



**STATE BANK OF INDIA**  
PREMISES AND ESTATE DEPARTMENT,  
LOCAL HEAD OFFICE, 2<sup>ND</sup> FLOOR, III/1, PT. J N MARG  
BHUBANESWAR-751001

**PART - I**

**TECHNICAL BID**

**E-TENDERING  
FOR**

**DESIGN, SUPPLY, INSTALLATION, TESTING AND COMMISSIONING (SITC) OF RE-MOTE MONITORING ON-GRID ROOFTOP SOLAR (PV) POWER SYSTEM AT AIIMS CAMPUS BRANCH, BHUBANESWAR, ODISHA**

<b>Tender No. BHU/P&amp;E/2024-25/22</b>
<b>Date: 05.09.2024</b>

**ELIGIBILITY: BANK'S EMPANELLED SOLAR VENDORS OF BHUBANESWAR CIRCLE UNDER CATEGORY SOA, SOB & SOC**

NAME OF TEDERER : .....

ADDRESS : .....

GST No. : .....

## NOTICE INVITING TENDERS

State Bank of India, Bhubaneswar Circle invites e-Tenders for Design, Supply, Installation, Testing and Commissioning (SITC) of remote monitoring grid connected (net metering) rooftop solar power system of tentative total capacity of 18kWp at AIIMS Campus Branch, Bhubaneswar on CAPEX model from **Bank's empanelled Solar Vendors of Bhubaneswar Circle.**

The other details of the tender are as under:

1.	Name of Work	Design, Supply, Installation, Testing and Commissioning (SITC) of Rooftop On-Grid connected Solar Power Plant of tentative total capacity of 18kWp at AIIMS Campus Branch, Bhubaneswar on CAPEX model.
2	Installation capacity	18kWp* *kWp may slightly vary as per site condition.
3	Earnest Money Deposit (EMD)	Rs.10,600/- (Rupees Ten Thousand Six Hundred only) as EMD submitted in the form of DD in favor of <b>State Bank of India</b> payable at <b>Bhubaneswar</b> on or before 11:00 AM, 09.09.2024 at LHO, Bhubaneswar. <u>Contractors submitting one time EMD/FD/relevant MSME certificate for EMD exemption need to update the scan copy online without fail.</u>
4	Initial Security Deposit (ISD)	NA
5	Date for downloading of Tender Document.	<b>11:00AM, 05.09.2024 to 11:00AM, 09.09.2024</b> from Bank's website: <a href="https://bank.sbi/web/sbi-in-the-news/procurement-news">https://bank.sbi/web/sbi-in-the-news/procurement-news</a> and <a href="https://tenderwizard.com/SBIETENDER">https://tenderwizard.com/SBIETENDER</a>
6	<b>Date and time for submission of Technical and Price Bid online.</b>	<b>Up to 12:00 PM on 09.09.2024.</b>  Note: The bidder should have valid digital signature for this e tender.
7	Documents to be submitted online	Bidders should submit the scan copy of the following documents without fail:  1) A copy of EMD or one time EMD/FD/relevant MSME certificate for EMD exemption.  2) A copy of Technical bid to be signed and sealed by the Authorized
8	<b>Date and time for opening of Technical Bid online.</b>	<b>At 12:10 PM on 09.09.2024</b>
9	<b>Date and time for opening of Price Bid online.</b>	<b>At 12:30 PM on 09.09.2024</b>
10	Validity of Offer for acceptance by the Bank.	3 (three) months from the date of opening of price bid.
11	Date of Commencement of Work	Immediately from the date of issue of work order.

12	<b>Time allowed for completion of work</b>	<p>1) Installation should be completed within 6 days from the date of issue of work order and;</p> <p>2) Net-metering to be completed by 31.10.2024.</p>
13	Deduction of TDS	Deduction will be made as applicable
14	Terms and mode of payment	<p>i. <b>75%</b> of total project cost against supply and installation of the solar plant on submission of test certificates with necessary documents showing requisite quality as mentioned in tender document.</p> <p>ii. <b>20%</b> of total project cost against testing and commissioning following the submission of 1<sup>st</sup> month power generation report supported by the on-grid solar inverter reading installed with the Solar Power Plant.</p> <p>iii. <b>5%</b> of total project cost will be held with us as a Security Deposit for 5 yrs (from the date of completion of work) and could be released against submission of Performance Bank Guarantee from any scheduled/ commercial Bank, other than SBI.</p> <p>iv. Payment shall be made by way of Electronic fund transfer and the bill will be paid by the SBI. Firm should furnish details of the bank, A/c no, IFSC code.</p> <p>v. Payments towards the above work shall be made by SBI. The GST Number of State Bank of India for Bhubaneswar is 21AAACS8577K1Z1.</p>
17	Penalty/ Liquidated damages	As per relevant clause in the tender document If the bidder is not able to complete within stipulated time from date of issue of work order, 0.5 % per week subject to total amount of 5% of Contract Value.
18	<b>Defect liability period/ warranty</b>	<b>The Solar PV Panels/ mechanical structures, power conditioners/ inverters/ charge controllers/ maximum power point tracker units and all allied equipment must be warranted against any manufacturing/ design/ installation defects for a period of 5 year from the date of completion (commissioning).</b>
19	Insurance	As per insurance clause of the tender document
20	Contact person for technical queries:	<p>1.Tapan Ku. Behera, Manager (Elect), Ph: 9867991919.</p> <p>2.B.Veera Pratap, Deputy Manager (Elect), Ph: 9937337964.</p>
21	<b>Declaration from OEM of On-Grid Solar Inverter</b>	<u>Bidder should submit the physical copy of declaration form duly signed by the Original Equipment Manufacturer of On-Grid Solar Inverter confirming the warranty of the equipment at our Office address and upload the same online along with the indicative price bid without fail.</u>

Note:

- In case the date of opening of tenders is declared as a holiday, the tenders will be opened on the next working day at the same time.
- The bidder, who is the authorized representative and participating on behalf of company/ Dealer/vendor, should have a valid digital signature certificate (DSC) for this e-tender. The validity of the DSC should be at least 3 months.

- Those bidders who got qualified in technical bid, only their price bid will be considered for opening.
- **SBI reserves the right to increase or decrease the Solar Power (PV) capacity (kWp) and also reserves the right to reject, cancel or revise or accept any or all the tenders without giving any reasons thereto.**
- **SBI reserves the rights to accept/reject any/all tender without assigning any reasons whatsoever and to increase or decrease the quantities of any item and contractor has to execute the same at the rate quoted and no correspondence shall be entertained in this regard.**
- **Conditional tenders are liable for rejection.**
- **Successful bidder(s) may visit the Branch allotted/ awarded before installation of Solar Power System (kWp) and submit the feasibility report as per the site condition.**

Assistant General Manager (P&E)

SBI LHO, Bhubaneswar.

## **BUSINESS RULES FOR ONLINE TENDER**

### **GENERAL TERMS AND CONDITIONS:**

1. For the proposed online bidding, interested and eligible vendors for the said purpose who fulfill all terms and conditions.
2. SBI will engage the services to a service provider who will provide all necessary training and assistance before commencement of online bidding on Internet.
3. SBI will inform the vendor in writing in case of online bidding, the details of service provider to enable them to contact and get trained.
4. Business rules like event date, time, start price, bid decrement, extensions, etc. also will be communicated through service provider for compliance.
5. Opening of online bids will be conducted on schedule date & time.
6. At the end of online bidding event, the lowest bidder value will be known on the network.
7. The lowest bidder has to fax the duly signed filled-in prescribed format as provided on case-to-case basis to SBI through service provider within 24 hours of completion of tender without fail.
8. Any variation between the on-line bid value and signed document will be considered as sabotaging the tender process and will invite disqualification of vendor to conduct business with SBI as per prevailing procedure.
9. In case SBI decides not to go for online bidding on procedure for this tender enquiry, the price bids and price impacts, if any already submitted and available with SBI shall be opened as per SBI standard practice.
10. Business Rule for finalization of the Tender: SBI shall finalize the tendering process of the item through online bidding mode. SBI has made arrangement with M/s Antares Systems Limited, Bangalore, who shall be SBI's authorized service provider for the same. Please go through the guidelines given below and submit your acceptance to the same along with your Commercial Bid.
  - Computerized online tendering shall be conducted by SBI, on pre-specified date, while the vendors shall be quoting from their own offices/ place of their choice. Internet connectivity and other paraphernalia requirements shall have to be ensured by vendors themselves. In the event of failure of their Internet connectivity, (due to any reason whatsoever it may be) it is the bidders responsibility / decision to send fax communication, immediately to ASL furnishing the price, the bidder wants to bid online, with a request to ASL to upload the faxed price on line so that the service provider will up load that price on line on behalf of the Bidder. It shall be noted clearly that the concerned bidder communicating this price to service provider has to solely ensure that the fax message is received by ASL in a readable / legible form and also the Bidder should simultaneously check up with ASL over phone about the clear receipt of the price faxed. It shall also be clearly understood that the bidder shall be at liberty to send such fax communications of prices to be up loaded by ASL only before the closure of Bid time and under no circumstances it shall be allowed beyond the closure of bid time. Such bidders have to ensure that the service provider is given a reasonable required time by the bidders, to upload such faxed prices online and if such required time is not available at the disposal of ASL at the time of receipt of the fax message from the bid-

ders, ASL will not be uploading the prices. It is to be noted that either SBI or ASL are not responsible for these unforeseen circumstances. In order to ward-off such contingent situation, bidders are requested to make all the necessary arrangements / alternatives whatever required so that they are able to circumvent such situation and still be able to participate in the online bidding successfully. However, the vendors are requested not to wait till the last moment to quote their bids to avoid any such complex situations.

- ASL shall arrange to train your nominated person(s), without any cost to you. They shall also explain you, all the Rules related to the Tendering/ Business Rules Document to be adopted along with bid manual. You are required to give your compliance on it before start of bid process.
- **BIDDING CURRENCY AND UNIT OF MEASUREMENT:** Bidding will be conducted in Indian Rupees (INR) per -one- (Unit) of the items.
- **BID PRICE:** The Bidder has to quote the total cost to SBI of the items specified inclusive of all taxes, duties, freight, service tax, overhead, contractor's profit etc. excluding GST. GST shall be paid extra as applicable.
- **VALIDITY OF BIDS:** The Bid price shall be firm for a period of three calendar months from the date of acceptance of tender which may be extended for a further period subject to mutual agreement.
- The successful bidder has to provide a detail break up for his commercial offer.
- Your bid will be taken as an offer to supply. Bids once made by you, cannot be cancelled / withdrawn and you shall be bound to supply as mentioned above at your final bid price. Should you back out and not execute the work as per the rates quoted, the earnest money deposited by you with us in this regard shall be forfeited without further reference to you.
- You shall be assigned a Unique User Name & Password by ASL. You are advised to change the Password after the receipt of initial Password from ASL to ensure confidentiality. All bids made from the Login ID given to you will be deemed to have been made by your company.
- At the end of the online tendering process, SBI will decide upon the winner. SBI's decision on award of Contract shall be final and binding on all the Bidders.
- SBI shall be at liberty to cancel the tender at any time, before ordering, without assigning any reason.
- SBI shall not have any liability to bidders for any interruption or delay in access to the site irrespective of the cause.
- Other terms and conditions shall be as per your techno-commercial offers and other correspondences till date.
- You are required to submit your acceptance to the terms / conditions / modality given above before participating in the online bidding.
- Successful bidder shall enter into a contract with the bank to carry out the work as per Bank's standard format.
- **OTHER TERMS & CONDITIONS:** The Bidder shall not involve himself or any of his representatives in price manipulation of any kind directly or indirectly by communicating with other suppliers/ bidders.

- The Bidder shall not divulge either his Bids or any other exclusive details of SBI to any other party. SBI's decision on award of Contract shall be final and binding on all the Bidders.
- SBI along with ASL can decide to extend, reschedule or cancel any tender. Any changes made by SBI and / or ASL, after the first posting will have to be accepted if the Bidder continues to access the site after that time.
- ASL shall not have any liability to Bidders for any interruption or delay in access to the site irrespective of the cause.
- ASL is not responsible for any damages, including consequential damages, including but not limited to systems problems, inability to use the system, loss of electronic information etc.

**N.B.** - All the bidders are requested to ensure that they have a valid digital certificate well in advance to participate in the online event. All the Bidders are required to submit the Agreement Form (Annexure- I) duly signed to M/s Antares system Limited, Bangalore, before due date. After the completion of the tender event, all the Bidders have to submit the Price Breakup immediately to M/s Antares system Limited, Bangalore for further proceedings.



## **PROCESS COMPLIANCE FORM**

(The bidders are required to print this on their company's letter head and sign, stamp before faxing)

To

Date:

M/s Antares Systems Limited,  
Registered Office at: - #24, Sudha Complex,  
3rd Stage, 4th Block,  
Bangalore – 560079.  
Ph.: 080-49352000 / 40482000  
Fax: 080-49352034

### **SUB: AGREEMENT TO THE PROCESS RELATED TERMS AND CONDITIONS FOR THE ONLINE BIDDING**

Dear Sir,

This has reference to the Terms & Conditions for the online bidding mentioned in the Tender for **“Design, Supply, Installation, Testing & Commissioning of On-Grid Remote Monitoring Rooftop Solar (PV) Power System at AIIMS Campus Branch, Bhubaneswar.”** This letter is to confirm that:

- 1) The undersigned is authorized representative of the company.
- 2) We have studied the Commercial Terms and the Business rules governing the online bidding and the RFP as mentioned in your letter and confirm our agreement to them.
- 3) We also confirm that we have taken the training on the tender tool and have understood the functionality of the same thoroughly.
- 4) We confirm that SBI Group and ASL shall not be liable & responsible in any manner whatsoever for my/our failure to access & bid on the e-tender platform due to loss of internet connectivity, electricity failure, virus attack, problems with the PC, any other unforeseen circumstances etc. before or during the tender event.
- 5) We understand that in the event we are not able to access the tender site, we may authorize ASL to bid on our behalf by sending a fax containing our offer price before the tender close time and no claim can be made by us on either State Bank Group or ASL regarding any loss etc. suffered by us due to acting upon our authenticated fax instructions.
- 6) I/we do understand that ASL may bid on behalf of other bidders as well in case of above mentioned exigencies.
- 7) We also confirm that we have a valid digital certificate issued by a valid Certifying Authority.
- 8) We also confirm that we will fax the price confirmation & break up of our quoted price as per the format as requested by SBI / ASL.
- 9) We, hereby confirm that we will honor the Bids placed by us during the tender process.





