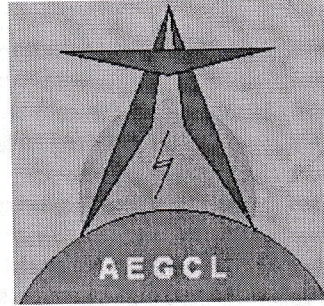


ASSAM ELECTRICITY GRID CORPORATION LIMITED
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**TERMS, CONDITIONS AND TECHNICAL SPECIFICATIONS OF CONTRACT
WITH ITEM RATE SCHEDULE**

NIT No:-AEGCL/DGM/MIRZA/T&T/Tech-12/2022/11 ; Dated:02/07/2022

**Bidding Document
For**

Engagement of surveyor for construction of new 132kV bays along with extension and strengthening of existing bus system & realignment of bays at 132kV APM GSS, AEGCL.

**DEPUTY GENERAL MANAGER
MIRZA T&T CIRCLE
AEGCL, MIRZA**

**Tender Fee:- ₹1000/-
EMD :- ₹7,000/-
DD/BC/FD/BG in favour of AEGCL payable at Guwahati.**

For and on behalf of the **Managing Director, Assam Electricity Grid Corporation Limited (AEGCL), the Deputy General Manager, Mirza T&T Circle, AEGCL, Mirza-781125** invites tender from eligible firms/companies/contractors for the above work. A single stage two envelope procedure (Techno-Commercial and Price Bid) will be adopted for this tender.

1.0 INFORMATION TO BIDDER:

1. **NAME OF WORK:- Engagement of surveyor for construction of new 132kV bays along with extension and strengthening of existing bus system & realignment of bays at 132kV APM GSS, AEGCL**
2. **LOCATION OF WORK:-132kV APM GSS, AEGCL**
3. **TENDER ADDRESS:- O/o the Deputy General Manager, Mirza T&T Circle, AEGCL, Mirza 781125**
4. **BID SECURITY: Rs. 7,000/-**
5. **TIME OF COMPLETION: 30 days from the date of issue of work order**

2.0 BIDDING PROCEDURE:-

- a) All tenders shall have to be submitted in prescribed forms attached herewith eventually to be drawn up in the rules of AEGCL.
- b) Two different envelopes to be used as follows.
Envelope-1: Bid document signed by bidder on all pages, Earnest Money, Techno- commercial data of the Bidder and other necessary documents must be enclosed.
Envelope-2: Price Bid
- c) All tenders shall have to be submitted under sealed & signed covers super-scribing the Tender Notice No and name of the work completely and clearly on the top of the cover.
- d) All tenders shall have to be submitted on or before the last date and time of submission of tenders either by post or in person.
- e) If Bidders desire to submit their Bid by post, at their own expenses, it should be posted well in advance so as to ensure that their tenders reach the office of the tendering address on or before the specified date and time of submission of tender. AEGCL will not take any responsibility for loss, damage, tempering or delay of tenders sent by post.
- f) Bidder submitting Bid in person should submit their Bid in the tender box during the working hours on the last date and time of submission of tender.
- g) Tender will be rejected if submitted beyond the aforesaid time and date.
- h) Tenders or their authorized representatives may remain present during the opening of the tenders.
- i) Only Price Bid of responsive Techno-Commercial Bidders will be opened.
- j) AEGCL has the right to cancel the tender at any moment, without assigning any reason thereof. Bidder will not be entitled to claim any expenses and AEGCL will not be responsible for any costs or expenses incurred on the preparation and submission of the Bids.
- k) Bidders may obtain further information from the office of the Deputy General Manager, Mirza T&T Circle, AEGCL, Mirza-781125 for the purpose of preparation of their bid.
- l) If tender fee and EMD is not received in Envelop-1, the bid shall not be processed and will be primarily rejected.

3.0 Key Dates:

Tender Start Date	11.00 Hrs. of	04/07/2022
Submission Start Date	12.00 Hrs. of	04/07/2022
Tender End Date	12.00 Hrs. of	23/07/2022
Tender Opening Date	13.00 Hrs. of	23/07/2022

4.0 Validity of Bids

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

5.0 Bid Security:

5.1. All bids must be accompanied by a bid security amounting to **₹ 7,000.00 only** in the form of Call Deposit/Demand Draft/Banker Cheque from any Nationalised Bank payable at Guwahati in favour of the **AEGCL**.

5.2. Scanned copy of the bid security must be submitted with the Technical Proposal. However, the original EMD document must be submitted in the O/o the Deputy General Manager, Mirza T&T Circle, AEGCL, Mirza 781125 one hour before opening of the bid. Bid security shall have to be valid for 90 days beyond the validity of Bid.

