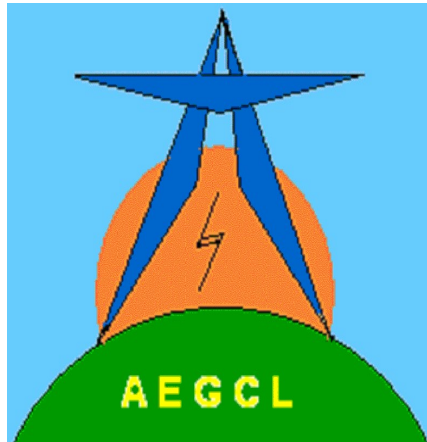


ASSAM ELECTRICITY GRID CORPORATION LIMITED
Regd. Office: 1st Floor, Bijulee Bhawan, Paltan Bazar, Guwahati-781001
CIN: U40101AS2003SGC007238
Ph: -0361-2739520/Fax:-0361-2739513 Web: www.aegcl.co.in



TENDER DOCUMENT

Name of Work: Construction of pile foundation at loc. no. 69 of 132 kV Salakati-APM
- TL.
Bid No.: AEGCL/MD/ TL 87/ Part-IV/ Pile
NIT No.: AEGCL/MD/TL-87/ Part-IV/Pt/5
FUND: TDF scheme of Govt of Assam

For and on behalf of Assam Electricity Grid Corporation Limited (AEGCL), the Chief General Manager (PP&D), invites e-tender from reputed Civil Engineering Firms / Contractors for the following works:

“Construction of pile foundation at loc. no. 69 of 132 kV Salakati-APM TL.”

A single stage two envelope procedure (Techno-Commercial and Price Bid) will be adopted for this tender.

(A) INFORMATION TO BIDDER: -

1. NAME OF WORK:

“Construction of pile foundation at loc. no. 69 of 132 kV Salakati-APM TL.”

2. NIT No.:

3. LOCATION OF WORK: - loc. no. 69 of 132 kV Salakati-APM TL. GPS Location. 26° 20' 01.70" N 90° 33' 56.55" E. However, the bidder is requested to visit the location before submission of tender.

4. CONTACT ADDRESS: -

The Chief General Manager (PP&D),
AEGCL, First Floor,
Bijulee Bhawan, Paltanbazar,
Guwahati-781001.
Email id- cgm.ppd@aegcl.co.in

5. BIDDING PROCEDURE: -

- a) The bidders must register themselves at <https://assamtenders.gov.in> as per the guidelines laid in the website.
- b) The bidders have to submit scanned copies of the relevant documents through the e-Tender Portal.
- c) The bid must be submitted online through e-tendering portal <https://assamtenders.gov.in>.
- d) Bidders may obtain further information from the office of the Chief General Manager (PP&D), Bijulee Bhawan, Paltan Bazar, Guwahati - 781001, Assam [e-mail: cgm.ppd@aegcl.co.in; Web site: www.aegcl.co.in].
- e) To participate in the tender the interested bidders may visit <https://assamtenders.gov.in> for all the relevant documents and information required to participate in the tender.

6. CRITICAL DATES:

Tender Start Date
Submission Start Date
Tender End Date
Opening Date of Techno Commercial bid

7. TENDER VALUE:

The tender value *inclusive of all taxes* is **Rs.27,23,410.00** (Rupees Twenty-Seven Lakh Twenty-Three Thousand Four Hundred and ten) only.

8. TENDER PROCESSING FEE AND MODE OF PAYMENT: -

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

Bidder has to pay Non-Refundable tender processing fee of **Rs.545.00 (Rupees Five**

Hundred and forty-five) only via e-tender portal www.assamtenders.gov.in.

9. BID SECURITY/EARNEST MONEY AND MODE OF PAYMENT: -

- a) For participation in bidding procedure, participants must compulsorily pay the Bid Security of **Rs.54,468.00 (Rupees Fifty-four Thousand four hundred and Sixty-eight)** only via e-tender portal www.assamtenders.gov.in.
- b) 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.
- c) The bid security of unsuccessful Bidders shall be returned as promptly as possible upon the successful Bidder's furnishing of the performance security.
- d) The bid security may be forfeited: -
 - (i) if a Bidder withdraws its bid during the period of bid validity period.
 - (ii) if the successful Bidder fails to sign the Contract within the specified period.
 - (iii) if the successful Bidder fails to furnish a performance security within 15 (Fifteen) days' time of issue of LOA/NOA.

10. PERFORMANCE GUARANTEE AND MODE OF PAYMENT: -

- a) Warranty: The materials and entire work are to be guaranteed against defective design, materials and workmanship and for satisfactory performance for a period of 18 (eighteen) Months from the date of final acceptance of the completed work by AEGCL.
- b) The successful Bidder shall have to deposit through a **Bank Guarantee/Fixed deposit/RTGS/NEFT** 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 including GST as performance security within **15(Fifteen) days** from issue of LOA/NOA duly pledged in favour of the Purchaser concerned (AEGCL) and such security deposit shall be **valid up 675 days beyond the warranty period..** In case of Abnormally Low Bid the amount to be taken as performance guarantee will be as per bid document.
- c) If the contractor/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) If the value of the work increases from original ordered value, the contractor has to provide performance guarantee for additional amount
- e) If any abnormally low bid is accepted under Clause no. (B) 5.B., after taking the additional performance security as per the assessment of the committee, however, the total performance security should not have to be exceeded 20% of the total contract value.
- f) The additional performance security shall be treated as the part of the original performance security and shall be valid for a period coextensive with the applicable defect liability period of the contract.
- g) Non submission of the additional performance security shall constitute sufficient ground to rejection of the bid and similar assessment shall be initiated for next ranked bidder if that bidder is identified as ALB.
- h) No interest shall be payable on such deposits.

11. CLARIFICATIONS: -

- a) A prospective Bidder requiring any clarification of the Bidding Document shall contact the AEGCL in writing their enquiries during Pre-bid meeting. AEGCL will respond to any request for clarification if deemed necessary. 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. The costs of visiting the site shall be at the Bidder's own expense.
- c) The Bidder and any of its personnel or representatives will be granted permission by AEGCL to enter upon its premises and lands for the purpose of such visit, but only upon the express condition that the Bidder and its personnel will release and indemnify the Employer and its personnel 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. VALIDITY OF BID: -

- a) Bid shall remain valid for the period of **180 days** after the 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.

13. TIME OF COMPLETION: -

- a) The allotted time of completion for the work is **75 days** from the handing over of the site.

14. DISCLAIMER: -

- a) AEGCL is not committed contractually in any way to those Bidders whose Bid are accepted. The issue of this Bid does not commit or otherwise oblige AEGCL to proceed with any part or steps of the process.

15. AMENDMENT OF TENDER DOCUMENT: -

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

16. LANGUAGE OF BID: -

- a) 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.

17. NEGOTIATION WITH BIDDER: -

The AEGCL reserve the right to hold negotiations with lowest bidder if AEGCL feels the quoted rates of particular item(s) are unreasonably high. The bid must be valid, eligible and technically acceptable and considered for award of contract.

18. VERIFICATION OF DOCUMENTS: -

- a) AEGCL reserves the right to verify the documents submitted by the bidders with issuing authority and if any abnormalities are observed in the same, their bids will be rejected.

19. RIGHT TO REJECT: -

- a) 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 Bid

document 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

(B) ELIGIBILITY QUALIFICATION:

- i. The Techno-Commercial Evaluation will be done on the basis of technical qualification, financial qualifications and fulfilment of the legal conditions.
- ii. The Price Bid of only Responsive Techno-Commercial Bidders will be opened and intimation will be issued in due course.

1. ELIGIBLE BIDDERS: -

- a) A Bidder may be a person, partnership, private entity or a government-owned entity.
- b) A Bidder, and all partners constituting the Bidder, shall have Indian nationality.
- c) In the case of the Joint Venture (JV): -
 - (i) When the bidder is a Joint Venture (JV) of two or more firms as partners, all partners shall be jointly and severally liable. The JV shall legally authorize one of the partners as the lead partner for the purpose of submitting the bid, incur liabilities; receive payments and instructions on behalf of the others. A copy of the **registered** JV agreement, executed on Non judicial stamp paper, shall be submitted with the bid. However, in case of successful bid, the agreement shall be signed by all the partners, so as to be legally binding on all the partners.
 - (ii) The lead partner must fulfil 40 percent of the qualifying criteria.
 - (iii) The other partner must fulfil individually not below the 20 percent of the qualifying criteria.
- d) 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: -
 - they have controlling partners in common; or
 - they receive or have received any direct or indirect subsidy from any of them; or
 - they have the same legal representative for purposes of this bid; or
 - 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) If 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.
- 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.
- g) 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.
- h) Bidders shall provide such evidence of their continued eligibility satisfactory to the AEGCL, as the Employer shall reasonably request.
- i) In case a prequalification process has been conducted prior to the bidding process, this bidding is open only to prequalified Bidders.
- j) The bidder must have experience of execution of work of similar nature previously. The bidder must submit experience and Performance Certificate for scrutiny by AEGCL.
- k) **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.

2. LEGAL ENTITY: -

- a) Verification may be undertaken to verify that an applicant is a bona-fide registered company or business. Bidders are required to provide evidence of the legal entity by providing a copy of an official document as mentioned in the appendix attached along with this bid document.

3. TECHNICAL QUALIFICATION: -

- a) Experience having completed similar works during the last 7 years ending last day of the month previous to the one in which applications are invited should be either of the following:
- i. **Three similar completed works** each costing not less than the amount equal to **Rs.10,89,364.00** (Rupees Ten Lakhs Eighty-nine Thousand Three Hundred and Sixty-four) only
or
 - ii. **Two similar completed works** each costing not less than the amount equal to **Rs.13,61,705.00** (Rupees Thirteen Lakhs Sixty-One Thousand Seven Hundred and Five) only.
or
 - iii. **One similar completed work** costing not less than the amount equal to **Rs.21,78,728.00** (Rupees Twenty-One Lakhs Seventy-eight Thousand Seven Hundred and Twenty-eight) only.

Note: Bidders should have experience in “Construction of Power transmission line for 132 kV and above” for Govt. Department or PSUs only.

