



# INDIA LITERACY BOARD

## LITERACY HOUSE, LUCKNOW

**India Literacy Board, Literacy House, Kanpur Road, Manas Nagar,  
Lucknow-226023, Uttar Pradesh, India**

**Telephone:(0522)2470268      Email: [directorilbko@gmail.com](mailto:directorilbko@gmail.com)**

**Website : [www.indialiteracyboard.org](http://www.indialiteracyboard.org)**

**-: Name of Work :-**

**Design, supply, installation, testing and commissioning, including comprehensive warranty maintenance, of 03 Units of 10KW each Grid Interactive Rooftop Solar Power Plant in Literacy House, Kanpur Road, Lucknow.**

**Bid Reference : NIT/Solar Power/ILB/2024**

**Date : 15.04.2024**

**Bid submission start date & time        :**        16.04.2024 10:00 AM

**Last Date and Time for  
Submission of Bids                                :**        27.04.2024 03:00 PM

**Date and Time of Opening of Bids        :**        27.04.2024 03:30 PM

**Earnest Money Deposit                                :**        ₹ 30,000.00 (Thirty Thousand)

**Place of Opening of Bids                                :**        India Literacy Board, Literacy  
House, Kanpur Road, Manas Nagar,  
Lucknow-226023, Uttar Pradesh,  
India

**Address for Communication                                :**        India Literacy Board, Literacy  
House, Kanpur Road, Manas Nagar,  
Lucknow-226023, Uttar Pradesh,  
India

## **TENDER NOTICE**

**Tenders are invited for Design, supply, installation, testing and commissioning including comprehensive warranty maintenance, of 03 Units of 10KW each Grid Interactive Rooftop Solar Power Plant in Literacy House, Kanpur Road, Lucknow.**

The details of submission of bids along with eligibility, date & time, opening of Technical/Financial bids, experience and other terms & conditions will be available in the tender document.

**Tender documents will be available in the Office of the Director, India Literacy Board, Literacy House, Kanpur Road, Lucknow at the price of Rs.500/- (Five Hundred only) as per the timeline mentioned in the bid document.** It can also be seen and studied at the official website of India Literacy Board- [www.indialiteracyboard.org](http://www.indialiteracyboard.org)

The interested Bidders can purchase the Tender Document by paying the above mentioned amount accordingly. The detailed terms and conditions are given in Tender document. The India Literacy Board, Literacy House reserves the right to reject or cancel any or all bids or annul the whole Bidding process without assigning any reason to bidders; and the decision of India Literacy Board, Literacy House will be final & binding.

**(Sandhya Tewari)**  
Director,  
India Literacy Board  
Lucknow.

## INVITATION FOR BIDS

1. Bidders are advised to study the tender Document carefully before submission of Bid. Submission of tender shall be deemed to have been done after careful study and examination of the procedures, terms and conditions of the tender document with full understanding of its implications.
2. Tender documents will be available in the Office of the Director, India Literacy Board, Literacy House, Kanpur Road, Lucknow at the price of Rs.500/- (Five Hundred only) during the timelines as mentioned in the following Table :-

(a)	Date of publication of Tender Notice & availability of Tender Document	Tender Notice has been published at the official website of India Literacy Board- <a href="http://www.indialiteracyboard.org">www.indialiteracyboard.org</a> and also in the leading daily news paper. Tender Document will be available from dated 16.04.2024, 10:00 AM till dated 27.04.2024, 3:00 PM
(b)	Bid submission start date & time	Start date 16.04.2024 at 10:00 AM
(c)	Bid submission end date & Time	End date 27.04.2024 at 03:00 PM
(d)	Bid opening date & time	27.04.2024 at 03:30 PM
(e)	Venue of opening of technical & financial Bids	India Literacy Board, Literacy House, Kanpur Road, Manas Nagar, LUCKNOW
(f)	<b>Earnest Money Deposit</b>	<b>₹ 30,000.00 (Thirty Thousand)</b>
(g)	Contact officer	Mr. Anoop Kumar Srivastava, OSD, India Literacy Board, Kanpur Road, Lucknow. Phone-9415322233.

