

**ASSAM ELECTRICITY GRID CORPORATION LIMITED**  
**Regd. Office:1st floor, Bijulee Bhawan,Paltanbazar,Guwahati-781001**  
**CIN: U40101 AS2003SGC007238**  
**Phone: 0361-2739520/Fax:0361-2739513 [web: www.aegcl.co.in](http://www.aegcl.co.in)**



**Bidding Document**

**For**

**Supply , Erection, Testing and Commissioning of 33 kV**  
**Vacuum Circuit Breaker for 33 kV Baskandi Feeder at**  
**132 kV Pailapool GSS**

**DEPUTY GENERAL MANAGER**  
**SILCHAR T&T CIRCLE**  
**AEGCL, SILCHAR-788015**

<b>Tender Cost:</b>	<b>₹1,000.00</b>
<b>EMD:</b>	<b>₹7,800.00</b>

For & on behalf of the **Managing Director, AEGCL, the Deputy General Manager, Silchar T&T Circle, AEGCL, Silchar**, invites tenders in prescribed form, from reputed Firms/Contractors/Manufacturers with sound technical and financial capabilities for the following work. A single stage two envelope procedure (**Techno-Commercial and Price Bid**) will be adopted for this tender.

Sl. No.	Name of work	Estimated Cost In INR	Time of Completion In Days	Bidding Address
1	Supply, Erection, Testing and Commissioning of 33 kV Vacuum Circuit Breaker for 33 kV Baskandi Feeder at 132 kV Pailapool GSS	3,87,925.00	150 days from the date of issue of Supply order	O/o The DGM, Silchar T&T Circle, AEGCL, Silchar, Meherpur, Silchar-15

**1.0 Cost of Bidding Document:**

Bidder has to pay Non-Refundable tender document cost of **Rs.1,000.00 (Rupees One Thousand)** only in the form of A/C payee Demand draft (Non-refundable) pledged in favour of “**Managing Director, AEGCL, Paltan Bazar, Guwahati-01**”, payable at Guwahati.

**2.0 Bidding Address:**

Tender papers can be purchased on application in plain paper from the **Deputy General Manager, Silchar T&T Circle, AEGCL, Silchar**.

**3.0 Key Dates: -**

a) Bid Document available in Website	12:00 Hrs of 01-10-2024
b) Bid Submission Start Time & date:	12:00 Hrs of 01-10-2024
c) Bid Submission end time & date:	14:00 Hrs of 21-10-2024
d) Techno-Commercial Bid Opening time:	11:30 Hrs of 22-10-2024

**4.0 Bidding Procedure :**

- All Tenders shall have to be submitted in prescribed forms attached herewith eventually to be drawn up in the rules of AEGCL.
- Two different envelopes to be used as follows:-  
**Envelope-1 (Technical Bid):** Bid document signed by the bidder on all pages, Tender fee, Earnest Money, Techno-commercial data of the Bidder, GTP and other mandatory documents must be enclosed.  
**Envelope-2 (Price Bid):** As per format of the Price Bid attach.
- 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 corner.
- All tenders shall have to be submitted/drop in the concerned tender box on or before the last date and time of submission of tenders either by post or in person.
- 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.
- Bidder submitting Bid in person should submit their Bid in the tender box during the working hours on or before the last date and time of submission of tender.
- Tender will be rejected if submitted beyond the aforesaid time and date.
- 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.

## **5.0 Validity of Bids and Bids Prices:**

- a) Bids shall remain valid for a 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. If a bid security shall also be extended for a corresponding period.
- b) Bidder may refuse the request without forfeiting its bid security. A Bidder granting the request shall not be required or permitted to modify its bid.

## **6.0 Bid Security:**

- a) All bids must be accompanied by a bid security amounting to **Rs. 7,800.00** only in the form of **Demand Draft** from any Nationalized Bank payable at Guwahati in favour “**Managing Director, AEGCL, Paltan Bazar, Guwahati-01**”, payable at Guwahati.
- b) Any bid not complying with the terms and conditions then his bid shall be rejected by the Employer as non-responsive.
- c) The earnest money of the successful Bidder shall be returned when the successful Bidder has signed the Contract and furnished the required performance security.
- d) The earnest money of the unsuccessful Bidders shall be returned as promptly as possible when the successful Bidder has signed the Contract.
- e) The earnest money may be forfeited:
  - If a Bidder withdraws its bid during the period of bid validity specified by the Bidder.
  - If the successful Bidder fails to Sign the Contract with in the specified period.
- f) The Bid Security of a JV shall be in the name of the JV that submits the bid.

## **7.0 Format and Signing of Bid:**

- a) The Bidder shall prepare one original copy of the Technical Bid and one original copy of the Price Bid comprising the Bid and clearly mark it —ORIGINAL - TECHNICAL BID and —ORIGINAL - PRICE BID.

In addition, the Bidder shall submit three copies of the bid, in the number specified and clearly mark each of them —COPY. In the event of any discrepancy between the original and the copies, the original shall prevail.
- b) The original and all copies of the Bid shall be typed or written in indelible ink and shall be signed by a person duly authorized to sign on behalf of the Bidder. This authorization shall consist of a written confirmation as specified in the Bid Document and shall be attached to the bid. The name and position held by each person signing the authorization must be typed or printed below the signature. All pages of the bid where entries or amendments have been made shall be signed or initialed by the person signing the bid.
- c) A bid submitted by a JV shall be signed so as to be legally binding on all partners.
- d) Any interlineations, erasures, or overwriting shall be valid only if they are signed or initialed by the person signing the bid.

## **8.0 Eligible Bidders:**

- a) A Bidder may be a private entity or a government-owned entity or any combination of such entities with the intent to enter into an agreement supported by a letter of intent or under an existing agreement in the form of a joint venture, consortium, or association (JV). In the case of a JV:
  - All partners shall be jointly and severally liable, and
  - The JV shall nominate a Representative who shall have the authority to conduct all business for and on behalf of any and all the partners of the JV during the bidding process and, in the event the JV is awarded the Contract, during contract execution.
- b) 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.

- c) AEGCL considers a **conflict of interest** to be a situation in which a party has interests that could improperly influence that party's performance of official duties or responsibilities, contractual obligations, or compliance with applicable laws and regulations, and that such conflict of interest may contribute to or constitute a prohibited practice under Anticorruption Policy of Government of India and Government Of Assam. In pursuance Anticorruption Policy's requirement that Employer as well as bidders, suppliers, and contractors observe the highest standard of ethics. AEGCL will take appropriate actions if it determines that a conflict of interest has flawed the integrity of any procurement process.
- d) A firm that is under a declaration of ineligibility by the AEGCL or any Government Entity or PSU at the date of the deadline for bid submission or thereafter i.e. on or before contract signing date shall be disqualified. Bidders shall provide such evidence of their continued eligibility satisfactory to the AEGCL, as the Employer shall reasonably request.

## **9.0 Financial Capability:**

- a) 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.
- b) **Average Annual Turnover:** Minimum average annual turnover **INR 1,16,377.50** calculated as total certified payments received for contracts in progress or completed, within the last 3 (Three) Years.

## **10.0 Work Experience:**

- a) Experience on similar nature of works under contracts in the role of manufacturers, contractor, subcontractor, or management contractor for at least the last 5 (Five) years prior to the bid submission deadline.
- b) The Bidder should have successfully completed similar works within last 5 (Five) Financial years. Documentary evidence such as Work Order, Completion Certificate, etc. should be submitted as per below mentioned criteria:
- **Three (3) similar** completed works costing not less than **Rs.1,55,170.00**
  - **Two (2) similar** completed works costing not less than **Rs. 1,93,962.50**
  - **One (1) similar** completed works costing not less than **Rs. 3,10,340.00**
- c) The Bidder must have experience of executing work of similar nature previously in AEGCL/APDCL or any other government organization or PSU. The bidder must submit experience and completion certificate for scrutiny by AEGCL. Each of such project/ works should consist of completion certificate.

## **11.0 Evaluation Criteria:**

- a) **Evaluation will be done on the basis of Bid Clause No. 8.0 : Eligible Bidders, Cl. No. 9.0 : Financial Capability, Cl. No. 10.0 : Work Experience and in accordance with the Annexure I to be duly filled in, signed and submitted by the bidder.**
- b) Price Bid of only **Responsive and Qualified Techno-Commercial Bidders** will be opened.
- c) **Price Bid Envelope of the Non-responsive Techno Commercial Bidders will be returned** to the respective bidders against submission of a written request by the bidder.

## **12.0 Correction of Errors in the Price Bid:**

- a) **Arithmetical Error**, if observed while in Price Bid evaluation, same will only be corrected.
- b) Arithmetic Errors in the Price Bid will be rectified on the following basis:
- If there is a 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 a 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.
  - The amount stated in the Price Bid will 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.

- c) **Any post bid correction request will NOT BE ENTERTAINED.**

### **13.0 Bid Evaluation Process for Abnormally Low Bids (ALB):**

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 the 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:** -When there are at least 5(five) nos. of substantially responsive bids and the lowest bid price is 20% or more below AEGCL's cost estimate. 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.

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 an ALB, the tender evaluation committee of the respective tenders shall undertake the following three stage review process which are as below:

- i. Identify ALB as per the steps mentioned in Clause No. (a). (i) and (a). (ii), whichever is applicable.
- ii. To seek and analyses the clarifications from the abnormally low Bidder in terms of resource inputs and pricing, including overheads, contingencies and profit margins. In that respect, the committee may refer to guideline of World Bank, AIIB, ADB etc. prescribed for ALB.
- iii. To decide whether to accept or reject the bid.

- (c) Additional Performance Security In case of acceptance of ALB:

- i. If any abnormally low bid is accepted with additional performance security, it is to be noted that the total performance security should not exceed 20% of the total contract value.
- ii. The additional performance security shall be treated as part of the original performance security and shall be valid for a period similar to that applicable for defect liability period of the contract.
- iii. Non submission of the additional performance security shall constitute sufficient ground for rejection of the bid and similar assessment shall then be initiated for next ranked bidder if that bidder is also identified as ALB.