- iv. If the nature of work and value differs from the above stated conditions, it will not be considered while evaluation of technical qualification.
 - v. Work order along with completion certificate are to be attached.
- b) Bidders must compulsorily submit work order and work competition certificate issued from Govt Department/reputed PSUs only satisfying the above-mentioned work experience criteria for technical qualification. Moreover, AEGCL reserves the right to scrutinise any work order/work competition certificate submitted by the bidders with issuing authority and if any abnormalities are observed in the same, their bids will be rejected.

4. FINANCIAL QUALIFICATION: -

- a) Minimum average annual turnover of **Rs.8,17,023.00** (Rupees Eight Lakhs seventeen thousand and twenty-three) only calculated as total certified payments received for contracts in progress or completed, within the last 3 (Three) years. (Audited Balance Sheet)
- b) The Contractor must furnish their Bank Solvency Certificate indicating the amount by concerned authority in necessary format as per their banks.
- c) Financial Statements for last 3 (three) years will be considered for calculation of turnover (should be CA/CMA certified).

5. PRICE BID EVALUATION PROCESS:

Identification:

- A. The following methodology will be practised for identification and treatment of the Abnormally Low Bids (ALB) in this tender process of AEGCL:
- (i) **Absolute Approach** is to be considered 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 to be considered 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.
- B. In case of an ALB, the tender evaluation committee/appropriate authority of the respective tenders shall undertake the following three stage review process which is as below:
 - (i) To identify ALB as per the steps mentioned in SI no. 5.A.(i) and 5.A.(ii) whichever is applicable.
 - (ii) To seek and analyse 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.
 - (iv) On acceptance of the bid, whether Additional Performance Security is to imposed on the bidder supplemented by adequate justification.
- C. **In case of acceptance of ALB with Additional Performance Security:**
 - (i) If any abnormally low bid is accepted under point 5.B.(iii) 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.

(C) GENERAL CONDITIONS OF CONTRACT:

1. INSPECTION OF SITE: -

- a) The Bidder is advised to visit and examine the site where the work is to be carried out and its surroundings, nature of work, site conditions, area for storage of materials, etc. and obtain for itself on its own responsibility all information that may be necessary for preparing the bid and entering into a contract. The costs of visiting the site shall be at the Bidder's own expense. Non-familiarity with the site conditions will not be considered a reason either for extra claims or for not carrying out the work in strict conformity with the specifications & requirements.
For site visit and any clarification/information/assistance, the intending Bidder may contact in written to the Office of the CGM (PP&D).

2. PREPARATION OF BID: -

- 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) Documents Establishing Conformity of the Goods and Services: -The documentary evidence of the conformity of the goods and services to the Bidding Document may be in the form of letter, drawings and data, and shall furnish. A detailed description of the

essential technical and performance characteristics of the goods and services, including the functional guarantees of the Goods, in response to the specification.

- c) Bidder should note clearly that department should not take any responsibility for issuing of any materials, equipment's and T&P's that may be required in the work.
- d) All materials, labours, equipment's, T&P and heavy vehicle etc. required in the work shall have to be arranged by the bidder/contractor from his own sources in the event of allotment of the said work to him/them.
- e) Water to be used in the work should be clean and free from all impurities; the bidder should note that no water will be provided to them for the execution of the work from the department
- f) The department is also not bound to supply power that may be required in the execution of the work. However, subject to the availability of the power source near the vicinity of the work site, the department on payment of tariff as applicable at the time of execution of work may arrange one point near the work site.
- g) The bidder should clearly understand that all materials to be utilized in the work must confirm to the specifications. No substandard materials will be allowed to utilize in the work. Samples of each and every material to be brought to the site of work shall have to be get approved by the competent authority of the department before use.
- h) The contract must not be sublet under any circumstances. If any contractor found in doing so, his work liable to be terminated.
- i) The specification for the work shall be as per specification laid down in the items of work contained in the enclosed schedule of items of work or as per the APWD schedule of rates for Building (civil works), Sanitary and Water supply and internal electrification respectively (whichever is applicable) but, certain modification in the specification and method of execution of work if required shall have to be carried out which shall be finalized with the contractor bilaterally through discussion

3. PRICE BID: -

- a) 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, delivery, testing of materials, construction, installation and completion of the Work. The rate should also include the cost of testing of materials at the approved laboratory, carriage and transportation of sample, preparation of report, submission of report in all respect as required by AEGCL. 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.
- b) Bidders are required to quote the price for the commercial, contractual and technical obligations outlined in the bidding document.
- c) **Bidders quoted price should include all cost of testing of materials, transportation of sample, storage, preparation and submission of report during approval period, construction period as well as after completion of the work.**
- d) Whenever forest produces like sand, stone, timbers etc are used in the work the contractor have to furnish documentary proof that requisite royalty on such produces has been paid to the concerned Department, otherwise will be deducted at source at

- applicable rate.
- e) Taxes like work contract, income tax etc. which need to be deducted at source as per the prevailing law, will be deducted at source.
 - f) 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.

4. SITE FACILITIES: -

- a) The contractor shall visit the site to assess the nature and volume of the work. It will be in their scope to make accessibility to their work site, cleaning, dismantling of the same. AEGCL will not provide any accommodation at the work site to the contractor and their field personnel. No claim shall be entertained from the bidder for making his own arrangement for providing accommodation to the labours and bidder will bear entire expense. The same has to be arranged by the contractor on their own. However, AEGCL may provide space for storage of the materials but responsibility of the material and their safety shall be taken care of by the Contractor. In case of non-availability of space under AEGCL the same should be arranged by the contractor outside AEGCL campus/work site at their own cost and responsibility.
- b) AEGCL shall not be responsible for the safety of the workers at site either on account of the works executed by the Contractor or on account of the works executed by any other agency involved at that time.
- c) AEGCL shall on no account be responsible for the expenses incurred by the Contractor during the progress of work at site, towards any incidental expenditure like medical amenities to the workers at site, security arrangements.
- d) The quoted price shall be deemed to include charges for all site facilities for labour that are considered necessary for execution of the work.
- e) No claim shall be entertained from the bidder for making his own arrangement for approach roads from outside PWD road to the site and bidder will bear entire expenses.
- f) AEGCL on no account shall be responsible for storage of materials or loss or pilferage or theft either in respect of the material stored or material already billed and paid for by the AEGCL.
- g) Any facilities available at site shall be utilized only with prior permission of AEGCL and it should not be taken as granted for availing such services.

5. DEFECT AFTER COMPLETION OF WORK: -

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

6. VARIATION AND DEVIATION OF QUANTITY: -

- a) The Tendered rates shall hold good for any variations in the Tendered quantities for legitimate completion of works as per original design on account of any modification in the bill of quantities.
- b) **Deletion of work:**
AEGCL and its representative have the right to delete or decrease any item or quantity

from schedule of quantity at its discretion if deemed necessary. No claim by the contractor will be admissible for this deletion or deduction of Item/quantity from schedule of quantity.

7. LABOUR LEGISLATION: -

- a) The Bidder shall comply with the provisions of the Apprentices Act 1961, payment of Wages Act 1936, Minimum Wages Act 1948, Employees Liability Act 1938, Workmen's Compensation Act 1923, Industrial Disputes Act 1947, Maternity Benefits Act 1961, and the Contract Labour (Regulation and Abolition) Act 1970, Provident Fund Act or the modifications thereof or any other laws relating thereto and the rules made there under from time to time.
- b) The Bidder shall indemnify and keep indemnified AEGCL against payments to be made under and for the observance of the laws aforesaid and the Contractors' Labour Regulations without prejudice to his right to claim. The laws aforesaid shall be deemed to be a part of this contract and any breach thereof shall be deemed to be a breach of this contract.
- c) The Bidder shall at his own expense arrange for all the safety provisions for the safety of all workers and employees directly or indirectly employed on the work by the Bidder.
- d) The Bidder shall be fully responsible at his own expenses for compliance all the labour regulations and rules to be observed by them. The Bidder shall fully indemnify AEGCL against any action by the state and/or Central Government for any default or alleged default by the Bidder for violation of any of such rules and regulations. If, due to any default of the Bidder, AEGCL has to incur any expenditure for compliance of the rules and regulations or for any other reason connected with such default, AEGCL shall be entitled to recover from the Bidder all such expenditure in full from any payment due to the Bidder.

8. GOVERNMENT AND LOCAL RULES: -

- a) The Contractor shall conform to the provisions of all local bye-laws and acts relating to the work and to the regulations etc. of the Government and Local Authorities and of any Company whose system and design is proposed to be connected/utilized. The cost, if any, shall be deemed to have been included in his quoted rates, taking into account all liabilities and shall indemnify AEGCL against such liabilities and shall defend all actions arising from.

9. ELIGIBILITY OF CONTRACTORS EMPLOYEES: -

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

10. ENGINEER AT LIBERTY TO OBJECT: -

- a) AEGCL's Site in-charge shall have right to remove any person provided by the Contractor who, in the opinion of the Site in-charge, misconducts himself, or is incompetent or negligent in the proper performance of his duties, or whose presence on Site is otherwise considered by the Engineer to be undesirable, and such person shall not be again allowed upon the Works without consent of the Engineer. Any person so removed from the Works shall be replaced immediately without hampering the work.

11. TAXES: -

- a) Any taxes, royalties and duties as per Govt. Law should be responsible of the contractor and must be included in their quoted rate.

12. INSURANCE: -

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

13. DAMAGE TO PERSON AND PROPERTY: -

- a) The Contractor shall be responsible for all injury to the work or to workmen, to persons, animals or things and for all damages to the structural and/or decorative part of property which may arise from the operations or neglect of contractor or its employees, against whether such injury or damage arise from carelessness, accident or any other cause whatsoever in any way connected with the carrying out of this Contract. The Contractor shall at his cost effect the insurance necessary and indemnify AEGCL entirely from all responsibility in this respect. The scope of insurance is to include loss or damage to the work and workmen due to carelessness, accident including fire, earthquake, floods, all medical expenses, compensation to be borne in the event of accident etc., damage or loss to the Contract itself till this is made over a complete state. Insurance is compulsory and must be affected from the very initial stage and should cover the entire contract period till handing over of complete works. The Contractor shall also be responsible for anything which may be excluded from damage to any property arising out of incidents, negligence or defective carrying out of this Contract.
AEGCL shall be at liberty and is hereby empowered to deduct the amount of any damages, compensations, costs, charges and expenses arising or occurring from or in respect of any such claim for damages from any sums due or to become due to the Contractor.

