WEST ZONE POWER DISTRIBUTION COMPANY LIMITED

Terms of Reference (ToR)

of

Project Implementation & Supervision Consultant (PISC) for Up-gradation and Extension of Power Distribution System in Monpura Islands

October 2023

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6.1 Introduction

West Zone Power Distribution Company Limited (WZPDCL) is implementing a project named "Up-gradation and Extension of Power Distribution System in Monpura Islands" during Mar'2023 to Feb'2025 under Bhola District in Monpura Upazilla. This project will be implemented with WZPDCL's own fund. By merging Monpura Island with Kolatoli Char, Kazir Char and Dhal Char through submarine cable, people will get uninterrupted electricity at the same affordable price for all other electricity users in Bangladesh in accordance with the tariff of the Bangladesh Energy Regulatory Commission (BERC)/Ministry of Power, Energy and Mineral Resources (MoPEMR). Also, this will contribute to the improvement of overall socio-economic conditions of the people of Monpura upazilla. For the said project WZPDCL now intends to appoint a "Project Implementation & Supervision Consultant (PISC)". The consultant shall monitor & supervise the project implementation and see over its successful completion.

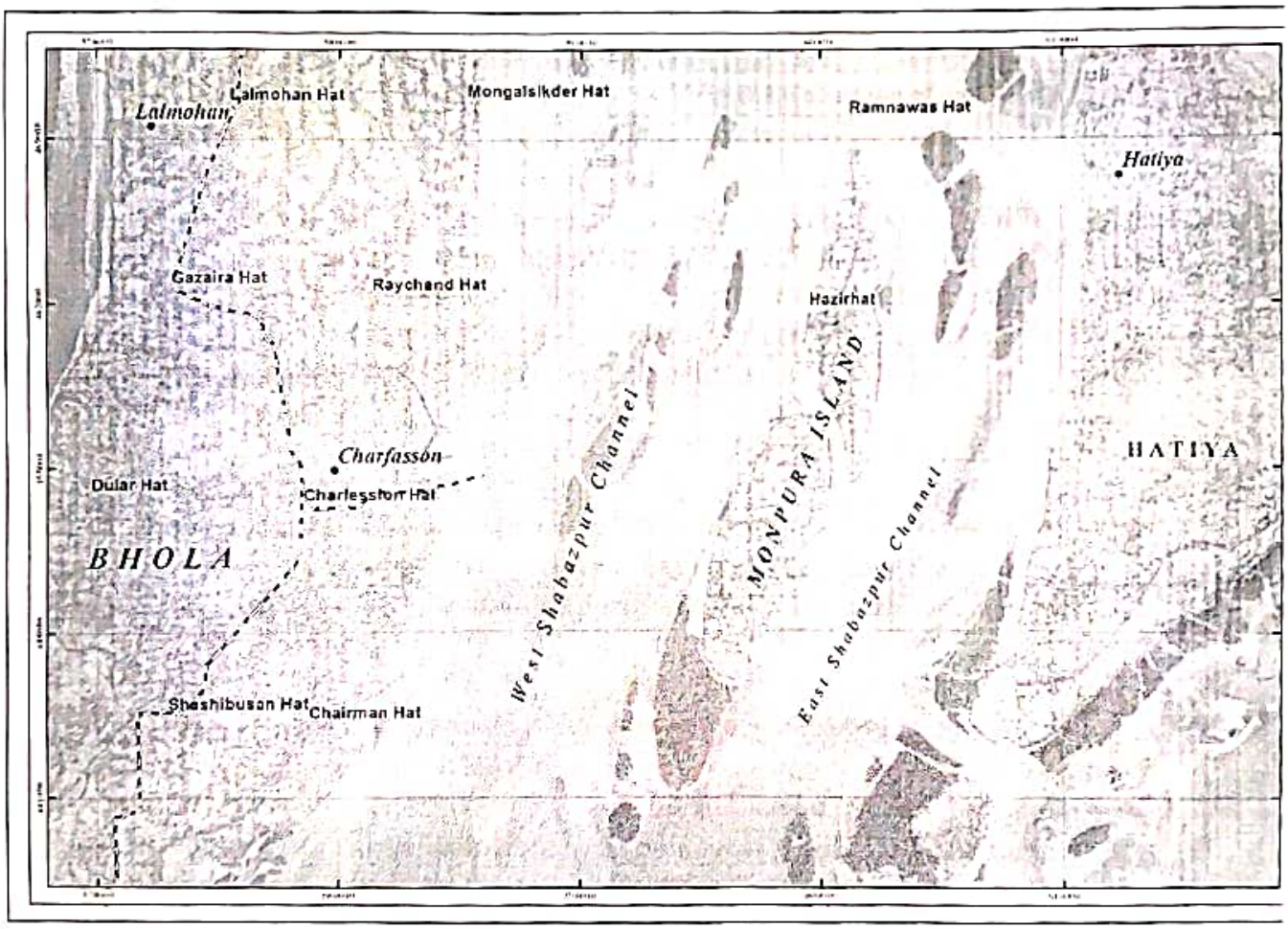

Figure 1: Map showing Geographic Location of Monpura Island

6.2 Objectives

The main objectives of this assignment is to select an Implementation & Supervision Consultant (PISC) for monitoring, supervising, documents preparing of distribution networks and surveying of best suitable location/alignment for installation of submarine cable along with optical fiber communication link through various Channel of Kolatoli Char, Kazir Char and Dhal Char to connect Monpura Island with distribution network and identify the necessary measures to keep the submarine cable fixed in the river under "Up-gradation and Extension of Power Distribution System in Monpura Islands Project".

6.3 Scope of the Works:

Project scope in brief is as follows:

Sl. No.	Items	New	Renovation
1	Construction of 11 kV Line	23 Km	1 Km
2	Construction of 11/0.4 kV Line	96 Km	4 Km
3	Construction of 0.4 kV Line	104 Km	15 Km
