



KOCHI METRO RAIL LTD  
(WATER METRO PROJECT)



**REQUEST FOR PROPOSAL (RFP)**  
**FOR**  
**ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE)**  
**(WATER METRO BOAT CHARGERS)**

Under Financial Arrangement with  
German Financial Cooperation with India  
KOCHI WATER METRO PROJECT  
BMZ No: 2013 66657

**PART-3**  
**QHSE MANUAL & EMP Plan**

KOCHI METRO RAIL LIMITED  
(A Joint Venture of Govt. of India and Govt. of Kerala)  
4th floor, JLN Stadium Metro Station, Banerji Road, Kochi – 682017

**JANUARY 2021**  
**DOC NO: KMRL-WM-EL-002**



KOCHI METRO RAIL LTD  
(WATER METRO PROJECT)

FUNDING BY



KFW

## Section XIII

# QHSE MANUAL

WATER METRO  
PROJECT

RFP FOR ELECTRIC VEHICLE  
SUPPLY EQUIPMENT

DOC NO: KMRL-WM-ELE-002  
Rev : R5 Dated : 05-01-2021

General Consultant  
**AECOM CONSORTIUM**  
AECOM \* UMTC \* ZEBEC



**1 INTENT OF THE SPECIFICATION**

- 1.1 The intent of this specification is to provide services for execution of the project according to most modern and proven techniques and codes. The omission of specific reference to any method, equipment, or material necessary for the proper and efficient services towards this specification shall not relieve the contractor of the responsibility of providing such services/ facilities to complete the work or portion of work awarded to him. The quoted /accepted rates/price shall deem to be inclusive of all such contingencies
- 1.2 The work shall conform to dimensions and tolerances given in various drawings and documents that will be provided during Installation. If any portion of works is found to be defective in workmanship and not conforming to drawings/ documents or other stipulations, the contractor shall dismantle and re-do the work duly replacing the defective materials at their own cost, falling which recoveries, as determined by Employer, shall be effected from contractor’s bills.
- 1.3 It is not the intent of this specification to specify herein all the details of package. However, the system shall conform in all respects to high standards of quality and workmanship for performing the required duties in a manner acceptable to purchaser who will interpret the meaning of drawings and specifications and shall be entitled to reject any work or material, which in his judgments is not in full accordance herewith
- 1.4 The omission of specific reference to any method, equipment or material necessary for proper and efficient working shall not relieve the tenderer of the responsibility of providing such facilities to complete the work at quoted rates. Inspection by Employer/ Engineer does not relieve vendor of his responsibility of executing quality erection.
- 1.5 Contractor shall erect and commission all the equipments and auxiliaries as per the sequence and methodology prescribed by Employer depending upon the technical requirements. Availability of materials and fronts will decide this. Employer /Engineer decision regarding the correctness of the work and method of working shall be final and binding on the contractor. No claims for extra payment from the contractor will be entertained on the ground of deviation from the methods/ sequence adopted in erection of similar sets elsewhere
- 1.6 Following shall be the minimum responsibility of contractor and have to be provided within finally accepted rates/prices
  - 1.6.1 Provision as required of all types of labour, supervisors, engineers, watch and ward, tools and tackles, calibrated MMEs (Monitoring and Measuring Equipment) as specified and otherwise required for the work, testing including material handling
  - 1.6.2 Achieving Proper out-turn/ Turn-over as per Employer plan and commitment
  - 1.6.3 Completion of work as per Employer Schedule
  - 1.6.4 Good quality and accurate workmanship for proper performance of the equipment

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1.6.5 Repair and rectification

1.6.6 Preservation/Re-conservation of all components during storage /erection/ commissioning till handing over.

**2 GENERAL SERVICES TO BE RENDERED BY THE BIDDER**

2.1 Services for design, build, delivery, installation and testing as well as commissioning of various equipment and accessories under the contract shall include but not be limited to the following:

2.2 Issuing materials from store/ open yard from time to time for erection as per the construction programme. The contractor shall be the custodian of all the materials issued the equipments is officilaly taken over by the Owner/Employer after/complete erection any successful testing and commissioing.

2.3 Transport of material to their respective places of erection and erection of the complete plant & equipment as supplied under this specification.

2.4 Testing and commissioning of individual equipment / sub-systems to the satisfaction of Owner /Employer

2.5 Deployment of all skilled and unskilled manpower required for construction, erection, supervision of erection, watch & ward, commissioning and other services to the rendered under this specification.

2.6 Deployment of all erection tools & tackle, construction machinery, transportation vehicles and all other implements in adequate number and size, appropriate for the construction & erection work to be handled under scope of this specification except otherwise specified.

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- 2.7 Providing support services for the contractor’s erection staff e.g. construction of site offices, temporary stores, residential accommodation and transport to work site for erection personnel, watch and ward for security and safety of the materials under the Contractor’s custody etc. as required.
- 2.8 Maintaining proper documentation of all the site activities undertaken by the Contractor as per the pro forma mutually agreed with Employer, Submission of monthly progress reports and any such documents as and when desired by Employer/owner, taking approval of all statutory authorities i.e, Fire department, Electric board Inspector, Inspector of Explosives etc, as applicable for respective portions of work fall under the jurisdiction of such statutes of laws.
- 2.9 Any other service, although not specifically called for but required for a contract of the size and nature indicated in the specification.

**3 GENERAL TECHNICAL REQUIREMENTS (CODES AND STANDARDS)**

- 3.1 Except where otherwise specified, the equipment shall comply with the appropriate Indian Standard or an agreed internationally accepted Standard Specification/ Technical requirements as per customer as mentioned elsewhere in contract specifications, each incorporating the latest revisions at the time of tendering. Where no internationally accepted standard is applicable, the Bidder shall give all particulars and details as necessary; to enable Employer to identify all of the plant/equipment in the same detail as would be possible had there been a Standard Specification.
- 3.2 Where the Bidder proposes alternative codes or standards he shall include in his tender one copy (in English) of each Standard Specification to which materials offered shall comply. In such Case, the adopted alternative standard shall be equivalent or superior to the standards mentioned in the specification.
- 3.3 In the event of any conflict between the codes and standards referred above, and the requirements of this specification, the requirements which are more stringent shall govern
- 3.4 Tools used during construction, erection, and commissioning shall not be accepted except with the specific approval of the Engineer.

**4 OBLIGATIONS OF CONTRACTOR**

**4.1 CONSUMABLES & OTHER ITEMS**

- 4.1.1 The contractor shall provide within finally accepted price /rates, all consumables(excepting those indicated in Employer scope) like welding electrodes (including alloy steel and stainless steel), filler wires, TIG filler wires, gases(inert, welding, cutting), soldering material, dye penetrants, radiography films, etc. Other erection consumables such as tapes, jointing compound, grease, mobile oil, M-Seal, Araldite, petrol, other cleaning agents, grinding and cutting wheels are to be provided by the contractor. Steel, packers, shims, wooden planks, scaffolding materials hardware items etc required for temporary works such as supports, scaffoldings are to be arranged by the contractor. Sealing compounds, gaskets, gland packing, wooden/concrete sleepers, for temporary

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work, required for completion of work except those which are specifically supplied by manufacturing unit are also to be arranged by the contractor.

- 4.1.2 All the shims, gaskets, and packing, which go finally as part of plant equipment, shall be supplied by Contractor free of cost
- 4.1.3 It shall be the responsibility of the contractor to plan the activities and store sufficient quantity of consumables. Non-availability of any consumable materials or equipment, suggested by Employer cannot be considered as reason for not attaining the required progress or for additional claim.
- 4.1.4 It shall be the responsibility of the contractor to obtain prior approval of Employer, regarding supplies, Type of electrodes etc before procurement of welding electrodes. On receipt of electrodes at site these shall be subjected to inspection and approval by Employer. The contractor shall inform Employer details regarding type of electrodes, batch number, date of expiry etc and produce test certificate for each lot /batch with correlation of batch/ lot number with respective test certificate. No electrode without a valid test certificate will be used.
- 4.1.5 Employer reserves the right to reject the use of any consumable including electrodes, gases, lubricants / special consumables if it is not found to be of the required standard / make/ purity or when shelf life has expired. Contractor shall ensure display of shelf life on consumable wherever required and records maintained.
- 4.1.6 Storage of all consumables including welding electrodes shall be done as per requirement/ instruction of the Engineer by the contractor at his cost.
- 4.1.7 In case of improper arrangement for procurement of any consumable, Employer reserves the right to procure the same from any source and recover cost from the contractors first subsequent bill at market value plus the overhead charges of Employer from time to time. Postponement of such recovery is normally not permitted. The decision of Engineer in this regard shall be final and binding on the Contractor
- 4.1.8 All service including labour and T&P will be provided by the contractor for handling, filling, emptying, refilling etc
- 4.1.9 All charges like sales tax and other duties on materials obtained from any source for carrying out the works in the scope of the contractor shall be borne by the Contractor.
- 4.2 **TOOLS AND PLANTS/ MONITORING AND MEASURING EQUIPMENT(MMEs)**
  - 4.2.1 T&Ps and MMEs to be provided by Contractor
    - 4.2.1.1 Contractor has to make his own arrangement at his cost for completing the formalities (including arrangement of Road permits, if any) if required with Sales Tax/ VAT authorities, for bringing their materials, plants and equipments at site for the execution of work under this contract.

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- 4.2.1.2 All suitable cranes, lifting and transport equipments for material handling at stores/yard/siding of Employer are included in contractor's scope. No extra cost shall be given by Employer
- 4.2.1.3 All T&Ps to be deployed by the contractor shall have the approval of Employer / Engineer with regard to brand, quality and specification.
- 4.2.1.4 Indicative list of Major T&Ps in the scope of Contractor are given in the Technical conditions of contract. Bidders to note that these are only indicative and as such all other T&P necessary for timely and satisfactory completion of work in scope shall be mobilized by Contractor.
- 4.2.1.5 Timely deployment of adequate T&Ps is the responsibility of the contractor. The contractor shall be prepared to augment the T&P at short notice to match the planned programme and to achieve the milestones.
- 4.2.1.6 Contractor shall maintain and operate his tools and plants in such a way that major breakdowns are avoided. In the event of major breakdown, contractor shall make alternative arrangements expeditiously so that the progress of work is not hampered.
- 4.2.1.7 In the event of contractor failing to arrange the required tools, plants, machinery, equipment, material or non-availability of the same owing to breakdown, Employer will make alternative arrangement at the risk and cost of the contractor. Decision of Employer shall be final and binding on the contractor
- 4.2.1.8 The T& P to be arranged by the contractor shall be in proper working condition and their operation shall not lead to unsafe condition. The movements of cranes and other equipment should be such that no damage/ breakage occur to foundations, other equipments, material, property and men. All arrangements for the movement of the T& P etc shall be the contractor's scope responsibility.
- 4.2.1.9 Use of welding generators/ rectifiers only shall be permitted for welding. Use of welding transformers will be subject to specific approval of Employer /Engineer.
- 4.2.1.10 The contractor at his cost shall carry out periodical testing of his construction equipments. Test certificates shall be furnished to Employer.