14. ACCEPTANCE OF BID AND CONTRACT AGREEMENT: -

- a) An agreement shall have to be drawn on non-judicial stamp of appropriate value with AEGCL 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 LOA/NOA.
Wherever there is any variation in between the conditions of AEGCL's General Conditions of Supply and Erection 2009 and the above terms & conditions, this bid conditions will supersede the conditions of AEGCL's General Conditions of Supply and Erection 2009.

15. STATUTORY AND SAFETY REQUIREMENT: -

- a) Each and every safety measure for MAN and MACHINE will be the sole responsibility of the Contractor without any prejudice. Compensation claims if any will also be the responsibility of the contractor without any prejudice.
- b) During the execution of the work, the contractor shall have to mark the site with banner warning/indicating precautions.
- c) The Contractor shall, throughout the execution and completion of the Works and the remedying of any defects therein:
- d) Have full regard for the safety of all persons entitled to be upon the Site and keep the Site (So far as the same is under his control) and the Works in an orderly state appropriate to the avoidance of danger to such persons, and
- e) Provided and maintain at his own cost all lights, guards, fencing, warning signs and watching, when and where necessary or required by the Engineer or by any duly constituted authority for the protection of the Works or for the safety and convenience of

the public or others, and Take all reasonable steps to protect the environment on and off the Site and to avoid damage or nuisance to persons or to property of the public or others resulting from pollution, noise or other causes arising as a consequence of his methods.

16. PAYMENT TERMS: -

- a) No advance/Mobilization advance shall be made in this contract.
- b) No claim for interest shall be entertained by AEGCL in respect of any money or balance which may be in AEGCL's hands owing to any dispute or difference or misunderstanding between the contractor and the AEGCL or due to the reason beyond the reasonable control of AEGCL.
- c) First running bill shall be paid to the contractor on 40% completion of the work and Second running bill shall be paid to the contractor on 70% completion of the work.
- d) Final bill must contain the original site register.
- e) Final payment shall be released to the contractor only after completion of the work/final acceptance by AEGCL.
- f) Payment is subject to availability of specific fund.
- g) 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
 - Banker's RTGS Code
 -

17. ADDITIONAL WORKS: -

The Contractor shall, when ordered in writing by the concerned authority, perform extra work and furnish extra materials not required by the invitation or included in the "Bill of Quantities", but forming an inseparable part of the work concerned. For extra work and materials will ordinarily be paid for the lump sum or unit price/rates stated in the order. Whenever in the judgement of the concerned authority, it is impractical, because of the nature of the work or for any other reason to otherwise fixed the price/rate in order, the extra work and materials shall be paid for on the basis or actual necessary cost plus overhead and profit allowances as indicated hereunder.

The actual necessary cost will include:

- a) Market value of the materials utilized in the extra work, including taxes and duties, if any.
- b) Actual cost of handling and transportation of materials wherever applicable.
- c) Direct labour charges.
- f) Further supervision charges and profit will be allowed at 10% on the sum. In case any material or parts are furnished by the department no overhead and profit will be allowed on the value of such materials or parts.

18. RETENTION MONEY: -

- a) 10% retention money will be deducted from running bill, which will be released along with the final bill on completion of the work in all respect.

19. WARRANTY: -

- a) The term period of warranty shall mean the period of 18 months from the date of Taking Over of the Work by AEGCL. A Taking over Certificate (TOC) will be issued by the Concerned AGM.
- b) The Contractor must handover the warranty card or other relevant documents from the

OEM at the time of submission of the bill.

20. SUSPENSION OF WORK: -

- a) If the contractor persistently neglects to carry out his obligations under the contract and/or commits default in complying with any of the terms and conditions of the contract and does not remedy it or take effective steps to remedy it within 7 days after a notice in writing is given to him in that behalf by AEGCL subject to other provisions contained, AEGCL may without prejudice to his any other rights or remedy against the Contractor in respect of any delay in commencing, completing the work may serve notice in writing absolutely determine and cancel the Contract.

21. EXTENSION OF TIME: -

- a) Time is the essence of the contract. No extension of time shall be allowed except on valid reason after pre-approval from competent authority.

22. CHANGE OF NAME OF THE TENDERER: -

- a) At any stage after tendering, AEGCL shall deal with the Contractor only in the name and the address under which he submitted the tender. All the liabilities/ responsibilities for due execution of the contract shall be that of the Contractor.
- b) Any change/ alteration of name/ constitution/ organization of contractor shall be duly notified to the AEGCL and the AEGCL reserves the right to determine the contract, in case of any such notification.

23. DEATH, BANKRUPTCY ETC.: -

If the Contractor becomes bankrupt or being a corporation is in the process of winding up, amalgamation or reorganization, the AEGCL shall be at liberty to:

- i. Terminate the contract forthwith by notice in writing to the Contractor or to the liquidator or receiver or to any person in whom the contract may become vested.
- ii. Give such liquidator, receiver or other person the option of carrying out the contract subject to his providing a guarantee for the due and faithful performance of the contract up to an amount to be determined by the AEGCL.

In case of death of the Contractor before completion of work and supply, the Engineer or AEGCL shall be at liberty to:

- a) Close up the contract and take over the completed portion of work done and made as per specification and make final payment to the legal heir of the Contractor on receipt of claim from such legal heir.
- b) Give the contract to the legal heir of the Contractor subject to his depositing a performance security for the due and faithful performance of the contract. The performance security amount shall be determined by the AEGCL commensurate with the incomplete portion of the work. The AEGCL will enter into a fresh contract with the legal heir of the Contractor on the same terms and conditions of the earlier contract.

24. CONTRACTUAL FAILURE, LIQUIDATED DAMAGE AND PENALTY: -

- a) Liquidity Damages 0.5% of the amount of delayed work per week subjected to the maximum 10 % of the contract value.

25. TERMINATION OF CONTRACT: -

- a) If the performance of the contract is not satisfactory and not corrected within 15 days of receiving notice, then employer shall be at liberty to terminate the contract and get the work executed through other means at the risk and cost of the Contractor.

- 26. PAYMENT ON TERMINATION: -**
- a) In the event of termination of the contract, AEGCL shall be at liberty to get balance work done by any third party at the risk and cost of the contractor and due payment of the contractor, if any shall be released after the completion of whole of the works.
- 27. SUSPENSION OF BUSINESS DEALINGS WITH FIRMS/ CONTRACTORS: -**
- a) The AEGCL may suspend business dealings with a Firm/ Contractor, if:-
- i. The Central Bureau of Investigation or any other investing agency recommends such a course in respect of a case under investigation; and if a prima facie case is made out that the firm is guilty of an offence involving unethical, unlawful, fraudulent means in relation to business dealings, which, if established, would result in business dealings with it being banned.
- ii. The AEGCL has past record of non-performance of the Firm in its previously awarded contracts.
- iii. The AEGCL has record of ban against the Firm by other Government /Public sector utility.
- b) However, the AEGCL shall give the Firm/ Contractor a fair chance to explain the circumstances of such previous suspensions.
- 28. BANNING OF BUSINESS DEALINGS WITH FIRMS/ CONTRACTORS: -**
- The AEGCL may ban business dealings with a Firm/ Contractor, if: -
- a) The owner (s) of the Firm/ Contractor is convicted by a court of law following prosecution for offences involving unethical, unlawful, fraudulent means in relation to business dealings.
- b) There is strong justification that the Firm has been guilty of malpractices such as, bribery, corruption, fraud, substitution of tenders, interpolation, mis-representation, evasion or habitual default in payment of any Government tax etc.
- c) The Firm continuously refuses to return government dues without showing adequate cause and government are reasonably satisfied that this is not due to reasonable dispute which would attract proceeding in arbitration or court of law.
- d) The Firm is found guilty of involving in unethical practices, such as:-
- i. "corrupt practice" involving offering, giving, receiving or soliciting, directly or indirectly, of anything of value to influence the action of any such official/ party in procurement process or in contract execution.
- ii. "fraudulent practice" involving misrepresentation or omission of facts in order to influence a procurement process or the execution of a contract to the detriment of the Employer.
- iii. "collusive practice" involving a scheme among bidders (prior to or after bid submission) designed to establish bid prices at artificial non-competitive levels and to deprive the Employer of the benefits of free and open competition.
- iv. "coercive practice" involving harming or threatening to harm directly or indirectly, persons or their property to influence procurement process or the execution of a contract. The AEGCL may sanction a Firm/ Contractor or its successor, including declaring ineligible, indefinitely or for a period of not less than 3 (three) years.
- 29. FORCE MAJEURE CONDITION**
- a) 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.

30. SETTLEMENT OF DISPUTE AND ARBITRATION: -

- a) 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 respective District of work.

31. POLLUTION AND ENVIRONMENT: -

- a) Each and every measure should be taken to adhere to the standard norms to avert any occasion of Air Pollution, Water Pollution, Soil Pollution and Sound Pollution. In case of any deviation leading to any legal action the Contractor will be solely responsible without any prejudice.

32. ACCEPTANCE AND TAKEOVER: -

- a) 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 Performance 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.

(D) WORK SCHEDULE:

1. SITE HANDOVER: -

- a) Handing over of the work site will be done in presence of AEGCL Officials of concerned site and contractor or its authorized representative.
- b) The contractor has to submit the list of manpower along with contact numbers to be engaged for the work to the AEGCL Officials .
- c) The date of site handing over to be noted on the Site register duly signed by the AEGCL Officials and contractor or its authorized representative.

2. WORK COMMENCEMENT: -

The work should be started only after having the following documents.

- a) Site Register
- b) Measurement Book
- c) Drawings
- d) Specifications of item & schedule of Quantity
- e) Approved Material

3. SITE REGISTER: -

- a) It will be issued by the department along with the work order.
- b) It will be the responsibility of the Contractor to record and update the site register with details of Day-to-Day activities and other details.
- c) The days on which no work is carried out should be recorded in the site register with proper justification.
- d) Any instruction by AEGCL officials during site visit must be noted properly and should be jointly signed by the official and the contractor or its authorised representative.

- In case of any disagreement, the Contractor must notify AEGCL in written.
- e) Any deviation in works must be properly noted in the site register by the Contractor along with proper justification for it.
 - f) Progress report along with work completion percentage must be prepared by the Contractor on the basis of site register log and has to be submitted to AEGCL on 1st and 16th date of the month.
 - g) Site register shall be verified from time to time by the Site In-charge and any anomalies found will be forwarded to higher authorities in written by the Site In-charge.

