

ASSAM ELECTRICITY GRID CORPORATION LIMITED
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NIT No: AEGCL/DGM/BONG/T&TC/T-1/2026/172; Dated:17.09.2026

**Bidding Document
For**

**Supply, erection, testing and commissioning of battery bank and battery charger for GSS
under Bongaigaon T&T Circle.**

**DEPUTY GENERAL MANAGER
BONGAIGAON T&T CIRCLE
AEGCL, DHALIGAON**

**Tender Fee: ₹500/-
EMD: ₹37,500/-**

SECTION 1
INSTRUCTION TO BIDDERS

For and on behalf of the **Managing Director, Assam Electricity Grid Corporation Limited (AEGCL), the Deputy General Manager, Bongaigaon T&T Circle, AEGCL, Dhaligaon-783385** invites tender from eligible firms/companies/contractors/manufacturers with sound technical and financial capabilities for the above work. A single stage two envelope procedure (Techno-Commercial and Price Bid) will be adopted for this tender.

1.1.0 INFORMATION TO BIDDER:

- a) NAME OF WORK: **Supply, erection, testing and commissioning of battery bank and battery charger for GSS under Bongaigaon T&T Circle.**
- b) TENDER ADDRESS: **O/o the Deputy General Manager, Bongaigaon T&T Circle, AEGCL, Dhaligaon 783385.**
- c) TENDER PAPER FEE: **₹500.00 in favor of the Managing Director, AEGCL payable at Guwahati.**
- d) BID SECURITY: **₹37,500.00 in favor of the DGM, Bongaigaon T&T Circle, AEGCL payable at Bongaigaon.**
- e) TIME OF COMPLETION: **180 days from the date of issue of work order.**

1.2.0 BIDDING PROCEDURE:

- a) All tenders shall have to be submitted in prescribed forms attached herewith eventually to be drawn up in the rules of AEGCL.
- b) Two different envelopes to be used as follows.
Envelope-1: Bid document signed by bidder on all pages, Earnest Money, Techno-commercial data of the Bidder, GTP and other necessary documents must be enclosed.
Envelope-2: Price Bid
- c) All tenders shall have to be submitted under sealed & signed covers super-scribing the Tender Notice No and name of the work completely and clearly on the top of the cover.
- d) All tenders shall have to be submitted on or before the last date and time of submission of tenders either by post or in person.
- e) If Bidders desire to submit their Bid by post, at their own expenses, it should be posted well in advance so as to ensure that their tenders reach the office of the tendering address on or before the specified date and time of submission of tender. AEGCL will not take any responsibility for loss, damage, tempering or delay of tenders sent by post.
- f) Bidder submitting Bid in person should submit their Bid in the tender box during the working hours on the last date and time of submission of tender.
- g) Tender will be rejected if submitted beyond the aforesaid time and date.
- h) Tenders or their authorized representatives may remain present during the opening of the tenders.
- i) Only Price Bid of responsive Techno-Commercial Bidders will be opened.
- j) AEGCL has the right to cancel the tender at any moment, without assigning any reason thereof. Bidder will not be entitled to claim any expenses and AEGCL will not be responsible for any costs or expenses incurred on the preparation and submission of the Bids.
- k) Bidders may obtain further information from the office of the Deputy General Manager, Bongaigaon T&T Circle, AEGCL, Dhaligaon-783385 For the purpose of preparation of their bid.

1.3.0 Key Dates:

Tender Start Date	12.00 Hrs. of	17.09.2026
Submission Start Date	12.00 Hrs. of	18.09.2026
Tender End Date	12.00 Hrs. of	08.10.2026
Tender Opening Date	14.00 Hrs. of	09.10.2026

1.4.0 Validity of Bids

- 1.4.1. Bids shall remain valid for the period of 180 days after the bid submission deadline date prescribed by AEGCL. In exceptional circumstances, prior to the expiration of the bid validity period, AEGCL may request Bidders to extend the period of validity of their bids. The request and the responses shall be made in writing.

1.5.0 Bid Security:

- 1.5.1. All bids must be accompanied by a bid security amounting to **₹37,500.00 only** in the form of Fixed Deposit/Demand Draft/Banker Cheque from any Nationalized Bank payable at Guwahati in favour of the **DGM, Bongaigaon T&T Circle, AEGCL.**
- 1.5.2. Any bid not complying with the terms and conditions shall be rejected by the employer as non-responsive.
- 1.5.3. The bid security of the successful Bidder shall be returned as promptly as possible once the successful Bidder has signed the Contract and furnished the required performance security.
- 1.5.4. The bid security of unsuccessful Bidders shall be returned as promptly as possible after the successful bidder has been allotted the work.
- 1.5.5. The bid security may be forfeited:

- a) If a Bidder withdraws its bid during the period of bid validity specified by the Bidder.
- b) If the successful Bidder fails to sign the Contract agreement within 10 (ten) days from issue of the letter of intent/detailed orders and furnishing performance security.

1.6.0 Eligibility Criteria

- 1.6.1. A Bidder may be a private entity or a government-owned entity.
- 1.6.2. No JV (Joint Venture) is allowed for this bid.
- 1.6.3. A Bidder, and all partners constituting the Bidder, shall have Indian nationality. A Bidder shall be deemed to have the nationality of a country if the Bidder is a national or is constituted, incorporated, or registered and operates in conformity with the provisions of the laws of Republic Of India. This criterion shall also apply to the determination of the nationality of proposed subcontractors or suppliers for any part of the Contract including related services.
- 1.6.4. **Bidder may be manufacturer of the offered products or a firm/company having authorization from a manufacturer. In case the bidder is not a manufacturer of the offered product(s), bidder must submit manufacturer's authorization using for that purpose Form-MA provided in Section-2 Bidding forms.**
- 1.6.5. A person, Firm or any other prospective bidder who is involved in fraud, unethical practices or barred from submitting bids by AEGCL or any sister concerns of AEGCL i.e. APDCL & APGCL will not be allowed to participate in the bids. If such cases are detected after submission of the bids, in later stages of the bidding process, then such bids will be rejected outright.
- 1.6.6. To be qualified for the bid the bidder must compulsorily meet the following minimum criteria specified in (i), (ii) and (iii) below.
 - i. Bidder OR if the bidder is not a manufacturer, offered product's manufacturer must have least 10 (ten) years of experience in design, manufacture and supply of 110 V and 220V DC battery bank and Charger. Bidder shall submit filled up form EXP-1 along with copy of past orders to establish its eligibility.
 - ii. The Bidder or if the Bidder is not a manufacturer, his supplier must have designed, manufactured, type tested, supplied 110V or above class Battery Bank and Charger which are in successful operation for at least 05 (Five) years. The Bidder shall submit filled up form EXP-2 to furnish a list of such works executed along with Client's Recent Performance Certificates to substantiate the requirement. Performance certificates should not be older than three (03) years as on the date of opening of the technical bid.
 - iii. Bidder must have experience of executing a supply order of electrical items in a Transmission/Generation/Distribution utility in past five years. Bidder shall submit filled up form EXP-3 along with copy of past orders and completion certificate/delivery Challan with customer signature to establish its eligibility.

1.7.0 Financial Capability:

- 1.7.1. **Bidder will require to submit along with the bid the audited balance sheets, IT return and other legal financial statements acceptable to AEGCL, for the last 3 (three) years to demonstrate the current soundness of the Bidders financial position and its prospective long-term profitability. As a minimum, an Applicant's net worth calculated as the difference between total assets and total liabilities should be positive.**
- 1.7.2. **Average Annual Turnover:** Minimum average annual turnover required are as follows and will be calculated as total certified payments received for contracts in progress or completed within the last 3 (Three) Years.

(a) INR 6,00,000.00

1.8.0 Experience:

- 8.1.1.1.1. Three completed similar works** costing not less than an amount equal to **40% of the estimated cost, or**
- 8.1.1.1.2. Two completed similar works** costing not less than an amount equal to **50% of the estimated cost, or**
- 8.1.1.1.3. One completed similar works** costing not less than an amount equal to **80% of the estimated cost**
- 1.8.2. The bidders who have already been awarded works from this end but not completed in time and also applied for time extension for several times, they are not eligible for participating in this tender process.
- 1.8.3. **List of contracts for similar Works and services executed in the past two years with copies of LoAs and execution status of each contract supported by client's certificate.**
- 1.8.4. **Audited Annual Accounts certified by CA of the company for the last three (3) years (in case of companies) or IT Return duly acknowledged by the tax department for the last three (3) years (in case of bidders other than companies)**
- 1.8.5. **Copies of Professional Tax Clearance Certificate, PAN and/or TAN Card, Registration Certificate (Form GST REG - 06) issued under Goods and Services Tax Laws.**
- 1.8.6. **Performance Certificates of the manufacturers of supply of similar nature needs to be submitted along with the techno-commercial bid.**

1.9.0 Evaluation Criteria:

- 1.9.1. Techno-Commercial Evaluation will be done on the basis of Work experience and Financial Capability submitted by the bidder.
- 1.9.2. Price Bid of only **Responsive Techno-Commercial Bidders** will be opened.

