

NIT NO	PRE202508002
DATE	26.08.2025



STATE BANK OF INDIA
PREMISES & ESTATE DEPARTMENT
INVITES ONLINE E-TENDER

FOR DESIGN, MANUFACTURE, SUPPLY, ERECTION, TESTING AND COMMISSIONING INCLUDING 5 YEARS WARRANTY OF 35 KWp (15+10+10) GRID CONNECTED ROOF-TOP SOLAR POWER PLANT WITH NET METERING ARRANGEMENT IN BANK'S OWN BUILDINGS IN UNDERWOOD GARDENS, RA PURAM, CHENNAI

THROUGH E-TENDERING PROCESS

Assistant General Manager,
Premises & Estate Department,
4th Floor, LHO,
State Bank of India,
16, College Lane, Nungambakkam,
CHENNAI-600 006
Phone No:044-28308416 / 8415 / 8404
Email: agmpre.lhoche@sbi.co.in / agmelec.lhoche@sbi.co.in

NOTICE INVITING TENDER

1.	Name of the Work	Design, manufacture, supply, erection, testing and commissioning including 5 years warranty of 35 KWp (15+10+10) grid connected roof-top solar photovoltaic power system with net metering in bank's own buildings in UNDERWOOD GARDENS, RA PURAM, CHENNAI
2.	Time for Completion of work	90 days (all sites) from the date of PO or handover of the site whichever is earlier.
3.	Eligibility of the contractor	1. Registered Solar Vendors with PM-Suryaghar National Portal for the State of Tamilnadu. 2. Registered Solar Vendors with State bank of India Chennai circle. 3. The vendor should have a valid digital signature to participate in the online tendering process
4.	Cost of Tender document	Nil
5.	Earnest Money Deposit (EMD)	Rs25,000/- . MSEs are exempted from submission of EMD. Please refer details in the General Conditions of Contract.
6.	Initial Security Deposit (ISD)	2% of the contract value
7.	Total Security Deposit (TSD)	5% (2% ISD + 3% Retention) will be retained till the completion of the warranty & AMC period of 5 Years.
8.	Contractors can also download the tender documents from the website	https://etender.sbi and https://bank.sbi/web/sbi-in-the-news/procurement-news
9.	Availability for download from the above web sites	From 27.08.2025 to 08.09.2025
10.	Date, time and venue of Pre-bid meeting	02.09.2025 @11.00AM at Office of AGM, State Bank of India-LHO, Premises & Estate Department, 4 th Floor, 16 College Lane, Nungambakkam, Chennai-600 006
11.	Posting of clarifications for the Bidder's queries in the e-tender portal	03.09.2025 Note: Clarifications, if any, shall be posted only in the e-tender portal. No individual communication shall be provided to the Bidder
12.	Last date and time for submission of online bids in e-tender portal	09.09.2025 by 3.00 P.M.
13.	Date and Time of opening of e-Tenders	09.09.2025 at 3.10 P.M. 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.
14.	Date & Time of price bid	Date of opening of price bid may be extended as it depends on the scrutiny of technical bid and will be advised to the qualified bidders through registered mail ids.

15.	Payment terms	<p>i) No advance payment.</p> <p>ii) 70% will be released after completion of the installation and successful commissioning system.</p> <p>iii) <u>25% will be released against verification of the average power generation of the plant shall be minimum of 4 KWH per day per KW and installation of Bi-Directional meter & completion in all respects.</u></p> <p>iv) 5% TSD will be released after completion of 5 years warranty or it can be released against submission of valid PBG with a validity of 5 years from the date of installation & commissioning of Bi-Directional meter.</p> <p>v) CAMC will commence after successful completion 5 years warranty period. The quarterly CAMC charges shall be paid after successful completion of the services of the respective quarter.</p>
16.	Warranty Period (Including operation and comprehensive maintenance)	5 years from the date of installation of Bi-Directional meter and successful Commissioning of the system.
17.	Liquidated Damages for delay in work	If the work is delayed beyond the scheduled completion date, then 0.50% of the total value of the contract per week (or part thereof) of delay will be deducted from the final bill value subject to max 5% of the value of work.
18.	Validity of tender	90 days from the date of opening of the price bid.
19.	Tax Deduction	TDS as per applicable rates
20.	Rates quoted by bidder	<p>1. The quoted rate should be inclusive of Cost of materials, transport, loading, unloading charges, cost of installation, wastages, machinery, temporary works such as scaffolding, statutory expenses, incidental charges, liaising with the Electricity Authorities for the required permissions, installation of Bi-directional meters and all related expenses required for the successful commissioning of the Solar System and shall be inclusive of overheads, profit, all taxes, duties etc (excluding GST).</p> <p>2. Additional claims other than the quoted amount will not be entertained.</p> <p>3. The quoted rates shall be firm throughout the completion of the project</p> <p>4. Claims for revision of the Quoted price by any bidder after the tender will not be entertained.</p>
21.	<p><u>Check list of documents to be uploaded in the e-tender portal</u></p> <p><u>Note:</u></p> <p>1. The original documents shall be scanned preferably in colour and uploaded in PDF format with required compression.</p>	<p>1. Scanned copy of EMD or <u>valid</u> EMD exemption certificate</p> <p>2. Scan of original Power of Attorney, authorizing the signatory of the Bid (in case of company or firm).</p> <p>3. Scan of Annexure 1: Undertaking to be submitted by the Bidder in his letter head duly signed and stamped</p>

	2. Product catalogues or pamphlets should not be uploaded.	4. Scan of Annexure 2: Make of Materials proposed to be supplied by the bidder in this Contract duly signed and stamped 5. Scan of Tender Document (Page nos:1 to 31 <u>excluding the above annexures</u>) duly signed and stamped on all the pages
22.	Any additional information	1. The make of materials should be chosen strictly from the preferred makes as given in the tender. 2. Firm should visit the e-portal website till last date and time of submission for changes/ corrigendum, if any 3. Any clarifications sought after opening of the tenders will not be entertained at any cost. 4. The Bank reserves the right to cancel or postpone the tenders at any stage without assigning any reason. 5. SBI reserves the right to accept or reject or cancel any or all bids without assigning any reasons thereof, even after opening of the bids.
23.	In case of any issues being faced/ any guidance required while submitting online tender, please contact our E-procurement solutions agency support team	e-Procurement Technologies Limited A-201/208, Wall Street-II, Nr. Opp. Orient Club, Ellis bridge, Ahmedabad – 380006, Gujarat (INDIA) <i>E-mail : etender.support@sbi.co.in</i> -
24.	The tender will be treated as unresponsive and will not be considered, if the Bidder	1. Failed to upload the Scan copy of required documents as mentioned in the documents to be uploaded. 2. Partly or fully Modifies, alters or corrects the tender document uploaded by Bank 3. The tender is not in the prescribed format or is unsigned or not signed as per the stipulations in the bid document 4. The required EMD has not been provided or exemption from EMD is claimed without acceptable proof of exemption 5. The bidder is not eligible to participate in the bid as per laid down eligibility criteria 6. The tenderer has quoted for goods manufactured by a different firm without the required authority letter from the proposed manufacturer 7. The bidder has not agreed to give the required performance security 8. The tenderer has not quoted for the entire requirement as specified in the Scope of works in the Bid. (example: if the scope of work includes supply the equipment, install and commission it but the tenderer has quoted only for supply of the equipment).

Details of the site where the proposed Solar plants are to be installed

S.NO.	NAME OF SITE	Building	PROPOSED PLANT CAPACITY(KWp)
1	Underwood Gardens, RA Puram, Chennai	CGM Bungalow **	15
		Common Services #	10
		VIP Guest House@	10

Note: Please inspect all the sites, understand the type of work involved and the site conditions and quote considering all the following factors.

** The EB meters are located in the meter room near the first entrance of the campus and the solar panels has to be installed in the terrace of the Annex building and solar inverter has to be installed in Annexe building. Approximate distance between meter and Solar Inverter is 300 mtr. However, **Bidders are advised to visit the site and assess the required length. Due to the longer length,** the AC reference cable from the meter to the inverter should be **3.5 core 35 sqmm aluminium armoured cable** and clamped on the compound wall from the meter to the inverter.

The **Common services EB meter** is located in the meter room near the second entrance of the campus and the solar panels has to be installed in the terrace of the E bungalow building and solar inverter has to be installed in **E bungalow building**. Approximate distance between meter and Solar Inverter is 150 mtr. However, **Bidders are advised to visit the site and assess the required length. Due to the longer length,** the AC reference cable from the meter to the inverter should be **3.5 core 25 sqmm aluminium armoured cable** and clamped on the compound wall and laid in existing trench from the **EB meter** to the inverter.

