

**PFC CONSULTING LIMITED**

**(A wholly owned subsidiary of PFC Ltd. -A Government of India Undertaking)**



**BID DOCUMENT FOR**

**Survey & Preparation of Report for “Static/Dynamic compensation requirement in the Northern Region Grid” using LiDAR Surveys Techniques**

**List of Technically Empaneled Firms**

1. M/s. GIS Data Solutions
2. M/s. Pratik Surveyors (India) Pvt. Ltd.
3. M/s. MNEC Consultants Pvt. Ltd.
4. M/s. Knifedge Technologies Private Limited.
5. M/s. VITS Total Power Solution Pvt. Ltd.



**Corporate Office**

**9<sup>th</sup> Floor, A-Wing, Statesman House, Connaught Place, New Delhi- 110001**

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## LIST OF ANNEXURE

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**PFC CONSULTING LIMITED**

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**BID INVITATION LETTER**

**Online bid is invited in single packet system from the Survey Agencies who are Technically Empaneled under LiDAR Survey with PFCCL for LiDAR based survey work and preparation of survey report for Transmission Scheme**

**List of Technically Empaneled Firms**

1. M/s. GIS Data Solutions
2. M/s. Pratik Surveyors (India) Pvt. Ltd.
3. M/s. MNEC Consultants Pvt. Ltd.
4. M/s. Knifedge Technologies Private Limited.
5. M/s. VITS Total Power Solution Pvt. Ltd.

**PFC Consulting Ltd. invites E-Tenders through GeM portal for appointment of Survey Agency for Survey & Preparation of Report for “Static/Dynamic compensation requirement in the Northern Region Grid” using LiDAR Survey Techniques.**

|    |                                        |                                                                                             |
|----|----------------------------------------|---------------------------------------------------------------------------------------------|
| a) | Tender Id                              | As displayed on e-procurement portal<br><a href="https://gem.gov.in">https://gem.gov.in</a> |
| b) | Opening date of Tender downloading     | 24/07/2026 from 13:00 hrs. (IST)                                                            |
| c) | Submission date of E-bid               | 27/07/2026 till 13:00 hrs. (IST)                                                            |
| d) | Opening of E-bids (Financial Proposal) | 27/07/2026 till 13:30 hrs. (IST)                                                            |

**Note:**

1. Tender Notice and Tender Document are available on PFC Consulting Limited (PFCCL) website and can be downloaded from <https://www.pfcclindia.com> or from the e-procurement portal <https://gem.gov.in>. All future Information viz. corrigendum/ addendum/ amendments etc. for this Tender shall be posted on the PFC Consulting Ltd. website and said e-procurement portal only.
2. The bidder would bear all costs associated with the preparation, submission of bid, participation in bidding process including cost of registration with the said e-procurement portal, if any. PFCCL in no way will be responsible or liable for these costs regardless of the conduct or outcome of the bidding process.
3. Bidders are advised to start the registration process little bit early on the e-procurement portal so as to avoid any delay in bid submission. Bidders may visit the said e-procurement portal for further details.

## **BID INVITATION LETTER**

Ref: 05/26-27/42/ITPs/TC/RFP

24.07.2026

.....

.....

.....

**Subject: Request for an offer for Consultancy Services Package for Technical Survey and Preparation of Report for “*Static/Dynamic compensation requirement in the Northern Region Grid*” using LiDAR Survey Techniques**

Dear Sir,

Central Electricity Authority (CEA) vide its Minutes of Meeting dated 20.07.2026 for 42<sup>nd</sup> National Committee for Transmission (NCT) has appointed PFC Consulting Limited (PFCCL) as the Bid Process Coordinator (BPC) for selection of bidder as Transmission Service Provider (TSP) to establish Inter-State transmission system “*Static/Dynamic compensation requirement in the Northern Region Grid*” through Tariff Based Competitive Bidding (TBCB) process.

PFCCL invites bids from the Survey Agencies who are Technically Empaneled under **LiDAR Survey** with PFCCL for survey and preparation of report for “*Static/Dynamic compensation requirement in the Northern Region Grid*” using LiDAR survey technique. The Scope of Work is indicated in **Volume-III** of this document. The eligibility criteria, submission of bid, deliverables, selection procedure and criteria, terms of payment, terms and conditions etc. are given below:

### **1.0 ELIGIBILITY CRITERIA**

The Consulting Organization (Bidder) should mandatorily possess Technical Empanelment Letter indicating the firm has been technically empaneled under LiDAR Survey issued by PFCCL.

### **2.0 CONTENTS OF BID DOCUMENTS**

- i) Bid Proposal Sheets (Volume-I)
- ii) Conditions of Contract (Volume-II)
- iii) Technical Specifications including Scope of Work for Survey and Preparation of Report (Volume-III)

### **3.0 PERIOD OF ENGAGEMENT**

The timeline for completion of assignment with respect to deliverables along with submission of Final Report and Estimation of Right of Way (ROW) would be Forty Five (45) days from the date of Letter of Award (LoA), however, the period of engagement would be till the transfer of Packages to Transmission Service Provider (TSP) by PFCCL. The Consultant is expected to be associated with the project for a period till transfer of Packages to Transmission Service Provider (TSP) by PFCCL and the Consultant should be able to extend its services as and when required till the period of engagement.

#### 4.0 BASIS OF PRICE OFFER

The price offer would be for the assignment as per **Schedule-3** of **Bid Proposal Sheet (Volume-I)** and would remain firm throughout the period of contract. Quoted lump sum price will be inclusive of taxes and duties including the applicable Goods and Services Tax, all travel, and stay, out of pocket expenses, cost of producing documents etc. and PFCCL will not pay and/or reimburse anything over and above the price quoted. TDS would be deducted as per provision of Income Tax Act and TDS certificate shall be issued to the Consultant by Employer.

All related travel expenses incurred by the Consultant's personnel for journeys to site or Employer's Office or anywhere in connection with the consultancy services/study under Scope will be borne by the Consultant and the Employer will not take any responsibility whatsoever on this account.

#### 5.0 SUBMISSION OF BID

**5.1** Bid shall consist of single packet comprising "**Financial Proposal**" and should be duly submitted online at e-Procurement Portal <https://gem.gov.in/> online from on or before 13:00hrs. (IST) on 27/07/2026. The Bid would consist of

**5.2** The **Financial Proposal** shall comprise the following:

i. **Supporting Documents:**

- a) Covering letter
- b) Authorization Letter
- c) Valid Technical Empanelment Letter issued by PFCCL indicating that the Bidder has been empanelled under the *[LiDAR Survey]*.
- d) MSEs Certificate (ref. OM No. F.20/2/2014-PPD(Pt.) dtd. 25.07.2017 issued by Procurement Division, MoF) for EMD exemption or Proof of Payment of EMD of **Rs.24, 150/-**.

ii. **Price Offer:** to be submitted only in the relevant cell of GeM portal

**5.3** The scanned copy of the **supporting documents** to be uploaded in the GeM Portal and the **Price Offer** to be submitted online at e-Procurement Portal <https://gem.gov.in/> online from on or before 13:00hrs. (IST) on 27/07/2026.

**Note:**

**5.4** A bid may be considered as in-complete/non-responsive in case of non-submission /wrong submission /alteration of any of the following documents:

- i) Covering Letter on the letter head of the organization/firm as per the Format of **Schedule -1 of Volume-I** (Bid Proposal Sheets) duly signed by the authorized signatory.
- ii) Authorization Letter in favor of the Authorized Signatory as per format provided at **Schedule-2 of Volume-I** (Bid Proposal Sheets).
- iii) Technical Empanelment Letter issued by PFCCL indicating that the firm has been empaneled under *[LiDAR Survey]*

- iv) MSEs Certificate (ref. OM No. F.20/2/2014-PPD(Pt.) dtd. 25.07.2017 issued by Procurement Division, MoF) for EMD exemption or Proof of Payment of EMD of Rs. **Rs.24, 150/-**.

EMD Amount will be paid through NEFT/RTGS in PFCCL's Bank Account. Bank Accounts details of PFCCL are as under:

Name of Organization: PFC Consulting Limited

Name of Bank & Branch: ICICI Bank, Connaught Place, New Delhi, 110001

Bank Account Name: PFC Consulting Limited

Account No. : 000705036117

IFSC: ICIC0000007

*PFCCL reserves the right to seek clarifications from Bidder in case of any deficiency is observed in the Supporting documents.*

- 5.5** The **Price Offer** should contain the lump sum price offered for Package and have to be submitted **only** online at e-Procurement Portal <https://gem.gov.in/> and not anywhere apart from e-Procurement Portal <https://gem.gov.in/> .
- 5.6** In case bidder not having MSE Certificate, bidder shall pay the due EMD amount through NEFT/RTGS in PFCCL's Bank Account. The same shall be returned to unsuccessful bidders within 7 days from uploading of bid results. However, for successful bidder, same shall be returned on Submission of Contract Performance Guarantee (CPG).
- 5.7** Bidder shall submit the original EMD document (copy of which uploaded on GeM portal as a supporting document) within 5 days from intimation from PFCCL as successful L1 Bidder. The same shall be returned upon submission of Contract Performance Guarantee.
- 5.8** Bidders are instructed to communicate with PFCCL only in writing/email to the official contact.

## **6.0 BID OPENING AND EVALUATION OF PROPOSALS**

### **6.1 Opening of Single Packet bid**

The "**Single Packet bid** " will be opened online on **27/07/2026 at 13:30hrs. (IST)**.

### **6.2 Completeness of bid with respect to the bidding document.**

- i) The **Single Packet bid** should contain all documents mentioned at Para 5.2 above, **duly filled and signed by Authorized Signatory**.
- ii) There should be no deviations from any or all the contents of the bidding documents or conditional or alternate bids. In-complete/In-responsive/In-adequate and/or conditional Financial Proposals will be rejected.

### **6.3 Financial Proposal Evaluation**

The assignment would be awarded to the bidder who has submitted responsive financial proposal and quoted lowest lump sum price quoted as per Clause 4 above, in Indian Rupees, without condition(s) or alternate price bid.

***In case of more than one bidder quoting L1 price, the Assignment shall be awarded to the bidder who submitted L1 bid first on the GeM portal.***

## **7.0 VALIDITY OF BID**

Bidders would keep their Bids/ Quotations valid up to **120 (One Hundred and Twenty) days** from the date of submission of bid. Bidders may be required to further extend the validity of Bid as per the requirement of PFCCL.

## **8.0 CONTRACT PERFORMANCE GUARANTEE (CPG)**

In the event of an award, the successful bidder, within **Seven (7) days** of receipt of Letter of Award (LoA) from Employer, will be required to arrange submission of CPG in the form of Bank Guarantee (BG) of **Five (05) Percent** of the contract value. The CPG/BG should be as per Performa (will be given to the successful bidder) and should be kept valid up to **twelve (12) months** from the date of issue of Letter of Award (LoA), which would require to extend till completion of the assignment.

## **9.0 CONTRACT AGREEMENT**

**9.1** In the event of award, the selected bidder (“**Consultant/Contractor**”) will be required to enter in to a Contract Agreement with the PFCCL **within 7 (Seven) days from the date of the Letter of Award (LoA) or within such extended time, as may be granted by the PFCCL** as per the pro-forma of the Contract Agreement as per **Schedule -4**.

**9.2** Formal Contract Agreement will be executed on Non-judicial stamp paper of Rs. 100/- (Rs. One Hundred only) as per the format provided at **Schedule-4**. Two sets of Non-Judicial Stamp papers of Rs.100/- each and water mark papers to be purchased by the Consultant from Delhi State.

**9.3** The Contract Agreement will be signed in two originals and the Consultant shall be provided with one signed original Contract Agreement.

**9.4** The date of execution of the Contract Agreement in no case would alter the date of start or completion period of the work.

**9.5** Till the time a ‘Contract Agreement’ is executed, the Letter of Award shall be read in conjunction with the Bidding Documents and would constitute a binding contract.

**9.6** The executed Contract Agreement may only be amended or supplemented by a written agreement between the parties.

## **10.0 TERMS OF PAYMENT:**

The payment terms for project shall be as below:

- a. **40% Payment of contract amount:** Upon the submission and technical acceptance by PFCCL of the preliminary Desktop Studies, Substation Identification, Route Alignment, Ground Walkover Survey and LiDAR Survey, Submission and acceptance of draft survey report incorporating all the required information.

- b. **40% Payment of contract amount:** Upon the submission and acceptance of Final Survey Report, incorporating all the required information / data and assigned technological aspects (Ground Walkover and LiDAR Survey) along with the delivery of all underlying digitized source files (KML/KMZ terrain grids, raw and classified point-clouds, high-resolution orthomosaics, and integrated PLS-CADD profiling data).
- c. **20% Payment of contract amount:** On Transfer of Packages to Transmission Service Provider (TSP) by PFCCL.

#### 11.0 DELIVERABLES:

**All the deliverables, as mentioned in this clause and Volume-III (Technical Specifications) shall be submitted.**

- 11.1 Consultant would submit weekly progress report for all the works/ studies/ survey as per the format mutually agreed upon.
- 11.2 Consultant shall adhere to the following timelines for carrying out desktop surveys, walkover surveys, Lidar survey, preparation and submission of Draft, Addressing the employers' comments, preparation and submission Final Survey Reports, including all deliverables specified in Annexure-A & B of Volume-III (Technical Specifications), in consultation with the Employer. The timelines shall be reckoned from the date of issuance of the Letter of Award (LoA):

| S.No. | Milestone                                                                                                                                                                                                                                                                                            | Timeline<br>(Issue of LoA: T Day) |
|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|
| 1.    | Identification, walk over & Lidar survey and submission of comparative statement of sub-station alternates/sites for finalization alongwith identification & confirmation of the availability of terminal bays at existing sub-stations, LILO points and its co-ordinates as per the approved scheme | T+10                              |
| 2.    | Finalization of transmission line route alongwith walkover & Lidar survey for review by employer                                                                                                                                                                                                     | T+27                              |
| 3.    | Submission of draft survey report                                                                                                                                                                                                                                                                    | T+34                              |
| 4.    | Submission of final survey report & RoW estimation                                                                                                                                                                                                                                                   | T+45                              |

- 11.3 The Consultant would submit five (05) hard copies of final report along with soft copy in english language, route maps and digitized toposheets within **forty five (45) days from the date of LoA.**
- 11.4 Consultant would be responsible for estimating Right of Way (RoW) cost for proposed transmission lines in accordance with prevailing state and central RoW Policy. It would include details as Circle rate/Guideline value/Stamp Act rates, Prevailing Market Rate, Area Features (Urban/Rural/Development Authority Area etc.), details of recent compensation awarded in vicinity for infrastructure projects (Transmission Line etc.) for area falling under RoW of Transmission Lines and any other details required for estimating RoW. The required coordination with local authorities for compiling inputs will be undertaken by Consultant.

The details as mentioned above should be backed by documentary evidences such as details from Revenue Officer, Registrar Office, Land Acquisition Officer, Local Governing Bodies, market rates certified by Valuer empaneled with Insolvency and Bankruptcy Board of India (IBBI)/Government Bodies/Public Sector Undertakings etc.

- 11.5** Consultant would be responsible to provide deliverables for as may be required, for successful completion of the assignment. The Consultant would be responsible for deliverables, as may be desired by PFCCL during the course of the assignment for the successful completion of the assignment to the satisfaction of PFCCL.

**Notes:**

- i. Where required for obtaining statutory clearances, approvals, required documentary evidence, consultations with local authorities, or for any other purpose specified by the Employer, the Consultant shall submit the Final Survey Report and related documents in the relevant regional language(s), at no additional cost to the Employer.
- ii. Any document related to the Scope of Work that is in a language other than English shall be accompanied by a certified English translation. The Consultant shall arrange such translation through a certified translation agency or obtain certification from the concerned State Government office/ authority, as applicable. All costs and expenses incurred towards translation and certification shall be borne solely by the Consultant and shall not be reimbursable by the Employer
- iii. The Consultant shall submit all raw data, processed data, survey records, calculations, GIS/KMZ files, LiDAR point cloud data, imagery, models, drawings, maps, databases and other source documents pertaining to the studies, reports and surveys carried out under the Contract. All such data shall become the property of the Employer.
- iv. All reports shall be submitted in A4-size format and all drawings/maps shall be submitted in A0-size format, unless otherwise specified by the Employer. All hard-copy reports and drawings shall be properly bound and printed on good-quality paper. In addition, editable soft copies and PDF versions of all reports, drawings and associated data shall be submitted in the prescribed digital formats.

**12.0 OTHER TERMS & CONDITIONS:**

- i) The financial proposal by the bidders would be in Indian Rupees as per format enclosed with no escalation at any stage during or after the completion of the assignment for any reason whatsoever.
- ii) The Consultant shall deploy adequate resources/multiple teams for the accomplishment of assignment within stipulated timeframe. Accordingly, the Consultant shall furnish the names, designations, e-mail addresses, and mobile numbers of the concerned executives/personnel to whom the scheme has been assigned within two (2) days of issuance of the Letter of Award. Such personnel shall be available for coordination with PFCCL and shall, whenever required by PFCCL, visit the project site or attend meetings at short notice, i.e., within a day of such request. Any change in the nominated personnel shall be communicated to PFCCL promptly along with details of the replacement personnel. Consultant shall share the name, designation and mobile number of concerned executives

to whom scheme have been assigned and able to reach by next day to the visit the project site/s as and when required.

- iii) The Consultant would make available the services of the identified personnel as may be required for successful execution of the assignment and or as may be required by PFCCL on specified dates, venues including PFCCL's office and time in order to meet the obligations of PFCCL.
- iv) In case the performance of the any team member(s) is not satisfactory, the Consultant will be asked to change/replace the team member(s) within three (03) days of receipt of such request from PFCCL with a member acceptable to PFCCL.
- v) All claims would be raised by the Consultant as per the terms of payment and would be accepted for payment based on satisfactory progress and quality of the work at the sole discretion of the competent authority.
- vi) In case there is a delay by the Consultant in accomplishing the deliverables which in the opinion of PFCCL is attributable to the Consultant, PFCCL reserves the right to get such specific work(s) done through any other Agency (ies) at the risk and cost of the Consultant for timely completion of the deliverables.
- vii) For any delays attributable to the Consultant, beyond the Scheduled dates/period of completion of single/multiple activities as per the schedule mentioned for deliverables, a Liquidity Damage (LD) equal to 0.5% of the contract value per week or part there of subject to maximum of 5% of the contract value may be levied from the bill of the agency.
- viii) PFCCL with the approval of CEO, can cancel the contract at any stage of the work, in case the performance of the consultant is not satisfactory, any information given at the time of submission of the bid is found to be incorrect.
- ix) Given the nature of the work being entrusted, the successful bidder firm would have to give an undertaking to the effect that the contents/ essence of any reference/ documents given would not be disclosed to any third person without the express approval of PFCCL, failing which the engagement of the firm would be terminated.
- x) If due to any reason or decision of the Govt. /Client, the Assignment is dropped and the Consultant is directed to discontinue work, the "Drop Dead Fee" would be limited to the payments received by the Consultant and the claims already raised and accepted by Employer, as per the payment terms relating to the Assignment, till the point of calling off the Assignment or as mutually agreed.
- xi) Conflict of Interest: Consulting organization or their Partners / any other Employee or Associate would not be hired for any work whose interests are that in conflict with their prior or current obligations to the other organizations, or that may place them in a position of being unable to carry out the work assigned to them at any point of time during the currency of engagement by PFCCL or above all enable them to pose a threat to PFCCL's consulting business in future. Without limitation on the generality of the foregoing, Consulting organizations would not be hired, under the circumstances set forth below:
  - a) Consulting organizations that have business or family relationship with member(s) of PFC's and/or PFCCL's employees or persons positioned in or on the Board of these two

organizations by whatever process would not be engaged. A declaration to this effect would be given by the organization when being engaged, and if found incorrect, the Consulting organizations would be debarred from any further engagement by PFCCL ever.

- xii) The Consultant would keep PFCCL, both during and after the term of this Contract, fully and effectively indemnified against all losses, damage, injuries, deaths, expenses, actions, proceedings, demands, costs and claims, including, but not limited to, legal fees and expenses, suffered by PFCCL or any Third Party, where such loss, damage, injury or death is the result of a wrongful action, negligence or breach of contract by the Consultant, or the Consultant's personnel, including the use or violation of any copyright work or literary property or patented invention, article or appliance
- xiii) Offers received in the designated office after the due time and date mentioned above would not be considered.
- xiv) PFCCL reserve the right to accept or reject any or all Proposals/Offer or annul the bid Process or modify/ change the content of the bid document without assigning any reason whatsoever.
- xv) PFCCL would not entertain any claim of any nature, whatsoever, including without limitations, any claim of expenses in relation to the preparation, submission or any other activity relating to bidding or any other expense till award of contract.