3. The Bids will be opened in the presence of bidder's representatives, who choose to attend at the venue, date and time mentioned in the above table. An authority letter of bidder's representative will be required to be produced.
4. The India Literacy Board, Literacy House, Kanpur Road Manas Nagar, Lucknow reserves the right to cancel any or all the bids without assigning any reason thereof. The decision of India Literacy Board, Literacy House will be final and binding.
5. In the event of date specified for Bids opening being declared a holiday for India Literacy Board, Literacy House, then the due date for opening of Bids shall be the following working day at the appointed time and place.
6. The bidder is expected to examine all instructions, forms, terms and specifications in the Bid document. Failure to furnish all information required as per the Bid document or submission of "non-responsive Bid" shall be the bidder's risk and may result in rejection of the Bid in question.
7. The Bid prepared by the bidder, as well as all correspondence and documents relating to the Bid exchanged by the bidder and the Client (ILB) shall be written either in English or Hindi language.

8. **Technical Bid** - Technical Bid will comprise of :-

- Technical Specification of the Products/ Brochure/catalogue.
- Copy of PAN card.
- Contractors/firms duly registered/empanelled with the NEDA shall be eligible.
- Copy of GST Registration certificate.
- Earnest Money Deposit of ₹30,000.00 (Thirty Thousand) in favour of “Director, India Literacy Board, Kanpur Road, Lucknow” in form of FDR/ Bank Draft/ Irrevocable Bank Guarantee. EMD can also be deposited cash in the office of the India Literacy Board against which a receipt will be provided by the India Literacy Board.
- The Test report of complete system/various components (PV module, PCU cum inverter complete system etc) issued from MNRE/NABL accredited test lab. The test report should be valid at the time of opening of Bid.
- The bidder should have at least 03 years of experience.

**Qualification Details :**

Includes copies of required documents as per Technical Bid justifying that the bidder is qualified to perform the contract if his/her bid is accepted and that the bidder meets the criteria outlined in the Qualification Requirement and Technical Specification and fulfill all the conditions of the Contract justifying that the bidder is complying with all the conditions of the Contract and Technical Specifications of the Bid Document as no deviation will be acceptable to the Client (ILB).

**Bid Form :**

The bidder shall purchase the Bid Form from the office of India Literacy Board and will complete the Bid Form as prescribed therein.

**Bid Price :**

The bidders can quote the price either item-wise or as a lump-sum price (**including GST**) for the complete work as a whole. The Prices shall be quoted in Indian Rupees only.

**Bid Submission :**

Bids will be submitted in a sealed envelope with mention of the name of work and name of bidder & Firm and address.

**Period of Validity of Bid :**

1. Bid shall remain valid up to one year after the date of Bid opening prescribed by the Client (ILB). Bid valid for a shorter period shall be rejected by the (ILB) as non-responsive.
2. In exceptional circumstances, the Client (ILB) may solicit the bidder's consent to an extension of the period of Bid validity. The request and the response thereto shall be made in writing. A bidder may refuse the request without forfeiting its Bid security. A bidder granting the request will not be required nor permitted to modify its Bid.

## Section-II

### TERMS & CONDITIONS OF TENDER

Bidder will have to comply with the following :-

1. Warranty period for the Solar Panels shall be 30 years and for rest of the works shall be 05 years.
2. It is mandatory to attach the certificate of experience.
3. The bidder must have implemented minimum three similar works of 200KW each or one work of 600KW in any private establishments or Central or State Governments in the last 3 years.
4. The bidder firm will have to attach Certificate of Goods & Service Tax (GST) registration and PAN along with tender document.
5. Contractors/firms should be duly registered/empanelled with NEDA.
6. **Earnest Money Deposit of ₹30,000.00 (Thirty Thousand) in favour of “Director, India Literacy Board, Kanpur Road, Lucknow” in form of FDR/ Bank Draft/ Irrevocable Bank Guarantee. EMD can also be deposited cash in the office of the India Literacy Board against which a receipt will be provided by the India Literacy Board.**
7. The Test report of complete system/various components (PV module, PCU cum inverter complete system etc) issued from MNRE/NABL accredited test lab. The test report should be valid at the time of opening of Bid.
8. Tender Document will not be accepted on photocopies/ Xerox.
9. After complete satisfaction of the departmental tender committee, appropriate decision will be taken keeping in view the departmental interest. The Committee shall have full power to reject any bid submitted by the bidder or cancel the tender, without any reason, or to change the conditions or terminate any condition. Any bidder will not have any right to debate on doing so.
10. The bidders can quote the price either item-wise or as a lump-sum price (**including GST**) for the total work as a whole. The Prices shall be quoted in Indian Rupees only.
11. Any dispute between the Bidder Firm and the Department will be subjected to Lucknow jurisdiction.

