TENDER DOCUMENT

NIT No.: DLI/C&E/WI-665/333

FOR

Tender for ‘Design, Engineering, Supply and supervision of installation, testing & commissioning of ‘7.5 Ton (4 nos) ELECTRIC HOIST AND ASSOCIATED WORKS’ for the project of “Augmentation of Raw Material Handling Receipt and Handling facilities with new OHP Part– B (Package- 061) of Bhilai Steel Plant, (SAIL)”.

VOLUME – 2B

TECHNICAL SPECIFICATION

ENGINEERING PROJECTS (INDIA) LIMITED
(A GOVT. OF INDIA ENTERPRISE)
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VOLUME - 2B

GENERAL

The following Technical Specification shall be read in conjunction with General Technical Specification (GTS) of Bhilai Steel Plant, SAIL and General Specification. If there are any provisions in this Technical Specification, which are at variance with the provisions of General Technical Specification (GTS) of Bhilai Steel Plant, SAIL and General Specification, the provisions in this Technical Specification shall take precedence.

1.0 DOCUMENTS / INFORMATION TO BE FURNISHED ALONGWITH OFFER.

(i) Clear Scope of supply.

(ii) Technical data sheets duly filled by the vendor (blank data sheets enclosed).
2.0 **SCOPE OF SUPPLY**

The scope of the supply includes Design, engineering, manufacture, shop fabrication, assembly, testing and inspection at manufacturer's works, packing, dispatch, transportation, delivery to site, receipt, required fabrication at site, installation, testing & commissioning completion of facilities, performance guarantee testing, final painting at site and handing over to Bhilai Steel Plant, SAIL/EPI of '7.5T (4 nos.) ELECTRIC HOISTS AND ASSOCIATED WORKS' as per specifications and scope defined in tender documents complete with all accessories and drive, which are not mentioned specifically but are required for the efficient and trouble free operation of the equipment/system.

**a) Following items are also included in bidder’s scope.**

(i) Complete Hoist including all the mechanical, electrical & Instrumentation items as per the details given in the specifications.

(ii) Consumables like first fill of lubricating oils etc. for the initial operation of the equipment till handing over.

(iii) Commissioning spares and start-up spare parts.

(iv) Special tools & tackles, if any required.

(v) Recommended spare parts for (3) three years trouble free O&M.

(vi) Painting of complete equipment (including final painting before handing over to the Employer).

(vii) Supervision of Installation, testing & commissioning at site.

(viii) All drawings / documents along with operation and maintenance manuals as per requirement mentioned elsewhere in the tender document.

(ix) Getting approval of design/drawings and any other design calculation related to the equipment from BSP/MECON.

(x) 3 Ph, 415V, +10% & -15%, 50 Hz +6% & -6%, power supply shall be provided at Diverter gate terminal at one point through power cable.

(xi) Carrying out any modifications/ deletions /additions / alteration in design / drawings/ documents as required by client & Client’s consultant and EPI for proper execution of works at site till completion and handing over of the project to the client.

(xii) Trailing / Flexible Cables as required for hoist shall be in bidder’s scope. Festoon cable trolley system for hoists shall be in bidder’s scope.

(xiii) Size of the monorail shall be furnished by successful bidder.

**Exclusions:**

(i) Civil works including grouting.

(ii) Monorail supply & fixing.
b) Tenderer to note the following:

(i) Makes of gear box shall be Elecon/ NAW/ Flender/ Premium energy transmission/ Shanthi gears.

(ii) All LT AC / DC motors, actuators, brakes etc. as per technological and process requirement.

(iii) Generally Squirrel Cage Induction Motor with DOL starter / VFD / Soft Starter will be provided. Use of Slip ring motor in general will be avoided. Suitable Rotor contactor panels and SS-grid Resistance Boxes will be provided for slip ring motors if inevitable

(iv) Soft starter will be provided for LT motors of rating more than 75kW.

(v) All LT motors for conveyors will be S6 duty and will have class F insulation with temperature rise limited to class B. Inverter duty motors (used for VFD application) will have class H insulation with temperature rise limited to class F.

(vi) Equipment selection and dating will generally be based on ambient temperature of +50 Deg.C. For specific areas and shops, the ambient temperature conditions indicated above will be taken into consideration and equipment suitably derated wherever necessary.

(vii) The equipment should be suitable for smooth, efficient and trouble free service in the tropical humid climate prevailing at plant site and under the ambient temperature conditions indicated elsewhere.

(viii) Roller bearings will be provided at DE end for motor of rating 30KW and above.