The complete bid document can be downloaded from our website: [www.pfcclindia.com](http://www.pfcclindia.com). The Bidder has to submit the BID at e-Procurement Portal <https://gem.gov.in/> on or before 13:00 hrs. (IST) on 27/07/2026.

Yours sincerely,

**For and on behalf of PFC Consulting Limited**  
**General Manager**

Encl: As above.

**PFC CONSULTING LIMITED**  
**(A wholly owned subsidiary of Power Finance**  
**Corporation Ltd. -A Government of India**  
**Undertaking)**



**VOLUME – I**

**BID PROPOSAL SHEETS**

**Survey & Preparation of Report for “Static/Dynamic compensation requirement in the Northern Region Grid”- using LiDAR Survey Techniques**

**COVERING LETTER**

(On the Letter head of the organization/Firm duly signed each page by Authorized signatory)

**Bidder's Proposal Ref. No. \_\_\_\_\_ and Date \_\_\_\_\_**

Name of Authorized Person : .....

Designation: .....

Telephone No.: .....

Email : .....

To

**General Manager,**

**PFC Consulting Ltd.**

9<sup>th</sup> Floor, A-Wing, Statesman House,  
Connaught Place, New Delhi 110001.

Dear Sir,

1. We hereby propose to provide the Consultancy Services for Survey and Preparation of Report using LiDAR Survey Technique for **"Static/Dynamic compensation requirement in the Northern Region Grid"**.
2. We have understood the instruction and the terms & conditions mentioned in the Bidding Documents and have thoroughly examined the specifications/ scope of work laid down in the Bidding Documents and are fully aware of nature of consultancy services required.
3. We herewith submit **Financial Proposals comprising Supporting Documents and Price Offer** for selection of our organization as consultant on lump sum basis for providing Consultancy Services for **"Static/Dynamic compensation requirement in the Northern Region Grid"**.
4. We are submitting our bid online consisting of:
  - i) Supporting Documents:
    - a. Covering letter
    - b. Authorization Letter
    - c. Technical Empanelment Letter issued by PFCCL indicating that the firm has been empanelled under the [LiDAR Survey]
    - d. MSEs Certificate (ref. OM No. F.20/2/2014-PPD(Pt.) dtd. 25.07.2017 issued by Procurement Division, MoF) for EMD exemption or Proof of Payment of EMD of **Rs.24,150/-**.
  - ii) **Price Offer** (as per format provided at Schedule 3 of BidProposal Sheets)
5. \_\_\_\_\_[Name and contact information] would be the Team Leader for the assignment.

6. We declare that the above quoted lump sum price is firm and would remain valid for the entire period of the consultancy assignment. We further declare that the above quoted lump sum price is inclusive of taxes and duties including the applicable Goods and Services Tax, all travel, and stay, out of pocket expenses, cost of producing documents and deliverables etc. and PFCCL will not pay and/or reimburse anything over and above the price quoted.
7. We hereby undertake that if any Income Tax, Surcharge or any other Corporate Tax is attracted under the law, we agree to pay the same to the concerned authorities.
8. We declare that the prices and other terms and conditions of this proposal are valid for a period of 120 days from the last date of submission of bid.
9. We declare that the services will be rendered strictly in accordance with the specifications and we do not have any deviation to any of the terms and conditions of the bidding documents.
10. We confirm our acceptance/compliance to the 'Deliverables with scheduled timeline' and 'Terms of payment' clauses as stipulated in the bid documents. We confirm that Contract Performance Guarantee of Five (05) Percent of the total consultancy fee in the form of bank guarantee/equivalent demand draft amount would be provided by us as per the prescribed format in case of placement of award.
11. We hereby declare that only the company, persons or firms interested in this proposal as principal or principals are named herein and that no other company, person or firm other than one mentioned herein have any interest in this proposal or in the contract to be entered into, in case of placement of award..
12. We give our unconditional acceptance/compliance to the Bid Documents issued by PFCCL. The proposal is unconditional.
13. We confirm that we agree and seek no deviations from the 'Scope of Work', 'Deliverables with scheduled timeline', 'Terms of payment' and all other terms and conditions as contained in the 'Bid Document'. Further, we agree to execute entire scope of work and deliverables of the bid document.
14. We unconditionally agree to the terms and conditions of the Contract Agreement as per the format at Schedule-4 of the Volume-I of Bid Document and undertake to execute the same in case the work is awarded to us.
15. We understand that PFCCL will award the contract to the successful Consultant whose offer is substantially responsive and to be the lowest evaluated offer.
16. We confirm and certify that all the information/ details provided in our bid are true and correct.
17. We also declare that by taking this assignment we do not have any conflict of Interest with

any of our prior or current obligations to other organizations/clients and also do not have business or family relationship with member(s) of PFC's and/or PFCCL's employees or persons positioned in or on the Board of these two organization by whatever process and if found incorrect, we may be debarred from any further engagements by PFCCL forever.

18. We certify that all the information provided in our bid are true. We understand that any willful mis-statement in the bid may lead to disqualification /cancellation of award / termination of contract. We also understand that in such a case we may be debarred for future assignments with PFCCL for a period of maximum three years from the date of such disqualification.
19. Further, we undertake that in the event of our appointment as Consultant, given the nature of the work being entrusted, the contents/ essence of any reference/ documents given would not be disclosed to any third person without the express approval of PFCCL, failing which the engagement of the organization would be terminated.
20. We hereby confirm and declare that we are not blacklisted/ De-registered/ debarred/ termination of contract / by any Government department/ Public Sector Undertaking (Including PFC/PFCCL)/ Private Sector/ or any other agency for which we have Executed/ Undertaken the works/ Services during the last 5 years.

**Signature of Authorized Person  
Name, Designation & Company seal**

Date:

Place:

**Note:** Details not provided as per format would be considered as non-responsive and would not be considered for bid evaluation.

**AUTHORISATION LETTER**

**(On the Letter head of the Organization/Firm)**

I \_\_\_\_\_ certify that I am \_\_\_\_\_ of the Organization, organized under the laws of \_\_\_\_\_ and that \_\_\_\_\_ who signed the above Proposal is authorized to bind the organization by authority of its governing body.

**Signature:**

**Full Name:**

**Address:**

**(Company Seal)**

**SCHEDULE OF PRICE OFFER**

The Lump sum quoted price for Package **to be submitted online on GeM portal only**. The lump sum price quoted would be inclusive of taxes and duties including the applicable Goods and Services Tax, all travel, and stay, out of pocket expenses, cost of producing documents and deliverables etc. and PFCL will not pay and/or reimburse anything over and above the price quoted.

Consultants **should not quote Price Offer anywhere** apart from e-Procurement Portal <https://gem.gov.in/>. **If quoted Price Offer is found anywhere** apart from e-Procurement Portal <https://gem.gov.in/>, **that Bid would be out-rightly rejected.**

**CONTRACT AGREEMENT**

This CONTRACT (hereinafter, together with all Appendices attached hereto and forming an integral part hereof, called the "Contract") is made this \_\_\_\_day of the month of \_\_\_\_\_, between:

**PFC Consulting Limited** (a wholly owned subsidiary of Power Finance Corporation Limited, a Government of India Company) incorporated under the Indian Companies Act 1956, having its registered office at first Floor 'Urjanidhi' 1-Barakhamba Lane, Connaught Place New-Delhi-110001 hereinafter referred to as "Employer" (which expression shall unless repugnant to the context or the meaning thereof include its successors and permitted assigns)

AND

\_\_\_\_\_ Firm/Company incorporated under the Indian Companies Act, 1956, having its registered office at \_\_\_\_\_ hereinafter called the 'Consultant' or 'Contractor' (which expression shall unless repugnant to the context or the meaning thereof include its successors and permitted assigns)

WHEREAS the Employer is in the process of selection of a firm for **Consultancy Services for Survey & Preparation of Report for "Static/Dynamic compensation requirement in the Northern Region Grid" using LiDAR survey techniques.** (Hereinafter to be referred as Project)

AND WHEREAS the Employer is intending to hire an experienced and qualified Consultant who has undertaken similar projects and is capable of providing consultancy services in conjunction with other specialist consultants, and personnel for providing "Services" and advice in regard to the "Consultancy Service" for the Project.

AND WHEREAS the Consultant, have represented to the Employer that they have the requisite experience, professional skills, adequate manpower and technical resources and personnel, to render the Services required by the Employer in a timely and efficient manner.

AND WHEREAS based on above representations of the Consultant, the Employer has agreed to appoint the Consultant to render services on the terms and conditions hereafter contained:

NOW THEREFORE THIS AGREEMENT WITNESSES THAT, IN CONSIDERATION OF THE PREMISES AND THE MUTUAL COVENANTS HEREIN CONTAINED, IT IS AGREED BETWEEN THE PARTIES AS FOLLOWS:

## **1.0 GENERAL PROVISIONS**

### **1.1 Definitions**

Unless the context otherwise requires, the following terms whenever used in this Contract, Appendices, Schedules and Exhibits shall have the following meanings:

- (a) "Approvals" shall mean all consents, licenses and approval of any Local Bodies, Administration, Statutory Bodies, Boards, Authority, State or National Authority necessary to carry out the services for each and every phase of the Project.
- (b) "Contract" means this Contract together with all Appendices, Attachments, Exhibits and Schedules and including all modifications made in accordance with the provisions of Clause 12 hereof between the Employer and the Consultant.
- (c) "Consultant/Contractor" means \_\_\_Company/firm and also includes any other consultants/contractor or sub-consultants/ sub-contractor as may be appointed by the Consultant herein with the written approval of the Employer, for providing of the services to the Employer in execution of the Project.
- (d) "Confidential Information" means any material, proprietary, non-public information acquired, developed, disclosed or exchanged among the parties pursuant to this Agreement.
- (e) "Effective Date" means the date on which this Contract comes into force and effect pursuant to Clause 3.1 hereof;
- (f) "Personnel" means persons hired by the Consultant or by his Sub-consultant as employees, for the purposes of rendering services or any part thereof; Personnel includes:
  - (i) "Local Personnel" mean such persons who at the time of being so hired have their domicile in India and;
  - (ii) "Foreign Personnel" mean such persons who at the time of being so hired had their domicile outside India
- (g) "Parties" means the Employer or the Consultant, as the case maybe;
- (h) "Contract time" means the duration of time of the Contract as referred to Clause 3.
- (i) "No claim Certificate" means certificate issued by the Employer after the Contract has expired and the consultant has performed all his Services as per the terms and conditions envisaged in this Contract and all undisputed payments of remuneration and reimbursable expenditures payable by the Employer to the Consultant has been made.
- (j) "Project" means "Consultancy Services for Survey & Preparation of Project Report for **Static/Dynamic compensation requirement in the Northern Region Grid**" using

LiDAR Survey Technique.

- (k) "Services" means the works to be provided/performed by the Consultant and/or, the Sub-Consultants for completion of various tasks as described in Letter of Award hereto;
- (l) "Starting Date" means the date referred to in Clause 3.3 hereof;
- (m) "Sub Consultant/ sub- contractor" means any person/entity to whom the Consultant /Contractor subcontracts for any part of the Services in accordance with the provisions of Clause 5.5 hereinafter; and
- (n) "Third Party" means any person or entity other than the Employer, the Consultant or his Sub- consultant.

## **2.0 LOCATION FOR PERFORMANCE OF THE SERVICES:**

- (a) The Consultant shall render/perform services at **Delhi** and at the **Project site of "Static/Dynamic compensation requirement in the Northern Region Grid"**.
- (b) The Consultant also undertakes to perform/render services at other location or elsewhere as required for the execution of project or as specified by the Employer from time to time. The Employer shall not bear any extra expenses/cost if, any, incurred by the consultant for providing services at other location.

## **3.0 COMMENCEMENT, COMPLETION, AND TERMINATION OF CONTRACT**

### **3.1 Commencement of Contract**

This contract would come into force from the date ("effective date") on which the Employer and the Consultant have signed the present contract.

### **3.2 Termination of Contract for Failure to Become Effective**

If this Contract has not become effective within **7 days** from effective date the Employer has the right to declare the same to be null and void, and in the event of such a declaration the consultant would not have any claim against the Employer.

In case the contract is rendered null and void on account of failure/inaction on the part of the consultant, the consultant would be liable to pay damages to the Employer.

### **3.3 Commencement of Services**

The Consultants would begin carrying out the Services immediately viz. from the date of issue of Letter of Award (the "Starting Date"), or on such date as the Parties may agree in writing.

### **3.4 Expiration of Contract**

Unless terminated earlier pursuant to Clause 10 hereof, this Contract would expire after the consultant has performed all his Services as per the terms and conditions envisaged in this Contract and the Employer has issued a 'No claim Certificate' to the Consultant.

The Employer shall issue the 'No claim certificate' after being satisfied that the Consultant has performed/rendered all the services to the satisfaction of the Employer, as per the contract and all undisputed payments of remuneration and reimbursable expenditures payable by the Employer to the Consultant has been made.

### **4.0 CONTRACT PERFORMANCE GUARANTEE**

**4.1** The Consultant within **7 days** from the date of issue of Letter of Award would furnish a Contract Performance Guarantee in the form of Bank Guarantee or equivalent mode like Demand Draft from any Bank towards performance of the Contract. The guarantee amount would be equal to **Five (05) percent** of the contract price in accordance with the terms and conditions specified in the contract and in the Bid Documents. The guarantee should be kept valid upto **twelve (12) months** from issue of Letter of Award, which would require to extend till completion of the assignment.

**4.2** The Contract Performance Guarantee is intended to secure the performance of the entire contract and shall not be construed as limiting the damages stipulated in other clauses in the Bid Documents.

**4.3** The Performance Guarantee will be returned to the Contractor upon satisfactory completion of the assignment i.e. till the transfer of Package to Transmission Service Provider.

### **5.0 OBLIGATIONS OF THE CONSULTANTS**

#### **5.1 Standard of Performance**

The Consultant would perform the Services and carry out his obligations hereunder with all due diligence, efficiency and economy, in accordance with generally accepted techniques and practices used with professional engineering and consulting standards recognized by professional bodies, and would observe sound management, and technical and engineering practices, and employ appropriate advanced technology and safe and effective equipment, machinery, materials and methods in execution of project. The Consultant would always act, in respect of any matter relating to this Contract or to the Services, as faithful advisers to the Employer, and would at all times support and safeguard the Employer's legitimate interests in any dealings with Consultants/Sub- consultants or Third Parties.

#### **5.2 Compliance with Rules and Regulations**

The Consultant agrees that it would be responsible and liable to comply with and

also undertakes to ensure and be responsible for compliance by the Sub consultants, agents of the Consultants and Sub-consultants and Personnel, with all the rules and regulations of various concerned government authorities and departments for the services rendered under this agreement.

**5.3 Conflict of Interest**

Consulting organization or their Partners / any other Employee or Associate would not be hired for any work whose interests are that in conflict with their prior or current obligations to the other organizations, or that may place them in a position of being unable to carry out the work assigned to them at any point of time during the currency of engagement by PFCCL or above all enable them to pose a threat to PFCCL's consulting business in future. Without limitation on the generality of the foregoing, consulting organizations would not be hired, under the circumstances set forth below:

Consulting organizations that have business or family relationship with member(s) of PFC's and/or PFCCL's employees or persons positioned in or on the Board of these two organizations by whatever process would not be engaged. A declaration to this effect would be given by the organization when being engaged, and if found incorrect, the Consulting organizations would be debarred from any further engagement by PFCCL ever.

**5.4 Benefit from Commissions, Discounts etc.**

Payment to the Consultant would constitute the Consultant's only payment in connection with this Contract or the Services, and the Consultant would not accept for their own benefit any trade commission, discount, or similar payment in connection with activities pursuant to this Contract or to the Services or in the discharge of their obligations under the Contract, and the Consultant would use their best efforts to ensure that the Personnel, any Sub-Consultants, and agents of either of them similarly would not receive any such additional benefits.

**5.5 Consultants and Affiliates not to be otherwise interested in Project**

The Consultant agrees that, during the term of this Contract, the Consultant, Sub Consultant, Personnel and/or any entity affiliated with the Consultant or Sub-Consultant would not provide services resulting from or directly related to the Consultant's Services for the preparation or implementation of the project to any third party. In the event of breach of the aforesaid condition the Employer would be entitled to disqualify such Consultant or the Sub Consultant or any of their Personnel from providing services to the Employer and further claim damages for breach.

**5.6 Prohibition of Conflicting Activities**

The Consultant would not engage and would cause their Personnel as well as their Sub-Consultants and their Personnel not to engage, either directly or indirectly, in any business or professional activities which would conflict with the activities assigned to them under this Contract.

**5.7 Insurance to be taken out by the Consultant**

The Consultant would take out and maintain, and would cause its Sub-Consultants to take out and maintain, at their own cost, insurance against risks etc.

#### **5.8 Liability of the Consultants**

The Consultant and each of his Members (consultant personnel, sub-consultant, sub-consultant personnel) would be jointly and severally liable to the Employer for the performance of the Services under this Contract and further for any loss suffered by the Employer as a result of a default of the Consultant or his members in such performance, subject to the following limitations:

- (a) The Consultant would not be liable for any damage or injury caused by or arising out of the act, neglect, default or omission of any persons other than the Consultants, its Sub-consultants or the Personnel of either of them; and
- (b) The Consultant would not be liable for any loss or damage caused by or arising out of circumstances of Force Majeure.

#### **5.9 Consultant Action Requiring Employer's Prior Approval**

The Consultant would obtain the Employer's prior approval in writing before taking any of the following actions:

- (a) appointing personnel to carry out any part of the Services, including the terms and conditions of such appointment;
- (b) entering into a subcontract with the Sub consultant for the performance of any part of the Services, it being understood:
  - (i) That the selection of the Sub-consultant and the terms and conditions of the subcontract would have been approved in writing by the Employer prior to the execution of the subcontract, and
  - (ii) That the Consultants would remain fully liable for the performance of the Services by the Sub-consultant and its Personnel pursuant to this Contract;

#### **5.10 Reporting Obligations**

The Consultant would submit to the Employer the reports and documents specified in **Letter of Award** hereto, in the form, in the numbers and within the time periods set forth in the said **Letter of Award**, including any supporting data required by the Employer.

#### **5.11 Documents Prepared by the Consultants to Be the Property of the Employer**

All plans, drawings, specifications, designs, reports and other documents prepared by the Consultants in performing the Services would become and remain the property of the Employer, and the Consultant would, not later than upon termination or expiration of this Contract, deliver all such documents to the Employer, together with a detailed inventory thereof.

## **6.0 CONSULTANT'S PERSONNEL**

### **6.1 General**

The Consultants would employ and provide such qualified and experienced Personnel as are required to carry out the Services.

### **6.2 Description of Personnel**

- (a)** The titles, job descriptions, minimum qualifications and estimated period of engagement in the carrying out of the Services of each of the Consultants' Personnel are described in **Letter of Award**.
- (b)** If required to comply with the provisions of **Clause 5.4** of this Contract, adjustments with respect to the estimated periods of engagement of Personnel set forth in may be made by the Consultant by written notice to the Employer, provided:
  - (i) that such adjustments would not alter the originally estimated period of engagement of any individual by more than 10% or one week, whichever is larger.
  - (ii) that the aggregate of such adjustments would not cause payments under this Contract to exceed the ceilings set forth in **Clause 8** of this Contract. Any other such adjustments would only be made with the Employer's written approval.
- (c)** If additional work is required beyond the scope of the Services specified in **Letter of Award**, the estimated periods of engagement of Personnel set forth in **Letter of Award** may be increased by agreement in writing between the Employer and the Consultants, provided that any such increase would not, except as otherwise agreed, cause payments under this Contract to exceed the ceilings set forth in **Clause 8** of this Contract.

### **6.3 Removals and/or Replacement of Personnel**

- a) Except as the Employer may otherwise agree, no changes would be made in the Personnel. If, for any reason beyond the reasonable control of the Consultants, it becomes necessary to replace any of the Personnel, the Consultants would forthwith provide as a replacement a person of equivalent or better qualifications.
- b) If the Employer:
  - i) finds that any of the Personnel has committed serious misconduct or has been charged with having committed a criminal action, or
  - ii) has reasonable cause to be dissatisfied with the performance of any of the Personnel, then the Consultants would, at the Employer's written request specifying the grounds therefore, forthwith provide as a replacement a person

with qualifications and experience acceptable to the Employer.

- c) The new personnel provided as a replacement would be governed by the same the terms and conditions of employment as the replaced personnel.
- d) The Consultants would bear all additional travel and other costs arising out of or incidental to any removal and/or replacement.

#### **7.0 OBLIGATIONS OF THE Employer**

In consideration of the Services performed by the Consultants under this Contract, the Employer shall make to the Consultants such payments and in such manner as is provided by Clause 8 of this Contract.