- 1.9.3. **Arithmetical Error**, if observed while in Price Bid evaluation, same will only be corrected.
- 1.9.4. Arithmetic Errors, in the Price Bid will be rectified on the following basis:
- a) If there is any discrepancy between the unit rate and the total cost that is obtained by multiplying the unit rate and quantity, the unit rate shall prevail and the total cost will be corrected unless in the opinion of AEGCL there is an obvious misplacement of the decimal point in the unit rate, in which case the total cost as quoted will govern and the unit rate corrected. If there is discrepancy between the total bid amount and the sum of total costs, the sum of total costs shall prevail and the total bid amount will be corrected.
 - b) The amount stated in the Price Bid shall be adjusted by AEGCL in accordance with the above procedure for the correctness of errors and shall be considered as binding upon the bidder. If the bidder does not accept the corrected amount of bid, its bid will be rejected, and the bid security may be forfeited.

1.10.0 Clarification

- 1.10.1. A prospective Bidder requiring any clarification of the Bidding Document shall contact the AEGCL in writing at the AEGCL's address indicated in the BDS or raise his enquiries prior to 3 (three) days of closing of the bid. The Employer will respond to any request for clarification, provided that such request is received no later than three (3) days prior to the deadline for submission of bids. The AEGCL's response shall be in writing with copies to all Bidders who have acquired the Bidding Document including a description of the inquiry but without identifying its source. Should AEGCL deem it necessary to amend the Bidding Document as a result of a request for clarification, it shall do so.
- 1.10.2. The Bidder is advised to visit and examine the site where the work is to be Carried out and its surroundings and obtain for itself on its own responsibility all information that may be necessary for preparing the bid and entering into a contract for the provision of plant and services. The costs of visiting the site shall be at the Bidder's own expense.
- 1.10.3. The Bidder and any of its personnel or agents will be granted permission by the Employer to enter upon its premises and lands for the purpose of such visit, but only upon the express condition that the Bidder, its personnel, and agents will release and indemnify the Employer and its personnel and agents from and against all liability in respect thereof, and will be responsible for death or personal injury, loss of or damage to property, and any other loss, damage, costs, and expenses incurred as a result of the inspection.

1.11.0 Amendment of Bidding Document

- 1.11.1. At any time prior to the deadline for submission of bids, the Employer may amend the Bidding Document by issuing addenda.
- 1.11.2. Any addendum issued shall be part of the Bidding Document and shall be communicated in writing to all who have obtained the Bidding Document from AEGCL.
- 1.11.3. To give prospective Bidders reasonable time in which to take an addendum into account in preparing their bids, AEGCL may, at its discretion, extend the deadline for the submission of bids.

1.12.0 Preparation of Bids by the Bidders:

- 1.12.1. **Cost of Bidding**
The Bidder shall bear all costs associated with the preparation and submission of its Bid, and AEGCL shall not be responsible or liable for those costs, regardless of the conduct or outcome of the bidding process.
- 1.12.2. **Language of Bid**
The Bid, as well as all correspondence and documents relating to the bid exchanged by the Bidder and AEGCL, shall be written in the English language.
- 1.12.3. **Bid Prices and Discounts**
- 12.3.1. **Bidders shall quote price inclusive of GST and all other applicable taxes. No extra calculation for discounts or other taxes will be done during evaluation.**
- 12.3.2. Unless otherwise specified in the Bid Document and/or AEGCL's Requirements, bidders shall quote for the entire plant and services on a —single responsibility basis such that the total bid price covers all the Contractor's obligations mentioned in or to be reasonably inferred from the bidding document in respect of the including procurement and subcontracting (if any), delivery, construction, installation and completion of the Work. This includes all requirements under the Contractor's responsibilities for completing the work and where so required by the bidding document, the acquisition of all permits, approvals and licenses, etc.; the operation, maintenance and training services and such other items and services as may be specified in the Bidding Document, all in accordance with the requirements of the General Conditions. Items against which no price is entered by the Bidder will not be paid for by the Employer when executed and shall be deemed to be covered by the prices for other items.
- 12.3.3. Bidders are required to quote the price for the commercial, contractual and technical obligations outlined in the bidding document.
- 12.3.4. GST, Royalty and all other taxes (as applicable) payable on the work should be shown separately.
- 12.3.5. Taxes like income tax etc. which need to be deducted at source as per the prevailing law of the land, will be deducted at source.

12.3.6. The prices shall be **FIXED & FIRM**.

The Bided Price should on Fixed Price basis, prices quoted by the Bidder shall be fixed during the Bidder's performance of the contract and not subject to variation on any account. A bid submitted with an adjustable price quotation will be treated as non-responsive and rejected.

1.13.0 Bid Evaluation Process:

1.13.1 AEGCL will carry out a detailed evaluation of the bids in order to determine whether the bidders are qualified and whether the technical aspects are substantially responsive to the requirements set forth in the bidding documents. In order to reach such a determination, AEGCL will examine the information supplied by the Bidders and other requirements in the bidding documents, taking into account the following factors:

(a) Qualification

- i. the determination will take into account the Bidder's financial and technical capabilities and past performance; it will be based upon an examination of the documentary evidence of the Bidder's qualifications submitted by the Bidder, pursuant to relevant Clauses as well as such other information as AEGCL deems necessary and appropriate; and
- ii. an affirmative determination will be a prerequisite for AEGCL to continue with the evaluation of the proposal; a negative determination will result in rejection of the Bidder's bid.

(b) Technical

- i. overall completeness and compliance with AEGCL's Requirements; the technical merits of materials and equipments offered and deviations from AEGCL's Requirements; suitability of the facilities offered in relation to the environmental and climatic conditions prevailing at the site; quality, function and operation of any process control concept included in the bid;

(c) Commercial

- ii. Deviations and omissions from the contractual and commercial conditions as identified in the Bid.
- iii. compliance with the time schedule called for in the Bidding Document and evidenced as needed in a milestone schedule provided in the bid; and
- iv. the functional guarantees of the facilities offered against the specified performance criteria of the plant and equipment.

1.13.2 The following methodology will be practiced for identification and treatment of the **Abnormally Low Bids (ALB)** in this tender process of AEGCL:

(a) Identification: For the identification of the Abnormally Low Bids, two approaches as applicable shall be adopted:

(i) Absolute Approach when there are fewer than five substantially responsive bidders and if the bid price is 20% or more below AEGCL's cost estimate then AEGCL's tender evaluation committee should clarify the Bid price with the bidder to determine whether the Bid is abnormally low.

(ii) Relative Approach is a statistical comparison method which will be applied when there are more than five nos. of substantially responsive bids. A potential ALB is identified where the low Bid is more than one standard deviation below the average of substantially responsive bids received.

In this approach first the Average bid price is determined and then by deducting the standard deviation from the average bid price, potentially ALB may be determined.

(b) In case of ALB, the tender evaluation committee of the respective tenders shall undertake the following three stage review which are as follows:

(i) Identify ALB as per the step mentioned in Clause No.1.13.2.(a).(i) and 1.13.2.(a).(ii) whichever is applicable.

(ii) Clarify and analyse the bidders resource inputs and pricing, including overheads, contingencies and profit margins. In that respect committee may seek the reference of the guidelines of World Bank, AIIB, ADB etc.

(iii) Decide whether to accept or reject the tender.

Additional Performance Security in case of acceptance of ALB:

If any abnormally low bid is accepted under point no. (b) (iii), after taking of additional performance security as per the

assessment of the committee, however the total performance security should not have to exceed 20% of the total contract value. The additional performance security shall be treated as part of the original performance security and shall be valid for a period coextensive with the applicable defect liability period of the contract.

Non submission of the additional performance security shall constitute sufficient ground to rejection of the bid and similar assessment shall be initiated for the next ranked bidder identified as ALB.

1.14.0 Preliminary examination of bids and determination of responsiveness:

- i. Prior to the detailed evaluation of bids, AEGCL will examine the bids to determine whether they are complete and all documents as per relevant Clauses are provided or not, whether the documents have been properly signed, whether the required bid security is included, and whether the bids are generally in order and provides any clarifications and/or substantiation that AEGCL may require.
- ii. A substantially responsive bid is one which conforms to all the terms, conditions and requirements of the bidding documents deviation or reservation and includes the amendments and changes, if any. AEGCL may waive any minor non-conformity or irregularity in a Bid which does not constitute a material deviation or reservation, provided such deviation or reservation does not (i) affect in any substantial way the scope, quality or performance of the Works; (ii) limit in any substantial way, inconsistent with the bidding document, AEGCL's rights or bidder's obligations under the contract; or (iii) whose rectification would affect unfairly the competitive position of other bidder's presenting substantially responsive bids.
- iii. Any bids found to be non-responsive for any reason or not meeting the minimum levels of the performance or other criteria specified in the bidding documents will be rejected by AEGCL and not included for further consideration.