@ The EB meters are located in the meter room near the second entrance of the campus and the solar panels has to be installed in the first floor terrace of the Guest House and solar inverter has to be installed in GH building. Approximate distance between meter and Solar Inverter is 150 mtr. However, **Bidders are advised to visit the site and assess the required length. Due to the longer length,** the AC reference cable from the meter to the inverter should be **3.5 core 25 sqmm aluminium armoured cable** The AC reference cable has to be laid and clamped on the compound wall and laid in existing trench from the meter to the inverter.

- The list and location shown above are indicative.
- Bank reserves the right to amend / modify / alter the locations, capacity and number as required.

*Assistant General Manager
Premises & Estate Department*

INSTRUCTIONS TO THE TENDERER

1.0 BRIEF DESCRIPTION OF THE WORK:

The scheme aims to reduce the fossil fuel-based electricity load on main grid and make building self-sustainable from the point of electricity to the extent possible by installation of grid-connected roof top solar PV modules on the roofs of Bank's Offices / Branches / ATMs / Residences. The generated solar power will be utilized to feed the building loads without battery Storage. Surplus energy, if any, is exported to the state electricity grid and shortfall, if any, is imported from the grid.

The detailed of works to be done are given in the Scope of work in General Conditions of the Contract. Bidders are advised to read them carefully and understand the works under the scope of this contract and its cost implications and submit their online quote accordingly.

Ignorance of the works under the scope of work at a later stage will not be accepted and Bank will not entertain any additional claims of whatsoever means from the bidder, in this regard.

2.0 TENDER DOCUMENTS

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

- Instructions to tenderer
- General Conditions of Contract
- Technical Specifications
- Price 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:

- Price Bid,
- Technical Specifications,
- General Conditions of Contract,
- Instructions to Tenderer

2.3 Complete set of tender documents including the Corrigendum can be downloaded from the Bank's e-tender portal on any day during the period mentioned in the NIT.

2.4 The tender documents are not transferable.

3.0 SITE VISIT

The Bidder is advised to inspect the site and must obtain on his own responsibility and his own expenses all the following information and data which may be required for the purpose of preparation and submission of their bids and for the satisfactory completion of the work:

- i) The location of the Solar Panel (shadow free area), DBs, Meter Board, Earth Pits etc
- ii) Required civil work like making opening in the wall for cable laying and its routing, DBs, space and provision for erection of panel
- iii) local authorities' requirement or restrictions
- iv) Security gate pass requirements
- v) Unloading and Storage space for the materials
- vi) Permissible working hours at the site
- vii) any other adverse conditions or hindrance for executing the work
- viii) traffic regulations, law & order situations in the area
- ix) Whether work has to be executed in coordination with other agencies etc
- x) availability of water and power facilities

The Bidder will be fully responsible for considering the financial effect of any or all the above factors while submitting his Bid. The Bank shall not be liable in any manner whatsoever for the same or for any other costs or other expenses incurred by a Bidder regardless of the conduct or outcome of the bidding process.

4.0 CLARIFICATION /AMENDMENTS AND CORRIGENDUM:

- 4.1 Any queries relating to the tender document and the terms and conditions contained therein should be addressed to the Tender Inviting Authority or the relevant contact person indicated in the tender by e-mail given in the NIT within the date/time mentioned.
- 4.2. The clarifications to the queries received or amendments in the tender will be posted on the Bank's e-tender portal as a corrigendum/addendum. No individual communication will be conveyed to the bidders. The interested parties/bidders are advised to check the above website regularly till the date of submission of bid document and ensure that clarifications / amendments issued, if any, have been taken into consideration before submitting the bid. Such amendments/clarifications, if any, issued by the Bank will be binding on the participating bidders. SBI will not take any responsibility for any omissions by the bidder. SBI, at its own discretion, may extend the deadline for submission of bids in order to allow prospective bidders a reasonable time to prepare the bid, for taking the amendment into account.
- 4.3 Depending upon the site conditions and the Bank's requirements, a pre-bid meeting, if required, will be held on the date and time specified in the tender which may be attended by the interested bidders or their representatives and get their queries clarified.
- 4.4. SBI reserves the right to amend, rescind or reissue the tender, at any time prior to the deadline for submission of bids.
- 4.5. Request for change in commercial/legal terms and conditions, other than what has been mentioned in the tender or any addenda/corrigenda or clarifications issued in connection thereto, will not be considered and queries in this regard, therefore will not be entertained. SBI is not under any obligation to entertain / respond to suggestions made or to incorporate modifications sought for.
- 4.6. Queries received after the scheduled date and time will not be responded/acted upon.
- 4.7 SBI will not entertain any queries with regard to the tenders after the pre-bid meeting.
- 4.8 The bidder shall be deemed to have examined the bid document, to have obtained his own information in all matters whatsoever that might affect the carrying out the works in line with the scope of work specified elsewhere in the document at the offered rates and to have satisfied himself to the sufficiency of his bid. The bidder shall be deemed to know the scope, nature and magnitude of the works and requirement of materials, equipment, tools and labour involved and as to what all works, he has to complete in accordance with the bid documents irrespective of any defects, omissions or errors that may be found in the bid documents.
- 4.9 The bidder should make a note of the unique Tender ID assigned to each tender, in case they want to obtain any clarification / help from the e-tender portal Helpdesk for any technical issues like digital signature issues, uploading the documents or submission of the online bids etc.

5.0 INSTRUCTIONS FOR ONLINE BID SUBMISSION

- 5.1 The Bidder is advised to read carefully all instructions and conditions in this document and understand them fully. All information and documents required as per the bid document must be furnished. Failure to provide the information and/or documents as required may render the bid technically unacceptable.
- 5.2 Bidders should note the number of documents - including the names and content of each of the document that need to be uploaded. Any deviations from these may lead to rejection of the bid. Bidder, in advance, should get these documents scanned in PDF format (with color option with compression which helps in reducing size of the scanned document). This will lead to a reduction in the time required for bid submission process. The bidder has to upload the required bid documents one by one as indicated in the tender document.

- 5.3 The Bank will not be held responsible for any sort of delay or the difficulties faced during the submission of bids in the online portal. The bidder should see that the bid documents submitted should be free from virus and if the documents could not be opened, due to virus, during tender opening, the bid is liable to be rejected.
- 5.4 Only those bidders satisfying the eligibility criteria given in the NIT need to apply. The bidders will be required to register their valid Digital Signature Certificate (Class III Certificates with signing key usage) issued by any Certifying Authority recognized by CCA India (e.g. Sify / nCode / eMudhra etc.), with their profile and valid email address and mobile numbers as part of the bidding process. These would be used for any communication from the E-tender Portal. Only one valid DSC should be registered by a bidder. Bidder then logs in to the site through the secured log-in by entering their user ID / password and the DSC.
- 5.5 Bids should be **submitted online by the bidders** in the website <https://etender.sbi>, with the bidder's valid digital certificate which confirms that the bidders have read and understood the tender terms and conditions. Claiming ignorance of all the terms and conditions in this tender either before or after the PO is issued or during the progress of the work will not be accepted.
- 5.6 **Offline bids will not be considered. Note:** The price bid given in the tender document is for the purpose of information of the bidders and to facilitate them to work out their prices well in time for easy submission in the online portal. The price bid format in the tender document **should not be filled** and uploaded. The bids containing the BOQ with rates filled or any indication of the prices quoted by the bidder, then the bid will be rejected.
- 5.7 The server time (which is displayed on the online portal dashboard) will be considered as the standard time for referencing the deadlines for submission of the bids by the bidders, opening of bids etc. The bidders should follow this time during bid submission. Bidder should log into the site well in advance for bid submission so that he/she upload the bid in time i.e. on or before the bid submission time. Bidder will be responsible for any delay due to other issues like network not available, power outages, slow network speed, system faults at bidder's end, files not getting uploaded etc.
- 5.8 The documents submitted online in the Technical Bid **should not contain any price information**. Such Bid, if received, will be rejected.
- 5.9 The online price bid will be opened only if the bid is unconditional and the bidder qualifies as per eligibility criteria and meets technical specifications.
- 5.10 If required, SBI shall conduct e-reverse auction among the qualified bidders and the same shall be communicated to the bidders.
- 5.11 The uploaded tender documents by the bidder become accessible to the Bank, only after the tender opening. Therefore, bidders are advised not to contact the Bank for any query in this connection, during the bidding process or from the time of opening of price bid to the time the contract is awarded.
- 5.12 Any effort by a bidder to influence SBI in its decisions on bid evaluation, or contract award may result in rejection of the bid.
- 6.0 **BID SUBMITTED BY A BIDDING COMPANY/ POWER OF ATTORNEY:**
The Bidding Company should designate one person to represent the Bidding Company in its dealings with SBI. The person should be authorized to perform all tasks including, but not limited to providing information, responding to enquires, signing of bid etc. The Bidding Company should submit, along with bid, a Power of Attorney in original, authorizing the signatory of the bid.
- 7.0 **ZERO DEVIATION**
This is a Zero Deviation bidding process. Bidder is to ensure compliance of all provisions

of the bid document and submit their bid accordingly. Tenders with any deviation to the bid conditions shall be liable for rejection.