5.3. The bid security of the successful Bidder shall be returned as promptly as possible once the successful Bidder has signed the Contract and furnished the required performance security.

5.4. The bid security of unsuccessful Bidders shall be returned as promptly as possible after the successful bidder has been allotted the work.

5. The bid security may be forfeited:

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

5.6. The Bid Security of a JV shall be in the name of the JV that submits the bid.

6.0 Eligible Bidders

6.1. 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:

- a) all partners shall be jointly and severally liable, and

6.2. 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.

6.3. A Bidder, and all partners constituting the Bidder, shall have Indian nationality. A Bidder shall be deemed to have the nationality of a country if the Bidder is a national or is constituted, incorporated, or registered and operates in conformity with the provisions of the laws of Republic Of India. This criterion shall also apply to the determination of the nationality of proposed subcontractors or suppliers for any part of the Contract including related services.

6.4. 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. Consequently all Bidders found to have a conflict of interest shall be disqualified. A Bidder may be considered to be in a conflict of interest with one or more parties in this bidding process if, including but not limited to:

- (a). they have controlling partners in common; or
- (b). they receive or have received any direct or indirect subsidy from any of them; or
- (c). they have the same legal representative for purposes of this bid; or
- (d). they have a relationship with each other, directly or through common third parties, that puts them in a position to have access to information about or influence on the bid of another Bidder, or influence the decisions of the Employer regarding this bidding process; or
- (e). a Bidder participates in more than one bid in this bidding process. Participation by a Bidder in more than one Bid will result in the disqualification of all Bids in which it is involved. However, this does not limit the inclusion of the same subcontractor, not otherwise participating as a Bidder, in more than one bid; or
- (f). a Bidder or any of its affiliates participated as a consultant in the preparation of the design or technical specifications of the plant and services that are the subject of the bid.

6.5. 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.

6.6. Bidders shall provide such evidence of their continued eligibility satisfactory to the AEGCL, as the Employer shall reasonably request.

7.0 The Bidder must have experience of executing work of similar nature previously. The bidder must submit experience and completion certificate for scrutiny by AEGCL.

7.1 A person, Firm or any other prospective bidder who is involved in fraud, unethical practices or barred from submitting bids by AEGCL or any sister concerns of AEGCL i.e. APDCL & APGCL will not be allowed to participate in the bids. If such cases are detected after submission of the bids, in later stages of the bidding process, then such bids will be rejected outright.

8.0 Financial Capability:

8.1. Bidder will require to submit along with the bid the audited balance sheets, IT return and other legal financial statements acceptable to AEGCL, for the last 3 (three) years to demonstrate the current soundness of the Bidders financial position and its prospective long term profitability. As a minimum, an Applicant's net worth calculated as the difference between total assets and total liabilities should be positive.

8.2. **Average Annual Turnover.** Minimum average annual turnover required are as follows and will be calculated as total certified payments received for contracts in progress or completed within the last 3 (Three) Years.

- (a) INR 1,50,000.00

9.0 Experience:

- 9.1 (a) Three similar works of atleast Rs. 1,35,000.00 each.

OR

- (b) Two similar works of atleast Rs.1,70,000.00 each.

- OR
- (b) Two similar works of atleast Rs.1,70,000.00 each.
- OR
- (c) One similar work of atleast Rs. 2,65,000.00.

9.2 a. List of contracts for similar Works and services executed in the past two years with copies of LoAs and execution status of each contract supported by client's certificate.

b. Audited Annual Accounts certified by CA of the company for the last three (3) years (in case of companies) or IT Return duly acknowledged by the tax department for the last three (3) years (in case of bidders other than companies)

c. Copies of Professional Tax Clearance Certificate, PAN and/or TAN Card, Registration Certificate (Form GST REG - 06) issued under Goods and Services Tax Laws.

9.3. Mandatory Submission, failing of any may led to rejection of BID.

- | | |
|------------------------|---|
| 1. CERTIFICATES | GST TAX REGISTRATION CERTIFICATE, PAN, LATEST IT ACKNOWLEDGEMENT, WORK ORDER OF SIMILAR NATURE, UP-TO-DATE GSTR. |
|------------------------|---|

10.0 Evaluation Criteria:

- 10.1. Techno-Commercial Evaluation will be done on the basis of Work experience and Financial Capability submitted by the bidder.
- 10.2. Price Bid of only **Responsive Techno-Commercial Bidders** will be opened.
- 10.3. **Arithmetical Error**, if observed while in Price Bid evaluation, same will only be corrected.