#### **8.0 PAYMENTS TO THE CONSULTANTS**

**8.1** The Lump-sum cost of services payable in Indian Rupees is set forth in Terms of Payment of Bid Document.

#### **8.2 Mode of Payment**

Payments will be made by the Employer to the consultant in accordance with the terms of payment as per Letter of Award. Any deviation in the payment terms is not permitted.

**8.3** The Consultant would submit the bills in **duplicate** to the Employer on printed bill forms indicating the work done by him during the period for which payment is sought.

**8.4** The Employer shall cause the payment of the Consultant as per the above given schedule of payment within **sixty (60) days** of the receipt of the bills raised along with supporting documents. However, it is agreed between the parties that the Employer may restrict/withhold the payment and/or levy liquidated damages, if the performance or progress of the services rendered by the Consultant or his members (sub consultants) is not satisfactory and not in accordance with the work program/schedule.

**8.5** The final payment under this Clause would be made only after satisfactory completion of the activities mentioned in the **Terms of Reference (as per Letter of Award)** and after the issuance of No Claim Certificate.

**8.6** All payments under this Contract would be made to the account of the Consultants with: Account No. \_\_\_\_\_ Bank Name \_\_\_\_\_

#### **9.0 SUSPENSION**

The Employer may, by written notice of suspension to the Consultants, suspend all payments to the Consultant and invoke Performance Bank Guarantee hereunder: \_\_\_\_\_

- a) if the Consultant fails to perform any of its obligations under this Contract, including carrying out of the Services, provided, that such notice of suspension (i) would specify the nature of the failure, and (ii) would request the Consultants to remedy such failure within a period not exceeding **seven (7) days** after receipt by the Consultant of such notice of suspension

**or**

- b) if at any stage it is found that the Consultant has provided any wrong information/ false information/ mis-represented the fact.

## **10.0 TERMINATION**

### **10.1 By the Employer**

- (a) The Employer may terminate this contract, by issuing a written notice not less than **fifteen (15) days**, from the date of occurrence of any of the events as specified in sub clause (a) to (e) of this Clause.
- (b) The Employer may terminate this contract, by issuing a written notice not less than **Fifteen (15) days**, from the date of occurrence of the event as specified in sub clause (f) of this Clause.
- (c) if the Consultants fail to remedy a failure in the performance of their obligations hereunder, as specified in a notice of suspension pursuant to Clause 9 hereinabove, within **seven (7) days** of receipt of such notice of suspension or within such further period as the Employer may have subsequently approved in writing;
- (d) if the Consultant fail to comply with any final decision reached as a result of arbitration proceedings pursuant to **Clause 19** hereof;
- (e) if the Consultant submit to the Employer a statement which has a material effect on the rights, obligations or interests of the Employer and which the Consultants know to be false;
- (f) if, as the result of Force Majeure, the Consultants are unable to perform a material portion of the Services for a period of not less than **fifteen (15) days**; or
- (g) if Consultant become Bankrupt and the company has been wound up through liquidation proceedings.
- (h) if the Employer, in its sole discretion and for any reason whatsoever, decides to terminate this Contract.

## **10.2 Cessation of Rights and Obligations**

Upon termination of this Contract pursuant to Clauses 10 hereof, or upon expiration of this Contract pursuant to Clause 3 hereof, all rights and obligations of the Parties hereunder shall cease, except

- (a) such rights and obligations as may have accrued on the date of termination or expiration,
- (b) the obligation of confidentiality set forth in Clause 16 hereof,
- (c) any right which a Party may have under the Applicable Law.

## **10.3 Cessation of Services**

Upon termination of this Contract by notice to pursuant to Clauses 10 hereof, the Consultant would, immediately upon dispatch or receipt of such notice, take all necessary steps to bring the Services to a close in a prompt and orderly manner and would make every reasonable effort to keep expenditures for this purpose to a minimum.

## **10.4 Payment upon Termination**

Upon termination of this Contract pursuant to **Clause-10** hereof, the Employer shall make the following payments to the Consultant:

- (a) remuneration pursuant to **Clause 8** hereof for Services satisfactorily performed prior to the effective date of termination;
- (b) reimbursable expenditures pursuant to Clause 8 hereof for expenditures actually incurred prior to the effective date of termination; and
- (c) except in the case of termination pursuant to paragraphs (a) to (b) of **Clause 10.1** hereof, reimbursement of cost duly supported by the documentary evidence incident to the prompt and orderly termination of the Contract.
- (d) If due to any reason or decision of the Client/ Govt./ the Regulator, the Assignment is dropped and the Consultant is directed to discontinue work, the "Drop Dead Fee" would be limited to the payments received by the Consultant and the claims already raised, as per the payment terms relating to the Assignment, till the point of calling off the Assignment or as mutually agreed.

## **11.0 FORCE MAJEURE**

### **11.1 Definition**

- (a) For the purposes of this Contract, "Force Majeure" means an event or circumstance or combination of events and circumstances, the occurrence of which is beyond the

reasonable control of either party and which materially affects the performance by either Party of its obligations under this agreement, provided such material and adverse effect could not have been prevented, overcome or remedied in whole or in part by the affected party and includes, but is not limited to, war, riots, civil disorder, earthquake, fire, explosion, storm, flood or other adverse weather conditions, strikes, lockouts or other industrial action (except where such strikes, lockouts or other industrial action are within the power of the Party invoking Force Majeure to prevent), confiscation or any other action by government agencies.

**(b)** It is however agreed that “Force Majeure” shall not mean or include:

- (1) any event caused by the negligence or intentional action of a Party or such Party’s Sub-consultants or agents or employees, nor
- (2) any event which a diligent Party could reasonably have been expected to take into account at the time of the execution of this Agreement , and avoid or overcome in the carrying out of its obligations hereunder.

**(c)** The Consultant would not be paid /reimbursed any further price or cost or any additional cost in re-activating the services after the end of Force Majeure event.

#### **11.2 No Breach of Contract**

Neither party shall be responsible or be liable for, or deemed to be in breach hereof because of any failure or delay in complying with its obligations under or pursuant to this Agreement due to one or more events of Force Majeure or its effects or any combination thereof, provided that the Party affected by such an event has taken all reasonable precautions, due care and reasonable alternative measures, all with the objective of carrying out the terms and conditions of this Contract. However it is agreed that in no event shall Force Majeure shall exclude any Party’s obligation to pay monies under this Agreement.

#### **11.3 Measures to be taken**

- (a)** A Party affected by an event of Force Majeure or any combination of events shall take all reasonable measures to remove such Party’s inability to fulfill its obligations hereunder with a minimum of delay.
- (b)** A Party affected by an event or any combination of events of Force Majeure shall notify the other Party of such event as soon as possible, and in any event not later than fourteen (14) days following the occurrence of such event, providing evidence of the nature and cause of such event, and shall similarly give notice of the restoration of normal conditions as soon as possible.
- (c)** The Parties shall take all reasonable measures to minimise the consequences of any event of Force Majeure.

#### **11.4 Extension of Time**

Any period within which a Party shall, pursuant to this Contract, complete any action or task, shall be extended for a period equal to the time during which such Party was unable to perform such action as a result of Force Majeure.

#### **11.5 Consultation**

Not later than thirty (30) days after the Consultant, as the result of an event of Force Majeure, have become unable to perform a material portion of the Services, the Parties shall consult with each other with a view to agreeing on appropriate measures to be taken in the circumstances.

#### **12.0 AMENDMENT/MODIFICATION**

This Agreement may not be altered, modified, revoked or cancelled in any way unless such alteration, modification or cancellation is in writing and duly signed by or on behalf of the parties which shall not be effective until the consent of the parties has been obtained. However, it is agreed between the parties that each Party shall give due consideration to any proposals for modification made by the other Party.

#### **13.0 AMICABLE SETTLEMENT**

The Parties shall use their best efforts to settle amicably all disputes arising out of or in connection with this Contract or the interpretation thereof. Any dispute between the parties as to matters arising pursuant to this Contract which cannot be settled amicably shall be resolved as per the Indian Arbitration Act, 1996 as amended from time to time.

#### **14.0 FAIRNESS AND GOOD FAITH**

##### **14.1 Good Faith**

The Parties hereunder undertake to act in good faith with respect to their performance, obligations and rights under this Agreement and further undertake, during the tenure of this Agreement, to take all reasonable measures, to ensure the achievement/realization of the objectives of this Agreement.

##### **14.2 Operation of the Contract**

The Parties recognize that it is impractical in this Contract to provide for every contingency which may arise during the life of the Contract, and the Parties hereby agree that it is their intention that this Contract shall operate fairly as between them, and without detriment to the interest of either of them, and that, if during the term of this Contract either Party believes that this Contract is operating unfairly, the Parties will use their best efforts to agree on such action as may be necessary to remove the cause or causes of such unfairness, but on failure to agree on any action

pursuant to this clause shall give rise to a dispute subject to arbitration in accordance with clause 18 hereof.

#### **15.0 TAXES AND DUTIES/ CHANGE IN LAW**

It is hereby agreed between the parties that the Consultant and its personnel would pay the taxes, duties, fees, levies and other impositions levied under the existing, amended or enacted laws during life of this contract and the Employer would deduct the taxes, duties and levy whatsoever as may be lawfully imposed.

#### **16.0 CONFIDENTIALITY**

The Consultant, their Sub-consultants and the Personnel of either of them would not, either during the term or within two (2) years after the expiration of this Contract, disclose any proprietary or Confidential Information relating to the Project, Services, under this Contract or any information pertaining to the Employer's business or operations without the prior written consent of the Employer.

#### **17.0 LAW GOVERNING CONTRACT**

This Agreement, its meaning and interpretation, and the relation between the Parties shall be governed by Indian Laws or any statutory modifications thereof, and shall be subject to the exclusive jurisdiction of the Courts of **Delhi** in any matter arising under this Agreement and or in matters pertaining to the conduct of arbitration, enforcement of the award or obtaining of interim relief(s) etc.

#### **18.0 SETTLEMENTS OF DISPUTES/ARBITRATION**

**18.1** The parties shall endeavor to resolve amicably, in the first instance, all disputes, controversies or differences which may arise between the Parties, out of or in relation to or in connection with this Agreement, or for breach thereof.

**18.2** In the event, the parties are unable to resolve such dispute/difference amicably within **ninety (90)** days after the same has arisen then the dispute shall be referred to arbitration in accordance with the Rules of Arbitration of the Indian Council of Arbitration and such arbitration shall be conducted in accordance with the rules of ICA. The place of arbitration shall be New Delhi or any other place mutually agreeable by the parties and the language of arbitration shall be English

The Arbitration shall be conducted by panel of 3 Arbitrators, one to be appointed by each party and third Arbitrator to be appointed by two Arbitrators as the Chairman of the Tribunal.

The Parties agree that the arbitrator's decision shall be final and conclusive. The costs of arbitration (including without limitation, those incurred in the appointment of the arbitrators) shall be borne equally by the Parties hereto; however each Party shall pay its respective legal charges. The Award shall be final and binding and non-appeal

able. Judgment on the award may be entered and enforced in any court of competent jurisdiction. By execution and delivery of this Agreement, each Party agrees and consents to the jurisdiction of the aforesaid arbitration panel and solely for the purpose of enforcement of an arbitral award, as referred to hereinabove, in any court of competent jurisdiction for itself and in respect of its property and waives in respect of both itself and its property, any defense it may have to or based on sovereign immunity, jurisdiction, improper venue or inconvenient forum.

## **19.0 GENERAL PROVISIONS**

### **19.1 Language**

This Contract has been executed in the English language, which shall be the binding and controlling language for all matters relating to the meaning or interpretation of this Contract.

### **19.2 Headings**

The headings shall not limit, alter or affect the meaning of this Contract.

### **19.3 Notices**

Any notice, request or consent required or permitted to be given or made pursuant to this Contract shall be in writing. Any such notice, request or consent shall be deemed to have been given or made when delivered in person to an authorized representative of the Party to whom the communication is addressed, or when sent by registered mail to such Party at the following address:

1. For the Employer: **PFC Consulting Limited** (A subsidiary of Power Finance Corp. Ltd.),  
9<sup>th</sup> Floor, A-Wing, Statesman House, Connaught Place, New Delhi - 110001

Attention: Mr. \_\_\_\_\_

Email: \_\_\_\_\_

2. For Consultants:

Attention:

Email: \_\_\_\_\_

### **19.4 Notice will be deemed to be effective as follows:**

- (a) in the case of personal delivery or registered mail, on delivery;
- (b) in the case of facsimiles, forty eight (48) hours following confirmed transmission.

### **19.5 A Party may change its address for notice hereunder by giving the other Party notice of such change pursuant to this Clause.**

**19.6 Authority of Consultant in Charge**

The Consultant hereby authorize: Mr./ Ms. \_\_\_\_\_ to act on their behalf in exercising all the Consultants' rights and obligations towards the Employer under this Contract, including without limitation the receiving of instructions and payments from the Employer.

**19.7 Authorised Representatives**

Any action required or permitted to be taken, and any document required or permitted to be executed under this Contract, may be taken or executed:

(a) on behalf of the Employer by \_\_\_\_\_ or his designated representative;

(b) on behalf of the Consultant by \_\_\_\_\_ or his designated representative;

**19.8 WAIVER OF RIGHT**

The failure of either party to enforce at any time or for any period of time, the provisions hereof shall not be construed to be waiver of any provision or of any right and shall not preclude such party from subsequently enforcing such provisions or right.

**19.9 SEVEREABILITY CLAUSE**

If any provision of this Agreement shall be determined to be void or unenforceable, such provision shall be amended or deleted in so far as is reasonably consistent with the provisions of this Agreement and to the extent necessary to conform to applicable law and the remaining provision of this Agreement shall remain valid and enforceable in accordance with their terms.

**19.10** This Agreement may be executed in any number of counterparts which together shall constitute a single agreement.

IN WITNESS WHEREOF, the Parties hereto have caused this Contract to be signed in their respective names as of the day.....Month..... and year..... first above written.

**FOR AND ON BEHALF OF [EMPLOYER]**

By: Authorized Representative

**FOR AND ON BEHALF OF [CONSULTANTS]**

By: Authorized Representative

**PFC CONSULTING LIMITED**  
**(A wholly owned subsidiary of Power Finance**  
**Corporation Ltd. -A Government of India**  
**Undertaking)**



**VOLUME – II CONDITIONS OF CONTRACT**

**Survey & Preparation of Report for “*Static/Dynamic compensation requirement in the Northern Region Grid*”- using LiDAR Survey Techniques**

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## **1.0. DEFINITION OF TERMS**

- 1.1 Unless defined otherwise, the following terms used in this document shall have the meanings.
- 1.2 “Employer” or “PFCCL” or Client” shall mean PFC Consulting Limited, New Delhi, India (a wholly owned subsidiary of Power Finance Corporation Ltd.) and shall include their legal representatives, successors and permitted assigns.
- 1.3 “Project In-charge” shall mean the officer appointed in writing by the Employer to act as “Coordinator” from time to time on behalf of Employer in all matters pertaining to this Contract.
- 1.4 “Specification” shall mean the Technical Specifications and the Conditions of Contract together with Bid Proposal Sheet forming a part of the bid documents and contract and such other schedules and drawings as may be mutually agreed upon.
- 1.5 “Notice of Award of Contract” / Letter of Award” shall mean the official intimation from the Employer notifying the successful bidder that its proposal has been accepted and that the bidder is required to sign the Contract Agreement.
- 1.6 “Date of Contract” shall mean the date on which both the parties have signed the Contract Agreement or any other date mentioned in the Contract/Letter of Award, as the effective date of Contract, whichever is earlier.
- 1.7 A “week” shall mean a continuous period of seven (07) days.
- 1.8 “Indian Rupees” or “Rs.” shall mean the mean the currency of the Government of India.
- 1.9 The “Government” shall mean the “Government of India” or an authorized representative/agency/department of the “Government of India”.
- 1.10 The words imparting singular shall also include the plural and vice-versa where the context so requires.
- 1.11 “Final Report” or “Report” will mean the final report or document prepared by the successful Bidder as per Employer’s Specification.
- 1.12 “Starting Date” shall mean the date from which the periods specified for various activities are measured and asset forth in the completion schedules. The starting date for each schedule, unless otherwise agreed, shall be as indicated in the respective schedule.
- 1.13 “Month” shall mean calendar month.
- 1.14 “Day or “Days” unless herein otherwise expressly defined shall mean calendar day or day of 24 hours each.

- 1.15 The title or heading shall not alter or affect the intent or scope of the clause or articles of the Documents.
- 1.16 The Date of Completion of Contract, unless otherwise terminated under the provisions of any other relevant clause of the document, Contract shall be deemed to have been completed after issuance of the certification from Project In-charge that there is no demand outstanding against the Consultant and all liabilities under the contract have been satisfactorily fulfilled by the Consultant.
- 1.17 The Completion Certification of Work under the scope shall be provided to the Consultant by Employer as hereinafter defined, on or before six (06) months after successful completion of the Consultancy assignment and submission of all documents, reports etc. to the Employer and acceptance of the reports by the concerned statutory Authorities, Government of India and upon certification by the Project In-charge.
- 1.18 Words imparting "Person" shall include firms, companies, corporations and association or bodies of individuals, whether incorporated or not.
- 1.19 "Consultant" or "Contractor" shall mean the bidder whose bid has been accepted by the Employer for the award of the work and shall include his legal representatives, successors and permitted assigns.
- 1.20 "Consultancy Assignment" or "Work" or "Study" or "Assessment" or "Services" shall mean the complete study as prescribed in the Specification / Terms of Reference.
- 1.21 "Contract" shall mean the Contract Agreement entered into between the Employer and the Consultant, together with the Contract documents referred to therein; they shall constitute the Contract and the term "Contract" shall in all such documents be construed accordingly.

## **2.0 VALIDITY**

The proposal shall be on firm price basis and valid for acceptance for at least 120 days from the date of submission of bid.

## **3.0 CURRENCY OF BID**

All prices quoted in the Schedules of the Bid Proposal Sheets should be in Indian Rupees and all payments shall be made in Indian Rupees.

## **4.0 THE BID DOCUMENTS**

- 4.1 This document is meant for exclusive purpose of submitting the offer by the bidder against the specification and shall not be transferred, reproduced or otherwise used for purposes other than for which it is specifically issued.
- 4.2 PFCCCL does not bind themselves to accept the lowest or any offer or to give reasons for their decision. PFCCCL reserves the right to reject any or all offers without assigning any reason.

## **5.0 CONTRACT PERFORMANCE GUARANTEE**

The successful bidder, within **Seven (7) days** of from the date of Letter of Award, will be required to arrange submission of CPG in the form of a Bank Guarantee (BG) or equivalent mode like Demand Draft of amount of **Five (05) Percent** of the contract consideration. The CPG/BG should be as per Performa provided by the Employer and should be kept valid up to **Twelve (12) months from the date of Letter of Award**, which would require to extend till completion of the assignment.

The Contract Performance Guarantee is intended to secure the performance of the entire contract and shall not be construed as limiting the damages stipulated in other clauses in the Bid Documents.

The Performance Guarantee will be returned to the Contractor without any interest at the end of the Guarantee Period.

## **6.0 UNDERSTANDING AND CLARIFICATIONS ON DOCUMENTS AND SPECIFICATIONS**

The bidder is required to carefully examine the specifications and documents and fully inform himself as to all the conditions and matters which may in any way affect the works or the cost thereof. If any bidder finds discrepancies or omissions in the specifications and documents or is in doubt as to the true meaning of any part, he shall seek clarification from Employer at once but in no case later than **Two (02) days** prior to the deadline for submission of bids prescribed by the Employer. After receipt of such interpretations and clarifications, the bidder may submit his offer but within the time and date as specified. All such interpretations and clarifications shall form an integral part of the specifications and documents and accompany the consultant's proposal.

Verbal clarifications and information given by the Employer or its employee (s) or its representatives(s) shall not in way be binding on the Employer.

## **7.0 DISCREPANCIES AND ADJUSTMENT OF ERRORS**

- 7.1** The Bid documents are mutually explanatory of one another. If there are varying or conflicting provisions made in any one of the bid documents, Employer shall be deciding authority with regard to the intention of the document.
- 7.2** Any errors in description, quantity or rate in Schedules or any omission there from shall not vitiate the Contract or release the Consultant from the execution of the whole or any part of the works comprised there in according to drawings and specifications or from any of his obligations under the contract.
- 7.3** If on checking any difference is found between the rates given by the consultant in words and figures or in the total amount worked out by him in the Schedules in the proposal, the same shall be rectified in accordance with the following rules:

- i) In the event of discrepancy between description in words and figures quoted by bidder, the description in words shall prevail.
- ii) In the event of an error occurring as a result of wrong extension of the unit rate and quantity, the unit rate shall be regarded, as firm and extension shall be amended on the basis of the rate.
- iii) All errors in totaling in the amount column and in carrying forward totals shall be corrected.