4	Construction of 0.23 kV Line	32 Km	5 Km
4	Supply, Delivery, Installation, Testing & Commissioning of 11 kV AIS Indoor Switching Sub-station	01 No	-
5	6.35/0.23 kV Distribution Transformer	215 Nos.	-
6	Supply, Delivery, Installation, Testing & Commissioning of 11 KV submarine cable with optical fiber cable and landing station	9.50 KM	

The scope of work of the Project Implementation & Supervision Consultant (PISC) shall generally include detailed Survey, Planning, Engineering, Designing & Supervision of Construction & Renovation works including Testing and Commissioning of 11kV, 11/0.4kV, 0.4kV& 0.23 kV overhead lines and 11/0.4kV pole mounted transformer and 11KV AIS Switching Sub-Station along with laying of 11 kV submarine cable of the above-mentioned area of Monpura Upazilla under "Up-gradation and Extension of Power Distribution System in Monpura Islands" Project. The Consultant must visit those Islands & char and go through the WZPDCL's records related to distribution line, sub-station etc. and ensure as to adequacy of completeness of information. The consultant shall verify on field whether the findings of these records by WZPDCL are still valid. Thereafter, the consultant will carefully assess and re-survey the works of the

facilities, if the facilities prepared by WZPDCL are found inadequate; they will determine the actual works as required.

Based on survey, the Consultant shall make the detailed planning works along with sketch drawings using AutoCAD showing the planned system (new construction & renovation) of each char and Island of Monpura Electric Supply.

During the execution of Consultancy services the Consulting firm must have the following logistics:

i) Transport and office accommodation having enough space for holding meeting with the representatives of WZPDCL.
ii) Computers, office furniture & communication facilities as required.
iii) Necessary manpower to execute the said assignment.
iv) Megger, Clamp on Meters, Voltmeters, Power Factor Meters, Earth Tester, Survey Equipment, Measuring Instrument etc. as required.

6.4 Detail's of Consultancy Services

The consulting firm shall perform the following tasks at the appropriate phase to execute the project.

