

VOLUME - II



**EPC PACKAGE WITH LAND FOR DEVELOPMENT OF UP
TO 500 MW (AC) SOLAR PV PROJECT ANYWHERE IN
THE STATE OF GUJARAT**

SCOPE OF WORK & TECHNICAL SPECIFICATIONS

PART – 1
SHEET 1 of 17

VOLUME – II

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PART – 1
SHEET 2 of 17

SCOPE OF WORK & TECHNICAL SPECIFICATIONS

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SCOPE OF WORK & TECHNICAL SPECIFICATIONS
SCHEDULE-I SCOPE OF WORK
1.0 SCOPE OF WORK:

- a) The scope of work includes Land, design, engineering, construction (as per detail technical specification) manufacturing, procurement of equipment, Transmission system including OPGW cable, FOTE at both ends (if required by SLDC/GETCO, etc.) etc. from Solar Project to GETCO Substation, shop testing, packing, transportation, delivery & unloading at site, storing and security at site, project management, stores management, insurance, erection, testing and commissioning of all equipment / system and post commissioning services of Solar PV Plant in accordance with this specification. It also includes the O&M works for period of five years.
- b) The scope of work mentioned in this specification covers all necessary works / equipment for the project. The statements and explanations contained in this regard are intended to provide a proper understanding to Bidders but should not be construed as limiting Bidder's responsibilities and / or Owner's right to amend / change the scope or the terms. It shall be clearly understood that the intent of the Owner is that the Bidder shall execute this project on turnkey basis for a lumpsum fixed price subject to the terminal points explicitly identified and consequently, any omissions, conflicts or contradictions in these specifications shall be noted, interpreted and applied appropriately to give effect to this intent. No risk related to land, soil and flooding shall not be passed on to the Owner after award of contract. Claims or disputes on account of wrong interpretation or wilful misinterpretation of this intent by bidder after award of Contract will not be entertained by Owner nor will they be legally binding on Owner.
- c) Bidder shall visit the site and assess the complete work before submitting the Bid.

1.1 SCOPE OF SUPPLY

- 1.1.1 Deleted.
- 1.1.2 Bidder to ensure that the manufacturers and makes of all the equipment offered are as per List of Approved Manufacturers as specified in Schedule -IV of this specification.
- 1.1.3 Any other supply item, erection or testing required for the plant is deemed to be considered in the scope of this contract even if not specifically mentioned in this specification.

1.2 SCOPE OF WORK - ERECTION, TESTING AND COMMISSIONING

- 1.2.1 The erection, testing and commissioning of all the equipment / items for completion of the project are deemed to be included in Bidder's scope.
- 1.2.2 Deleted.
- 1.2.3 Conducting Performance Guarantee (PG) tests and submission of relevant reports as per the agreed schedule and procedure under the supervision of Owner's representative shall be included in Bidder's scope.



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1.3 GENERAL REQUIREMENTS

1.3.1 Bidder shall comply with the following documents / guidelines:

- a) CEA / CERC
- b) CEIG requirements
- c) IEGC 2023
- d) IE rule
- e) GETCO / SLDC / RLDC /other statutory bodies

1.3.2 Bidder shall provide tariff metering system as per GETCO/SLDC/DISCOM/ any other agency for willing of power up to GACL's plant.

1.3.3 Bidder shall provide dedicated tariff metering CTs, PTs with an accuracy of Class 0.2s and 0.2 respectively with sealing arrangements as required by concerned competent authority (CTs, PTs terminals, TTB terminals front and Back, TBs, CTs, PTs compartments, Metering compartments, Meter terminal block, meter body etc.)

1.3.4 Dedicated Metering panel if required shall be provided as per regulatory commission/concern authorities /statutory body, however cost of the same is to be borne by bidder.

1.3.5 The Bidder shall be responsible for complete satisfactory working of the system with guaranteed parameters. All major equipment shall be installed, tested, and commissioned under the supervision of the manufacturer's representative of the respective equipment.

1.3.6 The detailed contract document and schedule of quantities covering even the minor equipment shall be worked out by the Bidder for the total implementation of the job. The technical requirements of the main equipment involved as per the scheme are covered in technical section and other appropriate sections forming part of this bid document.

1.3.7 The specification provided with this bidding document outlines the functional requirements. The Bidder must submit a proposal based on the functional requirements specified in the bidding documents.