**7.4** The bidder should ensure that the prices furnished in various price schedules are consistent with each other. In case of any inconsistency in the prices furnished in the specified price schedules (to be identified in Bid Proposal sheets (BPS) for this purpose), the Employer shall be entitled to consider the highest price for the purpose of evaluation and to award the contract at the lowest of the price in these schedules.

**7.5** Prior to detailed evaluation, the Employer will determine whether each bid is for acceptable quality, is generally complete and is substantially responsive to the bidding documents. For purposes of this determination, a substantially responsive bid is one that conforms to all the terms, conditions and specifications of the bidding documents without material deviation, objection, conditionality or reservation is one

- i) that affects in any substantial way the scope, quality or performance of the contract;
- ii) that limits in any substantial way, inconsistent with the bidding documents, the Employer's rights or the successful bidder's obligations under the contract; or
- iii) whose rectification would unfairly affect the competitive position of other bidders who are presenting substantially responsive bids.

The Employer's decision in respect of the determination of the responsiveness of a bid will be final and binding on all the bidders.

**7.6** A bid determined as not substantially responsive will be rejected by the Employer and may not subsequently be made responsive by the bidder correction of the non-conformity.

**7.7** The Employer may waive any minor informality or non-conformity or irregularity in a bid which does not constitute a material deviation, provided such waiver does not prejudice or affect the relative ranking of any bidder.

## **8.0 SIGNATURE OF BIDS/OFFERS**

**8.1** The offer must contain the name, residence and place of business of the person or persons making the offer and must be duly signed and stamped on each page by the bidder with his usual signature.

- 8.2** Offer by a partnership firm must be furnished with full names of all partners and be signed with the partnership name, followed by the signature(s) and designations(s) of the authorized partner(s) or other authorized representative(s).
- 8.3** Offers by Corporation/ Company must be signed with the legal name of the Corporation/Company by the President, Managing Director or by the Secretary or other person or persons authorized to furnish offer on behalf of such Corporation, Company in the matter.
- 8.4** An offer by a person who affixes to his signature the word 'President', 'Managing Director', 'Secretary' or other designation without disclosing his principal will be rejected.
- 8.5** The Bidder's name stated on the proposal shall be the exact legal name of the firm.
- 8.6** Erasures or other changes in the offer shall be over the initials of the person signing the bid.
- 8.7** Offers not conforming to the above requirements of signing may be disqualified.
- 9.0 PROGRESSIVE PAYMENT**  
All payments against the services shall be paid against production of invoice in quadruplicate by the Consultant. The payment of such fees shall be released as per clause No. 10.0 (Terms of Payment) of the Bid Invitation Letter on stage-wise completion of the services including submission of the Deliverables and subject to acceptance, approval and certification by the Project In-charge.
- 9.1 PROCEDURE OF PAYMENT**  
All the invoices of payment shall be supported by necessary documents and submitted in triplicate for the certification of Project In-charge which will require a maximum time of Seven (07) days before the same are submitted for processing the payment within Thirty (30) days of certification of the Project In-charge of the amount payable for the services. In the event, there is any query in respect of any item of such invoice requiring clarification, the Project In-charge shall notify the same within Fifteen (15) days of receipt of such invoice by the Employer that such a query has arisen and both the parties shall endeavor to reach an agreement within a period of Thirty (30) days thereafter. If no mutual agreement can be reached within a period of Forty Five (45) days after receipt of the invoices by the Project In-charge, the Employer shall make payment against the balance of invoice (original amount less the amount in question) to the Consultant within Thirty (30) days thereafter i.e. within Sixty (60) days from the date of receipt of invoice by the Project In-charge. The invoice for the balance amount under question shall be separately submitted for future consideration of the Employer.
- 10.0 LIABILITY OF THE CONSULTANT**  
Should any defect or inadequacy appear in the study carried out and report submitted by the contractor prior to the date of final acceptance of the work by the Employer, the

contractor shall perform at its own initiative and free of any cost to Employer, all such services as shall be necessary to remedy the said defect or inadequacy.

The contractor shall be further liable for the consequence of errors and omissions arising from the gross negligence on its part or on the part of its employees or associates or experts to the extent of the total contract value of this contract.

#### **11.0 TAXES, DUTIES AND INSURANCE**

All taxes (including professional tax, etc. as applicable but including Goods and Services Tax), duties, levies, insurance charges, license fees, etc. arising out of the contract shall be payable directly by Consultant and shall be included in the lump sum bid price for the entire scope of work. Employer will not bear any expenditure, whatsoever on this account. As regards income tax, surcharge on income tax and other corporate taxes, the Consultant shall be responsible for such payments to the concerned authorities. However, the Employer is entitled to deduct TDS as per the Government Policies/Tax Rules and Regulations.

The Contractor shall be liable to take/maintain all necessary insurance at its own cost.

#### **12.0 PATENT**

**12.1** The Contractor shall hold harmless and indemnify the client from and against loss, damage and expenses arising from any claim for infringement of patent, copy right, design and other such rights in existence or to be granted on an application published prior to the completion of this Consultancy with respect to or arising out of the sue or supply of design, or any work in accordance with the designs, drawings or specifications furnished, approved or recommended by the consultant.

**12.2** The Contractor shall promptly notify the Client in writing if the Consultant has or has acquired knowledge of any patent under which a claim or suit for infringement could reasonably be brought because of the use by the Client of any information, recommendation or specifications, services rendered by the Consultant.

**12.3** The Contractor , in such case, shall forthwith at its own cost make and furnish to the client alternative designs, drawings, specifications or recommendations to avoid the same and without putting the Client to additional cost.

#### **13.0 SETTLEMENT OF DISPUTE**

**13.1** Except as otherwise specifically provided in the Contract all disputes concerning questions of fact arising under the Contract shall be decided by the Project In-charge subject to a written appeal by the Consultant to the Project In-charge, whose decision shall be final to the parties hereto.

**13.2** Any disputes or difference including those considered as such by only one of the parties arising out of or in connection with the Contract shall be to the extent possible settled amicably between the parties.

**13.3** If amicable settlement cannot be reached then all disputed issues shall be settled by arbitration as provided in **ARBITRATION** clause.

#### **14.0 ARBITRATION**

**14.1** In the event of any question, dispute or difference arising out of or in connection with this consultancy work, whether during the progress of the work or after its completion, abandonment or breach of contract, the same shall be referred for arbitration, for which purpose the Client and the Consultant shall nominate one Arbitrator each. These Arbitrators shall appoint an Arbitrator not later than one month from the latest date of their respective appointment. The arbitration shall be conducted in accordance with the provisions of Indian Arbitration and Conciliation (Amendment) Act 2021, the rules framed hereunder and any statutory modifications thereof. The costs of reference and arbitration award shall be payable by the parties to the extent and in a manner as may be determined by the Arbitrators or the Umpire.

In case the Consultant is an Indian Public Sector Enterprise/ Govt. Dept. (but not a State Govt. Undertaking or Joint Sector Undertaking which is not a subsidiary of Central Govt. Undertaking), the dispute arising between the Employer and the Consultant shall be referred for resolution to Administrative Mechanism for Resolution of CPSEs Disputes (AMRCD) a Permanent Arbitration Machinery (PAM) of the Department of Public Enterprises, Govt. of India.

**14.2** Notwithstanding the existence of any dispute or difference and/or reference for the arbitration, the Consultant shall proceed with and continue without hindrance with the performance of the work under the contract with due diligence and expedition in a professional manner and the payment due to the Consultant shall not be withheld by the Client on account of such difference or arbitration proceedings unless such payment is subject matter of the arbitration.

**14.3** The arbitrators may from time to time with consent of the parties enlarge the time, for making and publishing the award. The venue of arbitration shall be the registered office of the Employer.

#### **15.0 Termination on Default:**

**15.1** The Employer may without prejudice to any other remedy for breach of contract, by written notice of default sent to the Consultant, terminate the Contract in whole or in part.

- i) If the Consultant fails to deliver any or all of the services within time period(s) specified in the contract or any extension thereof granted by the Employer in writing.
- ii) If the Consultant fails to perform any other obligation(s) under the contract or
- iii) If the Consultant, in either of the above circumstances, does not cure its failure within a period of Fifteen (15) days after receipt of the default notice from the Employer.

**15.2** In the event the Employer terminates in whole or in part, pursuant to Para 16.1.0, the Employer may get the services done, upon such terms and in such manner as it deems appropriate, similar to those not rendered, and the Consultant shall be liable to the Employer for any excess costs for such similar services. However, the Consultant shall continue performance of the Contract to the extent not terminated.

#### **16.0 TERMINATION FOR CONVENIENCE**

**16.1** The Employer, may by written notice sent to the Consultant, terminate the contact, in whole or in part, at any time for its convenience, The notice of termination shall specify that termination is for Employer's convenience, the extent to which performance of work under the contract is terminated and the date upon which such termination become effective.

**16.2** The studies/services that are completed and ready for final reporting within Thirty (30) days after the Consultant's receipt of notice of termination shall be accepted by the Employer at contract terms and prices. For the remaining services, the Employer may elect,

- i) To have any portion completed and delivered at the contract terms and prices and/or.
- ii) To cancel the remainder and pay to the Consultant an agreed amount for partially completed services.

#### **17.0 TERMINATION FOR INSOLVENCY**

**17.1** The Employer may at any time terminate the Contract by giving written notice to the Consultant, without compensation to the Consultant, if the Consultant becomes bankrupt or otherwise insolvent, provided that such termination will not prejudice or affect any right of action or remedy which has accrued or will accrue thereafter to the Employer.

**17.2** Upon termination of the contract at any time for whatever reason by the Employer compensation shall be payable to the Consultant for all services performed satisfactorily until the date of termination. In addition the Consultant will be paid for such of those items of work, which have been partially completed as per conditions stipulated under relevant clause. The Consultant shall provide available documentary evidences to this effect, acceptable to the Employer.

**17.3** Following issuance by the Employer of a notice of termination and prior to the effective date of such termination, the Consultant shall:

- i) Terminate performance of work in progress under the contract on the date and to the extent specified in the notice of termination.
- ii) Incur no further costs for services except as necessary to complete performance of any portion of the work under the contract not terminated by the said notice.
- iii) Terminate all outstanding orders, service contracts and sub-contracts to the extent that they relate to the performance of work terminated by the notice;

- iv) Transfer title and deliver to the Employer in the manner, at the times and to the extent, if any, as directed by the Employer, all completed or partially completed reports, designs, data, maps, plans, photographs, video, specifications, and commutations, etc. which, if the contract had been continued, would have been required to be furnished to the Employer.

The termination of the contract shall not relieve the Consultant of its duties and liabilities as per the contract for the portion of the services performed prior to the effective date of termination.

#### **18.0 SIGNING OF AGREEMENT**

The Authorized Signatory of the Consultant shall be required to sign the Contract Agreement within Seven (7) days of issue of Letter of Award or within such extended time, as may be granted by the Employer as per the pro-forma provided by the Employer. The Agreement will be signed in two originals and the Consultant shall be provided with one signed original Agreement.

#### **19.0 GOVERNING LAWS**

This Consultancy work shall be governed by the Indian Laws for the time being in force and the Delhi Courts alone shall have the jurisdiction.

#### **20.0 SUSPENSION OF THE OBLIGATION**

**20.1** The obligations stipulated in this specification can only be suspended in the case of any particular item or work, in the event of Force Majeure as defined in clause 21.0 or as the result of an agreement between the parties.

**20.2** In the event of Force Majeure, neither of the parties may be considered in default of its obligations under the terms of the Specifications.

#### **21.0 FORCE MAJEURE**

**21.1** Force Majeure is hereby defined as any cause which is beyond the control of the Consultant or Employer as the case may be, which they could not have foreseen and which substantially affect the performance of contract such as:

- i) Natural Phenomena including but not limited to floods, draughts, earthquakes and epidemics.
- ii) Acts of any government, domestic or foreign, including but not limited to war, declared or undeclared, priorities, embargoes, etc.

Provided either party shall within **Fifteen (15) days** from the occurrence of such a cause notify the other in writing of such cause.

## **22.0 HANDLING OF DOCUMENTS**

- 22.1** All plans, design calculations, studies, data, maps, drawings, video and specifications prepared by the Consultant in connection with the services to be provided by the Consultant shall be the property of the Employer. As when required or upon termination of the Contract, the aforesaid documents, prepared specifically for this Study (including originals), shall be handed over to the Employer before final acceptance or thereafter.
- 22.2** The Consultant shall take all necessary steps to ensure confidential handling of all matters pertaining to plans, designs, drawings, video, specifications, methods and any other information developed or acquired by him from the Employer under terms of the Contract or in performance thereof.
- 22.3** The Consultant shall not prepare articles or photographs/video for publication or speeches or presentations about the work and /or site and/or plant, contracts and installation in which has an interest without prior written consent of.
- 22.4** The Consultant shall take necessary steps to ensure that all persons employed on any work in connection with this contract have noticed that the Indian Official Secrets Act, 1923 (XIX of 1923) applies to them and shall continue to apply even after the execution of such work(s) under the contract.

## **23.0 ABANDONMENT OF WORK**

If any work included in the scope of specification to be done by the Consultant is abandoned or suspended for any cause or reasons, which cannot be attributed to the Consultant, payment, shall be made on a pro-rata basis for the work actually done and as decided by the Employer.

## **24.0 SUB-CONTRACT**

The Consultant cannot assign or sub-contract any of this work without the prior written consent of the Employer.

## **25.0 LIMITATION OF LIABILITIES**

- 25.1** The Employer shall in no way be responsible for any liabilities arising out of the Consultant's contractual obligation with the Consultant's personnel, experts, engineers, Sub-contractors, licensors, collaborators, vendors, or subsidiaries.
- 25.2** The Consultant and the Employer both agree that each shall assume full risk of damages of injury to its own properties, employees and representatives caused by any act or omission to act by their respective employees or representatives, during the performance.

## **26.0 CHANGES/ADDITIONS/DELETIONS**

- 26.1** The Employer shall have the right to request in writing additions or changes in the scope of services to be performed by the Consultant. If in the Consultant's opinion, any such

additions or changes affect the completion schedule or the fee, Employer will be advised accordingly and the same shall be mutually settled. However, the Consultant shall continue to carry out the work pending till final settlement, if any.

**26.2** The Employer reserves the right to delete any item/s or part thereof from the scope of services to be performed by the Consultant. For such purposes the Employer shall give to the Consultant a notice in writing on receipt of which the Consultant shall take necessary steps as may be directed by the Employer and shall stop incurring any expenditure and performing services in connection with the item/s of work so deleted.

**26.3** The corresponding fee for the deleted item(s) of work will be arrive based on the fee identified in the Contract and shall be deducted from the fee payable to the Consultant under the Contract. The Consultant, however, shall be entitled for the compensation of the amount of work and services already performed in connection with item(s) deleted from the scope, at a mutually acceptable fee.

**26.4** The corresponding fee for the added item(s) of work, if any specifically intimated by Employer under this clause will be arrive based on the fee identified in the Contract and shall be added to the fee payable to the Consultant under the Contract. The Consultant, however, shall be entitled for the compensation of the amount of work and services to be performed in connection with item(s) added in the scope, at a mutually acceptable fee.

#### **27.0 NO WAIVERS**

If Employer, in any instance, does not insist upon strict performance of any of the terms of the assignment, it shall not be construed as a waiver or relinquishment in the future till the assignment is in force and shall not relieve Consultant of any of its responsibilities under the assignment.

#### **28.0 INSTRUCTIONS AND NOTICES**

All notices to be given on behalf of the Employer and all other actions to be taken on its behalf may be given or taken by the Project In-charge or any officer for the time being entrusted with the functions, duties and powers of the Project In-charge.

All instructions, notices and communications, etc., shall be given in writing and if sent by registered / speed post to the last known place of business of the Consultant, shall be deemed to have been served on the dates when in the ordinary course of post these would have been delivered to him.

#### **29.0 BANKRUPTCY**

If the Consultant shall become bankrupt or have a receiving order made against him or compound with his creditors or being a corporation commence to be wound up, not being a voluntary winding up for the purpose only amalgamation or reconstruction, or carry on their business under a receiver for the benefit of their creditors or any of them, the Employer shall be at liberty:

- i) To terminate the assignment forthwith without any notice in writing to the Consultant or to the liquidator or receiver or to any person in whom the Consultant may become vested.
- ii) To give such liquidator receiver or other person the option of carrying out the consultancy assignment subject to their providing a guarantee for the due and faithful performance of the assignment up to an amount to be determined by the Employer.

### **30.0 PROGRESS REPORT**

**30.1** The Consultant shall prepare and submit to the Employer weekly progress report showing the progress and status of the `Works being performed by him including such materials as charts, networks and photograph/video (if any) as per the directives of the Employer. Draft formats of progress reports shall be enclosed by the Consultant with the offer.

**30.2** It is understood that submission of such reports and reviews thereof by the Employer shall not be deemed to absolve the Consultant of his responsibility of timely completion of the Assignment as per the time schedule indicated herein.

### **31.0 CORRESPONDENCE AND CONTRACT COORDINATION PROCEDURE**

**31.1** All correspondence during the pre-award stage and during execution of the contract shall be made as per following procedure:-

**31.2** On all technical matters pertaining to execution of the contract as per specification in the consultant shall directly interact with the Project In-charge.

**31.3** All correspondence from the Employer to the Consultant shall be made with the full time Coordinator to be identified by the consultant and agreed by Employer.

### **32.0 INSPECTION OF SITE BY CONSULTANT**

The Consultant shall inspect and examine the site and its surroundings and shall satisfy himself as to the form and nature of the site, the quantities and nature of work and the equipment / materials necessary information as to risks, contingencies, and other circumstances, which may influence or affect his tender, before bidding.

### **33.0 MANPOWER DEPLOYMENT**

The Consultant shall deploy task force of well qualified and experienced engineering / science executive and draftsmen for this work. The manpower proposed to be deployed for this task shall be guaranteed by the Consultant in his offer both discipline-wise and category wise (for Engineers / Scientists and draftsmen) required for completion of service included under the scope of the specification. The Consultant shall depute a senior level executive to act as fulltime overall coordinator and focal point for all interactions with the Employer throughout the entire period of consultancy assignment. The bio-data of the Engineering / Scientific personnel proposed to be included in the Task Force should be enclosed with the offer. The task force so proposed is subject to the approval of the Employer. The Employer may ask for suitable substitution of Engineers/Scientists in place of the proposed ones, if it

so desires.

**34.0 LIST OF EQUIPMENT / INSTRUMENTS**

The Employer shall not make any additional payment for any type of equipment / accessories required by the consultant for this package or for any other purpose.

**35.0 CO-ORDINATION PROCEDURE**

The coordination system to be adopted shall provide control and continuity of all functions. Employer's participation in the major decisions shall be essential to the extent desired by the Employer. The coordination procedure and schedules of coordination review meeting between the Employer and the Consultant shall be mutually discussed and finalized before award of the Contract.

**36.0 COLLABORATION**

The Consultant will be required to furnish the details its collaboration arrangement with various laboratories, institutions and other organizations along with consent letters from the collaborators categorically agreeing to carry out the assignment till the completion of the study. Such consent letter must contain a declaration that the consent given by the collaborator is irrevocable till successful completion of the assignment. The proposal will also precisely outline the responsibilities and task to be undertaken by the collaborator(s). The consent letters from the collaborators shall be enclosed with the Bid.

**37.0 ASSOCIATION OF THE EMPLOYER**

The Employer may depute its representative to be present during the entire course of studies or any part thereof. The Project In-charge or his/her authorized representatives will have to be provided necessary information when asked for. He/she may further monitor the field and laboratory activities, and supervise the finalization of the documents. The Engineers will also discuss results of studies and may suggest different cases to be studied. The Consultant shall provide all facilities for the Employer's Project In-charge / Representatives to have fruitful participation in the work. The Consultant will submit all study results draft sections / documents to the Project In-charge for his approval and the final document will be prepared after incorporating changes / modifications / additions / alterations suggested by the Project In-charge.

**38.0 LANGUAGE**

The offer must be submitted in English language, all documents, specifications, schedules, notices correspondences, operation & maintenance instructions, drawings or any other written material in connection with this work shall be in English language.

In case, any document related to the Scope of Work is in a language other than English shall be accompanied by a certified English translation. The Contractor shall arrange such translation through a certified translation agency or obtain certification from the concerned State Government office/authority, as applicable. All costs and expenses incurred towards translation and certification shall be borne solely by the Contractor and shall not be reimbursable by the Employer.

**39.0 UNITS & INDIAN STANDARDS / CODES / REGULATIONS**

Indian Standards, codes and regulations, wherever applicable, shall be adopted and

adhered to by the Consultant. In case of such Indian Standards / Codes / Regulations being not available in particular areas, applicable and accepted International standards shall be followed.