4. WORKING PROCEDURE:

- a) **All materials must be procured only after verification and approved at store by AEGCL or any authorised representative.**
- b) Any materials bought to the site of work without approval from AEGCL, those materials will not be accepted and cannot be used in carrying out the work.
- c) All the work must be carried out as per the directions of AEGCL and no deviation from the directions shall be allowed under any circumstances. In case of inevitable discourse, the contractor must get the deviation approved from the AEGCL.
- d) If any kind of unapproved deviations are observed during the course of the work, the contractor shall have to redo the work as per the direction of AEGCL at the cost of the Contractor.
- e) It shall be the contractor's responsibility to clear any unusable debris/left out materials from the AEGCL campus. No unwanted material can be left unattended by the contractor and the same must be cleared before handing over the site to AEGCL.
- f) The reusable or valuable dismantled materials during the work have to be shifted to a place as decided and directed by the AEGCL.
- g) Since multiple Agencies will be working on the same work site, there should be proper coordination between different contractors involved in the same project or related projects under AEGCL.
- h) The requirement of electricity and water for execution of mentioned work is in scope of the concerned contractor.

5. PERT CHART OR BAR CHART: -

The successful bidder within 10 (ten) days before the contract is awarded will make out a detailed PERT Chart covering all activities along with detailed program chart on accepted scheme indicating various stages of execution, method of execution and completion of work in different stages keeping the period of completion in view and submit the same to the Engineer for the consideration and approval.

(E) GENERAL SPECIFICATION OF WORK:

The work is to be executed as per specifications of the BOQ as provided by AEGCL. Any unauthorised deviation is strictly prohibited and any deviation is to be corrected by the contractor at his own risk and cost.

1. CONSTRUCTION OF BORED CAST IN-SITU-PILE FOUNDATION

(I) General Requirement

1. The specification covers the technical requirements for piling work, general description of work, quality and workmanship. In every case, work shall be carried out to the satisfaction of AEGCL in accordance with the Technical Specifications and conform to location, lines, grades and cross sections shown on the construction drawing

or as directed by AEGCL. The specifications are not, however, intended to cover all the minute details and the work shall be executed according to the specified IS Codes. In absence of the IS Codes, work shall be executed according to the best prevailing local Public Works Department practice or to the recommendations of the relevant International Standards or to the instructions of AEGCL. This specification shall have precedence in case anything contrary to this is stated anywhere in this Bid Document. In case of conflict between the Specification and Codes, the former shall prevail.

2. The work shall include mobilization of all necessary equipment, providing necessary engineering supervision through qualified and technical personnel, skilled and unskilled labour, etc. as required to carry out the complete piling work.

(II) Site Preparation

This section of the specification covers site preparation of the areas as indicated in the drawings or as per direction of the site engineer.

(III) Reference Points and Bench Marks

a. Permanent reference pillars have been established and under no circumstances shall the Contractor remove or disturb any permanent mark without the approval of AEGCL. The Contractor shall carefully maintain and protect all bench marks and reference points and shall layout all his work by accurate reference thereto. The Contractor shall remove all vegetation, excluding trees, from the site areas as directed by AEGCL officials.

b. The area shall be stripped to remove roots of grass, rubbish and slush, shrubs or other organic materials. Spoiled materials shall be burnt or removed to approved disposal areas on or near the job site as directed by AEGCL officials.

2. Properties of Construction Materials

All Constructional material shall be approved by the Site Engineer before using them at site.

This clause specifies the properties of common building materials unless otherwise mentioned in the drawings or schedule of items.

All materials viz., cement, steel, aggregates, water etc. which are to be used for pile construction are detailed below. However, aggregates more than 20mm shall not be used.

3. Coarse aggregates/Stone

1. All coarse aggregates shall be as per IS:383 consisting of hard, strong, compact grained and durable pieces of crushed stone having uniform in texture and colour and free from decay, flaws, veins, cracks and sand holes. Coarse aggregates should be of angular shape & rectangular surface and shall be free from organic or clay coatings and other impurities like disintegrated stones, soft flaky particles, adherent coatings, clinkers, slag, mica and any other materials liable to affect the strength, durability or appearance of concrete. The surface of a freshly broken stone shall be bright, clean, and free from any dull, chalky or earthy appearance. Coarse aggregates with round surface shall not be used. A coarse aggregate shall not absorb more than 5% of its weight of water after 24 hours immersion.

Samples shall be submitted by the Contractor and approved samples shall be retained by AEGCL for comparison of bulk supply.

2. Sieving and washing of aggregates by approved method shall be carried out wherever required.
3. Grading of coarse aggregate shall generally conform to IS:383 and shall be such as to produce a dense concrete of the specified proportions and strength and of consistency that will work readily into position without segregation.
4. The maximum size of aggregate shall be as follows unless specified otherwise:
 5. Reinforced concrete with very narrow space - 10mm.
 6. Reinforced concrete & Plain Concrete - 20mm.
 7. Lean Concrete M15 - 40mm.
8. All coarse aggregates & sand shall be stored on brick soling or an equivalent platform so that they do not come in contact with dirt, clay, grass or any other injurious substance at any stage. Aggregate of different sizes shall be kept in separate and easily measurable stacks. If so desired by AEGCL, aggregates from different sources shall be stacked separately with proper care to prevent intermixing.

4.

Cement

Cement used shall generally be Ordinary Portland Cement conforming to the latest Indian Standard Code IS:8112 or IS:12269. Alternatively, other varieties of cement other than ordinary Portland Cement such as Portland Pozzolana Cement conforming to IS:1489 or Portland Slag Cement conforming to IS:455 can also be used. The contractor shall submit the manufacturer's certificate, for each consignment of cement procured, to AEGCL. However, AEGCL reserves the right to direct the Contractor to conduct tests for each batch/lot of cement used by the Contractor and Contractor will conduct those tests free of cost at the laboratory.

Changing of brand or type of cement within the same structure shall not be permitted without the prior approval of AEGCL. Sulphate Resistant Cement shall be used if Sulphate content is more than the limits specified in IS:456, as per Geotechnical investigation report and as mentioned in the construction drawing. No additional payment shall be made for using Sulphate Resistant Cement.

The cement shall be stored in dry enclosed shed, well away from the walls and insulated from the floor to avoid contact with moisture. The cement shall be stacked in easily countable stacks to facilitate removal of first in first out basis. The cement bags shall be gently kept on the floor to avoid leakage of cement from the bags. Sub-standard or partially set cement shall be immediately removed from the site as soon as it is detected. Cement stored for period beyond 90 days shall be tested before use.

5.

Sand

Sand shall be hard, durable, clean and free from any adherent coatings or organic matter and shall not contain clay balls or pellets. The sand shall be free from impurities such as iron pyrites, alkalis, salts, coal, mica, shale or other laminated materials, in such forms or quantities as to affect adversely the hardening, strength, durability or appearance of concrete or to cause corruptions to any metal in contact with such concrete. In no case the cumulative percentage of impurities in sand shall be more than 5% by weight. All sand shall be properly graded. Unless otherwise directed by AEGCL, all sand shall pass through IS Sieve no. 2.36mm. Sand for concrete shall conform to IS:383.

6.

Water

Water shall be clean, fresh and free from organic matters, acids or soluble salts and other deleterious substances which may cause corrosion, discoloration, efflorescence etc. Potable water is generally considered fit for use. Water to be used shall comply with the requirements of IS:456. Average 28 days compressive strength of at least three 15 cm. cubes of concrete prepared with proposed water shall not be less than 90% of average strength of three similar cubes prepared with distilled water. PH of water shall generally be not less than 6

7.

Storage & Handling of construction Materials

All materials shall be stored by the Contractor in a manner aiding convenient access for identification and inspection at all times. The storage arrangements shall be subject to the approval of AEGCL. Storage of materials shall be as described in IS:4082.

All materials shall be so stored as to prevent deterioration or intrusion of foreign matter and to ensure the preservation of their quality and fitness for the work. Any material which has deteriorated or has been damaged or is otherwise considered defective by the Site engineer shall not be used for concrete, and shall be removed from site immediately, failing which, the Site engineer will get the materials removed and the cost thereof shall be recovered from contract price.

8.

Cement Concrete

General

1 This section of the specification deals with cement concrete, plain or reinforced, and covers the requirement for concrete mix design, strength and quality, pouring at all levels, forming, protection, curing finishing, admixtures, inserts and other miscellaneous works.

2 The provisions of IS:456 shall be complied with, unless permitted otherwise. Any other Indian Standard Code shall form the part of the specification to the extent it has been referred to or applicable within this specification.

3 The Contractor shall furnish all labour, material and equipment to form, place and finish all structural concrete, concrete works and miscellaneous items complete, as described herein.

a. **Admixtures**

i. The admixtures in concrete for promoting workability, improving strength or for any other purpose, shall be used only after the written permission from AEGCL. The

Admixtures shall conform to IS:9103.

ii. Admixtures should not impair durability of concrete nor combined with the constituent to form harmful compounds nor increase the risk of corrosion of reinforcement.

iii. Addition of admixtures should not reduce the specified strength of concrete in any case. The workability, compressive strength and the slump loss of concrete with and without the use of admixtures shall be established during the trial mixes before use of admixtures.

iv. The chloride content of admixtures shall be independently tested for each batch before acceptance.

v. If two or more admixtures are used simultaneously in the same concrete mix, data shall be provided to assess their interaction and to ensure their compatibility.

vi. In case admixtures are used in the concrete for any structure, fresh mix design be done considering the admixture with the specific approval from AEGCL. No extra payment shall be made to the Contractor on this account.

b. Grades of Concrete

The minimum grade of concrete to be used for piling shall be M-25 with minimum cement content 12 Bags of 50 kg each per cum and maximum water cement ratio of 0.5. Concrete shall conform to the controlled design mix as specified in IS:456. In addition, nominal mixes of 1:3:6 (with aggregates of nominal size 40mm maximum, by weight converted to equivalent volume shall also be used as per field quality plan. The concrete in aggressive surroundings due to presence of sulphate, etc., shall conform to IS:456. The slump of concrete shall be maintained between 150 to 200 mm.