1.3.8 Design temperature shall be 50°C or as per CEA Guidelines/Working committee report to be considered for design purpose for all equipment of the plant

1.3.9 The Bidder shall specifically mention in case of any deviation from the scope of the work. In general, the Bidder shall ensure compliance of all provisions of the bid documents and submit their bid accordingly and shall submit an undertaking that they have not taken any deviations.

1.3.10 Redundant Auxiliary power sources to be considered at the Solar Project.

1.3.11 Deleted.

1.3.12 The site study, if any, carried out by Owner viz., topographical survey, geotechnical survey, hydrology, ERT etc. shall be for information to Bidder. Bidder shall carry out their own study during detailed engineering. Such studies and activities shall be part of Bidder's scope.



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Bidder is responsible for all necessary studies and activities for successful completion of project.

Bidder to make necessary arrangement for construction power and water along with setting up of site offices as required for the execution of the project.

- 1.3.13 The bidder shall carry out the comprehensive operation & maintenance (O&M) of Solar plant for 5 year and Annual Maintenance Contract (AMC) of critical equipments for period of 10 year, as mentioned in tender document, of Solar PV project after successful commissioning and performance demonstration.

2.0 LAND AND POWER EVACAUTION SYSTEM

2.1 LAND FOR SOLAR PROJECT

Land for the solar project including transmission line shall be arranged by the bidder through any of the following methods for not less than 25 years from the date of commissioning of entire Project:

- a. Lease- Only Government/PSU land or MNRE/State Government Entity Approved Solar Park land /Private Land shall be accepted.
- b. Complete Land transfer (Mutation)-Government and private land shall be accepted.
- c. Right of Way for EHV transmission system from solar plant till GETCO/STU point of interconnection for 25 years from date of commissioning (minimum), including all applicable documentation, financial transactions, compensation etc shall be in bidder's scope.

Following shall be applicable for the land as a minimum:

- a. Land for the complete project with clear Title shall be transferred or leased to GIPCL without any encumbrance on land. **The Land should not be less than 3.5 Acres per MW AC. The land considered for each Solar Project Unit shall be either on complete lease or purchase but not a combination of both.**
- b. Complete transfer of ownership/sub-lease of land in favour of GIPCL shall be done within stipulated time schedule. All land documents and other requirements for applying for connectivity shall be in the bidder's scope.
- c. Tribal land shall not be accepted until the bidder furnishes approval of designated Government agencies regarding transferability of the land for the said purpose.
- d. Bidder has to bear the statutory charges like registration charges, etc. applicable for land transfer/Lease.
- e. Undertaking to establish Lease/Sub-lease/Complete transfer of 100% land for the project and unrestricted approach to the site shall be submitted along with Bid. The land should be available encumbrance free.



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Further, as a part of Bid response, the Bidder is required to demonstrate the availability of free land for setting up of the Solar Project capacity being bid by the Bidder. In case of Government land, along with the response to the bid, the bidder shall produce allocation letter from a Government Authority for government land allocated to them for RE capacity development.

In case of private land, lease or ownership documents establishing the title and legal possession to such private land is required to be produced along with the response to the Bid. The land should be available encumbrance free.

- f. The change in land parcels post award is not allowed. However, in extreme exigences GIPCL may consider the proposal for change in land parcels subject to submission of documentary evidences necessitating the change. In such situation Contractor will have to adhere to the agreed schedule without any financial implication to GIPCL. Contractor will also provide sufficient documentary evidences in respect of availability of connectivity, bays and fulfilment of other regulatory requirements at associated ISTS/STU Sub Station.
- g. Any change in quantity or recurring cost of the revenue land quoted in the bid shall be dealt as per the evaluation criteria/other relevant bid document.
- h. Project capacity at each location shall be as mentioned elsewhere in the tender document.
- i. Project site shall have identified motorable approach without any obstacle and ownership claim of any individual or agency.
- j. All the applicable permit and clearance such as Environment/Forest, Mines, Airport, Non-Agriculture use etc. from the competent authority for the land shall be arranged/facilitated by the contractor.
- k. Bidder can propose the solar project inside MNRE approved solar park (with STU connectivity) in compliance with the requirements of bid documents. All cost related to solar park (Upfront charges and recurring cost till completion of O&M period) shall be considered by the bidder as a part of the bid price. Necessary clearances from park developer/associated stake holders shall be submitted to GIPCL. Recurring cost like annual lease rent, annual park O&M charges etc. from completion of O&M period till 25th year shall be used for calculating evaluated bid price as indicated in bid evaluation criteria. The modality of payment to park developer shall be as per relevant statutory provisions.
- l. Bidder shall submit the land documents duly verified by authorized/licensed legal entity as per the appropriate procedure. GIPCL shall have right to carry out the site visit for due diligence and to get the submitted land documents verified by independent land consultant identified by them.
- m. Project registration charges: Applicable project registration charges as per Solar policy, shall be borne by GIPCL, however complete liaison work shall be done by the contractor for completion of the Project registration as well as commissioning. GIPCL will only make the payment based on final amount quoted by the respective government agencies. Project registration shall be in the name of GIPCL. In case due to connectivity/statutory requirements, GIPCL has to pay the Project registration charges second time, the same shall be recovered from respective bidder's contract price.