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- 4.2.1.11 Contractor shall ensure deployment of serviced and healthy T&Ps including cranes, lifting tackles, wire ropes, manila ropes, winches, and slings etc. History card and maintenance records for major T& Ps will be maintained by the contractor and will be made available to Employer/ Engineer for inspection as and when required. Fitness certificate / Test Certificates of T& P shall have to be submitted before it is put in use. Identification for such T&Ps will be done as per Employer/ Engineer advice. Employer reserves the right to permit only new slings up to 20 mm and lifting tackles up to 3 MT capacities. If required the contractor shall arrange at his cost for approval of factory Inspector or any other relevant statutory authorities.
- 4.2.1.12 Contractor shall ensure deployment of reliable and calibrated MMEs (Inspection measuring and Monitoring equipment). The MMEs shall have test /calibration certificates from authorized / Government approved/ accredited agencies traceable to National/ International standards. Each MME shall have a label indicating calibration status i.e. date of calibration, calibration agency, and due date for calibration. A list of such instruments deployed by contractor at site with its calibration status is to be submitted to Employer /Engineer for control.
- 4.2.1.13 Re-testing / Re-calibration shall also be arranged at regular intervals during the period of use as advised by Employer/ Engineer within the contract price. The contractor will also have alternate arrangements for such MME so that work does not suffer when the particular instrument is sent for calibration. If any MMEs not found fit for use, Employer shall have the right to stop the use of such item. Any readings taken by the defective instrument will be recalled and repeat the readings taken by that instrument with a proper one. In case he fails to do so, Employer may deploy MMEs and retake the readings at contractor’s cost.
- 4.2.1.14 Employer shall have lien on all T&P MMEs and other equipment of the contractor brought to the site for the purpose of construction, erection, testing, and commissioning. Employer shall continue to hold the lien on all such items throughout the period of contract and/ or his sub-contractors, without the prior written approval of the Engineer, shall remove no material brought to the site.
- 4.2.1.15 The month wise T& P deployment plan to execute the work is to be submitted as per relevant format as per the instruction of Employer. It shall be the contractor’s responsibility to deploy the required T&P, for timely and successful completion of the job, to any extent.

**5 RESPONSIBILITIES OF CONTRACTOR IN RESPECT OF LABOUR, SUPERVISORY STAFF, ETC**

- 5.1 Refer relevant clauses of General Conditions of contract (GCC) also in this regard
- 5.2 The contractor shall deploy all the necessary skilled/ semiskilled/unskilled labour including highly skilled workmen etc. These workmen shall have previous experience on similar job. They shall hold valid certificates wherever necessary Employer reserves the right to insist on removal of any

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employee of the contractor at any time if he is found to be unsuitable and the contractor shall forthwith remove him. Cost of the removal /withdrawal and deployment shall be in the scope of contractor.

- 5.3 Contractor shall also comply with the requirements of local authorities /project authorities calling for police verification of antecedents of the workmen, staff etc.
- 5.4 It is the responsibility of the contractor to engage his workmen in shifts and or on overtime basis for achieving the targets set by Employer. This target may be set to suit advance date of completion of events or due to their reasons. The decision of Employer in regard to setting the erection and commissioning targets will be final and binding on the contractor.
- 5.5 Contractor shall provide at different elevation suitable arrangement for urinal and drinking water facility with necessary plumbing & disposal arrangement including construction of septic tank. These installations shall be maintained in hygienic condition at all times.
- 5.6 The contractor in the event of engaging 20 or more workmen, shall obtain Independent license under the Contract labour (Regulation and Abolition) Act 1970 from the concerned authorities based on Form- V issued by the Principal Employer. In order to issue Form –V by Customer, Contractor shall fulfil all Statutory requirements like Insurance Policy, PF Code / PF Account number etc as per the requirement of Employer
- 5.7 Contractor shall deduct the necessary amount towards Provident Fund and contribute equal amount as Government of India Laws. This amount will be deposited regularly to the provident Fund Commissioner. Employer may insist for submission of the account code duly certified by PF Commissioner.
- 5.8 Contractor may also be required to comply with provisions of ESI Act in vogue if applicable and submit evidence to Employer
- 5.9 Employer may insist for witnessing the regular payment to the labour. They may also like to verify the relevant record for compliance with statutory requirements. Contractor shall enable such facilities to Employer.
- 5.10 Contractor shall deploy only qualified and experienced engineers/ supervisors. They shall have professional approach in executing the work.
- 5.11 The Contractor’s supervisory staff shall execute the work in the most professional manner in the stipulated time. Accuracy of work and aesthetic finish are essential part of this contract. They shall be responsible to ensure that the assembly and workmanship conform to dimensions and tolerances given in the drawings/instructions given by Employer/ Engineer from time to time.
- 5.12 The supervisory staff employed by the contractor shall ensure proper out turn of work and discipline on the part of the labour put on the job by the contractor. Also in general they shall see that the works

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are carried out in a safe and proper manner and in coordination with other labour and staff employed directly by Employer or other contractors of Employer or Engineer.

5.13 It is the responsibility of the contractor to arrange gate pass for all his employees, T&P etc for entering the project premises. Necessary coordination with customer officials is the responsibility of the contractor. Contractor to follow all the procedures laid down by the customer for making gate passes. Where permitted, by Employer, to work beyond normal working hours, the contractor shall arrange necessary work permits for working beyond normal working hours.

5.14 The actual deployment of Labour and Engineer / supervision staff shall be so as to satisfy the erection, Testing and commissioning targets set by Employer. If at any time, it is found that the contractor is not in a position to deploy the required engineers / supervisors / workmen due to any reason; Employer shall have the option to make alternate arrangement at contractors risk and cost. The expenditure incurred along with Employer overheads thereon shall be recovered from the contractor.

5.15 Contractor shall not deploy women labour at night.

## 6 MATERIAL HANDLING, STORAGE & PRESERVATION

### 6.1 MATERIAL HANDLING AND STORAGE

6.1.1 All the equipments/materials furnished under this contract shall be received from the project stores, sheds / storage yards and transported to pre assembly area / erection site and stored in the storage spaces in a manner so that they are easily retrievable till the contractor erects them. While drawing/lifting material from Employer stores, the contractor shall ensure that the balance / other materials are stacked back immediately. No claim is admissible on this account

6.1.2 All the equipment shall be handled very carefully to prevent any damage or loss. No untested wire ropes / slings etc. shall be used for unloading / handling. The equipment shall be properly protected to prevent damage either to the equipment or to the floor where they are stored. The equipment from the stores shall be moved to the actual location at the appropriate time so as to avoid damage of such equipment at site

6.1.3 Contractor shall ensure that while lifting slings shall be put over the points indicated on the equipment or as indicated in the manufacturer's drawings. Slings / shackles of proper size shall be used for all lifting and rigging purposes. All care shall be taken to safe guard the equipment against any damage. Dragging of piping / valves should be avoided. In case of any damage the cost shall be covered from the contractor.

6.1.4 Approach road conditions from the stores / yards to the erection site may not be equipped and ideal for smooth transportation of the equipment. Contractor may have to be adequately prepared to transport the materials under the above circumstances without any extra cost. The contractor may familiar himself with soil conditions at site.

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- 6.1.5 Contractor has to arrange sufficient number of watch / ward personal to avoid any pilferage of material
- 6.1.6 The contractor shall maintain an accurate and exhaustive record-detailing out the list of all equipment received by him for the purpose of construction / erection and keep such record open for the inspection of the engineer at any time.
- 6.1.7 All the material in the custody of contractor and stored in the open or dusty locations must be covered with suitable weather proof / fire retardant covering material wherever applicable and shall be blocked up on raised level above ground. All covering materials including blocks and sleeper shall be arranged by the contractor at his cost.
- 6.1.8 If the material belonging to the contractor are stored in area other than those earmarked for his operation the engineer will have the right to get it moved to the area earmarked for the contractor at the contractors risk and cost.
- 6.1.9 The contractor shall be responsible for making suitable indoor storage facilities to store all equipment (drawn by the contractor from Employer stores), which require indoor storage till the time of their installation. The Engineer will direct the contractor in this regard, which item in his opinion will require indoor storage, and the contractor shall comply with Engineer's decision.
- 6.1.10 The contractor shall ensure that all surplus / damaged / scrap / unused material, packing wood / containers/ special transporting frames etc are returned to Employer at a place in project area identified by the Engineer. The contractor will maintain an account for all items received and returned to Employer. Any shortage in returning such items shall be chargeable to the contractor except allowable wastage for packing wood only.
- 6.1.11 The contractor shall hand over all parts / materials remaining extra over the normal requirement with proper identification tags to the stores as directed by the concerned Employer /engineer.
- 6.1.12 The contractor shall ensure that all the packing materials and protective devices installed on equipment during transit and storage are removed before installation.
- 6.1.13 It shall be the responsibility of the contractor to keep the work / storage areas in neat, tidy and working conditions. All surplus/unusable packing and other materials shall be removed and deposited at location(s) specified by Employer within the project premises. If required weighing of the same within the project premises will have to be carried out.

**6.2 PRESERVATION OF COMPONENTS**

- 6.2.1 Items stored outdoors shall be stacked up at least six inches (6”) off the ground. Items should not be stored in a low lying area where water logging is a possibility. Contractor shall have sufficient numbers of wooden / concrete / steel sleepers for the job.

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- 6.2.2 Motors, valves, electrical equipment, control equipment and instruments, and special or precision items requiring special care, etc. shall be stored indoors. Motor windings shall be kept dry by use of external heat or space heaters.
- 6.2.3 Bearings and other wearing surfaces of plant materials shall be protected against corrosion and kept clean and should be regularly monitored.
- 6.2.4 Insulation materials shall be stored indoors or otherwise protected against getting wet/ damaged, using suitable measures and shall be protected from direct rain.
- 6.2.5 It shall be the responsibility of the contractor to apply preservatives / touch up paints (primer) on equipment handled and erected by him till such time of final painting. It shall be contractor's responsibility to arrange for required paints (primer), thinners, labour, scaffolding materials, cleaning materials like wire brush, emery sheets, etc, cleaning of surface and provide one coat of preservatives / paints (primer) from time to time as decided by Employer / Engineer. The accepted rate shall include this work also. It is to be noted that such painting may have to be done as and when required till such time the final painting is carried out.
- 6.2.6 The contractor shall effectively protect the finished work from action of weather and from damage or defacement and shall cover the finished parts then and there for their protection.
- 6.2.7 Any failure on the part of contractor to carry out works according to above clauses will entail Employer to carry out the job from any other party and recover the cost from contractor.