#### **40.0 EMPLOYER'S RIGHT**

Employer reserves the right for the following:

- i) Rejection of any or all offers without assigning any reason whatsoever.
- ii) Rejection of any offer which is incomplete with regard to the required information of Scope of Work.
- iii) Review of the work performed by the Consultant either himself or through another Consultant separately appointed by him and asks for any clarification and changes / modifications to the work performed by the Consultant. Such changes shall be mutually discussed and agreed upon between the Employer and Consultant in his work without any cost and liability to the Employer and without any dilution of the responsibility of the consultant.

#### **41.0 TRAVEL EXPENSES**

The travel expenses incurred by the Consultant's personnel for journeys to site or Employer's Office or anywhere in connection with the study under Scope of this Specification will be borne by the Consultant and the Employer will not take any responsibility whatsoever on this account

#### **42.0 ACCESS TO CONSULTANT'S OFFICE / WORK SITE**

The authorized representative(s) of the Employer shall be provided access to the Consultant's and/or its Associates premises or to the work site at any reasonable time during the currency of this work for expediting, inspection & checking of the progress of the Consultant's work.

**PFC CONSULTING LIMITED**  
**(A wholly owned subsidiary of Power Finance**  
**Corporation Ltd. -A Government of India**  
**Undertaking)**



**VOLUME – III TECHNICAL SPECIFICATION**

**Survey and Preparation of Report for “*Static/Dynamic compensation requirement in the Northern Region Grid*”- using LiDAR Survey Techniques**

## **TECHNICAL SPECIFICATIONS FOR SURVEY & PREPARATION OF REPORT USING LiDAR SURVEY**

### **TECHNIQUES**

#### **1. General Information & Scope of Work**

**1.1.** The technical specifications covers detailed LiDAR Survey for route alignment of transmission lines, identification of substation alternates/sites and preparation of report for the transmission scheme ***“Static/Dynamic compensation requirement in the Northern Region Grid”*** comprising the following elements:

| Sl. No.  | Description of Transmission Element                                                                                                      | Scope of work<br>(Type of Substation/Conductor capacity/km/no. of bays etc.)                                                                                                                                                      |
|----------|------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>A</b> | <b>STATCOM</b>                                                                                                                           |                                                                                                                                                                                                                                   |
| 1.       | 1 unit of STATCOM(±300MVAR) along with MSC (1x125 MVAR) & MSR (2x125 MVAR) at 765/400kV Aligarh (PG) S/s                                 | <ul style="list-style-type: none"><li>1 unit of STATCOM(±300MVAR) along with MSC (1x125 MVAR) &amp; MSR (2x125 MVAR)</li><li>400 kV STATCOM (GIS) bay: 1 No.</li></ul>                                                            |
| 2.       | 2 units of STATCOM (±300MVAR) along with MSC (2x125 MVAR with each unit) at 400/220kV Wagoora(PG) S/s                                    | <ul style="list-style-type: none"><li>2 units of STATCOM (±300MVAR) along with MSC (2x125 MVAR with each unit) at 400/220kV Wagoora (PG) S/s</li><li>400 kV STATCOM bays: 2 Nos.</li></ul>                                        |
| 3.       | 2 units of STATCOM (±300MVAR) along with MSC (2x125 MVAR with each unit) at 400/220kV Amargarh (Indigrid) S/s                            | <ul style="list-style-type: none"><li>2 units of STATCOM (±300MVAR) along with MSC (2x125 MVAR with each unit) at 400/220kV Amargarh (Indigrid) S/s</li><li>400 kV STATCOM (GIS) bays: 2 Nos.</li></ul>                           |
| 4.       | 2 units of STATCOM(±300MVAR) along with MSC (1x125 MVAR with each unit) & MSR (2x125 MVAR with each unit) at 765/400kV Jhatikara(PG) S/s | <ul style="list-style-type: none"><li>2 units of STATCOM (±300MVAR) along with MSC (1x125 MVAR with each unit) &amp; MSR (2x125 MVAR with each unit) at 765/400kV Jhatikara(PG) S/s</li><li>400 kV STATCOM bays: 2 Nos.</li></ul> |
| 5.       | 1 unit of STATCOM(±300MVAR) along with MSC (1x125 MVAR) & MSR (2x125 MVAR) at 400/220kV Mandola (PG) S/s                                 | <ul style="list-style-type: none"><li>1 unit of STATCOM(±300MVAR) along with MSC (1x125 MVAR) &amp; MSR (2x125 MVAR)</li><li>400 kV STATCOM bay: 1 No.</li></ul>                                                                  |
| <b>B</b> | <b>BUS REACTOR</b>                                                                                                                       |                                                                                                                                                                                                                                   |
| 6.       | 1 no. of 125 MVAR (420kV) Bus Reactor at 765/400/220kV Agra(PG) S/s                                                                      | <ul style="list-style-type: none"><li>125 MVAR (420kV) Bus Reactor-1 No.</li><li>400kV Bus reactor bay – 1 No.</li></ul>                                                                                                          |
| 7.       | 1 no. of 125 MVAR (420kV) Bus Reactor at 400/220kV Patran (IndiGrid) S/s (GIS)                                                           | <ul style="list-style-type: none"><li>125 MVAR (420kV) Bus Reactor-1 No. (in existing half diameter)</li></ul>                                                                                                                    |
| 8.       | 1 no. of 330 MVAR (765kV) additional Bus Reactor at 765/400kV Orail(PG) S/s                                                              | <ul style="list-style-type: none"><li>330 MVAR Bus Reactor-1 No.</li><li>765kV Bus reactor bay – 1 No. (GIS)</li></ul>                                                                                                            |

**Note:**

1. Bay(s) required for completion of diameter (GIS) in one-and-half breaker scheme shall also be executed.
2. Bus extension wherever required, shall also be executed under present scope.

3. *Additional land adjacent to the existing substation at Amargarh S/s and Wagoora S/s required for the installation of bays and associated elements, shall be within the scope of the successful bidder as per site conditions.*
4. *Respective TSP of S/s (Aligarh, Jhatikara, Mandola, Agra, Patran & Orai) is to provide free of cost unconditional access to the implementing ISTS licensee for installation of STACOMs/Bus reactors and commensurate bays.*
5. *Respective TSP of Amargarh and Wagoora is to provide free of cost unconditional access to the implementing ISTS licensee for termination of bays required for STATCOM installation.*

**1.2. The scope of work inter-alia shall include the following: -**

- a) Preparation of Single Line Diagram for assessment of land requirement for the proposed substations considering the present & future scope of the substations specified at Clause 1.1 above including provision of staff quarter.
- b) Identify the inputs required for carrying out the survey work, Shortlisting of Proposed Substation Alternates/Sites through Desktop Survey as detailed in Clause 4.0 hereinafter including marking of features (Forest, Mining, Airports Road, Rail, SEZ, Wildlife, CRZ, GIB or any other relevant features) and earmark proposed bay area and approach of terminating substation
- c) The Contractor shall visit the associated existing/upcoming Substation(s) within 3 days from issue of Letter of Award to assess termination arrangements, availability of line bays, Right of Way (RoW) constraints, feeder routing, line entry/exit feasibility, space availability for future extensions, and any other factors that may influence the planning and implementation of the proposed transmission scheme. The observations and recommendations arising from such visits shall be intimated to employer immediately.
- d) The Contractor shall also visit the shortlisted substation alternates/sites to assess the feasibility of site for proposed substation location. Further, it will prepare **Comparative Assessment for Minimum 3 Alternates as per Annexure-B**. Contractor will also facilitate the Employer for physical review of the shortlisted sites (if required).
- e) Route Alignment in KMZ/KML file on Bhuvan (Indian Geo-Platform of ISRO) / Google imagery and Survey of India topographical maps (both in hard & soft copies) to the extent required, inter-alia including:
  - (i) Identification of three alternative route alignments & selection of one optimized route alignment in consultation with the Employer i.e. PFCL. The output (both in hard & soft copies) shall be in the form of final route alignment in KML/KMZ file and pdf / digitized topographical map (i.e. digitized topo sheets of Survey of India) with latest details/features including but not limited to forest, revenue area, protected area, wildlife infringement, Animal/Bird sanctuary, infringement of endangered species habitats, Great Indian Bustard (GIB) area, civil and defense Airports, all rivers, sea, coal, mineral areas, mining areas, special demarcated area as scientific labs/research centre/communication set-up/International Boundary (such as DRRO Labs, GMRT, No go zone, Firing Range etc.), oil pipe line/underground inflammable pipe lines, railway lines, canals, roads, defense setup etc. upto 10 kms on both sides of selected route alignment.
  - (ii) Walk-over Survey of the route alignment (to be finalized in consultation with the Employer).
  - (iii) Preparation of Survey Report including identification and explanation of route constraints like Forest, revenue area, protected area, wildlife infringement, Animal/Bird sanctuary, infringement of endangered species habitats, GIB area, vicinity to civil and defense Airports, boundary details of army establishments, cantonment areas, NO-GO areas demarcated by Armed forces/Government, major river/water body/sea crossings & coal, mineral mining areas, oil pipe line/underground inflammable pipe lines, railway lines, canals, roads, defense setup, orbital rail corridor,

infrastructure details available enroute etc.

- f) Preparation of Survey Report incorporating the details as per **Annexure-A**.
- g) The Contractor will also facilitate the Employer for physical review of the final route alignment (if required).
- h) Initiation of any forest clearance based on survey of final route alignment with the concerned Authorities.
- i) The survey report should also mention about various clearances required in the final route alignment, probable RoW constraints areas etc.
- j) The survey work for sub-station and transmission route shall be carried out by the contractor using LiDAR survey technique. The technical specifications requirement & deliverables and general feature code list for LiDAR Survey is attached at **Annexure-E** and **Annexure-F** respectively.

The important aspects of LiDAR survey would be as:

- (i) LiDAR survey for a 150 m corridor i.e. approx. 75 m on either side of final route alignment after walkover survey.
  - (ii) Obtaining necessary clearances/permissions from Director General of Civil Aviation (DGCA), Ministry of Defense, Government of India as per DGCA procedures and guidelines and other agencies as may be required to complete the job of flying and data acquisition over the Area of Interest (Aoi).
  - (iii) Establish Horizontal and Vertical Control Network along the corridor.
  - (iv) Acquire LiDAR point cloud data and aerial images in the stipulated corridor.
  - (v) Carry out Quality assurance checks at various stages and re-flying if required for producing deliverables within the stipulated accuracy.
  - (vi) Classification of point cloud data and feature extraction.
  - (vii) Generate Digital Elevation Model (DEM), Digital Terrain Model (DTM) and Digital Surface Model (DSM)
  - (viii) Generate Contours at 0.5m interval in the stipulated corridor.
  - (ix) Generated Digital Ortho photo map of the stipulated corridor.
  - (x) Digitized profiling along the selected route along with plan details.
  - (xi) Computer aided tower spotting & optimization (PLS-CADD).
  - (xii) Carrying out estimation of tree quantity & type using LIDAR survey along with information captured during walkover survey.
  - (xiii) Scheduling of the Right of way corridor for land usage & Ownership type.
- k) The contractor shall host all the survey related data to a secured server upto release of final payment and provide access to Employer as well as bidders to the ISTS through a dedicated dashboard with all the requisite software support to access, review, process and generate reports.
  - l) Consultant would be responsible for estimating Right of Way (RoW) cost for proposed transmission lines in accordance with prevailing state and central RoW Policy. It would include details as Circle rate/Guideline value/Stamp Act rates, Prevailing Market Rate, Area Features (Urban/Rural/Development Authority Area etc.), details of recent compensation awarded in vicinity

for infrastructure projects (Transmission Line etc.) for area falling under RoW of Transmission Lines and any other details required for estimating RoW. The required coordination with local authorities for compiling inputs will be undertaken by Consultant. The details as mentioned above should be backed by documentary evidences such as details from Revenue Officer, Registrar Office, Land Acquisition Officer, Local Governing Bodies, market rates certified by Valuer empaneled with Insolvency and Bankruptcy Board of India (IBBI)/Government Bodies/Public Sector Undertakings etc.

**11.6** Consultant would be responsible to provide deliverables for as may be required, for successful completion of the assignment. The Consultant would be responsible for deliverables, as may be desired by PFCCCL during the course of the assignment for the successful completion of the assignment to the satisfaction of PFCCCL.

**1.3.** The quantities indicated in the scope of work are provisional. The final quantities for route alignment & survey (quantities in “kms” unit) shall be the route length along the optimized route alignment. The route alignment shall be carried out by the ‘Contractor’, as per the technical specifications stipulated herein. However, the price offer quoted by Contractor shall remain firm.

**1.4.** The Contractor must note that the Employer shall not be responsible for loss or damage to properties, trees etc. due to contractor’s work during survey. The Contractor shall indemnify the Employer for any loss or damage to properties, trees etc. during the survey work.

**1.5.** The Contractor should note that Employer will not furnish any software or topographical maps prepared by Survey of India, but may assist in obtaining these by providing letters of recommendations, if required, to concerned authorities. Contractor shall have to use original licensed version of the software (not the beta version). Contractor shall give along with their bid, the confirmation/comments/observation in respect of all clauses of technical specification.

**1.6.** The work shall be carried out by the contractor using LIDAR surveying techniques. The Contractor shall be responsible for obtaining necessary clearances/ permissions, as may be required from concerned authorities for procurement and use of equipment during survey work at site. The Contractor shall follow all rules and regulations notified by regulatory bodies for undertaking LiDAR Surveys for Transmission Line Routes and Substations. The Employer will provide assistance that may be required in obtaining these clearances/ permissions by providing letters of recommendation to the concerned authorities.

**1.7.** It shall be the responsibility of the Contractor to obtain required permissions from various authorities/ agencies (if required) for carrying out survey work. Employer will facilitate by way of issuing authorization letter to the Contractor.

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

**1.9. Location Details**

The bidders may visit the site to acquaint themselves with the terrain etc. For this purpose or for any other clarifications, they may contact the Employer at the following address:

**General Manager,**

PFC Consulting Limited,  
9<sup>th</sup> Floor, A-Wing, Statesman House,  
Connaught Place, New Delhi-110001 **Email:** [...](#)  
**Ph.:** ....,

## 2.0 Sub Stations

The contractor shall estimate and verify the requirement of land for the present & future scope of the proposed substations mentioned at clause 1.2, including provision of staff quarters and for this purpose. The contractor shall prepare a Single Line Diagram/Indicative General Arrangement (GA) for the Sub-station in order to assess the requirement of land in consultation with the Employer. The contractor shall identify a minimum of three sites of adequate size for sub-station. The optimum location of sub-station shall be finalized in consultation with the Employer. The contractor shall estimate the requirement of land including provision of staff quarters based on the scope of scheme provided by the Employer, additionally the cost of the proposed site and the prevalent rate/acre for various types of land, which shall also be separately indicated. The details as per **Annexure A** shall be furnished for each of the proposed alternative sites of the sub-station. Contractor shall provide details of elevations above mean sea level of the all three alternative sites of the Substation. GPS co-ordinates of the corners of the substation sites shall also be included in the report.

### 2.1 Selection of Substation site criteria:

- a) Preferably fairly levelled land and nearness to Motorable Road/State Highway (SH)/National Highway (NH).
- b) Away from vicinity of rivers, sea coast, creeks, marshy lands and area of subsidence.
- c) HFL of the nearest river or FRL of the nearest dam/reservoir to be provided and distance from such water body to be indicated.
- d) Avoiding forest land, scheduled areas, vicinity to airports, any land belonging to authorities like railways, highways, mining, oil, defense, educational institutions, religious institutions, hospital, Government housing plans etc.
- e) Area subjected to flooding and higher water accumulation should be avoided.
- f) Indicative level (Altitude above MSL) of the site and nearest motor able road/SH/NH to be indicated.
- g) Size of the land for the proposed site shall preferably be rectangular suitable for accommodating present and future scope of works and shall preferably have at least three side open for line corridors.
- h) Area with religious structures such as graveyard, temple, mosque etc. should be avoided.
- i) Approach road to the site shall be suitable for transportation of the heaviest equipment of the sub-station i.e. Transformer, Reactor etc. Requirement of strengthening of bridges/culverts, if required, needs to be indicated in the Report.
- j) Responses against indicative checklist attached at **Annexure-C** to be provided along with **Annexure-A**.

### 2.2 Details about Substation Vicinity:

The Contractor is to provide following details about the 3 Km in Generation Pooing Station/5 Km in Load Serving Station/10 Km in Intermediate Station area (as applicable) in the vicinity of the finalized substation location, so as to have flexibility for relocation of the substation, if required subsequently.

- a) Places of Archaeological importance, Places of Historical, Cultural, Religious or Tourist importance
- b) Sea, River (navigable or non-navigable), canal, streams, Creeks lakes, reservoir, largewater body

- c) Hills/ mountains/ Hillocks / sand dunes/ Marshy and low-lying areas
- d) Estuary, coal, mineral/ mining areas, shooting ranges/firing range, coastal regulation zones, oil pipe line/underground inflammable pipe lines etc.
- e) Defense installation/ Airports/Seaports/ shooting ranges/firing ranges
- f) Railway /Highway Crossings/ Power Line / Telecom Line Crossings
- g) Environmental and social aspect
  - i) Forest Involvement (revenue/ Reserve/protected etc.) / Clearance
  - ii) Social Issue / R&R Measure
  - iii) Wildlife infringement
  - iv) Animal/Bird sanctuary/ eco-sensitive zone / national park / GIB area(Priority/Potential area)
  - v) Elephant/ Tiger Corridor/ habitat of endangered species
- h) During the survey of the proposed Substation(s) specified in Clause 1.2, the Contractor shall also visit the associated existing Substation(s) to assess termination arrangements, availability of line bays, Right of Way (RoW) constraints, feeder routing, line entry/exit feasibility, space availability for future extensions, and any other factors that may influence the planning and implementation of the proposed transmission scheme. The observations and recommendations arising from such visits shall be intimated to employer.
- i) The Contractor is to provide land schedule and revenue /khasra map of the site finalized for substation location.

### **3.0 Route Alignment of Transmission Line**

**3.1** Route Alignment shall be done using Bhuvan / Google imagery and Survey of India topographical maps (scale 1:50,000). In case the required Survey of India maps are available in digitized form, the same shall be procured and used by the contractor. The contractor shall identify & examine three alternative route alignments and suggest to the Employer the optimal route alignment between the terminal points.

### **3.2 Requirement of Transmission Line Routing**

- a) The alignment of the transmission line shall be most economical from the point of view of construction (i.e. supply, erection and commissioning) and maintenance.
- b) The line routing should avoid large habitations, densely populated areas, urban areas industrial areas, scheduled areas, forest/national park/wildlife infringement/GIB/Animal/Bird Sanctuary, infringement of endangered species habitat, vicinity to civil and defense Airports, major river/sea crossings & coal/ mineral mining areas, existing and planned solar parks oil pipe line/underground pipe line/land slide prone areas, firing range, coastal regulation zones, inflammable pipe lines etc. to the extent possible. In case it is not possible to avoid the forests or areas having large trees completely, then keeping in view the overall economy, the route should be aligned in such a way that cutting of trees is minimum. In case, it is not possible to avoid such areas, specific guidelines w.r.t. type of tower and other technical requirement issued by MoP/CEA/Intimated by Employer should be followed.

- c) Routing of transmission lines shall be done in accordance with CEA (Technical Standards for Construction of Electrical Plants and Electric lines) Regulations 2022 and subsequent amendments, and relevant Indian Standard (IS)/ codes as amended from time to time.
- d) The route should have minimum crossings of Major River, Railway lines, National/State highways, overhead EHV power line and communication lines.
- e) The number of angle points shall be kept to a minimum.
- f) The distance between the terminal points specified shall be kept shortest possible, consistent with the terrain that is encountered.
- g) Creeks, Marshy and low lying areas, river beds and earth slip zones shall be avoided to minimize risk to the foundations.
- h) It would be preferable to utilize level ground for the alignment.
- i) Crossing of power lines shall be minimum. Alignment will be kept at a suitable distance from power lines to avoid induction problems on the lower voltage lines.
- j) Crossing of communication line shall be minimized and it shall be preferably at right angle. Proximity and parallel route with telecom lines shall be avoided to eliminate effect of induction in the telecom lines.
- k) Areas subjected to flooding such as Nalah shall be avoided.
- l) Restricted areas such as civil and military airfield and shooting ranges shall be avoided. Care shall also be taken to avoid aircraft landing approaches.
- m) All alignment should be easily accessible both in dry and rainy seasons to enable maintenance throughout the year.
- n) Certain areas such as quarry sites, tea, tobacco and saffron fields and rich plantations, gardens & nurseries which would cause problems in acquisition of right of way and construction and maintenance activities, should be avoided.
- o) Angle points should be selected such that shifting of the point within 100 m radius shall be possible at the time of construction of the line.
- p) The areas requiring special foundations and those prone to flooding should be avoided.
- q) For examination of the alternatives & identification of the most appropriate route, besides making use of information/data/details available/extracted through Survey of India Topographical maps, the contractor shall also carryout reconnaissance/ preliminary survey for verification & collection of additional information /data/details.
- r) The contractor shall propose no. of pile/special foundations if required, for crossing of major river spans/large water bodies/creek area and such crossings should be preferably through the narrowest width of the river/water body. The contractor shall propose any type of pile or special foundation required during routing of the line.
- s) The contractor shall submit his preliminary observations & suggestions along with various information/data /details collected and also processed satellite imagery data, scanned topographical map data marked with the alternative routes etc. The final evaluation of the alternative routes shall be conducted by the contractor in consultation with Employer's representatives and optimal route alignment shall be proposed by the contractor. Site visit and field verification shall be conducted by the contractor for the proposed route alignment.
- t) The route of the transmission line shall be recorded using GPS/DGPS of positional accuracy less than 3 m. The co-ordinates of all the angle points as well as other important crossings, landmarks etc. shall be recorded using LiDAR instrument. The details such as legends, project description, direction marker etc. shall be with white background.
- u) Wind Zone map of NBC-2016 and amendment thereof and if data available, from local metrological department is to be referred for identifying wind zone of the terrain through which the line traverses. Wind zone of every section (between consecutive angle points) of the line is to

be indicated in the final report. Further, for transmission line sections passing within a distance of 50 km from the boundary of two wind zones (indicated in NBC map), higher of the two wind zones shall be considered for such sections.