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Further, in case Project Development Fund as per the State Policy is required to be paid by the Developer to the State, the amount to be incurred on this account has to be declared by the Bidder. Such amount shall be paid by GIPCL. However, for evaluation the loading on account of this shall be done as per the Evaluation Criteria specified in the document.

Also, the Government of India/Supreme Court rules/guidelines issued from time to time in respect of the GIB (Great Indian Bustard) has to be adhered/comply during execution of the Project and without any Financial Implication to GIPCL and any change in Time Schedule for Project commissioning.

Power Evacuation System

Power Evacuation shall be through tie transformers at voltage level of interconnecting GETCO/STU substation, which shall be identified by bidder according to the location of solar plant. Bidders can refer to the tentative list of GETCO/STU Sub Station having available capacity at respective web portals. Supply and installation of metering panel at both ends, along with control cable shall be in bidder's scope. ABT metering arrangement at GETCO/STU substation ends shall be as per GETCO/STU requirement/standard. The system design and redundancy/capacity margin in EHV Power Transformer should be such that even during outage of one power Transformer, power equivalent to 60% of project capacity can be evacuated at any time to GETCO/STU Grid from Main pooling MV switchgear (This is not applicable for single location project size of up to 5 MW). In case bidder supply same power transformer as common mandatory spare which can be used as one to one replacement of transformers in service, then it shall also be accounted as redundancy. Bidder can adopt the following criteria for EHV power transformers:

1. 1x100% + 1 spare of equivalent capacity
2. 2x50% + 1 spare of equivalent capacity
3. 2x60%
4. 3x33.4 % (Min) or with higher number of transformer combinations.

The Tie Transformer specification, rating, configuration, dimension and foundation design shall be as per "Standard Technical Specifications of Transformer(s) for solar park Pooling Station" issued by CEA. If the transformer rating calculated as per above criteria comes out to be non-standard size with respect to the "Standard Technical Specifications of Transformer(s) for solar park Pooling Station", then next higher standard size shall be adopted.

Additionally, if Projects corresponding to award capacity are setup at more than one location, then common spare tie transformer which is interchangeable for all Projects can be considered. In such case, foundation and layout of power transformers for each Project shall be compatible to the offered spare transformer (largest size).


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The bay construction, if required, at GETCO/STU substation is in the scope of the bidder and the total cost including applicable consultancy charges (if any) for the same shall be borne by the bidder. However, Bank Guarantee (if any) to GETCO/STU shall be submitted by GIPCL.

If the bay execution work is not carried out by GETCO/STU, it shall be the responsibility of bidder for the execution of bay work along with complete integration with GETCO/STU system following the applicable standards/latest Technical Standard for Construction of Substation and Switchyard published by CEA/GETCO, data communication etc. as per requirement. All charges payable for the bay related works and co-ordination with GETCO/STU/SLDC shall be in bidder's scope. The coordination works, interface systems, software/hardware, data integration, telemetry data, RLDC/SLDC/CEA/ GETCO/STU requirements etc. as required for completeness of project commissioning are included in bidder's scope. The capacity of transmission system from solar plant to GETCO/STU substation shall comply with connectivity regulations and procedures. All equipment/hardware required for termination as well as equipment support structures and civil works for completing the connectivity of the system up to interconnection point is in the scope of the bidder.