11.0 Clarification

11.1. A prospective Bidder requiring any clarification of the Bidding Document shall contact the AEGCL in writing at the AEGCL's address indicated in the BDS or raise his enquiries prior to 3 (three) days of closing of the bid. The Employer will respond to any request for clarification, provided that such request is received no later than three (3) days prior to the deadline for submission of bids. The AEGCL's response shall be in writing with copies to all Bidders who have acquired the Bidding Document including a description of the inquiry but without identifying its source. Should AEGCL deem it necessary to amend the Bidding Document as a result of a request for clarification, it shall do so.

11.2. The Bidder is advised to visit and examine the site where the work is to be Carried out and its surroundings and obtain for itself on its own responsibility all information that may be necessary for preparing the bid and entering into a contract for the provision of plant and services. The costs of visiting the site shall be at the Bidder's own expense.

11.3. The Bidder and any of its personnel or agents will be granted permission by the Employer to enter upon its premises and lands for the purpose of such visit, but only upon the express condition that the Bidder, its personnel, and agents will release and indemnify the Employer and its personnel and agents from and against all liability in respect thereof, and will be responsible for death or personal injury, loss of or damage to property, and any other loss, damage, costs, and expenses incurred as a result of the inspection.

12.0 Amendment of Bidding Document

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

13.0 Preparation of Bids By The Bidders:

13.1. Cost of Bidding

The Bidder shall bear all costs associated with the preparation and submission of its Bid, and AEGCL shall not be responsible or liable for those costs, regardless of the conduct or outcome of the bidding process.

13.2. Language of Bid

The Bid, as well as all correspondence and documents relating to the bid exchanged by the Bidder and AEGCL, shall be written in the English and / or Assamese language.

13.3. Bid Prices and Discounts

13.3.1. Bidders shall quote price inclusive of GST and all other applicable taxes. No extra calculation for discounts or other taxes will be done during evaluation.

13.3.2. Unless otherwise specified in the Bid Document and/or AEGCL's Requirements, bidders shall quote for the entire plant and services on a —single responsibility basis such that the total bid price covers all the Contractor's obligations mentioned in or to be reasonably inferred from the bidding document in respect of the including procurement and subcontracting (if any), delivery, construction, installation and completion of the Work. This includes all requirements under the Contractor's responsibilities for completing the work and where so required by the bidding document, the acquisition of all permits, approvals and licenses, etc.; the operation, maintenance and training services and such other items and services as may be specified in the Bidding Document, all in accordance with the requirements of the General Conditions. Items against which no price is entered by the Bidder will not be paid for by the Employer when executed and shall be deemed to be covered by the prices for other items.

13.3.3. Bidders are required to quote the price for the commercial, contractual and technical obligations outlined in the bidding document.

13.3.4. GST, Royalty and all other taxes (as applicable) payable on the work should be shown separately.

13.3.5. Since the work is 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.

13.3.6. 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.

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

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

13.3.8 Bid Evaluation Process:

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

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

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

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

(i) Identify ALB as per the step mentioned in Clause No.(a).(i) and 10.b.(ii) whichever is applicable.

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

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

Additional Performance Security in case of acceptance of ALB:

If any abnormally low bid is accepted under point no. (b) (iii), after taking of additional performance security as per the assessment of the committee, however the total performance security should not have to exceed 20% of the total contract value.

The additional performance security shall be treated as part of the original performance security and shall be valid for a period coextensive with the applicable defect liability period of the contract.

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

14. Payment Terms:

A. As per AEGCL's General Conditions of Supply and Erection 2009. The pdf could be downloaded from www.aegcl.co.in.

14.0 Performance Security Deposit:

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

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

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

14.2. No interest shall be payable on such deposits.

15.0 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.

16.0 Settlement of Dispute and Arbitration:

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

17.0 Plea of Custom:

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

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

18.0 Final Acceptance and Taking Over:

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

22.0 Performance Guarantee / Defect Liability Period:

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

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

Employer's Requirement

1. Scope of Works

The brief description of the scope covered under this bidding document is furnished below:

a) Preparation of Route Alignment and Detailed survey report to initiate the process of construction of new 132kV Bay at 132/33kV APM GSS.