- v) Responses against indicative checklist attached at **Annexure-D** to be provided along with draft survey report.

### 3.3 Tower Scheduling

The tower schedule shall include details of all the towers of the transmission line with following aspects shall be borne in mind:

#### a) Span

The maximum length of a section shall not exceed 15 spans or 5 Km in plain terrain and 10 spans or 3 km in hilly terrain. Further, in case of line traversing through cyclone prone area i.e. areas up to 60 km from coast, the maximum length of a section shall not exceed 10 spans or 3 km, in order to reduce the failure of such towers in coastal areas due to cascading effect. A section point shall comprise of tension point with DB/B type or DC/C type or DD/D type towers as applicable. The normal span shall be considered as 350 m for 220 kV, 400 m for 400 kV lines and 400m for 765 kV lines. Similarly, normal span for monopoles may be considered as 150m – 200m (angle pole / pole structures) and 250m (tangent pole / pole structures) for 765 kV and 400kV respectively, 300m-350m for 220kV. Right of Way shall be as per statutory guidelines.

#### b) Railway Crossings

All the railway crossings enroute the transmission line shall be identified by the Contractor. The crossings shall be supported on DD/D type towers on either side. The crossing span will be limited to 300 meters. The crossing shall normally be at right angle to the railway track. No crossing shall be located over a booster transformer, traction switching station, traction sub-station, Overlap Section or a track cabin location in an electrified area. Clearance between the overhead line and railway track shall be in accordance with the Regulations for Power Line Crossings of Railway Tracks laid down by the Railway Authorities.

#### c) National Expressway/ National Highway/State Highway Crossings

All the highway crossings enroute the transmission line shall be identified by the Surveyor. Information about the planned/announced/notified highways should also be gathered. The crossing shall be supported on DD/D type towers on both sides of the crossing. The crossing span will be limited to 300 meters. The crossing shall normally be at a right angle to the highways.

#### d) Sea/River/canal/lake/Crossings

Suitable type of suspension/tension tower shall be used for crossings. Navigable or non-navigable river is to be identified. For non-navigable river, clearance shall be reckoned with respect to highest flood level (HFL). HFL and distance of the nearest recorded HFL point from the river crossing to be provided. Span and name of the river to be provided. For lake, reservoir, canal, & large water body crossing, crossing span to be provided along with Full Reservoir Level (FRL) wherever applicable. For line passing/crossing through sea, High tide level (HTL) to be provided.

#### e) Power line Crossings

For power line crossing following points shall also be applicable: -

- i) For power line crossing of 400 kV or above voltage level, large angle & dead end towers (i.e. D/DD/QD) shall be used on either side of power line crossing.
  - ii) For power line crossing of 110 kV/132 kV and 220 kV (or 230 kV) voltage level, angle towers (B/C/D/DB/DC/DD/QB/QC/QD) shall be used on either side of power line crossing depending upon the merit of the prevailing site condition and line deviation requirement.
  - iii) For power line crossing of 66 kV and below voltage level, suspension/tension towers shall be provided on either side of power line crossing depending upon the merit of the prevailing site condition and line deviation requirement.
- f) **Telecommunication Line Crossings**  
The angle of crossing shall be as near to 90 degree as possible. However, deviation to the extent of 30 degree may be permitted under exceptionally difficult situations.
- g) **Crossing of wildlife/ eco sensitive zones**
  - i) During the survey work of transmission lines (up to 400 kV level) which are passing through wildlife/ eco sensitive zones, the possibility of stringing the transmission line on available transmission corridor (i.e. vacant circuits) of existing multi circuit transmission lines, if any, traversing through the same wildlife/eco sensitive zone shall be explored by the surveyor and the coordinates of these existing transmission line towers shall be provided in the report. The details of route considering these multi circuit transmission towers for the wildlife/eco sensitive area shall be included as an alternative in the survey report.
  - ii) For the transmission lines up to 400 kV level which are passing through wildlife/ eco sensitive zones, the survey work for towers located in such sections shall be done considering Multi-circuit (4 circuits) configuration of same voltage level. The top cross arms of these multi-circuit towers shall be used for stringing initially & the balance cross arms shall be made available for stringing of any future transmission line (inter-state or Inter-state) passing through the same wildlife/ eco sensitive zone.
- h) **Crossing of Petroleum/Gas lines**
  - i) No tower footing/structure of an overhead line of voltage 33 kV or above/HVDC shall be closer than 25 meters from the edge of the Right of Way (ROW) of a Petroleum/National Gas Pipeline.
  - ii) Wherever overhead line of voltage 33 kV or above/HVDC shall intend to cross the Right of Way (RoW) of Petroleum/natural Gas Pipeline, the angle of crossing of overhead line with respect to the pipelines shall preferably be right angles, but the crossing angle shall not be less than 75 degrees in any case.
- i) **Clearance from Ground, Building, Trees etc.**
  - i) Clearance from ground, buildings, trees and telephone lines shall be provided in conformity with the CEA (Measures relating to Safety and Electricity Supply) Regulations, 2023, as amended.
  - ii) The contractor shall also intimate the Employer, his assessment about the likely no. of trees required to be cut during execution stage. This assessment shall be done considering prevailing practices/ guidelines local regulation and other enquiries from local authorities.

## 4.0 Survey Report

- 4.1 The format for preparation of Survey Report is enclosed at **Annexure-B** for reference. Although, any addition features, if required to be included in the report, would be intimated to Contractor.
- 4.2 Each angle point location with angle of deviation, elevation above MSL shall be shown with detailed sketches showing existing close-by permanent land marks such as specific tree(s), cattle shed, homes, tube wells, temples, electric pole/tower, telephone pole, canal, roads, railway lines etc. The relative distance of land marks from the angle points and their bearing shall be indicated in the sketch. These details shall be included in the survey report in tabular format along with sketches.
- 4.3 Information w.r.t. infrastructure details available enroute, identification and explanation of route constraints, etc. shall also be furnished in the Survey report
- 4.4 All observations which the Contractor thinks would be useful to the construction of the transmission lines mentioned under scope of work are to be reported.
- 4.5 Some portions of the line may require clearance from various authorities. The Contractor shall indicate the portion of the line that requires clearance and the name of concerned organizations such as local bodies, municipalities, P&T (name of circle), Inland navigation, Irrigation Department, Electricity Boards and Zonal railways, Divisional Forest Authorities, Civil & defense airports, sea ports, defense areas etc. from whom the clearance is required.
- 4.6 The Transmission Line may encounter snowbound areas and may also pass through elevations of above 1000 m above mean sea level (MSL). Contractor shall provide details of minimum & maximum elevations above mean sea level of the route alignment. The line sections which may be affected in snowbound areas to be indicated in the report.

## 5.0 Statutory Regulations and Standards

The Contractor is required to follow local statutory regulations stipulated in Electricity Act 2003, CEA (Measures relating to Safety and Electricity Supply) Regulations 2023, CEA (Technical Standards for Construction of Electrical Plants and Electric Lines) Regulations 2022 and its amendments, Railway Regulations, Defence /Civil aviation guidelines, MoEF guidelines, Inland Water Authority of India/Central Water Commission (CWC), DGCA, QCI Regulations/Guidelines etc. as amended from time to time and other applicable local rules and regulations

## 6.0 Completion Period for Survey using LiDAR Survey Techniques and preparation of report

- 6.1 The Contractor shall adhere to the following timelines for carrying out desktop surveys, walkover surveys, preparation and submission of Draft, Addressing the employers' comments, preparation and submission Final Survey Reports, including all deliverables specified in Annexure-E & F of Volume-III (Technical Specifications), in consultation with the Employer. The timelines shall be reckoned from the date of issuance of the Letter of Award (LoA):

| S.No. | Milestone                                                                                                                                                                                                                                                                                             | Timeline<br>(Issue of LoA: T Day) |
|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|
| 1.    | Identification, walk over & Lidar survey and submission of comparative statement of sub-station alternates/sites for finalization along with identification & confirmation of the availability of terminal bays at existing sub-stations, LILO points and its co-ordinates as per the approved scheme | T+10                              |

| S.No. | Milestone                                                                                        | Timeline<br>(Issue of LoA: T Day) |
|-------|--------------------------------------------------------------------------------------------------|-----------------------------------|
| 2.    | Finalization of transmission line route alongwith walkover & Lidar survey for review by employer | T+27                              |
| 3.    | Submission of draft survey report                                                                | T+34                              |
| 4.    | Submission of final survey report & RoW estimation                                               | T+45                              |

- 6.2 The Consultant would submit five (05) hard copies of final report along with soft copy in English language within **forty five (45) days from the date of LoA.**
- 6.3 Consultant would be responsible for estimating Right of Way (RoW) cost for proposed transmission lines in accordance with prevailing state and central RoW Policy. It would include details as Circle rate/Guideline value/Stamp Act rates, Prevailing Market Rate, Area Features (Urban/Rural/Development Authority Area etc.), details of recent compensation awarded in vicinity for infrastructure projects (Transmission Line etc.) for area falling under RoW of Transmission Lines and any other details required for estimating RoW. The required coordination with local authorities for compiling inputs will be undertaken by Consultant. The details as mentioned above should be backed by documentary evidences such as details from Revenue Officer, Registrar Office, Land Acquisition Officer, Local Governing Bodies, market rates certified by Valuer empaneled with Insolvency and Bankruptcy Board of India (IBBI)/Government Bodies/Public Sector Undertakings etc.
- 6.4 Contractor would be responsible to provide deliverables for as may be required, for successful completion of the assignment. The Consultant would have to provide assistance /deliverables, as may be desired by PFCCL during the course of the assignment for the successful completion of the assignment to the satisfaction of PFCCL.

**Notes:**

- a) Where required for obtaining statutory clearances, approvals, consultations with local authorities, or for any other purpose specified by the Employer, the Contractor shall submit the Final Survey Report and related documents in the relevant regional language(s), at no additional cost to the Employer.
  - b) Any document related to the Scope of Work that is in a language other than English shall be accompanied by a certified English translation. The Contractor shall arrange such translation through a certified translation agency or obtain certification from the concerned State Government office/authority, as applicable. All costs and expenses incurred towards translation and certification shall be borne solely by the Contractor and shall not be reimbursable by the Employer.
  - c) The Contractor shall submit all raw data, processed data, survey records, calculations, GIS/KMZ files, LiDAR point cloud data, imagery, models, drawings, maps, databases and other source documents pertaining to the studies, reports and surveys carried out under the Contract. All such data shall become the property of the Employer.
  - d) All reports shall be submitted in A4-size format and all drawings/maps shall be submitted in A0-size format, unless otherwise specified by the Employer. All hard-copy reports and drawings shall be properly bound and printed on good-quality paper. In addition, editable soft copies and PDF versions of all reports, drawings and associated data shall be submitted in the prescribed digital formats.
- 6.5 The Contractor would be responsible for the following activities till the award of work to Transmission Service Provider:
- i) Initiation of forest clearances (if optimized route is passing through forest land), including preparation & filing of application and follow-up/co-ordination with the concerned Authorities.
  - ii) Initiation of land acquisition (if applicable) for substation including preparation & filing of

application and follow-up/co-ordination with the the bidder/BPC for execution of the project.

iii) Initiation of any other clearance as above.

- 6.6 The Contractor shall be required to attend the meetings/conference with the prospective TSPs or any other agency as intimated by Employer to clarify the issues relating to Survey during the Bidding Process of the transmission scheme.
- 6.7 PFCCL team would verify the draft report / route alignment / site for substation as proposed by the Contractor, in the field. The contractor would ensure availability of the competent personnel with necessary instruments required during such field visits.
- 6.8 PFCCL shall evaluate the Contractors' performance based on compliance of conditions, quality of due diligence and adherence to timelines. It reserve the right to bar the Contractor from participate in future schemes under intimation to Contractor.

## **7.0 Deliverables:**

**All the deliverables, as mentioned in above clause with scheduled timelines of Volume-III (Technical Specifications) shall be submitted.**

- 7.1 The Contractor will submit progress report for all the works/ studies/ survey every week as per the format mutually agreed upon.
- 7.2 The Contractor will submit **three (03) hard copies** of the draft report with requisite plans & drawings in English language. The Contractor is also required to submit geotagged detailing of photographs of each Angle point (AP). The tower schedule shall include details of all the towers along with the transmission route.
- 7.3 The Contractor will submit **five (05) hard copies** of Final Report (high quality printout) with requisite plans & drawings in English language. The Final Report should be submitted within seven (07) days after comments of Employer on draft report. The final report and drawings (both hard copy as well as soft copy) shall also include the GPS coordinates of selected points of the final route as per specifications.
- 7.4 The Contractor shall submit a detailed RoW Compensation Estimation in editable Excel format for the finalized transmission line route based on the prevailing state and central RoW Policy. The estimation shall include village-wise, district-wise and state-wise compensation assessment considering applicable MoP and State Government guidelines, land use and area classification, circle/market rates, tower type and quantity, RoW area, crop compensation, tree compensation, and other applicable statutory compensation, along with calculation methodology and source references. Soft copy shall also be submitted for the Report along with drawings (if any).
- 7.5 The Contractor shall securely maintain and host all survey data, maps, LiDAR data, reports, GIS databases, photographs, and other project-related information on a cloud-based platform upto release of final payment. The Employer shall be provided secure access to retrieve, view, and download the data from any location at any time during this period. The Contractor shall ensure data confidentiality, integrity, and availability, and shall promptly resolve any issues related to data access, retrieval, or system functionality, preferably within **24 hours** of notification by the Employer.
- 7.6 All raw data for all the studies/ reports/ surveys shall also be submitted.
- 7.7 All reports shall be submitted in A4 size sheets with font size 12, properly bound and printed using good quality paper & material. Map/sketch shall be provided in appropriate size sheets.
- 7.8 Any other deliverable as per scope of work defined hereinabove **Volume-III (Technical Specifications)** as well as item covered under Annexure-III.



## Comparative Assessment of Alternative Substation Sites

| Sl. No. | Parameter                                                                      | Site-I | Site-II | Site-III | Remarks |
|---------|--------------------------------------------------------------------------------|--------|---------|----------|---------|
| 1       | Coordinates of Site (All Corners)                                              |        |         |          |         |
| 2       | Area (Acres)                                                                   |        |         |          |         |
| 3       | Site Dimensions (m × m)                                                        |        |         |          |         |
| 4       | Land Ownership (Govt./Private/Forest)<br>(Enclosed Land Schedule & Khasra Map) |        |         |          |         |
| 5       | Forest Land Involvement                                                        |        |         |          |         |
| 6       | Land Use (Agricultural/Waste/Barren)                                           |        |         |          |         |
| 7       | Circle Rate                                                                    |        |         |          |         |
| 8       | Market Rate                                                                    |        |         |          |         |
| 9       | Estimated Land Cost                                                            |        |         |          |         |
| 10      | Terrain                                                                        |        |         |          |         |
| 11      | Soil Type                                                                      |        |         |          |         |
| 12      | Number of Land Owners                                                          |        |         |          |         |
| 13      | Distance from Nearest Town                                                     |        |         |          |         |
| 14      | Highest Flood Level (HFL)                                                      |        |         |          |         |
| 15      | Requirement of Nallah/Canal Diversion                                          |        |         |          |         |
| 16      | Site Slope                                                                     |        |         |          |         |
| 17      | Extent of Leveling Required                                                    |        |         |          |         |
| 18      | Land Acquisition Feasibility                                                   |        |         |          |         |
| 19      | Government Land Availability                                                   |        |         |          |         |
| 20      | Planned/Unplanned Development                                                  |        |         |          |         |
| 21      | Number of Families Affected                                                    |        |         |          |         |
| 22      | Site Level vs Road Level                                                       |        |         |          |         |
| 23      | Distance from Coastline (if applicable)                                        |        |         |          |         |
| 24      | Accessibility/Approach                                                         |        |         |          |         |
| 25      | Construction Logistics                                                         |        |         |          |         |
| 26      | Obstacles in Reaching Site                                                     |        |         |          |         |
| 27      | Distance from Main Road                                                        |        |         |          |         |
| 28      | Approach Road Required (km)                                                    |        |         |          |         |
| 29      | Nearest Airport/Airstrip                                                       |        |         |          |         |
| 30      | Nearest Railway Station/Railhead                                               |        |         |          |         |
| 31      | Aviation Restrictions (Airport/Airforce/Airstrip)                              |        |         |          |         |
| 32      | Availability of Ground Water                                                   |        |         |          |         |
| 33      | Transmission Corridor Availability                                             |        |         |          |         |
| 34      | Existing Structures within Site                                                |        |         |          |         |
| 35      | Storm Water Disposal Feasibility                                               |        |         |          |         |
| 36      | Crop Pattern                                                                   |        |         |          |         |
| 37      | Number of Culverts Required                                                    |        |         |          |         |
| 38      | Nearest EHV Line                                                               |        |         |          |         |
| 39      | Construction Power Availability                                                |        |         |          |         |
| 40      | Frontage Available for Line Take-Off                                           |        |         |          |         |
| 41      | Telephone/Telecom Infrastructure                                               |        |         |          |         |
| 42      | Drinking Water Availability                                                    |        |         |          |         |
| 43      | Drainage Facilities                                                            |        |         |          |         |
| 44      | Distance to Community Facilities                                               |        |         |          |         |
| 45      | Security Considerations                                                        |        |         |          |         |
| 46      | Availability of Construction Water                                             |        |         |          |         |
| 47      | Seismic Zone                                                                   |        |         |          |         |
| 48      | Army Cantonment/Mining/No-Go Area                                              |        |         |          |         |
| 49      | Environmental Constraints                                                      |        |         |          |         |

|    |                            |  |  |  |  |
|----|----------------------------|--|--|--|--|
| 50 | Future Expansion Potential |  |  |  |  |
|----|----------------------------|--|--|--|--|

## SAMPLE SURVEY REPORT FORMAT

| TABLE OF CONTENTS |                                                                     |
|-------------------|---------------------------------------------------------------------|
| Sr. No.           | Section 1: Description                                              |
| 1.                | Scope of Work                                                       |
| 2.                | Approach and Methodology                                            |
| 3.                | Geographical Information                                            |
| SECTION: 2        |                                                                     |
| 2.0               | <b>Establishment of ---MVA (Voltage Ratio) Sub-Station Near ---</b> |
| 2.1               | Co-ordinates of Proposed Substation                                 |
| 2.2               | Information of Proposed Substation                                  |
| SECTION: 3        |                                                                     |
| 3.0               | <b>Name of Transmission Line</b>                                    |
| 3.1               | Coordinates of Both Ends                                            |
| 3.2               | Index Map of Survey of India (SOI) Toposheet                        |
| 3.3               | Coordinates of Proposed Route                                       |
| 3.4               | Summary of Proposed Route                                           |
| 3.5               | Wind Zone Map                                                       |
| 3.6               | Result and Conclusions                                              |
| 3.7               | Route Alignment Map on Digitized Toposheet                          |
| Disclaimer        |                                                                     |

## **Section:1**

### **1. Scope of Work**

Transmission Scheme for ---- in --- (-- MW), State:

| <b>Sl. No.</b> | <b>Details of Transmission Elements</b> |
|----------------|-----------------------------------------|
| 1              | Establishment of –Substation at ---     |
| 2              | Name of Transmission line               |

### **2. Approach & Methodology**

#### **(i) Land requirement of Substation:**

The land requirement for proposed --- substation is approximately – Acres/m<sup>2</sup>.