**7 DRAWINGS AND DOCUMENTS**

- 7.1 The detailed drawings, specifications available with Employer/ engineer will be made available to the contractor during execution of work at site. The contractor will also ensure availability of all drawings / documents at work place.
- 7.2 Necessary drawings to carry out the erection work will be furnished to the contractor by Employer on loan, which shall be returned to Employer / Engineer at site after completion of work. Contractor shall ensure safe storage and quick retrieval of these documents.
- 7.3 The contractor shall maintain a record of all drawings and documents available with him in a register as per format given by Employer /Engineer. Contractor shall ensure use of pertinent drawings / data / documents and removal of obsolete ones from work place and returning to Employer.
- 7.4 The data furnished in various annexure enclosed with this tender specification are only approximate and for guidance. However, the change in the design and in the quantity may occur as is usual in any such large scale of work. The contractors quoted rates shall be inclusive of the above factor
- 7.5 Should any error or ambiguity be discovered in the specification or information the contractor shall forthwith bring the same to the notice of Employer before commencement of work. Employer's interpretation in such cases shall be final and binding on the contractor.

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7.6 Deviation from design dimensions should not exceed permissible limit. The contractor shall not correct or alter any dimension / details, without specific approval of Employer.

**8 INSPECTION AND QUALITY**

8.1 Inspection, Quality Assurance, Quality Control

8.1.1 Preparation of quality assurance log sheets and protocols with customer/ consultants / statutory authority, welding logs, NDE records, testing & calibration records and other quality control and quality assurance documentation as per Employer of work / specification. These records shall be submitted to Employer for approval from time to time.

8.1.2 The protocols between contractor and Employer of installation, generally as per the requirement of Employer. This is necessary to ensure elimination of errors or keeping them within tolerable limits and to avoid accumulation and multiplication of errors.

8.1.3 A daily log book shall be maintained by every supervisor / engineer of contractor on the job in duplicate (one for Employer and one for contractor) for detailing and incorporating alignment/clearance/centering/levelling readings and inspection details of various equipment etc. Record of radiography containing details like serial number of weld joints, date of radiography, repairs, if any, re-shots etc shall also be maintained as per Employer/ Engineer Record of heat treatments performed shall be maintained as prescribed by Employer.

8.1.4 The performance of welders will be reviewed from time to time as per the Employer standards. Welder performance record shall be periodically furnished for scrutiny of Employer / Engineer. Corrective action as informed by Employer shall be taken in respect of those welders not conforming to these standards. This may include removal/ discontinuance of concerned welder(s). Contractor shall arrange for the alternate welders immediately.

8.1.5 All the welders shall carry identity cards as per the proforma prescribed by Employer / Engineer. Only welders duly authorized by Employer / Engineer shall be engaged on the work.

8.1.6 It is the responsibility of the contractor to prove the accuracy of the testing / measuring / calibrating equipments brought by him based on the periodicity of calibration as called for in the Employer 's quality assurance standards/ Employer/ Engineer instructions.

8.1.7 Any re-laying or re-termination of cables / re-erection of instruments / recalibration of instruments etc. required due to contractor's mistake or design requirement and found at any stage inspection, shall be carried out by the contractor at no extra cost.

8.1.8 Contractor shall ensure deployment of reliable and calibrated MMEs (Measuring and Monitoring Equipments). The MMEs shall have test / calibration certificates from authorised / Government approved / Accredited agencies traceable to National / International Standards. Re-testing / re-calibration shall also be arranged at regular intervals during the period of use as advised by Employer/ Engineer within the contract price. The contractor will also have alternate arrangements

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for such MMEs so that work does not suffer when the particular equipment / instrument is sent for calibration. Also if any MMEs not found fit for use, Employer shall have the right to stop the use of such item and instruct the contractor to deploy proper item and recall i.e. repeat the readings taken by that instrument, failing which Employer may deploy MME and retake the reading at Contractor's cost.

8.1.9 Re-work necessitated on account of use of invalid MMEs shall be entirely to the contractor's account. He shall be responsible to take all corrective actions, including resource augmentation if any, as specified by Employer to make-up for the loss of time.

8.1.10 In the courses of erection, it may become necessary to carry repeated checks of the work with instruments recently calibrated, re-calibrated. Employer may counter / finally check the measurements with their own MMEs. Contractor shall render all assistance in conduct of such counter / final measurements.

8.1.11 Total Quality is the watchword of the work and Contractor shall strive to achieve the Quality Standards, procedures laid down by Employer. He shall follow all the instructions as per Employer drawings and Quality Standards.

**8.2 Stage Inspection by QA Engineers**

8.2.1 Apart from day-to-day inspection by Employer/ Engineers stationed at Site and Customer's Engineers, stage inspection of equipment under erection and commissioning at various stages shall also be conducted by teams of Client/ Engineer. Contractor shall arrange all labour, tools and tackles etc along with proper access for such stage inspections free of cost.

8.2.2 Any Modifications Suggested by Employer Field staff and Engineer's QA team shall be carried out.

**8.3 Statutory Inspection of Work**

8.3.1 The work to be executed under these specifications has to be offered for inspection, at appropriate stages of work completion, to various statutory authorities for compliance with applicable regulations. The work related statutory inspections, though not limited to, are as under:

1) Electrical Inspector

2) Factory Inspector, Labour Commissioner, PF Commissioner and other authority connected to this project work. The scope includes getting the approvals from the statutory authorities, which includes arranging for inspection visits of statutory authority periodically as per Employer /Engineers instruction, arranging the materials for ground inspection, submitting co-related inspection reports, documents, radiographs etc and following up the matter with them. Contractor shall also make all arrangements for offering the Products / Systems for inspection at location, as applicable, to the concerned authority.

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8.3.2 Contractor should be aware of the latest IBR regulations and Electricity Act, including the amendments thereof.

8.3.3 The Quality Management System of Employer, The basic philosophy of the Quality Management System is to define the organizational responsibility, work as per documented procedures, verify the output with respect to acceptance norms, identify the non-conforming product / procedure and take corrective action for removal of non-conformance specifying the steps for avoiding recurrence of such non-conformities, & maintain the relevant quality records. The non-conformities are to be identified through the conduct of periodical audit of implementation of quality systems at various locations/stages of work. Suppliers / vendors of various products / services contributing in the work are also considered as part of the quality management system as such the contractor is expected not only to conform to the quality management system of Employer but also it is desirable that they themselves are accredited under any quality management system standard.

8.4 Field Quality Assurance

8.4.1 Contractor shall carry out all activities conforming to the approved Field Quality Plan (FQP) as revised from time to time. Total quality shall be the watchword of the work and contractor shall strive to achieve the quality standards, procedures laid down by Employer. He shall follow all the instructions as per Employer drawings and quality standards. Contractor shall provide the services of quality assurance engineer as per the relevant clauses.

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**9 OCCUPATIONAL HEALTH, SAFETY & ENVIRONMENT MANAGEMENT / QUALITY ASSURANCE PROGRAMME**

9.1 Quality of work to customer's satisfaction and fulfilment of system requirements are the essence of this Contract and therefore Contractor also shall organize /plan/perform all their activities to meet with the applicable requirements & Standards for HSE (Health, safety & Environment): Contractor shall comply with HSE (Health, Safety & Environment) requirements of Employer. HSE requirements in brief, are given below:

9.2 Contractor will nominate one of their qualified and experienced employees as Safety Officer, who will be responsible for all HSE related issues of contractors work area. Safety Officer will have authority to stop any activity, in case he observes that the activity is not being carried out in safe manner. He will conduct surprise inspection as well as periodic inspection/drill (at least once in a month) and submit such reports to Employer. He will conduct periodic meetings with supervisors of different working groups and explain HSE issues and use of PPEs to them. Reports of such meetings will be submitted to Employer. Contractor will develop suitable work procedures based upon HSE guidelines and implement it. Such work procedures will consist of Area of work, T&P Details, Work Procedure, and PPE requirements etc. Please refer Schedule VIII of BOCW Rules for number of safety officers, qualification, duties etc. Contractor shall highlight the requirement of safety to staff and labour through daily tool box meeting before start of the day's job. Contractor to also submit monthly safety reports as per the format / procedure of Employer .

9.2.1 The contractor shall arrange induction and regular health check of their employees as per schedule VII of BOCW rules by a registered medical practitioner. The contractor shall take special care of the employees affected with occupational diseases under rule 230 and schedule II of BOCW Rules. The employees not meeting the fitness requirement shall not be engaged for such job.

9.2.2 Following personnel protective equipments (PPEs),inadequate numbers, will be made available at site & their regular use by all concerned will be ensured like Helmet, safety goggles and welding face shields, safety belts, shoes, ear plug or ANY OTHER SAFETY EQUIPMENT REQUIRED FOR SAFE COMPLETION OF THE WORK Contractor to also submit monthly reports on above as per the format / procedure of Employer.

9.2.3 Providing appropriate First Aid facilities for prompt treatment of injuries and illness at work place. Arranging training to contractor workmen / employees for giving first aid.

9.2.4 Arranging ambulance in case of any emergency situation.

9.2.5 Identification of neared hospital and health check-up of workmen /employees.

9.2.6 Providing filtered drinking water at work place in cool container.

9.2.7 Providing Canteen, Rest Room, Washing facilities to the contracted employees as per provisions of Contract Labour Regulation Act 1970 (Chapter V).

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- 9.2.8 Providing appropriate fire-fighting equipment at designated work place and nominates a fire officer / warden adequately trained for his job
- 9.2.9 Identification of nearest fire station and display contact telephone nos./person’s name around work places for cases of emergencies.
- 9.2.10 Providing adequate no. of 24 V sources and ensures that no hand lamps are operating at voltage level above 24 Volts.
- 9.2.11 Fulfilling safety requirements at all power tapping points.
- 9.2.12 Red & White caution tape of proper width(1.5 to 2 inch) to be used for cordoning unsafe area such as open trench, excavation area etc.
- 9.2.13 Providing contractors company logo on cloths /uniform/ proper identity cards with photographs, for correct identification of people working at project site.
- 9.2.14 High / Low pressure welders to be identified with separate colour clothing. No welders will be deployed without passing appropriate tests and holding valid welding certificates. Approved welding procedure shall be displayed at work place.
- 9.2.15 Displaying safe handling procedures for all chemicals such as lube oil, acid, alkali, sealing compounds etc, at work place.
- 9.2.16 All scaffolding / platforms shall be made from materials of appropriate quality / grade so that these are safe for use. It shall be certified/declared safe for use by an experienced contractor person, before any scaffolding /platform is used. Please refer IS: 3696 part 1 & 2 and 4014 part 1 & 2
- 9.2.17 All T&Ps / MMEs shall be of reputed brand/appropriate quality & must have valid test / calibration certificates bearing endorsement from competent authority of Employer. Contractor to also submit monthly reports of T&Ps deployed and validity test certificates to Employer safety Officer as per the format/procedure of Employer.
- 9.2.18 Ensure that the regulatory requirement of excessive weight limits (to carry / lift / move weights beyond prescribed limits) for male and female workers are complied with.
- 9.2.19 Safety slogan, Safety / Caution boards, wherever required to be displayed in consultation with Employer.
- 9.2.20 Take suitable measures for waste management and environment related laws/legislation as a part of normal construction activities. Compliance with the legal requirements on storage/ disposal of paint drums (including the empty ones), Lubricant containers, Chemical Containers, and transportation and storage of hazardous chemicals will be strictly maintained. Ensure proper cleanliness of work place, housekeeping and waste management (including proper waste disposal) on daily basis.

