- c. Following items of work shall be performed by the Contractor
 - i. Checking of alignment of gantry rail at site. Any rectification required, however, will be done by the purchaser.
 - ii. Installing of the crane structure and associated machinery in position.
 - iii. Complete fitting and wiring of all electrical items
 - iv. Fixing of down shop leads.
 - v. Commissioning of the equipment. The crane performance shall be demonstrated after successful commissioning.
- d. Consignee's obligation with regard to erection & commissioning will be limited to the following:
 - i. Unloading, transporting materials free of cost from the destination station to the work site and storing until taken over by the supplier for erection.
 - ii. Supplying following free of cost at the site of work.
 - a. Electricity required for the purpose of erection/ lighting.
 - b. Test loads with slings and tackles for performing the load tests.
 - c. Ladder for going up the gantry rails.
- e. In the interest of early commissioning, the supplier shall ensure minimum amount of assembly is necessary at site. **The supplier, before proceeding with design details, shall check the span of gantry rails from us.**
- f. The crane shall be inspected and tested during different stages of its manufacture, starting from raw-materials till the completion of the crane, by the Purchaser or his authorized representative at the supplier's or his sub-supplier's works. However, the purchaser or his authorized representative is free to institute any further checks also, if he so desires.
- g. All electrical and mechanical equipment shall be tested in accordance with the appropriate Indian Standard at either the crane maker's or equipment manufacturer's works and test certificates provided if required by the Purchaser or his representative.
- h. Test on Purchaser's Premises.

- i. Start up and trial Operations Test (Commissioning Test)
- j. The contractor shall carry out the start up and trial operation tests (commissioning test) on receipt of authorization from the Purchaser. In addition to tests indicated in IS: 3177(latest), the following shall also be shown:
 - i. The earthing of the crane and control equipment, to be tested as per Indian Electricity Rules.
 - ii. The operation of brakes on long travel, cross traverse and hoisting motions.
 - iii. Inching control and speed as specified in annexure-I.
 - iv. There is no skewness in crane during long travel and cross travel motions, presence of vibrations and unusual noise in operation.
- k. The trials shall be carried out initially under no load conditions and on satisfactory completion of these, trials shall be repeated for various loads until the full rated load and operating range are covered.
- l. During the trial operation, all necessary adjustments shall be made so as to ensure compliance with the operating characteristics for the complete equipment as stipulated in the technical specifications.

38. **TRAINING**

Technical experts of the manufacturer during erection & commissioning of cranes will fully and adequately train operators / maintenance staff nominated by the consignees.

39. **REFERENCES**

The tenderer should provide satisfactory evidence, acceptable to the Purchaser, to show that he is licensed manufacturer and has adequate plant and manufacturing capacity and has a quality assurance programme. He should furnish a statement giving a list of items as per his offer and/or similar, supplied by him during the last 3 years, along with the Purchaser's name and address, order number, date and quantity supplied, comments on their performance, and whether the supplies were made within the delivery period. In the absence of the above information, the tender is liable to be rejected.

40. **PAINTING & COLOUR**

The crane should be epoxy painted (golden yellow colour) after obtaining surface finish better than or equal to SA 2½. All motors, brakes and panels should also be epoxy painted.

- a. All parts of the crane shall be thoroughly cleaned of all loose mill scales, rust or foreign matter.
- b. All parts inaccessible after assembly shall be painted before assembly.
- c. The interior of all gear box housing shall be painted with two coats of oil resistant enamel paint.

NOTE TO THE CRANE MANUFACTURERS / SUPPLIERS –

- 1) Crane manufacturers/suppliers in their quotation should include a comparative statement of the technical specifications of the crane indented versus the crane being offered by them, without this comparative statement the offer is liable to be rejected.
- 2) Suppliers/manufacturers should also enclose detailed technical catalogue of the crane being offered along with the quotation. Offer with a general catalogue is liable to be rejected.
- 3) The crane manufacturer must submit a detailed **quality assurance programme indicating QAP applicable at various stages of crane fabrication starting from raw material to final crane testing.**

A detailed QAP with necessary drawings documentation and calculation for obtaining necessary approval should be submitted to us before taking up crane fabrication.

RAJA RAMANNA CENTRE FOR ADVANCED TECHNOLOGY, INDORE

Data Sheet for 10 Ton Double Girder EOT Cranes		
1)	Location	SCRF Building
2)	Designation	EOT
3)	Duty Class of Crane (As per IS:807-2006)	M7
4)	Quantity	01
Crane Classification as per IS 13834		
5)	Mechanical	M7
6)	Electrical	M7
7)	Type	Overhead
8)	Type of Girder	Double
Capacity		
9)	Main Hoist	10 Ton
10)	Span	18.670 meters
11)	Longitudinal Travel	70 meters
Lifting Range		
12)	Main Hoist	6.5 meters (Hook Height)
Type of Hook		
13)	Main Hook	Plain shank with swiveling.
Speeds in		
14)	Main Hoist	3.0 meter /min] By pendant control &
15)	Long Travel	20.0 meter/min] also speed control thro
16)	Cross Travel	16.0 meter/min] wireless remote control
Operating Mode		
17)	Pendant	Push button trailing type & Wireless remote control