Sl. NO.	Item Description	Qty
1	Survey of the entire land area of the GSS in 5mX 5m grid marking with RL using total station and submit on AutoCAD,scaled drawing and marking by peg on the field.	1.00
2	Marking the existing switchyard including cable trench,control room building,residential building,bay kiosks,incoming and outgoing feeders etc. pn AutoCAD scaled drawing and marking by peg on the field.(This includes marking the necessary bay equipments, type of gantry tower and type of foundations of gantry required)	1.00
3	Feasibility study using autocad simulation for exploring the alternate options for 2 nos. of outgoing bays, Bus extension, realignment of existing 132kV Dhaligaon-APM line(with profile drawing),to facilitate space for bay against 132kV BTPS-APM Ckt-II line, earthfilling volume calculation, FGL, approach road, etc. with optimal use of substation area and minimal dismantling of existing substation/colony structures.	1.00
4	Preparing layout drawing to scale along with SLD, Plot Plan Layout, Section drawing, DSLP calculation & drawing clearly specifying the schemes on AutoCAD for construction of 2 nos. of new 132kV Bay at 132kV APM GSS such that the above items descriptions are incorporated in the drawings.	1.00
5	Preparation of BoQ	1.00

b) The different tasks that need to be carried out are mentioned in the scope of work which briefly comprises Preparation of Preliminary/Walkover Survey Report, Detailed Survey Report and preparation of BOQ as per approved tower schedule .

2. Contractor to Inform Himself Fully

2.1 The Contractor should ensure that he has examined the Specifications 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.

2.2 The Employer shall not be responsible for any misunderstanding or incorrect information obtained by the contractor other than information given to the contractor in writing by the Employer.

2.3 Contractor must note that the employer shall not be responsible for loss or damage of properties, trees etc due to contractors work during survey. The contractor shall indemnify the employer for any loss or damage to properties, trees etc during the survey works.

2.4 The Contractor should note that AEGCL will not furnish the NRSA satellite imageries or topographical maps prepared by Survey of India but will make available assistance that may be required in obtaining these by providing letters of recommendations, if required to concerned authorities. Bidder shall give along with their bid, clause by clause commentary indicating their confirmation / comments/ observation in respect of all clauses of technical specification.

2.5 The work shall be carried out by the contractor using modern surveying techniques. The bidder shall indicate in his offer, the detailed description of the procedure to be deployed. The details of the equipment & facilities including software's for image processing, etc. available with the bidder or his associates shall also be furnished with the bid.

2.6 Any other activity not specifically mentioned in this specification but required for successful completion of the scope of work shall be deemed included in the scope of the Consultant, without any cost implication to the Owner.

3. Conformity with Indian Electricity Rules & Other Local Regulations

3.1 The Contractor shall note that all transmission line 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 regulation relating to such works shall be consulted, if necessary, about the rules and regulations that may be applicable.

3.2 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.

4. Standards

4.1 Contractor is required to follow statutory regulations stipulated in Electricity (Supply) Act 1948, Indian Electricity Rules and other local rules & regulations.

4.2 The codes and standards referred to in these specifications shall govern. In case of a conflict between such codes/ standards and these specifications, the provisions of the specifications shall prevail. Such codes, standards referred to shall mean latest revisions, amendments, changes adopted and published by relevant agencies.

4.3 Other Internationally acceptable standards which ensure equivalent or better performance than those specified shall also be acceptable.

5. TECHNICAL SPECIFICATIONS

5.1 PRELIMINARY/WALKOVER SURVEY

5.1.1 Identification of three alternative route alignments & selection of optimized route alignment. This shall be done using low resolution satellite imageries of NRSA, Google images and Survey of India maps. The output shall be in the form of digitized route alignment drawing with latest topographical and other details/features up to 8 kms on either sides of selected route alignment (both in hard and soft copies).

5.1.2 Digital terrain modelling along the selected route using contour data from topographical maps. Digitization can be done manually and automatically using software. For this purpose ArcGIS Editor, Arc View, ERDAS, AutoCAD, R2V etc. are to be used.

5.1.3 **For selection of routes, the statutory clearances as per Relevant Standards should be complied with and clearly mentioned in the reports.**

5.1.4 Walk-over Survey of the route alignment (finalized in consultation with the AEGCL).

5.1.5 The following areas, however, are to be avoided as far as possible while selecting the routes of the line:

- a) Tough inaccessible areas where approach is difficult
- b) Towns and villages, leaving sufficient margin for their growth.
- c) Areas subject to floods, gushing nalas during rainy seasons, tanks, ponds, lakes, etc. and natural hazards.
- d) Wooded areas with high trees or fruit bearing trees involving payment of heavy compensations for cutting of the trees.
- e) Swamps and shallow lands subject to flood, marshy areas, low lying lands, river beds and earth slip zones, etc. involving risk to stability to foundations.
- f) High hillocks / hilly areas / sand dunes and areas involving abrupt changes in levels and requiring too many long spans.
- g) Series of irrigation wells.
- h) Shooting areas and other protected areas such as army / defence installations/ ammunition depots , areas of archaeological importance, forest areas and wild life sanctuary.
- i) Areas which involve risk to human life, damage to public & private properties, religious places, cremation grounds, quarry sites and underground mines, gardens, orchards and plantations.
- j) Areas which will create problems of right of way and way leaves.
- k) Buildings / Storage areas for explosives or inflammable materials, bulk oil storage tanks, oil or gas pipeline etc.