10) We read each pages, understood the technical bid & BOQ and I/we hereby agree to abide by and fulfill the terms and provisions and accepting all terms and conditions stipulated in the tender documents. After the accomplishment of tendering procedure, if we become the lowest bidder shall submit the hard copy of the Technical document duly signed with seal by the authorized representative/proprietor of the firm at the under mentioned office.

We, hereby confirm that we will honor the Bids placed by us during the tender process.

With regards

Signature with company seal

Date:

Name:

Company / Organization

**ARTICLES OF AGREEMENT**

This AGREEMENT is made at ..... on this ..... day of ..... between SBI, a body Corporate created under SBI Act 1955, having its Corporate Centre at State Bank Bhavan, Madame Cama Road, Mumbai 400 021 and one of the Circle office at III/1 Pandit Jawaharlal Nehru Marg, Bhubaneswar- 01 represented by authorized officer of SBI. (hereinafter called “the Employer”) on the one part and M/s \_\_\_\_\_ (proprietorship/partnership firm/Company), incorporated under the provisions of the Companies Act and having its registered office at \_\_\_\_\_ (hereinafter called “the Vendor”) represented by Shri ..... who is authorized to enter this agreement by its Board of Directors on the other part. +

AND WHEREAS the Employer has intention of engaging an empanelled Solar Power System vendor of SBI for execution of **Design, Supply, Installation, Testing & Commissioning of On-Grid Remote Monitoring Rooftop Solar (PV) Power System at AIIMS Campus Branch, Bhubaneswar.**

AND WHEREAS the Employer had called for tenders from empanelled vendors for the proposed work as indicated in the scope of work and other documents attached to the tender.

AND WHEREAS the Vendor and others submitted the tenders and the Employer has awarded the contract relating to “**Design, Supply, Installation, Testing & Commissioning of On-Grid Remote Monitoring Rooftop Solar (PV) Power System at AIIMS Campus Branch, Bhubaneswar**” as stated in the scope of work attached to the Tender Document to the Vendor.

AND WHEREAS both the parties to this agreement are desirous of recording the terms and conditions upon which the said services are to be rendered by the Vendor.

NOW IT IS HEREBY AGREED AS FOLLOWS:

1. In consideration of the said Contract Amount to be paid at the times and in the manner set forth in the said Conditions, the Contractor shall upon and subject to the said Conditions execute and complete the work shown upon the said Drawings and described in the said Specifications and the priced Schedule of Quantities.
2. The Employer shall pay to the Contractor the said Contract Amount, or such other sum as shall become payable, at the times and in the manner specified in the said Conditions.
3. The said Conditions and Appendix thereto shall be read and construed as forming part of this Agreement, and the parties hereto shall respectively abide by submit themselves to the said Conditions and perform the Agreements on their part respectively in the said Conditions contained.
4. The Plans, Agreements and Documents mentioned herein shall form the basis of this Contract.
5. This Contract is neither a fixed lump-sum contract nor a piece work contract but a contract to carry out the work as per enclosed schedule of Items and to be paid for according to actual measured quantities at the rates contained in the Schedule of Quantities or as provided in the said Conditions and approved by the SBI.
6. The Contractor shall afford every reasonable facility for the carrying out of all works relating to **Design, Supply, Installation, Testing & Commissioning of On-Grid Remote Monitoring Roof-**



**top Solar (PV) Power System at AIIMS Campus Branch, Bhubaneswar**, in the manner laid down in the said Conditions, and shall make good any damages done to walls, floors, etc. after the completion of his work.

7. The Employer reserves to itself the right of altering the drawings and nature of the work by adding to or omitting any items of work or having portions of the same carried out without prejudice to this Contract.

8. Time shall be considered as the essence of this Contract and the Contractor hereby agrees to commence the work soon after the Site is handed over to him and to complete the installation work within 6 days and net-mtering by 31.10.2024 subject to nevertheless the provisions for extension of time.

9. All payments by the Employer under this Contract will be made by State Bank of India.

10. All disputes arising out of or in any way connected with this Agreement shall be deemed to have arisen at Bhubaneswar and only the Courts in Bhubaneswar shall have jurisdiction to determine the same.

11. That the several parts of this Contract have been read by the Contractor and fully understood by the Contractor.

IN WITNESS WHEREOF THE EMPLOYER and the Contractor have set their respective hands to these presents and two duplicates hereof the day and year first hereinabove written.

SIGNATURE CLAUSE

SIGNED AND DELIVERED by the

\_\_\_\_\_ By the

(Employer)

hand of Shri \_\_\_\_\_

\_\_\_\_\_

(Signature of Employer)

(Name and Designation)

In the presence of :

Shri / Smt. \_\_\_\_\_

(Signature of Witness)

Address \_\_\_\_\_

\_\_\_\_\_

(Witness)

SIGNED AND DELIVERED by the

\_\_\_\_\_ by the



(Contractor)

(Signature of Contractors)

in the presence of :

Shri / Smt. \_\_\_\_\_

(Signature of Witness)

Address \_\_\_\_\_

## **INSTRUCTIONS TO THE TENDERERS:**

### **1.0 Scope of Work**

Online Tenders are invited for **Design, Supply, Installation, Testing & Commissioning of Remote Monitoring On-Grid Rooftop Solar (PV) Power System at AIIMS Campus Branch, Bhubaneswar.**

### **1.1 Site and Its Location**

The proposed work is to be carried out at the locations listed here under:

Sl. No.	Name of the Branch Building	Zone	Proposed Solar Plant Capacity (kWp)
1.	AIIMS Campus Branch, Bhubaneswar	Bhubaneswar	18

### **2.0. Tender Documents**

**2.1.** The work has to be carried out strictly according to the specifications and conditions stipulated in tender consisting the following documents and the most workman like manner,

- 2.1 (a) Instructions to tenderers
- 2.1 (b) General Conditions of Contract
- 2.1 (c) Special Conditions of Contract
- 2.1 (d) Additional Conditions for Electrical Installation
- 2.1 (e) Technical Specifications
- 2.1 (f) Priced Bid

**2.2.** The above documents shall be taken as complementary and mutually explanatory of one another but in case of ambiguities or discrepancies, shall take precedence in the order given below:

- a. Price Bid
- b. Technical Specifications
- c. Additional Conditions for Electrical Installation
- d. Special Conditions of Contract
- e. General Conditions of Contract
- f. Instructions to Tenderers

**2.3.** Complete set of tender documents including can be downloaded from <https://bank.sbi/web/sbi-in-the-news> under Procurement News and <https://tenderwizard.com/SBIETENDER>

### **3.0 SITE VISIT**

**The tenderer must obtain himself on his own responsibility and his own expenses all information and data which may be required for the purpose of filling this tender document**

**and enter into a contract for the satisfactory performance of the work. The Tenderer is requested satisfy himself regarding the availability of water, power, transport and communication facilities, the character, quality and quantity of the materials, labour, the law and order situation, climatic conditions local authorities requirement, traffic regulations etc.**

The tenderer will be fully responsible for considering the financial effect of any or all the factors while submitting his tender.

**4.0 EARNEST MONEY: Rs.10,600/-**

**5.0 INITIAL SECURITY DEPOSIT: NA**

**6.0 SECURITY DEPOSIT**

**6.1 Total security deposit shall be 5% of the final value of the work shall be deducted from the final bill of the work as Retention Money. Retention Money shall be paid after the defects liability period of 5 year as specified in the contract. The retention money will be interest free.**

**6.2 ADDITIONAL SECURITY DEPOSIT**

In case L-1 bidder quotes abnormally low rates (i.e.10% or more, below estimated project cost), the bank may ask such bidder to deposit additional security deposit (ASD) equivalent to difference of estimated cost vis-à-vis L-1 quoted amount for due fulfilment of contract. Such ASD could be in the form of FDR / Bank's guarantee in the Bank's name as per format approved by the Bank. On successful completion of work ASD will returned to the contractor. In case contractor fails to complete the work in time or as per tender specification or leave the job incomplete, the Bank will be at liberty to recover the dues from ASD or to forfeit such ASD as the case may be within its sole discretion.

6.3 No interest shall be paid to the amount retained by the Bank as Security Deposit.

**7.0 SIGNING OF CONTRACT DOCUMENTS**

The successful tenderer shall be bound to implement the contract with SBI by signing an agreement and conditions of contract attached herewith within **15 days** from the receipt of intimation of acceptance of his tender by the SBI. However, the written acceptance of the tender by the SBI will constitute a binding agreement between the SBI and successful tenderer whether such formal agreement is subsequently entered into or not.

**8.0 COMPLETION PERIOD:** As mentioned in the NIT.

**9.0 VALIDITY OF TENDER: 3 Months**

Tenders shall remain valid and open for acceptance for a period of 3 (Three) months from the date of opening price bid. If the tenderer withdraws his/her offer during the validity period or makes modifications in his/her original offer which are not acceptable to the SBI without prejudice to any other right or remedy the SBI shall be at liberty to take necessary action on the concerned company/agency.

**10.0 LIQUIDATED DAMAGES**

The liquidated damages shall be 0.5% per week subject to a maximum of 5% of the contract value.

## 11.0 RATES AND PRICES

### 11.1 In case of item rate tender

11.1.1 The tenderers shall quote their rates for individual items both in words and figures in case of discrepancy between the rates quoted in words and figures the unit rate quoted in words will prevail. If no rate is quoted for a particular item the contractor shall not be paid for that item when it is executed.

The amount of each item shall be calculated and the requisite total is given. In case of discrepancy between the unit rate and the total amount calculated from multiplication of unit rate and the quantity the unit rate quoted will govern and the amount will be corrected.

11.1.2 The tenderers need not quote their rates for which no quantities have been given. In case the tenderers quote their rates for such items those rates will be ignored and will not be considered during execution.

11.1.3 The tenderers should not change the units as specified in the tender. If any unit is changed the tenders would be evaluated as per the original unit and the contractor would be paid accordingly.

The tenderer should not change or modify or delete the description of the item. If any discrepancy is observed he should immediately bring to the knowledge of the SBI.

11.1.4 Each page of the BOQ shall be signed by the authorized person and cutting or overwriting shall be duly attested by him.

11.1.5 Each page shall be totalled and the grand total shall be given.

11.1.6 The rate quoted shall be firm and shall include all costs, allowances etc.

## **GENERAL CONDITIONS OF CONTRACT**

### **1.0 Definitions**

“**Contract**” means the documents forming the tender and the acceptance thereof and the formal agreement executed between SBI and the contractor, together with the documents referred therein including these conditions, the specifications, designs, drawings and instructions issued from time to time by the Bank and all these, documents taken together shall be deemed to form one contract and shall be, complementary to one another.

1.1 In the contract the following expressions shall, unless the context otherwise requires, have the meaning hereby respectively assigned to them.

1.1.1 ‘**SBI / Bank**’ shall mean State Bank of India (client) a body Corporate created under SBI Act 1955, having one of its Circle Office at State Bank of India, III/1 Pandit Jawaharlal Nehru Marg, Bhubaneswar- 01 and includes the client’s representatives, successors and assigns.

1.1.2 ‘**Architects/Consultants**’ shall mean **M/s.** \_\_\_\_\_

1.1.3 ‘**Site Engineer**’ shall mean an Engineer appointed by the Bank as their representative to give instructions to the contractors.

1.1.4 ‘**The Contractor**’ shall mean the individual or firm or company whether incorporated or not, undertaking the works and shall include legal personal representative of such individual or the composing the firm or company and the permitted assignees of such individual or firms of company.

1.1.5 The expression '**works**' or 'work' shall mean the permanent or temporary work described in the 'Scope of Work' and/or to be executed in accordance with the contract and includes materials, apparatus, equipment, temporary supports, fittings and things of all kinds to be provided, the obligations of the contractor hereunder and work to be done by the contractor under the contract.

1.1.6 '**Engineer**' shall mean the representative of the SBI.

1.1.7 '**Drawings**' shall mean the drawings prepared by the Architects and issued by the Engineer and referred to in the specifications and any modifications of such drawings as may be issued by the Engineer from time to time 'Contract value shall mean the value of the entire work as stipulated in the letter of acceptance of tender subject to such additions thereto or deductions there from as may be made under the provision herein after contained.

1.1.8 '**Specifications**' shall mean the specifications referred to in the tender and any modifications thereof as may time to time be furnished or approved by the SBI "Month" means calendar month.

1.1.9 "**Week**" means seven consecutive days.

1.1.10 "**Day**" means a calendar day beginning and ending at 00 Hrs and 24 hrs respectively.

## **CLAUSES:**

### **1.0 Total Security Deposit**

Total Security deposit comprise of:

- Earnest Money Deposit;
- Initial Security Deposit.