1.15.0 Corrupt or Fraudulent practices

It is required that bidders/suppliers/contractors observe the highest standard of ethics during the procurement and execution of the contracts. In Pursuance of this Clause AEGCL;

defines, for the purposes of this provision, the terms set forth below as follows:

- i. "corrupt practice" means behavior on the part of officials in the public or private sectors by which they improperly and unlawfully enrich themselves and/or those close to them, or induce others to do so, by misusing the position in which they are placed, and it includes the offering, giving, receiving or soliciting of anything of value to influence the action of any such official in the procurement process or in contract execution; and
- ii. "fraudulent practice" means a misrepresentation of facts in order to influence a procurement process or the execution of a contract to the detriment of the Borrower, and includes collusive practice among bidders (prior to or after bid submission) designed to establish bid prices at artificial non-competitive levels and to deprive the Borrower of the benefits of free and open competition;
 - a) will reject a proposal for award if it determines that the bidder recommended for award has engaged in corrupt or fraudulent practices in competing for the contract in question;
 - b) will declare a firm ineligible, either indefinitely or for a stated period of time, to be awarded a contract by AEGCL if it at any time determines that the firm has engaged in corrupt or fraudulent practices in competing for, or in executing, a contract.

1.16.0 Award Criteria

Purchaser shall in general award the contract to the lowest substantially responsive bidder. However, the purchaser reserves the right to not award contract to the lowest substantially responsive bidder without thereby incurring any liability to Bidders.

1.17.0 Late Bid:

- i. Any bid submitted after the due date and time will be rejected without any prejudice.
- ii. AEGCL will not be responsible for any Postal and/or Courier delay in delivering the bid. The same received after the scheduled closing date and time will be rejected without any prejudice.
- iii. Bidding through EMAIL will not be accepted.

1.18.0 Payment Terms:

- i. No advance payment shall be made in this contract.

- ii. No claim for interest shall be entertained by AEGCL.
- iii. The price is firm and no price variation shall be applicable.
- iv. First & Final bill for the supply will be entertained only after 100% completion of the work.
- v. Payment will be made by the DGM, Bongaigaon T&T Circle, AEGCL, Dhaligaon.

1.19.0 Performance Security Deposit:

Further, Performance Guarantee of 10% of total contract value for of the project in the form of Bank Guarantee (BG) from a nationalized or scheduled Bank of RBI for a period of 60 (sixty) months from the date of supply is to be submitted with acceptance of LOI and before signing of the Contract Agreement. Moreover, before one month (i.e. 30 days) of expiry of the BG, renewal is to be done by the contractor if required, otherwise revocation would be done by AEGCL within claim period. BG is to be submitted strictly as per prescribed format of the AEGCL. BG should remain valid up to 60 (sixty) days beyond warranty/ Performance Guarantee Period. Duly pledged in favour of the **MD AEGCL**, and such security deposit shall be valid up to 30 days beyond the warranty period of 12 (twelve) months.

Please note that, if the selected Bidder / Firm fails to furnish the requisite performance security as stated above and sign the contract within the stipulated period, LOI/work order issued in favour of the Bidder/ Firm will automatically be Null & void.

1.19.1. If the bidder / firm fails or neglects to observe and perform any of his obligations under the contract, Purchaser (AEGCL) shall have the right to forfeit either in full or in part at his absolute discretion, the security deposit furnished by the Contractor/Firm.

1.19.2. No interest shall be payable on such deposits.

1.20.0 Liquidated Damage:

The date of completion of work shall be deemed to be the essence of the contract and shall not be completed no later than the date specified in the contract. In case of failure to complete the work within the stipulated period AEGCL shall be entitled to:

I. Recover and amount at the rate of 1% (One Percent) of the Contract Price per week or part thereof of delay, subject to maximum of 10% (Ten Percent) of the contract price as liquidated damage to AEGCL. However, the payment of liquidated damages shall not in any way relieve the contractor from any of its obligations to complete the works or from any other obligations and liabilities of the contractor under the contract.

II. To complete the balance work giving notice to the contractor/firm and to recover any extra expenditure incurred thereby for having to complete the work at a higher price at the risk and responsibility of the contractor/firm.

1.21.0 Warranty:

- The supplier warrants that all goods are new, unused, and of the most recent or current models, and that they incorporate all recent improvements in design and materials, unless provided otherwise in the contract.
- The supplier further warrants that the goods shall be free from defects arising from any act or omission of the supplier arising from design, materials, and workmanship, under normal use in the conditions prevailing in the country of final destination. The supplier will provide warranty for the works executed by them.
- If during the period of warranty any defect is found, the purchaser shall give notice to the supplier stating the nature of defect together with all available evidence thereof, promptly following the discovery thereof. The purchaser shall afford all reasonable opportunity for the supplier to inspect such defects.
- If having been notified, the supplier fails to remedy the defect within a period of 15 (Fifteen) days, the purchaser may, following notice to the supplier, proceed to do such work, and the reasonable costs incurred by the purchaser in connection therewith shall be paid to the purchaser by the supplier or may be deducted by the purchaser from any amount due to the supplier or claimed under the Performance Security.
- The term period of warranty shall mean the period of **12 (Twelve) months from the date of supply**. The successful bidder should warrant the free replacement of any damaged/malfunctioning equipment and its accessories during the warranty period.

1.22.0 Performance Guarantee / Defect Liability Period

The materials and entire construction/work is to be guaranteed against defective design, materials and workmanship and for satisfactory performance for a period of 365 days from the date of final acceptance of the completed work.

1.23.0 Defect after completion of work

- i. The contractor shall make good at his own cost and to the satisfaction of AEGCL all defects, or other faults which may appear during the defect liability period / warranty period.
- ii. In default, AEGCL may employ and pay other agency or persons to amend and make good such damages. Losses and expenses consequent thereon or incidental thereto shall be made good and borne by the contractor, failing which the same shall be recoverable from the payment due to the contractor and performance guarantee. In the event of amount due and performance guarantee being insufficient, the balance amount will be recovered from the contractor from the amount due or retained for other works executed in AEGCL.

1.24.0 Variation and Deviation of Quantity

The Tendered rates shall hold good for any variations in the Tendered quantities for completion of work on account of any modification in the bill of quantities or design or specification.

1.25.0 Deletion of work

AEGCL and its representative have the right to delete or decrease any item or quantity from schedule of quantity at its discretion if deemed necessary. No claim by the contractor will be admissible for this deletion or deduction of Item/quantity from schedule of quantity.

1.26.0 Use of materials arranged by the Board

If any materials supplied by AEGCL are found to be misused or wasted due to negligence by the contractor comes to the notice of the Board then the contractor shall be liable to pay compensation to the Board as may be decided by the Board.

1.27.0 Labour Legislation

- i. The contractor shall comply with the provisions of the Apprentices Act 1961, payment of Wages Act 1936, Minimum Wages Act 1948, Employees Liability Act 1938, Workmen's Compensation Act 1923, Industrial Disputes Act 1947, Maternity Benefits Act 1961, and the Contract Labour (Regulation and Abolition) Act 1970, Provident Fund Act or the modifications thereof or any other laws relating thereto and the rules made there under from time to time.
- ii. The contractor shall indemnify and keep indemnified AEGCL against payments to be made under and for the observance of the laws aforesaid and the Contractors' Labour Regulations without prejudice to his right to claim. The laws aforesaid shall be deemed to be a part of this contract and any breach thereof shall be deemed to be a breach of this contract.
- iii. The contractor shall not employ persons below the age of 18 years as labours for the erection work.
- iv. The contractor shall at his own expense arrange for all the safety provisions for the safety of all workers and employees directly or indirectly employed on the work by the contractor. The contractor shall provide adequate safety devices like head protective gears, belt etc, to his labours while executing the erection work.
- v. The contractor shall be fully responsible at his own expenses for compliance all the labour regulations and rules to be observed by them. The contractor shall fully indemnify AEGCL against any action by the state and/or Central Government for any default or alleged default by the contractor for violation of any of such rules and regulations. If, due to any default of the contractor, AEGCL has to incur any expenditure for compliance of contractor the rules and regulations or for any other reason connected with such default, AEGCL shall be entitled to recover from the Bidder all such expenditure in full from any payment due to the contractor.

1.28.0 Eligibility of Contractor employees

The Contractor shall employ in and about the Execution of the works only such persons as are skilled and experienced in their several trades. A list of such personal should be submitted in corresponding Appendix.

1.29.0 Insurance

The Contractor shall arrange for any pay/cost of personnel accident insurance, medical treatment etc. in respect of their employees assigned to the works for all time and shall govern by Law of the land.

1.30.0 Damage to person and property

- i. The Contractor shall be responsible for all injury to the work or to workmen, to persons, animals or things and for all damages to the structural and/or decorative part of property which may arise from the operations or neglect of contractor or its employees, against whether such injury or damage arise from carelessness, accident or any other cause whatsoever in any way connected with the carrying out of this Contract. The Contractor shall at his cost effect the

insurance necessary and indemnify AEGCL entirely from all responsibility in this respect. The scope of insurance is to include loss or damage to the work and workmen due to carelessness, accident including fire, earthquake, floods, all medical expenses, compensation to be borne in the event of accident etc., damage or loss to the Contract itself till this is made over a complete state. Insurance is compulsory and must be affected from the very initial stage and should cover the entire contract period till handing over of complete works. The Contractor shall also be responsible for anything which may be excluded from damage to any property arising out of incidents, negligence or defective carrying out of this Contract.

- ii. AEGCL shall be at liberty and is hereby empowered to deduct the amount of any damages, compensations, costs, charges and expenses arising or occurring from or in respect of any such claim or damages from any sums due or to become due to the Contractor.