The Contractor shall carry out concrete mix design in accordance with IS:10262 and submit mix design calculations and get them approved from AEGCL well in advance of installation of pile foundations. The Contractor shall carry out adequate number of tests in accordance with IS:456 to ensure concrete of the minimum specified strength at requisite workability (i.e., Slump).

c. Workmanship

All workmanship shall be according to the current Industry standard and best practices. Before starting a pour, the Contractor shall obtain the approval of the AEGCL in a "Pour Card" maintained for this purpose. He shall obtain complete instructions about the material and proportions to be used, Slump / workability, Quantity of water per unit weight of cement, number of test cubes to be taken, type of finishing to be done, any admixture to be added, any limitation on size of pour and stopping of concrete in case of premature stopping of pours.

d. Mixing of Concrete

i. All design mix concrete shall be mixed in mechanically operated mixer of an approved size and type capable of ensuring a uniform distribution on the materials through the mass. However, contractor can also use central batching plant situated within the area allocated for the Contractor's particular use.

ii. The proportions of sand, coarse aggregate, cement and water shall be as determined by the mix design. However, in case of nominal mix concrete (for lean concrete only) the proportions of sand, coarse aggregate, cement and water shall be fixed. The proportions, as determined for design mix concrete and shall always be approved by AEGCL. The quantities of the cement, sand and coarse aggregates shall be determined by weight.

However, for a faster progress at site, quantities of the cement, sand and coarse

aggregates can be converted to equivalent volume. The water shall be measured accurately after giving proper allowance for surface water present in the aggregate for which regular check shall be made by the Contractor.

iii. The water shall not be added to the mix until all the cement and aggregates consisting the batch are already in the drum and dry mixed for at least one minute. Mixing of each batch shall be continued until there is a uniformity in colour and consistency but in no case shall mixing be done for less than two (2) minutes and at least forty (40) revolutions after all the materials and water are in the drum. When absorbent aggregates are used or when the mix is very dry, the mixing time shall be extended as may be directed by the Site engineer. Mixers shall not be loaded above their rated capacity as it prevents thorough mixing. If there is segregation after unloading from the mixer the concrete should be remixed.

iv. The entire contents of the drum shall be discharged before the ingredients for the next batch are fed into the drum. No partly set or remixed or excessively wet concrete shall be used and it shall be immediately removed from site. Each time the work stops, the mixer shall be thoroughly cleaned and when the next mixing commences, the first batch shall have 10% additional cement at no extra cost to AEGCL to allow for loss in the drum.

e. **Conveying Concrete**

- i. Concrete shall be handled and conveyed from the place of mixing to the place of final laying as rapidly as practicable, by approved means, before the initial setting of the cement starts. Concrete should be conveyed in such a way as will prevent segregation of Concrete which may occur during transportation of concrete. In case of any such segregation during transport, the concrete shall be re-mixed. During very hot or cold weather, if directed by AEGCL, concrete shall be transported in deep containers, having mortar leak proof, which will reduce the rate of water loss by evaporation and loss of heat. Conveying equipment's for concrete shall be well maintained and thoroughly cleaned before commencement of concrete mixing. Such equipment shall be kept free from set concrete.

f. **Placing of Concrete**

- i. Formwork and placement of reinforcement shall be approved in writing by AEGCL before concrete is placed. The forms shall be well wetted and oil shavings, dirt and water that may have collected at the bottom shall be removed before concrete is placed. Concrete shall be deposited in its final position without segregation, re-handling or flowing. The interval between adding the water to the dry materials in the mixer and the completion of the final placing inclusive of compaction of the concrete shall be well within the initial setting time for the particular cement in use or as directed by the AEGCL. As far as possible, concrete shall be placed in the formwork by means approved by AEGCL and shall not be dropped from a height or handled in a manner which may cause segregation. Any drop over 1800 mm shall have to be approved by AEGCL. Once the concrete is deposited in its final position, it shall not be disturbed. Care should be taken to avoid displacement of reinforcement or movement of formwork.
- ii. The placing of concrete shall be a continuous operation with no interruption in excess of 30 minutes between the placing of continuous portions of concrete.
- iii. After the concrete has been placed it shall be spread and thoroughly compacted by approved mechanical vibration to a maximum subsidence without segregation and thoroughly worked around reinforcement or other embedded fixtures into the correct form and shape. Vibrators shall not be used for pushing and shovelling concrete into adjoining areas. Vibrators must be operated by experienced men and over-vibration shall

not be permitted. Head tamping in some case may be allowed subject to the approval of the Owner. Care must be taken to ensure that the inserts, fixtures, reinforcement and form work are not displaced or disturbed during placing of concrete. No concrete shall be placed in open while it rains. If there has been any sign of washing of cement and sand, the concrete shall be entirely removed immediately. Suitable precautions shall be taken in advance to guard against rains before leaving the fresh concrete unattended. No accumulation of water shall be permitted on or around freshly laid concrete. Tie beams, pile caps, footings shall be poured in one operation normally, in special circumstances with the approval of AEGCL these can be poured in horizontal layers not exceeding 500 mm in depth. When poured in layers, it must be ensured that the under layer, is not already hardened. Blending of under layer if any, shall be effectively removed. Wherever vibration has to be applied externally the design of formwork and the disposition of vibrators shall receive special consideration to ensure efficient compaction and to avoid surface blemishes.

g. **Inserts**

All anchors, anchor bolts, inserts, etc. and any other items those are required to be embedded in the concrete shall be placed in correct position before pouring. Extra care shall be taken during pouring operation to maintain their position as indicated in the drawings. These inserts shall be welded to the nearest reinforcement to keep them in position and all such welding shall be deemed to be included in the unit rate quoted and no extra payment shall be made on this account.

h. **Repairs and Finishes of Concrete**

All concrete surfaces shall have even and clean finish, free from honeycombs, air bubbles, fins or other blemishes. The formwork joints marks for concrete work exposed to view shall be rubbed with carborundum stone and defects patched up with a paste of 1 part sand and 1 part cement and cured. The finish shall be made to the satisfaction of AEGCL.

The unit rate of concrete work shall be inclusive of the cost of cleaning and finishing exposed surface as mentioned above.

9. **Reinforcement Steel**

This section of the specification shall cover providing reinforcement steel and its cleaning, bending, binding, placing with arrangements for chairs, supports and suitable covers for all reinforced concrete works, below and above ground level as per drawings and specifications.

a) **General Requirements**

- i. Reinforcement steel of same type & grade shall be used for structural reinforcement work as detailed in the drawing released by AEGCL. No work shall be commenced without proper verification with the bar-bending schedule provided in the drawing.
- ii. Contractor shall supply, fabricate and place reinforcement to shapes and dimensions as indicated on the drawings and as per specifications. The reinforcement shall be either plain or deformed steel bars or welded wire fabric conforming to relevant IS specifications.
- iii. Any adjustment in reinforcement to suit field conditions and construction joints other than shown on drawings shall be

subjected to the approval of AEGCL.

Reinforcement shall be of Fe-500 complying to the appropriate Indian Standards from Primary Producer e.g., TATA Steel, SAIL, Jindal, RINL, or equivalent as per IS 13620:1993 or latest version. For reinforcement lapping for pile, only welding shall be adopted. Reinforcement steel shall be clean and free from loose mill scales, dust, loose rust, oil and grease or other coatings which may impair proper bond. Structural steel and medium tensile steel bars and hard drawn steel wire for concrete reinforcement shall conform to IS:432 (Part-I).

Hard drawn steel wire fabric shall conform to IS:1566. All steel bars including and above 6mm diameter shall be of tested for quality. Substitution of reinforcement, other than those mentioned above, shall not be permitted without the prior approval of AEGCL.

Reinforcement steel shall be stored consignment wise and size wise, off the ground and under cover. It shall be protected from rusting, oil grease and distortions. If directed by AEGCL officials, the reinforcement steel may have to be coated with cement wash before stacking, to prevent scale and rust at no extra cost to AEGCL. The stacks shall be easily measurable. Only steel needed for immediate use shall be removed from storage. Fabricated reinforcement shall be carefully stored to prevent damage, distortion, corrosion & deterioration

b) Bending

i. Unless otherwise specified, reinforcement steel shall be bent in accordance with procedure specified in IS:2502. Bends and shapes shall comply strictly with the dimensions in the approved Bar Bending Schedule. Contractor shall be entirely responsible for its correctness. Bars correctly bend shall only be used.

ii. No reinforcement shall be bent when in position in the work without approval of AEGCL, whether or not it is partially embedded in concrete. Bars shall not be straightened in a manner that will injure the material. Re-bending can be done only if approved by AEGCL. Reinforcement bars shall be bent by machine or other approved means producing a gradual and even motion. All the bars shall be cold bent unless otherwise approved.

c) Placing in position

i. All reinforcement shall be accurately fixed and maintained in position as shown on the drawings by approved means as mild steel chairs, and/or concrete spacer blocks. Bars intended to be in contact, at crossing points, shall be securely bond together at all such points by two number No.20G annealed soft-iron wire. Binders shall tightly embrace the bars with which they are intended to be in contact and shall be securely held. The vertical distance between successive layers of bars shall be maintained by provision of spacer bars. They should be so spaced that the main bars do not sag perceptibly between adjacent spacers.

ii. The placing of reinforcements shall be completed well in advance of concrete pouring. Immediately before pouring, the reinforcement shall be checked by the Site engineer for accuracy of placement and cleanliness and necessary correction as directed by him shall be carried out. The cover for concrete over the reinforcements shall be as shown on the approved drawings unless otherwise directed by AEGCL. Care should be taken to ensure that projecting ends of ties and other embedded metal do not encroach into the concrete cover. Where concrete blocks are used for ensuring the cover and positioning reinforcement, they shall be made of mortar 1:2 (one part cement: two parts

sand) by volume and cured for at least (7) days. The sizes and locations of the concrete blocks shall be approved by AEGCL.

iii. Longitudinal reinforcement in pile shall be high yield strength cold twisted deformed steel bars conforming to IS:1786. Thermo mechanically Treated (TMT) bars (equivalent grade) in place of Cold twisted deformed steel bars are also accepted. Lateral reinforcement in pile shall be of tor steel conforming to IS:432 Part-I.

iv. The longitudinal reinforcement lapping length shall be 50 times its diameter.

v. The minimum diameter of the links or spirals bar shall be 8mm and the spacing of the links or spiral shall not be less than 150mm and in no case more than 250mm. The laterals shall be tied to the longitudinal reinforcement to maintain its shape and spacing.

vi. Reinforcement cage shall be sufficiently rigid to withstand handling and installation without any deformation and damage. As far as possible number of joints (laps) in longitudinal reinforcement shall be minimum. In case the reinforcement cage is made up of more than one segment, these shall preferably be assembled before lowering into casing tube/pile bore by providing necessary laps as per IS:456.

vii. The minimum clear distance between the two adjacent main reinforcement bars shall normally be 100mm for the full depth of cage, unless otherwise specified.

viii. The laps in the reinforcement shall be such that the full strength of the bar is effective across the joint and the reinforcement cage is of sound construction. Laps and anchorage lengths of reinforcing bars shall be in accordance with IS:456, unless otherwise specified. If the bars in a lap are not of the same diameter, the smaller will guide the lap length.

ix. Lapping of pile main reinforcement shall be done by welding only.

x. Proper cover and central placement of the reinforcement cage in the pile bore shall be ensured by use of suitable concrete spacers or rollers, as required, without any additional cost to AEGCL.

xi. Minimum clear cover to the reinforcement shall be 75mm unless otherwise mentioned.

xii. Unless otherwise specified by AEGCL reinforcement shall be placed within the following tolerance as specified in IS: 456:2000.

a. For effective depth 200mm or less +10mm.

b. For effective depth more than 200mm +15mm.