8.0 SBI's RIGHT TO WITHDRAW THE TENDER OR TO ACCEPT OR REJECT ANY OR ALL BIDS

8.1 This tender may be withdrawn or cancelled by SBI at any time without assigning any reasons thereof.

8.2 SBI reserves the right to accept or reject any Bid in part or in full or to cancel the Bidding process and reject all Bids at any time prior to award of the contract, without incurring any liability to the affected Bidder or Bidders or any obligation to inform the affected Bidder or Bidders of the grounds for SBI's action.

8.3 The acceptance of a tender rests with the Competent Authority, who does not bind himself to accept the lowest tender and reserves to himself the authority to reject any or all of the tenders received, without assigning any reasons.

8.4 Tenders in which any of the prescribed conditions are not fulfilled or are incomplete in any respect are liable to be rejected.

8.5 SBI reserves its right to vary, modify, revise, amend or change any of the terms and conditions of the bid before submission.

8.6 The decision regarding acceptance or rejection of bid by SBI will be final.

9.0 SAFETY GUIDELINES FOR THE CONTRACTOR:

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. The Contractor should follow the following General safety Guidelines while executing the work:

9.1 Smoking is strictly prohibited at workplace.

9.2 No one is allowed to work at or more than three meters height without wearing safety belt and anchoring the lanyard of safety belt to firm support preferably at shoulder level. Chinstrap of safety helmet shall be always on and safety boot is worn.

9.3 Usage of eye protection equipment shall be ensured when workmen are engaged for grinding, chipping, welding and gas-cutting. For other jobs eye protection has to be provided as per the need.

9.4 All safety appliances like Safety shoes, Safety gloves, Safety helmet, Safety belt, Safety goggles etc. shall be arranged before starting the job.

9.5 Excavated pits for earthing, cable laying shall be barricaded till the backfilling is done. Safe approach to be ensured into every excavation.

9.6 Preferably the work shall be carried out during the daytime. However, adequate illumination at workplace shall be ensured in case any work is carried out at night.

9.7 All the dangerous moving parts of the portable / fixed machinery being used shall be adequately guarded.

9.8 Ladders being used at site shall be adequately secured at bottom and top. Ladders shall not be used as work platforms.

9.9 Debris, scrap and other materials to be cleared from time to time from the workplace and at the time of closing of work every day. Dismantled Material shall not be thrown from the height and shall be properly disposed of to prevent any injury to public/staff.

- 9.10 Other than electricians no one is allowed to carry out electrical connections, repairs on electrical equipment or other jobs related thereto.
- 9.11 All electrical connections shall be made using 3 or 5 core cables, having an earth wire.
- 9.12 Inserting of bare wires for tapping the power from electrical sockets is completely prohibited and plug tops of suitable capacity only shall be used.
- 9.13 All the unsafe conditions, unsafe acts identified by SBI to be corrected on priority basis.
- 9.14 No children or physically challenged persons shall be allowed to enter the workplace and shall not be utilized for any service during execution of the work.
- 9.15 All the Gas cutting, sharp tools, flammable materials and tackles shall be stored properly and safely when not in use.
- 9.16 Clamps shall be used on Return cables to ensure proper earthing for welding works.
- 9.17 Return cables shall be used for earthing.
- 9.18 All the pressure gauges used in gas cutting apparatus shall be in good working condition and in case of any leakages, the same shall not be used.
- 9.19 Proper eye washing facilities shall be made in areas where chemicals are handled.
- 9.20 Connectors and hose clamps are used for making welding hose connections.
- 9.21 Tapping of power by cutting electric cables in between must be avoided. Proper junction boxes must be used.

10. Governing Language:

All communication with respect to the Bid, clarifications, replies, contract documents etc shall be in English.

11.0 WORK DURING NIGHTS AND HOLIDAYS

No work shall be carried on during the night or on holidays without the permission in writing of SBI. If the work is unavoidable or absolutely necessary for the safety of the work, the contractor shall immediately advise SBI. All work at night or holidays, after obtaining approval from competent authorities, shall be carried out without unreasonable noise and disturbance.

12.0 CUTTING AND MAKING GOOD

Puncturing or drilling the roof or structural members in the site for the installation of Solar Panels are not allowed without prior consent of the Bank.

If permitted by Bank, it should be made good at the cost of the contractor.

READ, UNDERSTOOD AND ACCEPTED

GENERAL CONDITIONS OF CONTRACT

1.0 DEFINITIONS

In constructing these conditions, the specifications, the schedule of quantities, tender and agreement, the following words shall have the meaning herein assigned to them except where the subject or context otherwise requires.

In this connection, the following terms shall be interpreted as indicated below:

- i) **'The Employer/Bank/SBI'** shall mean State Bank of India, a body Corporate created under State Bank of India Act 1955, having its Corporate Centre at State Bank Bhavan, Madame Cama Road, Mumbai 400 021 and a Premises & Estate Department of LHO at Chennai and includes the client's representatives, successors and assigns.
- ii) **'Engineer'** shall mean an Engineer appointed by the Bank as their representative to give instructions to the contractors.
- iii) **"Bidder/Bidding Company"** shall mean an eligible entity/firm submitting the bid including its successors, executors and permitted assigns as the context may require.
- iv) **"Vendor/Contractor"** is the successful bidder to whom the work has been awarded.
- v) **"The Site"** means locations where the proposed work is to be carried out and services as desired in this tender document are to be provided.
- vi) **"Bid/Tender"** shall mean the Techno Commercial and Price Bid submitted by the Bidder along with all documents/credentials/attachment's annexure etc., in response to this tender, in accordance with the terms and conditions hereof.
- vii) **'The Contract'** shall mean the documents forming the tender and the acceptance thereof and the formal agreement executed between State Bank of India 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.
- viii) **"The Schedule of Quantities/BOQ"** shall mean the schedule of quantities as specified and forming part of this contract.
- ix) **'Contract value'** shall mean the value of the entire work as stipulated in the letter of acceptance of tender subject to such additions there to or deductions there from as may be made under the provision herein after contained.
- x) **'Works'** or **'project'** 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
- xi) **"The Material/Product"** means all the materials along with the accessories which the contractor is required to supply to the Bank under the Contract for the full and proper performance of its contractual obligations
- xii) **'Drawings'** shall mean the drawings prepared either by SBI or Contractor and referred to in the specifications
- xiii) **'Specifications'** shall mean the specifications referred to in the tender and any modifications thereof as may time to time be furnished or approved by SBI.
- xiv) **"Month"** means calendar month; **"Week"** means seven consecutive days; **"Day"** means a calendar day beginning and ending at 00 Hrs. and 24 hrs. respectively.
- xv) **"B.I.S"** shall mean specifications of Bureau of Indian Standards(BIS); **"MNRE"** shall mean

Ministry of New and Renewable Energy, Government of India; “**CEA**” shall mean Central Electricity Authority. “**OEM**” shall mean Original Equipment manufacturers of Rooftop Solar PV system PV Cells/ Solar Panels.

- xvi) “**Capacity Utilization Factor**” (CUF) shall mean the ratio of actual energy generated by SPV project over the year to the equivalent energy output at its rated capacity over the yearly period. (CUF = actual annual energy generated from the plant in kWh / (installed plant capacity in kW * 365 *24)).

2.0 INTERPRETATIONS

- Words importing persons include firms and corporations.
- Words importing the singular only, also include the plural and vice versa where the Context requires.
- An applicable law shall be construed as reference to such applicable law including its amendments or re-enactments from time to time.
- A time of day shall save as otherwise provided in any agreement or document be construed as a reference to Indian Standard Time.
- Different parts of this contract are to be taken as mutually explanatory and supplementary to each other and if there is any differentiation between or among the parts of this contract, they shall be interpreted in a harmonious manner so as to give effect to each part.
- The table of contents and any headings or subheadings in the contract has been inserted for case of reference only & shall not affect the interpretation of this agreement.

3.0 SCOPE OF WORK:

The contractor shall Supply, Install, test & Commission Grid Connected Roof-top Solar Power System with Bi-directional Net metering arrangement at various locations in Tamilnadu and maintain the systems during the 5 years warranty period.