1.31.0 Force Majeure Condition:

Force Majeure condition shall be considered as any circumstances beyond reasonable control of the party claiming relief, including but not limited to strikes, lockout, civil commotion, riot insurrection, hostilities, mobilization, war, fire, flood, earthquake, malicious damage or accidents could entitle contractor to extension time. Any such delay should be intimated within 10 (ten) days from the beginning of such delay to consider/approved, any claim without prior information may not be considered under force Majeure.

1.32.0 Settlement of Dispute and Arbitration:

Any dispute arising out of the contract will be first settled bilaterally between AEGCL and Contractor. In case, dispute cannot be settled bilaterally, it will be referred to arbitration to be by an arbitrator appointed by AEGCL. The contractor shall not stop the work during settlement of any dispute. All disputes shall be subjected to the jurisdiction of District Court of Kamrup District.

1.33.0 Scope of Work:

The brief description of scope covered under this Bidding Document is furnished below:

- a) Design, Supply, delivery of Battery Bank and Charger.
- b) Erection, Testing and commissioning of Battery Bank and Charger to AEGCL site.
- c) Arrangements of any permits required for transportation and movement of supplied materials. However, AEGCL shall assist as far as practicable in the process.
- d) Transit insurance and insurance during storage at site till commissioning shall be in the scope of the contractor.

1.34.0 Plea of Custom:

The plea of "Custom" prevailing will not on any account be permitted as an excuse for infringement of any of the conditions of contract or specifications.

The contract shall not be vitiated by any inadvertent omissions of any kind in the surveys, information, specifications, drawings or schedule of quantities.

1.35.0 Final Acceptance and Taking Over:

When the term of contract shall be fully complied with completing all works as per approved drawing and technical specifications to the satisfaction of the Department for a period as applicable, the Contractor/Firm shall have to submit completion certificate to the office of the undersigned after the satisfactory completion of the work through the executing authority for finalization of the work/payment as well as for the final acceptance and taking over the completed work and to issue the necessary certificate thereof.

1.36.0 Right to Reject:

AEGCL reserves the right to reject any or all the bids without assigning any reason thereof and the AEGCL further reserves the right to split up the work order in favour of more than one Contractor. The AEGCL also reserves the right to reject the lowest or any other price without assigning any reason. The clauses which are not appearing in this document (bid) will be as per The General Condition of Supply and Erection 2009 of AEGCL. The General Condition of Supply and Erection 2009 of AEGCL is available in the AEGCL's website www.aegcl.co.in under Acts, Rules and Policies.

SECTION 2
BIDDING FORMS

Form-1

Letter of Technical bid (On Bidders letterhead)

To,

The Deputy General Manager, Bongaigaon T&T Circle, AEGCL, Dhaligaon

Sub: Submission of Tender.

Ref:

1. NIT No:
2. Name of work:

Sir,

Having examined the terms & conditions, technical specifications, detailed items of work etc. as well as acquainting myself/ourselves with site of work, surroundings to get the required materials etc. I am/we are to submit herewith my/our tender for the above-mentioned work. My/our rates are quoted as per the specification laid down in the schedule of items of work.

I/We clearly understand that all materials, tools and plants, machineries, labours, testing of material, storage haulage etc. required in the work shall have to be arranged by me/us from my/our own resources in the events of allotment of the work to me/us.

I/We also clearly understand that in the event of acceptance/approved of my/our tender, the work shall have to be executed strictly as per specifications and the same shall have to be completed in all respects within the stipulated time failing which I, am/we are liable to be penalized as per rules laid down in tender document as well as agreement thereof.

Form-2

PROFILE OF THE BIDDER (Document checklist)

Hard copy of the following documents to be submitted with Techno-Commercial Bid.

SL. No.	Document to be submitted	Submitted (Yes/No)
1.	Letter of technical bid (Form-1)	
2.	Notarised Power of attorney for the person signing the tender	
3.	EMD payment receipt	
4.	Bidders company/firm registration certificate/certificate of incorporation	
5.	Manufacturer's authorization for Battery Bank and Battery Charger (Form MA) (Applicable for bidder who is not manufacturer of offered product)	
6.	GST registration	
7.	Filled up Form ELI-1	
8.	Filled up Form LIT	
9.	Filled up Form FIN-1	
10.	Audited Balance sheet for last three years	
11.	Bank solvency certificate/ other supporting document	
12.	Filled up Form EXP-1	
13.	Filled up Form EXP-2	
14.	Filled up Form EXP-3	
15.	Order/Contract copies establishing supplying offered product in past 6.6	
16.	Performance certificate of offered product as per clause 6.6 (ii)	
17.	Order/Contract copies establishing bidders experience in State/Central Utilities	
18.	GTP and drawings as per the BoQ	
19.	Type test reports	
20.	Completion schedule bar chart	
21.	Additional documents if any	

Form-3

Manufacturer's Authorization

(To be submitted in Manufacturer's Letterhead)

Bid No.:

To

The Deputy General Manager
Bongaigaon T&T Circle,
AEGCL, Dhaligaon

WE *[insert: **name of Manufacturer**]* who are established and reputable manufacturers of *[insert: **name and/or description of the Goods**]* having production facilities at *[insert: **address of factory**]* do hereby authorize *[insert: **name & address of Bidder**]* (hereinafter, the "Bidder") to submit a bid the purpose of which is to provide the following goods, manufactured by us, and to subsequently negotiate and sign the Contract:

1. -----
2. -----

We hereby extend our full guarantee and warranty in accordance with **Clause 1.21.0** of the bidding document, for the above specified Goods supporting the Supply of specified Goods and fulfilling the Related Services by the Bidder against this Bidding Documents, and duly authorize said Bidder to act on our behalf in fulfilling these guarantee and warranty obligations. We also hereby declare that, we will furnish the Performance Guarantee in accordance with **Clause 1.19.0**.

Further, we also hereby declare that we and *[insert: **name of the Bidder**]* have entered into a formal relationship in which, during the duration of the Contract (**including related services and warranty / defects liability**) we, the Manufacturer or Producer, will make our technical and engineering staff fully available to the technical and engineering staff of the successful Bidder to assist that Bidder, on a reasonable and best effort basis, in the performance of all its obligations to the Purchaser under the Contract.

For and on behalf of the Manufacturer

Common Seal and Signature of the authorised person:

Name:

Designation:

NOTE:

This MA should be signed by a person having either of the following-

- 1) Valid Power of attorney
- 2) Authorised by Managing Director
- 3) Member of Board of Directors

Form-ELI-1
Bidder's information Sheet

Sl. No.	Particulars	Bidders response
1	Bidders name and registered address	
2	Bidders authorised representative, designation and contacts	
3	GST registration no.	
4	MSME/SSI registration Udyog Adhaar/NSIC registration available?	Yes/No
5	EMD exemption claimed	Yes/No

(Signature and common seal)

Name:

Designation:

Date:

Form – LIT
Pending Litigation

Year	Matter in Dispute	Value of Pending Claim in Rupees	Value of Pending Claim as a Percentage of Net Worth

(Signature and common seal)

Name:

Designation:

Date:

Form FIN – 2
Average Annual Turnover

Annual Turnover Data for the Last 3 Years	
Year	Amount (Rupees)
Average Annual Turnover	

The information supplied should be the Annual Turnover of the Bidder in terms of the amounts billed to clients for each year for contracts in progress or completed.

(Signature and common seal)

Name:

Designation:

Date:

Form – EXP-1

Bidder must fill this form to establish eligibility as per clause 1.6.6(i)

Sl. No.	Customer name	Contract No. and date	Work order value	Contractor/supplier	Brief description of work

Note: Order/contract copies are to be submitted as supporting document.

(Signature and common seal)

Name:

Designation:

Date:

Form – EXP-2

Bidder must fill this form to establish eligibility as per clause 1.6.6(ii)

Fill up one (1) form per contract.

Contract of Similar Size and Nature			
Contract No. of.	Contract Identification		
Award Date		Completion Date	
Role in Contract	☐ Contractor		☐ Subcontractor
Total Contract Amount	(Rupees)		
Purchaser's Name Address Telephone/Fax Number E-mail			
1. Brief Specification of Goods supplied 2. Date of commissioning.			
Attached are copies of the following original documents. ☐ 1. Type Test Certificates. ☐ 2. Recent performance certificates (as per clause 1.6.6 (ii)) ☐ 3. Copy of the Contract Document/ Work order			

(Signature and common seal)

Name:

Designation:

Date:

Form – EXP-3

Bidder must fill this form to establish eligibility as per clause 1.6.6(iii)

Sl. No.	Customer name	Contract No. and date	Work order value	Contractor/supplier	Brief description of work	Completion date

Note: Following documents are to be submitted as supporting document:

- i) Relevant order/contract copies.
- ii) Completion certificate or Delivery Challan with customer signature.

(Signature and common seal)

Name:

Designation:

Date:

Section - 3

Purchaser's Requirements

3.1.0 SCOPE

The brief description of scope of scope covered under this Bidding Document is furnished below:

- a) Design, manufacture, supply and delivery of Battery Bank and Charger as per BoQ
- b) Erection, Testing and commissioning of Battery Bank and Charger to AEGCL site as per BoQ
- c) Arrangements of any permits required for transportation and movement of supplied materials. However, AEGCL shall assist as far as practicable in the process.
- d) Transit insurance and insurance during storage at site till commissioning shall be in the scope of the contractor.