**a) Earnest Money Deposit: Rs.10,600/-**

**b) Initial Security Deposit (ISD): 2% of the contract value.**

### **SECURITY DEPOSIT: RETENTION MONEY**

**Total security deposit shall be 5% of the final value of the work shall be deducted from the final bill of the work as Retention money. Retention Money shall be paid after the defects liability period of 5 year as specified in the contract. The retention money will be interest free.**

### **ADDITIONAL SECURITY DEPOSIT**

In case L-1 bidder quotes abnormally low rates (i.e. 10% or more, below estimated project cost), SBI may ask such bidder to deposit additional security deposit (ASD) equivalent to difference of estimated cost vis-à-vis L-1 quoted amount for due fulfilment of contract. Such ASD could be in the form of FDR / Bank's guarantee in the Bank's name as per format approved by the Bank. On successful completion of work ASD will returned to the contractor. In case contractor fails to complete the work in time or as per tender specification or leave the job incomplete, the bank will be at liberty to recover the dues from ASD or to forfeit such ASD as the case may be within its sole discretion.

No interest shall be paid to the amount retained by the Bank as Security Deposit.

### **2.0 Language Errors, Omissions and Discrepancies**

In case of errors, omissions and/or disagreement between written and scaled dimensions on the drawings or between the drawings and specifications etc, the following order shall apply.



- i) Between scaled and written dimension (or description) on a drawing, the latter shall be adopted.
- ii) Between the written or shown description or dimensions in the drawings and the corresponding one in the specification the former shall be taken as correct.
- iii) Between written description of the item in the specifications and descriptions in bills of quantities of the same item, the latter shall be adopted.
- iv) In case of difference between rates written in figures and words, the rate in words shall prevail.
- v) Between the duplicate/subsequent copies of the tender, the original tender shall be taken as correct.

### 3.0 Scope of Work

- a. **Scope of work covers in conducting feasibility study and Design, Supply, Installation & Commissioning of Remote Monitoring Grid Connected SPV Rooftop Plant under Net Metering as per the technical specification including warranty, operation and maintenance for a period of 5 years from the date of completion of commissioning.**
- b. Wiring up to Distribution Board from the SPV Rooftop system will be in the scope of the successful bidder(s). The cable should be flexible copper cable with suitable current carrying capacity.
- c. Mounting Structure within the scope of this tender.
- d. **Performance testing of the complete system and cleaning of PV panels/modules once in a quarter without fail.**
- e. The successful bidder shall undertake to supply spares free of cost for the maintenance of the offered items during the warranty/ maintenance period of 5 year period.
- f. **The successful bidder should conduct maintenance on quarterly basis and submit the detailed report (including solar generation report) to AGM (P&E), LHO, Bhubaneswar positively.**
- g. **If the operation or use of the system proves to be unsatisfactory as per its rating/design during the warranty period 5 years, the installer shall replace the faulty ones or carry out necessary repairs as per the warranty terms and conditions.**
- h. The successful bidder shall do necessary coordination with concerned agencies like DISCOM, CEIG & State government Electricity department as applicable, for procuring/arranging necessary approvals on behalf of the Bank. The cost of necessary approvals/charging and **bi-directional meter** or any other type of meter required at site, CT/PT (if required), **Solar Generation Meter** shall be borne by the successful bidder only.
- i. **Vendor should ensure that net (import - export) reading should come in the monthly Electricity Bill.**
- j. Nothing in this specification shall be constructed to relive the vendor of the responsibility.

### 4.0 (i) Letter of Acceptance

Within the validity period of the tender the SBI shall issue a letter of acceptance by registered post/e-mail/speed post or otherwise depositing at the address of the contractor as given in the ten-

der to enter into a Contract for the execution of the work as per the terms of the tender. The letter of acceptance shall constitute a binding contract between the SBI and the Contractor.

## **ii) Contract Agreement**

On receipt of intimation of the acceptance of tender from the SBI, the successful tenderer shall be bound to implement the contract and within fifteen days thereof, he shall sign an agreement in a non-judicial stamp paper of appropriate value (as per the Article of Agreement format earlier given in this document) with SBI.

### **5.0 Ownership of drawings**

All drawings, specifications and copies thereof furnished by the SBI, if any, are the properties of the SBI. They are not to be used on other work.

### **6.0 Detailed drawings and instructions**

The SBI shall furnish with reasonable promptness additional instructions by means of drawings or otherwise necessary for the proper execution of the work. All such drawings and instructions shall be consistent with the contract documents, true developments thereof and reasonably inferable there from.

The work shall be executed in conformity therewith and the contractor shall prepare a detailed programme schedule (i.e. BAR/ PERT Chart) indicating therein the date of start and completion of various activities on receipt of the work order and submit the same to the SBI.

### **7.0 Copies of Agreement**

Two copies of agreement/ tender document duly signed by both the parties with the drawings shall be handed over to the contractor keeping one at SBI and one copy for contractor.

### **8.0 Liquidated Damages**

If the contractor fails to maintain the required progress or to complete the work and clear the site including vacating their office on or before the contracted or extended date or completion without justification in support of the cause of delay, he may be called upon without prejudice to any other right of remedy available under the law to the SBI on account of such breach to pay a liquidated damages at the rate of 0.5% of the final value of work per week subject to a maximum of 5% of the contract value.

### **9.0 Materials, Appliances and Employees**

Unless or otherwise specified the contractor shall provide and pay for all materials, labour, water, power, tools, equipment transportation and any other facilities that are required for the satisfactory execution and completion of the work. Unless or otherwise specified all materials shall be new and both workmanship and materials shall be best quality. The contractor shall at all times enforce strict discipline and good order among his employees/workers and shall not employ on the work any unfit person/worker or anyone not skilled in the work assigned to him. Workman whose work or behaviour is found to be unsatisfactory by the SBI, he shall be removed from the site immediately.

### **10.0 Permits, Laws and Regulations**

Permits and licences required for the execution of the work shall be obtained by the contractor at his own expenses. The contractor shall give notices and comply with the regulations, laws/ labour laws, and ordinances rules, applicable to the contractor. If the contractor observes any discrepancy be-

tween the drawings and specifications, he shall promptly notify the SBI in writing. If the contractor performs any act which is against the law, rules and regulations he shall meet all the costs arising there from and shall indemnify the SBI any legal actions arising there from.

### **11.0 Setting out Work**

The contractor shall set out the work and shall be responsible for the true and perfect setting out of the same and for the correctness of the positions, levels, dimensions, and alignment of all parts thereof and get it approved by the SBI before proceeding with the work. If at any time any error in this respect shall appear during the progress of the works, irrespective of the fact that the layout had been approved by the SBI, the contractor shall be responsible for the same and shall at his own expenses rectify such error, if so, required to satisfaction of the SBI.

### **12.0 Protection of works and property**

The contractor shall continuously maintain adequate protection, of all his work from damage and shall protect the SBI's properties from injury or loss arising in connection with contract. He shall make good any such damage, injury, loss due to his fault or negligence except which are due to causes beyond his control.

He shall take adequate care and steps for protection of the adjacent properties. The contractor shall take all precautions for safety and protection of his employees on the works and shall comply with all applicable provisions of Government and local bodies' safety laws and relevant building codes to prevent accidents, or injuries to persons or property of about or adjacent to his place of work. The contractor shall take insurance covers as per clause 25.0 at his own cost. The policy may be taken in joint names of the contractors and the SBI and the original policy may be lodged with the SBI.

### **13.0 Inspection of Work**

SBI or their representatives shall at all reasonable time have free access to the work site and/or to the workshop, factories or other places where materials are lying or from where they are obtained and the contractor shall give every facility to the SBI and their representatives necessary for inspection and examination and test of the materials and workmanship. No person unless authorized by the SBI except the representative of Public authorities shall be allowed on the work at any time. The proposed work either during its construction stage or its completion can also be inspected by the Chief Technical Examiner's organization a wing of Central Vigilance Commission.

### **14.0 Assignment and subletting**

The whole of work included in the contract shall be executed by the contractor and he shall not directly entrust and engage or indirectly transfer assign or underlet the contract or any part or share thereof or interest therein without the written consent of the SBI and no undertaking shall relieve the contractor from the responsibility of the contractor from active superintendence of the work during its progress.

### **15.0 Quality of Materials, Workmanship & Test**

(i) All materials and workmanship shall be best of the respective kinds described in the contract and in accordance with SBI instructions and shall be subject from time to time to such tests as the SBI may direct at the place of manufacture or fabrication or on the site or an approved testing laboratory.

a. The contractor shall provide such assistance, instruments, machinery, labour and materials.

b. Contractor to made arrangement of laboratory on site, where weight of various materials like aluminium extrusions etc. can be done, Contractor should also make available a 3.00 meters, 15.00 meters & a 50.00 meters tape, a Vernier Calliper & Micrometer so any measurements/ tests can be taken on sites itself.

### **(ii) Samples**

a. All samples of adequate numbers, size, shades & pattern as per specifications shall be supplied by the contractor without any extra charges. If certain items proposed to be used are of such nature that samples cannot be presented or prepared at the site detailed literature/test certificate of the same shall be provided to the satisfaction of the SBI. Before submitting the sample/literature the contractor shall satisfy himself that the material/equipment for which he is submitting the samples/literature meet with the requirement of tender specification. Only when the samples are approved in writing by the SBI the contractor shall proceed with the procurement and installation of the particular material/equipment.

b. The approved samples shall be signed by the SBI for identification and shall be kept on record at site office until the completion of the work for inspection/comparison at any time. The SBI shall take reasonable time to approve the sample. Any delay that might occur in approving the samples for reasons of its not meeting the specifications or other discrepancies inadequacy in furnishing samples of best qualities from various manufacturers and such other aspects causing delay on the approval of the materials/equipment etc. shall be to the account of the contractor.

### **(iii) Cost of tests**

The cost of making any test shall be borne by the contractor if such test is intended by or provided for in the specifications or BOQ.

### **(iv) Cost of test not provided for**

If any test is ordered by the SBI which is either, If so intended by or provided for or (in the cases above mentioned) is not so particularized or through so intended or provided for but ordered by the SBI which is either to be carried out by an independent person at any place other than the site or the place of manufacture or fabrication of the materials tested or any Government/approved laboratory, then the cost of such test shall be borne by the contractor.

## **16.0 Obtaining Information related to execution of work**

No claim by the contractor for additional payment shall be entertained which is consequent upon failure on his part to obtain correct information as to any matter affecting the execution of the work nor any misunderstanding or the obtaining incorrect information or the failure to obtain correct information relieve him from any risks or from the entire responsibility for the fulfilment of contract.

## **17.0 Contractor's superintendence**

The contractor shall give necessary personal superintendence during the execution of the works and as long, thereafter, as the SBI may consider necessary until the expiry of the defects liability period, stated hereto.

## **18.0 Quantities**

i) The bill of quantities (BOQ) unless or otherwise stated shall be deemed to have been prepared in accordance with the Indian Standard Method of Measurements

The rate quoted shall remain valid for variation of quantity against individual item to any extent subject to maximum variation of the contract value by 25%. The entire amount paid under Clause 20 hereof as well as amounts of prime cost and provisional sums, if any, shall be excluded.

ii) Variation exceeding 25%: The items of work executed in relation to variation exceeding 25% shall be paid on the basis of provisions of clause 21(e) hereof.

### **19.0 Works to be measured**

The SBI may from time to time intimate to the contractor that he required the work to be measured and the contractor shall forthwith attend or send a qualified representative to assist the SBI in taking such measurements and calculation and to furnish all particulars or to give all assistance required by any of them. Such measurements shall be taken in accordance with the Mode of measurements detailed in the specifications. The representative of the SBI shall take joint measurements with the contractor's representative and the measurements shall be entered in the measurement book.

The contractor or his authorized representative shall sign all the pages of the measurement book in which the measurements have been recorded in token of his acceptance. All the corrections shall be duly attested by both representatives. No over writings shall be made in the measurement book. Should the contractor not attend or neglect or omit to depute his representative to take measurements then the measurements recorded by the representative of the SBI shall be final. All authorized extra work, omissions and all variations made shall be included in such measurements.

### **20.0 Variations:**

No alteration, omission or variation ordered in writing by the SBI shall vitiate the contract.

In case the SBI thinks proper at any time during the progress of works to make any alteration in, or additions to or omission from the works or any alteration in the kind or quality of the materials to be used therein, the Bank shall give notice thereof in writing to the contractor or shall confirm in writing within seven days of giving such oral instructions the contractor shall alter to, add to, or omit from as the case may be in accordance with such notice but the contractor shall not do any work extra to or make any alteration or additions to or omissions from the works or any deviation from any of the provisions of the contract, stipulations, specifications or contract drawings without previous consent in writing to the Bank and the value of such extras, alterations, additions or omissions shall in all cases be determined by the SBI and the same shall be added to or deducted from the contract value, as the case may be.

### **21.0 Valuation of Variations**

No claim for an extra shall be allowed unless it shall have been executed under the authority of the SBI with the concurrence of the SBI as herein mentioned. Any such extra is herein referred to as authorized extra and shall be made in accordance with the following provisions.

- i) The net rates or prices in the contract shall determine the valuation of the extra work where such extra work is of similar character and executed under similar conditions as the work priced herein.
- ii) Rate for the item, wherever possible should be derived out of the rate given in the priced BOQ.
- a) The net prices of the original tender shall determine the value of the items omitted, provided if omissions do not vary the conditions under which any remaining items of works are carried out, otherwise the prices for the same shall be valued under sub clause (c) hereunder.