The cover shall in no case be reduced by more than one-third of specified cover or 5mm whichever is less. Welding of reinforcement bars shall be avoided. However, welding may be done in specific case subject to prior permission from AEGCL.

10. **Construction of Pile Head, Pedestal, Tie Beam etc.**

The Contractor shall deploy all labour, equipment, tools & tackles and materials required for complete execution of the work in accordance with the drawings and as described herein:

A. Excavation

1. The Contractor shall control the grading in the vicinity of all excavation so that the surface of the ground will be properly sloped or diked to prevent surface water from running into the excavated areas during construction.

2. Excavation shall include the removal of all materials required to execute the work properly and shall be made with sufficient clearance to permit the placing, inspection and setting of forms and completion of all works for which the excavation was done.

3. Side and bottoms of excavation shall be cut sharp and true, undercutting shall not be permitted. Each side of excavation shall be used in lieu of formwork for placement of concrete unless authorised, in special cases, by AEGCL, where

limitation of space for larger excavation necessitates such decision.

4. When machines are used for excavation, the last 300mm before reaching the required level shall be excavated by hand or by such equipment that will leave the soil at the required final level, in its natural conditions.

5. Suitability for bearing of the bottoms of excavations shall be determined by the AEGCL officials.

6. The bottom of excavation shall be trimmed to the required level and when carried below such levels, by error, shall be brought to level by filling with lean concrete 1:3:6 mix, with aggregate of 40mm maximum nominal size at no additional cost to AEGCL.

7. The Contractor shall be responsible for assumptions and conclusions regarding the nature of materials to be excavated and the difficulty of making and maintaining the required excavations and performing the work required as shown on the drawing and in accordance with these specifications. The Contractor shall be responsible for any damage to any part of the work and property caused by collapse of sides of excavations. Materials may be salvaged, if it can be done with safety for the work and structure, as approved by AEGCL.

However, no extra claim shall be entertained for materials not salvaged or any other damage to Contractor's property as a result of the collapse. He shall not be entitled to any claim for redoing the excavation as a result of the same. Excavations for foundations specified shall be carried out at least 75mm or as specified in relevant drawings below the bottom of structural concrete and then be brought to the required level by placing lean concrete of 1:3:6 mix or as specified in drawings with aggregate of 40mm maximum nominal size.

8. When excavation requires coffer dams, sheet piling, bracing, sheeting, shoring, draining, dewatering etc. the Contractor shall have to provide the same as required and the cost there of shall be included in the unit rate quoted for the item of excavation and contractor shall submit necessary drawings showing arrangement and details of proposed installation and shall not proceed until he has received approval from AEGCL.

The Contractor shall have to constantly pump out the water collected in pits due to rain water, springs, seepage etc. and maintain dry working conditions at no extra cost to AEGCL.

9. For the purpose of excavation in earthwork, all types of soil including kankar, morum, shingle and boulders up to 150mm size are included and no separate payment shall be made for different type of soils encountered.

B. Shuttering and shoring

Shuttering and shoring works is to be done with timber planks of 25mm thickness wherever necessary including removal of the same for in-situ reinforced/plain cement concrete works. Plywood or equivalent shall be used where specified to obtain smooth surfaces for exposed concrete work.

When the Shuttering is ready for commencing concreting, the Engineer in Charge shall check the shuttering work for their alignment, strength and general fitness.

If the Site Engineer is satisfied with the quality of shuttering then may allow the contractor for pouring concrete.

Poor or old shuttering should not be used. The Site Engineer at his own discretion may reject any shuttering material if found not satisfactory.

C. Back Filling

(i) General Requirement

1. After completion of foundation footings, pile caps, pedestals, tie beams and other constructions below the elevation of the grades, and prior to back filling, all forms of temporary shoring, timber etc. shall be removed and the excavation cleaned of all trash, debris and perishable materials, back filling shall begin only with the approval of AEGCL.
2. The soil to be used for back filling purpose shall be inorganic material and shall be free from any foreign substance which can harm or impair the strength of footing in any manner. In any case the soil to be used for back filling purpose shall have the prior approval of AEGCL.
3. The soil to be used for back filling purpose shall be either from the excavated earth or from the borrow pits, as directed by AEGCL. The soil may have to be brought from a distance up to 2 km. By the shortest haulage route as approved by AEGCL. If directed by the Site engineer, the excavated earth from the adjoining areas (which is to be disposed off up to a distance of 500 meters by manual labour) shall be used as for back filling purpose.
4. Back filling shall not be dropped directly upon or against any structure where there is danger of displacement or damage.
5. Back filling shall be placed in horizontal layers not to exceed 200mm in thickness. Each layer shall be compacted with proper moisture content and with such equipment as may be required to obtain a density equal to or greater than 95% of maximum dry density as determined by the relevant Indian Standard. The method of compaction shall be subject to the approval of AEGCL. Pushing of earth for back filling shall not be adopted under any circumstances.
6. On completion of structures, the earth surrounding them shall be accurately finished to line and grade as shown on the drawings or as per the instruction of AEGCL. Finished surface shall be free of irregularities and depressions and shall be within 50mm of the specified level.
7. Any additional quantity of back filling, if required, beyond the excavation payment line shall be done by the contractor at his own expense.

D. Construction Joints

- a) When the work is to be interrupted, the concrete shall be rebated at the joint to such shape and size as may be required by AEGCL or as shown on the drawings. All vertical construction joints shall be made with stone boards, which are rigidly fixed and slotted to allow for the passage of the reinforcing steel. If desired by AEGCL, keys and/or dowel bars shall be provided at the construction joints. Construction joints shall be provided in positions as shown or described on the drawing. Where it is not described, the joints shall be in accordance with the following:
 - i) In a column, the joint shall be formed about 75mm below the lowest soffit of the beams framing into it.
 - ii) Concrete in tie beam shall be placed throughout without a joint, but if the provision or a joint is unavoidable, the joint shall be vertical and at the middle of the span.
 - iii) In forming a joint, concrete shall not be allowed to slope away to thin edge. The locations of construction joints shall be planned by the Contractor well in advance of pouring and have to be approved AEGCL officials.
- b) Before the fresh concrete is placed, the cement skin of the partially hardened concrete shall be thoroughly removed and surface made rough by hacking, sand blasting, water jetting, air jetting or any other method as directed by Site engineer. The rough surface shall be thoroughly wetted for about two hours and shall be dried and coated with 1:1 freshly mixed cement sand slurry immediately before placing the new concrete.

The new concrete shall be worked against the prepared surface before the slurry sets. Special care shall be taken to see that the first layer of concrete placed after a construction joint is thoroughly rammed against the existing layer. Old joints during pour shall be treated with 1:1 freshly made cement sand slurry only after removing all loose materials.

c) The unit rate of concrete work shall include the cost of construction joints.

E. Curing and Protection of Concrete

Newly placed concrete shall be protected by approved means from rain, sun & wind. Concrete placed below ground level shall be protected from falling earth during and after placing. Concrete placed in ground containing deleterious substances shall be kept free from contact with such ground or with water leaking from such ground during placing of concrete and for a period of three days or as otherwise instructed by the Site engineer after placing of concrete. The ground water around newly poured concrete shall be kept to an approved level by pumping or other approved means of drainage. Adequate steps shall be taken to prevent floatation or flooding. Steps, as approved by AEGCL, shall also be taken to protect -immature concrete from damage by debris, excessive loading, vibration etc. which may impair the strength or durability of the concrete. All fresh concrete shall be covered with a layer of Hessian or similar absorbent material and kept constantly wet for a period of seven days or more from the date of placing of concrete as per directions of AEGCL. Curing can also be made by ponding. Concrete shall be cured by flooding with water of minimum 25mm depth for the period mentioned above. Step shall also be taken to protect immature concrete from damage debris by excessive loading, vibrations, abrasions, deleterious ground water, mixing with earth or foreign materials, floatation etc. that may impair the strength and durability of the concrete. Approved curing compound can be used with the permission of AEGCL. Such compound shall be applied to all exposed surfaces of the concrete as soon as possible after the concrete has set.

11.

Pile Installation

Installation of piles shall be carried out as per pile layout drawings, installation criteria, technical specifications and the directions of AEGCL.

I. Installation Criteria

The Contractor while boring the pile bores, shall constantly collect the bore spoils and these shall be compared with the layer wise soil classifications reported in the bore-log details of the location, reported in the soil investigation report. Should there be any variation between the two-soil classification, these shall be immediately reported to AEGCL.

Whenever the rock strata is encountered in the pile bore, the Contractor shall immediately report the matter to the Site engineer and shall take up the work of rock chiselling or any other suitable method only after the certification/approval of the AEGCL. Since the piles are required to be terminated in the firm/hard strata and as stipulated in the construction drawing the Contractor shall demonstrate such founding strata and seek approval of Site engineer before terminating the piles.

1. The pile should be socketed and founded in good rock only. Whenever rock strata is encountered at any pile bore and the level of good rock (i.e. rock strata is not highly fractured and weathered and core recovery is not less than 80% with RQD 70%) is different than that is given in the Geotechnical Investigation report, in that case to establish the level of good rock, core drilling is necessary to be carried out at least upto 5m depth in rock strata encountered by the contractor without any additional cost

implication to AEGCL and no time extension will be permitted on this account.