5.1.6 Preliminary survey is to transfer the route to the ground with such deviations as may be necessary as per field constraints. Instruments like Survey chains, tapes, theodolite, total station etc are to be used.

5.1.7 Preliminary survey involves:

- i. Fixing of angle points of the towers
- ii. Identification of crossings of all electrical lines & details of the lines.
- iii. Finalizing of crossing points of Railway Tracks & details of such points.
- iv. Finalizing of crossing points of major rivers & details of such points
- v. Finalizing of crossing points of roads, national highways & details of such points

- vi. General classifications of soils, land including forest area (if any).
- vii. Measurement of route length etc
- viii. Pegging of locations.
- ix. Following points may be noted in this regard:
 - a. Measurements of the angles of deviation at all angle / section points are made. Resurvey of parts of the line route is done wherever it is possible to reduce the number of angle points and / or the magnitude of the angles of deviation.
 - b. The length of the line route is measured with the use of survey chains or with the theodolite. When using survey chains for measuring the length of the line route, the chain should be kept horizontal in uneven or undulating land so that horizontal distances are measured and not the distances along the contours of the land.
 - c. The number of consecutive spans between two angle / section points shall not exceed 15 (fifteen) in plain terrain and 10 (ten) spans in hilly terrain.
 - d. The length of any section of the line, i.e., between two angle / section points, shall not exceed 5 km in plain terrain and 3 km in hilly terrain. In case longer sections are available, then cut points / section points shall be provided by using "B" type tower.
 - e. If the terrain & line route permit, attempts can be made so that the section lengths are, as far as possible, in multiples of the basic span of the towers for the relevant voltage class.
 - f. The Preliminary survey report shall be prepared and submitted by the surveyor to the AEGCL. The points as per Annexure 3,5 shall be complied with and submitted as a part of the Preliminary survey report with remarks/comments if any.
 - g. After approval is given, the surveyor shall go ahead with the detailed survey.

5.1.9 Requirement of Transmission Line Routing

- i. The alignment of the transmission line shall be most economical from the point of view of construction and maintenance.
- ii. During routing of transmission line, the points in Clause 5.1.6 should be kept in mind.
- iii. Routing of transmission line through protected/reserved forest area should be avoided. In case it is not possible to avoid the forests or areas having large trees completely, then keeping in view of the overall economy, the route should be aligned in such a way that cutting of trees is minimum.
- iv. The route should have minimum crossings of Major river, Railway lines, National/State highways, overhead EHV power line and communication lines.
- v. The number of angle points shall be kept to a minimum.
- vi. The distance between the terminal points specified shall be kept shortest possible, consistent with the terrain that is encountered.
- vii. Marshy and low lying areas, river beds and earth slip zones shall be avoided to minimize risk to the foundations.
- viii. It would be preferable to utilize level ground for the alignment.
- ix. Alignment will be kept at a suitable distance from power lines to avoid induction problems on the lower voltage lines.
- x. Crossing of communication line shall be minimized and it shall be preferably at right angle. Proximity and parallelism with telecom lines shall be eliminated to avoid danger of induction to them.
- xi. Areas subjected to flooding such as Nalah shall be avoided.
- xii. Restricted areas such as civil and military airfield shall be avoided. Care shall also be taken to avoid aircraft landing approaches.
- xiii. All alignment should be easily accessible both in dry and rainy seasons to enable maintenance throughout the year.
- xiv. Certain areas such as quarry sites, tea, tobacco and saffron fields and rice plantations, gardens & nurseries which will present the AEGCL problems in acquisition of right of way and way leave clearance during construction and maintenance, should be avoided as far as possible.
- xv. Angle points should be selected such that shifting of the point within 100 m radius shall be possible at the time of construction of the line.
- xvi. The line routing should avoid large habitations, densely populated areas, Forest, Animal/Bird sanctuary, reserve coal belt areas, oil pipeline/underground inflammable pipe lines etc. to the extent possible.
- xvii. The areas requiring special foundations and those prone to flooding should be avoided as far as possible.
- xviii. In case of Tower Types, foundations, modern techniques like Monopoles, Multi-Circuit Towers, Narrow Based Towers, etc. shall be explored.