1. **Survey of existing 0.4/11 kv Substation, 11 kV, 0.4 kV, and 0.23 kV lines, distribution transformers, service connections, etc.**

   To determine the extent of required renovation and new works, the consultant shall conduct the survey of the existing 11 kV, 11/0.4KV, 0.4 kV, and 0.23 kV lines in the area and record the data and information.
   Also, the consultant shall survey the existing 11/0.4 kV Distribution Transformer record the data.
   The data and information collected from the existing system will be consolidated into a comprehensive master, ensuring its satisfactory organization as per standard format.

2. **Preparation of load data based on survey and load forecasting under Monpura Electric Supply.**

   The Consultant shall survey the current load demand of different types of consumers (i.e., residential, commercial etc.)
   A load demand curve of the project area shall be prepared based on the previous historical data, & load forecasting for the next 10 years. Based on load data the consultant will consider voltage drop and line length during design.

3. **Design and complete mapping of the applicable electrical distribution system based on Survey.**

The consultant will be responsible for conducting a physical survey of the proposed routes for the construction and renovation of 11kV, 11/0.4kV, 0.4kV, and 0.23kV distribution lines and the installation of 6.35/0.23kV distribution transformers, 11 KV Switching Sub-station will be proposed.

Based on the survey, consultants will find suitable locations for the laying of the Submarine Cable and its landing station. For connecting various char (Kolatoli, Dhal, & Kazir) to the Monpura Island through submarine cable consultant shall consider the following activities for the channel study;

a) Collection and review of available data (hydrological, hydraulic, topographic, bathymetric, satellite imageries), maps and study reports;
b) Analyze the available time-series satellite images of the various Channel in order to ascertain the bank erosion and accretion;
c) Carry out bathymetric survey of Channels and adjacent area.
d) Measure the water level at least two locations of each channel which covers the spring and neap tide condition and flow velocity in two locations for current profiling.
e) Analyze available data on the cross-sections and flow velocities of Channels to understand the prevailing morphological changes of the study area;
f) Development of 2D hydrodynamic model to understand the velocity distribution at different locations;
g) Development of Morphological model to understand the bed level changes in the Channels.
h) Assessment of present and future morphological conditions of Channels and its erosion vulnerability
i) Selection of the suitable locations in of Channels for the Submarine cable installation for transmitting reliable power supply from Monpura Island;
j) Assess the bed material distribution
k) Design the required burial depth for protection of the cable
l) Identify the necessary measures to keep the submarine cable fixed in the river

4. **Preparation of detailed distribution line map and engineering report.**

The consultant shall prepare Engineering Report in respect of the project area under the Project.
The Engineering Report shall contain:

i. Planning and design criteria based on WZPDCL / BPDB guidelines.
ii. Full details of the existing 11kV, 11/0.4kV & 0.4kV distribution network with 11/0.4kV distribution transformers including the description of physical condition oflines and distribution transformer.
iii. A detailed drawing (AutoCAD) of the existing system based on the survey shall be submitted to the Project Director.

iv. A detailed AutoCAD drawing including the proposed routes for the different lines, the location of the landing station, 11KV AIS Indoor switching sub-station and the positions of the 6.35/0.23kV distribution transformers to be installed shall be submitted based on the survey.

v. Loss reduction criteria to be proposed by the consultant for acceptance by WZPDCL.

vi. For the submarine cable laying consultant will submit the following information to report:
   a) Hydro morphological characteristics of Channels adjacent to Monpura Island
   b) Show the Erosion vulnerable area
   c) Topography of the river bed around the alignment of Submarine cable
   d) Erosion deposition pattern at and around the sub-marine cable
   e) Best alignment for installation of submarine cable
   f) Bed material characteristics
   g) Burial depth of submarine cable and the layout plan of burial depth.
   h) Necessary measures to keep the submarine cable fixed in the channel

vii. Implementation schedule including construction and renovation works in bar chart

The consultant shall submit the Engineering Report with soft copy containing the data and information

5. Preparation of detailed specifications and design drawings for the construction of civil works and supply of necessary equipment and materials for project implementation.

The appointed consultant for this project has the responsibility to meticulously plan and execute all aspects of the construction and implementation process. The crucial task of preparing detailed specifications and design drawings for the civil works will be undertaken by them, ensuring compliance with standards and regulations.Through research, analysis, and site assessments, comprehensive specifications will be developed, providing clear guidelines for the construction team. Additionally, the consultant will create detailed design drawings that visually represent the planned construction, facilitating effective communication and minimizing errors.