The works shall be completed and maintained in every respect strictly in accordance with this contract and to the satisfaction of the Bank. **The contractor to quote the prices considering the following details of the work under the scope of this contract.**

SCOPE	DETAILS
Survey	<p>The successful bidder shall assess</p> <ol style="list-style-type: none"> Roof structural conditions to suit the installation, Load bearing capacity, Solar resource availability, Identification Safety risks, Shadow free area on rooftop any other hinderance for hassle free installation and maintenance of the proposed system etc
Design	<ol style="list-style-type: none"> Selecting efficient PV Modules, Optimum PV Panels layout Inverter selection, Mounting structure, Routing cables and connectivity, Attaining maximum output (max. utilization of rooftop area), Ensuring Safety standards...etc.
Supply, Installation, Testing and Commissioning	<ol style="list-style-type: none"> Procure and supply all the necessary equipment, accessories and any other materials required for the successful implementation <u>Liaisoning and obtaining load enhancements</u> from TANGEDCO, wherever applicable Installation of the Solar Power System as per standards Wiring up to Bank's Distribution System from the Solar system. <u>Note: Please visit the site and assess the required length of the cable from the Panel to the meter</u> Testing the complete Solar Power system as per the technical specifications. Preparation of Single line diagram as required for obtaining permissions, liaising and Obtaining Approval of Statutory Authorities like CEA, TANGEDCO...etc. for commissioning of the unit and

	connecting to the grid etc g) Procure and provide a suitable Bi-directional meter h) Payment of required fees / deposits to Govt Authorities like TANGEDCO / CEA / Municipality / Regulatory authorities etc., shall be borne by contractor and the same shall be reimbursed against submission of receipts. i) Any other necessary activity required for successful commissioning of the system shall be within the scope of the contractor.
Maintenance for 5 years from the date of commissioning.	a) Quarterly Preventive Maintenance Check of the Solar System b) Replacement of defective modules, invertors / Power Conditioning Unit (PCU), spares, consumables & other parts c) Rectification of breakdowns and attending to complaints d) Checking and maintaining the Supporting Structure - replacing the worn out / rusted /corroded parts of the structure

The Bank will issue written instructions/ directions from time to time, detailed directions and explanations which are hereafter collectively referred to as SBI instructions in regard to the variation or modification of the design, quality or quantity of work or the addition or omission or substitution of any work, any discrepancy or between the BOQ and/or drawings and/or specifications, the removal from the site of any material brought thereon by the contractor and the substitution of any other materials thereof, the demolition, removal and/or re-execution of any work executed by him, the dismissal from the work of any person employed/engaged thereupon.

4.0 EARNEST MONEY DEPOSIT:

Bidders are required to submit EMD. Bids not accompanied by EMD will not be considered. Upon the successful bidder furnishing the signed agreement and ISD, EMD of unsuccessful bidder will be returned without interest within 30 (thirty) days of notice of award of contract. The successful supplier's EMD shall be adjusted against the SD.

5.0 EXEMPTION FROM EMD: The Micro and Small Enterprises (MSE)s are exempted from payment of earnest money, subject to furnishing of relevant **valid certificate** for claiming exemption. The MSEs must, along with their offer, provide proof of their being registered as MSE (indicating the terminal **validity date** of their registration) for the item tendered, with any agency mentioned in the notification of the Ministry of Micro, Small and Medium Enterprises (Ministry of MSME), indicated below:

- (a) District Industries Centres;
- (b) Khadi and Village Industries Commission;
- (c) Khadi and Village Industries Board;
- (d) Coir Board;
- (e) National Small Industries Corporation;
- (f) Directorate of Handicraft and Handloom; and
- (g) Any other body specified by the Ministry of MSME.

6.0 PRICE BID: RATES QUOTED BY BIDDER

6.1 The contractor shall satisfy himself before Bidding as to the correctness and sufficiency of his Bid for the works and the rates/ amounts stated in the schedule of quantities and / or the schedule of rates and amount as provided covering all his obligations under the contract and all matters necessary for proper completion of the works expected in this document.

6.2 Unless otherwise provided in the Schedule of Quantities/Specifications, the rates quoted by the contractor shall be all inclusive and shall apply to all heights, lifts, leads and depths of the work and no extra charges will be paid over and above the contract amount on account of any other charges (existing or future addition) or on any other account.

6.3 The GST shall be paid extra as applicable.

6.4 The rate quoted shall be firm and rate revision in the contract amount is not permitted during the validity period of the contract for any reason including during the extended

period, if any.

6.5 Any request for review of the price bid after the bid opening will not be entertained.

6.6 Tax exemptions including certificates of any sort, if available may be dealt with the concerned Department of Government of India by the bidder. SBI, in no case, will be responsible for providing any tax exemptions to the bidder.

7.0 OPENING AND EVALUATION OF BIDS

7.1 In the two-bid system, the technical bids will be opened at the scheduled time mentioned in the NIT. Representatives of Bidder may be present during opening of Bids. However, Bids would be opened even in the absence of any or all the bidder's representatives. In case, if the date of opening is declared as nonworking day or Holiday, the bids will be opened on the next working day. The price bid of the qualified vendors will be opened on the same day or on a subsequent date which will be intimated to the bidders.

7.2 Bids will be examined to determine whether they are conforming to all the terms and conditions of the Bidding Document without any deviations and are generally in order & accompanied by supporting documents. If a Bid is not conforming to the terms and conditions, it will be rejected. However, SBI will have right to demand submission of more information as required, if any of the document is partly submitted. If the bidder does not respond within the stipulated time, SBI will reject or disqualify the bid.

7.3 During evaluation of bids, SBI may, at its discretion ask the bidders for clarification of its bid. The request for clarification shall be in writing and no change in prices or substance of the bid shall be sought, offered or permitted. No post bid clarification at the initiative of the bidder shall be entertained.

7.4 The tenders must be unconditional. Conditional tenders leading to unknown / indefinite liability may be summarily rejected.

8.0 OPENING OF PRICE BIDS / AWARD OF WORKS / DISTRIBUTION OF WORKS

8.1 The price bids of only those bidders who qualify in technical evaluation will be opened. The rates quoted by the Bidder will be validated / scrutinized by committee and compared to market price for adaptability. The lowest total rate quoted will be considered for award of work.

8.2 The Bank will not be bound to accept the lowest tender and reserves the right to accept or reject any or all the tenders without assigning any reason whatsoever even after opening of price bid.

8.3 A letter of acceptance by e-mail or post will be send to the lowest evaluated bidder. The selected Bidder should convey acceptance of the award of contract by returning duly signed and stamped duplicate copy of the PO within 7 days of receipt of the communication and to enter into an agreement with the Bank.

8.4 SBI reserves the right at the time of award of contract to increase or decrease the quantity of work and / or services from what was originally specified while floating the tender, without any change in unit price or any other terms and conditions.

9.0 VALIDITY OF BID

Bids shall remain valid and open for acceptance for a period stipulated in this document from the date of opening of price bid. If the Bidder withdraws his/her offer during the validity period or makes modifications in his/her original offer, which are not acceptable to the Bank, without prejudice to any other right or remedy, the Bank shall be at liberty to forfeit the EMD.

10.0 INITIAL SECURITY DEPOSIT

10.1 The successful bidders shall submit Initial security deposit of 2% of contract value in favour of the Bank, unless or otherwise specified, by means of D/D within a period of 15 days of acceptance of Bid

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

11.0 SIGNING OF CONTRACT DOCUMENTS

The successful Bidder shall be bound to execute the Agreement within 15 days from the receipt of intimation of acceptance of his Bid by SBI. However, the written acceptance of the Bid by SBI will constitute a binding agreement between the Bank and successful Bidder pending execution of formal agreement. All expenses, stamp duty and other charges/ expenses in connection with the execution of the Agreement as a result of this tendering process shall be borne by the successful bidder.

12.0 COMMENCEMENT OF WORKS

The date of commencement of the work will be reckoned as the recorded date of handing over site by SBI or 15 days from the date of issue of Letter of Acceptance of Bank, whichever is later. The Bidder shall complete the project within time as specified in the NIT from the date of issue of allocation letter

13.0 RATE OF PROGRESS

If the rate of progress of the work or any part thereof, at any time, is too slow. SBI shall 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 SBI neither shall relieve the contractor from fulfilling obligations under the contract nor he shall be entitled to raise any claims arising out of such directions.

14.0 COMPLETION PERIOD

The Successful Tenderer shall be complete the work within time period (as mentioned in the NIT) from the date of the work order issued to the contractor to commence the work.

- i) The work shall be considered as complete only when the certificate of virtual completion is issued by the Bank.
- ii) The defects liability or warranty period 'as prescribed in the contract shall commence only from date of such virtual completion.
- iii) Any defect that may appear within the defect's liability or warranty period shall be rectified by the contractor within reasonable time on receipt of necessary instructions from Bank to that effect.

15.0 VIRTUAL COMPLETION CERTIFICATE (VCC)

On successful completion of entire works covered by the contract, the contractor shall ensure that the following works have been completed to the satisfaction of 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 temporary works, structures and other items and things whatsoever brought upon or erected at the site and not incorporated in the permanent works.
- c) Remove all rubbish, debris etc. from the site as required by SBI.
- d) All defects/imperfections made to SBI properties while installation of Solar PV System have been attended and rectified as pointed out by SBI to the full satisfaction of SBI.