### **14.0 Late Bid:**

- a) Any bid submitted *after the due date and time* will be rejected without any prejudice.
- b) 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.
- c) Bidding through **EMAIL WILL NOT BE ACCEPTED.**

### **15.0 Clarification on Bid Documents and Contacting AEGCL:**

- a) A prospective Bidder requiring any clarification of the Bidding Document shall contact the AEGCL in writing at the AEGCL's address (**O/o the Deputy General Manager, Silchar T&T Circle, AEGCL, Silchar-788015**) and raise his enquiries prior to 7 (seven) days of closing of the bid. The Employer will respond to any request for clarification, provided that such request is received no later than seven (7) 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.

- b) 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.
- c) 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.

#### **16.0 Amendment of Bidding Document:**

- a) At any time prior to the deadline for submission of bids, the Employer may amend the Bidding Document by issuing addenda.
- b) 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.
- c) 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.

#### **17.0 Preparation of Bids by the Bidders:**

- a) **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.
- b) **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.

#### **18.0 Bid Prices and Discounts:**

- a) 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.
- b) 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.
- c) Bidders are required to quote the price for the commercial, contractual and technical obligations outlined in the bidding document.
- d) Sales Tax, GST and all other taxes (as applicable) payable on the work should be indicated separately. In case of failure to indicate so AEGCL will consider such taxes are included in the Offered Price.
- e) Since the work being "work contract" which is one and individual and which involves no separate contract for the sale of materials, the contractor shall have not be entitled to get any VAT and or any other taxes, levies reimbursed from the AEGCL for the supply of the materials.
- f) Taxes like work contract, income tax etc. which need to be deducted at source as per the prevailing law of the land, will be deducted at source.

g) **The Prices shall be FIXED and 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.

**19.0 Mandatory Documents:**

- i) Bidders(s) knowledge from actual personal investigation of the resources of the region or District (S) in which he/they offers the work.
- ii) The Bidder shall furnish copy of their **PAN Card**. In case the bidder is a partnership Firm, the **PAN** card must be in the name of firm.
- iii) In case the bidder is a partnership Firm, the **work experience, solvency and turn over** shall be in the name of **partnership Firm** only.
- iv) **GST registration No.**
- v) **Registered Power of attorney, if any.**
- vi) **IT Return for last three Years.**
- vii) **Audited Balance Sheet for last three years.**
- viii) **Bank Solvency Certificate**
- ix) **GTP of the equipment to be supplied.**
- x) **Manufacturer's authorization.**
- (ix) **Valid Electrical License (132 kV & above)**

**20.0 SCOPE OF WORK:-**

**20.1 Intent of specification:**

This section of the specification deals with the technical information & criteria for "**Supply, Erection, Testing and Commissioning of 33 kV Vacuum Circuit Breaker for 33 kV Baskandi Feeder at 132 kV Pailapool GSS**". The Contractor's proposal shall be based on the use of materials complying fully with the requirements specified herein.

**20.2 Scope of Works :-**

The various activities under the scope of work shall among other related aspects cover the following:-

- a) **Supply, Erection, Testing and Commissioning of 33 kV Vacuum Circuit Breaker for 33 kV Baskandi Feeder at 132 kV Pailapool GSS.**
- b) Loading at manufacturer's works, transportation and delivery at the substation site, including unloading at destination site.
- c) Freight & Transit Insurance, storage at site and site insurance of all materials at site shall be in the scope of the contractor.
- d) Arrangements of any permits required for transportation and movement of supplied materials. However, AEGCL shall assist as far as practicable in the process.

**20.3 Supplier to Inform himself fully:-**

- The supplier should ensure that he has examined the specifications and schedules as brought out in this section as well as other sections of the Bidding Document and has satisfied himself as to all the conditions and circumstances affecting the contract price and fixed his price according to his own views on these matters and acknowledge that no additional allowances except as otherwise provided therein will be levied.
- The Purchaser shall not be responsible for any misunderstanding or incorrect information obtained by the contractor other than information given in writing by the Purchaser.

**20.4 Service Conditions:-**

The plant and materials supplied shall be suitable for operation under the following climatic and other conditions:

<b>Peak ambient day temperature in still air</b>	<b>: 45<sup>0</sup>C</b>
<b>Minimum night temperatures</b>	<b>: 0<sup>0</sup>C</b>
<b>Reference ambient day temperature</b>	<b>: 45<sup>0</sup>C</b>
<b>Maximum Relative Humidity</b>	<b>: 100%</b>
<b>Minimum Relative Humidity</b>	<b>: 10%</b>
<b>Altitude</b>	<b>: Below 1000 M above MSL</b>
<b>Maximum Wind Pressure</b>	<b>: As per IS:802 latest code</b>
<b>Seismic Intensity</b>	<b>: ZONE-V as per IS 1893</b>

## **20.5 Conformity with Indian Electricity Rules & Other Local Regulations:-**

- The Supplier shall note that all substation works shall comply with the latest provisions of Indian Electricity Rules and with any other regulations. Local authorities concerned in the administration of the rules and regulations relating to such works shall be consulted, if necessary, about the rules and regulations that may be applicable.
- All registration and statutory inspection fees, if any, in respect of his work pursuant to this Contract shall be to the account of the contractor.

## **20.6 Standards:-**

- The equipment covered under this Bidding Document shall, unless otherwise stated be designed, constructed and tested in accordance with the latest revisions of relevant Indian Standards and shall conform to the regulations of local statutory authorities.
- In case of any conflict between the standards and this specification, this specification shall govern.
- Equipment conforming to other International or authoritative Standards which ensure equivalent or better performance than that specified above shall be accepted. In that case relevant extracts of the same shall be forwarded with the bid.

## **20.7 Engineering Data:-**

- The furnishing of engineering data by the supplier shall be in accordance with the Bidding Document. The review of these data by the Purchaser will cover only general conformance of the data to the specifications and not a thorough review of all dimensions, quantities and details of the materials, or items indicated or the accuracy of the information submitted. This review by the Purchaser shall not be considered by the supplier as limiting any of his responsibilities and liabilities for mistakes and deviations from the requirements, specified under these specifications.
- All engineering data submitted by the supplier after review by the Purchaser shall or part of the contract document.

## **20.8 Drawings and Documents for approval:-**

- All necessary drawings and documents required for completion of the project is to be submitted by the contractor for approval. The drawings provided with bid (if any) are for indicative purpose only and fresh drawings are to be prepared by the contractor as per actual site condition after survey. The drawings and documents are to be approved by AEGCL before procurement or commencement of work.
- All drawings submitted by the Contractor including those submitted at the time of Bid shall be with sufficient detail to indicate the type, size, arrangement, dimensions, material description, Bill of Materials, weight of each component break- up for packing and shipment, fixing arrangement required, the dimensions required for installation and any other information specifically requested in these specifications.
- Each drawing submitted by the Contractor shall be clearly marked with the name of the Employer, the specification title, the specification number and the name of the Project. All titles, noting, markings and writings on the drawing shall be in English. All the dimensions should be to the scale and in S.I. units.
- **The drawings submitted for approval to the Employer shall be in quadruplicate.** One print of such drawings shall be returned to the Contractor by the Employer marked "approved/approved with corrections". The contractor shall there upon furnish the Employer additional prints as may be required along with one reproducible in original of the drawings after incorporating all corrections.
- The Contractor shall perform the work strictly in accordance with these drawings and no deviation shall be permitted without the written approval of the Employer, if so required.
- All manufacturing, fabrication and erection work under the scope of Contractor prior to the approval of the drawings shall be at the Contractor's risk. The contractor may make any changes in the design which are necessary to conform to the provisions and intent of the contractor and such changes will again be subject to approval by the Employer.
- The approval of the documents and drawings by the Employer shall mean that the Employer is satisfied that:
  - a) The Contractor has completed the part of the Works covered by the subject document (i.e. confirmation of progress of work).
  - b) The Works appear to comply with requirements of Specifications.
- In no case the approval by the Employer of any document does imply compliance with neither all technical requirements nor the absence of errors in such documents. If errors



are discovered any time during the validity of the contract, then the Contractor shall be responsible of their consequences.

- For equipment and items in the scope of supply:
  - a) General arrangement drawing with full dimensions.
  - b) Electrical schematic diagram, where applicable.
  - c) Wiring diagram, where applicable.
- All Designs/Drawings/Calculations/Data submitted by the contractor, from time to time shall become the property of the Employer and Employer has the right to use or replicate such designs for future contracts / works without the permission of the Contractor. The Employer has all rights to use/ offer above designs/drawings/data sheets to any other authority without prior Permission of the Contractor.

#### **20.9 Final Drawings and Documents:-**

The successful supplier shall require providing following documents and drawings for each bay constructed in printed form:

- a) *Instruction manuals of all equipment in 3 (Three) copies.*  
*This instruction manual shall generally consist of*
  - *Operation Manuals*
  - *Maintenance Manuals and*
  - *Spare Parts Bulletins*
- b) *Copies of routine test reports (in triplicate) of relevant equipment.*
- c) *Final guaranteed and other technical particulars of relevant equipment.*

In addition to the above, the contractor shall provide **5 (Five) sets** of all drawings and documents to Purchaser in printed form for his reference and record.

#### **20.10 Quality Assurance Documents:-**

- The contractor shall be required to submit all the quality assurance documents as stipulated in the quality plan at the time of Purchaser's inspection of equipment/material.
- The Purchaser or his duly authorized representatives reserves the right to carry out quality audit and quality surveillance of the systems and procedures of the contractors/his vendors quality management and control activities.

#### **20.11 Employer's Supervision:-**

- a) To eliminate delays and avoid disputes and litigation it is agreed between the parties to the Contract that all matters and questions shall be resolved in accordance with the provisions of this document.
- b) The manufacturing of the product shall be carried out in accordance with the specifications. The scope of the duties of the Employer, pursuant to the contract, will include but not be limited to the following.
  - Interpretation of all the terms and conditions of these Documents and Specifications.
  - Review and interpretation of all the Contractors drawings, engineering data etc.
  - Witness or authorize his representative to witness tests at the manufacturer's works or at site, or at any place where work is performed under the contract.
  - Inspect, accept or reject any equipment, material and work under the Contract, in accordance with the Specifications.
  - Issue certificate of acceptance and/or progressive payment and final payment certificate.
  - Review and suggest modification and improvement in completion schedules from time to time,
  - Supervise the Quality Assurance Programme implementation at all stages of the works.