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- 9.2.21 It is imperative on the part of the contractor to join and effectively Contribute in joint measures such as tree plantation, environment protection, contributing towards social up liftment, conversion of packing woods to school furniture, keeping good relation with local populace etc. It is imperative on the part of the contractor to join and effectively Contribute in joint measures such as tree plantation, environment protection, contributing towards social up liftment, conversion of packing woods to school furniture, keeping good relation with local populace etc.
- 9.2.22 The contractor shall carry out periodic air and water quality check and illumination level checking in his area of work place and take suitable control measure.
- 9.2.23 The Contractor is required to provide proper safety net systems (IS-11057) where ever the hazard of fall from height is present as per instruction of Employer/ Engineer. The safety nets shall be fire resistant, duly tested and shall be of ISI Mark and the nets shall be located as per site requirements to arrest or to reduce the consequences of a possible fall of persons working at different heights.
- 9.2.24 All applicable Employer OCPs (Operational control procedures) will be followed by contractor as per Employer instructions. This will be done as part of normal scope of work. OCPs (applicable ones) will be made available to contractor during work execution at site. For reference purpose, OCP's are kept with Safety Officer of Employer

**9.3 Safety & Cleanliness**

- 9.3.1 The contractor shall take all necessary safety precautions and arrange for appropriate appliances as per discretion of Employer or its authorised officials (Site Construction Manager) to prevent loss of human lives, injuries, to personnel engaged and damage to property. Before commencing the work, the contractor shall submit a Safety Plan to the above authorised Employer official and obtain approval on the same. The safety plan shall indicate in detail the measures that would be taken by the contractor to ensure safety of men, equipment, materials and environment during execution of the work. This will also include an organization structure, role and responsibilities of the concerned key personnel, the safety practices that will be followed, PPEs deployed, plan for handling critical activities and emergencies.
- 9.3.2 If the contractor fails to take appropriate safety precautions or to provide necessary safety devices and equipment or to carry out instructions issued by the authorised Employer official, Employer shall have the right to take corrective steps at the risk and cost of the contractor.
- 9.3.3 During the course of construction, alternation or repairs, scrap with protruding nail, sharp edge etc and all other debris shall be kept clean from working areas, passage, ways and stairs in and around site.
- 9.3.4 Combustible scrap and debris shall be removed at regular intervals during the course of execution. Safe means shall be provided to facilitate such removal. The combustible scrap shall be stored in safe place away from the plant materials to avoid fire accidents. The area shall be chosen in consultation with the Engineer and to be cordoned off.

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- 9.3.5 Rigging equipment for materials handling shall be inspected prior to use in each shift and as necessary during its use to ensure that it is safe. Defective rigging equipment will be removed from service.
- 9.3.6 Rigging equipment shall not be loaded in excess of its recommended safe working load. Rigging equipment, when not in use, shall be removed from the original work area so as not to present a hazard to employees.
- 9.3.7 Contractor shall notify the engineer, of his intention to bring on to site any equipment or any container, with liquid or gaseous fuel or other substance which may create a hazard. The Engineer shall have the right to prescribe the condition under which such equipment or container may be handled and used during the performance of the works and the contractor shall strictly adhere to such instructions. The Engineer shall have the right to inspect any construction tool and to forbid its use, if in his opinion it is unsafe. No claim due to such prohibition will be entertained.
- 9.3.8 Where it is necessary to provide and/or store petroleum products or petroleum mixture & explosives, the contractor shall be responsible for carrying out such provision / storage in accordance with the rules & regulations laid down in the relevant petroleum act, explosive act and petroleum and carbide of calcium manual, published by the chief inspector of explosives of India. All such storage shall have prior approval if necessary from the chief inspector of explosives or any other statutory authority. The contractor shall be responsible for obtaining the same.
- 9.3.9 Cylinders shall be moved by tilting and rolling them on their bottom edges. They shall not be intentionally dragged, struck or permitted to strike each other violently.
- 9.3.10 When cylinders are transported by powered vehicle they shall be secured in a vertical position.
- 9.3.11 All workmen of the contractor working on construction area shall wear safety shoes, hand gloves, safety helmets and safety belt as applicable. The contractor shall provide to its workforce and ensure the use of following personnel protective equipment as found necessary and as directed by Employer.
- 9.3.12 Safety Helmets conforming to IS-2925 : 1984
- 9.3.13 Safety Belts conforming to IS-3521:1983
- 9.3.14 Safety Shoes conforming to IS-1989 : 1978
- 9.3.15 Eye and face protection devices conforming to IS -1179:1967, IS-5983:1980, IS-8521 Part 1:1977, IS-8521 Part 2: 1994.
- 9.3.16 Hand and body protection devices conforming to IS 4770:1991 and IS- 6994 : Part 1: 1973, IS – 8619 : 1977
- 9.3.17 Ear protection IS-9167:1979
- 9.3.18 Respiratory Protective Devices as per IS-9473:2002, IS 4746:1999 and IS 14166:1994

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- 9.3.19 The contractor shall insure his workmen against all accidents and the policy shall be presented to Employer/ Engineer on demand. Otherwise, Employer will arrange the same and the expenditure towards this will be debited to the contractor. In case of a fatal or disabling injury accident to any person at construction site due to lapses by the contractor, the victim and/or his/her dependents shall be compensated by the contractor as per statutory requirements. However, if considered necessary Employer shall have the right to impose appropriate financial penalty on contractor and recover the same from payments due to the contractor for suitably compensating the victim and/or his/her dependence before imposing any such penalty. Appropriate enquiry shall be held by Employer giving opportunity to the contractor for presenting his case. Above safety conditions are not exhaustive but give an idea for the contractor and contractor shall adhere to all safety precaution given by the Engineer at site.
- 9.3.20 The contractor shall arrange at his cost adequate lighting facilities e.g. flood lighting, hand lamps, area lighting etc. at various levels for safe and proper working operations during night hours at the work spot as well as at the pre- assembly area
- 9.3.21 The contractor shall be responsible for provision of all the safety notices and safety equipment. He shall be held responsible for any violation of statutory regulations (local, state or central) and Employer instruction that may endanger safety of men, equipment and material.
- 9.3.22 The contractor shall provide temporary fencing wherever required as a safety measure against accident and damage to properties. Suitable caution notices shall be displayed where access to any part is found to be unsafe and hazardous.
- 9.3.23 Contractor shall ensure safety of all the workmen, material and equipment either belonging to him or to others working at site. He shall observe safety rules and codes applied by Employer without exception.
- 9.3.24 It will be the responsibility of the contractor to ensure safe lifting of the equipment, taking due precaution to avoid any accident and damage to other equipment and personnel. All requisite tests and inspection of handling equipment, tools & tackle shall be periodically done by the contractor by engaging only COMPETENT PERSONS as per law. Defective equipment or uncertified shall be removed from service. Any equipment shall not be loaded in excess of its recommended safe working load.
- 9.3.25 The contractor shall provide necessary first aid facilities as per Employer norms Employer shall have no obligation in this regard. The first aid boxes shall be placed at various elevations so as to make them available at the quickest possible time. Contractor to arrange for Ambulance, OHC and CMO as per Employer Rules

**9.4 Training**

- 9.4.1 The contractor shall arrange induction safety training for all employees before assigning work. In addition, awareness programme, mock drill at regular intervals and daily tool box meetings shall be

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arranged. Monthly report of the above to be given to Employer safety Officer as per prescribed Employer formats.

- 9.4.2 All the contractor’s supervisory personnel and sufficient number of workers shall be trained for fire protection systems. Enough number of such trained personnel must be available during the tenure of contract. Contractor shall nominate his supervisor to coordinate and implement the safety measures.
- 9.4.3 Contractor shall provide enough fire protecting equipment of the types and numbers at his office, stores, temporary structure in labour colony etc. Such fire protection equipment shall be easy and kept open at all times. The fire extinguishers shall be properly refilled and kept ready which shall be certified at periodic intervals. The date of changing shall be marked on the Cylinders. All other fire safety measures as laid down in the 'codes for fire safety at construction site' issued by safety coordinator of Employer shall be followed. Non-compliance of the above requirement under fire protection shall in no way relieve the contractor of any of his responsibility and liabilities to fire accident occurring either to his materials or equipment or those of others. Emergency contacts nos. must be displayed at prominent locations.
- 9.4.4 The contractor shall at his cost, remove from vicinity of work at least once each day all combustible waste, scrap, painting materials, rubbish, unused or other materials and deposit them in places specified by Employer to keep the work site clear and tidy. Use of undercoated canvas paper, corrugated paper, and fabricated carton, plastic or other flammable materials shall be restricted to the minimum and promptly removed.
- 9.4.5 The contractor shall not use any hand lamp energized by Electric power with supply voltage of more than 24 volts in confined spaces like inside water boxes, turbine casings, condensers etc.
- 9.4.6 All portable electric tools used by the contractor shall have safe plugging system to source of power and be appropriately earthed. Only electricians licensed by appropriate statutory authority shall be employed by the contractor to carry out all types of electrical works. Details of earth resource and their tests date to be given to Employer safety officer as per the prescribed formats of Employer.
- 9.4.7 In case of any delay in completion of a job due to mishaps attributable to lapses by the contractor, Employer shall have the right to recover cost of such delay from the payments.
- 9.4.8 Valve protection caps shall be kept in place and secured.
- 9.4.9 Tarpaulin being inflammable shall not be used (instead, only non-infusible covering materials shall be used) as protective cover while preheating, welding, stress relieving etc. at site.
- 9.4.10 If the contractor fails to improve the standards of safety in its operation to the satisfaction of Employer after being given reasonable opportunity to do so and/or if the contractor fails to take appropriate safety precautions or to provide necessary safety devices and equipment or to carry out instruction regarding safety issued by Employer, Employer shall have the right to take

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corrective steps at the risk and cost of the contractor after giving a notice of not less than 7 days indicating the steps that would be taken by Employer.