The Bidder is agreed to adhere to the Terms & Conditions as mentioned above.

**Signature**  
**Bidder's Official Seal**

**BILL OF QUANTITY & TECHNICAL SPECIFICATION FOR 10 KW  
ONGRID SOLAR POWER PLANT FOR THREE (03) UNITS**

- a. Scope of work covers Design, Supply, Installation, Commissioning and five years Comprehensive warranty Maintenance and Operation of various capacity of Grid Connected SPV Rooftop Plant for captive use (Capex Mode) in various Government buildings at various place sin the State of Uttar Pradesh as per the technical specification given in this bid.
- b. Wiring up to Distribution Board from the SPV Rooftop system will be in the scope of the Successful bidder (s).
- c. Performance testing of the complete system.
- d. Remote Monitoring System all the necessary approvals from UPPCL/DISCOM (Electrical Utility)/ Electrical Inspectorate, feasibility study, necessary civil work, Mounting of Module Structures, PV Module Installation, Inverter Installation, DC/AC Cabling and interconnections, Installation of Lightning Arresters and Earthing System as per the standards, Net Metering, arranging all the necessary inspections from UPPCL/Electrical Inspectorate as part of Pre Commissioning, if any, Commissioning of the PV Power Plant, are coming under the scope of the bidder.

**TECHNICAL SPECIFICATIONS :**

A Grid Tied Solar Rooftop Photo Voltaic (SPV) power plant consists of SPV array, Module Mounting Structure, Power Conditioning Unit (PCU) consisting of Maximum Power Point Tracker (MPPT), Inverter, Controls & Protections, Net meter, interconnect cables, Junction boxes, Distribution boxes and switches. PV Array is mounted on a suitable structure. Grid tied SPV system will be without battery and unidirectional should be designed with necessary features. Components and parts used in the SPV power plants including the PV modules, metallic structures, cables, junction box, switches, PCUs etc., should conform to the BIS or IEC or international specifications, wherever such specifications are available and applicable. Solar PV rooftop systems hall consist of following major equipment/components.

- Solar PV module
- Grid interactive Power Conditioning Unit
- Mounting structures
- Junction Boxes.
- Earthing and lightening protections.
- IR/UV protected PVC Cables, pipes and accessories
- Remote Monitoring System

The solar photovoltaic technology Crystalline based RTS projects for generation of electricity will be deployed under the Programme. Project proponents to adhere to the national/international standards specified by MNRE from time to time.

## **SOLAR PHOTO VOLTAIC MODULES :**

Solar PV modules should be of the crystalline solar Photovoltaic Technology, manufactured in India. Detailed specifications of the solar PV modules are given below :-

	<b>Must have test certificate as per MNRE guidelines and specified in this tender</b>
Origin	<b>Manufactured in India both cell and module</b>
Efficiency module	$\geq 15\%$
Fill factor	$\geq 70\%$
warranty	Panel output ( $W_p$ ) capacity to be $\geq 90\%$ at the end of 12 years and $\geq 80\%$ of at the end of 25 years.
Module frame	Non-corrosive and electric ally compatible with the mounting structure material
Termination box	Thermo-plastic, IP65, UV resistant
Blocking diodes	Schottky type
Module minimum rated power	The nominal power of as ingle PV module shall not be less than 250 Wp.
Identification tag for each solar module	Shall be provided inside the module and must be able to withstand environmental conditions and last the life time of the solar module.
Identification tag data	Name of the manufacturer with logo Month and year of manufacture Model No ( Should consists of the voltage and rate wattage) Module serial number Made in India
Power output rating	To be given for standard test conditions (STC). I- V curve of the each module shall be submitted.
Compliance with standards and codes	IEC61215/ IS14286 IEC61730 Part1 and2
Salt Mist Corrosion Testing	As per IEC61701

The bidder shall carefully design & accommodate requisite numbers of the modules to achieve the rated power output and overall performance of plant.