#### **20.12 Inspection and Inspection Certificate:-**

- The Employer, his duly authorized representative and/or outside inspection agency acting on behalf of the Employer shall have, at all reasonable times, access to the

premises and works of the Contractor and their sub-contractor(s)/sub-vendors and shall have the right, at the reasonable times, to inspect and examine the materials and workmanship of the product during its manufacture.

- All routine and acceptance tests whether at the premises or works of the Contractor or of any Sub Contractor, the Contractor except where otherwise specified shall carry out such tests free of charge. Items such as labours, materials, electricity, fuel, water, stores apparatus and instruments as may be reasonably demanded by the Employer/inspector or his authorized representative to carry out effectively such tests in accordance with the Contract shall be provided by the Contractor free of charge.
- If desired by the Employer, the Contractor shall also carry out type tests as per applicable Standards for which Employer shall bear the expenses except in cases where such tests have to be carried out. The Contractor is required to quote unit rates of type test charges in a separate Schedule (if such schedule is provided in the Bidding Document). However, these type test charges shall not be taken into account in comparing Price Bid.
- The inspection by Employer and issue of Inspection Certificate thereon shall in no way limit the liabilities and responsibilities of the Contractor in respect of the agreed Quality Assurance Programme forming a part of the Contract.

### **20.13 Tests:-**

- The type, acceptance and routine tests and tests during manufacture to be carried-out on the material and equipment shall mean as follows:
  - a) **Type Tests:** - Type Tests shall mean those tests, which are to be carried out to prove the process of manufacture and general conformity of the material to this Specification. These tests shall be carried out on samples prior to commencement of commercial production against the order. The Bidder shall indicate his schedule for carrying out these tests.
  - b) **Acceptance Tests:** - Acceptance Tests shall mean those tests, which are to be carried out on samples taken from each lot offered for pre-dispatch inspection, for the purposes of acceptance of that lot.
  - c) **Routine Tests:** - Routine Tests shall mean those tests, which are to be carried out on the material to check requirements, which are likely to vary during production.
  - d) **Tests during Manufacture:** - Tests during manufacture shall mean those tests, which are to be carried out during the process of manufacture and end inspection by the Contractor to ensure the desired quality of the end product to be supplied by him.
- The norms and procedure of sampling for these tests will be as per the Quality Assurance Programme to be mutually agreed to by the Contractor and the Employer.
- The standards and norms to which these tests will be carried out are specified in subsequent Sections of this Specification. Where a particular test is a specific requirement of this Specification, the norms and procedure of the test shall be as specified or as mutually agreed to between the Contractor and the Employer in the Quality Assurance Programme.
- For all type and acceptance tests, the acceptance values shall be the values specified in this Specification or guaranteed by the Bidder or applicable Standards, as applicable.

### **20.14 Type Test Reports:-**

- Materials, which have never been tested for critical performance, shall not be accepted. In such cases, a promise or agreement by a bidder to have the equipment tested after award of a contract is not acceptable.
- All Bids must be accompanied by the Type Test Certificates of materials offered. Such type test certificates shall be acceptable only if:
  - i) Tests are conducted in an independent testing laboratory with NABL accreditation/CPRI,
  - ii) Tests are conducted in manufacturer's own laboratory.

In this case

- (a) The laboratory must have NABL accreditation; and
  - (b) Tests have been witnessed by technically qualified representatives of earlier clients or purchaser.
- Test reports to be acceptable must be related directly to the equipment offered i.e. it is fully identical in design, rating and construction with the equipment for which the type test certificates have been submitted. Test reports for higher class (by capacity/voltage

etc.) of equipment are acceptable with commitment to perform the type tests free of any charge on the particular equipment after the award of contract.

- **Type Test Reports older than five (5) years on the date of Technical bid opening shall not be accepted.**

#### **20.15 Guaranteed Technical Particulars:-**

- The Guaranteed Technical Particulars of the various items shall be furnished by the Bidders with the Technical Bid in the prescribed Schedules attached in this bidding document. The Bidder shall also furnish any other information's as in their opinion is needed to give full description and details to judge the item(s) offered by them.
- The data furnished in Guaranteed Technical Particulars should be the minimum or maximum value (as per the requirement of the specification) required. A Bidder may guarantee a value more stringent than the specification requirement. However, for testing purpose or from performance point of view, the material shall be considered performed successfully if it achieves the minimum/maximum value required as per the technical specification. No preference whatsoever shall be given to the bidder offering better/more stringent values than those required as per specification except where stated otherwise.

#### **20.16 Materials Handling and Storage:-**

- All the supplies under the Contract as well as Employer supplied items (if any) arriving at site shall be promptly received, unloaded and transported and stored in the stores by the Contractor.
- Contractor shall be responsible for examining all the shipment and notify the Employer immediately of any damage, shortage, discrepancy etc. for the purpose of Employer's information only. The Contractor shall submit to the Employer every week a report detailing all the receipts during the week. However, the Contractor shall be solely responsible for any shortages or damages in transit, handling and/or in storage and erection at site. Any demurrage, and other such charges claimed by the transporters, railways etc., shall be to the account of the Contractor.
- The Contractor shall maintain an accurate and exhaustive record-detailing out the list of all items received by him for the purpose of erection and keep such record open for the inspection of the Employer.
- All items shall be handled very carefully to prevent any damage or loss. The materials stored shall be properly protected to prevent damage. The materials from the store shall be moved to the actual location at the appropriate time so as to avoid damage of such materials at Site.
- All the materials stored in the open or dusty location must be covered with suitable weather-proof and flameproof covering material wherever applicable.
- The Contractor shall be responsible for making suitable indoor storage facilities, to store all items/materials, which require indoor storage.
- The Contractor shall have total responsibility for all equipment and materials in his custody, stored, loose, semi-assembled and/or erected by him at site. The contractor shall make suitable security arrangements including employment of security personnel to ensure the protection of all materials, equipment and works from theft, fire, pilferage and any other damages and loss.

### **21.0 SPECIFICATION OF 36 KV OUTDOOR TYPE PORCELAIN CLAD VACUUM CIRCUIT BREAKERS (PCVCB):-**

#### **GENERAL TECHNICAL REQUIREMENTS:-**

##### **21.1 INTRODUCTION:-**

The circuit breakers should be complete in all respects with insulators, bimetallic connectors, interrupting chamber, operating mechanism control cabinet, interlocks, auxiliary switches indicating devices, supporting structures, accessories, etc., described herein and briefly listed in the schedule of requirements. The scope of supply shall also include necessary special tools and plants required for erection as indicated, if any.

##### **21.2 STANDARDS:-**

The circuit breaker shall conform in all respects to the requirements of latest issue of IS/IEC specifications except for modifications specified herein. The equipment manufactured according to any other authoritative standards which ensure an equal or better quality than the provision of IS/IEC specifications shall also be acceptable. The salient point of difference between the proposed standard and provision of these specification shall

be clearly brought out in the tender. A copy of English version of such specifications shall be enclosed with the tender.

The list of standards mentioned in this specification and to which the circuit conform is given below:

1.	IEC-62271-100	High Voltage A.C. Circuit Breakers
2.	IEC-60137	Bushing for alternating Voltages above 1000 volts
3.	IEC-60071	Insulation Co-ordination
4.	IEC-60694	Common clauses for high voltages switchgear and control gear standards
5.	IEC-60815	Specification for Creepage distances
6.	IS-13118	Specifications for high voltage alternating current circuit breakers
7.	IS-2099	High voltages porcelain bushings
8.	IS-4379	Identification of the contents of industrial gas cylinders
9.	IS-3072	Installation and maintenance of switchgear
10.	IEC-60267	Guide for testing of circuit breakers with respect to out of phase switching
11.	IS-802	Code of practice for use of structural steel in overhead transmission lines
12.	IEC-17A Study Group Dec.1981	Sealing of interrupters / breakers
13.	IS-1554	PVC insulated cables upto and including 1000 volts
14.	IS-5	Colors for ready mixed paints and channels
15.	Ref.Standard IES	Internal Electro-Technical Commission Bureau Central Data Commission, Electro Technique International, 1, Ruede Verembe, Geneva, Switzerland
16.	IS	Indian Standard Bureau of India Standard, Manak Bhawan 9, Bahadurshah Zafar Marg, New Delhi – 110 002, India

### **21.3 SERVICE CONDITONS :-**

#### **AUXILIARY POWER SUPPLY**

Auxiliary electrical equipment shall be suitable for operation on the following supply system

a)	Power Devices (like motors)	415 V, 3 phase 4 wire 50 Hz, neutral grounded AC supply
b)	DC Alarm, Control and Protective Devices	110 V/30 V DC, ungrounded 2 wire (Substation wise exact details shall be furnished by the successful bidder after survey)
c)	Lighting	240 V, single phase 50 Hz AC supply

Bidder's scope includes supply of interconnecting cables, terminal boxes, etc. The above supply voltage may vary as indicated below and all devices shall be suitable for continuous operation over the entire range of voltages

i)	AC Supply	Voltage + 10% -15% Frequency $\pm$ 5%
ii)	DC Supply	-15% to + 10%

### **21.4 GENERAL REQUIREMENT OF 36 KV/OUTDOOR VACUUM CIRCUIT BREAKERS :-**

The vacuum type circuit breaker shall have vacuum interrupters, designed to provide a long contact life at all currents upto rated making and breaking current during switching operation. The vacuum interrupters sealed for life shall be encapsulated by porcelain insulators for outdoor installation requirement of the circuit breakers. The offered breakers shall be suitable for outdoor operation under climatic conditions specified without any protection from sun, rain and dust storm.

The vacuum interrupters of each phase shall be housed in a separate porcelain insulator. The three identical poles shall be mounted on a common base frame and the contact system of three poles should be mechanically linked to provide three pole gang opening/closing for all type of faults.

- i) The offered equipment shall be practically maintenance free over a long period.

- ii) All mechanical parts and linkages shall be robust in construction and maintenance free, over at least 10,000 switching operations, except for lubrication of pins/articulated joints at interval of 5 years or 5000 operations.
- iii) Similar parts shall be strictly interchangeable without special adjustment of individual fittings. Parts requiring maintenance shall be easily accessible, without requiring extensive dismantling of adjacent parts.
- iv) The operating mechanism will be self maintained and of proper operation endurance not less than the mechanical life of circuit breaking unit. It shall be spring operated type described hereinafter.
- v) The circuit breaker shall be supplied complete with all auxiliary equipment, meant necessary for the safe operation, routine and periodic maintenance. All internal wiring including those of spare auxiliary contacts shall be complete and wired up to terminal blocks.
- vi) The breaker shall be totally re-striking free under all duty conditions. The details of any device incorporated to limit or control the rate of rise of re-striking voltage across the circuit breaker contacts shall be stated.
- vii) The breaker shall be reasonably quiet in operation and the noise level shall not exceed 140 decibels.
- viii) The breaker shall be suitable for three phase re-closing operation.
- ix) An operation counter, visible from the ground level even with the mechanism housing closed shall be provided.