- 9.4.11 If the contractor succeeds in carrying out its job in time without any fatal or disabling injury accident and without any damage to property Employer may, at its sole discretion, favourably consider to reward the contractor suitably for the performance.
- 9.4.12 The contractor shall carefully follow the safety requirement of Employer / the purchaser with the regard to voltages used in critical areas.
- 9.4.13 The contractor shall use only properly insulated and armoured cables which conform to the requirement of Indian Electricity Act and Rules for all wiring, electrical applications at site. Employer reserves the right to replace any unsafe electrical installations, wiring, cabling etc. at the cost of the contractor. All electrical appliances used in the work shall be in good working condition and shall be properly earthed. No maintenance work shall be carried out on live equipment. The contractor shall maintain adequate number of qualified electricians to maintain his temporary electrical installations. Area wise Electrical safety inspection is to be carried out on monthly basis as per 'Electrical safety Inspection checklist' and the report is to be submitted to Employer safety officer.
- 9.4.14 The contractor shall arrange adequate number of persons specifically for clearing any debris and for housekeeping of the erection area including restacking of components in the erection areas. Housekeeping to be carried to be submitted to Employer safety officer
- 9.4.15 In case of any damage to property due to lapses by the contractor, Employer shall have the right to recover the cost of such damages from the contractor after holding an appropriate enquiry.
- 9.4.16 The contractor shall submit report of all accidents, fires and property damage etc to the Engineer immediately after such occurrence, but in any case not later than 24 hours of the occurrence. Such reports shall be furnished in the manner prescribed by Employer. In addition periodic reports on safety shall also be submitted by the contractor to Employer from time to time as prescribed by the Engineer. Compiled monthly reports of all kinds of accidents, fires and property damage to be submitted to Employer safety officer as per prescribed formats.
- 9.4.17 Before commencing the work, the contractor shall appoint/nominate a responsible person to supervise implementation of all safety measures and liaison with his counterpart of Employer.
- 9.4.18 Suitable scaffolds shall be provided for workman for all works that cannot safely be done from the ground, or from solid construction except in the case of short duration of work which can be done safely from ladders. When a ladder is used, it shall be of rigid construction made of steel. The steps shall have a minimum width of 45 cm and a maximum rise of 30 cm. Suitable handholds of good quality wood or steel shall be provided and the ladder shall be given an inclination not steeper than ¼ horizontal and 1 vertical.
- 9.4.19 Scaffolding or staging more than 3.6 m above the ground floor, swung or suspended from an overhead support or erected with stationery support shall have a guard rail properly bolted, braced

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or otherwise secured, at least 90 cm above the floor or platform of such scaffolding or staging and extending along the entire length of the outside and ends thereof with only such openings as may be necessary for the delivery of materials. Such scaffolding or staging shall be so fastened as to prevent it from savor, from swaying, from the building or structure.

- 9.4.20 Every opening in the floor or a building or in a working platform shall be provided with suitable means to prevent the fall of persons or materials by providing suitable fencing or railing whose minimum height shall be 90 cm.
- 9.4.21 Wherever there are open excavations in ground, they shall be fenced off by suitable railing and danger signals installed at night so as to prevent persons slipping into the excavations.
- 9.4.22 Safe means of access shall be provided to all working places. Every ladder shall be securely fixed. No portable single ladder shall be over 9 m in the length while the width between side rails in rung ladder shall in no case be less than app. 29.2 cm for ladder up to and including 3 m in length. For longer ladders this width shall be increased at least 1/4" for each additional foot of length.
- 9.4.23 A sketch of the ladders and scaffolds proposed to be used shall be prepared and approval of the Engineer obtained prior to Construction.
- 9.4.24 All personnel of the Contactor working within the plant site shall be provided with safety helmets. All welders shall wear welding goggles while doing welding work and all metal workers shall be provided with safety gloves. Persons employed on metal cutting and grinding shall wear safety glasses.
- 9.4.25 Adequate precautions shall be taken to prevent danger for electrical equipment. No materials on any of the sites of work shall be so stacked or placed as to cause danger or inconvenience to any person or the public.
- 9.4.26 All trenches, 1.25m or more in depth, shall at all times be supplied with at least one ladder for each 30 m in length or fraction thereof. The ladder shall be extended from bottom of the trench to at least 90 cm above the surface of the ground. Sides of the trenches which are 1.50 m or more in depth shall be stepped back to give suitable slope or securely held by timer bracing, so as to avoid the danger of sides collapsing. The excavated materials shall not be placed within 1.5 m of the edges of the trench or half of the depth of the trench whichever is more. Cutting shall be done from top to bottom. Under no circumstances undermining or undercutting shall be done.
- 9.4.27 The contractor shall take permission of Employer prior to risky jobs such as working at height, hot work, lifting activities, etc through permits. No job shall be started without permits.
- 9.4.28 The Contactor shall take all measures at the sites of the work to protect all persons from accidents and shall be bound to bear the expenses of defence of every suit, action or other proceeding at law that may be brought by any persons for injury sustained or death owing to neglect of the above precautions and to pay any such persons such compensation or which may with the consent of the

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Contractor be paid to compromise any claim by any such person should such claim proceeding be filed against Employer, the Contractor hereby agrees to indemnify Employer against the same.

- 9.4.29 Before any demolition work is commenced and also during the process of the work the following shall be ensured:
- 9.4.30 All roads and open areas adjacent to the work site shall either be closed or suitably protected.
- 9.4.31 No electric cable or apparatus which is liable to be a source of danger nor a cable or an apparatus used by the operator shall remain electrically charged.
- 9.4.32 All practical steps shall be taken to prevent danger to persons employed from the risks of fire or explosion or flooding. No floor, roof or other part of the building shall be so overloaded with debris or materials as to render them unsafe.
- 9.4.33 All necessary personnel safety equipment as considered adequate by the Engineer shall be kept available for the use of the persons employed in the Site and maintained in a condition suitable for immediate use and the Contractor shall take adequate steps to ensure proper use of equipment by those concerned.
- 9.4.34 Those engaged in stone breaking, white washing and mixing or stacking of cement bags or any materials which are injurious to the eyes shall be provided with protective goggles.
- 9.4.35 Those engaged in welding works shall be provided with Welders protective eyesight lids.
- 9.4.36 The Contractor shall not employ men below the age of 18 years and women on the work of painting with products containing lead in any form. Wherever men above the age of 18 are employed on the work of lead painting, the following precautions shall be taken.
- (a) No paint containing lead or lead products shall be used except in the form of paste or readymade paint.
  - (b) Suitably face masks shall be supplied for use by the workers where paints are applied in the form of spray or a surface having lead paint dry rubbed and scrapped.
  - (c) Overalls shall be supplied by the Contractor to the workmen and adequate facilities shall be provided to enable the working painters to wash during the cessation of work.
- 9.4.37 When the work is being done near any place where there is risk of drowning all necessary equipment shall be provided and kept ready for use and all necessary steps taken for prompt rescue of any person in danger and adequate provision shall be made for prompt first aid treatment of all injuries likely to be sustained during the course of the work. Emergency contact details should be displayed.
- 9.4.38 Motors, gearing, transmission, electric wiring and other dangerous parts of hoisting appliances shall be provided with efficient safe guards. Hoisting appliance shall be provided with such means as will reduce to the minimum the risk of any part of a suspended load becoming accidentally displaced.

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When workers employed on electrical installations which are already energized, insulating mats, wearing apparel, such as gloves, sleeves and boots as may be necessary shall be provided. The worker shall not wear any rings, watches and carry keys or other materials which are good conductor of electricity.

- 9.4.39 All scaffolds, ladders and other safety devices mentioned or described herein shall be maintained in safe condition and no scaffold, ladder or equipment shall be altered or removed while it is in use. Adequate washing facilities shall be provided at or near the places of work.
- 9.4.40 The contractor shall maintain and ensure necessary safety measures as required for inspection and tests HV test, Pneumatic test, Hydraulic test, Spring test, Bend test etc as applicable, to enable Inspection Agency for performing Inspection. If any test equipment is found not complying with proper safety requirements then the Inspection Agency may withhold inspection, till such time the desired safety requirements are met.
- 9.4.41 The Contractor shall notify Employer of his intention to bring to site any equipment or material which may create hazard. Employer shall have the right to prescribe the conditions under which such equipment or materials may be handled and the contractor shall adhere to such instructions. Employer may prohibit the use of any construction machinery, which according to him is unsafe. No claim for compensation due to such prohibition will be entertained by Employer.
- 9.4.42 All safety precautions shall be taken for welding and cutting operations as per IS-818. All safety precautions shall be taken for foundation and other excavation marks as per IS-3764
- 9.4.43 All gas cylinders shall be stored in upright position. Suitable trolley shall be used. There shall be flash-back arrestors conforming to IS-11006 at both cylinder and burner ends. Damaged tube and regulators must be immediately replaced. No of cylinders shall not exceed the specified quantity as per norms.
- 9.4.44 These safety provisions shall be brought to the notice of all concerned by display on a notice board at a prominent, place at work spot. The persons responsible for compliance of the safety code shall be named therein by the Contractor.
- 9.4.45 To ensure effective enforcement of the rules and regulations relating to safety precautions the arrangement made by the contract shall be open to inspection by the Engineer of the Engineer's representative.
- 9.4.46 Keeping the work area clean/ free from debris, removed scaffoldings, scraps, insulation/sheeting wastage /cut pieces, temporary structures, packing woods etc. will be in the scope of the contractor. Such cleanings has to be done by contractor within quoted rate, on daily basis by an identified group. If such activity is not carried out by contractor / Employer is not satisfied, then Employer may get it done by other agency and actual cost along with Employer overheads will be deducted from contractor's bill. Such decisions of Employer shall be binding on the contractor.

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9.4.47 Notwithstanding the above clauses there is nothing to exit the Contractor from the operations of any other Act or Rule in force in area of work in this respect. Provided always that all safety measures apart from those specifically provided in this agreement which are brought to the notice of the Contractor from time to time by the Engineer shall be complied by the Contractor. Provided further that all consequences, damages, or losses arising by reason of any safety code shall be met with by the Contractor.

9.4.48 If the construction is carried out at a casting yard developed exclusively for Employer project then, Non Compliance & Nonconformity of Safety Rules and Safety Appliances Will Be Viewed Seriously and Employer (Customer) Has Right to Impose Fines on the Contractor as Under for every instance of violation noticed:

**Table 1: Fine for Safety Non Compliance**

SI.No	Violation of Safety Norms	Fine (Rs)
1.	Not wearing Safety Helmet	500 *
2.	Not wearing Safety Belt or not anchoring life line	1000*
3.	Not wearing Safety shoe	1000*
4.	Not keeping gas cylinders vertically	1000
5.	Not using flash back arrestors	500
6.	Not wearing gloves	500*
7.	Grinding without Goggles	500*
8.	Not using 24V Supply For Internal Work	2000
9.	Electrical Plugs Not used for Hand Machine	1000
10.	Not Slinging properly	1000
11.	Using damaged Sling	1000
12.	Lifting cylinders Without Cage	2000
13.	Not using proper Welding cable With Lot of Joints And Not Insulated Property	1000
14.	Not removing Small Scrap From Platforms	1000
15.	Gas cutting without Taking Proper Precaution or not using Sheet below Gas Cutting	1000
16.	Not Maintaining Electric Winches which are Operated Dangerously	1000
17.	Improper earthing of Electrical T& P	1000
18.	No or improper barricading	1000
19.	Activity carried out without Safety work permit (Height work, Lifting activity, Hot work-each person/case)	5000
20.	Accident resulting in Partial Loss in Earning Capacity	50,000 per victim
21.	Fatal Accident /Accidents Resulting in total loss in Earning Capacity	2,00,000

Legend:-\*:per head, #:or as deducted by Customer whichever is higher

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Any other non-conformity noticed not listed above will also be fined as deemed fit by Employer. The decision of Employer/ engineer is final on the above. The amount will be deducted from running bills of the contractor. The amount collected above will be utilized for giving award to the employees who could avoid accident by following safety rules. Also the amount will be spent for purchasing the safety appliances and supporting the safety activity at site.

