Terms of Reference (TOR)
for
Technical Study for Innovative Designing of Grid Transmission Tower using Optimum Area of Land
(Package N0. S-04)

Background:

Bangladesh has a large population residing all over the country and the electricity supply need of this population creates requirement of a large transmission and distribution system. Transmission line is an integrated system consisting of conductor subsystem, ground wire subsystem and one subsystem for each category of support structure. Mechanical supports of transmission line represent a significant portion of the cost of the line and they play an important role in the reliable power transmission. They are designed and constructed in wide variety of shapes, types, sizes, configurations and materials. The cost of towers constitutes about quarter to half of the cost of transmission line and hence optimum tower design will bring in substantial savings. The selection of an optimum outline together with right type of bracing system contributes to a large extent in developing an economical design of transmission line tower.

Objectives:

The goal of study is to innovative best design for power grid transmission tower using optimum area of land. But, because of the practical restrictions this has been achieved through intuition, experience and repeated trials, a process that has worked well. There are the following objectives:

- Innovative design of Grid Transmission Tower.
- Tower configuration analysis.
- Tower weight estimation.
- Cost analysis and span optimization.
- Using optimum area of land.

Scope of Services:

To accomplish the scope of work the consultant shall carry out (but not limited to) the following tasks:

- Analysis the Innovative design of Bangladesh Grid Transmission Tower.
- To assist in preparation of Technical Requirements such as technical specifications and basic design.
- Prepare conceptual designs for requiring to be built in optimum area of land to serve the growing demand.
- Cost estimates, economic and financial analysis and justification of designed tower.
- Prepare layout and design to be used in the electrical, communications and SCADA, civil, structural and architectural works.
- Examine the technical, economic and commercial impacts.
- Topographic Survey of the tower area
- Assessment of investments.
- Identifying the benefits of the designed towers.
- Identifying the barriers of Integration with Regional Grid.

- Security analysis for transmission tower.
- Understanding of the risks.
- Analyze relevant data & information for the study and Compile the reports on the study.

Period of Performance:

The duration of this assignment will be 6 months.
Total 38 Man-months for key experts.

Team Composition & Qualification Requirements for the Key Experts:

The preferred experience of proposed key staff is mentioned below:

(1) **Team Leader (International, 6 Man-months):** At least master degree in minimum graduation in Electrical/Mechanical engineering with 5 years working experience in design of power grid transmission system relevant study/analysis with minimum 20 years working experience at transmission network, power inter-connection and other relevant tasks in power sector.

(2) **Transmission Expert (International, 5 Man-months):** At least Bachelor's degree in Electrical Engineering with minimum 15 years experience in power transmission planning, design, operation & maintenance.

(3) **Mechanical Expert (International, 4 Man-months):** At least Bachelor's degree in Mechanical Engineering with minimum 15 years experience in power transmission tower design, operation & maintenance.

(4) **Design Expert (International, 6 Man-months):** Minimum Bachelor's degree in civil/mechanical/electrical engineering or relevant subject with 5 years working experience in design of transmission tower including power transmission system projects with minimum 15 years experience in power sector.

(5) **Civil Expert (International, 3 Man-months):** Minimum Bachelor's degree in civil engineering with minimum 10 years professional experience with 3 years working experience in power system projects.

(6) **Transmission Expert/Deputy Team Leader (National, 6 Man-months):** At least Bachelor's degree in Electrical Engineering with minimum 15 years experience in power transmission planning, design, operation & maintenance.

(7) **Legal Expert (National, 2 Man-months):** At least master degree in Law with minimum 12 years working experience.

(8) **Survey Expert (National, 3 Man-months):** Diploma in civil engineering with minimum 10 years professional experience with 3 years working experience in power system projects.

(9) **Financial Expert (National, 3 Man-months):** At least Master degree in Finance or relevant subject with minimum 12 years professional experience with 5 years experience in power sector.

List of Reports and Schedule of Deliveries:

- **Inception Report:** Consultant will submit an Inception Report within 2 weeks from signing of the Contract, stating their jobs understanding, concept on the requirements of the assignment, readiness and strategy for undertaking the project.
- **Interim Report:** Consultants will submit Interim Report within 3 months from the date of Contract signing.
- **Draft Final Report (DFR):** Consultants shall submit Draft Final Report within 5 months from the date of Contract signing.

- **Stakeholders Workshop:** Hold Stakeholders Consultation Workshop on Draft Final Report after 15 days of submission of Draft Final Report.
- **Final Report:** Final Report shall be submitted within 6 months from the date of signing of the Contract.

Transfer of Knowledge (Training):

The consultant shall conduct/recommend necessary local/foreign/on-job- training. The responsible &relevant personnel of Power Division, Power Cell and other utilities will be preferred for the training.

Client's Input and Counterpart Personnel

(a) Data, Personnel, facilities and local services to be provided by the Client:

The entities of power sector will ensure access to the available pertinent information to this assignment. Consultant will work in close association with Power Division/Power Cell and other relevant entities. A coordination mechanism will be set up to review progress, provide guidance and advice. The designated personnel of the entities will interact with the consultants and provide data, arrange discussions and assistance as required.

(b) Logistics Support

Office accommodation, field visits, secretarial service will have to be arranged by the consulting firm at their own costs.

Institutional Arrangements:

Power Cell will act as contact administrator of the assignment and consultant will work with the concern utilities/stakeholders under Power Division.