**21.5 FIXED AND MOVING CONTACT :-**

The fixed and moving contacts of the breaker have to ensure permanent full contact during closing. All making and breaking contacts shall be hermetically sealed and free from atmospheric effects.

The main contacts should have low contact resistance.

**21.6 RECOVERY VOLTAGE AND POWER FACTOR :-**

The circuit breaker shall be capable of interrupting rated power with recovery voltage equal to the rated maximum line to line service voltage at rated frequency and at a power factor equal to or exceeding 0.15. In case of multiple break circuit breaker, devices/method adopted for ensuring uniform voltage distribution across all the breaks shall be indicated and actual voltage distribution recorded during interruption tests shall be furnished with the bid.

**21.7 RESTRICKING RECOVERY :-**

The complete data for the phase factor, amplitude factor, etc., for rate of rise of re-striking voltage shall be furnished in the tender.

**21.8 LINE CHARGING INTERRUPTING CAPACITY :-**

- The circuit breaker shall be designed so as to be capable of interrupting line charging currents without undue rise in the voltage on the supply side without re-strike and without showing sign of undue strains.
- The maximum permissible switching over voltage shall not exceed 2.5 p.u. The guaranteed over voltage, which will not be exceeded while interrupting the rated line charging current for which the breaker is designed to interrupt shall also be stated. The results of the tests conducted along with the copies of the oscillographs to prove ability of the breakers to interrupt the rated as well as lower values of the line charging current shall be furnished with the tender.

**21.9 TRANSFORMER CHARGING CURRENT BREAKING CAPACITY :-**

The breaker shall be capable of interrupting inductive currents, such as those occurring while switching off unloaded transformers, without giving rise to undue over voltage and without re-strikes. The maximum over voltage value, which will not be exceeded under such conditions shall be stated in the tender.

**21.10 BREAKING CAPACITY FOR SHORTLINE FAULTS :-**

The interrupting capacity of the breaker for short line faults shall be stated in the tender. The details of the test conducted for proving the capability of the breaker under a short line fault occurring from one phase to earth conditions shall also be stated in the tender. The rated characteristics for short line faults shall be in accordance with stipulation contained in clause 4.105 of IEC 62271-100.

### **21.11 AUTOMATIC RAPID RECLOSING :-**

36 kV circuit breaker shall be suitable for 3 pole rapid re-closing.

### **21.12 OUT OF PHASE SWITCHING :-**

The circuit breaker shall be capable of satisfactory operation even under conditions of phase opposition that may arise due to faulty synchronization. The maximum power that the breaker can satisfactorily interrupt under "Phase Opposition" shall be stated in the bid".

### **21.13 TEMPERATURE RISE:-**

- The maximum temperature attained by any part of the equipment when in service at side and under continuous full load conditions and exposed to the direct rays of the sun shall not exceed the permissible limits fixed by IEC. When the standards specify the limits of temperature rise these shall not be exceeded when corrected for the difference between ambient temperature specified in the approved specification.
- The limits of temperature rise shall also be corrected for altitude as per IEC and stated in the bid.

### **21.14 INSULATORS SUPPORTS AND HOUSING :-**

- The porcelain used shall be homogenous, free from cavities and other flaws. The insulators shall be designed to have ample insulation, mechanical strength and rigidity for satisfactory operation under conditions specified above. The puncture strength of bushing shall be greater than the flash over value. The design of bushing shall be such that the complete bushing in a self-contained unit and no audible discharge shall be detected at a voltage upto a working voltage (Phase Voltage) plus 10%. The support insulator shall conform to IEC-60137. Minimum clearance between phases, between live parts and grounded objects shall be as per IS-3072-1975 and should conform to Indian Electricity Rules-1956. The minimum creepage distance for severely polluted atmosphere shall be 25 mm/KV as per IEC-815-1985.
- The air clearance of bushing should be such that if the bushings were tested at an altitude of less than 1000 meters, air clearance would withstand the application of higher voltages (IS-2099-1973 para 6.1). In order to avoid breakdown at extremely low pressures the support insulators should not be covered by moisture and conducting dust. Insulators should therefore be extremely clean and should have antitracking properties. Sharp contours in conducting parts should be avoided for breakdown of insulation. The insulators shall be capable to withstand the seismic acceleration of 0.3 g in horizontal direction.

### **21.15 OPERATING MECHANISM GENERAL REQUIREMENTS :-**

The operating mechanism shall be stored energy type and capable of giving specified duty of the breaker (sequence of opening and closing) as specified under O-0.3 sec-CO-3 min-CO. The breaker shall also pass the operational test which ascertains the capabilities of operating mechanism. The operating mechanism shall be capable to perform the following functions efficiently.

- i) To provide means where the circuit breaker can be closed rapidly, at all currents from zero to rated making current capacity.
- ii) To hold the circuit breaker in closed position by toggles or latches till the tripping signal is received.
- iii) To allow the circuit breaker to open without delay immediately on receiving tripping signal.
- iv) To perform auto re-closure duty cycle.
- v) To perform the related functions such as indication, contacts, etc.

Operating mechanism should also be suitable for three phase auto re-close duty. The closing spring shall be automatically charged by motor immediately after closing operation. In case of failure of supply to the spring charging motor, the spring shall be chargeable by hand-crank.

#### **a) TRIPPING/CLOSING COILS :-**

The circuit breakers shall be provided with two trip coils and one closing coil per breaker. First trip coil shall be utilized for tripping the breaker on main protection fault detection. Whereas second trip coil shall be used to trip the breaker when first trip coil fails to trip the breaker and backup protection comes into operation and shall also be used to trip the breaker on command. Provision shall be given for trip circuit supervision both in pre close and post close condition of the breaker. All the breakers

shall have provision for independent electrical operation of trip coils from local as well as remote through local/remote selector switch.

**b) TRIP FREE FEATURES :-**

- When the breaker has been instructed to close by manual instructions using push button, the operating mechanism will start operating for closing operations. If in the mean time a fault has taken place, the relay provision shall be such that it should close the trip circuit simultaneously interrupting the live circuit of closing coil which has been instructed for close command.
- The trip free mechanism shall permit the circuit breaker to be tripped by the protective relay even if it is under the process of closing. An anti-pumping device to prevent the circuit breaker from reclosing after an automatic opening shall be provided to avoid the breaker from pumping i.e., anti pumping relay should interrupt the closing coil circuit.

**c) Controls :-**

- The circuit breaker shall be controlled by a control switch located in the control cabinet . The control arrangement shall be such as to disconnect the remote control circuits of the breaker, when it is under test. Local control devices, selector switch and position indicator shall be located in weather and vermin-proof cabinet with degree of protection not less than IP-55. The circuit breaker control scheme shall incorporate trip circuit supervision arrangement. Local/remote selector switch shall be provided for all breakers for selection of “Local” control/remote control.
- Provision shall be made for local manual, electrical and spring controls. Necessary equipment's for local controls shall be housed in the circuit breaker cabinet of weather-proof construction. In addition to this, a hand closing device for facilitating maintenance shall also be provided.
- Each circuit breaker shall have a mechanical open/closed and spring charge indicator in addition to facilities for provisions for semaphore indicators for breakers which are required for the mimic diagram in the control room. Lamps for indicating, 'close/open' position of the breaker shall also be provided.
- The contact pressure spring and tripping spring shall be chargeable during closing operation to ensure the breaker is ready to open. Mechanically ON/OFF indicator, spring charged indicator and operation counter shall be provided on the front of the control cubicle. For tripping, the spring provided shall ensure the trippings
- Mechanical indicator, to show the 'open' and 'close' position of the breaker shall be provided in a position where it will be visible to a man standing on ground with mechanism housing open. An operation counter, visible from the ground even with the mechanism housing closed, shall be provided. Electrical tripping of the breaker shall be performed by shunt trip coils.
- Closing coil shall operate correctly at all value of voltage between 85% and 110% of the rated voltage. Shunt trip coils shall operate correctly under all operating conditions of the circuit breaker upto the rated breaking capacity and at all values of supply voltage between 85% and 110% of rated voltage. The variation in A.C. supply voltage shall be -15%to +10% while variation in frequency shall be  $\pm 3$ . Working parts of the mechanism shall be non-corrosive material. Bearings which require grease shall be equipped with pressure type fillings.
- Bearing pins, bolts, nuts and other parts shall be adequately pinned or locked to prevent loosening or changing adjustment with repeated operation of the circuit breaker. It shall be possible to trip the circuit breaker even in the event of failure of power supply.
- Operating mechanism and all accessories shall be enclosed in control cabinet. A common marshalling box for the three poles of the breaker shall be provided, along with supply of tubing, cables from individual pole operating boxes to the common marshalling box, local.

**21.16 SPRING OPERATED MECHANISM :-**

The motor compressed spring mechanism shall consists of a closing spring which is wound or compressed by an electric motor immediately after the breaker closes.

After the breaker has tripped, the tripping spring shall remain in the released position as long as the breaker is open, but the closing spring shall remain wound and ready for closing operation. The operating mechanism shall have all the necessary auxiliaries, apparatus for operation and supervision, like motor starter with thermal overload release, one closing coil, two trip coils, push button for local electrical operation, local/remote control selector switch, push button for direct mechanical tripping, auxiliary switches, anti puming contactors, operation counter, socket for inspection,

lamp and heater with switch. Spring charging motor shall be standard single phase universal motor suitable for 220 volts AC supply.