Upon the satisfactory fulfillment by the contractor as stated above, the contractor shall be entitled to apply for virtual completion certificate. If SBI is satisfied of the completion of the work, SBI shall within fourteen (14) days, issue a VCC.

16.0 PAYMENT TERMS

- i) No advance payment.
- ii) Payment shall be made by way of Electronic fund transfer
- iii) Contractor should furnish details of the bank a/c no, IFSC code along with their invoices.
- iv) Payment shall be made at the respective RBOs / Branches

- 16.1 Part/Interim payment is paid as per the payment terms mentioned in the NIT. All the interim payments shall be regarded as payments by way of advance against the final payment only and not as payments for work actually done and completed, and shall not preclude the requiring of bad, unsound, and imperfect or unskilled work to be removed and taken away and reconstructed, or re-erected or be considered as an admission of the due performance of the contract, or any part thereof in any respect or the accruing of any claim, nor shall, it conclude, determine or affect in any way the power of the Employer under these conditions or any of them as to the final settlement and adjustment of the accounts or otherwise or in any other way vary or affect the contract.
- 16.2 If the Bank has supplied any materials to the contractor, the cost of any such materials or goods will be progressively deducted from the amount due to the contractor in accordance with the quantities consumed in the work.
- 16.3 The final bill shall be accompanied by a certificate of completion or Commissioning report signed by an official of the Bank. Payments of final bill shall be made after deduction of Retention Money as specified, which shall be refunded after the completion of the Defects Liability Period provided the contractor has rectified all defects to the satisfaction of the Bank. The acceptance of the payment of the final bill by the contractor would indicate that he has no further claim in respect of the work executed.
- 16.4 Statutory deduction towards income tax and other taxes as and when directions from statutory bodies are received will be made at the time of making payments as applicable as per Government Rules. GST-TDS as per applicable rates will be deducted, wherever applicable.
- 16.5 **GST:**
- It is the responsibility of the bidder to ensure that the GST registration number is valid and active. Payments will not be made to inactive or invalid GST invoices. Non-GST invoices will not be accepted.
 - Invoice should specifically disclose the amount of GST levied at applicable rate as per GST provision
 - In case of Correction in the bills after scrutiny, contractor should submit fresh bills for payment
 - Contractor should timely file his GST return in accordance with GST provisions to enable the bank to claim the credit of GST paid to the contractor
- 16.6 The works will be paid for as “measured work” on the basis of actual work done and not as “lump sum” contract, unless otherwise specified.

17.0 PERIOD OF CONTRACT & EXTENSION OF TIME

- 17.1 Time is the essence of the contract. The Contract shall be executed within the stipulated period in the NIT. No request for extension will be entertained and the bidder has to plan and mobilize his resources for the satisfactory completion of the project within the time period agreed in the tender.
- 17.2 If in the opinion of the Bank, the work is delayed due to the following reasons not attributable to the contractor, the Bank shall make a fair and reasonable extension of time, for completion of the Contract works
- By force majeure (or)
 - By reason of any exceptionally inclement weather (or)
 - By reason of proceedings taken or threatened by or dispute with adjoining or neighboring owners of public authorities arising, then through the Contractor's own default (or)
 - By the works not referred in the Schedule of Quantities or specifications (or)
 - By reason of civil commotion, workmen strike or lock-out (or)
 - In consequence of the Contractor not having in due time, necessary instructions from the Employer for which he shall have specifically applied in writing ahead of time, giving reasonable time to prepare such instructions
- 17.3 In case of such strike or lock-out, the Contractor shall as soon as possible give written

notice thereof to the Bank, but the Contractor shall nevertheless constantly use his endeavors to prevent delay and shall do all they may reasonably be required, to the satisfaction of the Bank to proceed with the work.

17.4 In case the work is held up for any site conditions not attributable to the contractors or for any decisions instructions / want of details from Bank, the contractor shall be allowed reasonable extension of time by the Bank but any claim for idle labour shall not be entertained by the Bank. Contractor's quoted rates should include for all such contingencies.

17.5 If the completion of work is likely to be delayed for any reasons beyond control, the contractor shall apply to 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 SBI the provision of liquidated damages as stated in the bid document 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.

17.6 FORCE MAJEURE:

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 wars, insurrections, revolution, civil disturbance, riots, terrorist acts, public strikes, hartal, bandh, fires, floods, epidemic, quarantine restrictions, freight embargoes, declared general strikes in relevant industries, hostilities, 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.

17.7 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.

17.8 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 therefrom 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.

17.9 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.

18.0 LIQUIDATED DAMAGES / PENALTY FOR DELAY IN COMPLETION:

If the contractor fails to maintain the required progress or to complete the work and clear the site including removing debris on or before the contracted or extended date of 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 pay a liquidated damages at the rate of **0.5% of the contract value per week or part thereof subject to a maximum of 5% of the contract value**. Upon further delay, the allocation of project order shall be cancelled, and the Security Deposit amount would be forfeited.

DEBARRED FROM PARTICIPATING IN FUTURE TENDERS

In case it is observed that a bidder has not fulfilled its obligations in meeting the various timelines envisaged, in addition to the other provisions of the tender, such bidders may be debarred from participating in SBI in any future tender for a period as decided by the competent authority of SBI.

19.0 SECURITY DEPOSIT

The Security Deposit is required to protect the interest of the Bank against delay in

supply/installation and the risk of non-performance of System Provided; or poor performance of the material or system supplied; or breach of any terms and conditions of the Agreement, which may warrant invoking of Security Deposit.

All costs, damages or expenses which SBI may have paid or incurred, which under the provisions of the Contract, the successful bidder is liable/will be liable, will be claimed by SBI. All such claims shall be recovered by actions of law or otherwise, if the successful bidder fails to satisfy SBI of such claims.

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, SBI shall have the power to rescind the contract (of which rescission notice in writing to the contractor by SBI shall be conclusive evidence) and in which case the security deposit of the contractor shall be forfeited and be absolutely at the disposal of SBI.

- 19.1 From each running bill, an amount at the rate of 8% of the gross value of the running bill shall be recovered as retention money, till the total retention amount including the ISD amount already with the Bank become **5%** of the value of the total contract amount. This amount is called as Total Security Deposit, which consists of two components
- a) ISD - Initial Security Deposits including EMD
 - b) RM - Retention Money.

- 19.2 The total security deposit will be kept with the Bank and shall be refunded without interest to the contractor 30 days after the end of defects liability period, provided he has satisfactorily carried out all the works and attended to rectification of all defects in accordance with the conditions of the contract including clearing the site.

- 19.3 The contractor shall make good at his own cost and to the satisfaction of the Employer all defects, which may appear within the defects liability (warranty) period. In case of failure on the part to do so, the cost of rectifying the defects through any other agency shall be deducted from the amount of security deposit due to the contractor.

- 19.4 During the contract period, all compensation or other sums of money payable by the Contractor to Bank under the terms of this contract, will be deducted from the security deposit, or from any sum that may become due to the Contractor on any account whatsoever.

- 19.5 In the event of the Security Deposit being reduced by reasons of any such deductions, the Contractor shall within 7 days of being asked to make good, by DD, any sum which have been deducted from his security deposit.

19.6 PERFORMANCE BANK GUARANTEE(PBG) in lieu of SECURITY DEPOSIT:

The security Deposit retained by the Bank will be released against a PBG for a similar amount valid for the entire period of the contract including the warranty period. Format of PBG will be provided by SBI at the time of commissioning and handing over by the contractor.

20.0 VARIATION IN QUANTITY / SUBSTITUTION OF ITEM

- 20.1 The Schedule of Quantities, unless otherwise stated, shall be deemed to have been prepared in accordance with the Standard Procedure shall be considered to be approximate and no liability shall attach to the employer for any error which may be discovered therein. Any material which have not been specifically mentioned in this Contract, but which are necessary for the performance or completeness of the project shall be provided by the Bidder without any extra cost and within the time schedule for efficient and smooth operation and maintenance of the SPV plant.

- 20.2 The Bank reserves the right to increase or decrease or delete or omit or execute only a part or the whole or any excess thereof, as per the site requirements, without assigning any reason therefor at the time of allotment / execution of work. Contractor will be paid for the actual work done at the site. No variation shall vitiate the contract.

- 20.3 The tender rates shall be fixed and applicable for any increase or decrease in the tendered quantities. Nothing extra will be paid by the Bank on account of omission /

deletion of items or decrease in the quantity of items. The Bank shall not entertain any claim whatsoever from the contractor on this account. In such case, the contractor shall not claim any charges on the cartage or cost of materials brought to the site of the work by him. Ownership of material rests on the successful bidder and he should remove materials and vacate the premises on his own.

20.4 Bank reserves the right to order more quantities than what is mentioned in this tender (at the same rate and terms and conditions) either at the same site or other sites as per the need within the validity of this tender.

