TENDER DOCUMENT

NIT No.- DLI / C&E / WI-665 / 752 (R)

FOR

Tender for ‘Design, Engineering, Supply, Installation, Calibration, Testing & Commissioning of ‘IN-MOTION WEIGH BRIDGE 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

(Scope of Work & Technical Specification)

ENGINEERING PROJECTS (INDIA) LIMITED

(A GOVT. OF INDIA ENTERPRISE)
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Scope of Work - In-Motion Weigh Bridge (2 Nos)

Scope of work for electronic In-motion Weigh Bridge shall include (but not limited to):

- Design, engineering, manufacture, shop fabrication, assembly, testing, inspection at manufacturer’s works, packing, supply, dispatch, transportation, delivery at site, loading/unloading/handling of In-motion Weigh Bridge equipments/materials, required fabrication & assembly at site, completion of facilities, erection, calibration, testing, get stamping by weights and measures department of Govt. of Chhattisgarh, arrangement of test wagons from SEC railway and commissioning together, performance guarantee testing, final painting and handing over to Bhilai Steel Plant. All necessary assistance for coordination of bidder with railway authority regarding installation of weigh bridge shall be provided by BSP/EPI.

- Supply and installation of In-motion Weigh Bridge System complete in all respects with all the components of In-motion Weigh Bridge system, laying of cables and conduits as per system requirements with required accessories. Civil construction of weigh room shall not be in the scope of bidder. Civil and structural work for weigh bridge foundations shall be in the bidder's scope.

- EPI shall construct weighing room as per the approved weigh room drawing of In-motion Weigh Bridge. The weigh room shall be of hexagonal type heavy duty, front and side glasses of 8m X 4m X 3 m double door with hydraulic door closure. The civil and structural drawings for weigh room construction shall be prepared and submitted by the successful bidder for approval of EPI/BSP/MECON as per the requirements given in technical specification.

- All the civil work in weigh zone area with required mounting accessories for installation of In-motion Weigh Bridge shall be in bidder’s scope. Rail fixing, Rail cutting etc. as required for installation of In-motion Weigh Bridge shall be in the scope of bidder.
- Supply and installation of 2 nos of 1.5 t capacity split AC and 36” ceiling fans, 4 nos tables, 6 nos chairs, Indoor and outdoor illumination with HPSV lamp etc. per weigh room shall be in bidder’s scope.

- Proper earthing of all electrical installation will be carried out as per IE rules and IS:3043. Special RF earthing will be provided for electronic installation.

- EPI shall provide 3 phase, 415 +10% & -15%, 50 Hz +4% & -6% power supply at single point in weigh room through power cable. Other voltage levels including distribution as required for the system shall be in bidder’s scope. Required junction boxes, On-line UPS of suitable rating with input & output isolation, power distribution, required electrics, cabling, conduiting, trenching, system earthing, earthing pit as required and associated civil works shall be in the scope of bidder. For lighting 1 Phase, 230 V +10% & -15%, 50 Hz +4% & -6% power supply shall be provided at single point in weigh room, onwards distribution complete in all respects shall be in bidder’s scope.

- Submitting Basic engineering, detailed engineering and reference category of drawings, operating software and documents in requisite copies for approval of BSP / MECON. Further the successful bidder will furnish final basic & detailed engineering drawings, manufacturing drawings of fast wearing items and non-standard items, as built drawings, erection drawings/documents, operating software, operation and maintenance manuals in soft editable format.

- Receipt of material, loading/unloading, storage, watch & ward, complete erection, calibration, testing, commissioning, handing over to BSP, demonstration of performance guarantee. Preparation and approval of erection survey/alignment schemes, grouting clearances, painting clearances, testing of welds, pressure testing protocols and other related site protocols.

- Supply of all commissioning & start-up spares, special tools & tackles and insurance spares. A list of such commissioning & start-up spares and insurance spares shall be indicated separately in the offer. Bidder shall furnish separately priced list for two years O&M spares.
- Specialized training to BSP’s / Consultant’s personnel for operation, maintenance, for smooth handing over shall be included in bidder's scope.