5.1.10 For examination of the alternatives & identification of the most appropriate route, besides making use of information/data/details available/extracted through Survey of India Topographical maps and computer-aided processing of NRSA's satellite imagery.

5.1.11 The contractor shall submit his preliminary observations & suggestions along with various information/data /details collected and also processed satellite imagery data, scanned topographical map data marked with the alternative routes etc. The final evaluation of the alternative routes shall be conducted by the contractor in consultation with AEGCL's representatives and optimal route alignment shall be proposed by the contractor. Site visit and field verification shall be conducted by the contractor for the proposed route alignment.

5.1.12 The co-ordinates of all the angle points as well as other important crossings, landmarks etc. shall be recorded using GPS instrument.

6. DETAILED SURVEY

6.1 The detailed survey shall be carried out using GPS, total stations, digital theodolites etc. along the approved route alignment. As an alternative, the contractor may also use ALTM (Airborne Laser Terrain Modeling) techniques of equal or better accuracy for the detailed survey and plotting on topo sheet to fix up angle point.

6.2 **Soil resistivity**, along the route alignment shall be measured in dry weather by four electrode method keeping inter – electrode spacing of 50 mtrs. For calculating soil resistivity formula $2\pi ar$ (where $a=50$ m and r =megger reading in ohms) shall be adopted. In case of soil characteristics changes within 2 to 3 km, values shall have to be measured at intermediate locations also. Megger reading and soil characteristics should also be indicated in the soil resistivity results.

6.3 Route Marking:

The route of the transmission line shall be recorded using GPS of positional accuracy less than 3m. The co-ordinates of all the angle points as well as other important crossings, landmarks etc. shall be recorded using GPS for easy relocating. At the starting point of the commencement of route survey the co-ordinates shall be recorded. The co-ordinates of the location of the survey instrument shall also be recorded. Further, the co-ordinates at prominent position at intervals of not more than 750 meter along the transmission line to be surveyed upto the next angle point shall also be recorded. Wherever the line alignment crosses the EHT line, Railway line, P&T line or roads, the contractor shall record co-ordinates on the points of crossing. Wherever line route alignment passes over permanent land marks such as rock, boulders, culverts etc. suitable white paint marks with directional and AEGCL markings shall be made and co-ordinates recorded. Surveyor should provide concrete block of size 1000x150x150 mm buried to a depth of atleast 750 mm with AEGCL's name embossing on the concrete block at all angle point locations and important crossings etc.

6.4 Profiling

6.4.1 The complete profiling along the route shall be carried out using surveying equipments viz. total stations, GPS, digital theodolite, long range scanners etc. Reference levels at every 20 meters along the route are to be recorded. R/Ls at other undulations along the route as well as in the route plan and other enroute details viz. crossings, building & structures, trees & other infrastructure etc shall also be recorded. Areas along the route, which in the view of the contractor, are not suitable for tower spotting.

6.4.2 The complete profiling details shall be digitized and the data shall be prepared & stored in the format compatible to computer – aided tower spotting software.

6.4.3 A printed / plotted output of the digitized profiling shall be submitted by the contractor to AEGCL's site-in-charge for review before taking up computer- aided tower spotting.

6.5 Optimization of tower location / tower spotting :

6.5.1 Optimization of tower locations shall be done by the Contractor using computer-aided tower spotting software (PLS CADD). In order to verify the results of computer aided tower spotting, the contractor shall supply the AEGCL, one soft copy of tower spotting & optimization report.

6.5.2 The sag-tension characteristics of the conductor as well as tower spotting data, sag template curves, if any required for tower spotting shall be prepared by the contractor on acrylic sheet indicating cold curve, hot curve, ground clearance curve and support footing curve.

6.5.3 Tower Spotting: While profiling & spotting the towers, the following shall to be borne in mind:

(a) Span: The number of consecutive spans between the section points shall not exceed **15 spans or 5 km in plain terrain and 10 spans or 3 km in hilly terrain** for all lines. A section point shall comprise of tension

point with minimum angle of deviation type towers as applicable.