Bidder can evacuate the power using single circuit or multi-circuit configuration having enough redundancy complying with applicable connectivity regulations and also bays specifications at the GETCO/STU Sub Station

Miscellaneous Component to be supplied:

- a. Two (2) sets- Jacks for changing the direction of bi-directional wheels of Generating Transformer.
- b. Contractor will arrange suitable number of oil filtration machines, hoses for transformer oil preparation at the time of commissioning of Transformer.

Handling and preservation of spare Power Transformer

The storage of spare Power Transformer shall be done as per standard practice. The positive pressure of N₂ shall be maintained until oil filling is started. Accessories like all Bushings, Conservator & its pipework, Breather, Buchholz relay, PRV etc. shall be necessarily mounted on transformer. The conservator along with air cell, pipework & breather arrangement shall also to be mounted.

The Oil filling under vacuum/ filtration shall be done as per standard practice followed for the main transformer. Oil used shall be same as supplied with the transformer.

Following periodical checks shall be done:

- i. The silica gel shall be monitored periodically and attended as required.
- ii. Oil level in conservator & bushings shall be periodically monitored and topped up whenever required.
- iii. The oil sample shall be taken periodically and shall be tested as per IS for water content, BDV etc.
- iv. The oil level in the Breather cup shall be checked and free air passage shall be checked.
- v. Any oil leakage etc. shall be attended immediately.


SCOPE OF WORK & TECHNICAL SPECIFICATIONS
Transportation:

The prospective bidders are advised in their interest to inspect the road conditions up to project site before submitting the bid.

Maximum weight and size of a single package should be such that the same can be transported in the easily available standard wagons or can be transported by road.

The Supplier shall dispatch the Power Transformer filled with nitrogen at positive pressure. Necessary arrangement shall be provided by the Supplier to take care of pressure drop of nitrogen during transit and storage till completion of oil filling during erection/ storage. A gas pressure testing valve with necessary pressure gauge and adaptor valve shall be provided. The representative of bidder escorting the Transformers during transportation shall maintain logbook for actual nitrogen pressure readings taken in 8 hours interval and shall be submitted to the EIC of the Project. The readings of nitrogen pressure on alternate day basis shall be provided by the supplier to purchaser from commencement of GT transportation up to receipt at site. The surprise check may be made by the customer to verify the actual nitrogen pressure readings during transportation.

Each transformer shall be fitted with impact recorders (on returnable basis for each Power Transformer) during transportation to measure the movement due to impact in all three directions. The recording shall commence in the factory before dispatch and must continue till the unit is installed on its foundation. The data of electronic impact recorders shall be downloaded at site and a hard/ soft copy of it shall be handed over to EIC.

3.0 Telemetry System

- 3.1 The arrangement to transmit data required by the Load Dispatch Centre (LDC) from Solar plant to GETCO/SLDC as per extant regulations and procedures for grid management.
- 3.2 The required hardware and software, including laying and termination/splicing with all required connectors etc. of Communication/Fibre Optic cable, to MGVCL/GETCO Substation as applicable, required for communication of Solar plant data is included in the Bidder's scope. Communication link and communication controller/Gateway used for data communication to SLDC shall be redundant (one for normal operation and other as hot standby). FOTE system for both ends if required (by SLDC/GETCO/competent authority) shall be in scope of bidder.
- 3.3 Bidders are advised to update themselves with RLDC / LDC /ALDC/ SLDC requirement for compliance related to Automatic Meter Reading (AMR), telemetry data, channel and procedures for engineering of telemetry solution accordingly.
- 3.4 The above real time data communication facility with RLDC/ LDC/ SLDC shall comply CERC (Communication System for Interstate Transmission of electricity) Regulation 2017, Procedure for Implementation of the Framework on Forecasting and Scheduling for Renewable Energy (RE) Generating Stations, CEA (Technical Standards for Communication System in Power Systems Operations) Regulations,2020 and amendments thereof. Bidder shall also comply to GERC/CERC/CEA/ Any authorities guidelines as applicable.



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4.0 TERMINAL POINTS

- a. Land along with Boundary wall, approach road up to land
- b. Solar Project includes Solar PV modules, String combiner boxes, Inverters, Switchgears (HT <), Inverter Transformers, Power Transformers, Switchyard, Cables, Fire Protection System, CCTV, SCADA, SAS, C&R panels, Weather Station, etc.
- c. Transmission system with OPGW cable up to GETCO/STU substation
- d. ABT metering system at both ends
- e. PQM meter at both ends (if applicable)
- f. FOTE at both ends, if applicable
- g. All civil work for entire project which includes work at MGVCCL/GETCO Substation also.
- h. Integrating and interfacing of Solar Plant data, voice and protection with MGVCCL/GETCO/SLDC/Competent Authority, etc. For this all required items shall be in scope of bidder.