- i) Operating voltages for closing/tripping coils shall be 110 Volts DC or as per actual DC voltage available at existing substations which is to be verified by supplier after award of contract.
- ii) Operating voltages for heater elements shall be 220V AC 50 HZ. Other features of the spring operated mechanism shall be as follows.
  - a) The spring operating mechanism shall have adequate energy stored in the operating to close and latch the circuit breaker against the rated making current and also to provide the required energy for tripping mechanism in case the tripping energy is derived from the operating mechanism.
  - b) The mechanism shall be capable of performing the rated operating duty cycle of O-0.3Sec-CO-3 Min-CO...
  - c) The spring charging motor shall be AC or DC operated and shall not take more than 30 sec., to fully charge the closing spring made for automatic charging. Charging of spring by the motor should not interfere with the operation of the breakers.
  - d) The motor shall be adequately rated to carry out a minimum of one duty cycle. Also provision shall be made to protect the motor against overloads.
  - e) In case of failure of power supply to spring charging motor, the mechanism shall be capable of performing one open-close-open operation.
  - f) Mechanical interlocks shall be provided in the operating mechanism to prevent discharging of the closing springs when the breaker is already in closed position. Provision shall be made to prevent a closing operation to be carried out with the spring partially charged.
  - g) Facility shall be provided for manual charging of closing springs.

#### **21.17 CONTROL CABINET :-**

The switchgear operating mechanism, the control equipment such switch for closing and tripping the breakers, various control relays, antipumping device, a set of terminal blocks for wiring connections, MCB's for disconnecting the control auxiliary power supplies including relays, etc., shall be enclosed in a cabinet to be mounted on a suitable structure at a convenient working height at the end of the breaker in the outdoor switchyard. The supporting structure and the enclosure shall be capable of withstanding the typical tropical climatic conditions, change of ambient temperature, severe dust-storms, very high relative humidity those are prevailing at the site of location of switchgear.

##### **a) ENCLOSURE:-**

- The enclosure shall be made out of stretched level steel plates not less than 3 mm thick and of light section structural steel. It should be weather proof as well as vermin proof.
- The enclosure shall provide protection against dust and foreign objects. Each cabinet section shall have full width and full-length hinged doors mounted on the front that swing fully open. The doors shall be provided with latches to securely hold it with the cabinet. Doors shall be of sturdy construction, with resilient material covering, fully perimetrically contacting the cabinet frame to provide dust protection and prevent metal to metal contact except at the latch points. Filtered ventilation shall be provided along with the rigid supports for control and other equipment, measuring instruments, mounting cabinet members and equipment shall not restrict easy access to terminal blocks for terminating and testing external connection or to equipment for maintenance.
- All screws and bolts used for assembling and mounting wire and cable termination, supports, devices and other equipment shall be provided with lock washers or other locking devices. All metal parts shall be clean and free of weld splatter, rust and mill scale prior to application of double coat of zinc chromate primer which should be followed by an under coat to serve as base and binder for the finishing coat. The shade of exterior and interior shall be as per GTR. The mounting structure shall be galvanized and shall be as per IS-802-II-1978.



**b) HEATERS:-**

Suitable heaters shall be mounted in the cabinet to prevent condensation. Heaters shall be controlled by thermostat and shall be provided with ON/OFF switches and fuses. Heaters shall be suitable for 240 V AC supply voltage.

**c) LIGHTING :-**

At least one 13-watt CFL fixture and lamp working on 240 V 50 c/s AC supply shall be provided in each switchgear control cubicle section and shall be located suitably to provide adequate interior lighting of the cubicle. A single-pole 6 Amp. lighting switch shall be provided for each cubicle alongwith 5/15 amp.

The lighting and convenient outlet circuits shall be completely wired in conduit and terminated on cubicle terminal blocks.

**d) WIRING AND CABLING: -**

- Unless otherwise specified control wire shall be stranded tinned copper switchboard wire with 1.1 kV PVC insulation conforming to the requirements of IS-1554.
- All the control circuit and secondary wiring shall be wired completely and brought out to terminal block ready for external connections in the control cabinet. The cross-section of control wire shall not be less than 2.5 mm<sup>2</sup> copper (14 SWG).
- All spare auxiliary contacts of the circuit breaker shall be supplied wired upto terminal block. Each terminal in terminal block shall be suitable for at least 2 x 2.5 mm<sup>2</sup> copper conductor.
- All wiring termination on terminal blocks shall be made through lugs.
- All wires shall be identified with non-metallic sleeve or tube type markers at each terminations.
- Terminal blocks shall be made up of moulded non-inflammable plastic material with blocks and barriers moulded integrally have white marking strips for circuit identification and moulded plastic covers. Disconnecting type terminal blocks will be provided.

**e) GROUNDING :-**

A ground bus of copper bar not less than 6 mm by 25 mm shall be provided for grounding the cabinet.

**21.18 ACCESSORIES :-**

Each circuit breaker assembly shall be supplied with the following accessories.

- i) Line and earthing terminals and terminal connectors.
- ii) Control housing with:
  - a) One auxiliary switch with adequate number of auxiliary contacts, but not less than 20 nos. (10 NO + 10 NC) for each breaker. These shall be over and above the No. of contacts used for closing, tripping and re-closing and interlocking circuit of the circuit breaker. All auxiliary contacts shall be capable of use as “Normally closed” or “Normally open” contacts. Special auxiliary contacts required for the re-closing circuit if any, shall also be provided. There shall be provision, to add more auxiliary contacts at a later date, if required.
  - b) Operation counter
  - c) Position indicator (Close/Open)
  - d) Necessary cable glands
  - e) Fuses
  - f) Manual trip device and local test push buttons
  - g) Terminal blocks and wiring for all control equipment and
  - h) Adequate number of heaters for continuous operation to prevent moisture condensation in the housing of operating mechanism
  - i) Selector switch for local/remote control.

**21.19 SUPPORTING STRUCTURE :-**

- The circuit breakers shall be supplied complete with necessary galvanized steel supporting structures, foundation and fixing bolts, etc., the galvanizing shall be as per IS. The mounting of the breaker shall be such as to ensure the safety of the operating staff and should conform to Indian Electricity Rules, 1956. Minimum ground clearance of live part from ground level shall be 3700 mm from finished ground level.
- The bidder shall submit detailed design calculations and detailed design drawings in respect of supporting structures suitable for the equipment offered.
- All material for making connections between the circuit breaker and its control shall also be included in the scope of supply. Facility to earth the circuit breaker structure at two points shall be provided.

#### **21.20 SURFACE FINISH :-**

- All interiors and exteriors of tanks, control cubicles and other metal parts shall be thoroughly cleaned to remove all rust, scales, corrosion, greases or other adhering foreign matter. All steel surfaces in contact with insulation oil, as far as accessible, shall be painted with not less than two coats of heat resistant, oil insoluble, insulating paint.
- All metal surfaces exposed to atmosphere shall be given two primer coats of zinc chromate and two coats of epoxy paint with epoxy base thinner. All metal parts not accessible for painting shall be made of corrosion resisting material. All machine finished or bright surfaces shall be coated with a suitable preventive compound and suitably wrapped otherwise protected. All paints shall be carefully selected to withstand tropical heat and extremes of weather within the limits specified. The paint shall not scale off or wrinkle or be removed by abrasion due to normal handling.
- All ferrous hardware, exposed to atmosphere, shall be hot dip galvanized.

#### **21.21 GALVANISING :-**

All ferrous parts including all sizes of nuts, bolts, plain and spring washers, support channels, structures, shall be hot dip galvanized conforming to latest version of IS:2629 or any other equivalent authoritative standard.

#### **21.22 CABLE TERMINATION :-**

Suitable cable glands for terminating the multicore cable, shall be provided wherever required.

#### **21.23 TERMINAL CONNECTIONS AND EARTH TERMINALS :-**

Each circuit breaker connected with incoming and outgoing feeders shall be provided with solderless clamp type connectors suitable for ACSR conductor.

Each circuit breaker pole and control cabinet shall be provided with appropriate number of grounding terminals and clamps for receiving ground connections.

Each circuit breaker pole and control cabinet shall be provided with appropriate number of grounding terminals and clamps for receiving ground connections.

#### **21.24 INTERLOCKS :-**

Necessary interlocks to prevent closing or opening of the breaker under low pressure of the contact spring and devices for initiating alarm shall be provided. The detailed interlocking scheme based upon single line diagram as applicable for the substation shall be provided by the contractor

Requirement of interlock shall be as given below:

- i) Isolator should not be operated unless the associated breaker is in open position.
- ii) The circuit breaker shall close only after all isolators associated with it have been in closed position.

In case of double bus bar arrangement following additional requirement for interlocking shall be provided.

- a) One bus bar selector isolator of any bay excepting the bus coupler bay shall close only when,
  - i) The circuit breaker of corresponding bay is open and locked.
  - ii) The other bus isolator of that bay is open.

- b) When one bus isolator of any bay excepting the bus coupler bay is closed. The other shall close only when the bus coupler circuit breaker and both the bus isolators are closed.
- c) Bus isolator of bus coupler bay shall operate only when the bus coupler breaker is open.
- d) The bypass isolator of feeder shall close when the feeder circuit breaker and its adjoining isolators are closed.

**21.25 EARTHING SYSTEM:-**

All switchgear enclosures should be bolted metal to metal and should carry the full earth return current. Connection between phases at the earthing points shall be dimensioned for carrying full earth return current i.e., actual service current not rated current.

**21.26 VACUUM INTERRUPTER ASSEMBLY :-**

- Each pole of the circuit breaker shall be provided with vacuum interrupter, one for each phase, hermetically sealed for life and encapsulated by ceramic insulators. The interrupter shall be provided with steel chromium arc chamber to prevent vaporized contact material being deposited on the insulating body. A further shield giving protection to the metal bellows shall also follow the travel of the moving contacts to seal the interrupter against the surroundings atmosphere.
- It shall have high and consistent dielectric strength of vacuum unaffected by environment and switching operations. Bronzed joints should ensure retention of vacuum for life time. It shall have low and stable contact resistance due to absence of oxidation effects and shall ensure low power loss. The arcing voltage shall be low and minimum contact erosion.

**21.27 TESTS :-**

a) **TYPE TESTS :-**

Each circuit breaker shall comply with requirements of type tests prescribed in IEC publication No. 62271-100

- i) Short time and peak withstand current test.
- ii) Short circuit breaking capacity and making capacity.
- iii) Capacitive current switching test: Cable charging current breaking test ( $U_r$  less than or equal to 52 kV).
- iv) Dielectric test i.e., power frequency withstand and impulse withstand test
- v) Temperature rise test.
- vi) Mechanical Endurance Test at ambient temperature.
- vii) Measurement of resistance of the main circuit.

b) **ROUTINE TESTS :-**

Routine Tests as per IEC- 62271-100 shall be carried out on each breaker in presence of purchaser's representative at the manufacturer's expenses at his works except, where agreed to otherwise. All test reports should be submitted and should be got approved from the purchaser before despatch of the equipment.

c) **SITE TESTS ON CONTROL AND AUXILIARY CIRCUIT :-**

The following tests shall be conducted at site.