2. In order to verify the terminating depth, where rock strata is met with, the rock samples obtained from the bore spoils of pile shall also be tested for point load strength index and these shall then be compared/correlated to the values of uniaxial compression strength test shown in the soil investigation report. Accordingly, the termination of piles in the socketing zone shall be done with prior approval of AEGCL.

II. Control of position and alignment

Piles shall be installed vertically as accurately as possible as per the construction drawing. The permissible limits for deviation with respect to position and inclination/alignment shall conform to IS-2911 (Part I/Sec.2), as reproduced below. Maximum permissible deviation in alignment is 1.5%. Piles should not deviate more than 75mm or D/10 whichever is less from their positions at the working level. In case of piles deviating beyond these limits, the piles should be replaced or supplemented by one or more additional piles including the revised cap size (as the situation may be) at no additional cost to AEGCL. Any extra claim whatsoever from the contractor on this account shall not be entertained.

III. Boring

- a) Boring operations shall be done by rotary or percussion type drilling rigs using Direct Mud Circulation (DMC), Reverse Mud Circulation (RMC) methods or grab method. In soft clays and loose sands bailer method, if used, shall be used with caution to avoid the effect of suction. In cohesive soils, use of water for boring shall be restricted to a minimum, while boring in cohesion less deposits water level in the bore hole shall be maintained at or slightly above the standing water table.

Boring operations by any of the above methods shall be done using drilling mud. The bidder shall be required to furnish along with their bid, complete details regarding the installation of piles and the method by which they wish to install the piles.

- b) The Contractor shall satisfy himself about the suitability of the method to be adopted for site. If DMC or RMC is used, bentonite slurry shall be pumped through drill rods by means of high-pressure pumps. The cutting tools shall have suitable pores for the bentonite slurry to flow out at high pressure. If the Contractor fails to make proper bore for any reason, the Contractor has to modify the boring technique and switchover to other boring methods as approved by AEGCL at no extra cost to AEGCL.
- c) Working level shall be above the pile cut off level. After the initial boring of about 1.0 to 2.0m temporary guide casing shall be lowered in the pile bore. The diameter of guide casing shall be of such diameter to give the necessary finished diameter of the concrete pile. The centre line of guide casing shall be checked before continuing further boring. Guide casing shall be minimum 2.0m length. Additional length of guide casing shall be used depending on the conditions of the strata, ground water level etc. as required by AEGCL without any additional cost to AEGCL.
- d) Use of drilling mud (bentonite slurry) for stabilising the sides of the pile bore is necessary wherever subsoil is likely to collapse in the pile bore.
- e) The bentonite slurry and the cuttings, which are carried to the surface by the rising flow of the slurry shall pass through settling tanks of adequate size to remove the sand and spoils from the slurry before the slurry is recirculated back to the boring. The bentonite slurry mixing and recirculation plant shall be

- suitably designed and installed.
- f) The bentonite slurry shall be maintained at 1.5m above the ground water level during boring operations and till the pile is concreted. When DMC or RMC method is used the bentonite slurry shall be under constant circulation till start of concreting.
 - g) The size of cutting tools shall not be less than the diameter of the pile as specified in the drawing and not more than 75mm.

IV. Chiselling

Chiselling, if required, may be resorted to with the permission of the Site engineer below the socketing horizon. The chiselling tool or bit shall be of adequate size and weight so as to reach the desired depth.

V. Cleaning of Pile bore

- a) After completion the pile bore up to the required depth, the bottom of the pile bore shall be thoroughly cleaned. Cleaning shall ensure that the pile bore is completely free from sludge/bored material, debris of rock/boulder etc. Necessary checks shall be made as given in this Section to confirm the thorough cleaning of the pile bore.
- b) Pile bore shall be cleaned by fresh drilling mud through tremie pipe before start of concreting and after placing reinforcement.
- c) Pile bore spoil along with used drilling mud shall be disposed off from site up to 2 Km. or as directed by the AEGCL officials.

VI. Adjacent Structures

When working near existing structures care shall be taken to avoid any damage to such structures.

VII. Concreting

1. Concreting shall not be done until AEGCL is satisfied that the bearing strata (soil/rock) met with the termination level of pile, satisfied the installation criteria/approved founding depth.
2. The time between the completion of boring and placing of concrete shall not exceed 6 hrs. In case the time interval exceeds 6 hrs the pile bore shall be abandoned. However, the Site engineer may allow concreting, provided the Contractor extends the pile bore by 0.5 m beyond the proposed depth, and clean the pile bore properly. The entire cost of all operation and materials for this extra length shall be borne by the Contractor.
3. Pile bore bottom shall be thoroughly cleaned to make it free from sludge or any foreign matter before and after placing the reinforcement cage.
4. Proper placement of the reinforcement cage to its full length shall be ensured before concreting.
5. Entire concreting in pile bores shall be done by tremie method. The operation of tremie concreting shall be governed by IS:2911 Part I/Sec.2. Drilling mud shall be maintained sufficiently above the ground water level.
6. Concreting operations shall not proceed if the contaminated drilling mud at the bottom of the pile bore possess density more than 1.25 T/Cu.m. or sand content more than 7%. The drilling mud sample shall be collected from the bottom of pile bore. This shall be checked at regular intervals, as decided by the Site engineer thereafter.
7. Consistency of the drilling mud suspension shall be controlled throughout

concreting operations in order to keep the bore stabilised as well as to prevent concrete getting mixed up with the thicker suspension of the mud.

8. It shall be ensured that volume of concrete poured is at least equal to the theoretically computed volume of pile shaft being cast.

9. The temporary guide casing shall be entirely withdrawn cautiously, after concreting is done up to the required level. While withdrawing the casing concrete shall not be disturbed.

10. Tests on concrete cubes shall be carried out as specified in this section of the Specifications.

VIII. Cut-off-level (COL)

- a) Cut-off-level of piles shall be as indicated in approved construction drawings or as directed by the Engineer-in-Charge.
- b) The top of concrete in pile shall be brought above the COL to dismantle all laitance and weak concrete and shall be re-casted to ensure good concrete at COL for proper embedment into pile head.
- c) When the pile cut off level is less than 1.0 meter below the working level, concrete shall be cast up to the piling platform level to permit overflow of concrete for visual inspection. In case COL of pile is more than 1.0 meter below working level then concrete shall be cast to minimum of one meter above COL.
- d) In the circumstances where COL is below ground water level, the need to maintain a pressure on the unset concrete equal to or greater than water pressure shall be observed and accordingly length of extra concrete above COL shall be determined by the Contractor with prior approval of AEGCL.

IX. Sequence of Piling

- a) Each pile shall be identified with a reference number and date wise proper record of construction shall be maintained by the Contractor.
- b) The convenience of installation may be taken into account while scheduling the sequence of piling in a group. This scheduling shall avoid piles being bored close to other recently constructed piles.

X. Building up of Piles

If any pile, already cast as per construction drawing, requires any extra casting due to any change in cut off level or the cast pile top level is less than the specified level or for any other reason, then the pile shall be built up by using M-25 grade of concrete, ensuring proper continuity with the existing concrete and to the satisfaction of AEGCL official. Necessary reinforcement as per design requirement and suitable shuttering shall be provided before casting the concrete. Surrounding soil shall also be built up to the required level by proper compaction to ensure lateral capacity of the pile

XI. Breaking off of Piles

If any pile already cast requires breaking due to lowering in cut off level or for any other reason, then the same shall be carried out, (not before seven days of casting of concrete in the piles) without affecting the quality of existing pile such as loosening, cracking etc. to the satisfaction of AEGCL official. No extra payment shall be made on this account.

XII. Preparation of Pile head

1. The soil surrounding the piles shall be excavated up to the bottom of the lean concrete below the pile cap with provision for working space sufficient enough to place shuttering, reinforcement, concreting and any other related operations.
2. The exposed part of concrete above the COL, shall be removed/chipped off and made square at COL not before seven days of casting of pile.
3. The projected reinforcement above COL shall be properly cleaned and bent to the required shape and level to be anchored into the pile cap as shown in the drawing.
4. The pile top shall be embedded into the pile cap by minimum 50mm or clear cover to reinforcement, whichever is higher. All loose material on the top of pile head after chipping to the desired level shall be removed and disposed off up to a lead of 2km or as directed by the Site engineer.

XIII. Rejection and Replacement of Defective Piles

AEGCL reserve the right to reject any pile which in his opinion is defective with reference to technical specification & construction drawings on account of load capacity, structural integrity, position, alignment, concrete quality etc. Piles that are judged defective shall be pulled out or left in place as decided by the AEGCL without affecting the performance of adjacent piles. The Contractor shall install additional piles to substitute the defective piles as per the directions of the Site engineer at no extra cost to AEGCL.

- a) During execution of pile foundation work, if the bore holes need to be abandoned due to any reason and pile position to be shifted or realigned, other than for any design requirement by AEGCL, fresh bore holes are to be executed at a suitable new position, which may vary from 2D to 3D (where, D is diameter of pile) as decided by the Site engineer, which may demand for resizing of pile cap including possible increase in reinforcement quantity due to resizing of pile cap. In all such cases the abandoned bore holes are to be filled up with plain cement concrete M15 so that no cavity remains in the bore hole of the abandoned pile. Any extra claim whatsoever from the contractor on account of abandoned bore hole, filling up of abandoned bore hole with concrete and any extra cost due to resizing of pile cap including increase in reinforcement quantity shall not be entertained by AEGCL & the same have to be borne by the contractor.

XIV. Criteria for Terminating the Piles

- a) The piles can be terminated at a depth based on design developed by AEGCL, where loads on the piles can be transmitted to the soil in a proper manner or the depth where specified 'Value is achieved, whichever occurs later. However, in no case piles should be terminated at a higher level than that indicated in the construction drawing.
- b) Standard penetration test (SPT) shall be carried out starting from 1.0 M above the specified pile termination depth and there after @ 1m. up to the pile termination depth.
- c) The Standard Penetration Test (SPT) shall be carried out based on the following test procedures:
- d) The test shall be conducted by driving a standard split spoon sampler in the borehole by means of a 650 N hammer having a free fall of 0.75 M. The sampler shall be driven for 450 mm using the hammer and the number of blows shall be recorded for every 150mm penetration. The number of blows for the last 300 mm drive shall be reported as N value. The test shall be discontinued when the blow count is equal to 100 or the penetration is less than 25mm for 50 blows, whichever is earlier.