5.0 Deleted

6.0 Tests

6.1 Type Test

All equipment to be supplied shall be of type tested design. During detailed engineering, the Bidder shall submit for Owner's approval the type test reports of all equipment. The time validity of the reports shall be as per CEA standard guidelines. For equipment where type test validity is not mentioned in CEA, Bidder to ensure the type testing is within 5 years from the LOA date. All type test reports shall be from NABL Accredited laboratory /CPRI

6.2 Routine Test

All acceptance and routine tests as per the specification and relevant standards shall be carried out. Charges for these shall be deemed to be included in the equipment price. An indicative list of tests / checks mentioned in respective specification. However, the manufacturer is to furnish a detailed Quality Plan and MQAP, CEA Guidelines for Model Quality Assurance Plan (MQAP) for Major equipment of Power Sector and in line with relevant standards indicating the practice and procedure along with relevant supporting documents.

7.0 STATUTORY COMPLIANCE, GRID CONNECTIVITY AND POWER EVACUATION

- a) Bidder shall comply all provisions and amendments including but not limited to the following. Further all the charges and approvals for commissioning and O&M of the plant is in the scope of Bidder.
 - (i) CERC (Grant of Connectivity, Long Term Access and Medium-term Access in Interstate Transmission and related matters) Regulation 2009



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- (ii) CERC's revised procedure for "Grant of Connectivity to Projects based on renewable sources to inter-state transmission system"
- (iii) CEA (Technical Standards for Connectivity to Grid) Regulation,2007
- (iv) CEA (Technical Standards for construction of Electrical Plants and Electrical Lines) Regulation,2022
- (v) CEA (Grid Standard) Regulation,2010
- (vi) CEA (safety requirements for construction, operation and maintenance of Electrical Plants and Electrical Lines) Regulations,2011
- (vii) CEA (Measures relating to Safety and Electrical Supply) Regulations,2010
- (viii) CEA (Installation and Operation of Meters) Regulations 2006
- (ix) Indian Electricity Grid Code Regulation,2010
- (x) CEA (Technical standards for communication system in Power system operations) Regulation 2020
- (xi) CERC (Communication System for Inter State Transmission of Electricity) Regulations 2017
- (xii) MNRE guidelines/OM/Advisory/Clarifications
- (xiii) CEA (Cyber Security in Power Sector) Guidelines 2021
- (xiv) POSOSCO / RLDC first time charging, approval including registration fees is in the scope of Bidder.
- (xv) Electrical inspector approval for charging of Solar generation plant and 33kV transmission lines up to PSS-1 including PTCC clearance if required.
- (xvi) GNA (General Network Access) Regulation 2022 and its amendments from time to time.
- (xvii) Guidelines for the validity period of type test(s) conducted on major electrical equipment as amended from time to time
- (xviii) Guidelines for Model Quality Assurance Plan (MQAP) for major equipment of Power sector
- (xix) GERC Regulations
- (xx) PTCC/ Section 68 or any other requirement for completion of the project
- (xxi) And any other applicable standard/regulations / draft regulations.

b) Inverter and WMS shall be provided with Dual Master facility.

c) Bidder shall conduct and get approval for detailed Grid compliance studies with Power Plant Controllers for solar project as per CEA technical standard for grid connectivity and latest guidelines and practices of GERC/GETCO/SLDC, etc. for first charging clearance (within stipulated timeline as given in the applicable regulations). Bidder to refer latest FTC (First Time Charging) procedures as applicable. The grid compliance studies to be done in PSS/E and PSCAD as per GETCO/SLDC requirement. Bidder shall provide and get approval from respective authorities, all the technical details including but not limited to Inverter bench marking report, Generic model data of inverters, suitable for use in PSS/E and PSCAD software available at RLDC and Encrypted user-defined model (UDM) /generic model of inverter in suitable software format as per requirement of RLDC. In case any site testing required for grid compliance shall also be conducted by Bidder.