3.2.0 SERVICE CONDITIONS

Bidder should note the following climatic and other conditions prevailing in the location of work:

- a) Peak ambient day temperature in still air : 45°C
- b) Minimum night temperatures : 0°C
- c) Ground temperatures : 40°C
- c) Reference ambient day temperature : 45°C
- d) Relative Humidity a) Maximum : 100 %
 b) Minimum : 10 %
- e) Altitude : Below 1000 M above MSL
- f) Maximum wind pressure : As per IS: 802 latest code.
- g) Seismic Intensity : ZONE-V as per IS 1893.

3.3: TECHNICAL SPECIFICATION FOR 110V, 220V and 48V DC BATTERY AND CHARGER

A. VALVE REGULATED LEAD ACID BATTERY

3.3.1. SCOPE:

(i) The scope covers the design, manufacture, assembly, testing at the manufacturer's works, delivery at site, installation, testing and commissioning of 110V D.C. Maintenance free Valve regulated Lead Acid Battery and associated battery charger with provisions of both float and boost charging of battery along with necessary accessories, fittings, etc for 132 kV sub-stations.

Each battery shall have sufficient capacity considering continuous emergency and intermittent loads for the periods specified below and for all bays with the charger out of service:

- a) Continuous DC load for protection, control, indications, alarms and interlock for 10 hours.
- b) Emergency lighting loads for 10 hours.
- c) Intermittent DC load for closing and tripping operation of Circuit Breakers, Isolators and Earth Switches.

This load shall be determined considering simultaneous tripping of breakers on bus-bar protection. Duration of intermittent load shall be considered as one minute when the battery has reached the end cell voltage. Battery shall be of 2X100% capacity and shall have 20% spare capacity with matching 2x 100% battery charger. Supplier shall furnish characteristic curve for satisfactory operation and maintenance of battery under service condition.

Bidder shall select number of cells, float & boost voltage to achieve following system requirement:

System Voltage During Float	Maximum Voltage During Float operation	Minimum Voltage available when no charger working and battery fully discharged upto 1.85V per cell.	Minimum no of cells.
110V	123.75V	99V	55
220V	242V	198V	109

48V	52.8V	43.2V	24
-----	-------	-------	----

Bidder shall furnish calculation in support of selection of capacity as well as number of Cells, Float & Boost charger current / Voltages.

3.3.2. RATING OF BATTERY AND FUNCTION OF CHARGER:

D.C. Power Supply shall comprise a set of Battery (110V) of desired capacity, Dual Float cum Boost Battery Charger (minimum 60A) in parallel operation. In this mode the charger shall be required not only to continuously feed a variable load but also deliver trickle/boost charging current for the battery. Charger shall have 20% spare capacity. Battery will be capable of feeding the DC load requirement of the Sub-station in case of failure of the charger. Ampere-hour capacity of the battery shall be designed considering the current load and expected future load due to extension of the Sub-Station (if not specified, then minimum 3 nos of future bays are to be considered for each voltage class). A detailed design calculation for both battery & charger are to be submitted for approval.

3.3.3. TRICKLE / BOOST CHARGE VOLTAGE:

The trickle and Boost charge voltage per cell shall be as follows:

- a) 220V Battery Bank, 110V Battery bank, 48V battery bank
- i) TRICKLE CHARGE: Per Cell Voltage $2.2\text{ V to }2.25\pm0.02\text{ V}$
- ii) Boost charge voltage should vary between 2.23 to 2.3V/cell.

3.3.4. VOLTAGE / CURRENT REGULATION OF CHARGER:

Output voltage for float charging from battery charger shall be auto controlled by adjusting the firing angle of thyristor for float charger to keep the voltage variation within $\pm 1\%$ from no load to full load and AC supply voltage variation of $\pm 10\%$ and frequency variation of $\pm 3\%$ of 50 Hz. Manual control of output voltage shall also be possible through Auto/Manual selector switch.

The Boost / Quick charger shall be similar type as Float / Trickle charging equipment, but shall be provided with control arrangement for 'auto/manual' current regulation features with current adjustment setting up to 150%, necessary for quick charging. An automatic VOLTAGE controller for boost charging shall control the output VOLTAGE WITH CURRENT LIMIT AS LIMITED FOR RESPECTIVE BATTERY CAPACITY by adjusting the firing angle of the thyristor.

3.3.5. CLIMATIC CONDITIONS:

The equipment to be supplied against the specification shall be suitable for satisfactory continuous operation under the required climatic condition.

3.3.6. DESCRIPTION OF BATTERY:

3.3.6.1 Type:

The DC batteries shall be VRLA (Valve regulated Lead Acid) type & shall be Normal Discharge type and shall conform to IS 15549:2004/ IEC 60896-21 & 22:2004/ BS 6290- PART IV/ IEEE-1188 standard. These batteries are to be factory-filled, charged & shall be suitable for a long life under continuous float operations & occasional discharges. The 110V DC system is unearthed system. The offered battery shall be compact and shall require no maintenance. All safety equipment required for installation shall be provided by the manufacturer.

3.3.6.2 Constructional requirements:

The design of battery shall be as per field proven practices. Partial plating of cells is not permitted. Paralleling of cells externally for enhancement of capacity is not permitted. Protective transparent front covers with each module shall be provided to prevent accidental contact with live module/ electrical connections.

3.3.6.3 Plates:

Positive plates shall be made pasted type using high purity corrosion resistant alloy for deep discharge, durability, maintenance free, long life both in cyclic as well as in float applications. The Grids are of Semi Radial Squarish grid to reduce internal resistance and travel current in shorter time. Negative plates shall be heavy duty, durable flat pasted plate using lead alloy pasted Semi Negative Squarish Grid. Negative plates shall be designed to match the life of Positive plates & combination of positive & negative plates shall ensure long life, durability & trouble-free operation of battery. Computer controlled/ PLC operated in-house equipment should be deployed for preparation of lead oxide and paste to ensure consistency in paste quality & properties.

3.3.6.4 Containers:

The container material shall have chemical & electro-chemical compatibility & shall be acid resistant and shall conform to UL-94/ASTM-D-2863 standard. The material shall meet all the requirements of liquid station lead-acid batteries and be consistent with the life of battery. The container shall be fire retardant and transparent. The porosity of the container shall be such as not to allow any gases to escape except from the regulation valve. The tensile strength of the material of the container shall be such as to handle the internal cell pressure of the cells in the worst working condition. Cell shall not show any deformity of bulge on the sides under all working conditions. The container shall be capable of withstanding the rigorous of transport, storage and handling. The containers shall be enclosed in a steel painted tray/rack with minimum earthing provision.

For identification, each cell/module shall be marked in a permanent manner to indicate the following information:

- (i) Cell Serial Number
- (ii) Positive & Negative, embossed on the cover
- (iii) Month & Year of Manufacturing

3.3.6.5 Cell Covers:

The cell covers shall be made of suitable material compatible with the container material and permanently fixed with the container by Hermetic Heat-Sealing technique. It shall be capable to withstand internal pressure without bulging or cracking. It shall also be fire retardant. Fixing of Pressure Regulation Valve & terminal posts in the cover shall be such that the seepage of electrolyte, gas escapes and entry of electro-static spark are prevented.

3.3.6.6 Separators:

The separators used in manufacturing of battery cells, shall be of glass mat or synthetic material having high acid absorption capability, resistant to sulphuric acid & shall have good insulating properties. Sufficient separator overlap & PVC shield protection in bottom edges of the plates is to be provided to prevent short circuit formation between the edges of adjacent plates. The design of separators shall ensure that there is no misalignment during normal operation & handling.

3.3.6.7 Pressure Regulation Valve:

Each cell shall be provided with a pressure regulation valve. The valve shall be self-re-sealable. The vent plug shall be made with suitable grade of fire-retardant plastic material. Each valve opening shall be covered with flame barrier capable of preventing the ingress of flame into the cell interior, when the valve opens & hydrogen/ oxygen gas mixture is released. The valve unit shall be such that it cannot be opened without a proper tool. The valve shall be capable to withstand the internal cell pressure specified by the manufacturer.

3.3.6.8 Terminal Posts:

Both the +ve & -ve terminals of the cells shall be capable of proper termination & shall ensure its consistency with the life of the battery. The terminals shall have lead plated adequate solid copper/ brass core cross-section to avoid overheating at maximum current load. The surface of the terminal post extending above the cell cover including bolt hole shall be coated with an acid resistant & corrosion retarding material. Terminal posts or any other metal part which is in contact with the electrolyte shall be made of the same alloy as that of the plates or of a proven material that does not have any harmful effect on cell performance. Both +ve & -ve posts shall be clearly and unambiguously identifiable.

3.3.6.9 Connectors, Nuts & Bolts, Heat Shrinkable Sleeves:

Where it is not possible to bolt the cell terminals directly to assemble a battery, separate non-corroding lead coated copper connectors of suitable size shall be provided to enable connection of the cells. Copper connections shall be suitably lead coated to withstand corrosion due to sulphuric acid/fumes at a very high rate of charge or discharge. Nuts & bolts for connecting the cells shall be made of copper, brass or stainless steel. Copper or brass nuts & bolts shall be effectively lead coated to prevent corrosion. Stainless steel bolts & nuts can be used without lead coating. All inter cell connectors shall be protected with heat shrinkable sleeves for reducing the environmental impact including a corrosive environment.