- e) At the location where the test discontinued, the penetration and the number of blows shall be reported. Sufficient quantity of disturbed sample shall be collected from the split spoon sampler for identification/classification of soil. The sample shall be visually classified and recorded at the site.
- f) The specification for the equipment's and other accessories, procedure for conducting the test and collection of the disturbed soil sample shall conform to IS:2131. Recording of Piling Data
- g) The Contractor shall record all the information during installation of piles. Typical data sheet for recording pile data as shown in Appendix D of IS:2911 Part I/Sec.2 shall be maintained by the contractor. The pile data shall also include all the details as in Annexure-D. On completion of each pile installation, pile record in triplicate shall be submitted to AEGCL within two days of completion of concreting of the pile.

XV. Check for Pile bore

- a) On completion of boring and cleaning the bottom of each pile bore shall be checked by the methods as approved by AEGCL, to ensure that it is free from pile bore spoil/debris and any other loose material, before concreting. Concreting shall be done only after the approval of AEGCL.
- b) For sampling of drilling mud from the pile bore the following method or any other suitable method shall be adopted. A solid cone shall be lowered by a string to the bottom of pile bore. A sampler tube closed at top with a central hole (hollow cylinder) is lowered over the cone, then a top cover shall be lowered over the cylinder. Care shall be taken for proper fittings of assembly to minimise the leakage while lifting the cone assembly to the ground surface. The slurry collected in the sampler tube shall be tested for density and sand content.

XVI. Properties of drilling mud

- a) Properties of drilling mud shall be checked as per requirements prior to the commencement of piling work and thereafter at least once in a week or as found necessary by site engineer, one sample consisting of 3 specimens shall be tested.
- b) Density and sand content of the drilling mud shall be checked in each pile.

XVII. Erection of Steel Embedded Parts

- a) Setting of stubs (sets of 4) including transportation and distribution of stub and accessories from store to site shall in the scope of the contractor.
- b) This covers the technical requirements for the supply and fabrication and/or erection of all embedded steel parts by the Contractor. The extent and type of embedded steel parts to be erected shall be as per detailed drawings.
- c) The supply of embedded steel parts like ladders, steel pieces set in concrete inserts, dowel bars required for construction joints etc. are in the scope of the Contractor.
- d) Embedded steel parts shall include items such as foundation anchor bolts, stubs, ladders, steel pieces set in concrete inserts, dowel bars for concrete work etc. shown on the drawing or as required by AEGCL. Material shall also include setting in forms for connecting in place and grouting as required. The grouting operations, if required, shall be performed as per the direction of AEGCL.
- e) The Contractor shall erect all embedded steel parts in accordance with the drawings and this specification including setting materials in concrete or grouting pieces in place, furnishing all labour, materials, scaffolding, tools and services

necessary for and incidental to the work to its transporting, unloading, storing, handling and erection. Contractor shall furnish welding rods and arrange for field welding as required in accordance with IS: 816.

- f) Exposed surface of embedded material is to be painted with one coat of approved anticorrosive and/or bituminous paint without any extra cost to AEGCL. The threads of holding down bolts shall be greased and protected with water proof tape.

12. Protection Against Damage in Transit

All steel work shall be efficiently and sufficiently protected against damage in transit to site from any cause whatsoever. All protecting plates or bars and all ends of members at joints shall be stiffened, all straight bars and plates shall be bundled, all screwed ends and machined surface shall be suitably packed and all bolts, nuts, washers and small loose parts shall be packed separately in cases so as to prevent damage or distortion during transit. Should there be any distortion of fabricated members, the Contractor shall immediately report the matter to AEGCL. Distorted reinforcement bars or plates received from stores or distorted during transport from stores to the fabrication yard shall not be used in fabrication unless the distortions are minor which in the opinion of AEGCL can be removed by acceptable methods. The cost of all such straightening shall be borne by the Contractor within his unit rates.

These distortions shall be rectified by the Contractor by cold bending. If heating is necessary to rectify the defects, the details of the procedure shall be intimated to AEGCL whose approval shall be taken before such rectification. The temperature of heat treatment shall not exceed the limits beyond which the original properties of steel are likely to be impaired.

13. Curing

The work shall be cured for a period of 7 days commencing 24 hours after the completion of the grouting and under pinning operations. The curing shall be done by covering the surfaces with wet gunny bags.

14. Bar Grips

- a) This covers the technical requirement for furnishing and installation of bar grips complete including all labour materials, equipment, staging, etc.
- b) The Contractor shall furnish and install the bar grips for various dia of deformed bars as indicated in drawings and as required by these specifications. The bar grip splicing system shall be of approved manufacturer and of the best quality available subject to approval of AEGCL.

15. Splicing

- i. a) The reinforcement bars are to be joined without any gap and the sleeve placed in position.
 - b) Pressure is applied by means of a hydraulic press which swages the sleeve down on the bar ends in a series of bites which are applied at high pressure.
 - c) The job can also be done in two stages. The 1st stage is to press the half sleeve on the loose bar at the reinforcement yard. The 2nd stage work is to be done at the actual site

after the loose bar is inserted through the unrepresented end of the sleeve and pressed in-situ.

- ii. The joints shall be staggered as far as possible. Necessary staging arrangements are to be made by the Contractor.
- iii. It may be necessary to fix the sleeve to the reinforcement bars at one end in the open yard for the facility of working. All these working details are to be furnished earlier subject to the approval of AEGCL.
- iv. The length of the sleeve should be adequate, that it is safe under the pull-out loading conditions.
- v. One percent representative samples of each dia, bars shall be sent for laboratory testing at the cost of the Contractor to check the efficiency of the joints under ideal condition. These samples of sleeves will be sent in the Laboratory for pull out tests.
- vi. All bar grips installation shall be subject to inspection and approval by AEGCL before concreting operation are performed. In case of any defect or joint being not up to mark, the same shall be replaced by the Contractor at no extra cost.

NOTE:

At the time of execution, the soil strata should match with the parameters considered in the design of pile foundation.

For that req. standard penetration tests will be carried out by contractor at his own cost to ascertain the design parameters. Any change req. in design will have to be carried out with the prior approval of Engineer-in-charge.

All other specifications shall be as per the approved drawings and as described in the price schedule.

Appendix-1

COVERING LETTER (ON THE APPLICANT'S LETTER HEAD)

To,

The Chief General Manager (O&M), CAR
Assam Electricity Grid Corporation Limited
Bijulee Bhawan, Paltanbazar, Guwahati-01.

Sub: "Construction of pile foundation at loc. no. 69 of 132 kV Salakati-APM TL."

Ref:

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, considering cost of design & preparation of structural drawing, materials, labours, haulage, taxes, royalty etc.

I /We clearly understand that all materials, tools and plants, machineries, labours, 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.

Yours Faithfully

Appendix-2
PROFILE OF THE BIDDER

Sl. No.	Particulars	To be filled by Bidder
a)	Name of the Bidder	:-
b)	Registration with Memorandum of Association	:-
c)	Financial statements for last 3(three) years (CA/CMA certified)	
d)	PAN	:-
e)	GST Registration number	:-
f)	Employees Provident Fund	:-
g)	Employees State Insurance Certificate	:-
h)	Labour License registration	:-
i)	Bank Solvency Certificate indicating the amount	:-
j)	Income Tax Return (for the last three years)	
k)	Date of Establishment/ Incorporation	:-
l)	Postal Address	:-
	House No.	:-
	Lane	:-
	Street	:-
	Town/Village	:-
	Post Office	:-
	P.S.	:-
	District	:-
	Pin code	:-
m)	Telephone Number	:-
	Mobile No.	:-
	E-Mail Address	:-
	Website	:-
n)	Name(s) of the Owners / Directors/Partners	:-
o)	Name of the Banker with Address and Telephone Number	:-
p)	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: - Mobile Number: - Email Address: -

Note: Bidder may attach additional sheets, if required.

Appendix-3

WORK EXPERIENCE OF THE BIDDER

- a) Experience having completed similar works during the last 7 years ending last day of the month previous to the one in which applications are invited should be either of the following:
- i. **Three similar completed works** each costing not less than the amount equal to **Rs.10,89,364.00 (Rupees Ten Lakhs Eighty-nine Thousand Three Hundred and Sixty-four)** only
or
 - ii. **Two similar completed works** each costing not less than the amount equal to **Rs.13,61,705.00 (Rupees Thirteen Lakhs Sixty-One Thousand Seven Hundred and Five)** only.
or
 - vi. **One similar completed work** costing not less than the amount equal to **Rs.21,78,728.00 (Rupees Twenty-One Lakhs Seventy-eight Thousand Seven Hundred and Twenty-eight)** only.

Note: Bidders should have experience in “Construction of Power transmission line for 132 kV and above” for Govt. Department or PSUs only.

- (a) If the nature of work and value differs from the above stated conditions, it will not be considered while evaluation of technical qualification.
- (b) Work order along with work completion certificate are to be mandatorily attached for technical bids to be responsive.

Name of work	Nature of Work	Executed Amount	Starting Date	Completion Date

- b) Bidders must compulsorily submit work order and work completion certificate issued from Govt Department/reputed PSUs satisfying the above-mentioned work experience criteria for technical qualification. Moreover, AEGCL reserves the right to scrutinise any work order/work completion certificate submitted by the bidders with issuing authority and if any abnormalities are observed in the same, their bids will be rejected.

Note:

- a) Bidder has to attach additional sheets, if required.
- b) Bidder have to furnish necessary work order copies for technical evaluation of experience.

Appendix-4

FINANCIAL QUALIFICATIONS

Financial Qualifications:

- (i) Minimum average annual turnover of **Rs.8,17,023.00 (Rupees Eight Lakhs seventeen thousand and twenty-three)** only calculated as total certified payments received for contracts in progress or completed, within the last 3 (Three) years (Audited balance sheet)
- (ii) The Contractor must furnish their Bank Solvency Certificate indicating the amount by concerned authority in necessary format as per banks.
Note: Bidder may attach additional sheets, if required.
- (iii) Financial Statements for last 3 (three) years will be considered for calculation of turnover (should be CA/CMA certified).