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- d) Bidder shall prepare and get approval from applicable authorities the detailed consolidated Grid compliance system studies as per GNA/CEA regulations during detail engineering up to MGVCL/GETCO Substation as applicable and any other approvals for commissioning of Solar Project. Bidder to check availability of PSSE and PSCAD model of Inverter and PPCs shall be ensured by Bidder during selection of respective Manufacturer(s).
- e) The preliminary system study input parameters related to the Solar Project, Transmission line, GETCO Substation and all other details pertaining to Solar Project and transmission line shall be provided by the successful Bidder during detail engineering stage.
- f) Any other parameters required for system study is in the scope of Bidder.
- g) Bidder shall update themselves latest requirement for technical data requirement/ PSSE/PSCAD generic Model as per SLDC/GETCO.
- h) All equipment, materials and services whether explicitly stated in Technical Specifications or otherwise and that are necessary for the successful commissioning of Solar Plant as per latest statutory regulations/procedures issued by bodies like CERC/SERC, CEA, SLDC, STU, MNRE, other Ministry /Authorities etc. shall be deemed to be included in the scope of work of the Bidder.


SCOPE OF WORK & TECHNICAL SPECIFICATIONS
SCHEDULE-II PROJECT INFORMATION
1.0 PROJECT INFORMATION

Introduction:

GIPCL proposes to setup Ground mounted solar PV projects for aggregate capacity up to 500 MW (AC) within the state of Gujarat. Capacity of individual solar block shall be minimum as follows

- a. For evacuation in 11kV Grid of MGVCCL- 16 MW (AC) (single project cannot be less than 4 MW and total 16 MW capacity shall be within radius of 5 KM from each other)
- b. For evacuation at 400/220/132/66kV level - 25 MW.

The Solar Projects shall be implemented as EPC package.

Project Capacity :Up to 500 MW (AC)

Name of the Project : EPC package with land for development of Solar Projects (up to 500 MW) within the state of Gujarat and to be connected in GETCO/STU network

2.0 Project capacity

| | |
|---------------------|--|
| Name of the Project | EPC PACKAGE WITH LAND FOR DEVELOPMENT OF UP TO 500 MW (AC) SOLAR PV PROJECT ANYWHERE IN THE STATE OF GUJARAT |
| Plant Capacity | <ol style="list-style-type: none"> a. For evacuation in 11kV Grid of MGVCCL- 16 MW (AC) (single project cannot be less than 4 MW and total 16 MW capacity shall be within radius of 5 KM from each other) b. For evacuation at 400/220/132/66kV level - 25 MW. |

3.0 TECHNOLOGY

In Solar Photo Voltaic Power Generation, the direct conversion of solar radiation into electricity is achieved by using semiconductor devices "Solar Cells", which work on the principles of photo electric effect.

4.0 OTHER DETAILS

The following clearances shall be arranged by bidder. However, necessary documentations/ applications shall be in the name of GIPCL.

| Sr. No. | ITEM | DETAILS |
|---------|---------------------------------------|-----------------------------|
| 1 | Water Requirement during construction | By bidder |
| 2 | Power Requirement during construction | By bidder |
| 3 | MNRE Clearance | To be facilitated by bidder |


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| | | |
|---|---|-----------|
| 4 | Chief Electrical Inspector Clearance | By bidder |
| 5 | Any other applicable clearance/approval required for commissioning and O&M of the plant | By bidder |
| 6 | Land and RoW related clearance | By bidder |

5.0 SITE SPECIFIC TECHNICAL DATA

A. SOLAR INSOLATION DATA FOR PROPOSED SITE: Bidder shall submit the Solar Insolation and guaranteed generation unit for the offered Land using Solargis data of that particular location.

B. MODULE MOUNTING – Fix / Tracker (Seasonal) Manual Tilt is not acceptable.

C. CABLE LAYING METHODOLOGY

- All cable to be laid above ground / underground keeping in view of the site-specific issues related to water submergence, soil condition etc, which shall be reviewed during the detail design engineering. Bidder may suggest alternate cable laying methodology which will be finalised during detail engineering. Bidder to ensure that the cables are laid properly in line with the design consideration adopted in sizing calculations and have to guarantee the cable performance and tolerance to the site conditions.
- The cables specifications / design shall be suitably selected as per laying final philosophy/ methodology decided during detail engineering by the Bidder considering the site environmental conditions etc. Bidder shall submit the final specification with methodology for GIPCL Approval. Methodology for all underground 33kV cables (including spare 33kV cable) laying in Park area (in allocated corridor) shall be as per Park Developer's requirements if offered land is in RE park.