- i) Voltage tests on control and auxiliary circuit.
- ii) Measurements of resistance of the main circuit.
- iii) Mechanical Operation Tests.

**21.28 NAME PLATE :-**

Equipment should be provided with name plate giving full details of manufacture, capacities and other details as specified in the relevant ISS or other specification stipulated.

**21.29 TECHNICAL PARAMETERS:-****36 kV CIRCUIT BREAKERS**

Sl. No.	DESCRIPTION	VALUES
1)	Rated voltage of outdoor Circuit Breaker (KV) :	33 KV
2)	Rated frequency (Hz) :	50
3)	Maximum continuous voltage of outdoor Circuit Breaker (KV) :	36 KV
4)	Type of Outdoor Circuit Breaker:	Porcelain Clad
5)	Designation of outdoor circuit breaker:	36PV25A
6)	System neutral earthing :	Solidly grounded system
7)	Type of arc quenching medium :	Vacuum
8)	Type of operation:	Mechanically coupled Gang Operated
9)	Rated continuous current of outdoor circuit breaker (Amps) :	1250 Amps
10)	Number of poles :	3
11)	Installation :	Outdoor type
12)	Rated symmetrical short circuit breaking current (for 3 sec) of outdoor circuit breaker in kA(rms) 25 kA :	26.3 kA rms
13)	Rated duration of short circuit :	3 Seconds
14)	Rated Short Circuit:	
	a) Interrupting capacity at 36 kV:	26.3 kA
	b) The percentage of DC components:	As per IEC-62271-100
	c) Duration of Short Circuit:	3 Seconds
15)	Opening time (ms) :	< 60 ms
16)	Closing time (ms) :	< 80 ms
17)	Dynamic peak withstand capacity (kA):	65.75 kA
18)	DC Voltage level:	Shall be as per site
19)	Rated operating duty cycle :	O-0.3 Second - CO-3 Minutes-CO
20)	Amplitude factor of outdoor circuit breaker on restriking voltage at 100% rated breaking capacity:	1.4 as per IEC
21)	First pole to clear factor of outdoor circuit breaker on restriking voltage at 100% rated breaking capacity	1.5
22)	Rate of rise of restriking voltage of outdoor circuit breaker on restriking voltage at 100% rated breaking capacity (kV/Microsecs)	70
23)	Dry-1 minute power frequency withstand voltage of outdoor circuit breaker between line terminal and earth( kV rms):	70 kV rms
24)	Dry-1 minute power frequency withstand test voltage for outdoor circuit breaker between terminal with breaker contacts open in kV rms :	70
25)	1.2/50 micro second impulse withstand voltage for outdoor circuit breaker between line terminal and earth in kvp :	170
26)	1.2/50 micro second impulse withstand voltage for outdoor circuit breaker between terminals with breaker contacts open in kvp:	170
27)	Material of main contacts of outdoor circuit breaker:	Copper Chromium
28)	Material of terminal pad of outdoor circuit breaker ( Copper/Aluminium):	Aluminium
	a)If Terminal pads are made of metal other than Aluminium, thickness of silver plating on terminal pads :	Shall be at least 25 microns
	b)The Current density for copper terminal pad :	Not more than 1.6 A/Sq. mm
	c) The Current density for other than copper terminal pad :	Not more than 1 A/Sq. mm
29)	Net cross section of terminal pad of outdoor circuit breaker (Sq. mm):	As per type tested design
30)	Material of make-break contacts in Vacuum Interrupter:	Copper Chromium
31)	Material of tips of Main contacts of Circuit Breaker:	Copper Chromium
32)	Size of auxiliary contacts of outdoor circuit breaker (Sq. mm):	Adequate
33)	Material of auxiliary contacts of outdoor circuit breaker:	Copper
34)	Continuous current capacity of Auxiliary contacts of outdoor	10 A

	circuit breaker (Amps):	
35)	Breaking current capacity of Auxiliary contacts of outdoor circuit breaker (Amps):	1 kA
36)	Insulation level of Auxiliary contacts of outdoor circuit breaker (Volts):	2 kV
37)	1 minute P.F withstand voltage of auxiliary contacts of outdoor circuit breaker (kV rms) :	2 kV
38)	No. of normally open auxiliary contacts provided for outdoor circuit breaker available for use in remote C&R panels:	2 NO + 2 NC
39)	No. of normally close auxiliary contacts provided for outdoor circuit breaker available for use in remote C&R panels:	8 NO + 8 NC
40)	Whether Potential free contact available for remote indication of spring charged of outdoor circuit breaker:	Yes
41)	Voltage rating of bushing used for outdoor circuit breaker (kV)	36 kV
42)	Dry-1 minute power frequency withstand voltage of bushing used for outdoor circuit breaker (kV rms):	70 kV rms
43)	Dry flashover voltage of bushing used for outdoor circuit breaker (kV rms):	70 kV rms
44)	Wet flashover voltage of bushing used for outdoor circuit breaker (kV rms):	70 kV rms
45)	1.2/50 micro second impulse withstand voltage of bushing used for outdoor circuit breaker (kV peak) :	170 kV peak
46)	Shunt Trip:	110 VDC
47)	Closing Coil:	110 VDC
48)	Total creepage distance of bushing used for outdoor circuit breaker:	As per type tested design
49)	Center to center minimum clearances in air between phases of outdoor circuit breaker (mm):	700 mm
50)	Minimum clearances provided in air between two phases (mm):	430 mm
51)	Minimum clearances provided in air between live part to live part of phases of outdoor circuit breaker (mm):	430 mm
52)	Minimum clearances in air between live part to earth of outdoor circuit breaker (mm):	450 mm
53)	Minimum clearances in air between live part of outdoor circuit breaker to ground level (mm):	3700 mm
54)	Height of the lowest part of the support insulator from ground level :	530 mm
55)	Class of insulating material :	B
56)	Max. closing time in ms (max.150 ms) :	Less than 100 ms
57)	Max. total break time at 100% rated interrupting breaking capacity : 100 ms	Less than 60 ms
58)	Type of closing mechanism of outdoor circuit breaker shall be motor assisted spring charged mechanism	Yes
59)	Type of tripping mechanism of outdoor circuit breaker shall be motor assisted spring charged mechanism with shunt trip coil.	Yes
60)	Burden of trip coil of outdoor circuit breaker at 110V (DC) in watts	250 W
61)	Burden of closing coil of outdoor circuit breaker at 110V (DC) in watts	250 W
62)	Whether mechanical on/off and “spring charged” indications for outdoor circuit breaker provided	Yes
63)	Whether manual trip/close of outdoor circuit breaker possible	Yes
64)	Whether mechanical spring charging for outdoor circuit breaker possible	Yes
65)	Voltage rating of spring charging motor outdoor circuit breaker in volts	230V AC
66)	Burden of spring charging motor of outdoor circuit breaker in VAmp	300W
67)	Control circuit voltage of outdoor circuit breaker shall	Yes

	be 30V DC	
68)	The surface finish paints of non galvanized metallic part of VCB shall be battleship gray shade No.632 of IS. 5	Yes
69)	Process of painting of parts of outdoor circuit breaker	Powder coating
70)	Type of primer use for painting of parts of outdoor circuit breaker	7 tank per treatment
71)	Type of finish paint used for painting of parts of outdoor circuit breaker	Galvanized support structure
72)	Degree of protection of operating mechanism enclosure is IP 55 as per IEC529/IS 2147	IP 55

### **21.31 DRAWINGS AND INSTRUCTION MANUALS :-**

Following drawings for each item are to be supplied as part of the contract.

- i) General outline drawings, showing dimensions, front and side elevations and plan of the circuit breaker and its local control panel.
- ii) Outline drawing of bushings showing dimensions and number of sheds and creepage distance.
- iii) Assembly and sub-assembly drawings with numbered parts.
- iv) Sectional views showing the general constructional features, operating mechanism and are extinguishing chamber, etc.
- v) Dimension and assembly of important auxiliaries.
- vi) Detailed drawings of operating mechanism. And inter-phase mechanism.
- vii) Test certificates.
- viii) Detailed drawings of mounting structure.
- ix) Spare parts and catalogue
- x) Wiring diagram showing the local and remote control scheme of breaker including alarms indication devices instruments relay and timer wiring.
- xi) Write up on working of control schematic of breaker.
- xii) Foundation plan including weights of various components and impact loadings for working foundation design. Three copies for each pkg. of the above drawings and instruction manuals covering instructions for installations, operation and maintenance shall be supplied by the contractor(s) without any extra cost.

### **22.0 SITE VISIT:-**

The interested bidders are advised to visit the site and examine the site of works and its surroundings and obtain for itself on its own responsibility all information that may be necessary for preparing the bid. The costs of visiting the Site shall be at the bidder's own expense.

### **23.0 Contract Agreement:-**

An agreement shall have to be drawn on non-judicial stamp of appropriate value with the Department by the selected Contractor in AEGCL's **General Conditions of Supply and Erection 2009** of contract within **15 (fifteen) days** from the date of issue of the **LOI/Work Order**.

### **24.0 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:

- a) Recover an 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.

- b) 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.

## **25.0 Warranty:-**

- a) The contractor 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 term period of warranty shall mean the period of **18 months** from the date of the materials are received at site in good and acceptable condition. If during the period of warranty, any defect is found, the Contractor shall rectify all defects in design, materials and workmanship that may develop under normal use of the equipment upon written notice from the Purchaser who shall indicate in what respects the equipment is faulty. The rectification / free replacement must be carried out within a reasonable time period and at free of cost.
- b) In the event of any emergency, where in the judgment of AEGCL, delay would cause serious loss or damages, repairs or adjustment may be made by the engineer or a third party chosen by the engineer without advance notice to the contractor and the cost of such work shall be paid by the contractor. In the event such action is taken by the engineer, the contractor will be notified promptly and he shall assist wherever possible in making necessary corrections. This shall not relieve the contractor of his liabilities under the terms and conditions of the contract.
- c) If it becomes necessary for the contractor to replace or renew any defective portions of the works, the provision of this clause shall apply to portion of the works so replaced or renewed until the expiry of twelve (12) months from the date of such replacement or renewal.
- d) The repaired or new parts will be furnished and erected free of cost by the contractor. If any repair is carried out on his behalf at the site, the contractor shall bear the cost of such repairs.
- e) The acceptance of the equipment by the Employer shall in no way relieve the contractor of his obligation under this clause.
- f) In the case of those defective parts, which are not repairable at site but are essential for the commercial operation of the equipment, the contractor and the engineer shall mutually agree to a programme of replacement or renewal, which will minimize interruption to the maximum extent in the operation of the equipment.