The rated output power of any supplied module shall have maximum tolerance of +/- 3%. 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.

## **WARRANTIES :**

- a) Material Warranty :
- i. Material Warranty is defined as: The manufacturer should warrant the Solar Module(s) to be free from the defects and/or failures specified below for a period not less than Thirty (30) years from the date of sale to the original customer.
  - ii. Defects and/or failures due to manufacturing.
  - iii. Defects and/or failures due to quality of materials.

Non conformity to specifications due to faulty manufacturing and/or inspection processes. If the solar Module(s) fails to conform to this warranty, the manufacturer will replace the solar module(s), at the Owners sole option.

**Test reports/certificate from IEC/NABL/MNRE accredited laboratory to be mandatorily enclosed for relevant IEC/equivalent BIS Standards.**

**Solar PV Mounting Structure :**

The PV modules shall be mounted on fixed metallic structures having adequate strength and as per requirement of site to withstand the load of the modules and high wind velocities. The mounting structure steel shall be as per latest IS2062:1992 and galvanization of the mounting structure shall be in compliance of latest IS 4759.

Detailed specifications for the mounting structure are given below: Wind velocity withstanding capacity	150 km/hour The designs have been certified by a recognized Lab/Institution/certified engineers in this regard and submit wind loading calculation sheet to users if they desire so. Suitable fastening arrangement such as grouting and calming should be provided to secure the installation against the specific wind speed.
Structure material	Pregalvanized sheet steel with a minimum galvanization thickness of 80 microns and the structural patterns shall be made before galvanizing.
Bolts, nuts, panel mounting clamps, fasteners (with spring washers)	Stainless steel SS304
Mounting arrangement for metal sheet roofs	Mounting directly on the sheet metal, ensuring stability and wind with standing capacity or penetrating the sheet metal and fixing to the sub-structure, ensuring that the roof remains waterproof and ensuring stability and wind withstanding Capacity.
Mounting arrangement for elevated structures	The elevated structure has to be securely anchored to the supporting surface. Concrete foundations of appropriate weight and depth for elevated structures mounted directly on the ground; Bolted with anchor bolts of appropriate strength for elevated structures mounted on RCC surfaces.
Mounting arrangement for RCC-flat roofs Installation	With removable concrete ballast made of pre-fabricated PCC (1:2:4), M15. The structures shall be designed for simple mechanical on-site installation. There shall be no requirement of welding or complex machinery at the installation site.
Minimum distance between roof edge and mounting structure	0.5m
Access for panel cleaning and maintenance	All solar panels must be accessible from the top for cleaning and from the bottom for access to the module-junction box.



Panel tilt angle	North – south orientation with an adjustable tilt angle arrangement of 22-26 degrees (depending on location), south facing. However to accommodate more capacity the angle inclination may be reduced until the plant meets the specified performance ratio requirements.
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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.

The total load of the structure (when installed with PV modules) on the terrace should be less than 60kg/m<sup>2</sup>. The array structure shall be grounded properly using maintenance free earthing kit suitable for mounting over building terrace.

#### **Solar Array Fuse :**

The cables from the array strings to the solar grid inverters shall be provided with DC fuse protection. Fuses shall have a voltage rating and current rating as required. The fuse shall have DIN rail mountable fuse holders and shall be housed in thermo plastic IP 65 enclosures with transparent covers.

#### **Solar Grid Inverter :**

As SPV array produce direct current electricity, it is necessary to convert this direct current into alternating current and adjust the voltage levels to match the grid voltage. Conversion shall be achieved using an electronic Inverter and the associated control and protection devices. All these components of the system are termed the “Power Conditioning Unit (PCU)”. In addition, the PCU shall also house MPPT (Maximum Power Point Tracker), an interface between Solar PV array & the Inverter, to the power conditioning unit/inverter should also be DG set interactive. If necessary. Inverter output should be compatible with the grid frequency. Under normal condition the building load is fed from a SPV electricity and in the absence of SPV power or low SPV power conditions an external AC source can be used for supply of electrical energy to load. In case the PV power generated at any instant of time is more than the load requirement of building or at no load conditions this excess PV power shall be reduced or make it open automatically. All these operation should be automatic.