- b) Where the extra works are not of similar character and/or executed under similar conditions as aforesaid or where the omissions vary the conditions under which any remaining items or works are carried out, then the contractor shall within 7 days of the receipt of the letter of acceptance inform the SBI of the rate which he intends to charge for such items of work, duly supported by analysis of the rate or rates claimed and the SBI shall fix such rate or prices as in the circumstances in his opinion are reasonable and proper, based on the market rate.
- c) Where extra work cannot be properly measured or valued the contractor shall be allowed day work prices at the net rates stated in the tender of the BOQ or, if not, so stated then in accordance with the local day work rates and wages for the district; provided that in either case, vouchers specifying the daily time (and if required by the SBI) the workman's name and materials employed be delivered for verifications to the Bank at or before the end of the week following that in which the work has been executed.
- d) It is further clarified that for all such authorized extra items where rates cannot be derived from the tender, the contractor shall submit rates duly supported by rate analysis worked on the "market rate basis" for material, labour, hire/running charges of equipment and wastages etc. plus 15% towards establishment charges, contractor's overheads and profit. Such items shall not be eligible for escalation.

## 22.0 Final Measurement

The measurement and valuation in respect of the contract shall be completed within **one month** of the virtual completion of the work.

## 23.0 Virtual Completion Certificate (VCC)

On successful completion of entire works covered by the contract to the full satisfaction of the SBI, the contractor shall ensure that the following works have been completed to the satisfaction of the SBI:

- a) Clear the site of all scaffolding, wiring, pipes, surplus materials, contractor's labour, equipment and machinery.
- b) Demolish, dismantle and remove the contractor's site office, temporary works, structures including labour sheds/camps and constructions and other items and things whatsoever brought upon or erected at the site or any land allotted to the contractor by the SBI and not incorporated in the permanent works.
- c) Remove all rubbish, debris etc from the site and the land allotted to the contractor by the SBI and shall clear, level and dress, compact the site as required by the SBI.
- d) Shall put the SBI in undisputed custody and possession of the site and all land allotted by the SBI.
- e) Shall hand over the work in a peaceful manner to the SBI.
- f) All defects/imperfections have been attended and rectified as pointed out by the SBI to the full satisfaction of SBI.. If the SBI is satisfied of the completion of the work, relative to which the completion certificate has been sought, the SBI shall within fourteen (14) days of the receipt of the application for virtual completion certificate, issue a VCC in respect of the work for which the VCC has been applied. This issuance of a VCC shall be without prejudice to the SBI's rights and contractor's liabilities under the contract including the contractor's liability for defects liability period nor shall the issuance of VCC in respect of



the works or work at any site be construed as a waiver of any right or claim of the SBI against the contractor in respect of works or work at the site and in respect of which the VCC has been issued.

## **24.0 Work by other agencies**

The SBI reserves the rights to use premises and any portion of the site for execution of any work not included in the scope of this contract which it may desire to have carried out by other persons simultaneously and the contractor shall not only allow but also extend reasonable facilities for the execution of such work. The contractor however shall not be required to provide any plant or material for the execution of such work except by special arrangement with the SBI. Such work shall be carried out in such manners not to impede the progress of the works included in the contract.

## **25.0 Insurance of Works**

- 25.1 Before taking up the work, the Contractor shall, obtain and submit to the Employer (Bank), contractor's all risk policy and a third-party insurance policy in original, issued by any Public-Sector Insurance Company.
- The Policy should be issued in the joint names of Employer and contractor with Employer's name appearing first. For minimum value Rs.5 lacs until completion of project or handing over whichever is later for any type of accident / incidence.
- The contractor shall, from time to time, provide documentary evidence as regards payments of premium for all insurance Policies for keeping them valid till the completion of the work.
- Without prejudice to any of its obligations and responsibilities specified above, the Contractor shall, within 10 days from the date of work order, submit documentary evidence as required by the Employer in support of having obtain requisite insurance cover.
- No work shall be taken up by the Contractor at site unless the Insurance Policies as mentioned above are obtained.
- Also, no payment shall be made to the Contractor on expiry of insurance policies unless renewed by them and renewed policy is submitted with the SBI. Nothing extra shall be payable on this account.

## **25.2 Damage to persons and property**

The contractor shall, except if and so far as the contract provides otherwise indemnify the SBI against all losses and claims in respect of injuries or damages to any person or material or physical damage to any property whatsoever which may arise out of or in consequence of the execution and maintenance of the works and against all claims proceedings, damages, costs, charges and expenses whatsoever in respect of or in relation thereto except any compensation of damages for or with respect to :

- a) The permanent use or occupation of land by or any part thereof.
- b) The right of SBI to execute the works or any part thereof, on, over, under, in or through any lands.
- c) Injuries or damages to persons or properties which are unavoidable result of the execution or maintenance of the works in accordance with the contract.

d) Injuries or damage to persons or property resulting from any act or neglect of the SBI, their agents, employees or other contractors not being employed by the contractor or in respect of any claims, proceedings, damages, costs, charges and expenses in respect thereof or in relation thereto or where the injury or damage was contributed to by the contractor, his servants or agents such part of the compensation as may be just and equitable having regard to the extent of the responsibility of the SBI, their employees, or agents or other employees, or agents or other contractors for the damage or injury.

### **25.3 Contractor to indemnify SBI**

The contractor shall indemnify the SBI against all claims, proceedings, damages, costs, charges and expenses in respect of the matters referred to in the provision sub-clause 25.2 of this clause.

### **25.4 Contractor's superintendence**

The contractor shall fully indemnify and keep indemnified the SBI against any action, claim, or proceeding relating to infringement or use of any patent or design or any alleged patent or design rights and shall pay any royalties which may be payable in respect of any article or part thereof included in the contract. In the event of any claim made under or action brought against SBI in respect of such matters as aforesaid the contractor shall be immediately notified thereof and the contractor shall be at liberty, at his own expenses to settle any dispute or to conduct any litigation that may arise there from, provided that the contractor shall not be liable to indemnify the SBI if the infringement of the patent or design or any alleged patent or design right is the direct result of an order passed by the SBI in this behalf.

### **25.5 Third Party Insurance**

25.5.1 Before commencing the execution of the work the contractor but without limiting his obligations and responsibilities under clause 25 of GCC shall insure against his liability for any material or physical damage, loss, or injury which may occur to any property including that of SBI, or to any person, including any employee of the SBI, by or arising out of the execution of the works or in the carrying out of the contract, otherwise than due to the matters referred to in the provision to clause 25 thereof.

25.5.2 Minimum Amount of Third Party Insurance:

Such insurance shall be affected with an insurer and in terms approved by the SBI which approval shall not be reasonably withheld and for at least the amount stated below. The contractor shall, whenever required, produce to the SBI the policy or policies of insurance cover and receipts for payment of the current premiums.

The minimum insurance cover for physical property, injury, and death is Rs.5.0 lacs per occurrence with the number of occurrences limited to four. After each occurrence contractor will pay additional premium necessary to make insurance valid for four occurrences always.

### **25.7 Accident or Injury to Workmen**

25.7.1 The SBI shall not be liable for or in respect of any damages or compensation payable at law in respect or in consequence of any accident or injury to any workmen or other person in the employment of the contractor or any sub-contractor, save and except an accident or injury resulting from any act or default of the SBI or their agents, or employees. The contractor shall indemnify and keep indemnified SBI against all such



damages and compensation, save and except as aforesaid and against all claims, proceedings, costs, charges and expenses whatsoever in respect thereof or in relation thereto.

#### 25.7.2 Insurance against accidents etc. to workmen

The contractor shall insure against such liability with an insurer approved by the SBI during the whole of the time any person employed by him on the works and shall, when required, produce such policy of insurance and receipt for payment of the current premium. Provided always that, in respect of any persons employed by any sub-contractor the contractor's obligation to insure as aforesaid under this sub-clause shall be satisfied if the sub-contractor shall have insured against the liability in respect of such persons in such manner that SBI is indemnified under the policy but the contractor shall require such sub-contractor to produce to the SBI when required such policy of insurance and the receipt for the payment of the current premium.

#### 25.7.3 Remedy on Contractor's failure to insure

If the contractor fails to effect and keep in force the insurance referred to above or any other insurance which he may be required to effect under the terms of contract, then and in any such case the SBI may effect and keep in force any such insurance and pay such premium or premiums as may be necessary for that purpose and from time to time deduct the amount so paid by the SBI as aforesaid and also deduct 15% of contract value from any amount due or which may become due to the contractor, or recover the same as debt from the contractor.

Without prejudice to the other rights of the SBI against contractors, in respect of such default, the SBI shall be entitled to deduct from any sums payable to the contractor the amount of any damages costs, charges, and other expenses paid by the SBI and which are payable by the contractors under this clause. The contractor shall upon settlement by the insurer of any claim made against the insurer pursuant to a policy taken under this clause, proceed with due diligence to rebuild or repair the works destroyed or damaged. In this event all the monies received from the insurer in respect of such damage shall be paid to the contractor and the contractor shall not be entitled to any further payment in respect of the expenditure incurred for rebuilding or repairing of the materials or goods destroyed or damaged.

### **26.0 Commencement of Works**

The date of commencement of the work will be reckoned as the recorded date of handing over site by the SBI or **15 days** from the date of receipt of Letter of Acceptance/work order from SBI, whichever is later.

### **27.0 Time for completion**

Time is the essence of the contract and shall be strictly observed by the contractor. The entire work shall be completed as mentioned in the NIT. If required in the contract or as directed by the SBI, the contractor shall complete certain portions of work before completion of the entire work. However the completion date shall be reckoned as the date by which the whole work is completed as per the terms of the contract.

## 28.0 Extension of Time

If, in the opinion of Bank, the work be delayed for reasons beyond the control of the contractor, the contractor may submit a request to the SBI to grant a fair and reasonable extension of time for completion of work as per the terms of contract. If the contractor needs an extension of time for the completion of work or if the completion of work is likely to be delayed for any reasons beyond the due date of completion as stipulated in the contract, **the contractor shall apply to the SBI in writing at least 15 days before the expiry of the scheduled time and while applying for extension of time he shall furnish the reasons in detail and his justification if any, for the delays**. While granting extension of time the contractor shall be informed the period extended time which will qualify for levy of liquidated damages. For the balance period in excess of original stipulated period and duly sanctioned extension of time by the SBI the provision of liquidated damages as stated under clause 8 of GCC shall become applicable. Further contract shall remain in force even for the period beyond the due date of completion irrespective whether the extension is granted or not.

## 29.0 Rate of progress

Whole of the materials, plant and labour to be provided by the contractor and the mode, manner and speed of execution and maintenance of the works are to be of a kind and conducted in a manner to the satisfaction of the SBI. Should the rate of progress of the work or any part thereof be at any time be in the opinion of the SBI too slow to ensure the completion of the whole of the work by the prescribed time or extended time for completion the SBI shall thereupon take such steps as considered necessary to expedite progress so as to complete the works by the prescribed time or extended time. Such communications from the SBI neither shall relieve the contractor from fulfilling obligations under the contract nor shall he be entitled to raise any claims arising out of such directions.

## 30.0 Work during nights and holidays

Subject to any provision to the contrary contained in the contract no permanent work shall save as herein provided be carried on during the night or on holidays without the permission in writing of the SBI, save when the work is unavoidable or absolutely necessary for the saving of life or property or for the safety of the work in which case the contractor shall immediately advise the SBI. However the provision of the clause shall not be applicable in the case of any work which becomes essential to carry by rotary or double shifts in order to achieve the progress and quality of the part of the works being technically required and continued with the prior approval of the SBI at no extra cost to the SBI.

All work at night after obtaining approval from competent authorities shall be carried out without unreasonable noise and disturbance so as to avoid disputes with the neighbours.

## 31.0 No compensation for restrictions of work

If at any time after acceptance of the tender SBI shall decide to abandon or reduce the scope of work for any reason whatsoever and hence not require the whole or any part of the work to be carried out, the SBI shall give notice in writing to that effect to the contractor and the contractor shall act accordingly in the matter. The contractor shall have no claim to any payment of compensation or otherwise whatsoever, on account of any profit or advantage which he might have derived from the execution of the work fully but which he did not derive in consequence of the foreclosure of the whole or part of the work. Provided that the contractor shall be paid the charges on the cartage only of materials actually and bona fide brought to the site of the work by the contractor and rendered surplus as a result of the abandonment, curtail-

ment of the work or any portion thereof and then taken back by the contractor, provided however that the SBI shall have in such cases the option of taking over all or any such materials at their purchase price or a local current rate whichever is less. In case of such stores having been issued from SBI stores and returned by the contractor to stores, credit shall be given to him at the rates not exceeding those at which were originally issued to the contractor after taking into consideration and deduction for claims on account of any deterioration or damage while in the custody of the contractor and in this respect the decision of SBI shall be final.

### **32.0 Suspension of work**

i) The contractor shall, on receipt of the order in writing of the SBI (whose decision shall be final and binding on the contractor) suspend the progress of works or any part thereof for such time and in such manner as SBI may consider necessary so as not cause any damage or injury to the work already done or endanger the safety thereof for any of following reasons.

- On account of any default on the part of the contractor, or
- For proper execution of the works or part thereof for reasons other than the default of the contractor, or
- For safety of the works or part thereof.
- The contractor shall, during such suspension, properly protect and secure the works to the extent necessary and carry out the instructions given in that behalf by the SBI.

ii) If the suspension is ordered for reasons (b) and (c) in sub-Para (i) above :

The contractor shall be entitled to an extension of time equal to the period of every such suspension. No compensation whatsoever shall be paid on this account.

### **33.0 Action when the whole security deposit is forfeited**

In any case in which under any clause or clauses of this contract, the Contractor shall have rendered himself liable to pay compensation amounting to the whole of his security deposit, the following course may be adopted by the contractor as they may deem best suited to the interest of the SBI.