More than one cable may be required to be connected to the battery terminals. Suitable arrangement for termination of multiple cables shall be provided so as to avoid extra load on the battery terminals.

Necessary insulating supports for termination of these cables on batteries shall also be supplied by the bidder.

All cell connectors shall be capable of continuously carrying the 30 min. discharge current of the respective batteries and shall be capable to carry 4KA for 1 sec. **The inter-cell connectors shall be capable to carry minimum 10KA for 1 sec.**

3.3.6.10 Flame Arrestors:

Each cell shall be equipped with a Flame Arrestor to defuse the Hydrogen gas escaped during charge & discharge. Material of the flame arrestor shall not affect the performance of the cell.

3.3.6.11 Battery Bank Stand:

All batteries shall be mounted in a suitable metallic stand/ frame. The frame shall be properly painted with the acid resistive paint & should have protection against harmful effects due to tropical environment. The suitable insulation shall be provided between stand/ frame and floor to avoid the grounding of the frame/ stand. The jointing of the frames should not leave crevices and ensure proper and tight fit. Numbering tags for each cell shall be attached to the racks. Provision for clamping outgoing cables shall be kept.

3.3.7. CAPACITY REQUIREMENTS:

When the battery is discharged at 10-hour rate, it shall deliver 80% of Rated Capacity (corrected at 27°C) before any of the cells in the battery bank reaches 1.85 V/cell.

The battery shall be capable of being recharged from the fully exhausted condition (1.75 V/cell) within 10hrs up to 90% state of charge. All the cells in a battery shall be designed for continuous float operation at the specified float voltage throughout the life.

The capacity (corrected at 27°C) shall also not be less than Rated capacity & not more than 120% of Rated capacity before any cell in the battery bank reaches 1.75 V/cell. The battery voltage shall not be less than the following values, when a fully charged battery is put to discharge at a rate of 1/10th of the Rated Capacity:

- (a) After SIX minutes of discharge: 1.98V/cell
- (b) After SIX hours of discharge: 1.92V/cell
- (c) After EIGHT hours of discharge: 1.85V/cell
- (d) After TEN hours of discharge: 1.75V/cell

Loss in capacity during storage at an average ambient temperature of 35°C for a period of 6 months shall not be more than 60% and the cell/battery shall achieve 85% of its rated capacity within 3 charge/discharge cycles and full rated capacity within 5 cycles, after the storage period of 6 months. Voltage of each cell in the battery set shall be within 0.05V of the average voltage throughout the storage period. Ampere hour efficiency shall be better than 90% and watt-hour efficiency shall be better than 80%. However, the battery to be manufactured and to be delivered at site in such a way that load can be connected with the battery within 15 days from date of installation, date of initial charging is to be mentioned on the battery.

3.3.8. EXPECTED BATTERY LIFE

The battery shall be capable of giving 1200 or more charge/discharge cycles at 80% Depth of Discharge at an average temperature of 27°C. Depth of Discharge is defined as the ratio of the quantity of electricity (in Ampere Hour) removed from a cell or battery on discharge to its rated capacity. The battery sets shall have a minimum expected life of 20 years at Float operation.

3.3.9. ASSOCIATED EQUIPMENTS & ACCESSORIES (For each set of battery):

a)	Best quality metallic stand/frame	as per Clause 18.6.
b)	Stand insulators	+5% extra
c)	Inter row connectors	Appropriate quantity
d)	Inter tier connectors	Appropriate quantity
e)	Centre-zero (3-0-3) volts DC Voltmeter	: 1 No
f)	Torque wrench/ Spanners	: 1 No
g)	Connection hardware, such as strips, bolts, nuts	(with 5% extra)
h)	Cable clamps with hardware	
g)	Connection hardware, such as strips, bolts, nuts	(with 5% extra)
i)	Cell numbering tags with fixing arrangement	
j)	Two sets of special tools and tackles for connecting terminals of the battery	
k)	Any other accessories not specified but required for satisfactory operation.	Free-standing portable eye wash equipment, etc.

3.3.10. TYPE TEST OF BATTERY:

The Bidder/ Supplier shall supply type tested battery as per IS 15549:2004/ IEC 60896-21 & 22 over the range of at

least one capacity per design. The Bidder/ Supplier shall submit necessary evidences enclosed during detailed engineering.

Sr. No.	DESCRIPTION
1	Gas Emission
2	High Current Tolerance
3	Short Circuit Current & DC Internal resistance
4	Protection against Internal Ignition from External Spark source
5	Protection against Ground Short Propensity
6	Content & Durability of required marking
7	Material Identification
8	Valve Operation
9	Flammability Rating of Material
10	Intercell Connector Performance
11	Discharge Capacity
12	Charge Retention during Storage
13	Float Service with Daily Discharge for reliable mains power
14	Recharge behavior
15	Service Life at an operating temperature of 40°C for brief duration exposure Time
16	Impact of Stress Temperature of 60°C for brief duration exposure time with 3hrs discharge test
17	Abusive Over Discharge
18	Thermal Runaway Sensitivity
19	Low Temperature Sensitivity
20	Dimensional Sensitivity at Elevated Internal Pressure & Temperature
21	Stability against Mechanical abuse of units during installation

3.3.11. Routine Test:

- (i) Physical Examination Test
- (ii) Visual Inspection
- (iii) Dimensions, Mass & Layout
- (iv) Marking & Packing

3.3.12. ACCEPTANCE TEST OF BATTERY

- (i) Polarity Marking
- (ii) Verification of Dimensions
- (iii) Test of AH Capacity

LIST OF FACTORY & SITE TESTS FOR BATTERY

Sr. No	TEST	FACTORY TESTS	SITE TESTS
1	Physical Verification	YES	YES
2	Capacity Test on the cell at 1/10 th of Rated Capacity, corrected at 27°C	YES	
3	8hrs Charge & 15mins Discharge Test at Full Rated Load		YES

B. BATTERY CHARGERS**3.3.13. SCOPE:**

Battery Charger for 110V DC Battery Bank:

(i) **The 110V chargers shall be of Dual FCBC type which will have output connectivity to single battery bank and load.**

(ii) The DC system for 110V DC is unearthed. The Battery Chargers as well as their automatic regulators shall be of static type and shall be compatible with liquid station lead-acid batteries. All battery chargers **shall match with the battery** and shall be capable of continuous operation at the respective rated load in float charging mode while supplying the DC load. The chargers shall also be capable of Boost charging the associated DC battery at the desired rate.

Under normal operating conditions the charger should give a D.C. output equal to the steady demand load for signal lamps, auxiliary relays etc. plus an output to trip coils and closing coils of the circuit breakers and relays as and when required as well as float charging current of the battery. Charger shall have 20% spare capability.

(iii) **The ratings of the charger shall be as under:**

a. 110V DC System: 85A

b. 220V DC System: 110A

c. 48V DC System: 50A

3.3.14. GENERAL DESCRIPTION FOR CHARGERS:

a) The battery chargers shall be provided with facility for both automatic and manual control of output voltage and current. A selector switch shall be provided for selecting the mode of output voltage/current control, whether automatic or manual. When on automatic control mode during float charging, the chargers output voltage shall remain within + 1% of the set value, for AC input voltage variation of + 10%, frequency variation of + 5% a combined voltage and frequency variation of + 10% and a DC load variation from zero to full load.

b) The battery chargers shall have constant voltage characteristics throughout the range (from zero to full load) at the floating value of the voltage so as to keep the battery fully charged but without harmful overcharge and designed to provide fully automatic voltage stabilization and current limitation for charging.

c) The chargers shall have load limiters having drooping characteristics, which shall cause, when the voltage control is in automatic mode, a gradual lowering of the output voltage when the DC load current exceeds the Load limiter setting of the Charger. The Load-limiter characteristics shall be such that any sustained overload or short circuit in DC system shall not damage the Charger nor shall it cause blowing of any of the Charger fuses. The Charger shall not trip on overload or external short circuit.

d) Uniform and step less adjustments of voltage setting (in both manual and automatic modes) shall be provided on the front of the Charger panel covering the entire float charging output range specified. Step less adjustments of the Load-limiter setting shall also be possible from 80% to 100% of the rated output current for charging mode.

e) During Boost Charging, the Battery Charger shall operate on constant voltage with current limit mode (when automatic regulator is in service) to restrict battery charging current as specified. After completion of boost charging this float cum boost converter section either goes standby mode or float mode as desired by the system.

f) The Charger manufacturer may offer an arrangement in which the voltage setting device for Float charging mode is also used as output voltage limit setting device for Boost charging mode and the Load-limiter of Float charging mode is used as current setting device in boost charging mode for Float cum Boost Converter section. For Float charger section shall provide separate arrangement.

g) Suitable filter circuits shall be provided in all the chargers to limit the ripple content (Peak to Peak) in the output voltage to 1% irrespective of the DC load level, when they are not connected to a battery.

h) **MCCB**

All Battery Chargers shall have sufficient MCCBs on the input side to receive cables from two sources.