Typical technical features of the inverter shall be as follows:

1	Total output power AC	To match solar PV plant capacity while achieving optimum system efficiency Single or three phase as per requirement of Site and capacity of plant.
2	Input DC voltage range	As required for the solar grid inverter for corresponding capacity
3	Maximum power point (MPPT)	Shall be incorporated
4	Number of independent MPPT inputs	1 or more
5	Operation AC voltage	As per requirement of the site
6	Operating Frequency range	47.5 – 52.5Hz
7	Nominal frequency	50 Hz
8	Power factor of the inverter	>0.95 at nominal power
9	Total harmonic distortion	Less than 3%
10	Built-in Protection	AC high/low voltage; AC high/low frequency

11	Operating ambient temperature range	-5°C to +55°C
12	Humidity	0 – 95%Rh
13	Inverter efficiency	>93% (In case of 10 kW or above within-built galvanic isolation) >97% (In case of 10 KW or above without in-built galvanic isolation)
14	Inverter efficiency	>90% (In case of less than 10 kW)
15	Protection degree	IP65 for out door mounting, IP54 for indoor mounting
16	Communication interface	RS485/RS232/ RJ45
17	Safety compliance	IEC62109-1, IEC62109-2
18	Environmental Testing	IEC60068-2 (1, 2, 14,30)
19	Efficiency Measurement Procedure	IS/IEC61683
20	Cooling	Convection
21	Display type	LCD for data display. LCD/LED for status display
22	Display parameters to include	Output power (W), cumulative energy (Wh), DC voltage(V), DC current(A), AC voltage (V), AC frequency (Hz), AC current (A), cumulative hours of operation(h).

- a) Three phase PCU/ inverter shall be used with each power plant system (10kW and/or above) but in case of less than 10kW single phase inverter or as per building requirement can be used.
- b) PCU/inverter shall be capable of complete automatic operation including wake-up, synchronization & shutdown.
- c) The output of power factor of PCU inverter is suitable for all voltage ranges or sink of reactive power, inverter should have internal protection arrangement against any sustainable fault in feederline and against the lightning on feeder.
- d) Built-in meter and data logger to monitor plant performance through external computer shall be provided.
- e) Anti-islanding (Protection against Islanding of grid): The PCU shall have anti islanding protection in conformity to IEEE 1547/UL1741/ IEC62116 or equivalent BIS standard.
- f) The PCU/ inverter generated harmonics, flicker, DC injection limits, Voltage Range, Frequency Range and Anti-Islanding measures at the point of connection to the utility services should follow the latest CEA (Technical Standards for Connectivity Distribution Generation Resources) Guidelines.
- g) The power conditioning units / inverters should comply with applicable IEC/ equivalent BIS standard for efficiency measurements and environmental tests as per standard codes IEC61683/IS61683 and IEC60068-2 (1,2,14,30)/Equivalent BIS Std.
- h) The MPPT units environmental testing should qualify IEC 60068-2 (1, 2, 14, 30)/ Equivalent BIS std. The junction boxes/ enclosures should be IP 65 (for outdoor)/ IP 54 (indoor) and as per IEC529 specifications.

The PCU/inverters should be tested from the MNRE approved test centres/ NABL/ BIS/ IEC accredited testing-calibration laboratories.

## **REMOTE MONITORING SYSTEM :**

Remote Monitoring system with per minute logging of data, Wi-Fi based, viewable on desktop and smart phones.

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

Remote Monitoring and data acquisition through Remote Monitoring System software at the owner location with service connectivity for online/real time data monitoring/control complete to be supplied and operation and maintenance/control to be ensured by the bidder.

## **POWER CONSUMPTION :**

Regarding the generated power consumption, priority need to give for internal consumption first and thereafter any excess power can be made open.