- a) To rescind the contract and in which case the security deposit of the contractor shall be forfeited and be absolutely at the disposal of SBI.
- b) To employ labour paid by the SBI and to supply materials to carry out the work, or any part of the work, debiting the contractor with the cost of the labour and materials (the cost of such labour and materials as worked out by the SBI shall be final and conclusive against the contractor) and crediting him with the value of the work done, in all respects in the same manner and at the same manner and at the same rates as if it had been carried out by the contractor under the terms of this contract the certificate of Bank as to the value of work done shall be final and conclusive against the contractor.
- c) To measure up the work of the contractor, and to take such part thereof as shall be unexecuted, out of his hands, and to give it to another contractor to complete in which case any expenses which may be incurred in excess of the sum which would have been paid to the original contractor, if the whole work had been executed by him shall be borne by original contractor and may be deducted from any money due to him by SBI under the contract or

otherwise, or from his security deposit or the proceeds of sale thereof, or sufficient part thereof.

In the event of any of above courses being adopted by the SBI, the contractor shall have no claim to compensation for any loss sustained by him by reasons of his having purchased or procured any material or entered into any engagements or make any advances on account of, or with a view to the execution of the work or the performance of the contract and in case the contract shall be rescinded under the provision aforesaid, the contractor shall not be entitled to recover or to be paid any sum or any work thereto for actually performed under this contract, unless, and until the SBI will have certified in writing the performance of such work and the value payable in respect thereof, and he shall only be entitled to be paid the value so certified.

#### **34.0 Owner's Right to Terminate the Contract**

If the contractor being an individual or a firm commit any 'Act of Insolvency' or shall be adjusted an insolvent or being an incorporated company shall have an order for compulsory winding up voluntarily or subject to the supervision of Government and of the Official Assignee of the liquidator in such acts of insolvency or winding up shall be unable within seven days after notice to him to do so, to show to the reasonable satisfaction of the SBI that he is able to carry out and fulfil the contract, and to give security therefore if so required by the SBI.

Or if the contractor (whether an individual firm or incorporated Company) shall suffer execution to be issued or shall suffer any payment under this contract to be attached by or on behalf of any of the creditors of the contractor.

Or shall assign or sublet this contract without the consent in writing of the SBI shall charge or encumber this contract or any payment due to which may become due to the contractor there under.

- a) Has abandoned the contract; or
- b) Has failed to commence the works, or has without any lawful excuse under these conditions suspended the progress of the works for 14 days after receiving from the SBI written notice to proceed, or
- c) Has failed to proceed with the works with such diligence and failed to make such due progress as would enable the works to be completed within the time agreed upon, or has failed to remove the materials from the site or to pull down and replace work within seven days after written notice from the SBI that the said materials were condemned and rejected by the Bank under these conditions; or has neglected or failed persistently to observe and perform all or any of the acts, matters or things by this contract to be observed and performed by the contractor for seven days after written notice shall have been given to the contractor to observe or perform the same or has to the detriment of good workmanship or in defiance of the SBIs instructions to the contrary subject any part of the contract. Then and in any of said cases the SBI, may notwithstanding any previous waiver, after giving seven days' notice in writing to the contractor, determine the contract, but without thereby affecting the powers of the SBI the obligation and liabilities of the contractor the whole of which shall continue in force as fully as if the contract had not been so determined and as if the works subsequently had been executed by or on behalf of the contractor. And, further the contractor or their agents may enter upon and take possession of the work and all plants, tools, scaffoldings, materials, sheds, machineries lying upon the premises or on the adjoining lands or roads, use the same by means of their own employees or workmen in carrying on and com-

pleting the work or by engaging any other contractors or persons to complete the work and the contractor shall not in any way interrupt or do any act, matter or thing to prevent or hinder such other contractor or other persons employed for completing and finishing or using the materials and plant for the works. When the works shall be completed or as soon thereafter as convenient to the SBI shall give a notice in writing to the contractor to remove his surplus materials and plants and should the contractor fail to do so within 14 days after receipt thereof by him the SBI. SBI sell the same by public auction after due publication and shall adjust the amount realized by such auction. The contractor shall have no right to question any of the act of the SBI incidental to the sale of the materials etc.

### **35.0 Certificate of Payment**

Payment will be made as per terms mentioned in the NIT.

- The prices in the Price Schedule shall be exclusive of GST or any other applicable taxes as may be levied by the Government from time-to-time and the same shall be charged in addition to the applicable rate.
- The SBI shall make all endeavor to make payments within 30 days from the date of the receipt of the invoice, to the Contractor subject to submission of necessary and supporting documents witnessed for the completion of the work.
- All payments shall be made in Indian Currency by means of an Account Payee Cheques/ RTGS/ NEFT only.
- SBI shall be entitled to deduct in accordance with Applicable Law, Income Tax or withholding tax or other deductions (as the case may be), from any payments made to the Contractor, and the amount so deducted shall be deemed to be a payment made to the Contractor. SBI shall provide a certificate certifying the deduction so made.
- No payment shall be made in advance nor will any loan from any bank or financial institution be recommended on the basis of the order of award of work.
- Payment will be made as per the actual work done at site based on final measurement. The measurement will be taken in presence of representatives from both SBI and contractor.

### **36.0 Settlement of Disputes and Arbitration**

Except where otherwise provided in the contract all questions and disputes to the meaning of the specifications, design, drawings and instructions herein before mentioned and as to the quality of workmanship or materials used on the work or as to any other question, claim, right, matter or thing whatsoever in any way arising out of or relating to the contract, designs, drawings specifications, estimates, instructions orders or these conditions or otherwise concerning the work or the execution or failure to execute the same whether arising during the progress of the work or after the cancellation, termination, completion or abandonment thereof shall be dealt with as mentioned hereinafter:

- i) If the Contractor considers that he is entitled to any extra payment or compensation in respect of the works over and above the amounts admitted as payable by the authorized person of SBI or in case the Contractor wants to dispute the validity of any deductions or recoveries made or proposed to be made from the contract or raise any dispute, the Contractor shall forthwith give notice in writing of his claim, or dispute to the

AGM (P&E), LHO Bhubaneswar, within 30 days from the date of disallowance thereof or the date of deduction or recovery. The said notice shall give full particulars of the claim, grounds on which it is based and detailed calculations of the amount claimed and the Vendor shall not be entitled to raise any claim nor shall the SBI be in any way liable in respect of any claim by the Contractor unless notice of such claim shall have been given by the Contractor to the AGM (P&E), LHO Bhubaneswar, in the manner and within the time as aforesaid. The Vendor shall be deemed to have waived and extinguished all his rights in respect of any claim not notified to the AGM (P&E), LHO Bhubaneswar, in writing in the manner and within the time aforesaid.

- ii) The AGM (P&E), LHO Bhubaneswar, shall give his decision in writing on the claims notified by the Contractor. The Contractor may within 30 days of the receipt of the decision of the AGM (P&E), submit his claims to the conciliating authority for conciliation along with all details and copies of correspondence exchanged between him and the SBI.
- iii) If the conciliation proceedings are terminated without settlement of the disputes, the Contractor shall, within a period of 30 days of termination thereof shall give a notice to the concerned DGM & CDO, LHO Bhubaneswar for appointment of an arbitrator to adjudicate the notified claims falling which the claims of the Contractor shall be deemed to have been considered absolutely barred and waived.
- iv) Except where the decision has become final, binding and conclusive in terms of the contract, all disputes or differences arising out of the notified claims of the Contractor as aforesaid and all claims of the SBI shall be referred for adjudication through arbitration to the Sole Arbitrator appointed by the Chief General Manager, LHO Bhubaneswar and who will be an officer not less than the rank of Deputy General Manager. If the arbitrator so appointed is unable or unwilling to act or resigns his appointment or vacates his office due to any reason whatsoever another sole arbitrator shall be appointed in the manner aforesaid by the said Chief General Manager, LHO Bhubaneswar of the SBI, such person shall be entitled to proceed with the reference from the stage at which it was let by his predecessor.
- v) It is a term of this contract that the party invoking arbitration shall give a list of disputes with amounts claimed in respect of each dispute along with the notice for appointment of arbitrator.
- vi) It is also a term of this contract that no person other than a person appointed by such Chief General Manager, LHO Bhubaneswar of the SBI as aforesaid should act as arbitrator.
- vii) The conciliation and arbitration shall be conducted in accordance with the provisions of the Arbitration & Conciliation Act 1996 or any or any accordance modification or re-enactment thereof and the rules made there under.
- viii) It is also a term of the contract that the Arbitrator shall be deemed to have entered on the reference on the date he issues notice to both the parties calling them to submit their statement of claims and counter statement of claims. The venue of the arbitration shall be such place as may be fixed by the arbitrator in his sole discretion. The Cost of the reference and of the award shall be in the discretion of the arbitrator who may direct to any by whom and in what manner, such costs or any part thereof, shall be paid and fix or settle the amount of costs to be so paid



### **37.0 Water Supply (Not Applicable)**

### **38.0 Power supply**

The contractor shall make his own arrangements for power and supply/ distribution system for driving plant or machinery for the work and for lighting purpose at his own cost. The cost of running and maintenance of the plants are to be included in his tender prices. He shall pay all fees and charges required for the power supply and include the same in his tendered rates and hold the owner free from all such costs. He has to obtain necessary approvals from the appropriate authorities, if required.

### **39.0 Treasure Trove etc.**

Any treasure trove, coin or object antique which may be found on the site shall be the property of SBI and shall be handed over to the SBI immediately.

### **40.0 Method of Measurement**

Unless otherwise mentioned in the schedule of quantities or in mode of measurement, the measurement will be on the net quantities or work produced in accordance with up to date. Rules laid down by the Bureau of Indian Standards. In the event any dispute/disagreement the decision of the Bank shall be final and binding on the contractor.

### **41.0 Maintenance of Registers**

The contractor shall maintain the following registers as per the enclosed format at site of work and should produce the same for inspection of SBI whenever desired by them. The contractor shall also maintain the records/registers as required by the local authorities/Government from time to time.

### **42.0 Force Majeure**

42.1 Neither contractor nor SBI shall be considered in default in performance of their obligations if such performance is prevented or delayed by events such as war, hostilities revolution, riots, civil commotion, strikes, lockout, conflagrations, epidemics, accidents, fire, storms, floods, droughts, earthquakes or ordinances or any act of god or for any other cause beyond the reasonable control of the party affected or prevented or delayed. However a notice is required to be given within 30 days from the happening of the event with complete details, to the other party to the contract, if it is not possible to serve a notice, within the shortest possible period without delay.

42.2 As soon as the cause of force majeure has been removed the party whose ability to perform its obligations has been affected, shall notify the other of such cessation and the actual delay incurred in such affected activity adducing necessary evidence in support thereof.

42.3 From the date of occurrence of a case of force majeure obligations of the party affected shall be suspended during the continuance of any inability so caused. With the cause itself and inability resulting there from having been removed, the agreed time of completion of the respective obligations under this agreement shall stand extended by a period equal to the period of delay occasioned by such events.

42.4 Should one or both parties be prevented from fulfilling the contractual obligations by a state of force majeure lasting to a period of 6 months or more the two parties shall mutually decide regarding the future execution of this agreement.

#### **43.0 Local Laws, Acts, Regulations:**

The contractor shall strictly adhere to all prevailing labour laws inclusive of contract labour (regulation and abolition act of 1970) and other safety regulations. The contractor shall comply with the provision of all labour legislation including the latest requirements of all the Acts, laws, any other regulations that are applicable to the execution of the project.

- i. Minimum Wages Act, 1948 (Amended)
- ii. Payment of Wages Act 1936 (Amended)
- iii. Workmen's Compensation Act 1923 (Amended)
- iv. Contract Labour Regulation and Abolition Act 1970 and Central Rules 1971(Amended)
- v. Apprentice Act 1961 (Amended)
- vi. Industrial Employment (Standing Order) Act 1946 (Amended)
- vii. Personal Injuries (Compensation Insurance) Act 1963 and any other modifications
- viii. Employees' Provident Fund and Miscellaneous Provisions Act 1952 and amendment thereof
- ix. Shop and Establishment Act
- x. Any other Act or enactment relating thereto and rules framed there under from time to time.

#### **44.0 SAFETY CODE:**

Safety as per Annexure-II given should be followed.

#### **45.0 Accidents**

The contractor shall immediately on occurrence of any accident at or about the site or in connection with the execution of the work report such accident to the SBI. The contractor shall also report immediately to the competent authority whenever such report is required to be lodged by the law and take appropriate actions thereof.



**APPROVED MAKE**

1	PV modules	Vikram Solar/ Waaree Energies Ltd./ Waaree Renewables Pvt. Ltd./ RenewSys India Pvt. Ltd./ Emmvee Solar Pvt. Ltd./ Sova Solar Ltd./ Navitas Green Solutions Pvt. Ltd./ Novasys Greenenergy Pvt. Ltd./ Contendre Greenenergy Pvt. Ltd./ Rayzon Green Energies/ Shanti Solar.
2	Inverters:	SMA/ /Solar age /Polycab / Fimer (ABB)/ Growthwatt/ Power One/ Sungrow/ Hitachi/ Delta/ K-Solare or other make approved by the Bank.
3	DC cables	Havells/ Polycab/ KEI / Finolex/ L&T KEI/ KEC/ UNIVERSAL/ NICCO / R R Kabel
4	AC Distribution Board	MDS/Hager/L&T (should be IP65 rated)
5	DC Distribution Board	MDS/Hager/L&T (should be IP65 rated)
6	LV Switchgear	ABB/ L&T/ Schneider/ MDS or Equivalent
7	String Combiner Box	Robotina/ Trinity Touch/ Hensel/ Cape Electric, AKG or Equivalent
8	Weather Monitoring station	Pyranometer: Kipp & Zonnen or Equivalent
9	Energy Meter	Secure/L&T or Equivalent
10	Firefighting & Detection System	Reputed Make or Equivalent
11	Connectors	MC4 or Equivalent
12	Surge protection (spd)	MDS, L&T, Hager
13	Solar Charge Controller	Morningstar/ Schneider/ Blue Sky/ Genasun/ Midnite Solar/ Outback Power/ Magnum Energy

**Important:** Please Tick (/) the make of materials considered in the Tender.

**The vendor has to comply with all State & Central Government norms for choosing the make, supply and erection.**

**Note:** -

1. The contractor should obtain prior approval from SBI before placing order for any specific materials SBI may / delete any of the makes or brands out of the above list.
2. All materials should conform to relevant standards and codes of BIS. Materials with I.S.I. mark shall be used duly approved by the SBI Engineer.
3. Any material is found to be not up to the mark, the contractor will have to produce original bills/certificate from the manufacturer or his authorized Distributor for authenticity and genuineness of the material for consideration and as per make approved by the SBI. The same will not be considered for payment.
4. Any of the above items/ other items if any will be supplied and installed as approved by the Engineer-in-charge.