- Testing and cold trial run of systems/ sub - systems and integrated testing including load test, overload test as per applicable standards, accuracy and performance testing shall be carried out by the successful bidder on continuous basis along with associated facilities followed by commissioning. On successful commissioning of the various sub-systems, PG test shall be carried out.

- Supply of consumables like first fill of lubricants, oil etc. for initial operation of the equipment till handing over

- Getting BSP/ MECON approval of the drawings, documents and calculation to be submitted by the successful bidder, obtaining required approval from statutory authorities, providing adequate personnel, equipment, tools & tackles for timely completion of the project.

- Providing all drawings and documents with operation & maintenance manuals.

- The scope of bidder shall be deemed to include all such items which although are not specifically mentioned in the specifications but needed to make make system complete in all respect with all mountings,fittings,fixtures and standard accessories.

- Drawings /Documents Submission:

   **(1) Documents/Information to be submitted by bidder with offer:**
   - List of commissioning spares and start up spares
   - List of special tools and tackles,
   - Price schedule for supply & installation, calibration ,testing and commissioning work as per the format.
   - List of recommended spare parts for 2 (Two) years trouble free operation and maintenance as per the format .
   - Technical specifications, Catalogues/ Leaflets and O&M manuals
   - Reference list of customers for similar supply of items.
- Unpriced copy of price schedules (with technical bid).
- No deviation declaration to NIT technical and commercial terms and conditions and duly signed with date and stamped copy of NIT Vol-1, Vol-2(2A, 2B&2C) and Vol-3.
- Approximate weight of the equipment.

(2) Documents/Information to be submitted by successful for Approval/Reference

- General arrangement and layout drawings
- Mounting arrangement Drawings
- Weigh Room Civil construction drawing
- Weigh Room Internal arrangement drawing
- Bill of materials
- Technical specifications
- Pre requirements for Installation of In- motion Bridge system
- Cable and conduit layout drawings
- Earthing layout drawing
- Cable schedule
- Wiring Diagram and termination drawings.
- Technical data sheet of all components, cables; electronic devices etc. for In-motion weigh Bridge
- Total power consumption details
- Approximate weight of the equipment
- Internal test reports and certificates
- Accuracy / Performance check reports
- Drawings and documents as per RDSO norms.
- Test reports for degree of protection on enclosure of sensing element.
- Quality assurance for the In-motion Weigh Bridge
- Operation and maintenance manuals
- Other drawings/ documents as per BSP/ MECON requirement for the system and drgs as per the recommendation of manufacturer.

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Technical Specifications : In-motion Weigh Bridge

1. **General :**

Technical Up gradation and Expansion of Bhilai Steel Plant to 7.0 MT of Steel is planned. New units like, Wagon Tippler, Track Hopper Building, the conveyor galleries and junction houses, etc. have been envisaged and located at the periphery of the plant.

2. **Track Hopper :**

The New Track Hopper Building is located between the existing ash pond and SMS muck dump area on south of peripheral unloading yards & is part of the proposed Merry–go–round system. The railway bulb of Merry-go-round system will be finally connected with the Marouda Exchange Yard via peripheral unloading yard. Planning, design and construction of associated railway track work and cross drainage work will be taken up by BSP under different packages.

3. **Location of In-Motion Weigh Bridge :**

The location of Weigh Bridge shall be considered at entry of pre hopper yard. However as the total railway track is being engineered by RITES, the location of Weigh Bridge may undergo change in detailed engineering. The system should be suitable for environment conditions normally prevail in ore handling plant area of steel plant and for weighing iron ore/other materials trains while in motion and in coupled condition.

4. **Codes and Standards:**

The In-Motion Weigh Bridge shall be designed, manufactured, assembled, tested and installed in conformity to acts ,rules & applicable statutory regulations and safety codes of the Republic of India as well as the jurisdiction in which the project is to be located and the latest edition of applicable standards and codes.
5. The Rail Weigh Bridge:

For weighment of incoming and outgoing general purpose wagons of Indian railways / plant owned wagons electronic type In-motion rail weigh bridges have been envisaged. Design, supply, erection, testing and get stamping by weights and measures department of Govt. of Chhattisgarh and arrangement of test wagons from SEC Railway and commissioning together are under bidder’s scope of work.. Dispatch from works and receipt at site loading / unloading / handling of weigh bridge equipments / materials and arrangement of test wagons from S.E.C. Railway are within bidder’s scope. The civil & structural work for weigh bridge foundations shall be in bidder’s scope.