20.5 The price of all additional items/non-tendered items will be worked out on the basis of rates quoted for similar items in the contract wherever existing. If similar items are not available, the rates for such items will be derived as per standard method of rate analysis based on prevalent fair price of labour, material and other components as required with 15% towards contractor's profit and overheads.

21.0 MATERIALS, QUALITY, WORKMANSHIP, SAMPLES, TESTING OF MATERIALS

21.1 All the works shall be executed in the best and most workman like manner with materials of the best and approved quality of the respective kinds in accordance with the particulars contained in and implied by the specifications and instructions as may from time to time be given by SBI during the execution of the work and to his entire satisfaction.

21.2 The Design, engineering, manufacture, supply, installation, testing and performance of the equipment shall be in accordance with latest appropriate IEC/Indian Standards as detailed in the technical specifications. Where appropriate Indian Standards and Codes are not available, other suitable standards and codes as approved by the MNRE shall be used. The Contractor shall use only products bearing ISI marking in the work for those materials for which no makes are mentioned in the tender.

21.3 No refurbished, second hand and spurious materials should be used. SBI reserves its right to enquire and collect data from the supplier to confirm the authenticity of the materials. SBI has the right to stringent action against the contractor, as deemed fit, in addition to suspend / cancel the contract.

21.4 Should be contractor desire to substitute any specified materials with "Equal" or "Other approved" etc., he/they must obtain the specific approval of the Bank in writing for any such substitution, well in advance.

21.5 Samples of all materials to be used must be submitted when so directed by SBI. If required, the contractor shall have to carry out tests on materials in approved materials testing laboratories or as prescribed by SBI at his own cost to prove that the materials etc., under test conform to the relevant I.S Standards or as specified in the specifications. The necessary charges, transporting, testing etc., shall have to be borne by the contractor. No extra payment on this account will be entertained.

21.6 If the contractor has used any material which is not complying with the specifications, or the workmanship is bad or the material used is substandard or second hand or the progress of the work is not satisfactory or very slow or not in a workmanship manner or of poor quality or violative of safety protocols etc., SBI shall during the progress of the work have power to order the removal and substitution of the material or proper re-execution of the work within a reasonable time. In case the contractor refuses to comply with the order, in the interest of the work, SBI shall have the power to employ other agencies or persons to rectify or re-execute the work at the cost and risk of the contractor. contractor shall allow all reasonable facilities and extend cooperation for the execution of such work.

21.7 Should the work be suspended by reason of rain, strike, lock-outs or any other cause, the contractor shall take all precautions necessary for the protection of work and at his own expenses shall make good any damage arising from any of these causes.

21.8 All expenses consequent thereon or incidental thereto as certified by SBI shall be borne by the contractor or may be deducted from any money due to or that may become due to

the contractor. No certificate shall relieve the contractor from his liability in respect of unsound work or bad materials.

21.9 CUSTODY AND SECURITY OF MATERIALS

The contractor shall store their materials like Solar Panels, cables, DBs, wires, tools etc at the site with the permission of the Bank. However, the contractors shall be responsible for the custody and security of all materials and equipment at site. No claim for loss or theft will be entertained by the Bank. Shelter or stay and other amenities for the technicians have to be arranged by the contractor at his own expense and responsibility.

On completion of the works, the contractor shall remove all tools, surplus materials, rubbish and temporary works of every kind and leave the whole of the site and the works clean and in a workman like condition to the satisfaction of the Bank

22.0 PROTECTION OF WORKS AND PROPERTY

All works shall be done by the contractor with utmost care and if any loss or damage shall result from fire or from other cause, the contractor shall promptly make good such loss or damage e/or replace and make the employer free from all such expenses.

The contractor shall continuously maintain adequate protection, of all his work from damage and shall protect SBI's properties from injury or loss arising in connection with contract. The contractor shall be responsible for any loss or damage to SBI property, materials, tools or other articles used in connection with the work. 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.

ACCIDENTS:

The contractor shall immediately on occurrence of any accident at the site in connection with the execution of the work report such accident to 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.

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 building codes to prevent accidents, or injuries to persons or property or adjacent to his place of work. The contractor shall take insurance covers as per insurance clause mentioned in the NIT at his own cost.

In case the contractor refuses to comply with the order the Employer shall have the power to employ and pay other agencies to carry out the work and all expenses consequent or incidental there to as certified by SBI shall be borne by the contractor or may be deducted from any money due to or that may become due to the contractor. No certificate shall relieve the contractor from his liability in respect of unsound work or bad materials.

23.0 PATENT RIGHTS AND ROYALTIES

The contractor shall fully indemnify SBI against any action, claim, costs, charges, demands, damages, expenses or proceeding relating to infringement or use of any patent or design or any alleged patent or design rights, trademarks, or the protected rights in respect of any equipment, software, work or material used for or in connection with the works 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 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 SBI in this behalf. The Contractor shall defend all actions arising from such claims, unless he has informed SBI before any such infringement and received their permission to proceed and shall himself pay all royalties, license fees, damages, cost and charges of all and every sort that may be legally incurred in respect thereof.

24.0 ASSIGNMENT AND SUBLETTING

The whole of the works included in the contract shall be executed by the contractor and the contractor shall not directly or indirectly transfer, assign or underlet the contract or any part, share or interest therein nor, shall take a new partner, without written consent of the Employer and no subletting shall relieve the contractor from the full and entire responsibility of the contract or from active superintendence of the work during their progress

25.0 INSURANCE OF WORKS

The Bidder shall be responsible and take an Comprehensive All Risk Insurance Policy for transit-cum-storage-cum-erection for all the materials (to cover all risks and liabilities for supply of materials on site basis), Third Party Liability covering loss of human life, injuries to technicians and workmen and covering the risks of damage to the third party/material/equipment/properties during execution of the Contract.

26.0 DAMAGE TO PERSONS AND PROPERTY & CONTRACTOR TO INDEMNIFY SBI

The contractor shall indemnify SBI against all losses and claims in respect of injuries or damage resulting from any act or neglect of contractor, to persons or property of 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 SBI, their employees, or agents or other employees, or agents or other contractors for the damage or injury.

The contractor shall keep the Employer saved harmless and indemnified against claims if any of the workmen and all costs and expenses as may be incurred by the Employer in connection with any claim that may be made by any workmen.

27.0 BANK'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 Assignees 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 SBI that he is able to carry out and fulfill the contract, and to give security therefore if so required by 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 assignor sublet this contract without the consent in writing of SBI or 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 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
- d) Has failed to remove the materials from the site or to pulldown and replace work within seven days after written notice from SBI that the said materials were condemned and rejected by SBI under these conditions: or
- e) 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 SBI's instructions to the contrary subject any part of the contract.

Then and in any of said cases SBI, after giving seven days' notice in writing to the contractor, terminate the contract without any conditional clauses.

28.0 SETTLEMENT OF DISPUTES AND ARBITRATION

Except where otherwise provided in the contract all questions and disputes relating 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 SBI or incase the contractor wants to dispute the validity of any deductions or recoveries made or proposed to be made from the contractor raise any dispute, the Contractor shall forth with give notice in writing of his claim, or dispute to the Assistant General Manager (Premises & Estate), 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 contractor shall not be entitled to raise any claim nor shall the Bank 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 Assistant General Manager (Premises&Estate) in the manner and within the time as aforesaid. The contractor shall be deemed to have waived and extinguished all his rights in respect of any claim not notified to the Assistant General Manager (Premises&Estate) in writing in the manner and within the time aforesaid.
- ii) The Assistant General Manager (Premises&Estate) 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 Assistant General Manager (Premises&Estate) submit his claims to the conciliating authority namely the Circle Development Officer for conciliation along with all details and copies of correspondence exchanged between him and the Assistant General Manager (Premises&Estate).
- 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 Chief General Manager of the Bank for appointment of an arbitrator to adjudicate the notified claims failing 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 afore said and all claims of the Bank shall be referred for adjudication through arbitration by the Sole Arbitrator appointed by the Chief General Manager. It will also be no objection to any such appointment that the Arbitrator so appointed is a Bank Officer and that he had to deal with the matters to which the Contract relates in the course of his duties as Bank Officer. 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. Such person shall be entitled to proceed with the reference from the stage at which it was left by his predecessor.

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.

It is also a term of this contract that no person other than a person appointed by such Chief General Manager aforesaid should act as arbitrator.

The conciliation and arbitration shall be conducted in accordance with the provisions of the Arbitration & Conciliation Act 1996 or any statutory modification or re-enactment thereof and the rules made there under.

It is also a term of the contract that if any fees are payable to the arbitrator these shall be paid equally by both the parties. However, no fees will be payable to the arbitrator if he is

a Bank Officer.

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 fees if any, of the arbitrator shall, if required to be paid before the award is made and published, be paid half and half by each of the parties. The cost of the reference and of the award (including the fees, if any of the arbitrator) 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.