CITATION:-If safety record of the contractor in execution of the awarded job is to the satisfaction of safety department of Employer, issue of an appropriate certificate to recognize the safety performance of the contractor may be considered by Employer after completion of the job

9.5 MEMORANDUM OF UNDERSTANDING

After Award of Work, Contractors are required to enter into a Memorandum of Understanding as given below:

**Memorandum of Understanding**

KMRL, committed to Health, Safety and Environment Policy (EHS Policy).

M/s \_\_\_\_\_ do hereby also commit to the same EHS Policy while executing the Contract Number\_\_\_\_\_

M/s \_\_\_\_\_ shall ensure that safe work practices not limited to the above are followed by all construction workers and supervisors. Spirit and content therein shall be reached to all workers and supervisors for compliance.

KMRL will be carrying out EHS audits twice a year and M/s \_\_\_\_\_ shall ensure to close any non-conformity observed/reported within fifteen days.

Signed by authorized representative of M/s -----

Name:

Place & Date:

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## 10 PERFORMANCE MONITORING

- 10.1.1 Performance of the contractor is monitored through various reports/reviews and shall be jointly evaluated every month for unit wise identified packages as per prescribed formats. Based on the net weighted scores obtained, Contractors shall be rated ‘Good’ or ‘Satisfactory’ or ‘Unsatisfactory’
- 10.1.2 In case of any dispute on performance rating and the contractor refuses to sign on the performance rating given by Employer package In charge, the same shall be reviewed by Employer site In charge/Construction Manager and his decision shall be final.
- 10.1.3 Release of RA Bills will be contingent upon joint evaluation of performance.
- 10.1.4 Performance of the contractor will be taken into consideration for assessing the capacity of the bidder to execute future jobs under tender, as detailed in the Notice Inviting Tender. Risk of non-evaluation or non-availability of the Monthly performance evaluation reports is to be borne by the Bidder.
- 10.1.5 In case of ‘Unsatisfactory performance’ for a continuous period of three or more months for a package or packages, Employer has the right to get the balance works executed at the risk and cost of the contractor.
- 10.1.6 In case of ‘Unsatisfactory performance’ in a financial year, Employer reserves the right to put on hold such Contractors for a period of six months for similar package

## 11 COVID SOP

The contractor has to strictly abide by the SOP developed for curtaining the COVID -19 Pandemic at workplace. The SOP and the checklist included below needs to be strictly adhered by the contractor during the execution of this contract.

### 11.1 Introduction

This SOP is prepared to resume the work at Kochi Metro Rail Project sites after the lockdown period due outbreak of COVID-19. By following SOP the probability of the spread of corona spread will be minimized and works can be carried out in a safe manner. All precautionary measures are to be ensured at Kochi Metro Project sites so that employees / contract workers feel safe and secure during work.

### 11.2 Purpose

The purpose of this Standard Operating Procedure (SOP) is to describe the procedure to be followed for resuming work after lockdown due to COVID-19 outbreak as per the guidance of MHA, MoHFW & MoHUA. This document gives details to ensure safety of construction of site workers.

### 11.3 Scope

These guidelines are applicable to entire Kochi metro rail project locations.

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**11.3.1 General Guidelines applicable to all**

- All Protocol including Emergency Response will be laid out. Identity Card will be issued to everyone entering site. Periodic tool box talks will be arranged to review site protocols in view of highly dynamic scenario ensuring social distancing norms. During these TBTs, everyone including workers will be informed about the safety guidelines and important updates. Necessary arrangements for announcements shall be made at every site.
- Each site shall be assigned with a COVID Marshal who is efficient and capable to implement this SOP in co - ordination with project team. Names of those identified as COVID Marshall should be intimated to KMRL.
- Mandatory Thermal Scanning of everyone entering and exiting a construction site will be done for fever with thermal scanners. If body temperature range is more than 38 deg. C (OR) 100 deg. F, person shall be sent back to his / her respected accommodation. COVID marshal shall ensure that the individual is taken to nearest Primary Health Center for detailed diagnosis. In case a Hospitalization is required, it shall be as per the strict guidance of Health Department.
- If anyone leaves and re-enters the site during the shift, re-screening of the individual will be done prior to re-entry into the work site.
- Provision for hand wash & sanitizer (touch free recommended) will be made at all entry and exit points and common areas (including at distant locations). Everyone will be required to wash & sanitize his/her hands before entering the site. Same procedure to be followed after exiting the premise. Sufficient quantities of all the items shall be available at the site.
- Everyone entering site area shall mandatorily wear face mask. Hand gloves shall be used by the workers who are handling material coming from outside. Re-usable equipment shall be thoroughly cleaned and shall not be shared with others.
- Spitting in open shall be strictly prohibited. There will be strict ban on Gutka, Tambaku, Paan etc. on site.
- Food shall be consumed at designated areas only ensuring social distancing. Common sitting arrangements shall be removed. Post lunch, waste shall be disposed by individual in designated bins and area shall remain clean.
- Areas with a probability of bigger gathering, for e.g. Site offices, rest areas, toilets etc. shall be identified and all arrangements shall be made to ensure social distancing.
- Entire construction site including site office, labour camp, canteens, pathways, toilets, entry/ exit gates will be disinfected on daily basis. Housekeeping team shall be provided with necessary Personal Protective Equipment.
- There will be total ban on non-essential visitors at sites (including from Head office staff, vendors etc.)
- Name of hospital (Govt.Medical College, Kalamassery) which is authorized to treat COVID-19 patients & DISHA COVID toll free # 1056 shall be posted at site all the time.
- Medical officer shall be available and periodicity of his visit shall be at least once in a week.
- Appropriate signage at construction site spelling out safety practices in the language which is understood by all and to be placed at prominent locations.
- For any confusion, clarification and update, everyone should approach designated authority or

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rely on authentic source. Do not believe in rumors and don't spread them

11.3.2 Guideline for Workers

- On day 0, before resuming the work on sites post lockdown period, mandatory medical check-up will be arranged for all workers. The workers coming from outside (if any) should observe home-quarantine for at-least 14 days as per the guidelines issued by MoHFW. Only medically fit workers will be deployed at site and medical assistance will be arranged for unfit workers. Medical check-up camp shall be arranged periodically at least once in a month.
- Photo identity card with serial number will be issued for the workers staying at site. Proper record of all these workers will be maintained. They will not be allowed to go outside site area. All the essential items will be made available to them at site only. If necessary, they can go out wearing face mask, after informing supervisor. No outside worker will be allowed to stay at site without following proper procedure and instructions.
- Start time on site will be staggered to avoid congestion at the entry gates. Number of workers working at a particular time / place will be reduced by making arrangements for different shifts / areas. Accordingly, additional staff such as security guards, supervisors etc. will be deployed.
- As in most cases, workers reside at the sites; hence no travel arrangements are required for them. The workers staying outside (nearby locations) shall reach at the site either by walking or by their individual mode of transport (bicycle, two-wheeler etc.).
- During attendance, training and other sessions, social distancing guidelines will be followed.
- All workers may be advised to take care of their own health and look out for respiratory symptoms/fever and, if feeling unwell, shall leave the workplace immediately after informing their reporting officers. They shall observe home-quarantine as per the guidelines issued by MoHFW and should immediately inform the nearest health centre.
- Workers shall not shake hands when greeting others and while working on the site.
- Mandatorily wear face masks while working on site. While not wearing masks, cover your mouth and nose with tissues if you cough/sneeze or do so in the crook of your arm at your elbow.
- Avoid large gatherings or meetings. Maintain at least 1 meter (3 feet) distance from persons, especially with those having flu-like symptoms, during interaction. Not more than 2/4 persons (depending on size) shall be allowed to travel in personnel hoists. Use of staircase for climbing shall be encouraged.
- Workers shall clean hands frequently by washing them with soap and water for at least 20-40 seconds. When hand washing isn't possible, alcohol-based hand sanitizer with greater than 70% alcohol shall be used.
- Workers shall not share their belongings like food, water bottles, utensils, mobile phones etc. with others. The utensils shall be washed properly post use at designated place.
- Post work, workers shall change their clothes before leaving the site and clothing should not be shook out.
- Avoid touching your eyes, nose, or mouth with unwashed hands.

11.3.3 Guidelines for Material, Tools, Machinery, Vehicles etc

- At all point of time, easy access to parking should be ensured since public transit is limited.

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- All vehicles and machinery entering the premise shall be disinfected by spray mandatorily.
- All construction material arriving from other states at site shall be left idle for 3 days before use to ensure safe usage.
- Non-touch garbage bins with biodegradable garbage bag shall be installed for waste collection at all common access areas. Proper disposal of garbage bags along with daily cleaning and sanitization of bins shall be ensured.
- Wipe down interiors and door handle of machines or construction vehicles, the handles of equipment and tools that are shared, with disinfectant prior to using.

**11.4 Transportation of Workers**

- Transporting workers from Camp to Construction site: To be based on Governments' criteria for Phasing of restrictions and relaxation of lockdown, like 2/3rd capacity in company provided vehicles, subject to observing social distance protocols such as compulsory face masks, hand sanitizers and no standing passenger policy etc.

**11.5 Check List on HSE Measures**

- The check list attached as below. This check list has to be completed & submitted on a daily basis duly approved by the concerned Project Manager.