The specfications and required design & drawing of the equipment and materials for the MIUEPDS project implementation shall be prepared by the consultant.

6. Preparation of detailed Bill of Quantities (BoQ), Cost Estimate, Procurement plan, and tender documents in accordance with the laws of Bangladesh.

Based on planning and detailed design, the consultant shall prepare final bill of quantities (BOQ) and cost estimate for planned distribution network including different type of lines, Substations, submarine cable, distribution transformer and the civil works. BOQ shall have to be prepared feeder-wise and materials

category-wise such as, Poles, Conductors, Cables, Insulator, Pole Top Assembly, Guy Assembly etc. BOQ and cost estimate shall be submitted to the Project Director for approval. After approval of BOQ and cost estimate, the consultant shall prepare Tender Documents with cost estimate (Lot wise) for construction and renovation works of 11kV submarine cable laying, 11 kV indoor switching Substation, 11kV, 11/0.4kV, 0.4kV, 0.23kV lines including 6.35/0.23kV distribution transformer.

Procument plan for the equipment and materials for the project implementation shall be prepared by the consultant.

Tender documents to be prepared for the procument of equipment and materials shall include instruction to bidders, general conditions of contract, special condition of contract, scope of works, technical description of items of works, standard drawings, Bill of quantities, schedule of rates and price, guaranteed data schedule etc. It is the consultant's responsibility to prepare these tender documents in accordance with the procurement plan and detailed design.

7. **Preparation of RDPP in the specified format for project-related work.**

   During the implementation of the project, if any changes are required in the scope or procurement plan due to any constraints in reality, RDPP should be prepared in the specified format.

8. **Ensuring construction and renovation work of the project are carried out attentively and successfully.**

   The consultant's responsibility is to oversee the construction and renovation work of the project and ensure that it is carried out attentively and successfully. They will closely monitor the contractor's activities and progress to ensure adherence to the project requirements and specifications. The consultant will provide guidance and support to the tenderer, addressing any issues or challenges that may arise during the construction process. Regular inspections and quality checks will be conducted by the consultant to ensure the work meets the necessary standards and regulations.

9. **Ensuring the implementation and adherence of Quality Management System and Environmental Management System as per ISO 9001 and ISO 14001 respectively.**

   The consultant's role includes ensuring that the contractor implements and adheres to the Quality Management System and Environmental Management System according to ISO 9001 and ISO 14001 standards, respectively. They will closely monitor the contractor's activities to ensure compliance with these systems and provide guidance or support as needed.

10. **Ensuring the work environment, health, and safety measures of the project in accordance with ISO 45001.**

    Throughout the implementation process, it is the consultant's responsibility to ensure that the work environment, as well as health and safety measures of the

project, are in accordance with ISO 45001 standards. They will monitor and assess the project site to identify any hazards or risks and provide recommendations for their mitigation. The consultant's aim is to create a safe and healthy work environment for all personnel involved in the project.

11. **Preparation of detailed Environmental and Social Management Plan (ESMP) based on the site-specific Environmental and Social Management Framework (ESMF), and ensuring monitoring and implementation.**

The consultant will be tasked with the duty of preparing a comprehensive Environmental and Social Management Plan (ESMP) based on the site-specific Environmental and Social Management Framework (ESMF). This plan will outline the measures and strategies to be implemented for effective environmental and social management during the project. The consultant will also oversee the monitoring and implementation of the ESMP to ensure compliance with the prescribed guidelines and standards. The project's adherence to environmental and social responsibilities and mitigation of any potential negative impacts on the environment and local communities is ensured by them.

12. **Preparation of RAP (if applicable).**

If deemed necessary, the consultant will be responsible for preparing a Resettlement Action Plan (RAP) during the implementation of the project. This plan will outline the necessary steps and strategies for addressing any potential displacement or resettlement of affected individuals or communities. The Resettlement Action Plan will be developed in accordance with applicable laws & regulations, and will involve thorough assessment, consultation, and stakeholder engagement processes.