29.0 LOCAL LAWS, ACTS, REGULATIONS

- 29.1 The contractor shall conform to the provisions of any Acts of the Legislature relating to the work, and to the Regulations and Bye-Laws of any authorities like Electricity, Pollution Control Boards, Municipal Authorities, water and Sewerage boards and shall before making any variations from the drawings or specifications that may be associated to so conform, give the Employer written notices specifying the variations proposed to be made and reasons for making them and apply for instruction thereon. The Employer on receipt of such intimation shall give a decision within a reasonable time.
- 29.2 The contractor/s shall arrange to give all notices required for by the said Acts, Regulations or Bye-laws to be given to any authority, and to pay to such authority or to any public officer all fees that may be properly chargeable in respect of the work and lodge the receipts with the Employer.
- 29.3 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.
- a) Minimum Wages Act, 1948(Amended)
 - b) Payment of Wages Act 1936(Amended)
 - c) Workman's Compensation Act 1923(Amended)
 - d) Contract Labour Regulation and Abolition Act 1970 and Central Rules 1971(Amended)
 - e) Apprentice Act 1961(Amended)
 - f) Industrial Employment (Standing Order) Act 1946(Amended)
 - g) Personal Injuries (Compensation Insurance) Act 1963 and any other modifications
 - h) Employees Provident Fund and Miscellaneous Provisions Act 1952 and amendment
 - i) Shop and Establishment Act
 - j) Any other Act or enactment relating thereto, and rules framed there under from time to time.

30.0 OTHER CONDITIONS:

- 30.1 The Successful bidder shall not display the photographs of the work and not take advantage through publicity of the work without written permission of SBI.
- 30.2 The Successful bidder shall not make any other use of any of the documents or information of this contract, except for the purposes of performing the contract.
- 30.3 The Contractor shall employ technically qualified / having appropriate skill and competent persons fully trained and adequately experienced technicians, who are medically fit. They should be free from any contagious diseases. They shall be well mannered and properly dressed, shoes etc.
- 30.4 The contractor shall not employ person who is not an Indian National. Contractor should not engage child labour in any of the activities in this contract.
- 30.5 The contractor / firm shall be held responsible for any misdeeds / mis behaviour of their employees within the premises. Bank is not responsible for any damages or claims on account of the misbehavior / misdeeds of his employees. For this purpose, any person

supplied by the contractor to be engaged on the work on regular basis or as an alternate arrangement, under the direct order or control of the Employer or his representative shall be deemed to be a person employed by the contractor.

- 30.6 The contractor shall on the request of the Employer immediately dismiss from works any person employed thereon by him, who in the opinion of the Employer be unsuitable or incompetent or who may misconduct. Such discharges shall not be the basis of any claim for compensation or damages against the Employer or any of their officer or employee.
- 30.7 No employee of the Bank is allowed to work as a contractor for a period of 2 years of his/her retirement from Bank Services without previous permission of the Bank. This contract is liable to be cancelled, if either the contractor or any of his employees is any time to be such a person who had not obtained the permission of Bank as aforesaid before submission of the tender or engagement in the contractor's service.

31.0 CONTRACTOR'S RESPONSIBILITIES DURING WARRANTY & AMC PERIOD:

- 31.1 During the warranty and AMC period, Contractor will have to undertake comprehensive support of the entire Solar Power system including all the components (hereinafter referred as "System") supplied by them at no additional cost to the Bank.
- 31.2 Comprehensive maintenance shall include, among other things, periodic maintenance of the system when required or in the event of system breakdown/ malfunctioning or desired performance was not achieved etc.
- 31.3 Contractor shall maintain the system to comply with satisfactory performances and Contractor shall be responsible for all costs relating to labour, spares, maintenance (preventive and corrective) and transport charges from and to the site(s) in connection with the repair/ replacement of the system (hardware/ equipment or any component/ part thereunder), which, under normal and proper use and maintenance thereof, proves defective in design, material or workmanship or fails to conform to the specifications, as specified.
- 31.4 Contractor shall ensure that services of professionally qualified personnel are available for providing comprehensive on-site maintenance of the system
- 31.5 In case of failure of system or any of its components, Contractor shall ensure that system is made operational to the full satisfaction of the Bank within the given timelines.
- 31.6 Contractor shall provide preventive maintenance schedules as per periodicity.
- 31.7 Contractor warrants Products against defect arising out of faulty design, materials, etc.. Contractor shall repair or replace worn out or defective parts including all plastic parts of the Equipment at his own cost including the cost of transport.
- 31.8 In the event of failure of support from OEM or OEM shutting down their operations, discontinuation of product etc the Contractor shall take responsibility to source the Solar modules, PCBs, spares, components and parts etc from the market or equivalent makes and make all arrangements to restore the system to its full functionality
- 31.9 Escalation matrix with the name, designation and contact details of the Contractor's Service team shall be submitted to the Bank/Branch/Site. Updated escalation matrix shall be made available to the Bank, each time the technicians or service managers change.
- 31.10 For evaluating satisfactory performance of the Solar system, the Contractor has to maintain CUF at minimum 15% during the entire warranty & AMC period of 5 years.

TECHNICAL SPECIFICATIONS

The proposed solar PV system shall be commissioned as per the technical specifications given below. Any shortcomings will lead to cancellation of contract in full or part as decided by SBI & Competent Authority's decision will be final and binding on the bidder.

1.0 DEFINITION

A Grid Tied Solar Roof Top Photo Voltaic (SPV) system shall consist of following equipment / components.

- Solar PV modules consisting of required number of PV modules.
- Grid interactive Power Conditioning Unit (Inverter, MPPT, Controls & Protections)
- Mounting structures.
- Junction Boxes.
- Interconnection cables & links.
- Cable trays/ UPVC Pipes for cable supports.
- Earthing and lightening protections.
- IR/UV protected PVC Cables, Interconnect switches and accessories

Grid tied SPV system is without battery and should be designed with necessary features to supplement the grid power during daytime. 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.

2.0 PLANNING AND DESIGNING:

1. The bidder should carryout Shadow Analysis & wind load calculation at the site and accordingly design strings & arrays layout considering optimal usage of space, material and labor. The bidder should submit the array layout drawings to SBI for approval. The work shall be executed in conformity therewith.
2. SBI reserves the right to modify the Layout and specification of sub-systems and components at any stage as per local site conditions/requirements.
3. The bidder shall submit preliminary drawing for formal approval of the Bank to proceed with the work, subject to modification or recommendation, if any.

3.0 DRAWINGS/MANUALS TO BE FURNISHED BY BIDDER

- i Layout of solar Power Array
- ii Single line diagram related to electrical infrastructure including wiring of existing campus for CEA approval (wherever required)
- iii O&M manuals

4.0 SOLAR PHOTOVOLTAIC MODULES:

- (i) The PV modules used should be **made in India**.
- (ii) The total solar PV array capacity should not be less than the required capacity (kWp) and should comprise of solar crystalline modules of **minimum 500 Wp and above wattage**. **Module capacity less than minimum 500 watt peak will not be accepted.**
- (iii) Protective devices against surges at the PV module shall be provided.
- (iv) Low voltage drop bypass diodes shall be provided.
- (v) PV modules prototype must be tested and approved by one of the IEC authorized test centers.
- (vi) The module frame shall be made of corrosion resistant materials, preferably having anodized aluminum.
- (vii) The bidder shall carefully design & accommodate requisite numbers of the modules to achieve the rated power in his bid.
- (viii) Other general requirement for the PV modules and sub-systems shall be the Following:

- a) 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.
- b) 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 by-pass diode. The box shall have hinged, weatherproof lid with captive screws and cable gland entry points or may be of sealed type and IP-65 rated.

Type	Crystalline silicon (mono)
Efficiency	$\geq 19.0\%$
Fill factor	$\geq 70\%$
Module frame	Frameless/Non-corrosive and electrolytically compatible with the mounting structure material
Termination box	Thermo-plastic, IP 65, UV resistant
Blocking diodes	Schottky type
Module minimum rated power	The nominal power of a single PV module shall not be less than 500Wp.
Power output rating	To be given for standard test conditions (STC). I-V curve of the sample module shall be submitted.
Rated o/p power tolerance	$\pm 3\%$
Rated for wind loads	up to 2,400 Pa
Operating temperature	- 40°C to 85°C

5.0 IDENTIFICATION AND TRACEABILITY

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

- 1) Name of the manufacturer of the PV module
- 2) Name of the manufacturer of Solar Cells.
- 3) Month & year of the manufacture (separate for solar cells and modules)
- 4) Country of origin (separately for solar cells and module)
- 5) I-V curve for the module Wattage, I_m , V_m and FF for the module
- 6) Unique Serial No and Model No of the module

6.0 ARRAY/ MOUNTING STRUCTURE

- a) Hot dip galvanized Iron mounting structures may be used for mounting the modules / panels /arrays. Each structure should have angle of inclination as per the site conditions to take maximum insolation.
- b) The minimum clearance of the structure from the roof level should be **450 mm(bottom of Panel) and 600mm (Top of Panel)**. Sufficient clearance should be provided between the rows of the Solar panels to facilitate the maintenance and cleaning of the panels.
- c) The Mounting structure shall be so designed to withstand the speed for the wind zone of the location where a PV system is proposed to be installed. Suitable Solid Cement Concrete Blocks arrangement should be provided to secure the installation in the terrace. **Grouting to the terrace is not permitted.**
- d) 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.
- e) 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
- f) 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.