## **PROTECTIONS :**

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

## **LIGHTNING PROTECTION :**

The SPV power plants shall be provided with lightning & overvoltage protection. The main aim in this protection shall be to reduce the over voltage to a tolerable value before it reaches the PV or other subsystem components. The source of over voltage can be lightning, atmosphere disturbances etc The entire space occupying the SPV array shall be suitably protected against Lightning by deploying required number of Lightning Arrestors. Lightning protection should be provided as per IEC 62305 /IS 2309 standard. The protection against induced high-voltages shall be provided by the use of metal oxide varistors (MOVs) and suitable earthing such that induced transients find an alternate route to earth.

## **SURGE PROTECTION :**

Surge protection shall be provided on both the DC and the AC side of the solar system. The DC surge protection devices (SPDs) shall be installed in the DC distribution box adjacent to the solar grid inverter. The AC SPDs shall be installed in the AC distribution box adjacent to the solar grid inverter. The SPDs earthing terminal shall be connected to earth through the above mentioned dedicated earthing system. The SPDs shall be of type2 as per IEC60364-5-53.

## **EARTHING PROTECTION :**

- (a) Each array structure of the PV yard should be grounded/earthed properly as per IS:3043-1987. In addition the lighting arrester/masts should also be earthed inside the array field. Earth Resistance shall be tested in presence of the representative of Discom as and when required after earthing by calibrated earth tester. PCU, ACDB and DCDB should also be earthed properly.
- (b) Earth resistance shall not be more than 5 ohms. It shall be ensured that all the earthing points are bonded together to make the mat the same potential.

## CABLES :

The rate quoted by the bidder shall be inclusive of required AC and DC Cables Length. Cables of appropriate size to be used in the system shall have the following characteristics:-

- a) Shall meet IEC60227 / IS694, IEC60502 / IS1554 standards Temp. Range:- 10oCto+80oC. Voltage rating 660/1000V.
- b) For the DC cabling, Solar cables with multi stranded copper conductors XLPE or XLPO insulated and sheathed with the voltage rating of 1000 V DC or higher UV stabilised single core flexible copper cables shall be used. Multi-core cables shall not be used.
- c) For the AC cabling, PVC or XLPE insulated and PVC sheathed single or multi-core flexible copper cables shall be used. Outdoor AC cables shall have a UV-stabilised outer sheath.
- d) The total voltage drop on the cable segments from the solar PV modules to the solar grid inverter shall not exceed 1.0%.
- e) The total voltage drop on the cable segments from the solar grid inverter to the building distribution board shall not exceed 2.0%.
- f) The DC cables from the SPV module array shall run through a UV-stabilised PVC conduit pipe of adequate diameter with a minimum wall thickness of 1.5mm or through a High Density Poly Ethylene(HDPE) conduit. The conduits shall not run across the path way of the terrace. Flexible corrugated PVC conduits shall not be used.
- g) Cables and wires used for the interconnection of solar PV modules shall be provided with solar PV connectors (MC4) and couplers.
- h) All cables and conduit pipes shall be clamped to the rooftop, walls and ceilings with thermo-plastic clamps at intervals not exceeding 50 cm. The minimum DC cable size shall be 4.0 mm<sup>2</sup> copper. The minimum AC cable size shall be 4.0 mm<sup>2</sup> copper for up to 10kWp and 16.0mm<sup>2</sup> for above 10kWp /required standard size. In three phase systems, the size of the neutral wire shall be equal to the size of the phase wires. The following colour coding shall be used for cable wires.
  - i) DC positive : red (the outer PVC sheath can be black with a red line marking)
  - j) DC negative : black
  - k) AC single phase : Phase : red; neutral: black
  - l) AC three phase : Phases : **red, yellow, blue**; neutral : **black** Earthwires : **green**
- m) Cables and conduits that have to pass through walls or ceilings shall be taken through a PVC pipe sleeve.
- n) Cable conductors shall be terminated with tinned copper end-ferrules to prevent fraying and breaking of individual wire strands. The termination of the DC and AC cables at the Solar Grid Inverter shall be done as per instructions of the manufacturer, which in most cases will include the use of special connectors.
- o) Cable lugs and end -ferrules for all cable conductor and wire terminations shall be crimped with crimping pliers and end-ferrule pliers.
- p) All cable ties shall be UV resistant.
- q) The Cable should be so selected that it should be compatible up to the life of the solar. PV panels i.e. 30 years.
- r) The ratings given are approximate. Bidder to indicate size and length as per system

design requirement. All the cables required for the plant provided by the bidder. Any change in cabling sizes if desired by the bidder/approved after citing appropriate reasons. All cable schedules/layout drawings approved prior to installation.