#### **(ii) Identification of land for --- kV (voltage ratio) -----(No. of transformers X MVA) Substation at --.**

The land sighting and land selection ---

#### **(iii) Benefits from the selected land:**

i. ....

ii. ....

### **3. Geographical**

Details of geography of the area selected for substation.

#### **Geography**

Details of geography of the area

#### **Soil**

Details of soil at the area selected.

#### **Climate**

Details of climate of the area

### **4. Tentative implementation timeline:**

## **SECTION: 2**

**Co-ordinates of proposed substation (voltage ratio) ----- (No. of transformers X MVA)  
near ---**

| Village: ---, Tehsil: --, District: ..., State: .... (latitude and longitude) |         |          |          |           |          |
|-------------------------------------------------------------------------------|---------|----------|----------|-----------|----------|
| S. No                                                                         | Easting | Northing | Latitude | Longitude | Altitude |
| Corner No. 1                                                                  |         |          |          |           |          |
| Corner No. 2                                                                  |         |          |          |           |          |
| Corner No. 3                                                                  |         |          |          |           |          |
| Corner No. 4                                                                  |         |          |          |           |          |
| Corner No. 5                                                                  |         |          |          |           |          |
| Corner No. 6                                                                  |         |          |          |           |          |
| Corner No. 7                                                                  |         |          |          |           |          |
| Corner No. 8                                                                  |         |          |          |           |          |
| ....                                                                          |         |          |          |           |          |
| Corner n                                                                      |         |          |          |           |          |

**Information of Proposed Substation of --- kV (voltage ratio) -----(No. of  
transformers X MVA) Substation near ---**

| S. No. | Criterion         | Proposed Substation |
|--------|-------------------|---------------------|
| 1.0    | Land Co-ordinates |                     |
| a)     | Corner 1          |                     |
| b)     | Corner 2          |                     |
| c)     | Corner 3          |                     |
| d)     | Corner 4          |                     |
| e)     | Corner 5          |                     |
| f)     | Corner 6          |                     |

| S. No. | Criterion                                                 | Proposed Substation |
|--------|-----------------------------------------------------------|---------------------|
| g)     | Corner ....                                               |                     |
| h)     | Corner n                                                  |                     |
| 1.1    | Size (Acre) (mtr x mtr,)                                  |                     |
| 1.2    | Govt. /Private/Forest land                                |                     |
| 1.3    | Forest details                                            |                     |
| 1.4    | Agriculture/Waste land                                    |                     |
| 1.5    | Development                                               |                     |
| 1.6    | Approximate cost                                          |                     |
|        | a. Circle rate per acre                                   |                     |
|        | b. Market rate per acre                                   |                     |
|        | c. Approx. cost of the land                               |                     |
| 1.7    | Terrain                                                   |                     |
| 1.8    | Type of soil                                              |                     |
| 1.9    | No. of Owners                                             |                     |
| 1.10   | Environment/Pollution in the vicinity                     |                     |
| 1.11   | Location with reference to nearest town                   |                     |
| 1.12   | Highest Flood Level (HFL) Data                            |                     |
| 1.13   | Diversion of Nallah/Canal required                        |                     |
| 1.14   | Slope                                                     |                     |
| 1.15   | Approximate Extent of leveling required (in meter)        |                     |
| 1.16   | Land acquisition feasibility                              |                     |
| 1.17   | Rate of Govt. Land                                        |                     |
| 1.18   | No. of Owners                                             |                     |
| 1.19   | Extent of approach                                        |                     |
| 1.20   | Planned/unplanned development                             |                     |
| 1.21   | Size of sites (m x m)                                     |                     |
| 1.22   | No. of families to be displaced                           |                     |
| 1.23   | Level of site with reference to road level                |                     |
|        | a. Level of road                                          |                     |
|        | b. Level of site                                          |                     |
| 1.24   | Distance from sea shore                                   |                     |
| 1.25   | Approach                                                  |                     |
| 1.26   | Logistics Survey                                          |                     |
| 2.0    | Obstacles in reaching site                                |                     |
| 2.1    | Nearby main road                                          |                     |
| 2.2    | Length of approach road to be constructed                 |                     |
| 2.3    | Name of nearest airport (name)/ Distance from main road   |                     |
| 2.4    | Name of nearest Rail head                                 |                     |
| 2.5    | Upcoming Aviation/Airport zone/Airforce Station/Airstrips |                     |
| 2.6    | Availability of ground water                              |                     |

| S. No. | Criterion                                                                                      | Proposed Substation |
|--------|------------------------------------------------------------------------------------------------|---------------------|
| 2.7    | Availability of transmission corridor (entry of line and exit of lines)<br>(Three /four sides) |                     |
| 2.8    | Existence of structures/dwelling units in the land of the proposed site                        |                     |
| 2.9    | Availability of disposal of rain/storm water                                                   |                     |
| 2.10   | Crops grown and types (multi-crop/single crop)                                                 |                     |
| 2.11   | Nearest railway station (BG/MG)                                                                |                     |
| 2.12   | Unloading facility at railway station                                                          |                     |
| 2.13   | No. of Culverts required for approach                                                          |                     |
| 2.14   | Nearest EHV line/Nearest sub-station                                                           |                     |
| 2.15   | Length of line between this site and nearest substation for construction power at 33/11 kV     |                     |
| 2.16   | Frontage for line take off                                                                     |                     |
| 2.17   | Telephone/Telegraph line                                                                       |                     |
| 3.0    | Community Facilities                                                                           |                     |
| 3.1    | Drinking Water                                                                                 |                     |
| 3.2    | Drainage                                                                                       |                     |
| 3.3    | Distance from<br>a. Post Office<br>b. Telephone line<br>c. School<br>d. Market                 |                     |
| 3.4    | Security arrangement                                                                           |                     |
| 3.5    | Availability of construction water                                                             |                     |
| 3.6    | Availability of drinking water                                                                 |                     |
| 4.0    | Seismic zones                                                                                  |                     |
| 5.0    | Army cantonment / Mining/ No Go areas                                                          |                     |

### **Conclusion and Recommendations**

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## **SECTION: 3**

### **COORDINATES OF SUBSTATION**

#### **Substation Detail**

| Substation Name                                                                                                                   | Coordinate |          |
|-----------------------------------------------------------------------------------------------------------------------------------|------------|----------|
|                                                                                                                                   | UTM        | Lat-Long |
| <b>Proposed <u>--- kV (voltage ratio)</u> ----- (No. of transformers X MVA)</b><br><br>Village:<br>Tehsil:<br>District:<br>State: |            |          |
| <b>---kV                  Sub-Station        ---</b><br><br>Village:<br>Tehsil:<br>District:<br>State:                            |            |          |

### **INDEX MAP SOI TOPOSHEETS**

## COORDINATES OF THE PROPOSED ROUTE

| Name of Transmission line |         |          |          |           |                    |                       |                    |                  |          |           |
|---------------------------|---------|----------|----------|-----------|--------------------|-----------------------|--------------------|------------------|----------|-----------|
| AP No.                    | Easting | Northing | Latitude | Longitude | Section length (m) | Cumulative Length (m) | Angle of Deviation | Crossing Details | Altitude | Wind Zone |
| GANTRY                    |         |          |          |           |                    |                       |                    |                  |          |           |
| AP-01                     |         |          |          |           |                    |                       |                    |                  |          |           |
| AP-02                     |         |          |          |           |                    |                       |                    |                  |          |           |
| AP-03                     |         |          |          |           |                    |                       |                    |                  |          |           |
| AP-04                     |         |          |          |           |                    |                       |                    |                  |          |           |
| AP-.....                  |         |          |          |           |                    |                       |                    |                  |          |           |
| AP-n                      |         |          |          |           |                    |                       |                    |                  |          |           |
| GANTRY                    |         |          |          |           |                    |                       |                    |                  |          |           |

### -----Transmission Line

#### River Crossing

| Sl. No. | Name of River | Approximate Span in Meters (bank to bank width) | Perennial / Weathered Flow | HFL Information | Navigable / Non - Navigable | Remarks (Crossing in Between Location No.) | Pile Foundations required (Yes/No) | Mid-span Piles required (Yes/No) & Nos. |
|---------|---------------|-------------------------------------------------|----------------------------|-----------------|-----------------------------|--------------------------------------------|------------------------------------|-----------------------------------------|
| 1       |               |                                                 |                            |                 |                             |                                            |                                    |                                         |
| 2       |               |                                                 |                            |                 |                             |                                            |                                    |                                         |
| ...     |               |                                                 |                            |                 |                             |                                            |                                    |                                         |
| n       |               |                                                 |                            |                 |                             |                                            |                                    |                                         |

**Railway Line Crossing**

| Sl. No. | Name of the Railway Line | Type of Gauge<br>Broad / Meter / Narrow | Single/Double/<br>Triple Line | Stone No. | Electrified / Non-Electrified | Remarks (Crossing in Between Location) |
|---------|--------------------------|-----------------------------------------|-------------------------------|-----------|-------------------------------|----------------------------------------|
| 1       |                          |                                         |                               |           |                               |                                        |
| 2       |                          |                                         |                               |           |                               |                                        |

**Power Line crossings (110 kv and Above)**

| Sl No. | Circuit Details | Voltage Rating in kV / Crossing | Name of Owner (SEBs/DOT) | Remarks (Crossing in Between Location No.) |
|--------|-----------------|---------------------------------|--------------------------|--------------------------------------------|
| 1      | Single Circuit  |                                 |                          |                                            |
| 2      | Single Circuit  |                                 |                          |                                            |
| 3      | Single Circuit  |                                 |                          |                                            |
| 4      | Single Circuit  |                                 |                          |                                            |
| 5      | Double Circuit  |                                 |                          |                                            |
| 6      | Double Circuit  |                                 |                          |                                            |

**Forest Details**

| Sl.No. | Section AP to AP | Name of the Forest | Type of Forest (Reserved / Protected / Social /Revenue) | Forest Stretches (m) | Affected Forest Area(sqkm) |
|--------|------------------|--------------------|---------------------------------------------------------|----------------------|----------------------------|
|        |                  |                    |                                                         |                      |                            |

**Wildlife/Elephant Corridor/Bird Sanctuary/GIB Details**

| Sl.No. | Section AP to AP | Name of the Wildlife | Type of Wildlife (Reserved / Protected / Social) | Wildlife Stretches (m) | Affected Wildlife Area(sqkm) |
|--------|------------------|----------------------|--------------------------------------------------|------------------------|------------------------------|
|        |                  |                      |                                                  |                        |                              |

### NH and SH Crossings

| Sl.No. | Name of the Road | Type of Road<br>National Highway<br>/ State Highway | Nearest<br>City /<br>Town<br>From<br>Crossing | Approximate<br>Both Side<br>KMS. Stone<br>of Crossing | Remarks<br>(Crossing<br>Between<br>Location<br>No.) |
|--------|------------------|-----------------------------------------------------|-----------------------------------------------|-------------------------------------------------------|-----------------------------------------------------|
| 1      |                  |                                                     |                                               |                                                       |                                                     |
| 2      |                  |                                                     |                                               |                                                       |                                                     |

## SUMMARY OF PROPOSED ROUTE

### Name of transmission Line

#### Summary of the Proposed Route

| Sl. No. | Description                                                                       | Proposed Route |
|---------|-----------------------------------------------------------------------------------|----------------|
| 1       | Bee Line Length                                                                   |                |
|         | Line Length                                                                       |                |
|         | a) Plain                                                                          |                |
|         | b) Undulated terrain                                                              |                |
| 2       | Terrain                                                                           |                |
| 3       | Snow bound Route (in meters)                                                      |                |
| 4       | Length of line in heavy rainfall area which may affect working season (in meters) |                |
| 5       | Angle Point                                                                       |                |
| 6       | Forest (Approx.)                                                                  |                |
|         | a) Reserved Forest                                                                |                |
|         | b) Protected Forest                                                               |                |
|         | Open Scrub                                                                        |                |
| 7       | Wildlife infringement                                                             |                |
| 8       | Animal/Bird sanctuary                                                             |                |
| 9       | Infringement of endangered species habitat                                        |                |
| 10      | National Park                                                                     |                |
| 11      | Great Indian Bustard (GIB) area (Priority/GIB Potential Zone)                     |                |
| 12      | Creek, Marshy and low-lying area                                                  |                |
| 13      | No. of Piles/Special Foundations required                                         |                |
| 14      | Transportation facilities                                                         |                |

|    |                                                               |  |
|----|---------------------------------------------------------------|--|
|    | Maintenance Facilities                                        |  |
| 15 | Power Line crossings (110 kV and Above)                       |  |
| 16 | Telecom Line Crossing                                         |  |
| 17 | Railway Crossing                                              |  |
|    | a) Existing                                                   |  |
|    | b) Proposed                                                   |  |
| 18 | Airport / Air Strip                                           |  |
| 19 | Upcoming Airports/ Aviation zone/ Airforce Station            |  |
| 20 | Army cantonment/Mining/No go areas/ Air Strips                |  |
| 21 | River                                                         |  |
|    | a) Major                                                      |  |
|    | b) Minor                                                      |  |
| 22 | National Expressway Crossing                                  |  |
|    | a) Existing                                                   |  |
|    | b) Proposed                                                   |  |
| 23 | NH Crossing                                                   |  |
|    | a) Existing                                                   |  |
|    | b) Proposed                                                   |  |
| 24 | SH Crossing                                                   |  |
|    | a) Existing                                                   |  |
|    | b) Proposed                                                   |  |
| 25 | Circle rate of land (Rs per Acre)                             |  |
| 26 | Land Availability (if required for acquisition)               |  |
|    | i) Extent of land available                                   |  |
|    | ii) Land use pattern (agricultural, barren, forest etc.)      |  |
|    | iii) Land ownership (Govt. Private, tribal, non- tribal etc.) |  |
| 27 | Approaches for construction                                   |  |
| 28 | Wind Zone to be considered inclusive of Overlapping Zone      |  |
| 29 | State                                                         |  |
| 30 | District                                                      |  |
| 31 | Coastal Zone                                                  |  |
| 32 | Elephant Corridor/Reserve                                     |  |

### **Results and Conclusions**

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## **CHAPTER-2.7**

### **ROUTE ALIGNMENT MAP ON DIGITIZED TOPOSHEET**

## DISCLAIMER

Bidders may please note that the Bid Process Coordinator (BPC) has carried out a survey of the Transmission System associated with the Project. While every possible care has been taken in identifying the involvement of forest area / animal and bird sanctuary/ mines in the proposed routes. However, Bidders in their own interest should carry out required surveys and field investigation for submission of their Bid. For the purpose of carrying out required survey, the address and co-ordinate of each location of sub-station has been provided by the BPC. The coordinate of location of the sub-station is only for the purpose of facilitating Bidders to locate the sub-station and the same should not be considered as the point of termination of transmission line. For exact point of termination of transmission line, the Bidder shall have to coordinate with the agency responsible for construction of sub-station / switchyard who shall provide the inter-connection facility. Bidders in their own interest should visit the project site to confirm the location of sub- stations and any apprehension in this regard should be brought to the notice of the BPC.

Failure to verify the location of sub-station, investigate the route of the Transmission Lines associated with the Project and to examine, inspect site or subsurface conditions fully shall not be grounds for a Bidder to alter its Bid after the Bid Deadline nor shall it relieve a Bidder from any responsibility for appropriately eliminating the difficulty or costs of successfully completing the Project.

The BPC, its authorized representative, any of the Long Term Transmission Customer(s), nor their directors, employees or advisors/consultants make any representation or warranty, express or implied, or accept any responsibility or liability, whatsoever, in respect of any statements or omissions made in the Survey Report, or the accuracy, completeness or reliability of information contained therein, and shall incur no liability under any law, statute, rules or regulations as to the accuracy, reliability or completeness of such survey report, even if any loss or damage is caused to the Bidders by any act or omission on their part.

## Checklist for Substation Site Survey &amp; Selection

| S. No.                                     | Particulars                                       | Yes/No | Remarks |
|--------------------------------------------|---------------------------------------------------|--------|---------|
| <b>A. General Information</b>              |                                                   |        |         |
| A.1                                        | Name of Transmission Scheme                       |        |         |
| A.2                                        | Name of Proposed Substation                       |        |         |
| A.3                                        | Voltage Level (132/220/400/765 kV/HVDC)           |        |         |
| A.4                                        | Capacity and Future Expansion Provision Assessed  |        |         |
| A.5                                        | District / State Details Available                |        |         |
| A.6                                        | Latitude & Longitude of Site Available            |        |         |
| A.7                                        | Elevation above Mean Sea Level (MSL) Available    |        |         |
| A.8                                        | Date of Survey Recorded                           |        |         |
| <b>B. Land Details</b>                     |                                                   |        |         |
| B.1                                        | Total Land Requirement Assessed                   |        |         |
| B.2                                        | Available Land Area Verified                      |        |         |
| B.3                                        | Site Dimensions (L × W) Available                 |        |         |
| B.4                                        | Land Ownership Verified                           |        |         |
| B.5                                        | Land Use Classification Available                 |        |         |
| B.6                                        | Revenue/Khasra Map Available                      |        |         |
| B.7                                        | Land Schedule Available                           |        |         |
| B.8                                        | Site Shape Suitable (Rectangular)                 |        |         |
| B.9                                        | Provision for Future Expansion Available          |        |         |
| B.10                                       | Provision for Staff Quarters Available            |        |         |
| B.11                                       | Estimated Land Cost Assessed                      |        |         |
| B.12                                       | Prevailing Market Rate Assessed                   |        |         |
| B.13                                       | Number of Landowners Identified                   |        |         |
| B.14                                       | Land Acquisition Feasibility Assessed             |        |         |
| B.15                                       | Litigation/Encroachment Status Verified           |        |         |
| <b>C. Accessibility &amp; Logistics</b>    |                                                   |        |         |
| C.1                                        | Motorable Road Available                          |        |         |
| C.2                                        | Distance from Nearest Major Road Assessed         |        |         |
| C.3                                        | Road Suitable for Heavy Equipment Transportation  |        |         |
| C.4                                        | Monsoon Accessibility Verified                    |        |         |
| C.5                                        | Bridge/Culvert Strengthening Requirement Assessed |        |         |
| C.6                                        | Nearest Railway Station Identified                |        |         |
| C.7                                        | Unloading Facility at Railhead Available          |        |         |
| C.8                                        | Nearest Airport Identified                        |        |         |
| C.9                                        | Logistics Route Survey Completed                  |        |         |
| <b>D. Topography &amp; Terrain</b>         |                                                   |        |         |
| D.1                                        | Topographical Survey Completed                    |        |         |
| D.2                                        | Contour Map Prepared                              |        |         |
| D.3                                        | Ground Level Variation Assessed                   |        |         |
| D.4                                        | Slope Suitable for Development                    |        |         |
| D.5                                        | Cutting/Filling Requirement Assessed              |        |         |
| D.6                                        | Levelling Requirement Assessed                    |        |         |
| D.7                                        | Rocky Area Assessment Completed                   |        |         |
| D.8                                        | Soil Type Identified                              |        |         |
| D.9                                        | Geotechnical Suitability Assessed                 |        |         |
| <b>E. Hydrology &amp; Flood Assessment</b> |                                                   |        |         |
| E.1                                        | Nearest River/Canal/Reservoir Identified          |        |         |
| E.2                                        | Distance from Water Body Assessed                 |        |         |
| E.3                                        | HFL Available                                     |        |         |
| E.4                                        | FRL Available (if applicable)                     |        |         |