Mechanical interlock should be provided such that only one source shall be closed at a time. It shall be of P2 duty and suitable for continuous duty with breaking capacity minimum 25KA at 415V AC. MCCB's should have auxiliary contacts for annunciation.

i) **Rectifier Transformer**

The rectifier transformer shall be continuously rated, dry air cooled (A.N) an of class F insulation type. The rating of the rectifier transformer shall have 10% overload capacity. The transformer shall be of suitable rating to comply with maximum output with minimum input voltage.

j) **Rectifier Assembly**

The rectifier assembly shall be fully/half-controlled bridge type and shall be designed to meet the duty as required by the respective charger. The rectifier shall be provided with heat sink having their own heat dissipation arrangements with natural air cooling. Necessary surge protection devices and rectifier type test acting HRC fuses shall be provided in each arm of the rectifier connections.

k) **Instruments**

One AC voltmeter and one AC ammeter along with selector switches shall be provided for all chargers. One DC voltmeter and DC ammeter (with shunt) shall be provided for all chargers. The instruments shall be of 96 mm X 96 mm square dial & shall be flush type, dust proof and moisture resistant. The instruments shall have easily accessible means for zero adjustment. The instruments shall be of 1.5 accuracy class. In addition to the above a centre zero voltmeter with selector switch shall also be provided for 220 V Chargers for testing purpose.

l) **Air Break Switches**

One DC output switch shall be provided in all chargers. They shall be air break type suitable for 500 Volts AC/ 250 V DC. The contacts of the switches shall open and close with a snap action. The operating handle of the switch shall be fully insulated from circuit. 'ON' and 'OFF' position on the switch shall be clearly indicated. Rating of switches shall be suitable for their continuous load. Alternatively, MCCB's of suitable ratings shall also be acceptable in place of Air Break Switch.

m) **Fuses**

All fuses shall be HRC Link type. Fuses shall be mounted on fuse carriers which are in turn mounted on fuse bases. Wherever it is not possible to mount fuses on carriers, fuses shall be directly mounted on plug-in type base. In such case one insulated fuse pulling handle shall be supplied for each charger. Fuse rating shall be chosen by the Bidder depending on the circuit requirement. All fuses in the chargers shall be monitored. Fuse failure annunciation shall be provided on the failure of any fuse.

n) **Blocking Diode**

Blocking diode shall be provided in the positive pole of the output circuit of each charger to prevent current flow from the DC battery into the charger. All the semiconductor devices shall be protected with power transient suppressor circuit.

o) **Annunciation System**

Audio-visual indications through bright LEDs shall be provided in all Chargers for the following abnormalities: -

- (i) AC Power failure.
- (ii) Rectifier/chargers fuse blown (separate for Float & Float cum boost).
- (iii) Over voltage across the battery when boost charging.
- (iv) Abnormal DC Bus voltage (High/Low)
- (V) Charger Failure
- (v) Any other annunciation if required

Potential free NO contacts of above abnormal conditions shall also be provided for common remote indication "CHARGER TROUBLE" in Owner's Control Board. Indication for charger in float mode and boost mode through indication lamps shall be provided for chargers. A Potential free contact for float/boost mode shall be provided for external interlocks.

p) **Name Plates and Marking**

The name plates shall be white with black engraved letters. On top of each Charger, on front as well as rear sides, larger and bold name plates shall be provided to identify the Charger. Name plates with full and clear inscriptions shall also be provided on and inside of the panels for identification of the various equipment and ease of operation and maintenance.

q). The power factor shall be better than 0.8 lagging at full load and minimum efficiency at half-load is not less than 85% at rated line voltage. It shall be ensured that the harmonics due to Silicon controlled Rectifier commutation are not reflected back into the AC power supply.

3.3.15. **Charger Construction**

The Chargers shall be indoor, floor-mounted, self-supporting sheet metal enclosed cubicle type. The Contractor shall supply all necessary base frames, anchor bolts and hardware. The Chargers shall be fabricated from 2.0mm cold rolled sheet steel and shall have folded type of construction. Removable gland plates for all cables and lugs for power cables shall be supplied by the Contractor. The lugs for power cables shall be made of electrolytic copper with tin coat. Power cable sizes shall be advised to the Contractor at a later date for provision of suitable lugs and drilling of gland plates. The Charger shall be tropicalized and vermin proof. Ventilation louvers, if provided shall be backed with screens. All doors and covers shall be fitted with synthetic rubber gaskets. The chargers shall have hinged double leaf doors provided on front and on backside for adequate access to the Charger's internals. All the charger cubicle doors shall be properly earthed. The degree of protection of enclosure shall be at least IP -42 as per

IS: 13947 Part-1.

All indicating instruments, control switches and indicating lamps shall be mounted on the front side of the Charger. Each Charger shall be furnished completely wired up to power cable lugs and terminal blocks and ready for external connections. The control wiring shall be carried out with PVC insulated, 1.5 sq.mm. Stranded copper wires. Control terminals shall be suitable for connecting two wires, with 2.5 sq.mm stranded copper conductors. Each wire shall be continuous from end to end and shall not have any joint within itself. The insulation grade of the wiring shall be 1100 V grade. The colour of 3 Phase, 4 Wire AC. supply shall be red, yellow, blue and black for phases and neutral. The D.C. wiring shall be of the colour other than the above (preferably grey) with the +ve and -ve marking in the ferrule. All terminals shall be numbered for ease of connections and identification. Each wire shall bare a ferrule or tag on each end for identification. At least 20% spare terminals shall be provided for control circuits. The insulation of all circuits, except the low voltage electronic circuits shall withstand test voltage of 2 KV AC for one minute. An air clearance of at least ten(10) mm shall be maintained throughout for such circuits, right up to the terminal lugs. Whenever this clearance is not available, the live parts shall be insulated or shrouded.

3.3.16. Painting of Charger

The Panels shall be pre-treated using 7-Tank process and then Epoxy Powder Coated with Paint shade of RAL 7032.

The inside of the chargers shall be glossy white. Each coat of finishing synthetic enamel paint shall be properly staved. The paint thickness shall not be less than fifty (70) microns.

3.3.17. TESTS ON CHARGER

Battery Chargers shall conform to all type tests as per relevant Indian Standard. Performance test on the Chargers shall also be carried out on each charger as per specification. Rectifier transformer shall conform to all type tests in IS: 4540 and short circuit test as per IS: 2026. Following type tests shall be carried out for compliance of specification requirements:

- a. Voltage regulation test.
- b. Load limiter characteristics test
- c. Efficiency tests
- d. High voltage tests
- e. Temperature rise test
- f. Short circuit test at no load and full load at rated voltage for sustained short-circuit.
- g. Degree of protection test
- h. Measurement of ripple by oscilloscope.
- i. Temperature compensation feature demonstration

The contractor may be required to demonstrate to the OWNER that the chargers conform to the specification particularly regarding continuous rating, ripple free output, voltage regulation and load limiting characteristic, before dispatch as well as after installation at site. At site the following tests shall be carried out:

- (i) Insulation resistance test
- (ii) Checking of proper annunciation system operation

If a Charger fails to meet the specified requirements, the Contractor shall replace the same with appropriate Charger without affecting the commissioning schedule of the Sub- Station, and without any extra cost to the OWNER.

The Contractor shall present for inspection, the type and routine test certificates for the following components whenever required by the OWNER.

- (i) Switches
- (ii) Relays/MCCBs
- (iii) Instruments
- (iv) DC fuses
- (v) SCR
- (vi) Diodes
- (vii) Condensers
- (viii) Potentiometers
- (ix) Semiconductor
- (x) Annunciator
- (xi) Control wiring
- (xii) Push buttons and contactors

Makes of above equipment shall be subject to Owner's approval.

3.3.18. DOCUMENTATION

The successful bidder shall submit four sets of drawings for approval.

The following drawing shall be supplied with the tender:

Outline drawings of all apparatus showing sufficient details to enable the purchaser to determine whether the design proposed can be installed satisfactorily or not. Wiring diagram of battery charger.