SL NO.	ITEM	REQUIREMENTS	REMARKS	ACTION BY
1.1	Thermal Scanning	<ul style="list-style-type: none"> <li>• Sufficient number of Scanners</li> <li>• Scanning Locations Identified.</li> <li>• Re-screening of the individual who left the site during the shift conducted prior to re-entry</li> <li>• Register maintained</li> </ul>		
1.2	Transport of Workers	<ul style="list-style-type: none"> <li>• Decontamination of Transport vehicles done</li> <li>• Transportation in compliance with Governments' criteria for Phasing of restrictions</li> </ul>		
1.3	Personal Protective Equipment	<ul style="list-style-type: none"> <li>• Mask provided while travelling and while at work.</li> <li>• Hand gloves while handling materials coming from outside</li> </ul>		

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**FUNDING BY**



**KFW**

SL NO.	ITEM	REQUIREMENTS	REMARKS	ACTION BY
1.4	Social Distancing	<ul style="list-style-type: none"> <li>Congestion of workers avoided at all locations.</li> <li>Large Meetings &amp; gatherings avoided.</li> <li>3 meter distance maintained from persons</li> </ul>		
1.5	Training & Awareness	<ul style="list-style-type: none"> <li>All workers/staff got <b>Aryogya Setu App</b> downloaded on their mobile.</li> <li>Workers are informed about the safety guidelines and important updates regarding COVID-19</li> <li>Necessary arrangements for announcements including megaphones at site.</li> <li>Banners &amp; posters of COVID-19 prevention measures are displayed at prominent locations.</li> </ul>		
1.6	Hygiene Measures	<ul style="list-style-type: none"> <li>Provision for hand wash with soap is provided at all entry and exit points and common areas &amp; making sure workers are cleaning clean hands.</li> <li>Alcohol-based hand sanitizer provided where hand washing isn't possible.</li> <li>Proper disposal of garbage bags along with daily cleaning and sanitization of bins ensured.</li> <li>Ban on gutka, Tambaku, Paan etc. at site.</li> </ul>		
1.7	Food Consumption.	<ul style="list-style-type: none"> <li>Food shall be consumed at designated areas by ensuring social distancing</li> <li>Post lunch, waste is disposed in designated bins and area maintained clean.</li> </ul>		
1.8	Emergency Response.	<ul style="list-style-type: none"> <li>Name &amp; phone # of Hospital which is authorized to treat COVID-19</li> </ul>		

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RFP FOR ELECTRIC VEHICLE  
SUPPLY EQUIPMENT

DOC NO: KMRL-WM-ELE-002  
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General Consultant

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## Section- XIII -A

# ENVIRONMENT MANAGEMENT PLAN

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**1. General EMP**

The contractor shall prepare a project specific Environmental Management Plan that needs all applicable environmental requirements (Including all applicable laws, regulations and any requirement of any relevant Authority and any directions of the Employer / Engineer) that apply to the Site or the Navigation Channel area. The EMP shall document the Contractor's auditable compliance with the Contract Requirements and shall ensure the following;

- a) The application of Best Management Practice (BMP) for management of environment aspects for the Works;
- b) The implementation of the Employer's environmental obligations as outlined in the following:
  - The Environment and Social Management Plan (ESMP) of Employer
  - The Environmental Impact Assessment Report of EIA Study Consultant (WAPCOS) of the Works with all relevant and applicable environmental regulatory and institutional requirement; and
  - That the environmental aspects and impacts associated with the Works are properly managed including adequate traffic management;
  - Close and regular coordination, briefing, information sharing and liaison with the Employer / Engineer.
- c) The Contractors EMP shall include, but not be limited to, the following elements
  - Background
  - Environmental Management
  - Implementation
  - Monitoring and Review
  - Reporting

The Contractor shall submit the Draft EMP to the Employer / Engineer within 28 days of the Contract Commencement Date. The Engineer and Employer will review the EMP and will issue comments (if any) to be incorporated by the Contractor.

The Contractor shall strictly abide by the Environmental and Social Impact Assessment report of Employer. Any violation will be considered as Non-compliance. Nonconformity of Environmental norms will be viewed seriously and Employer has every right to impose fines on the contractor for any violation mentioned in Summary of Environmental Monitoring Programme implementation during project construction phase. The fines applicable are as mentioned in table below,

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**Table 2: Fines for Non-Compliance**

S. No	Violation of Safety Norms	Fine (In INRs)
1	First Violation	1000
2	Second Violation	5000
3	Third Violation onwards	50000



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**REQUEST FOR PROPOSAL (RFP)  
FOR  
ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE)  
(WATER METRO BOAT CHARGERS)**

Under Financial Arrangement with  
German Financial Cooperation with India  
KOCHI WATER METRO PROJECT  
BMZ No: 2013 66657

**PART-4  
(PREAMBLE & BILL OF QUANTITIES)**

KOCHI METRO RAIL LIMITED  
(A Joint Venture of Govt. of India and Govt. of Kerala)  
4th floor, JLN Stadium Metro Station, Banerji Road, Kochi – 682017

**JANUARY 2021  
DOC NO: KMRL-WM-EL-002**



KOCHI METRO RAIL LTD  
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## Section XIV PREAMBLE & BILL OF QUANTITIES

WATER METRO  
PROJECT

RFP FOR ELECTRIC  
VEHICLE SUPPLY  
EQUIPMENT

DOC NO: KMRL-WM-ELE-002  
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General Consultant  
**AECOM CONSORTIUM**  
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### PREAMBLE

The following shall be read in conjunction with the Conditions of Contract, Employer’s Requirements, Scope of Work, Specifications and Drawings, QHSE Compliance requirements and the Price Schedules provided along with this RFP and Annexures for **Design, Build, Supply, Delivery, Installation, Testing and Commissioning of Electric Vehicle Supply Equipment (EVSE) Including Related Electrical Infrastructures.**

1. This is a Design Build (EPC) Contract.
2. The rates and prices in the priced Schedule of Prices shall include Detailed Engineering and Design works and drawings, all labour, supervision, machineries, materials, all temporary works, erection, maintenance, establishment and overhead charges, profit, taxes, levies and other charges, together with all general risks, liabilities and obligations set out or implied in the Contract and including remedy of any defects during the Defects Notification Period. The works shall be executed as per the design and drawings approved by the Engineer.
3. The Bidder is required to furnish the unit rate as provided in E-BOQ format. It shall be clearly understood that there shall not be any claim whatsoever by the Bidder on unit rates provided in the BOQ, even though the final Product ratings are changed due to design and functional requirements to that of the minimum requirements specified in Part-2, Section-VII (Scope of Works). The Bidder should not quote prices in different currencies.
4. This unit rates provided by the bidder in the BOQ will be only be considered for making payments to the Contractor confirming to the finalised and accepted product ratings vide scope of works and taking over for the completed terminals.
5. The contractor is deemed to be familiar with the Site, weather, available means of access and the location of any existing services and working restrictions due to site features or other contractor’s works in order to execute the works.
6. In submitting the offer the Bidder is deemed to have visited the site(s) at his own expense and made himself familiar with the Scope of Work and the site conditions. No additional cost /reimbursements shall be paid by Employer on this.

The rates quoted by the Contractor in the Schedule of Prices for the individual Items / components shall remain firm during the entire tenure of Contract irrespective of variations in the individual quantity of the Items actually ordered to be executed. The Contractor shall be paid as per the actual quantity of Items executed as per the approved GFC drawings.

7. The whole cost of complying with the provisions of the Bid document shall be included in the items provided in the Schedule of Prices and where no items are provided, the cost shall be deemed to be distributed among the rates and prices entered for the available items of work. The price quoted shall include all costs up to successful completion of Defects Notification Period Obligations by the Contractor.
8. The rates and prices quoted by the Bidder in the Schedule of Prices shall be for finished works / Items, except insofar as it is otherwise provided under the Contract, including but not limited to all

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Bidder's equipment, labour, temporary works, supervision, materials, machineries, wastage, fuel, detailed engineering design & GFC drawings, transportation, packing, Construction, insurance, profit, overheads, together with all general risks, liabilities and obligations set out or implied in the Bid document including all taxes, duties, fees, royalty and other statutory deductions.

9. The rates quoted by the Contractor shall also include compliance with / work requirements of the following:
  - i. General works such as setting out, clearance of site before setting out and clearance of works after completion;
  - ii. Detailed program for the completion of the works & further updates during the course of contract, submission of various progress reports, etc.
  - iii. Samples of various materials proposed to be used on the work for conducting tests thereon as required as per the provisions of the contract;
  - iv. Testing of various finished items and materials as required under these specifications and furnishing test reports / certificates;
  - v. Inspection Reports of items/materials as per the relevant Specifications;
  - vi. Any other data which may be required as per these specifications or the conditions of contract or any other annexure / schedules forming part of the contract;
  - vii. Any other item of work / Component which is not specifically provided in the Schedule of Prices but which is necessary for completion of works & for complying with the provisions of the contract;
  - viii. Cost of in-built provisions for quality Assurance;
  - ix. Cost of safeguarding the environment, Health & Safety
  - x. Cost of providing "as-built drawings" as specified
  - xi. Cost of other facilities, permanent or temporary, and requirements connected with the work;
10. Other Work requirements, directions and descriptions of work and materials, given in the Specifications or Drawings or Conditions of Contract are not necessarily repeated nor summarised in the Schedule of Prices. Bidder is specifically advised to check and include any other item required for completeness of the Works as per the scope of work and specification.
11. Any downtime or expenses on account of weather, rains, floods, pandemic etc, shall be borne by the Contractor. No extra cost shall be payable by the Employer on this account.
12. The E- BOQ given in e-tender portal shall be used for quoting the price for the components/ Items of works.
13. The payments for the Items shall be made as per the payment schedule specified in Annexure-II of Section-XII, Part-B (GCC/PCC) Part-3 of this RFP.

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14. When requested by the Employer for the purposes of making payments or part payments, valuing variations or evaluating claims, or for such other purposes as the Employer may reasonably require, the Contractor shall provide the Employer with a breakdown of any composite or lump sum items included in the Schedules.

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Tender Inviting Authority: DGM - Procurement

Name of Work: Design, Build, Delivery, Installation, Commissioning and Maintenance of Electric Vehicle Supply Equipment (EVSE) including Related Electrical Infrastructures for Kochi Water Metro Project.

Contract No: KMRL-WM-ELE-002

Name of the Bidder/ Bidding Firm / Company :	
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**PRICE SCHEDULE**

(This BOQ template must not be modified/replaced by the bidder and the same should be uploaded after filling the relevant columns, else the bidder is liable to be rejected for this tender. Bidders are allowed to enter the Bidder Name and Values only )

NUMBER #	TEXT #	NUMBER #	TEXT #	NUMBER #	NUMBER	NUMBER	NUMBER #	NUMBER #	NUMBER #	TEXT #
Sl. No.	Item Description	Quantity	Units	BASIC RATE In Figures To be entered by the Bidder in Rs. P	GST (If applicable in Percentage)	GST Amount in Rs. P	HSN / SAC Code	TOTAL AMOUNT excluding taxes in Rs. P	TOTAL AMOUNT including taxes in Rs. P	TOTAL AMOUNT In Words
1	2	4	5	7	8	9	10	11	12	13
	<b>Part A</b>									
1.01	Design, Build, Supply, Delivery, Installation, Testing and Commissioning of Fast charging DC Electric Vehicle Supply Equipment (EVSE) of capacity 150kW with 1 number of CC2 gun with all test certification and statutory approvals including its control systems, fittings and mounting accessories, foundation & structural works, client software and associated networking components, warranty, insurance, lisioning charges etc as per tender specification.	24.00	Nos			0.00		0.000	0.000	INR Zero Only
1.02	Spare ( 2sets of spares and tool kits) as per technical specification and scope of work	1.00	Lot			0.00		0.000	0.000	INR Zero Only
	<b>Part B</b>									
2.01	Electrical Infrastructure for EVSE including 11kV/433V Transformer: Pre-construction survey/Site survey, design works, preparation of detail drawing and submission for approval before commencing execution of works, construction/Installation of Electrical Infrastructure for EVSE including but not limited to the following works: (i) Design, fabrication, supply, installation, testing and commissioning of indoor type transformer enclosure consisting of 11kV/433V 3 Ph, 50 Hz, Dyn11, dry type, Transformer with IP23 enclosure, winding temperature alarm and trip on transformer compartment and LV chamber suitable for termination of cable, complete with all standard fittings and accessories etc. including necessary louvers and as per specifications in all respects as required. (ii) All necessary control cabling for alarm, tripping & indication, all internal cabling as required. (iii) All materials, lead, lift, necessary civil foundation, trench work, structural works etc. complete as per technical specification and the lisioning charges for getting statutory approvals etc. (iv) Supply and fixing single line diagram, schematic diagrams etc. of A0 size on suitable Aluminium sheet including lamination etc. as required complete on wall. (v) Supply and fixing of fire retardant/extinguishing electrical insulated synthetic mat, Fire extinguishers, 11kV grade Hand Glove, danger notice board, Shock treatment chart, Fire Bucket with stand, First aid box as per technical specification and statutory requirement. (vi) Supply & installing outdoor E-Stop pushbutton station and wiring and interlocking with the tripping circuit of the feeding switchgear including supply, installation, termination of copper control cable etc. as per technical specification. (vii) Harmonic elimination devices (if any) complete in all respect as per scope of work and technical specification.	12.00	Nos.			0.00		0.000	0.000	INR Zero Only
2.02	Boat Charger LT Switch Board: Supply, Installation, Testing & Commissioning of Boat Charger LT Switch Board , cubicle type of 2mm thick CRCA sheet or Stainless Steel (SS 316) sheet of 1.6mm , totally enclosed, IP 54 form 4b, free standing, floor mounting, dust and vermin proof, outdoor, compartmentalized, suitable for operation on 3 phase , 415 V, 50Hz AC system with busbars, circuit breakers, measuring & protection equipments including internal wiring with suitable wires/cable, interconnection, duty powder coated with seven tank process etc., as per scope of work and technical specifications. The price shall include fire flooding system inside the panel and fire extinguishers in the LT panel premises complete in all manner.	12.00	Nos.			0.00		0.000	0.000	INR Zero Only

