

TERMS OF REFERENCE (TOR) FOR RECRUITMENT OF A CONSULTING FIRM FOR TOPOGRAPHICAL SURVEY, DETAILED DESIGN, TECHNICAL SPECIFICATIONS, BIDDERS CLARIFICATION RESPONSES, AND CONTRACT NEGOTIATION FOR AN ELECTRICITY ACCESS PROJECT

1. Introduction:

This document outlines the Terms of Reference (ToR) for conducting a topographical survey, detailed design, execution design, preparation of the technical component of the bidding document, responding to clarifications during bidding, and participation in contract negotiation for the implementation of electrical infrastructure projects.

The projects include the construction of about 160km of Medium Voltage (MV) lines, low voltage (LV) lines for about 93 villages in LRR, WCR, and NBR (some might be in other regions), distribution transformers for the about 93 villages, and a 2km bridge crossing between Farafenni and Soma.

It should be noted that the design shall be consistent with the World Bank Environmental and Social Safeguard requirements.

The list of villages and a KML file outlining an indicative network for the MV are provided separately.

2. Objectives:

The main objectives of this assignment are as follows:

- a. Conduct a comprehensive topographical survey of the project area to gather essential data for the design and construction of the electrical infrastructure.
- b. Develop a detailed design plan for the construction of 160km of MV lines and LV lines for 93 villages, ensuring efficient and reliable power distribution.
- c. Conduct studies to determine the appropriate distribution transformer requirements for the 93 villages, considering load demand, voltage regulations, and future expansion needs.
- d. Design a 2km bridge crossing to provide a safe and reliable route for the electrical infrastructure.
- e. Prepare the technical component of the bidding document, including Employer's Requirements, data sheets of all materials to be used in the project, the price schedule and cost estimate, and the final Bill of Quantities (BoQ).
- f. Provide timely support in preparation of responses to clarifications and inquiries from bidders during the bidding process. Participate in pre-bid meeting and site visit.

- g. Participate in contract negotiation with potential contractors to finalize the agreement terms and conditions.

3. Scope of Work:

The scope of work includes, but is not limited to, the following:

a. Topographical Survey:

- Conduct a comprehensive topographical survey of the project area, covering the alignment of the MV lines, combine constructions, LV lines, and the proposed bridge crossing.
- Collect accurate elevation data, contours, land features, and any other relevant information necessary for the design and construction of the electrical networks. This survey shall cover a corridor of 20m at least. All obstacles shall be well represented and a minimum of 50m between the points shall be considered.
- Prepare detailed topographical maps and profiles with readable scales printed in at least A2 format.

b. Detailed Design:

- Prepare a detailed design plan for the construction of about 160km of MV lines, including pole locations, conductor sizes, sag calculations, and necessary clearances.
- Design the LV lines to connect 93 villages, considering load requirements, voltage drop limitations, and appropriate conductor sizes.
- Determine the optimal route for the MV and LV lines, considering terrain, environmental factors, and existing infrastructure.
- Prepare a design plan for the 2km bridge crossing, including the design of all the materials required and all the required studies and drawings in a very clear manner.
- This shall include the full calculation notes using Jove, mechanical and execution designs for the complete networks taking into account the weight of the transformers to be proposed.
- Prepare cost estimates.

c. Studies for Distribution Transformers:

- Conduct load demand studies for each of the 93 villages to determine the appropriate capacity and number of distribution transformers required.
- Propose the most optimal location for each transformer.

- Analyse the voltage regulations and determine the optimal locations for the distribution transformers to minimize voltage fluctuations and ensure efficient power distribution.
- Consider future growth and expansion needs of the villages and recommend suitable strategies for accommodating increased load demand.
- Quantify all the households and public buildings, like schools, hospitals, health centers, etc. to be connected on each transformer, providing a list with names and phone numbers of each household head.

d. Preparation of Bidding Document:

- Develop the Employer's Requirements, clearly outlining the project's objectives, technical specifications, and performance requirements.
- Create data sheets for all the equipment and materials required for the project, including specifications, technical parameters, standards, and any relevant certifications.
- Prepare the price schedule, detailing the breakdown of costs for materials, labor, equipment, and any other project-related expenses.
- Compile the final Bill of Quantities (BoQ) document, providing a comprehensive list of items, quantities, for the construction and installation works.

e. Clarification Responses:

- Review and respond, in collaboration with the PIU, to clarifications and inquiries from bidders during the bidding process.
- Provide necessary technical clarifications and ensure a clear understanding of the project requirements.
- Participate in pre-bid meeting and site visit.

f. Contract Negotiation:

- Participate in contract negotiation with potential contractors.
- Collaborate with the client to finalize the agreement terms and conditions.
- Address any technical concerns or modifications to ensure compliance with project requirements.

4. Deliverables:

The following deliverables are expected:

- a) Topographical Survey:
 - Comprehensive survey report, including accurate topographical maps, profiles, and relevant data.
 - Digital copies of the survey data in a compatible format – excel, dwg drawings, and any necessary format.