## **26.0 Payment terms:-**

- **No advance payment** shall be made in this contract.
- No claim for interest shall be entertained by AEGCL.
- The price is firm and no price variation shall be applicable.
- First & Final bill for the supply will be entertained only after **100%** completion of the work.
- Payment will be made by **DGM, Silchar (T&T) Circle, AEGCL, Meherpur, Silchar**. The Bidder / Firm will have to be submitted the following Net Banking details.
  - Banker's Name & Branch
  - Account No
  - Banker's address
  - Banker's IFSC Code

## **27.0 Performance Security Deposit:-**

- a) The successful bidder shall have to deposit through a **Bank Guarantee** from a Nationalized or scheduled Bank of RBI in AEGCL's standard proforma on non-judicial stamp of appropriate value for an amount equivalent to **10% (ten percent)** of the total value of the order as performance security, immediately within **10 (ten) days** from the issue of the letter of intent/detailed orders (as the case may be), duly pledged in favour of "**Managing Director, AEGCL, Paltan Bazar, Guwahati-01**", payable at **Guwahati**, and such security deposit shall be **valid up to 30 (Thirty) days** beyond the **warranty period of 18 (Eighteen) months**. The **Bank Guarantee (BG)** should be submitted to the **O/o the Deputy General Manager, Silchar T&T Circle, AEGCL, Silchar-788015** by the successful Bidder.
- b) Please note that, if the selected Bidder / Firm fail to furnish the requisite performance security in the form of **Bank Guarantee**, an amount equivalent to **10%** of the Contract Price shall be retained as Security Deposits which shall be retained up to **18 (Eighteen) months** from the date of Supply.

- c) 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.
- d) No interest shall be payable on such deposits.

### **28.0 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 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.

### **29.0 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 **Cachar District**.

### **30.0 Insurance :**

- a) The “Supplier” shall, have, unless, otherwise specified by the Purchaser, insure the materials through their underwrites at their cost and shall keep it insured against any loss/ damaged/ pilferage in transit, destruction or damage by fire/ flood, without exposure to vagaries of weather or through riot, civil commotion, war or rebellion, for the full value of the materials until the materials are received at the purchaser’s destination store.
- b) The “Supplier” shall be responsible for safe arrival at destination, unloading and receipt of the materials by the consignee. The Purchaser will discharge consignee’s responsibilities only and shall not be responsible for any damage/ loss/ pilferage/ non-delivery by the carriers.
- c) In case of any loss/ damage/ pilferage/ non-delivery/ short delivery by carriers etc.; the Supplier shall replace free of cost missing / damaged / lost materials within **30(thirty) days** from the receipt of report thereof from the consignee(s) without waiting for settlement of their claims with their carriers / under-writers. Normally, such reports from the consignee(s) to the supplier shall be initiated within a period of 30(thirty) days from the date of receipt of each consignment by him /them.
- d) If it is considered necessary that the damage equipment either in part or in full to be sent back to the manufacturer’s works for repair, the manufacturers/ suppliers will furnish the Bank Guarantee for the full value of equipment needing repairs and such Bank Guarantee shall remain valid till such time, the equipment are repaired and returned to the consignee in good condition. The to and fro freight, handling and insurance charges in such cases will be borne by the Supplier.
- e) Unless, otherwise mutually agreed upon, in case of failure by the Supplier to replenish /make good of the loss /damage /short supplied quantities, within the stipulated period, the Purchaser reserves the right to forfeit the security deposit and/ or adjust any outstanding payment to the “Supplier” with the Purchaser or take any other appropriate action.

### **31.0 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](http://www.aegcl.co.in) under Acts, Rules and Policies Tab.**



**Appendix-1**

**Letter of Technical Bid**

[Bidder's Letter head]

Date: \_\_\_\_\_

Tender No.: \_\_\_\_\_

Invitation for Bid No: \_\_\_\_\_

To: \_\_\_\_\_

We, the undersigned, declare that:

(a) We have examined and have no reservations to the Bidding Document, including Addenda No.:

\_\_\_\_\_.

(b) We offer to supply in conformity with the Bidding Document and in accordance with the completion/delivery schedule specified in the bid document, the following Goods and Related Services: \_\_\_\_\_ .

(c) Our Bid shall be valid for a period of \_\_\_\_\_ days from the date fixed for the bid submission deadline in accordance with the Bidding Document, and it shall remain binding upon us and may be accepted at any time before the expiration of that period;

(d) If our Bid is accepted, we commit to obtain a Performance Security in the amount of \_\_\_\_\_ percent of the Contract Price for the due performance of the Contract;

(e) We are not participating, as Bidders, in more than one Bid in this bidding process;

(f) We understand that this Bid, together with your written acceptance thereof included in your notification of award, shall constitute a binding contract between us, until a formal Contract is prepared and executed.

(g) Our firm, its affiliates or subsidiaries, including any Subcontractors or Suppliers for any part of the contract, has not been declared ineligible by AEGCL, APDCL or APGCL under the Employer's country laws or official regulations

(h) We understand that you are not bound to accept the lowest evaluated bid or any other bid that you may receive.

Name \_\_\_\_\_

In the capacity of \_\_\_\_\_

Signed \_\_\_\_\_

Duly authorized to sign the Bid for and on behalf of \_\_\_\_\_

Date \_\_\_\_\_

## Price Proposal Submission Sheet

Date: \_\_\_\_\_

Tender No.: \_\_\_\_\_

Invitation for Bid No: \_\_\_\_\_

To: \_\_\_\_\_

We, the undersigned, declare that:

(a) We have examined and have no reservations to the Bidding Document, including Addenda No.:  
\_\_\_\_\_

(b) We offer to supply in conformity with the Bidding Document and in accordance with the completion/delivery schedule specified Schedule of Supply & Erection, the following Goods and Related Services: \_\_\_\_\_

(c) The total price of our Bid, excluding any discounts offered in item (d) below is:  
\_\_\_\_\_

(d) The discounts offered and the methodology for their application are:  
\_\_\_\_\_

(e) The following commissions, gratuities, or fees have been paid or are to be paid with respect to the bidding process or execution of the Contract:

Name of Recipient	Address	Reason	Amount

(If none has been paid or is to be paid, indicate "none.")

Name \_\_\_\_\_

In the capacity of \_\_\_\_\_

Signed \_\_\_\_\_

Duly authorized to sign the Bid for and on behalf of \_\_\_\_\_

Date \_\_\_\_\_

## Bidding Forms

Name of work: \_\_\_\_\_

Bid Identification No: \_\_\_\_\_

### General

- (i) Name of the Firm/Contractor:
- (ii) Full Address:
- (iii) Constitution of the Firm:
- (iv) Whether Partnership or any type:

### A) Experience

- (i) No of years the Firm/Contractor has been in operation under its present name.
- (ii) Details of work executed/being executed by the tenderer in the last three years.
- (iii) Testimonials from Clients Company on various works executed for the last three years.

(Details of works executed/under execution in the last three years including another department)

Sl. No.	Name of work & W/O No.	Worked Done Under	Value of Work	Specified date of completion	Present status/completed on

### B) Financial Position

- (i) Financial Turnover during the last three years (copies of Audited Annual report, Accounts or a statement duly certified by a chartered accountant and Income Tax return.

Year	Turn over

Any other details that the tenderer may like to furnish to substantiate their financial and technical ability to undertake this work and complete the same within stipulated period of completion.

Name of the Bidder: - .....

Signature of the Bidder/Firm .....

Full Name .....

Postal Address .....

Phone/Mobile No. ....

## PRICE BID

(To be submitted in the Part-II, 'Price bid' in sealed envelope in quadruplicate)

**Name of the Bidder:**

**NIT No.** AEGCL/STTC/Tech-12/2024-25/17

**Dated:** 30-09-2024

**Name of the work:** Supply, Erection, Testing and Commissioning of 33 kV Vacuum Circuit Breaker for 33 kV Baskandi Feeder at 132 kV Pailapool GSS.

Sl. No.	Item description	Unit	Qty	Unit Price (Rs.)	Total
1	Supply of 33 kV, 25 kA, 1250 Gang Operated Vacuum Circuit Breaker Including all accessories and terminal connectors as required (so as to retrofit in the existing foundation)	Set	1		
2	F&I against the supply of Circuit Breaker	Set	1		
3	Erection, testing and commissioning of Circuit Breaker including all necessary associated works	Set	1		
4	Dismantling of existing Circuit Breaker (including all necessary associated works) for 33 kV level (With structure)	Set	1		
5	Dragging of dismantled 33 kV Circuit Breaker to a suitable site at the switchyard. Weight =850 kg =0.85 MT Approx. Distance =100m Total Quality= 0.85 x 100 =85	Per MT/mtr	85		
6	Fabrication of equipment structure (upto 33 kV level)	Per Job	1		
<b>Total=</b>					
<b>Add GST@18%</b>					
<b>Grand Total=</b>					

Rupees in words \_\_\_\_\_

Name of the Bidder: -

Signature of the Bidder/Firm .....

Full Name .....

Postal Address .....

Phone/Mobile No. ....

## **ANNEXURE – I**

**Following information is to be furnished in the 'Technical and Commercial bid' as first page.**

(Please tick mark where necessary.)