2.03	Supply and installation of required size XLPE insulated PVC sheathed, FRLS earthed Aluminium conductor armoured power cable of 11 KV grade conforming to IS 7098 amended up to date and laying the cable from 11kV VCB panel outgoing to the Transformer in recess/surface /wall with saddles, masonry open duct or in cable tray including supply & installation of suitable size perforated Hot Dipped Galvanized Iron cable tray (galvanization thickness not less than 50 microns) with perforation not more than 17.5%. The cable tray shall include necessary GI cable tray bends, Tee, Cross member, Cable tray covers, clamps, coupler plates, GI Bolt/nuts, washers and all other accessories as required. Necessary GI cable tray supports to be supplied and installed at an interval of not more than 1.5mtr interval as per specification. The work also includes the supply, installation of outdoor/indoor cable termination with heat shrinkable jointing kit complete with all accessories including lugs suitable for 3 core, XLPE Aluminium conductor cable of 11kV grade as required.	560.00	Mtr.			0.00		0.000	0.000	INR Zero Only
2.04	Supply and installation of required size XLPE insulated PVC sheathed, FRLS earthed Aluminium conductor armoured power cable of 11 KV grade conforming to IS 7098 amended up to date and laying the cable from 11kV VCB panel outgoing to the Transformer direct in ground including excavation, sand cushioning, protective covering and refilling the trench etc. as required or laying in RCC/ HUME/ METAL/ISI marked HDPE pipes with suitable size of 10 kgf/cm2 conforming to as per IS 4984,1985 PE-100 including all fittings and tees, elbows, bends, reducers, end caps, complete including supply and installation of pipes etc. in complete as required and technical specification. Necessary saddles, plugs, coupling, MTA etc. including price of all jointing materials, bolts, nuts, rubber washers, ferrule, pipe supports, hire of tools, cutting and finishing etc. shall also to be supplied and installed as per the requirement and specification. Providing, laying and fixing suitable dia RCC pipe NP 2 class (light duty) in ground complete with RCC collars, jointing with cement mortar 1:2 (1 cement : 2 fine sand) including trenching and refilling etc. as required also covered in the scope. The work also includes the supply, installation of outdoor/indoor cable termination with heat shrinkable jointing kit complete with all accessories including lugs suitable for 3 core, XLPE Aluminium conductor cable of 11kV grade as required.	224.00	Mtr.			0.00		0.000	0.000	INR Zero Only
2.05	Supply and installation of required size XLPE insulated PVC sheathed, FRLS earthed Aluminium conductor armoured power cable of 11 KV grade conforming to IS 7098 amended up to date and laying the cable from 11kV VCB panel outgoing to the Transformer direct in ground including excavation, sand cushioning, protective covering and refilling the trench etc. as required or laying in RCC/ HUME/ METAL/ISI marked HDPE pipes with suitable size of 10 kgf/cm2 conforming to as per IS 4984,1985 PE-100 including all fittings and tees, elbows, bends, reducers, end caps, complete including supply and installation of pipes etc. in complete as required and technical specification. Necessary saddles, plugs, coupling, MTA etc. including price of all jointing materials, bolts, nuts, rubber washers, ferrule, pipe supports, hire of tools, cutting and finishing etc. shall also to be supplied and installed as per the requirement and specification. Providing, laying and fixing suitable dia RCC pipe NP 2 class (light duty) in ground complete with RCC collars, jointing with cement mortar 1:2 (1 cement : 2 fine sand) including trenching and refilling etc. as required also covered in the scope. The work also includes the supply, installation of outdoor/indoor cable termination with heat shrinkable jointing kit complete with all accessories including lugs suitable for 3 core, XLPE Aluminium conductor cable of 11kV grade as required.	800.00	Mtr.			0.00		0.000	0.000	INR Zero Only
2.06	Supply and installation of required size and required runs of 1.1 kV grade XLPE insulated, PVC sheathed, FRLS armoured Aluminium conductor cable conforming to IS 7098 (Part 1 amended up to date) as per technical specification which shall run (laying) from the secondary of 11kV/433V transformer secondary to Boat Charger LT Panel Board in ground including excavation, sand cushioning, protective covering and refilling the trench etc. as required or laying in RCC/ HUME/ METAL/ISI marked HDPE pipes with suitable size of 10 kgf/cm2 conforming to as per IS 4984,1985 PE-100 including all fittings and tees, elbows, bends, reducers, end caps, complete including supply and installation of pipes etc. in complete as required and technical specification. Necessary saddles, plugs, coupling, MTA etc. including price of all jointing materials, bolts, nuts, rubber washers, ferrule, pipe supports, hire of tools, cutting and finishing etc. shall also to be supplied and installed as per the requirement and specification. Providing, laying and fixing suitable dia RCC pipe NP 2 class (light duty) in ground complete with RCC collars, jointing with cement mortar 1:2 (1 cement : 2 fine sand) including trenching and refilling etc. as required also covered in the scope. The work also includes the supply, installation of cable termination with all accessories including double compression cable glands, lugs suitable for XLPE cable of 1.1kV grade as required.	240.00	Mtr.			0.00		0.000	0.000	INR Zero Only
2.07	Supply and installation of required size & required runs of 1.1 kV grade PVC insulated FRLS sheathed, multicore bright annealed stranded copper conductor, unarmoured, flexible cable conforming to IS 694 (amended up to date) and IS:8130 (amended up to date) as per technical specification which shall run from the Boat charger LT Panel Board to EVSE Module in recess/surface /wall with saddles, masonry open duct or in cable tray including supply & installation of suitable size perforated Hot Dipped Galvanized Iron cable tray (galvanization thickness not less than 50 microns) with perforation not more than 17.5%. The cable tray shall include necessary GI cable tray bends, Tee, Cross member, Cable tray covers, clamps, coupler plates, GI Bolt/nuts, washers and all other accessories as required. Necessary GI cable tray supports to be supplied and installed at an interval of not more than 1.5mtr interval as per specification. The work also includes the supply, installation of cable termination with all accessories including double compression cable glands, lugs suitable for 1.1kV grade as required.	1160.00	Mtr.			0.00		0.000	0.000	INR Zero Only

2.08	Supply and installation of required size & required runs of 1.1 kV grade PVC insulated FRLS sheathed, multicore bright annealed stranded copper conductor, unarmoured flexible cable conforming to IS 694 (amended up to date) and IS:8130 (amended up to date) as per technical specification which shall run from the Boat charger LT Panel Board to EVSE Module in ground including excavation, sand cushioning, protective covering and refilling the trench etc. as required or laying in RCC/ HUME/ METAL/ISI marked HDPE pipes with suitable size of 10 kg/cm2 conforming to as per IS 4984, 1985 PE-100 including all fittings and tees, elbows, bends, reducers, end caps, complete including supply and installation of pipes etc. in complete as required and technical specification. Necessary saddles, plugs, coupling, MTA etc. including price of all jointing materials, bolts, nuts, rubber washers, ferrule, pipe supports, hire of tools, cutting and finishing etc. shall also to be supplied and installed as per the requirement and specification. Providing, laying and fixing suitable dia RCC pipe NP 2 class (light duty) in ground complete with RCC collars, jointing with cement mortar 1:2 (1 cement : 2 fine sand) including trenching and refilling etc. as required also covered in the scope. The work also includes the supply, installation of cable termination with all accessories including double compression cable glands, lugs suitable for 1.1kV grade as required.	348.00	Mtr.		0.00	0.000	0.000	INR Zero Only
2.09	Supply, installation, testing and commissioning of maintenance free earthing using 4 mtrs length, 20mm dia 250 microns molecularly copper bonded steel rod, stainless steel connectors and fasteners for connecting earth strip. The earth electrode shall be filled with earth enhancing compound (12.5 kg mineral compound / 22.6 kg low resistivity graphite compound), FRP (UFE FRP) Earth electrode inspection chamber with heavy duty cover should be used to cover the Earth Rod. The dimension shall be 300mmx 300mmx 300mm with a weight bearing capacity of 15KN. The item shall be inclusive of installation charges, including digging bore, providing all required accessories like terminal connector, screw for fixing earth pit cover etc. Maki	72.00	Nos.		0.00	0.000	0.000	INR Zero Only
2.10	Providing and fixing GI/Cu strip/wire on surface or in recess for connections etc. as required. 50mmX6mm GI	875.00	Mtr.		0.00	0.000	0.000	INR Zero Only
2.11	Providing and fixing GI/Cu strip/wire on surface or in recess for connections etc. as required. 25mm x 6 mm GI	700.00	Mtr.		0.00	0.000	0.000	INR Zero Only
2.12	Supplying and laying, connecting following GI or copper strip (tinned at the points of contacts) / wire at 0.6m below ground level including excavation and refilling for conductor earth electrode including welding etc as required. 50mmX6mm GI	420.00	Mtr.		0.00	0.000	0.000	INR Zero Only
2.13	Supplying and laying, connecting following GI or copper strip (tinned at the points of contacts) / wire at 0.6m below ground level including excavation and refilling for conductor earth electrode including welding etc as required. 25mm x 6 mm GI	280.00	Mtr.		0.00	0.000	0.000	INR Zero Only
<b>Total in Figures</b>						<b>0.000</b>	<b>0.000</b>	INR Zero Only
<b>Quoted Rate in Words</b>	<b>INR Zero Only</b>							