(ix) BCH make brakes shall be provided in all Electric Hoists in the free end side of Gear Box.
3.0 **TECHNICAL SPECIFICATION OF ELECTRIC HOIST**

3.1 The hoist shall be designed in accordance with IS: 3938-1983.

3.2 For outdoor hoists, motors, brakes & other equipment shall be covered to suit to outdoor operation.

3.3 All trailing cables shall be clamped with PVC or non-metallic clamps.

3.4 Defects in the materials like fractures, cracks, blowholes, or laminations are not allowed.

3.5 No cast iron parts shall be used except for electrical equipments and no wood or combustible material shall be used unless specifically mentioned otherwise.

3.6 All working parts requiring replacements or inspection or lubrication shall be easily accessible without the need for dismantling of other equipment or structure.

3.7 All bolts except those with nyloc nuts shall be provided with grip lock nuts or spring washer.

3.8 All parts of the hoist shall be thoroughly cleaned of all loose mill scales, rust or foreign matter & then painted as specified. All parts inaccessible after assembly shall be painted before assembly & assembled while paint is still wet.

3.9 All parts except motors, resistors, gears, thrustors, solenoids, etc. shall be de-rusted manually & painted as follows.

3.10 **MECHANICAL DETAILS**

3.10.1 Wheel & drive

The electric hoist shall run on two pairs of wheels, a pair of which shall be driven by motor through reduction gear. The wheels shall be of cast steel/forged steel, single flanged with taper / parallel treads to suit to monorail. The wheels shall be mounted on anti-friction bearings & shall be easily removable for repair & replacement. The wheel diameter shall be selected such that skidding does not take place even under unloaded condition.

3.10.2 Hoist mechanism

The hoist mechanism shall consist of a bottom block fitted with a standard forged swivel hook of the specified capacity, supported on 2 or 4 falls of wire rope. However, non-spinning type of wire rope shall be used for 2 falls rope arrangement. The wire rope shall be wound on a grooved drum which shall be sufficiently long to accommodate in one layer the length of rope requisite for the specified lift & in addition not fewer than two turns at each anchored end & one spare groove at the opposite end. The hoist drum shall be motor driven through gears enclosed in oil filled reduction gearbox.
3.10.3 Gearing
Straight & helical spur gearing shall be used for all motions. Worm & bevel gears shall not be used with specific permission from purchaser. Preferably all first reduction gears shall have single helical teeth. All gears shall be hardened & tempered alloy or carbon steel with machine cut teeth. Surface hardening of teeth is not acceptable. All gears shall be enclosed in oil filled gear box except when not possible.

3.10.4 Couplings
Each motor shall be connected to its gear drive by a flexible coupling.

3.10.5 Lubrication
All gears & bearings shall be lubricated either by splash lubrication or by grease. If possible, all the lubricating points shall be grouped together in easily accessible positions.

3.10.6 Bearings
Ball & roller antifriction bearings of reputed make shall only be used, with minimum bearing life as per IS: 3938

3.10.7 Brakes
D.C. Electromagnetic brake shall be provided for each motion, however in case of conical rotor motors manufacturer's standard brake can be used.

3.10.8 Travelling speed (CT speed) shall be considered as 10 Mtr/min
3.10.9 Speed with safe working load lifting height (Lifting speed):
   a) For 15T : 3Mtrs/min
   b) For 7.5T : 3Mtrs/min for < 20 Mtr Height
      : 4Mtrs/min for > 20 Mtr Height
   c) For 5T  : 3Mtrs/min for < 20 Mtr Height
      : 5Mtrs/min for > 20 Mtr Height
   d) For 3T  : 3Mtrs/min for < 20 Mtr Height
      : 6Mtrs/min for > 20 Mtr Height

3.11 ELECTRICAL DETAILS
3.11.1 For Electrical specification, refer volume 4 of Tender documents.

3.12 The Electric hoists shall be inspected as per IS: 3938 - 1983 and as specified in tender document.
## TECHNICAL DATA SHEET
(To be filled by the vendor)

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<td><strong>HOIST</strong></td>
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<td>Speeds with safe working load</td>
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<td>5B.</td>
<td><strong>WIRE ROPES</strong></td>
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<td>a) Type of construction</td>
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<td><strong>ROPE DRUM</strong></td>
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<td><strong>DRIVES</strong></td>
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<td>a) Type &amp; material of gear box</td>
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<td>b) Gear &amp; pinion</td>
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<td><strong>MOTORS</strong></td>
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<th>Clearance diagram indicating the basic dimensions.</th>
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