- g) The total load of the structure (when installed with PV modules) on the terrace should be less than 60 kg/m².
- h) Use SS bolts and couplers for jointing of array and fixing the modules on the array

7.0 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 FRP / Powder Coated Aluminum. All wires/cables must be terminated through cable lugs. The JB's shall be such that input & output termination can be made through suitable weatherproof 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.
- c) Each Junction Box shall have High Quality Suitable Capacity Metal Oxide Varistors (MOVs) / SPDs, suitable Reverse Blocking Diodes. 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

8.0 DC DISTRIBUTION BOARD:

DC DBs shall have sheet from enclosure of dust & vermin proof conform to IP65 protection and compatible for MC4 connectors. The bus bars are made of copper of desired size. Suitable capacity MCBs/MCCB shall be provided for controlling the DC power output to the PCU along with necessary surge arrestors (DC surge protection device (SPD), class 2 as per IEC 60364-5-53). If a DC isolator is used instead of a DC circuit breaker, a DC fuse shall be installed inside the DC Distribution Box to protect the DC cable that runs from the DC Distribution Box to the Solar Grid Inverter.

9.0 AC DISTRIBUTION PANEL BOARD:

- AC Distribution Panel Board (DPB) shall have necessary surge arrestors. Inter connection from ACDB to mains at LT Bus bar while in grid tied mode.
- All the termination works related to changeover switches; cabling work should be undertaken by the bidder as part of the project.
- 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, 50Hz.
- The panels shall be designed for minimum expected ambient temperature of 45degree Celsius, 80 percent humidity and dusty weather.
- All indoor panels will have protection of IP54 or better. All outdoor panels will have protection of IP65 or better.
- Should conform to Indian Electricity Act and rules (till last amendment).
- All the 415 V 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	+/- 10 %
Variation in supply frequency	+/- 3 Hz

11.0 PCU / Inverter:

The MPPT (Maximum Power Point Tracker), an interface between Solar PV array & the Inverter, shall be integrated in the PCU/inverter to maximize energy drawn from the array. If necessary, 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 (for capacities above 5KWp) (or) 230V, 1 phase, 50 Hz (for capacities upto 5KWp) (as per site conditions)
Grid Frequency Synchronization range	± 3 Hz

Ambient temperature considered	0°C to 50°C
Humidity	95 % Non-condensing
Protection of Enclosure	IP-20(Min) for indoor / IP-65(Min) for outdoor.
Grid Frequency Tolerance range	± 3
Grid Voltage tolerance	- 20% & + 15 %
No-load losses	Less than 1% of rated power
Inverter efficiency(minimum)	>93% (In case of 10kW or above)
THD	< 3%
PF	> 0.9
Display type	LCD for data display. LCD/LED for status display
Communication interface	RS 485 / RS 232 / RJ45

- i. PCU/inverter shall be capable of complete automatic operation including wake-up, synchronization & shutdown.
- ii. 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.

12.0 DATA ACQUISITION SYSTEM MONITORING

1. Built-in meter and data logger to monitor plant performance through external computer (IoT) shall be provided for each of the solar PV plant.
2. **Electrical Energy:** Digital Energy Meters to log the actual value of AC/ DC voltage, Current & Energy generated by the PV system provided. The following parameters are accessible via the operating interface display in real time separately for solar powerplant:
 - i. AC Output current.
 - ii. AC Voltage
 - iii. Output Power
 - iv. DC Input Voltage.
 - v. DC Input Current.
 - vi. Power produced and feed-in
3. Protective function limits (Viz-AC Over voltage, AC Under voltage, Over frequency, Under frequency ground fault, PV starting voltage, PV stopping voltage)
4. All instantaneous data shall be shown on the computer screen. Software shall be provided for USB/ internet download and analysis of DC and AC parametric data.

13.0 CABLES

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

- i Temp. Range: –10°C to +80°C.
- ii Voltage rating: 1100V grade
- iii Flexible and excellent resistance to fire (FRLS), heat, cold, water, oil, abrasion, UV radiation.
- iv Sizes of 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.
- v 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 ferrule or by other means so that the cable easily identified.
- vi The Cable should be so selected that it should be compatible upto the life of the solar PV panels i.e. 25 years.
- vii Multi Strand, Annealed high conductivity copper conductor PVC type 'A' pressure extruded insulation or XLPE insulation. Overall PVC/XLPE insulation for UV protection Armored 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 elsewhere in this document.

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

15.0 METERING:

1. The bi-directional electronic energy meter through TANGEDCO (class shall be as per the TANGEDCO norms) shall be installed for the measurement of import/Export of energy.
2. The bidder must take approval / NOC from the TANGEDCO for the connectivity, technical feasibility and synchronization of SPV plant with distribution network before commissioning of SPV plant.
3. Reverse power relay shall be provided by bidder (if necessary), as per the local DISCOM requirement.

16.0 INTEGRATION OF PV POWER WITH GRID:

The output power from the inverters 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 / DG power connection need to be provided.

For buildings or loads with diesel generator backup, the wiring of the solar grid inverter shall be such that **the solar grid inverter cannot run in parallel with the diesel generator**. The solar grid inverter must be connected to a distribution board on the grid side of the automatic or manual change- over switch.

17.0 POWER CONSUMPTION:

Regarding the generated power consumption, priority shall be given for internal consumption and thereafter any excess power shall be exported to grid.

18.0 PROTECTIONS

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

18.1 LIGHTNING PROTECTION

- 18.1.1 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 (not to use existing lightening arrestors of the building). **one number dedicated earth pit for the lightening arrestor shall be provided**
Lightning protection should be provided as per IEC 62305 standard.

18.2 SURGE PROTECTION

Internal surge protection shall consist of “3” MOV type effective surge-arrestors connected from +ve and –ve terminals to earth (via Y arrangement). Any damage of SBI appliances due to surge protection failure shall be the responsibility of successful bidder.

18.3 EARTHING PROTECTION

- 18.3.1 Each array structure of the PV yard should be grounded / earthed properly as per IS:3043-1987. In addition, the lightning arrester/masts should also be earthed inside the array field. Earth Resistance shall be tested in presence of the representative of SBI as and when required after earthing by calibrated earth tester. PCU, ACDB and DCDB should also be earthed properly.
- 18.3.2 Earth resistance shall not be more than 1 ohm. It shall be ensured that all the earthing points are bonded together (interlinked) to make them at the same potential.
- 18.3.3 **Suitable earth conductors from PV modules, Inverter and LA** shall be used for the Earthing connection to the Earth pit.
- 18.3.4 **3 nos Earth pits shall be provided for the earthing of the Solar panels-1, LA-1 and one earth pit for the Inverter.**

18.4 GRID ISLANDING PROTECTION

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.”

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.

A manual disconnect 4pole isolation switch 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.

19.0 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 solar array area, DB and Meter room.

21.0 ACTION WHERE THERE IS NO SPECIFICATION

In case of any class of work for which there is no specification mentioned, the same will be carried out in accordance with the Indian Standards Specifications (IS)/ MNRE/ NISE/ BEE standards subject to the approval of the Bank

22.0 TEST CERTIFICATES AND REPORTS TO BE FURNISHED

Type Test Certificates shall be provided for the solar modules and the solar grid inverter to provide evidence of compliance with standards as specified by Ministry of New and Renewable Energy (MNRE). Bank reserves the right to ask for additional test certificates or (random) tests to establish compliance with the specified standards.

23.0 CONFIRMATION TO MNRE TECHNICAL SPECIFICATIONS AND STANDARDS

The Tenderer should ensure that all components and systems used under this Scheme shall strictly adhere to the Technical Specifications and Guidelines issued by MNRE, and as amended from time to time.

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

All components of grid-connected rooftop solar PV system/plant must conform to the relevant standards and certifications given below:

Solar PV Modules/ Panels	
IEC 61215/ 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 ₃) 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
Solar PV Inverters	
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/ IEEE1547 (as applicable)	Utility-interconnected Photovoltaic Inverters - Test Procedure of Islanding 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
Fuses	
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
Surge Arrestors	
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
Cables	
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
Earthing/ Lightning	
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
Junction Boxes	
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
Solar PV Roof Mounting Structure	
IS 2062/IS 4759	Material for the structure mounting
IEC 62548	PV arrays – Design requirements