|                                                     |                                                      |  |  |
|-----------------------------------------------------|------------------------------------------------------|--|--|
| E.5                                                 | Site Above HFL/FRL                                   |  |  |
| E.6                                                 | Waterlogging/Flood Risk Assessed                     |  |  |
| E.7                                                 | Drainage Pattern Studied                             |  |  |
| <b>F. Environmental &amp; Statutory Constraints</b> |                                                      |  |  |
| F.1                                                 | Forest Land Involved                                 |  |  |
| F.2                                                 | Eco-sensitive Zone Involved                          |  |  |
| F.3                                                 | Wildlife Sanctuary/National Park Nearby              |  |  |
| F.4                                                 | CRZ Area Involved                                    |  |  |
| F.5                                                 | Archaeological/Protected Monument Nearby             |  |  |
| F.6                                                 | Scheduled Area Involved                              |  |  |
| F.7                                                 | Mining Area/Lease Area Nearby                        |  |  |
| F.8                                                 | Defence/Airport Restriction Zone Nearby              |  |  |
| <b>G. Social &amp; Local Constraints</b>            |                                                      |  |  |
| G.1                                                 | Habitation Nearby                                    |  |  |
| G.2                                                 | Religious Structures Nearby                          |  |  |
| G.3                                                 | Graveyard/Burial Ground Nearby                       |  |  |
| G.4                                                 | School/College Nearby                                |  |  |
| G.5                                                 | Hospital Nearby                                      |  |  |
| G.6                                                 | Industrial Area Nearby                               |  |  |
| G.7                                                 | R&R Issues Anticipated                               |  |  |
| G.8                                                 | Families Likely to be Displaced Identified           |  |  |
| <b>H. Existing Utility Infrastructure</b>           |                                                      |  |  |
| H.1                                                 | Existing Transmission Lines Nearby                   |  |  |
| H.2                                                 | Existing Substation Nearby                           |  |  |
| H.3                                                 | Railway Crossing Involved                            |  |  |
| H.4                                                 | Highway Crossing Involved                            |  |  |
| H.5                                                 | Pipeline Crossing Involved                           |  |  |
| H.6                                                 | Telecom Infrastructure Present                       |  |  |
| H.7                                                 | Existing HT/LT Lines Passing Through Site            |  |  |
| <b>I. Technical Suitability</b>                     |                                                      |  |  |
| I.1                                                 | Preliminary SLD Prepared                             |  |  |
| I.2                                                 | Space Available for Planned Bays                     |  |  |
| I.3                                                 | Space Available for Future Bays                      |  |  |
| I.4                                                 | Space Available for Transformer/Reactor Installation |  |  |
| I.5                                                 | Space Available for Switchyard Expansion             |  |  |
| I.6                                                 | Line Entry/Exit Corridor Available                   |  |  |
| I.7                                                 | Minimum Three Sides Available for Line Corridors     |  |  |
| I.8                                                 | Termination Feasibility Verified                     |  |  |
| <b>J. Existing Substation Assessment</b>            |                                                      |  |  |
| J.1                                                 | Existing Substation Visited                          |  |  |
| J.2                                                 | Available Line Bays Assessed                         |  |  |
| J.3                                                 | Bus Arrangement Studied                              |  |  |
| J.4                                                 | Termination Arrangement Verified                     |  |  |
| J.5                                                 | Future Extension Feasibility Assessed                |  |  |
| J.6                                                 | RoW Constraints Identified                           |  |  |
| <b>K. Survey Deliverables</b>                       |                                                      |  |  |
| K.1                                                 | GPS Coordinates of Site Corners Available            |  |  |
| K.2                                                 | Site Photographs Attached                            |  |  |
| K.3                                                 | Drone/LiDAR Imagery Attached                         |  |  |
| K.4                                                 | Google/Bhuvan Imagery Attached                       |  |  |
| K.5                                                 | Topographical Map Prepared                           |  |  |
| K.6                                                 | Contour Map Prepared                                 |  |  |
| K.7                                                 | Revenue/Khasra Map Attached                          |  |  |
| K.8                                                 | Alternative Site Comparison Matrix Prepared          |  |  |
| K.9                                                 | Recommendation for Final Site Provided               |  |  |

|                                |                                            |  |  |
|--------------------------------|--------------------------------------------|--|--|
| <b>L. Design Inputs</b>        |                                            |  |  |
| L.1                            | Seismic Zone Identified                    |  |  |
| L.2                            | Wind Zone (NBC-2016) Identified            |  |  |
| L.3                            | Basic Wind Speed Determined                |  |  |
| L.4                            | Terrain Category Assessed                  |  |  |
| L.5                            | Construction Water Source Identified       |  |  |
| L.6                            | Construction Power Source Identified       |  |  |
| <b>M. Final Recommendation</b> |                                            |  |  |
| M.1                            | Recommended Site Finalized                 |  |  |
| M.2                            | Justification for Selection Provided       |  |  |
| M.3                            | Comparison with Alternative Sites Provided |  |  |
| M.4                            | Employer's Observations Incorporated       |  |  |
| M.5                            | Final Site Coordinates Certified           |  |  |
| M.6                            | Final Report Submitted                     |  |  |

#### Substation Site Evaluation and Ranking

| Parameter                             | Weightage (%) | Site-I Score | Site-II Score | Site-III Score |
|---------------------------------------|---------------|--------------|---------------|----------------|
| Land Availability & Shape             | 20            |              |               |                |
| Transmission Corridor Availability    | 20            |              |               |                |
| Accessibility & Logistics             | 15            |              |               |                |
| Land Cost & Acquisition Feasibility   | 15            |              |               |                |
| Topography & Leveling Requirement     | 10            |              |               |                |
| Environmental & Statutory Constraints | 10            |              |               |                |
| Future Expansion Potential            | 10            |              |               |                |
| <b>Total Score</b>                    | <b>100</b>    |              |               |                |

## Checklist for Identification of Features for Selection of Transmission Line Route

| Sl. No.  | Feature                                         | Feature Involved (Y/N) | Existing / Proposed | Details to be Considered for Route Alignment                      | Remarks |
|----------|-------------------------------------------------|------------------------|---------------------|-------------------------------------------------------------------|---------|
| <b>1</b> | Airport / Aerodrome / Airstrip                  |                        |                     | To be identified within 20 km radius of proposed route            |         |
| 1(a)     | Civil Aviation Airport                          |                        |                     | Route preferably $\geq 10$ km from Airstrip Reference Point (ARP) |         |
| 1(b)     | Defence Aviation Facility                       |                        |                     | Clearance to be obtained from concerned authority                 |         |
| 1(c)     | Emergency Landing Airstrip                      |                        |                     | Avoid wherever feasible                                           |         |
| 1(d)     | Rifle Range / Air-to-Ground Firing Range        |                        |                     | Maintain adequate lateral clearance                               |         |
| 1(e)     | Helipad                                         |                        |                     | Allowable tower height = 80 m per km distance from helipad        |         |
| 1(f)     | Radar Station                                   |                        |                     | Check restrictions from concerned authority                       |         |
| 1(g)     | Water Aerodrome                                 |                        |                     | Avoid wherever feasible                                           |         |
| <b>2</b> | Forest & Protected Areas                        |                        |                     |                                                                   |         |
| 2(a)     | Reserved/Protected Forest                       |                        |                     | Avoid/minimize forest involvement                                 |         |
| 2(b)     | Revenue/Social/Deemed Forest                    |                        |                     | Avoid/minimize involvement                                        |         |
| 2(c)     | Oran Land (Rajasthan)                           |                        |                     | Avoid to extent possible                                          |         |
| 2(d)     | National Park/Wildlife Sanctuary/Tiger Reserve  |                        |                     | Avoid and identify from Gazette Notification                      |         |
| 2(e)     | Elephant Corridor                               |                        |                     | Avoid to extent possible                                          |         |
| 2(f)     | Eco-Sensitive Zone (ESZ)                        |                        |                     | Avoid/minimize involvement                                        |         |
| 2(g)     | Coastal Regulation Zone (CRZ)                   |                        |                     | Mention category and overlap length                               |         |
| 2(h)     | GIB Priority/Potential Area                     |                        |                     | Avoid priority area; minimize potential area                      |         |
| 2(i)     | Bird Sanctuary/Avifauna Area                    |                        |                     | Avoid wherever feasible                                           |         |
| 2(j)     | Schedule-V/VI Area                              |                        |                     | Identify and minimize involvement                                 |         |
| <b>3</b> | Army Cantonment / Ammunition Depot / No-Go Area |                        |                     | Avoid                                                             |         |
| <b>4</b> | Dam / Reservoir / Catchment Area                |                        |                     | Route to be kept away from dam structures                         |         |
| <b>5</b> | Major River Crossing (>600 m)                   |                        |                     |                                                                   |         |
| 5(a)     | Navigable River                                 |                        |                     | Check as per National Waterways Act                               |         |
| 5(b)     | Non-Navigable River                             |                        |                     | Crossing details to be recorded                                   |         |
| <b>6</b> | Roads                                           |                        |                     |                                                                   |         |
| 6(a)     | National Expressway                             |                        |                     | Avoid crossing wherever possible                                  |         |
| 6(b)     | National Highway                                |                        |                     | Minimize crossings                                                |         |
| 6(c)     | State Highway                                   |                        |                     | Minimize crossings                                                |         |
| 6(d)     | Major District Road                             |                        |                     | Record crossing details                                           |         |
| <b>7</b> | Permanent Structures within                     |                        |                     | Avoid structures within                                           |         |

|           |                                          |  |  |                                                                      |  |
|-----------|------------------------------------------|--|--|----------------------------------------------------------------------|--|
|           | RoW                                      |  |  | corridor                                                             |  |
| <b>8</b>  | Railway Crossings                        |  |  | Crossing preferably outside station limits and railway boundaries    |  |
| <b>9</b>  | Existing Power Line Crossings            |  |  |                                                                      |  |
| 9(a)      | 400 kV & Above                           |  |  | Record crossing angle and clearance                                  |  |
| 9(b)      | 110 kV to 400 kV                         |  |  | Record crossing details                                              |  |
| 9(c)      | 66 kV & Below                            |  |  | Record crossing details                                              |  |
| <b>10</b> | Wind Mill Area                           |  |  | Maintain clearance = Hub Height + $\frac{1}{2}$ Rotor Diameter + 5 m |  |
| <b>11</b> | Solar Park                               |  |  | Avoid wherever feasible                                              |  |
| <b>12</b> | Natural Gas/Crude Oil/Petroleum Pipeline |  |  | Obtain crossing approval requirements                                |  |
| <b>13</b> | Mines                                    |  |  |                                                                      |  |
| 13(a)     | Major Mines                              |  |  | Avoid as far as possible                                             |  |
| 13(b)     | Minor Mines/Quarries                     |  |  | Minimize involvement                                                 |  |
| 13(c)     | Coal Blocks                              |  |  | Avoid wherever feasible                                              |  |
| 13(d)     | Underground Mines                        |  |  | Avoid wherever feasible                                              |  |
| <b>14</b> | Master Development Plan Area             |  |  | Avoid future urban/commercial zones                                  |  |
| <b>15</b> | Economic Corridor                        |  |  | Avoid                                                                |  |
| <b>16</b> | Industrial Corridor / Industrial Area    |  |  | Avoid to extent possible                                             |  |
| <b>17</b> | Landslide Prone Zone                     |  |  | Avoid                                                                |  |
| <b>18</b> | Avalanche Prone Zone                     |  |  | Avoid                                                                |  |
| <b>19</b> | Orchards / Plantations / Tea Gardens     |  |  | Minimize involvement                                                 |  |
| <b>20</b> | RoW Constraint Area                      |  |  | Assess need for monopoles/special towers                             |  |
| <b>21</b> | Coastal Area                             |  |  | Identify if within 60 km of coastline                                |  |
| <b>22</b> | Wind Zone Boundary                       |  |  | Consider 50 km buffer and higher wind zone                           |  |
| <b>23</b> | Creek / Marshy / Waterlogged Area        |  |  | Minimize involvement                                                 |  |
| <b>24</b> | Snow Zone                                |  |  | Record snow loading requirement                                      |  |
| <b>25</b> | Hilly / Undulating Terrain               |  |  | Assess impact on tower spotting and construction                     |  |
| <b>26</b> | Habitations / Villages / Towns           |  |  | Avoid as far as possible                                             |  |
| <b>27</b> | Religious Structures                     |  |  | Avoid completely                                                     |  |
| <b>28</b> | Schools / Hospitals                      |  |  | Avoid as far as possible                                             |  |
| <b>29</b> | Existing Substations                     |  |  | Assess termination feasibility                                       |  |
| <b>30</b> | Proposed Infrastructure Projects         |  |  | Check NHAI, Railways, Industrial Corridors, etc.                     |  |

**Additional summary table Selection of Transmission Line Route (Based on Desktop Survey)**

| <b>Feature</b>                                    | <b>Route-I</b> | <b>Route-II</b> | <b>Route-III</b> |
|---------------------------------------------------|----------------|-----------------|------------------|
| Estimated Route Length (km)                       |                |                 |                  |
| Forest Involvement (ha)                           |                |                 |                  |
| Protected Area Involvement (km/ha)                |                |                 |                  |
| Number of Major River Crossings                   |                |                 |                  |
| Number of Railway Crossings                       |                |                 |                  |
| Number of NH/SH Crossings                         |                |                 |                  |
| Habitation Involvement (Nos.)                     |                |                 |                  |
| Length in Hilly Terrain (km)                      |                |                 |                  |
| Length in RoW Constraint Area (km)                |                |                 |                  |
| Wind Farm Involvement                             |                |                 |                  |
| Solar Park Involvement                            |                |                 |                  |
| Pipeline Crossings                                |                |                 |                  |
| Number of Special Towers                          |                |                 |                  |
| Estimated Construction Complexity Low/Medium/High |                |                 |                  |
| Overall Ranking                                   |                |                 |                  |

## A. Technical Requirements for LiDAR Survey

| Sl. No.    | Description                                          | Unit                  | Minimum Requirement    |
|------------|------------------------------------------------------|-----------------------|------------------------|
| <b>1</b>   | Geodetic Datum & Projection                          | -                     | WGS-84, UTM Projection |
| <b>2</b>   | LiDAR Sensor                                         |                       |                        |
| 2.1        | Number of Returns per Pulse                          | Nos.                  | $\geq 4$               |
| 2.2        | Pulse Repetition Rate                                | kHz                   | $\geq 300$             |
| 2.3        | GNSS Positioning Mode                                | -                     | RTK and/or PPK         |
| 2.4        | IMU Accuracy                                         | Roll/Pitch            | $\leq 0.015^\circ$     |
| <b>3</b>   | GNSS Base Station                                    |                       |                        |
| 3.1        | Minimum Operating Time (Base Station)                | Hours                 | $\geq 4$               |
| 3.2        | Minimum Satellites for RTK/PPK Fix                   | Nos.                  | $\geq 9$               |
| 3.3        | Maximum Spacing Between Base Stations                | km                    | $\leq 10$              |
| 3.4        | Maximum Spacing Between Ground Control Points (GCPs) | km                    | $\leq 1$               |
| 3.5        | Required GCP Horizontal Accuracy ( $1\sigma$ )       | cm                    | $\leq 3$               |
| 3.6        | Required GCP Vertical Accuracy ( $1\sigma$ )         | cm                    | $\leq 2$               |
| <b>4</b>   | On-board RGB Camera                                  |                       |                        |
| 4.1        | Sensor Resolution                                    | Megapixel             | $\geq 20$ MP           |
| 4.2        | Ground Sample Distance (GSD)                         | cm/pixel              | $\leq 5$               |
| 4.3        | Planimetric Accuracy                                 | cm                    | $\leq 5$               |
| <b>5</b>   | UAV/Drone Platform                                   |                       |                        |
| 5.1        | Valid UIN and Regulatory Compliance                  | -                     | Mandatory              |
| 5.2        | Flight Endurance                                     | Minutes               | $\geq 40$              |
| 5.3        | Terrain Following Capability                         | -                     | Preferred              |
| <b>6</b>   | LiDAR Deliverables                                   |                       |                        |
| 6.1        | Point Density Requirement                            |                       |                        |
| 6.1.1      | Plain Terrain                                        | points/m <sup>2</sup> | $\geq 100$             |
| 6.1.2      | Hilly/Mountainous/Vegetated Terrain                  | points/m <sup>2</sup> | $\geq 150$             |
| <b>6.2</b> | Accuracy Requirement                                 |                       |                        |
| 6.2.1      | Non-Vegetated Vertical Accuracy (RMSEz)              | cm                    | $\leq 10$              |
| 6.2.2      | Vegetated Vertical Accuracy (RMSEz)                  | cm                    | $\leq 15$              |
| 6.2.3      | Horizontal / Planimetric Accuracy                    | cm                    | $\leq 5$               |
| <b>6.3</b> | Swath Overlap                                        |                       |                        |
| 6.3.1      | Plain Terrain                                        | %                     | $\geq 60$              |
| 6.3.2      | Forest Terrain                                       | %                     | $\geq 70$              |
| 6.3.3      | Hilly/Mountainous Terrain                            | %                     | $\geq 70$              |

## B. Deliverables from LiDAR Survey

| Sl. No. | Deliverables                            |
|---------|-----------------------------------------|
| 1       | Raw LiDAR Data (LAS/LAZ)                |
| 2       | Classified Point Cloud                  |
| 3       | Digital Terrain Model (DTM)             |
| 4       | Digital Surface Model (DSM)             |
| 5       | Digital Elevation Model (DEM)           |
| 6       | Orthophoto Mosaic                       |
| 7       | Contours (0.5 m / 1 m interval)         |
| 8       | KMZ/KML Route Files                     |
| 9       | Feature Extraction Database             |
| 10      | Transmission Line Profile               |
| 11      | Tower Spotting & Optimization           |
| 12      | PLS-CADD Compatible Files               |
| 13      | Accuracy Assessment Report              |
| 14      | Ground Control Point Register           |
| 15      | Flight Logs and GNSS Processing Reports |

The LiDAR survey shall be carried out using DGCA-compliant UAVs equipped with survey-grade LiDAR sensors and RGB cameras. The survey shall achieve the minimum point density, accuracy, overlap, and quality requirements specified herein and shall be suitable for transmission line route alignment, profiling, tower spotting, contour generation, substation planning, and preparation of DPRs using PLS-CADD or equivalent software.

## General Feature Code List (Transmission Line Survey)

| Feature Code | Feature Description       |
|--------------|---------------------------|
| 100          | Angle Point (AP)          |
| 101          | Ground Level              |
| 102          | Benchmark (BM)            |
| 103          | Temporary Benchmark (TBM) |
| 104          | Tower Location            |
| 105          | Proposed Substation       |
| 106          | Existing Substation       |
| 200          | Hut                       |
| 201          | Government Building       |
| 202          | Pump House                |
| 203          | Building                  |
| 204          | Residential Area          |
| 205          | Industry                  |
| 206          | Village                   |
| 207          | School                    |
| 208          | Industrial Area           |
| 209          | Temple                    |
| 210          | Mosque                    |
| 211          | Church                    |
| 212          | Graveyard/Burial Ground   |
| 213          | GSM Tower                 |
| 214          | Wind Mill                 |
| 215          | Water Tank                |
| 216          | Solar Park                |
| 217          | Hospital                  |
| 218          | College/Institution       |
| 219          | Defence Establishment     |
| 300          | Railway Boundary          |
| 301          | Railway Track             |
| 302          | LT Line                   |
| 303          | 11 kV OH Line             |
| 304          | 33 kV OH Line             |
| 305          | 66 kV OH Line             |
| 306          | 132 kV OH Line            |
| 307          | 220 kV OH Line            |
| 308          | 400 kV OH Line            |
| 309          | ±500 kV HVDC Line         |
| 310          | 765 kV OH Line            |
| 311          | ±800 kV HVDC Line         |
| 312          | 1200 kV OH Line           |
| 313          | Underground Cable         |
| 314          | Telephone Line/Pole       |
| 315          | Transformer               |
| 316          | Water Pipeline            |
| 317          | Gas Pipeline              |
| 318          | Oil Pipeline              |
| 319          | Other Pipeline            |
| 320          | Water Course              |

|            |                     |
|------------|---------------------|
| <b>321</b> | Canal               |
| <b>322</b> | Nallah/Drain        |
| <b>323</b> | River               |
| <b>324</b> | Pond/Lake           |
| <b>325</b> | Reservoir           |
| <b>400</b> | National Highway    |
| <b>401</b> | State Highway       |
| <b>402</b> | Major District Road |
| <b>403</b> | Village Road        |
| <b>404</b> | Concrete Road       |
| <b>405</b> | Kutcha Road         |
| <b>406</b> | Bridge              |
| <b>407</b> | Culvert             |
| <b>408</b> | Flyover             |
| <b>500</b> | Single Tree         |
| <b>501</b> | Tree Cluster        |
| <b>502</b> | Orchard             |
| <b>503</b> | Forest Area         |
| <b>504</b> | Plantation          |
| <b>505</b> | Protected Forest    |
| <b>506</b> | Reserved Forest     |
| <b>600</b> | Boundary Wall       |
| <b>601</b> | Compound Wall       |
| <b>602</b> | Fence               |
| <b>603</b> | Gate                |
| <b>604</b> | Borewell            |
| <b>605</b> | Hand Pump           |
| <b>606</b> | Open Well           |
| <b>607</b> | Quarry              |
| <b>608</b> | Mine Area           |
| <b>609</b> | Marshy Land         |
| <b>610</b> | Rocky Outcrop       |

**Additional LiDAR Classification Codes (Optional)**

| <b>Code</b> | <b>Description</b> |
|-------------|--------------------|
| GND         | Ground             |
| VEG-L       | Low Vegetation     |
| VEG-M       | Medium Vegetation  |
| VEG-H       | High Vegetation    |
| BLD         | Building           |
| PWR         | Powerline          |
| TWR         | Transmission Tower |
| BRG         | Bridge             |
| WTR         | Water Body         |

The Contractor shall adopt a standardized Feature Code List for collection, processing and presentation of survey data. All features captured during DGPS, LiDAR, walkover survey and topographical survey shall be coded using the approved Feature Code List. The same codes shall be consistently reflected in GIS databases, CAD drawings, profile plans, route maps, contour maps, KMZ/KML files and all project deliverables.