1)	Earnest money (EMD)	:Submitted/Not submitted
	a) Amount of EMD	:Rs.
	b) Submitted in the form of Bank Guarantee /Demand Draft	: Yes/No.
2)	Validity of the offer	: ..... days from the date of opening of 'Technical & Commercial Bid' & 'Price
3)	Nature of price offered	
	i) 'FIRM' Price	: Yes/No
4)	Terms of payment (Whether agreeable to accept payment as specified in clause- <b>26.0</b> )	: Yes/No
5)	Date of completion of supply (Please specify the date of completion of supply as per specification)	: Yes/No
6)	'Security and performance guarantee' (Whether agreeable to accept as specified in Clause no- <b>27.0</b> )	: Yes/No
7)	List of orders executed for similar works furnished	: Yes/No
8)	Performance certificate from the Govt./Govt. undertaking furnished	: Yes/No
9)	Deviation from the specifications	
	a) Technical	: Yes/No
	b) Commercial	: Yes/No
10)	Information in respect of technical capability is furnished	: Yes/No
11)	Information in respect of Financial capability certificate from the Banker is furnished	: Yes/No
13)	PAN card as per Cl. No. <b>19.0 (ii)</b>	: Yes/No
14)	GST registration no. as per Cl. No. <b>19.0 (iv)</b>	: Yes/No
15)	Registered Power of Attorney as per <b>Cl.no. 19.0 (v)</b> enclosed.	: Yes/No

Name of the Bidder: -

Signature of the Bidder/Firm .....

Full Name .....

Postal Address .....

Phone/Mobile No. ....

**GUARANTEED TECHNICAL PARTICULARS OF 33 kV Vacuum Circuit Breaker (VCB)**

(To be filled in and signed by the Bidder)

Sl. No.	DESCRIPTION	VALUES
1)	Name of Manufacturer:	
2)	Rated voltage of outdoor Circuit Breaker (KV) :	
3)	Rated frequency (Hz) :	
4)	Maximum continuous voltage of outdoor Circuit Breaker (KV) :	
5)	Type of Outdoor Circuit Breaker:	
6)	Designation of outdoor circuit breaker:	
7)	System neutral earthing :	
8)	Type of arc quenching medium :	
9)	Type of operation:	
10)	Rated continuous current of outdoor circuit breaker (Amps) :	
11)	Number of poles :	
12)	Installation :	
13)	Rated symmetrical short circuit breaking current (for 3 sec) of outdoor circuit breaker in kA(rms) 25 kA :	
14)	Rated duration of short circuit :	
15)	Rated Short Circuit:	
	d) Interrupting capacity at 36 kV:	
	e) The percentage of DC components:	
	f) Duration of Short Circuit:	
16)	Opening time (ms) :	
	Closing time (ms) :	
17)	Dynamic peak withstand capacity (kA):	
18)	DC Voltage level:	
19)	Rated operating duty cycle :	
20)	Amplitude factor of outdoor circuit breaker on restriking voltage at 100% rated breaking capacity:	
21)	First pole to clear factor of outdoor circuit breaker on restriking voltage at 100% rated breaking capacity	
22)	Rate of rise of restriking voltage of outdoor circuit breaker on restriking voltage at 100% rated breaking capacity (kV/Microsecs)	
23)	Dry-1 minute power frequency withstand voltage of outdoor circuit breaker between line terminal and earth( kV rms):	
24)	Dry-1 minute power frequency withstand test voltage for outdoor circuit breaker between terminal with breaker contacts open in kV rms :	
25)	1.2/50 micro second impulse withstand voltage for outdoor circuit breaker between line terminal and earth in kvp :	
26)	1.2/50 micro second impulse withstand voltage for outdoor circuit breaker between terminals with breaker contacts open in kvp:	
27)	Material of main contacts of outdoor circuit breaker:	
28)	Material of terminal pad of outdoor circuit breaker ( Copper/Aluminium):	
	a)If Terminal pads are made of metal other than Aluminium, thickness of silver plating on terminal pads :	
	b)The Current density for copper terminal pad :	
	c) The Current density for other than copper terminal pad :	
29)	Net cross section of terminal pad of outdoor circuit breaker (Sq. mm):	
30)	Material of make-break contacts in Vacuum Interrupter:	
31)	Material of tips of Main contacts of Circuit Breaker:	
32)	Size of auxiliary contacts of outdoor circuit breaker (Sq. mm):	

33)	Whether electrical anti pumping device provided for outdoor circuit breaker : (Yes/No)	
34)	Material of auxiliary contacts of outdoor circuit breaker:	
35)	Continuous current capacity of Auxiliary contacts of outdoor circuit breaker (Amps):	
36)	Breaking current capacity of Auxiliary contacts of outdoor circuit breaker (Amps):	
37)	Insulation level of Auxiliary contacts of outdoor circuit breaker (Volts):	
38)	1 minute P.F withstand voltage of auxiliary contacts of outdoor circuit breaker (kV rms) :	
39)	Whether any contact multiplier are used for outdoor circuit breaker : (Yes/No) (if “Yes” then fill 38 to 41)	
40)	Make of contact multiplier used for circuit breaker :	
41)	Making and breaking capacity of contact multiplier used for outdoor circuit breaker in kA:	
42)	Voltage rating of contact multiplier used for outdoor circuit breaker in kV:	
43)	Capacity of coil of contact multiplier used for outdoor circuit breaker in watts:	
44)	No. of normally open auxiliary contacts provided for outdoor circuit breaker available for use in remote C&R panels:	
45)	No. of normally close auxiliary contacts provided for outdoor circuit breaker available for use in remote C&R panels:	
46)	Whether Potential free contact available for remote indication of spring charged of outdoor circuit breaker:	
47)	Voltage rating of bushing used for outdoor circuit breaker (kV)	
48)	Dry-1 minute power frequency withstand voltage of bushing used for outdoor circuit breaker (kV rms):	
49)	Dry flashover voltage of bushing used for outdoor circuit breaker (kV rms):	
50)	Wet flashover voltage of bushing used for outdoor circuit breaker (kV rms):	
51)	1.2/50 micro second impulse withstand voltage of bushing used for outdoor circuit breaker (kV peak) :	
52)	Shunt Trip:	
53)	Closing Coil:	
54)	Total creepage distance of bushing used for outdoor circuit breaker:	
55)	Center to center minimum clearances in air between phases of outdoor circuit breaker (mm):	
56)	Minimum clearances provided in air between two phases (mm):	
57)	Minimum clearances provided in air between live part to live part of phases of outdoor circuit breaker (mm):	
58)	Minimum clearances in air between live part to earth of outdoor circuit breaker (mm):	
59)	Minimum clearances in air between live part of outdoor circuit breaker to ground level (mm):	
60)	Height of the lowest part of the support insulator from ground level :	
61)	Class of insulating material :	
62)	Max. closing time in ms (max.150 ms) :	
63)	Max. total break time at 100% rated interrupting breaking capacity : 100 ms	
64)	Type of closing mechanism of outdoor circuit breaker shall be motor assisted spring charged mechanism	
65)	Type of tripping mechanism of outdoor circuit breaker shall be motor assisted spring charged mechanism with shunt trip coil.	
66)	Burden of trip coil of outdoor circuit breaker at 110V (DC) in watts	
67)	Burden of closing coil of outdoor circuit breaker at	

	110V (DC) in watts	
68)	Whether mechanical on/off and “spring charged” indications for outdoor circuit breaker provided	
69)	Whether manual trip/close of outdoor circuit breaker possible	
70)	Whether mechanical spring charging for outdoor circuit breaker possible	
71)	Voltage rating of spring charging motor outdoor circuit breaker in volts	
72)	Burden of spring charging motor of outdoor circuit breaker in Vamp	
73)	Control circuit voltage of outdoor circuit breaker shall be 30V DC	
74)	The surface finish paints of non galvanized metallic part of VCB shall be battleship gray shade No.632 of IS. 5	
75)	Process of painting of parts of outdoor circuit breaker	
76)	Type of primer use for painting of parts of outdoor circuit breaker	
77)	Type of finish paint used for painting of parts of outdoor circuit breaker	
78)	Degree of protection of operating mechanism enclosure is IP 55 as per IEC529/IS 2147	
79)	Mounting of CB on hot dip galvanized steel support structure or on the operating mechanism box, as the case may be, to be supplied by the tenderer	
80)	Whether all type tests are carried out on outdoor circuit breaker at <b>NABL laboratories</b> within five years from date of operating on tender <b>(Yes/No)</b>	
81)	Whether type tested on offered design of outdoor circuit breaker <b>(Yes/No)</b>	
82)	A list of recommended spares with unit rates for each circuit breaker that may be necessary for satisfactory operation and maintenance of the circuit breaker for a period of 5 years shall be submitted	
83)	A list and unit rates of all the special tools, equipments and instruments required for erection, testing, commissioning and maintenance of the breaker shall be submitted	
84)	The list of necessary tools/equipments which will be supplied free of cost with each CB furnished separately	
85)	Are following Type test reports submitted with offer for offered equipment	
	a. Lightning impulse withstand voltage test : (Yes/No)	
	b. Power Frequency voltage withstand test (dry & wet) :(Yes/No)	
	c. Temperature rise test:(Yes/No)	
	d. Measurement of resistance of circuit:(Yes/No)	
	e. Short time and peak withstand current test :(Yes/No)	
	f. Mechanical operation test :(Yes/No)	
	g. Degree of protection (IP55) for all cabinets :(Yes/No)	
	h. Out of phase making and breaking test :(Yes/No)	
	i. Short circuit making and Breaking current Test  a) No load operation before and after test b) Basic test duties no.1 to5 c) Single phase short circuit test d) Condition of breaker after short circuit test	
86)	Are the following drawing submitted	



87)	a) General outline drawings showing outside dimensions, shipping dimensions, weights, quantity of insulating media air receiver capacity and such other prominent details :(Yes/No)	
	b) Sectional views showing the general constructional features of the circuit breaker including operating mechanism, arcing chambers, contacts. With lifting dimensions for maintenance :(Yes/No)	
	c) Schematic diagrams of the scheme for control, supervision and reclosing :(Yes/No)	
	d) Structural drawing, design calculations and loading data for support structures :(Yes/No)	
	e) Foundation drilling plain and loading data for foundation design :(Yes/No)	
	f) Type test reports of circuit breakers along with a separate list showing all the tests carried out with date & place of test :(Yes/No)	
	g) Test reports, literatures and pamphlets of bought out items and raw materials :(Yes/No)	
88)	Whether bidder adequate in-house testing facilities for conducting acceptance tests in accordance with relevant IS	
89)	Type of operation shall be suitable for 3 phase reclosing :(Yes/No)	