- (b) Extension / Truncation: An individual span shall be as near to the normal design span as possible. In case an individual span becomes too short with normal supports on account of undulations in ground profile, one or both the supports of the span may be extended by inserting standard body / leg extension. In case of locations where the ground clearance is available, truncated towers may be spotted. The provision kept in the design of towers with respect to body/leg extensions, truncations shall be intimated to the contractor by the AEGCL during execution stage.
- (c) Loading: There shall not be any upward force on suspension towers under normal working conditions and the suspension towers shall support at least the minimum weight span as provided in the designs. In case uplift is unavoidable, it shall be examined if the same can be overcome by adding standard body extensions to the towers failing which tension towers designed for the purpose shall be employed at such positions.
- (d) Road/NH Crossing: At all important road crossings, the tower shall be fitted with double suspension or tension insulator strings depending on the type of tower but the ground clearance at the roads under maximum temperature and in still air shall be such that even with conductor broken an adjacent span, ground clearance of the conductor from the road surfaces will not be less than 9 Mtr for 400kV, 220KV & 132kV lines. At all national highways tension towers shall be utilised and crossing span shall not be more than 250 meters.
- (e) Railway Crossings: All the railway crossings coming enroute the transmission line shall be identified by the contractor. At the time of detailed survey, the railway crossings shall be finalized as per the regulation laid down by the Railway Authorities.
The following are the important features of the prevailing regulations (revised in 1987).
- i) The crossing shall be supported on large angle type tower on either side depending on the merits of each case.
 - ii) The crossing shall normally be at right angle to the railway track.
 - iii) The minimum distance of the crossing tower shall be at least equal to the height of the tower plus 6 meters away measured from the centre of the nearest railway track.
 - iv) No crossing shall be located over a booster transformer, traction switching station, traction sub-station or a track cabin location in an electrified area.
 - v) Minimum ground clearance above rail level of the lowest portion of any conductor under condition of maximum sag shall be maintained at 17.90 mtr for 400 kV line, 15.40 Mtr for 220KV line. And 14.6 Mtr for 132KV line.
 - vi) The crossing span will be limited to 80% of Normal Span or 250 meters whichever is less.
- (f) River Crossings: In case of major river crossings, towers shall be of suspension type and the anchor towers on either side of the main river crossing shall be large angle Y/ D type tower. Clearance required by navigation authority shall be provided. For non navigable river, clearance shall be reckoned with respect to highest flood level (HFL). Minimum ground clearance above the highest flood level river and lowest point of conductor shall be 6.1 mtr for 132 kV line, 7.0 Mtr. for 220kV line and 8.84 Mtr for 400 kV line.
- (g) Power line crossings: Where this line is to cross over another line of the same voltage or lower voltage, R / A type tower with suitable extensions shall be used. Provisions to prevent the possibility of its coming into contact with other overhead lines shall be made in accordance with the Indian Electricity Rules, 1956 / Indian Electricity Act, 2003 as amended upto date. In order to reduce the height of the crossings towers it may be advantageous to remove the groundwire of the line to be crossed (if this is possible, and permitted by the AEGCL of the line to be crossed). For power line crossings of voltage level of 132 KV and above, an angle towers shall be provided on either side of tangent R / A type tower which can be temporary dead end condition with proper guying.
- (h) Telecommunication Line Crossings: The angle of crossing shall be as near to 90 degree possible. However, deviation to the extent of 30 degree may be permitted under exceptionally difficult situations. When the angle of crossing has to be below 60 degree, the matter will be referred to the authority incharge of the telecommunication system. On a request from the contractor, the permission of the telecommunication authority may be obtained by the owner. Also, in the crossing span, power line support will be as near the telecommunication line as possible, to obtain increased vertical clearance between the wires.
- (i) Details en route: All topographical details, permanent features, such as trees, building etc. 24Mtr (Total 48Mtr) 17.5Mtr (Total 35Mtr) for 220KV line on either side of the alignment and 13.5Mtr (Total 27Mtr.) for 132KV Line on either side of the alignment shall be detailed on the profile plan.