- b) Detailed Design:
 - Detailed design plan for the construction of 160km of MV lines.
 - Detailed design plan for the LV lines connecting 93 villages and location of distribution transformers.
 - Design plan for the 2km bridge crossing.
 - A final detailed execution study for the whole the entire networks to construct.
 - Detailed cost estimates (by different components/materials)

- c) Studies for the Distribution Transformers:
 - Load demand study report for the 93 villages, including recommendations for distribution transformer capacity and locations.
 - Analysis report on voltage regulations and strategies for efficient power distribution.
 - List of clients to connected on each transformers

- d) Preparation of Bidding Document:
 - Employer's Requirements document.
 - Data sheets of all equipment.
 - Price schedule.
 - Final Bill of Quantities (BoQ).
 - Any other technical documentation required for the bidding process.

- e) Clarification Responses:

Timely and comprehensive responses, in collaboration with the PIU, to bidders' clarifications and inquiries during the bidding process. Participation and support in pre-bid meeting and site visit.

- f) Contract Negotiation:
 - Finalized contract agreement with potential contractors, including all necessary modifications and technical considerations.

5. Key and support Staff:

The minimum following personnel are required from the consulting firm for the successful completion of the project:

- **Project Senior Engineer/Manager:** Responsible for overall project coordination, management, and ensuring deliverables are met within the defined timeline and budget. He/she will oversee the entire project and coordinate with the client, team members, and stakeholders. He/she shall demonstrate knowledge on The Gambian electricity networks and dynamics. He/she will be responsible for developing the detailed design

plans and ensuring compliance with technical specifications. He/she shall be proficient in preparing the technical component of the bidding document, including the Employer's Requirements, equipment data sheets, price schedule, and BoQ. He/she will ensure the document is comprehensive, clear, and meets the requirements of the project. He/she will work alongside the project manager and client representatives to negotiate and finalize the contract agreements with potential contractors. He/she shall have a minimum experience of 8 years in a similar role with at least two similar projects in the last 5 years. He/she shall be a Master's Degree holder in Engineering or management.

- **2 Lead Topographical Surveyors:** Experienced in conducting topographical surveys, collecting accurate elevation data, and preparing topographical maps and profiles. A minimum of 5 years' experience in a similar role with a Master's Degree in Electrical Engineering, Civil Engineering, or a related field, with at least experience in two similar projects in the last 5 years is required. These experts shall lead the survey team(s) on the ground during survey works. The survey teams are considered as support staff and their time shall be costed in the bid.

- **Electrical Engineer Designer:** Specialized in electrical infrastructure design, including medium voltage (MV) and low voltage (LV) lines, distribution transformers. He/she will take part in developing the detailed design plans and ensuring compliance with technical specifications. This Engineer shall be proficient in preparing the technical component of the bidding document, including the Employer's Requirements, equipment data sheets, price schedule, and BoQ. He/she shall demonstrate knowledge on the Gambian electricity networks and dynamics. A minimum of 5 years' experience in a similar role with a Master's Degree in Electrical Engineering, Civil Engineering, or a related field, with at least experience in two similar projects in the last 5 years is required.

- **Electrical Engineer:** : Specialized in electrical infrastructure, including medium voltage (MV) and low voltage (LV) lines, distribution transformers and underground networking. He/she will take part in defining the optimal line routes, taking into consideration cost and network challenges. This Engineer shall provide information in preparing the technical component of the bidding document, including the Employer's Requirements, equipment data sheets, price schedule, and BoQ. He/she will ensure the document is comprehensive, clear, and meets the requirements of the project. He/she will work alongside the project manager and client representatives to negotiate and finalize the contract agreements with potential contractors. He/she shall demonstrate knowledge on the Gambian electricity networks and dynamics. This Engineer shall be more of a general T&D Engineer with either operations or supervision background to assist the Design Engineer. A minimum of 5 years' experience in a similar role with a BSc Degree in Electrical Engineering, or a related field, with at least experience in two similar projects in the last 5 years is required.

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- **Support Staff:** extra technical staff if deemed necessary, administrative personnel, safeguard officers, data entry operators, and other support staff may be required to assist with various project-related tasks, document ; management, and coordination. Their cost shall be included in the total cost of the proposal.

6. Timeline and Level of effort:

The estimated timeline for the completion of the project is as follows:

- Contract effectiveness: W0
- Draft Topographical Survey: W0 to W6
- Final Topographical Survey: W0 to W8
- Draft Detailed Design including studies on distribution transformers: W0 to W10
- Final Detailed Design including studies on distribution transformers: W0 to W15
- Draft technical documents for the Bidding Document: W0 to W10
- Final technical documents for the Bidding Document: W0 to W16

e) Clarification Responses: As required during the bidding process

f) Contract Negotiation: As required for finalizing the contract agreement

It is anticipated that the total level of effort for this assignment is **9** staff-months.