13. **Inspection and certification of submitted bills by the contracting authority.**

The consultant will check and certify the bills submitted by the contracting authority. This involves carefully reviewing the details and documentation provided in the bills to ensure their accuracy and compliance with the agreed-upon terms and conditions of the contract. The consultant will verify the quantities, current market prices, and quality of the items or services mentioned in the bills, and cross-check them against the project's specifications and requirements. By certifying the bills, the consultant provides assurance that the payments requested by the contracting authority are valid and in accordance with the contractual obligations.

14. **Supervision of new construction & renovation works of 11kV, 11/0.4kV, 0.4kV & 0.23kV distribution network with 11 KV switching Sub-station, Laying of 11kV submarine cable with optical fiber and landing station and 6.35/0.23 kV distribution transformer and assist WZPDCL for Testing & Commissioning.**

The consultant shall be responsible for supervision of the construction of 11kV AIS indoor switching Substation, laying of 11 kV submarine cable with optical fiber and **Construction** landing station, construction & renovation works of 11kV, 11/0.4kV 0.4 kV & 0.23 kV distribution network and 6.35/0.23 kV distribution transformers and assist WZPDCL for Testing & Commissioning.

The consultant shall also supervise the construction & renovation works on a continuous basis and inspect all construction activities to ensure that the works are carried out as per specification /standards and in accordance with approved work schedule.

The performance of contractors will be supervised, and the progress of work completed by the contractors will be monitored by them. They will also assist WZPDCL in accepting and taking over the works done by the contractors.

15. Preparation of As-built Drawing of Lines, switching substation and Distribution transformer including marking of poles & x-formers by using AutoCAD software package.

The consultant shall prepare as-built drawing of the construction & renovation works done by the contractor using AutoCAD software package. Those as-built drawings shall be submitted to the Project Director.

All the poles, transformers, equipment shall be numbered in the as-built drawings, feeder wise by the consultant as per standard procedure.

16. Preparation of detailed distribution system documentation, creation of databases, generation of inventory reports for goods, and integration into inventory management software.

The consultant shall prepare detailed documentation for the distribution system. This includes creating databases and generating inventory reports for goods. Furthermore, they will ensure the integration of this documentation and inventory management into the designated software.

17. Collaboration with WZPDCL on various relevant issues related to the project.

The consultant is obligated to engage in collaborative efforts with WZPDCL (West Zone Power Distribution Company Limited) regarding diverse, pertinent matters linked to project implementation. This collaboration encompasses active participation in addressing a broad range of project-related concerns alongside WZPDCL. The consultant's role entails establishing effective communication channels and fostering a cooperative environment with WZPDCL. Through close collaboration, the consultant and WZPDCL aim to address challenges, find solutions, and ensure the successful execution of the project.

6.5 Reports and Documents to be Submitted:

Consultant shall submit the following documents and reports with soft copy to the Project Director in quantities mentioned below:

Sl	Descriptions	Reports
1.	Inception Report with soft copy.	5 (Five) Sets
2.	Engineering Report with soft copy.	5 (Five) Sets
3.	Bill of quantities for ➢ Construction & renovation of 11 kV, 11/0.4kV, 0.4 kV & 0.23 kV distribution network ➢ Supply, delivery, installation, testing & commissioning of 11KV submarine cable with optical fiber & landing station. ➢ Supply, delivery, installation, testing & commissioning of 11 kV AIS indoor switching substation as per planning under the project with soft copy.	3 (Three) Sets
4.	Tender document (with soft copy) with estimate as per existing/competitive rate for ➢ construction and renovation of 11 kV, 11/0.4 kV, 0.4 kV & 0.23 kV distribution network. ➢ Supply, delivery, installation, testing & commissioning of 11 kV submarine cable with optical fiber and landing station ➢ Supply, delivery, installation, testing & commissioning of 11 kV AIS indoor switching substation and installation of 6.35/0.23 kV distribution transformer with soft copy.	3 (Three) Sets
5.	As built drawing as per ➢ construction and renovation work of 11 kV, 11/0.4 kV 0.4 kV & 0.23 kV distribution network. ➢ Supply, delivery, installation, testing & commissioning of 11kV submarine cable with optical fiber and landing station. ➢ Supply, delivery, installation, testing & commissioning of 11kV AIS indoor switching substation and ➢ 6.35/0.23kV distribution transformer done by the contractor along with the statement of BOQ .	3 (Three) Sets
6.	Monthly progress report with soft copy.	5 (Five) Sets
7.	Quarterly progress report with soft copy.	5 (Five) Sets