**TOOLS & TACKLES AND SPARES :**

After completion of installation & commissioning of the power plant, necessary tools & tackles are to be provided free of cost by the bidder for maintenance purpose.

**DANGER BOARDS AND SIGNAGES :**

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

**FIRE EXTINGUISHERS :**

The fire fighting system for the proposed power plant for fire protection shall be consisting of: Portable fire extinguishers in the control room for fire caused by electrical short circuits Sand buckets in the control room. The installation of Fire Extinguishers should confirm to TAC regulations and BIS standards. The fire extinguishers shall be provided in the control room housing PCUs as well as on the Roof or site where the PV arrays have been installed.

**DRAWINGS & MANUALS:**

Two sets of Engineering, electrical drawings and Installation and O & M manuals are to be supplied.

**PLANNING AND DESIGNING:**

The bidder should carry out Shadow Analysis at the site and accordingly design strings & arrays layout considering optimal usage of space, material and labor.

**SOLAR PV SYSTEM ON THE ROOFTOP FOR MEETING THE ANNUAL ENERGY REQUIREMENT :**

The Solar PV system on the rooftop of the selected buildings will be installed for meeting the annual energy requirements depending upon the area of rooftop available and the remaining energy requirement of the office buildings will be met by drawing power from grid at commercial tariff of DISCOMs.

**SAFETY MEASURES :**

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.

**DC Combiner Box :**

A DC Combiner Box shall be used to combine the DC cables of the solar module arrays with DC fuse protection for the outgoing DC cable(s) to the DC Distribution Box.

**DC Distribution Box :**

A DC distribution box shall be mounted close to the solar grid inverter. The DC distribution box shall be of the thermo-plastic IP65 DIN-rail mounting type and shall comprise the following components and cable terminations:

Incoming positive and negative DC cables from the DC Combiner Box;

DC circuit breaker, 2 pole (the cables from the DC Combiner Box will be connected to this circuit breaker on the incoming side);

DC surge protection device (SPD), class 2 as per IEC 60364-5-53; Outgoing positive and negative DC cables to the solar grid inverter.

As an alternative to the DC circuit breaker a DC isolator may be used inside the DC Distribution Box or in a separate external thermoplastic IP 65 enclosure adjacent to the DC Distribution Box. 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.

**AC Distribution Box :**

An AC distribution box shall be mounted close to the solar grid inverter. The AC distribution box shall be of the thermos plastic IP65 DIN rail mounting type and shall comprise the following components and cable terminations:

Incoming 3-core /5-core(single-phase/three-phase) cable from the solar grid inverter AC circuitbreaker, 2-pole /4-pole AC surge protection device (SPD), class2 as per IEC60364-5-53.

**Annexure-2**

**Financial Quote / Bid Price**

<b>S. No.</b>	<b>Item of Work</b>	<b>Qty.</b>	<b>Unit</b>	<b>Rate</b>	<b>Amount</b>
<b>1.</b>	Complete Job of design, supply, installation, testing and commissioning including comprehensive warranty maintenance, for 10KW Grid Interactive Rooftop Solar Power Plant in Literacy House, Kanpur Road, Lucknow.	<b>3</b>	<b>3 Nos</b>		

**Important Note :**

- The bidders shall quote their bid price including the GST charges.
- Any extra charges shall not be admissible.
- The total bid price shall be deemed for Complete Job of design, supply, installation, testing and commissioning including comprehensive warranty maintenance for three (03) units of 10KW Grid Interactive Rooftop Solar Power Plant at separate buildings in the Literacy House Campus, Kanpur Road, Lucknow.