D. PROJECT LOCATION CLASSIFICATION (CORROSION PROTECTION)

- Corrosive Category (Galvanization):** For Project site with normal conditions, the Galvanization of all structural steel shall be min. 80 microns at any point of Galvanization. No averaging is allowed to measure the thickness of Galvanization. Galvanization shall be as per IS Standard.
- Corrosive Category (Galvanization):** For Project site having high Saline Zone and extreme weather condition, Galvanization shall be as follows:

| Parameter | Corrosive Category (as per ISO12944-2) | Minimum Galvanized Thickness at any point of measurement and no averaging shall be allowed |
|--|---|---|
| For below Ground Structures (including up to 300mm above ground) | C5-M | 110 Microns |


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| | | |
|---|----|------------|
| For Above Ground Structures (Beyond 300mm) | C4 | 90 Microns |
|---|----|------------|

3. Corrosive category (for Paints)

- a) Classification of environments for Corrosive category shall be in accordance with ISO12944-2, the applicable atmospheric corrosivity categories C4 (high); C5-M (very high marine).
- b) ISO12944-5 shall be used related to paint systems in combination with guidance for the selection of different types of protective paint system.
- c) Wherever specification allows LT electrical panels, UPS, SCADA panel, Fire protection panel etc. associated with Inverter station to be placed outdoor, the enclosure of the same should be well engineered product having proper ventilation system and must be protected from harsh environment & direct sunlight/rainfall. Radiation and absorption effects of outdoor environment must be considered for temperature rise calculations. The temperature rise should not be more than working temperature of components. Requirement of suitable shed/canopy shall be reviewed based on the offered solution during detailed engineering stage.
- d) For metal enclosed outdoor HT switchgear, pooling switchgear on the LT side (if applicable) from string inverter to inverter transformer, suitable shed shall be provided considering the O&M space.
- e) Painting of outdoor metallic enclosed electrical panels including HT switchgear shall be as per ISO 12944-5, corresponding to minimum C5 category.
- f) For outdoor inverter including containerized solution, painting corresponding to site condition shall be provided.

Unless noted otherwise, all steel structures exposed to environment would be painted to meet the requirements as mentioned in Clause no 5 (D) of Project information.

E. SEISMIC DATA & DESIGN CRITERIA – Land location as per Seismic Zone of IS 1893 (Part 1) design criteria shall be followed.

F. WIND DATA & DESIGN CRITERIA

Basic wind speed shall be as per IS 875 (Part-3) (Based on survey of India Political map printed in 2002).

The minimum design wind pressure (Pd) to be considered for design of MMS, Equipment Fixing, Buildings, Rooms, etc. as below:

| BASIC WIND SPEED, m/s | Design Wind Pressure, min, Pd (N/m ²) |
|-----------------------|---|
| 47 | 890 |

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The minimum design wind pressure (Pd) = 890 N/m²

G. The requirement of Comprehensive AMC of Critical Equipment is as follows:

| Equipment/System | Comprehensive AMC* |
|-------------------------|--------------------|
| Inverter | 10 Years |
| SCADA | 10 Years |
| SAS (if applicable) | 10 Years |
| Tracker (if applicable) | 10 Years |

* Starts from date of commissioning of full capacity of Solar PV project.

**SCOPE OF WORK & TECHNICAL SPECIFICATIONS****PROVENNESS CRITERIA**

The vendor/ sub-vendor(s) who are not part of Approved vendor List is/are required to meet the Provenness criteria and/or qualification requirement for critical component and bought out item as per the criteria stipulated below:

1. Tracker System (if applicable):

The vendor should have designed, manufactured, supplied, erected/supervised erection, and commissioned/supervised commissioning Solar Tracker System of the proposed design/type of cumulative capacity of 40 MWp or above, out of which at least one such supply order for a single plant should be of 10 MWp or above capacity. The Vendor may use the credentials of its Parent/Group/Holding company for meeting the requirement. The reference plant in which 10 MWp or above capacity Solar Tracker System was supplied, must have been in successful operation for at least one (1) year prior to the following reference date:

Date of submission of Provenness documents to GIPCL or (LOA date + 6 months), whichever is earlier.

And

The proposed Tracker design/type shall be of proven technology with Independent Engineers Bankability review report from reputable agencies like Black and Veatch, DNV, IITs or other premier institutions/agencies.