6.5.4 Clearance from Ground, Building, Trees etc.

- (a) Clearance from ground, buildings, trees and telephone lines shall be provided in conformity with the Indian Electricity Rules, 1956 / Indian Electricity Act, 2003 as amended upto date.
- (b) The contractor shall count, mark and put proper numbers with suitable quality of paint at his own cost on the trees that are to be cut by the AEGCL at the time of actual execution of the work as detailed below. Contractor may please note that AEGCL shall not pay any compensation for any loss or damage to the properties or for tree cutting due to contractor's work.
- (c) To evaluate and tabulate the trees and bushes coming within 24mtr for 400KV, 17.5 mtr. for 220KV line and 13.5 mtr. for 132KV line on either side of the central line alignment the trees will be numbered and marked with quality paint serially from angle point 1 (1) onwards and the corresponding number will be painted on the stem of trees at a height of 1 meter from ground level.
- (d) The trees list should contain the following :
 - i. Girth (circumstances) measured at a height of 1 meter from ground level.
 - ii. Approximate height of the tree with an accuracy of +2 meters.
 - iii. Name of the type of the species / trees.
 - iv. The bushy and under growth encountered in the 48 Mtr. Belt for 400KV line and 35Mtr for 220KV line should also be evaluated with its type, height, girth and area in square meters, clearly indicating the growth in the tree / bush statement.
 - v. The contractor shall also intimate the AEGCL, his assessment about the likely amount of tree & crop compensation etc required to be paid by the AEGCL during execution stage. This assessment shall be done considering prevailing practices / guidelines, local regulations and other enquiries from local authorities.

6.5.5 The profile sheets showing the locations of the towers together with preliminary schedules of quantities indicating tower types, wind & weight spans, angle of deviation, crossing & other details etc shall be submitted by the contractor for review & approval by AEGCL's site in charge.

6.5.6 Types of tower shall be A, B, C, D as per IS 5613 and other relevant standard for transmission lines.

6.5.7 Conductor to be used for 400 KV, 220 KV and 132 KV lines shall be ACSR Moose, Zebra and Panther respectively.

6.5.8 Tower Schedule submitted shall be as per format specified in Annexure 6.

6.5.9 Detailed survey of tower locations:

- (a) The detailed survey shall be conducted to locate the tower locations on ground conforming to the profile and tower schedule.
- (b) The co-ordinates of all the tower locations shall also be recorded using GPS of positional accuracy less than 3m for easy relocating. The positions of all tower locations shall be marked in the final digitized route alignment drawing with relative distances from any permanent bench mark in the area.
- (c) The contractor shall also collect required data at each tower location in respect of soil strata, ground water level, history of water table in adjacent areas / surface water and classify the suitable type of foundation at each tower location based on the data collected at each location and detailed soil investigations carried out at selected locations etc.
- (d) The levels up or down of each pit centre with respect to centre of tower location shall be recorded at intervals of 2m using total stations / GPS / digital theodolite and digitized contour plans shall be made. Based on the digitized elevation plans, the quantities of benching & protection work vis-à-vis possible unequal leg extensions shall be optimized using suitable computer aided techniques / softwares.

6.5.10 The changes desired by the AEGCL in the preliminary tower schedule or as may be required based on detailed survey of tower locations & contouring by the contractor, shall be carried out by the contractor and the final tower schedule shall be submitted for approval of AEGCL. The tower schedule shall show position of all type of towers, span length, type of foundation for each tower, benching & revetment requirement, unequal leg extensions, deviation at all angles, crossings & other details etc.

7.0 DOCUMENTS RELATED TO STATUTORY/ROW CLEARANCES

Some portions of the line may require clearance from various authorities. The Contractor shall indicate the portion of the line so affected, the nature of clearance required and the name of concerned organizations such as local bodies, municipalities, P&T (name of circle), Inland navigation, Irrigation Department, Electricity Boards and Zonal railways, Divisional Forest Authorities etc.

Appendix-1

COVERING LETTER (ON THE BIDDERS LETTER HEAD)

To,

The Deputy General Manager, Mirza T&T Circle, AEGCL, Mirza

Sub: Submission of Tender.

Ref:-

1. NIT No:-
2. Name of work:-
- 3.

Sir,

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

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

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

**Appendix-2
PROFILE OF THE BIDDER**

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

Sl. No.	Particulars	To be filled by Bidder
a)	Name of the Bidder	:-
b)	Registration with Memorandum of Association	:-
c)	PAN	:-
d)	GST Registration number	:-
e)	Labour License registration	:-
f)	Income Tax Clearance Certificate	:-
g)	Date of Establishment/ Incorporation	:-
h)	EPF	
i)	Annual turnover of last 3 years	
j)	Work order of similar nature	
k)	Postal Address	:-
	House No.	:-
	Lane	:-
	Street	:-
	Town/Village	:-
	Post Office	:-
	P.S.	:-
	District	:-
	Pincode	:-
l)	Telephone Number	:-
	Mobile No.	:-
	E-Mail Address	:-
	Website	:-
m)	Name(s) of the Owners / Directors/Partners	:-
n)	Name of the Banker with Address and Telephone Number	:-
o)	Contact Person Details <i>(Furnish here name of that person with whom AEGCL may get in touch for more information or clarifications)</i>	Name:- Designation:- MobileNumber:- EmailAddress:-