**Signature of contractor With Seal**

**LETTER OF UNDERTAKING**

**The Assistant General Manager (P&E)**  
 SBI Local Head Office,  
 Premises & Estate Department,  
 2<sup>nd</sup> Floor, III/1 Pandit Jawaharlal Nehru Marg,  
 Bhubaneswar- 751001

Dear Sir,

**e-TENDER FOR DESIGN, SUPPLY, INSTALLATION, TESTING & COMMISSIONING OF REMOTE MONITORING ON-GRID ROOFTOP SOLAR (PV) POWER SYSTEM AT AIIMS CAMPUS BRANCH, BHUBANESWAR**

Having examined the terms & conditions, drawings, specifications, design relating to the works specified in the memorandum hereinafter set out and having visited and examined the site of the works specified in the said memorandum and having acquired the requisite information relating thereto and affecting the quotation, I/We hereby offer to execute the works specified in the said memorandum within the time specified in the said memorandum on the item rate basis mentioned in the attached schedule and in accordance in all respect with the specifications, design, drawings and instructions in writing referred to in conditions of Tender, conditions of contract and with such conditions so far as they may be applicable.

**MEMORANDUM**

(a)	Description of work	<b>Design, Supply, Installation, Testing &amp; Commissioning of Remote Monitoring On-Grid Rooftop Solar (PV) Power System of capacity 503.84 kWp (tentative) at AIIMS Campus Branch, Bhubaneswar.</b>
(b)	Earnest Money	<b>Rs.10,600/-</b>
(c)	Initial Security Deposit	<b>NIL</b>
(d)	Time allowed for completion of work	<b>1) Installation should be completed within 6 days from the date of issue of work order and; 2) Net-metering to be completed by 31.10.2024.</b>

- i. Should this tender be accepted, I/we hereby agree to abide by and fulfill the terms and provisions of the said conditions of Contract annexed hereto so far as they may be applicable or in default thereof to forfeit and pay to SBI, the amount mentioned in the said conditions.
- ii. We understand that as per terms of this tender, the SBI may consider accepting our tender in part or whole or may entrust the work of various buildings proposed (**i.e. Design, Supply, Installation, Testing & Commissioning of Remote Monitoring On-Grid Rooftop Solar (PV) Power System at AIIMS Campus Branch, Bhubaneswar.**) in phases. We, therefore, undertake that we shall not raise any claim / compensation in the eventuality of Bank deciding to drop any of the Branch / buildings from the scope of work of this tender at any stage during the contract period. Further, we also undertake to execute the work entrusted to us in phases on our approved rates and within the stipulated time limit without any extra claim for price escalation.
- iii. As when ask by the SBI, I/we shall submit the supporting technical data sheet, specification and make of the items as per the BOQ.
- iv. We, hereby, also undertake that, we will not raise any claim for any escalation in the prices of any of the material during the currency of contract/execution/completion period.

- v. I / We have not made any modification / corrections / additions /deletions etc. in the PQ/Tender documents downloaded from web by me / us. In case at any stage later, it is found there is difference in our downloaded PQ/Tender documents from the original and / or any documentation, SBI shall have the absolute right to disqualify / reject our Tender and also debar me / us in participating in any future tenders of SBI without any prior intimation to me / us.
- vi. I/We hereby undertake and confirm that all the information furnished in this tender is correct and true to the best of our knowledge and belief and we own full responsibility for its correctness and authenticity
- vii. I / We hereby understood and accordingly confirm that all Tender documents along supporting documents/annexures etc. are required to be submitted by us strictly in the prescribed format only. In case, the Bid/documents submitted by us along with this tender is found in any other formats and not complying this condition, we hereby authorize the SBI to summarily reject our tender for which we shall not make any protest.

Yours faithfully,

Signature of contractor  
With Seal



**CERTIFICATE**

The measurements on the basis of which the above entries for the bill No. \_\_\_\_\_ were made have been taken jointly on (date) \_\_\_\_\_ and are recorded at pages \_\_\_\_\_ to \_\_\_\_\_ of measurement /sheet \_\_\_\_\_ book No. \_\_\_\_\_.

Dated

Signature of Contractor

\_\_\_\_\_

The work recorded in the above mentioned measurements has been verified at the site satisfactorily as per tender drawings, conditions and specifications.

Signature of Project Engineer, SBI

Designation:

Dated:

**SAFETY CODE****SAFETY MEASURES AT SITE:**

1. All personnel at site should be provided with Helmets and Safety Boots with some Identification Mark. Visitors also should be provided with Helmets. It should be ensured that these are used properly.
2. First Aid Box should be kept at site with all requisite materials.
3. No one should be allowed to inspect / work at a height without Safety Belt.
4. Suitable scaffolds should be provided for workmen for all Works that cannot safely be done from the ground, or from solid construction except such short period Work as can be done safely from ladders. When a ladder is used an extra Mazdoor shall be engaged for holding the ladder and if the ladder is used for carrying materials as well as suitable footholds and handholds shall be provided on the ladder and the ladder shall be given an inclination not steeper than  $\frac{1}{4}$  to 1 ( $\frac{1}{4}$  horizontal and 1 vertical).
5. Scaffolding or staging more than 3.5 meters above the ground or floors, swung or suspended from an overhead support or erected with stationary support shall have a guard rail properly attached, bolted, braced and otherwise secured at least 1 Meter high above the floor or platform of such scaffolding or staging and extending along the entire length of the outside and ends thereof with only such openings as may be necessary for the delivery of materials. Such scaffolding or staging shall be so fastened as to prevent it from swaying from the building or structure.
6. Working platforms, Gangways, and Stairways should be so constructed that they do not sag unduly or unequally, and if the height of the platform or the Gangway or the Stairway is more than 3-5 Meters above ground level or floor level they should be closely boarded, should have adequate width and should be suitably fenced, as described.
7. Every opening in the floor of a building or in a working platform be provided with suitable means to prevent the fall of persons or materials by providing suitable fencing or railing whose minimum height shall be 1 Meter.
8. Safe means of access shall be provided to all working platforms and other working places. Every ladder shall be securely fixed. No portable single ladder shall be over 9 Meters in length while the width between side rails in rung ladder shall in no case be less than 30cms for ladder upto and including Meters in length. For longer ladders this width should be increased at least 6mm for each additional 30 cms. Uniform step spacing shall not exceed 30 cms.
9. Adequate precautions shall be taken to prevent danger from electrical equipment. For electrical on line works gloves, rubber mats, and rubber shoes shall be used.
10. All trenches 1.2 Meters or more in depth shall at all times be supplied with at least one ladder for each 30 Meters length or fraction thereof. Ladder shall be extended from bottom of the trench to at least 1 Meter above the surface of the ground. The sides of the trenches, which are 1.5 Meters or more in depth shall be stepped back to give suitable slope, or securely held by timber bracing, so as to avoid the danger of sides collapsing. The excavated materials shall not be placed within 1.5 Meters of the edge of the trench or half of the depth of the trench whichever is more cuttings shall be done from top to bottom. Under no circumstances undermining or under cutting shall be done.
11. Before any demolition work is commenced and also during the process of the work:-

- a) All roads and open areas adjacent to the Work Site shall either be closed or suitably protected;
  - b) No electrical cable or apparatus which is liable to be a source of danger over a cable or apparatus used by the operator shall remain electrically charged.
  - c) All practical steps shall be taken to prevent danger to persons employed from risk of fire or explosion or flooding. No floor, roof or other part of the building shall be so overloaded with debris or materials as to render it unsafe.
  - d) All necessary personal safety equipment as considered adequate by the Site Engineer should be kept available for the use of the persons employed on the Site and maintained in a condition suitable for immediate use; and the Contractor should take adequate steps to ensure proper use of equipment by those concerned.
  - e) Workers employed on mixing Asphaltic materials, cement and lime mortars shall be provided with protective footwear and protective goggles.
  - f) Those engaged in white washing and mixing or stacking of cement bags or any materials which is injurious to the eyes shall be provided with protective goggles.
  - g) Those engaged in welding works shall be provided with Welder's protective eye-shields.
  - h) Stone breakers shall be provided with protective goggles and protective clothing and seated at sufficiently safe intervals.
  - i) When workers are employed in sewers and manholes, which are in use, the Contractor shall ensure that the manhole covers are opened and are ventilated at least for an hour before the workers are allowed to get into the manholes and the manholes so opened shall be cordoned off with suitable railing and provided with warning signals and boards to prevent accident to the Public.
12. Use of hoisting machines and tackle including their attachments, anchorage and support shall conform to the following standard or conditions:-
- a) These shall be of good mechanical construction, sound material and adequate strength and free from patent defect and shall be kept in good repairs and in good working order.
  - b) Every rope used in hoisting or lowering materials or as a means of suspension shall be of durable quality and adequate strength, and free from patent defects.
  - c) Every crane driver or hoisting appliance operator shall be properly qualified and no person under the age of 21 years should be in-charge of any hoisting machine including any scaffold, winch or give signals to the operator.
  - d) In case of every hoisting machine and of every chain ring hook, shackle swivel and pulley block used in hoisting or lowering or as means of suspension the safe working load shall be ascertained by adequate means.
  - e) Every hoisting machine and all gear referred to above shall be plainly marked with the safe working load. In case of hoisting machine having a variable safe working load, each safe working load of the conditions under which it is applicable shall be clearly indicated. No part of any machine or of any gear referred to above in this paragraph shall be loaded beyond the safe working load except for the purpose of testing.
  - f) Motor, Gearing, Transmission, Electric wiring and other dangerous parts of hoisting appliances should be provided with efficient safeguards, hoisting appliances should be provided with such means as will reduce to the minimum the risk of accidental descent of the load,



adequate precautions should be taken to reduce to the minimum the risk of any part of a suspended load becoming accidentally displaced.

g) When workers are employed on electrical installation, which are already energized, insulating mats, wearing apparel such as gloves, rubber footwear etc.

Address: \_\_\_\_\_

Signature of Tenderer:

Date:

## **TECHNICAL SPECIFICATIONS**

### **1.1 INTRODUCTION:**

In grid-connected Solar Photo-Voltaic (SPV) systems, solar energy is fed into the building loads that are connected to the public electricity grid through a service connection with surplus energy being fed into the grid and shortfall being drawn from the grid. Production of surplus energy may happen when solar energy produced exceeds building load energy demand. This surplus is fed into the grid, when energy demand in the building exceeds solar energy production, energy is drawn from the grid. Grid connected solar PV systems have no battery storage and will not work during grid failure. For buildings with grid-connected solar PV systems, the service connection meter needs to be of the bidirectional type, whereby import kWh and export kWh are separately recorded.

### **1.2 QUALITY AND WORKMANSHIP:**

**Solar PV modules are designed to last 25 years or more. It is therefore essential that all system components and parts, including the mounting structures, cables, junction boxes, distribution boxes and other parts also have a life cycle of at least 25 years. Therefore all works shall be undertaken with the highest levels of quality and workmanship. During inspection of Bank Engineer and its representatives will pay special attention to neatness of work execution and conformity with quality and safety norms. Non-compliance works will have to be redone at the cost of the Vendor.**

### **1.3 DEFINITION:**

A Grid Tied Solar Rooftop Photo Voltaic (SPV) power plant consists of SPV array, Module Mounting Structure, Power Conditioning Unit (PCU) consisting of Maximum Power Point Tracker (MPPT), Inverter, and Controls & Protections, interconnect cables and switches. PV Array is mounted on a suitable structure. Grid tied SPV system is without battery and should be designed with necessary features to supplement the grid power during day time. Components and parts used in the SPV power plants including the PV modules, metallic structures, cables, junction box, switches, PCUs etc., should conform to the BIS or IEC or international specifications, wherever such specifications are available and applicable.

Solar PV system shall consist of following equipments/components:

- Solar PV modules consisting of required number of Crystalline PV modules with linear performance warranty.
- Grid interactive Power Conditioning Unit with Remote Monitoring System.
- Mounting structures.
- Junction Boxes.
- Earthing and lightning protections (both DC & AC sides).
- IR/UV protected PVC Cables, pipes and accessories.

### **1.4 SOLAR PHOTOVOLTAIC MODULES:**

1.4.1 The PV modules used must qualify to the latest edition of IEC PV module qualification test or equivalent BIS standards **Crystalline Silicon** Solar Cell Modules IEC 61215 (II)/IS14286. In addition, the modules must conform to IEC 61730 Part-2-requirements for construction & Part 2 – requirements for testing, for safety qualification or equivalent IS.

- a) For the PV modules to be used in a highly corrosive atmosphere throughout their lifetime, they must qualify to IEC 61701/IS 61701.