6.6 Key Personnel and Qualification:

i. **Project Manager:** He/ She should have masters or equivalent degree in Engineering from a recognized University. He/ She must have the experience to conduct the consultancy service for the implementation & Supervision of distribution system development project, out of which at least ten (10) years'

experience as team leader/team coordinator/team manager in power sector utilities. He/She must have capability to plan, lead, organize, monitor & coordinate the team consisting of consultants of different disciplines.

ii. **Substation Expert:** He/ She should graduate in Electrical Engineering from a recognized University. He/ She should have the experience in the relevant field, out of which at least eight (8) years' experience in substation design, construction, operationetc.

iii. **Distribution line Expert:** He/ She should graduate in Electrical Engineering from a recognized University. And He/ She must have the experience in planning and construction of distribution lines, out of which at least eight (8) years' experience as an engineer in generation, transmission, and distribution system, etc.

Submarine cable Expert: He/ She should graduate in Electrical/ Water Resources / Civil Engineering from a recognized University. He/ She must have the experience in relevant field, out of which at least eight (8) years' experience as an engineer in subamarine Cable laying, Root Analysis, morphological & hydrodynamic study and modelling of river, collect & analyze data on water level, current Speed, sediment concentration channel and review of coastal bathymetry/hydrographic chart, Satellite Images etc.

iv. **Engineer (Civil):** He/ She should have master's or equivalent degree in Civil Engineering from a recognized University. He/ She must have the experience in Civil Infrastructure Development, out of which at least eight (08) years' experience in feasibility study, technical study, preparation of design drawings and construction supervision of civil works etc.

v. **Engineer (Survey):**He/She should graduate in Electrical Engineering from a recognized University. And He/She must have the experience in the relevant field, out of which at least eight (08) years' experience in distribution consultancy services including surveying & data collection of power distribution network. He/ She must have capability to plan, organize, monitor & coordinate all the functions related to surveying and data collection of electrical distribution system under this proposed project and lead the survey team.

vi. **Procurement Expert:** He/ She should have master's or equivalent degree in Engineering from a recognized University. He/ She must have the experience to conduct the consultancy service for the implementation & Supervision of distribution system development project, out of which at least Eight (8) years' experience as team leader/team coordinator/team manager in power sector utilities. He/She must have capability to plan, lead, organize, monitor & coordinate the team consisting of consultants of different disciplines.

viii. **Commissioning Expert:** He/ She should graduate in Electrical Engineering from a recognized University. And He/ She must have the experience in planning and construction of distribution lines, out of which at least eight (8) years' experience as an engineer in substation construction, testing, commissioning etc.

6.7 Client's Responsibilities

The Consultant shall work under the direct supervision of the authorized person(s) of WZPDCL. Authorized person(s) shall be responsible for providing logistics, facilities, data, information, literatures, documents, comments and opinions etc. available with WZPDCL. Project Director shall arrange meetings with the Consultant as and when necessary but at least once in a month to review the progress of the Study. If any problem arises solution of which is beyond the authority of Project Director shall be referred to the Senior Officials for immediate solution.

6.8 Consultant Responsibilities

The Consultant shall carry out the services as detailed as mentioned in this Scope of Work, Objectives, Tasks & Responsibilities of Key personnel in order to produce indicated Outputs of the services to the standard acceptable to WZPDCL and with the best interest of the Government with utmost care, skill and diligence with sound engineering, administrative and financial practices. The Consultant shall be responsible to WZPDCL for discharging their responsibilities. Consultant shall have to arrange interactive meetings, workshops frequently with client and stake holders relevant to study.