3.3.19 TECHNICAL PARAMETERS

Sl. No	DESCRIPTION	PARTICULARS
1	Type	VRLA
2	Conforming Standards	IS 15549:2004/ IEC 60896-21 & 22:2004/ BS 6290- PART IV/ IEEE-1188
3	System Voltage	110V
4	Maximum Voltage During Float operation	123.75V
5	Minimum Voltage available when no charger working and battery fully discharged upto 1.85V per cell	99V
6	Minimum no. of cell	55
7	Trickle charge voltage	2.2 V to 2.25±0.02V/cell
8	Boost charge voltage	2.23 to 2.3V/cell
9	When a fully charged, battery is put to discharge at a rate of 1/10 th of the Rated Capacity, the battery voltage shall not be less than:	
	After SIX minutes of discharge	1.98 V/cell
	After SIX hours of discharge	1.92 V/cell
	After EIGHT hours of discharge	1.85 V/cell
	After TEN hours of discharge	1.75 V/cell
10	Battery life	1200 or more charge/discharge cycles at 80% Depth of Discharge at an average temperature of 27°C

3.3.19(A): TECHNICAL SPECIFICATION FOR 110V DC BATTERY AND CHARGER

Sl. No	DESCRIPTION	PARTICULARS
1	Type	VRLA
2	Conforming Standards	IEC 60146, IEC 60478, IEC 60529, IEEE C57.12.01, ANSI C63.4, IEEE 446, NEMA 250, NEMA PE5, NFPA 70
3	System Voltage	415V AC +/- 10% 110V DC Battery
4	Name of the Manufacturer	To be furnished by Bidder
5	Location of the Factory	To be furnished by Bidder
6	Type & Model of charger	To be furnished by Bidder
7	Total Dimension of Float cum Boost Charger in mm	To be furnished by Bidder
8	Minimum thickness of sheet (mm)	To be furnished by Bidder
9	Charger Characteristics	To be furnished by Bidder
10	Type of Rectifier with Model	To be furnished by Bidder
11	Capacity of Battery Charger in Amps	As per requirement
12	Float/Trickle charger current in Amps	To be furnished by Bidder
13	Boost/Quick charger current in Amps	To be furnished by Bidder
14	Voltage Regulation of Float charger (%)	To be furnished by Bidder

15	Ripple content (%)	To be furnished by Bidder
16	Schematic & GA drawings submitted	Yes/No
17	List of Alarms	To be furnished by Bidder
18	Audible noise at any point 150 centimeters from any vertical surface	Not exceeding 65dBA
19	Any other relevant information	To be furnished by Bidder

3.3.19 (B): The Battery Charger shall have Dual Source AC Input (AC Input 1 and AC Input 2) with individual MCCB and shall be provided with Auto Changeover arrangement.

3.3.19 (C): The Battery Charger shall have an IP Rating of IP42 or better. The Charger shall be type tested for IP42 or better rating.

Section 5 - Contract Forms

This Section contains the format for Notification of Award, the Contract Agreement and Appendices to the Contract Agreement which, once completed, will form the Contract along with the Section 4. The Bidder should note that this Section shall be completed fully at the time of Contract signing.

[AEGCL's letter head]

Notification of Award

[date]

To: [Name and address of the Contractor]

This is to notify you that your Bid dated *[date]* for execution of the *[name of the work]* against *[Bid identification number]* for the Contract Price in the aggregate of Rupees *[amounts in numbers and words]* (as per Price Schedule-1), as corrected and modified in accordance with the Instructions to Bidders is hereby accepted, and it is decided to award on you the **'Supply, erection, testing and commissioning of battery bank and battery charger for GSS under Bongaigaon T&T Circle'** covering inter-alia supply of all services specified in bidding document.

You are requested to furnish the Performance Security within fifteen (15) days in accordance with the Conditions of Contract, using for that purpose one of the Performance Security Forms included in Section 6 (Contract Forms) of the Bidding Document.

[Authorized Signature]

[Name and Title of Signatory]

Assam Electricity Grid Corporation Limited

Attachment: 1) Price schedule (with arithmetic correction if any)
2) Draft Contract agreement

STAMP

1. Contract Agreement
(Supply and related services Contract)

THIS AGREEMENT made the _____ day of _____, _____,

BETWEEN

Assam Electricity Grid Corporation Limited (herein after referred to as AEGCL), a corporation incorporated under the laws of Company Act, 1956 and having its registered office at First Floor, Bijuli Bhawan, Paltanbazar, Guwahati-781001, Assam and [**name of Contractor**], a firm/company incorporated under the laws of Company Act, 1956 and having its principal place of business at [**address of Contractor**] (hereinafter called "the Contractor"). [~~**in case of JV insert name and address of the Lead Partner as well as other Partners**~~]

WHEREAS AEGCL desires to engage the Contractor to the 'Ex-works Supply Contract' (also referred to as the 'First Contract') covering inter-alia supply of all equipment and materials for the complete execution of '**Supply, erection, testing and commissioning of battery bank and battery charger for GSS under Bongaigaon T&T Circle**' as detailed in the Contract Document ("the Facilities"), and the Contractor has agreed to such engagement upon and subject to the terms and conditions hereinafter appearing.

NOW IT IS HEREBY AGREED as follows:

Article 1
Contract Documents

1.1 Contract Documents

The following documents shall constitute the Contract between the Purchaser and the Contractor, and each shall be read and construed as an integral part of the Contract:

- (a) This Contract Agreement and the Appendices hereto
- (b) Letter of Price Bid and Price Schedules submitted by the Contractor
- (c) Letter of Technical Bid and Technical Proposal submitted by the Contractor
- (d) Special Conditions of Contract
- (e) General Conditions of Supply and Erection.
- (f) Specification (Purchaser's Requirements)
- (g) Drawings (Purchaser's Requirements)
- (h) Other completed Bidding Forms submitted with the Letters of Technical and Price Bids
- (i) Guaranteed and other Technical Particulars (as submitted with the Bid).
- (j) Any other documents shall be added here

1.2 Order of Precedence

In the event of any ambiguity or conflict between the Contract Documents listed above, the order of precedence shall be the order in which the Contract Documents are listed in Article 1.1 (Contract Documents) above.

1.3 Definitions

Capitalized words and phrases used herein shall have the same meanings as are ascribed to them in the SCC.

Article 2
Contract Price and
Terms of Payment

2.1 Contract Price

The Purchaser hereby agrees to pay to the Contractor the Contract Price in consideration of the performance by the Contractor of its obligations hereunder. The Contract Price shall [. . . **amounts in rupees in words** . . .], [. . . **amounts in figures**. . .] as specified in Price Schedule No. 3 (Grand Summary).
The Contract Price is fixed.

2.2 **Terms of Payment**

The terms and procedures of payment according to which the Purchaser will pay the Contractor are given in the Appendix (Terms and Procedures of Payment) hereto.

**Article 3
Commencement Date
and Completion Time**

3.1 **Commencement Date**

The Commencement Date upon which the period until the Time for Completion of the Works shall be counted from is the date when this Contract Document is signed.

3.2 **Completion Time**

The whole works under the scope of this Contract shall be completed within **180 (One Hundred and Eighty Days)** months from Contract Commencement Date.

Article 4. Appendices

4.1 The Appendices listed in the attached List of Appendices shall be deemed to form an integral part of this Contract Agreement.

4.2 Reference in the Contract to any Appendix shall mean the Appendices attached hereto, and the Contract shall be read and construed accordingly.

IN WITNESS WHEREOF the Purchaser and the Contractor have caused this Agreement to be duly executed by their duly authorized representatives the day and year first above written.

Signed by, for and on behalf of the Purchaser

Signed by, for and on behalf of the Contractor

[**Signature**]

[**Signature**]

[**Title**]

[**Title**]

in the presence of

in the presence of

[**Signature**]

[**Signature**]

[**Title**]

[**Title**]

APPENDICES

- Appendix 1 - Special Conditions of Contract
- Appendix 2 - Completion schedule (bar chart)
- Appendix 3 - List of delivery destinations
- Appendix 4 - Performance Security.
- Appendix 5 - Price Schedule.
- Appendix 6 - Guaranteed Technical Particulars

**Appendix 4 - Form of Performance Security
Bank Guarantee**

(To be stamped in accordance with Stamp Act)
(The non-Judicial Stamp Paper should be in the name of issuing Bank)

**Beneficiary: Managing Director, AEGCL
Name and Address of Purchaser**

**Bank's Name:
Address of Issuing Branch or Office:
Email id and phone no for correspondence:**

Bid Security No.:

WHEREAS _____ [name and address of Contractor] (hereinafter called "the Contractor") has undertaken, in pursuance of LoA No. _____ dated _____ to execute _____ [name of Contract and brief description of Works] (hereinafter called "the Contract");

AND WHEREAS it has been stipulated by you in the said Contract that the Contractor shall furnish you with a Bank Guarantee by a recognized/scheduled bank for the sum specified therein as security for compliance with its obligations in accordance with the Contract;

AND WHEREAS we have agreed to give the Contractor such a Bank Guarantee;

NOW THEREFORE we hereby affirm that we are the Guarantor and responsible to you, on behalf of the Contractor, up to a total of _____ [amount of Guarantee] _____ [in words], such sum being payable in the currencies in which the Contract Price is payable, and we undertake to pay you, upon your first written demand and without cavil or argument, any sum or sums within the limits of _____ [amount of Guarantee] as aforesaid without your needing to prove or to show grounds or reasons for your demand for the sum specified therein.

We hereby waive the necessity of your demanding the said debt from the Contractor before presenting us with the demand.

We further agree that no change or addition to or other modification of the terms of the Contract or of the Works to be performed there under or of any of the Contract documents which may be made between you and the Contractor shall in any way release us from any liability under this guarantee, and we hereby waive notice of any such change, addition or modification.

BG expiry date:
BG clam date:

Bank's seal and authorized signature(s)

NOTE

1. *All italicized text is for use in preparing this form and shall be deleted from the final document. An amount is to be inserted by the Guarantor, representing the percentage of the Contract Price specified in the Contract.*
2. *This guarantee shall be valid upto 30 days beyond the Warranty Period as per the Contract.*
3. *For BG amount equal to or more than 50,000.00, BG should be signed by two bank officers to be valid.*
4. **Address of the banker with email and phone number for correspondence with banker should be clearly mentioned. Any correspondence related to the BG with the banker shall be made to the address mentioned in the BG.**