- b) The total solar PV array capacity should not be less than allocated capacity (kWp) and should comprise of solar crystalline modules of **minimum 335 Wp and above wattage**. Module capacity less than 335 Watts shall not be accepted.
- c) Protective devices against surges at the PV module shall be provided. Low voltage drop bypass diodes shall be provided.
- d) PV modules must be mandatorily tested and approved by one of the IEC authorized test centers.
- e) The module frame shall be made of corrosion resistant materials, preferably having anodized aluminum.
- f) The bidder shall carefully design & accommodate requisite numbers of the modules to achieve the rated power in his bid. Bank shall allow only minor changes at the time of execution.
- g) **L-1 bidder(s) has to arrange for visit of Bank's Engineer for Solar PV (photo-voltaic) Module testing at manufacturers unit/location before placing order and bidder has to ensure the efficiency of the Solar PV Module should be minimum 17% and above (certification has to be submitted).**

**1.4.2 Other general requirement for the PV modules and subsystems shall be the Following:**

- a) The rated output power of any supplied module shall have tolerance of +/- 3%.
- b) The peak-power point voltage and the peak-power point current of any supplied module and/or any module string (series connected modules) shall not vary by more than 2 (two) per cent from the respective arithmetic means for all modules and/or for all module strings, as the case may be.
- c) The module shall be provided with a junction box with either provision of external screw terminal connection or sealed type and with arrangement for provision of bypass diode. The box shall have hinged, weather proof lid with captive screws and cable gland entry points or may be of sealed type and IP-65 rated.
- d) IV curves at STC should be provided by bidder.

**1.4.3 Modules deployed must use a RF identification tag. The following information must be mentioned in the RFID used on each modules (This can be inside or outside the laminate, but must be able to withstand harsh environmental conditions).**

- a) Name of the manufacturer of the PV module.
- b) Name of the manufacturer of Solar Cells.
- c) Month & year of the manufacture (separate for solar cells and modules).
- d) Country of origin (separately for solar cells and module).
- e) I-V curve for the module Wattage,  $I_m$ ,  $V_m$  and FF for the module.
- f) Unique Serial No and Model No of the module.

- g) Date and year of obtaining IEC PV module qualification certificate.
- h) Name of the test lab issuing IEC certificate.
- i) Other relevant information on traceability of solar cells and module as per ISO 9001 and ISO 14001.

#### 1.5. ARRAY/MODULE MOUNTING STRUCTURE:

- i. Hot dip galvanized MS/ Aluminium mounting structures shall be used for mounting the modules/ panels/arrays. Each structure will have angle of inclination as per the site conditions to take maximum insolation.
- ii. The Mounting structure must be Non-Invasive Ballast type and any sort of penetration of roof to be avoided. The design details are as follows:
  - a. **The inclination of module should be within 10° – 15° and the Ballast structure installed should have proper clearance for cleaning the roof.**
  - b. The upper edge of the module must be covered with wind shield so as to avoid bulk air ingress below the module. Clearance must be provided on both edges (upper & lower) to allow air for cooling as well as for cleaning the roof.
- iii. The mounting structure should be as per latest IS 2062: 1992 and galvanization of the mounting structure shall be in compliance of latest IS 4759.
- iv. The fasteners should be made up of stainless steel. The structures shall be designed to allow easy replacement of any module. The array structure shall be so designed that it will occupy minimum space without sacrificing the output from the SPV panels.
- v. The total load of the structure (when installed with PV modules) on the terrace should be less than 60 kg/m<sup>2</sup>. The load shall be well distributed so that point loads are well within the limits.
- vi. The structures should be laid on the rooftop on weather resistant FRP mountings which should be non-penetrating type and proper drainage of rain water over terrace through the installation area should be maintained.
- vii. The structures should be suitably loaded with reinforced concrete blocks of appropriate weight made out of M25 concrete mixture.
- viii. Special care should be taken while designing all structures for modules to cater to heavy wind and rainfall.
- ix. The array shall be located sufficiently inside the boundary wall of the terrace (parapet wall) and should not be projecting out. PV array shall be installed in the terrace space free from any obstruction and/or shadow. PV array shall be installed utilizing optimum terrace space to minimize effects of shadows due to adjacent PV panel rows.
- x. Adequate spacing shall be provided between two panel frames and rows of panels to facilitate personnel protection, ease of installation, replacement, cleaning of panels and electrical maintenance.
- xi. The PV array structure design shall be appropriate with a factor of safety of minimum 1.5.
- xii. **Each array may be provided with two bird repellents spikes at a level higher than the upper edge of the array.** The location of the spike should be selected for minimum shadow effect.
- xiii. The support structure shall be free from corrosion when installed.

- xiv. PV modules shall be secured to support structure using screw fasteners and/or metal clamps. Screw fasteners shall use existing mounting holes provided by module manufacturer. No additional holes shall be drilled on module frames. Module fasteners/clamps shall be adequately treated to resist corrosion.
- xv. Adequate spacing shall be provided between any two modules secured on PV array for improved wind resistance.
- xvi. The structure shall be designed to withstand operating environmental conditions for a period of minimum 25 years.
- xvii. The structure should be appropriately designed to withstand high wind velocities up to 200 km per hour. (The bidder is required to submit a certificate from an authorized chartered engineer with regards to the strength and durability of the structure)**

#### 1.6 JUNCTION BOXES (JBs):

- a. The junction boxes are to be provided in the PV array for termination of connecting cables. The Junction Boxes (JBs) shall be made of GRP/FRP/Powder Coated Aluminium /cast aluminium alloy/PC with full dust, water & vermin proof arrangement. All wires/cables must be terminated through cable lugs. The JB's shall be such that input & output termination can be made through suitable cable glands.
- b. Copper bus bars/terminal blocks housed in the junction box with suitable termination threads conforming to IP65 standard and IEC 62208 Hinged door with EPDM rubber gasket to prevent water entry. Single / double compression cable glands. Provision of earthing. It should be placed at 5 feet height or above for ease of accessibility.
- c. Each Junction Box shall have High quality Suitable capacity Metal Oxide Varistors (MOVs) /SPDs, suitable Reverse Blocking Diodes. Suitable earthing should be provided to SPD. The Junction Boxes shall have suitable arrangement monitoring and disconnection for each of the groups.
- d. Suitable markings shall be provided on the bus bar for easy identification and the cable ferrules must be fitted at the cable termination points for identification.
- e. Array Junction Box should be IP 65 as per IEC 60529 and should be provided with fuses and breakers/isolators of suitable ratings.**

#### 1.7 DISTRIBUTION BOARD:

- i. Distribution panel to receive the DC output from the array field.
- ii. DC DPBs shall have sheet from enclosure of dust & vermin proof conform to IP 65 protection. The bus bars are made of copper of desired size and suitable capacity.
  - a) The mounting structure steel shall be as per latest IS 2062: 1992 and galvanization of the mounting structure shall be in compliance of latest IS 4759.
  - b) Structural material shall be corrosion resistant and electrolytically compatible with the materials used in the module frame, its fasteners, nuts and bolts. Necessary protection towards rusting need to be provided either by coating or anodization.

- c) The fasteners used should be made up of stainless steel. The structures shall be designed to allow easy replacement of any module. The array structure shall be so designed that it will occupy minimum space without sacrificing the output from the SPV panels. Lay out should allow for easy access for panel cleaning.
- d) Regarding civil structures the bidder need to take care of the load bearing capacity of the roof and need arrange suitable structures based on the quality of roof.
- e) The total load of the structure (when installed with PV modules) on the terrace should be within permissible limit.
- f) CBs/MCCB shall be provided for controlling the DC power output to the PCU along with necessary surge arrestors.

**1.8 AC DISTRIBUTION PANEL BOARD:**

- a. Distribution Panel Board (DPB) shall control the AC power from PCU/ inverter, and should have necessary surge arrestors. Interconnection from ACDB to mains at LT Bus bar while in grid tied mode.
- b. All switches and the circuit breakers, connectors should conform to IEC 60947, part I, II and III/ IS60947 part I, II and III.
- c. The changeover switches, cabling work should be undertaken by the bidder as part of the project.
- d. All the Panel's shall be metal clad, totally enclosed, rigid, floor mounted, air - insulated, cubical type suitable for operation on three phase / single phase, 415 or 230 volts, 50 Hz
- e. The panels shall be designed for minimum expected ambient temperature of 45 degree Celsius, 80 percent humidity and dusty weather.
- f. All indoor panels will have protection of IP54 or better. All outdoor panels will have protection of IP65 or better.
- g. Should conform to Indian Electricity Act and rules (till last amendment).
- h. All the 415 AC or 230 volts devices / equipment like bus support insulators, circuit breakers, SPDs, VTs etc., mounted inside the switchgear shall be suitable for continuous operation and satisfactory performance under the following supply conditions

Variation in supply voltage	+/- 5 %
Variation in supply frequency	+/- 3 Hz

**1.9. PCU/ ARRAY SIZE RATIO:**

- a) **Total Inverter capacity should be greater than or equal to the Rooftop Power Plant Capacity.**
- b) **Maximum power point tracker shall be integrated in the PCU/ inverter to maximize energy drawn from the array.**

### 1.10PCU/ Inverter:

As SPV array produce direct current electricity, it is necessary to convert this direct current into alternating current and adjust the voltage levels to match the grid voltage. Conversion shall be achieved using an electronic Inverter and the associated control and protection devices. All these components of the system are termed the “Power Conditioning Unit (PCU)”. In addition, the PCU shall also house MPPT (Maximum Power Point Tracker), an interface between Solar PV array & the Inverter, to the power conditioning unit/inverter. The Inverter output should be compatible with the grid frequency. Typical technical features of the inverter shall be as follows:

- Switching devices: IGBT/MOSFET.
- Control: Microprocessor /DSP.
- Nominal AC output voltage and frequency: 415V, 3 Phase, 50 Hz (In case single phase inverters are offered, suitable arrangement for balancing the phases must be made.).
- Output frequency: 50 Hz.
- Grid Frequency Synchronization range: + 3 Hz or more.
- Ambient temperature considered: -20° C to 80° C.
- Humidity: 95 % Non-condensing.
- Grid Frequency Tolerance range: + 3 or more.
- Grid Voltage tolerance: - 20% & + 15 %.
- No-load losses: Less than 1% of rated power.
- Inverter efficiency (minimum): >93%.
- THD: < 3%.
- PF: > 0.95.

a. Three phase PCU/ inverter shall be used with each power plant system (5kW and/or above) but in case of less than 5kW, single phase inverter can be used.

**b. PCU/inverter shall be capable of complete automatic operation including wake-up, synchronization & shutdown. And it should have in-built remote monitoring feature.**

c. The output of power factor of PCU inverter is suitable for all voltage ranges or sink of reactive power, inverter should have internal protection arrangement against any sustainable fault in feeder line and against the lightning on feeder.

d. Built-in meter and data logger to monitor plant performance through external computer shall be provided.

e. The power conditioning units / inverters should comply with applicable IEC/ equivalent BIS standard for efficiency measurements and environmental tests as per standard codes IEC 61683/IS 61683 and IEC 60068-2(1,2,14,30) /Equivalent BIS Std.

f. The charge controller (if any) / MPPT units environmental testing should qualify IEC 60068-2(1, 2, 14, 30)/Equivalent BIS std. The junction boxes/ enclosures should be IP 65(for outdoor)/ IP 54 (indoor) and as per IEC 529 specifications.

g. The PCU/ inverters should be tested from the MNRE approved test centers / NABL /BIS /IEC accredited testing calibration laboratories. In case of imported power conditioning units, these should be approved by international test houses.

h. **Protection:** The inverter should have the following features:

- i) Anti-Islanding Protection
- ii) Insulation Resistance Detection
- iii) Residual Current Monitoring
- iv) Over Voltage Protection
- v) Surge Protection
- vi) DC switch

### **1.11 INTEGRATION OF PV POWER WITH GRID:**

The output power from SPV would be fed to the inverters which converts DC produced by SPV array to AC and feeds it into the main electricity grid after synchronization. In case of grid failure, or low or high voltage, solar PV system shall be out of synchronization and shall be disconnected from the grid. 4 pole isolation of inverter output with respect to the grid need to be provided.

### **1.12 DATA ACQUISITION SYSTEM / PLANT MONITORING:**

i. Data Acquisition System shall be provided for each of the solar PV plant.

ii. Data Logging Provision for plant control and remote monitoring, time and date stamped system data logs for analysis with the high quality, Metering and Instrumentation for display of systems parameters and status indication to be provided.

iii. Data from the inverter shall be uploaded to internet via sim card based device. The monitoring details should be shared by the Bank.

iv. The following parameters are accessible via the operating interface display in real time separately for solar power plant.

1. AC Voltage.
2. AC Output current.
3. Output Power.
4. Power factor.
5. DC Input Voltage.
6. DC Input Current.
7. Time Active.
8. Time disabled.
9. Time Idle.
10. Power produced
11. Protective function limits (Viz-AC Over voltage, AC Under voltage, Over frequency, Under frequency ground fault, PV starting voltage, PV stopping voltage).

v. All major parameters available on the digital bus and logging facility for energy auditing through the internal microprocessor and read on the digital front panel at any time) and logging facility (the current values, previous values for up to a month and the average values)

should be made available for energy auditing through the internal microprocessor and should be read on the digital front panel.

vi. PV array energy production: Digital Energy Meters to log the actual value of AC/ DC voltage, Current & Energy generated by the PV system provided. Energy meter along with CT/PT should be of 0.5 accuracy class.