The weigh room will be of hexagonal type heavy duty, front and side glasses of 8m x 4m x 3m double door with hydraulic door closure, 2 nos. of 1.5 t capacity split A.C. and 36” ceiling fans, 4 nos. table, 6 nos. chairs. Indoor & outdoor illumination with HPSV lamp will be provided. Proper earthing of all electrical installation will be carried out as per IE rules and IS:3043. Special RF earthing will be provided for electronic installation.

6. The Rail Weigh Bridge - Basic Requirements:

The rail weigh bridge will satisfy the following basic requirements:
<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
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<tbody>
<tr>
<td>Number &amp; type of rail weigh bridge</td>
<td>2 Nos. 150 T capacity Pitless Type electronic In-motion weighbridge without RDSO approval. However, bidder shall comply with all other technical norms for electronic In-motion weighbridge as per RDSO specification. Meeting all the technical requirements stated, bidder shall submit the relevant documents/ drawings for BSP/MECON’s approval.</td>
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<td>Types of wagons to be weighed</td>
<td>General purpose wagons of Indian railways (8 wheels wagons) like BOX, BOBR, BOBRN, BOXN, BOXNHS, BOI, BOBS etc.</td>
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<td>Capacity of weigh bridges</td>
<td>22.5 t per axle load with provision of upto 40 T axle load in future to suit the future railway wagons with 130 T capacity.</td>
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<td>Overload capacity of weigh bridge</td>
<td>150% of rated capacity</td>
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<tr>
<td>Railway track gauge</td>
<td>1676 mm</td>
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<tr>
<td>Rail section</td>
<td>60 Kg</td>
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<tr>
<td>Increment</td>
<td>100 Kg</td>
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<tr>
<td>Calibration</td>
<td>Auto calibration with auto zero and auto gain compensation.</td>
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<tr>
<td>Weighment accuracy</td>
<td>For in-motion weighment, the error will not be greater than 0.2% for whole train load. For individual wagons the error will not exceed 0.5%.</td>
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7. System:

The system will be made of electronic integrated circuits consisting of microprocessors with high operational reliability, long life and standardized connections. The microprocessors will have programming facility for auto calibration with auto zero and auto gain.

The system will be capable of being interfaced with the main computer situated at a different location.

8. Load Cells:

Load cells will be provided in adequate number of reputed make, confirming to OIML / NTEP Standard preferably digital type. They will be splash and dust proof. The enclosures will conform to protection category IP 67 or IP 68. These will be environmentally insensitive against humidity, dust, pollution and high ambient temperature which may rise to about 55°C near the railway track.

Output signal from the load cells will be large enough to make it insensitive to the electrical disturbances.

Load cells will be capable of giving very accurate measurements.

The load cells will be heavy duty type capable of withstanding safe overload of about 150% of rated capacity and ultimate overload of 300% of rated capacity.

9. Electronics:

The system will be micro-processor based and have adequate memory storage for batching data, tare weight, identification etc. It will be modular in design having features like diagnostics, calendar clock, battery back-up for retention of memory for minimum 30 minutes during power failure. The system will have a power stabilizing unit to provide protection from the power mains variation and other interferences. It will be provided with digital indicating devices to indicate each weighment. The indication will be clear, distinct and unambiguous.
It will have provision for acceptance of additional information to be entered externally through keyboard and to process them. It will be capable of computing the net weight automatically.

10. **Visual Display Unit**:
A robust, dust-proof wall mounted / cabinet type / desk model with prominent display screen will be provided. The display will be clear, distinct and unambiguous and means will be provided for ensuring that the indication at changeover point is stable. The size of the screen will be adequate to display all information. The PC based system with colour monitor will be provided with a keyboard unit having arrangement to enter all the information.