Computerized DC String/Array monitoring and AC output monitoring shall be provided as part of the inverter and/or string/array combiner box or separately.

vii. String and array DC Voltage, Current and Power, Inverter AC output voltage and current (All 3 phases and lines), AC power (Active, Reactive and Apparent), Power Factor and AC energy (All 3 phases and cumulative) and frequency shall be monitored.

viii. The data shall be recorded in a common work sheet chronologically date wise. The data file shall be MS Excel compatible. The data shall be represented in both tabular and graphical form.

ix. All instantaneous data shall be shown on the computer screen.

x. Software shall be provided for USB download and analysis of DC and AC parametric data for individual plant.

xi. Provision for Internet monitoring and download of data shall be also incorporated.

xii. Remote Server and Software for centralized Internet monitoring system shall be also provided for download and analysis of cumulative data of all the plants.

xiii. Simultaneous monitoring of DC and AC electrical voltage, current, power, energy and other data of the plant to be provided.

xiv. **Remote Monitoring and data acquisition through Remote Monitoring System software at the Bank location with latest software/hardware configuration, service connectivity via mobile network (including the SIM recharge for the period of 5 years)/ LAN/ WI-FI connected for online /real time data monitoring/control complete to be supplied, operation & maintenance/control to be ensured by the supplier. Provision for interfacing these data on [NAME OF THE ORGANISATION] server and portal in future shall be kept.**

### 1.13 METERING:

a. The bidirectional electronic energy meter as per the statutory requirements of DISCOMs shall be installed for the measurement of Import/ Export of energy (getting statutory requirements and installation of bi-directional meter is installer scope).

b. Solar meter to be installed to measure the solar generation as per OERC guidelines.

c. **The bidder must take approval/ NOC from the Concerned DISCOM for the connectivity, technical feasibility, and synchronization of SPV plant with distribution network and copy submit to Bank before commissioning of SPV plant.**

d. Inverter should comply with anti-islanding norms of OERC.



### 1.14 POWER CONSUMPTION:

Regarding the generated power consumption, priority need to give for internal consumption first and thereafter any excess power can be exported to grid. Decisions of appropriate authority like DISCOM, state regulator may be followed.

### 1.15 PROTECTIONS:

The system should be provided with all necessary protections like earthing, Lightning, and grid islanding as follows:

#### 1.15.1 LIGHTNING PROTECTION:

The SPV power plants shall be provided with lightning & overvoltage protection. The main aim in this protection shall be to reduce the over voltage to a tolerable value before it reaches the PV or other sub system components. The source of over voltage can be lightning, atmosphere disturbances etc. The entire space occupying the SPV array shall be suitably protected against Lightning by deploying required number of Lightning Arrestors. Lightning protection should be provided as per IEC 62305 standard. Lightening conductor should be made of 25 mm dia 4000mm long GI spike as per Provision of IS 2309-1969. Necessary concrete foundation to be provided for holding Lightning conductor considering the wind speed. It should be earthed through 20mm X 3mm GI flat from pit with proper insulation and nut-bolting arrangement. Height of Lightening conductor from array structure should be minimum 1 meter.

#### 1.15.2 SURGE PROTECTION:

Internal surge protection shall consist of three MOV type surge-arrestors connected from +ve and -ve terminals to earth (via Y arrangement)/ SPD (type II). SPD should be provided in AC and DC side of solar PV system. It should have protection voltage of 2.5kv and nominal discharge current of 5kA (8/20) micro sec. SPD earthing terminals should be connected to earthing system.

#### 1.15.3 EARTHING PROTECTION:

a. Each array structure of the PV yard should be grounded/ earthed properly as per IS: 3043-1987. In addition the lighting arrester/masts should also be earthed inside the array field. Earth Resistance shall be tested in presence of the representative of Bank engineer as and when required after earthing by calibrated earth tester. PCU, ACDB and DCDB should also be earthed properly. **Minimum 3 Nos copper pipe chemical earthing to be provided as per relevant IS code.**

b. **Earth resistance shall not be more than 3 ohms.** It shall be ensured that all the earthing points are bonded together to make them at the same potential.

### 1.16. Grid Islanding:

a. In the event of a power failure on the electric grid, it is required that any independent power-producing inverters attached to the grid turn off in a short period of time. This prevents the DC-to-AC inverters from continuing to feed power into small sections of the grid, known as "islands." Powered islands present a risk to workers who may expect the area to be unpowered, and they may also damage grid-tied equipment. The Rooftop PV system shall be equipped with

islanding protection. In addition to disconnection from the grid (due to islanding protection), disconnection due to under and over voltage conditions shall also be provided.

b. A manual disconnect 4pole isolation switch (MCB/ MCCB) as per max inverter output current beside automatic disconnection to grid would have to be provided at utility end to isolate the grid connection by the utility personnel to carry out any maintenance. This switch shall be locked by the utility personnel.

**1.17 CABLES:** Cables of appropriate size to be used in the system shall have the following characteristics:

- i. Shall meet IEC 60227/IS 694, IEC 60502/IS1554 standards.
- ii. Temp. Range:  $-10^{\circ}\text{C}$  to  $+80^{\circ}\text{C}$ .
- iii. Voltage rating 660/1000V.
- iv. Excellent resistance to heat, cold, water, oil, abrasion, UV radiation Flexible.
- v. Sizes of flexible copper cables between array interconnections, array to junction boxes, junction boxes to Inverter etc. shall be so selected to keep the voltage drop (power loss) of the entire solar system to the minimum. The cables (as per IS) should be insulated with a special grade PVC compound formulated for outdoor use.

Copper cable Routing/Marking: All cable/wires are to be routed in a GI cable tray and suitably tagged and marked with proper manner by good quality ferule or by other means so that the cable easily identified.

The copper cable should be so selected that it should be compatible up to the life of the solar PV panels i.e. 25years.

The ratings given are approximate. Bidder to indicate size and length as per system design requirement. All the cables required for the plant provided by the bidder. Any change in cabling sizes if desired by the bidder/approved after citing appropriate reasons. All cable schedules/layout drawings approved prior to installation.

Multi Strand, Annealed high conductivity copper conductor PVC type A pressure extruded insulation or XLPE insulation. Overall PVC/XLPE insulation for UV protection Armoured cable for underground laying. All cable trays including covers to be provided. All cables conform to latest edition of IEC/ equivalent BIS Standards as specified below: BoS item / component Standard Description Standard Number Cables General Test and Measuring Methods, PVC/XLPE insulated cables for working Voltage up to and including 1100 V ,UV resistant for outdoor installation IS /IEC 69947.

The size of each type of DC selected shall be based on minimum voltage drop however the maximum drop shall be limited to 1%.

The size of each type of AC cable selected shall be based on minimum voltage drop however the maximum drop shall be limited to 2%.

#### **1.18 TOOLS & TACKLES AND SPARES:**

Operation and maintenance guide and consumable spares like fuses should be provided by vendor.

### **1.19 DANGER BOARDS AND SIGNAGES:**

Danger boards should be provided as and where necessary as per IE Act. /IE rules as amended up to date. Three signage shall be provided one each at battery –cum- control room, solar array area and main entry from administrative block. Text of the signage may be finalized in consultation with Bank.

### **1.20 DRAWINGS & MANUALS:**

Two sets of Engineering, electrical drawings and Installation and O&M manuals are to be supplied. Bidders shall provide complete technical data sheets for each equipment giving details of the specifications along with make/makes in their bid along with basic design of the power plant and power evacuation, synchronization along with protection equipment.

I. Approved ISI and reputed makes for equipment be used.

II. For complete electro-mechanical works, bidders shall supply complete design, details and drawings for approval to Bank before progressing with the installation work.

### **1.21 PLANNING AND DESIGNING:**

i. The bidder should carry out the considering optimal usage of the space, material & labour. The bidder should submit the array layout, drawings along with shadow analysis report to Bank for approval. Bidders should submit detailed SLD for approval.

ii. Bank reserves right to change/modify sub-systems and components at any stage as per the local site conditions/ requirements.

iii. The bidder shall submit preliminary drawing for approval & based on any modification or recommendation, if any. The bidder shall submit three sets and soft copy in CD of final drawing for formal approval to proceed with installation work.

### **1.22 DRAWINGS TO BE FURNISHED BY BIDDER AFTER AWARD OF CONTRACT:**

i. The Contractor shall furnish the following drawings Award/Intent and obtain approval.

ii. General arrangement and dimensioned layout Schematic drawing showing the requirement of SV panel, Power conditioning Unit(s)/ inverter, Junction Boxes, AC and DC Distribution Boards, meters etc. Structural drawing along with foundation details for the structure.

iii. Itemized bill of material for complete SV plant covering all the components and associated accessories.

iv. Layout of solar Power Array.

**1.23 Safety - The bidder shall take entire responsibility for electrical safety of the installation(s) including connectivity with the grid and follow all the safety rules & regulations applicable as per Electricity Act, 2003 and CEA guidelines etc.**

**1.24 Display Board:** Vendor shall provide the display board of schematic diagram/SLD of size 3 ft x 3 ft with all details of the Solar Plant.

**QUALITY CERTIFICATION, STANDARDS AND TESTING FOR GRID-CONNECTED ROOFTOP SOLAR PV SYSTEMS/ POWER PLANTS**

Quality certification and standards for grid-connected rooftop solar PV systems are essential for the implementation of this technology. Hence, all components of grid-connected rooftop solar PV system/ plant must conform to the relevant standards and certifications given below:

<b>Solar PV Modules</b>	
IEC 61215 Edition (II)/ IS 14286	Design Qualification and Type Approval for Crystalline Silicon Terrestrial Photovoltaic (PV) Modules
IEC 61646 / Equivalent IS (Under Dev.)	Thin Film Terrestrial PV Modules
IEC 62108	Concentrator PV Modules & Assemblies
IEC 61701	Salt Mist Corrosion Testing of Photovoltaic (PV) Modules
IEC 61853- Part 1/ IS 16170: Part 1	Photovoltaic (PV) module performance testing and energy rating –: Irradiance and temperature performance measurements, and power rating
IEC 62716	Photovoltaic (PV) Modules – Ammonia (NH <sub>3</sub> ) Corrosion Testing (As per the site condition like dairies, toilets)
IEC 61730-1,2	Photovoltaic (PV) Module Safety Qualification – Part 1: Requirements for Construction, Part 2: Requirements for Testing
<b>Solar PV Inverters</b>	
IEC 62109-1, IEC 62109-2	Safety of power converters for use in photovoltaic power systems – Part 1: General requirements, and Safety of power converters for use in photovoltaic power systems;  Part 2: Particular requirement for inverters. Safety compliance (Protection degree IP 65 for outdoor mounting, IP 54 for indoor mounting)
IEC/IS 61683 (as applicable)	Photovoltaic Systems – Power conditioners: Procedure for Measuring Efficiency (10%, 25%, 50%, 75% & 90-100% Loading Conditions)
IEC 62116/ UL 1741/ IEEE 1547 (as applicable)	Utility-interconnected Photovoltaic Inverters - Test Procedure of Is-landing Prevention Measures
IEC 60255-27	Measuring relays and protection equipment – Part 27: Product safety requirements
IEC 60068-2 / IEC 62093 (as applicable)	Environmental Testing of PV System – Power Conditioners and Inverters
<b>Fuses</b>	
IS/IEC 60947 (Part 1, 2 & 3), EN 50521	General safety requirements for connectors, switches, circuit breakers (AC/DC): a) Low-voltage Switchgear and Control-gear, Part 1: General rules b) Low-Voltage Switchgear and Control-gear, Part 2: Circuit Breakers c) Low-voltage switchgear and Control-gear, Part 3: Switches, disconnectors, switch-disconnectors and fuse-combination units d) EN 50521: Connectors for photovoltaic systems – Safety requirements and tests
IEC 60269-6	Low-voltage fuses - Part 6: Supplementary requirements for fuse-links for the protection of solar photovoltaic energy systems

<b>Surge Arrestors</b>	
BFC 17-102:2011	Lightening Protection Standard
IEC 60364-5-53/ IS 15086-5 (SPD)	Electrical installations of buildings - Part 5-53: Selection and erection of electrical equipment - Isolation, switching and control
IEC 61643-11:2011	Low-voltage surge protective devices - Part 11: Surge protective devices connected to low-voltage power systems – Requirements and test methods
<b>Cables</b>	
IEC 60227/IS 694, IEC 60502/IS 1554 (Part 1 & 2)/ IEC69947 (as applicable)	General test and measuring method for PVC (Polyvinyl chloride) insulated cables (for working voltages up to and including 1100 V, and UV resistant for outdoor installation)
BS EN 50618	Electric cables for photovoltaic systems
(BT(DE/NOT)258)	mainly for DC Cables
<b>Earthing/ Lightning</b>	
IEC 62561	Series (Chemical earthing) (as applicable)
IEC 62561-1	Lightning protection system components (LPSC) - Part 1: Requirements for connection components
IEC 62561-2	Lightning protection system components (LPSC) - Part 2: Requirements for conductors and earth electrodes
IEC 62561-7	Lightning protection system components (LPSC) - Part 7: Requirements for earthing enhancing compounds
<b>Junction Boxes</b>	
IEC 60529 IEC 529	Junction boxes and solar panel terminal boxes shall be of the thermoplastic type with IP 65 protection for outdoor use, and IP 54 protection for indoor use
<b>Energy Meter</b>	
IS 16444 or as specified by the DISCOMs	A.C. Static direct connected watt-hour Smart Meter Class 1 and 2—Specification (with Import & Export/Net energy measurements)
<b>Solar PV Roof Mounting Structure</b>	
IS 2062/IS 4759	Material for the structure mounting
IEC 62548	PV arrays – Design requirements
<b>QUALITY STANDARDS AND CERTIFICATIONS FOR A GRID-CONNECTED ROOFTOP SOLAR PV SYSTEM</b>	
<p>Equivalent standards may be used for different components of the systems. In case of clarification, the following organizations/ agencies may be contacted:</p> <ul style="list-style-type: none"> <li>• Ministry of New and Renewable Energy(MNRE)</li> <li>• National Institute of Solar Energy(NISE)</li> <li>• The Energy and Resources Institute(TERI)</li> <li>• TÜVRheinland</li> <li>• UL</li> </ul>	