

**TENDER ID : PAT202001046**

**SBI INFRA MANAGEMENT SOLUTIONS PVT LTD**

**(WHOLLY OWNED SUBSIDIARY OF SBI)**

**PATNA CIRCLE OFFICE**

**INVITES TENDERS ON BEHALF OF SBI PATNA CIRCLE**

**FOR**

**DESIGN, SUPPLY, INSTALLATION, TESTING, COMMISSIONING AND MAINTENANCE OF  
20 KWp ROOF TOP GRID CONNECTED PHOTOVOLTAIC SOLAR POWER PLANT  
(WITHOUT BATTERY) FOR CAPTIVE CONSUMPTION AT  
SBI, DUMKA BRANCH BUILDING**

Last date of submission of Tender: **Up to 3.00 P.M (IST) on 31.01.2020**

Opening of Tenders: **3.30 P.M (IST) on 31.01.2020**

**CIRCLE HEAD**

**SBIIMS, CIRCLE OFFICE PATNA**

Signature and Name, Address & contact nos. of Contractor

## NOTICE INVITING TENDERS

### STATE BANK OF INDIA, SBI, LHO, PATNA INVITES THE SEALED TENDER FOR SUPPLY, INSTALLATION, TESTING, COMMISSIONING AND MAINTENANCE OF 20KWp ROOF TOP GRID CONNECTED PHOTOVOLTAIC SOLAR POWER PLANT (WITHOUT BATTERY) WITH NET METERING FOR CAPTIVE CONSUMPTION AT SBI, DUMKA BRANCH BUILDING

Tenders are invited in two (02) bid system (Technical & Financial bid) from Reputed Solar Vendors, who have experience more than 5 years in the similar field are only eligible to apply. **(Vendors should furnish proof of the same)**

The details of the Tender are as under:-

Sl No.	Description	Details
1	Name of work	“Supply, Installation, Testing, commissioning and maintenance of 20KWp Roof top grid connected Photovoltaic Solar Power plant (without Battery) for captive consumption at SBI Dumka Branch building”
2	Time allowed for completion	<b>30 days</b>
3	Cost of Tender Papers(Processing fee) Non-refundable	<b>Rs.3000/-</b> (Rupees Three thousand only) through “ <b>SB COLLECT</b> ” payment portal by using SBI Internet Banking site <a href="http://www.onlinesbi.com">www.onlinesbi.com</a> . The receipt of payment to be submitted along with the technical bid. Without tender processing fee tender will be rejected. The steps involved in making the payment is provided at <b>Annexure-A</b>
4	Earnest Money Deposit (EMD)	NIL
5	Initial Security Deposit(ISD)	NIL
6	Security Deposit	5% of Contract/final bill value which will be deducted from contractor’s bill and will be refunded 60 months after defect liability period provided the contractor attend to all defects satisfactorily during the one year defect liability period.
7	Date of issue of Tender Documents from Bank’s Website	<b>16.01.2020 to 31.01.2020</b> from Bank’s web site <a href="http://www.sbi.co.in">www.sbi.co.in</a> under Link-Procurement news.
8	Address at which tenders are to be submitted	SBIIMS Circle office, Patna 2 <sup>nd</sup> floor, SBI Patna Main branch West Gandhi Maidan, Patna-800001
9	Last date of submission of technical bid, financial bid.	<b>31.01.2020 Up to 3.00 P.M</b>

10	Date and time of opening of Technical Bids	<b>31.01.2020 at 3.30 P.M at the above address in presence of the vendors or their authorized representative who desires to be present. (Price Bid will be opened on later date, those qualify in Technical Bid.)</b>
11	Liquidated damages	0.50% of Contract amount per week of delay in completion of work subject to maximum 5% of contract value or final bill value.
12	Defect Liability period	60 Months from date of completion of work.
13	Terms of Payment	Only final bill will be paid. No Advance will be paid.
14	Validity of Tender	90 days from the date of opening of price bid
15	Eligible taxes	<p>A) Income tax will be deducted at source as per govt. guidelines.</p> <p>B) Reimbursement of GST will be made only on submission of proper GST Invoice as per applicable GST provisions/Rules. The contractor should comply with the following :</p> <ul style="list-style-type: none"> <li>• Contractor should have GST Registration Number.</li> <li>• Invoice should specifically/separately disclose the amount of GST levied at applicable rate as per GST provisions/Rules.</li> </ul>
16	Information Regarding Submission of Tenders	<p>Eligible vendors should download the Technical and financial bid from Bank's web site. Vendors should submit Technical and financial bids in 02 (two) separate sealed cover and super scribed with the name of the work. Both the Technical and financial bid should be in a separate large envelope sealed and super scribed with the name of the work.</p> <p><b><u>Technical bid</u></b> : Technical bid should contain the following :-</p> <ol style="list-style-type: none"> <li>i) Receipt of Tender processing fee</li> <li>ii) GST Registration copy</li> <li>iii) All tender papers duly signed &amp; stamped by the vendor.</li> <li>iv) Copy of completed project in proof of experience.</li> </ol> <p><u>Without the any one of the above in the Technical bid, the Tender will be rejected and price bid will be returned without being opened.</u></p> <p><b><u>Financial/Price Bid/Item wise BOQ</u></b> : Vendor should submit the price bid in a separate sealed envelope. The price bid/Item wise BOQ should only contain the priced offers and general rebate (if any).</p>

Any condition in the price bid/BOQ will be liable for rejection of tender.

**Tenderers are advised to inspect the site in consultation with the Bank's Electrical Engineer before submission of the tender in order to get acquainted with the proposed work and Site condition and satisfy themselves before quoting the rate. No deviation in condition or specification or additional items shall be entertained at a later date.**

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 &venue.

Bank reserves the right to accept or reject any or all tenders/proposal without assigning any reasons, whatever be the cause of cancellation. In any case, the court of jurisdiction is at Patna.

Signature & seal of the Contractor

#### **Annexure-A**

The Steps involved in making the payment through SB Collect are as under :-

1. The Vendor needs to use SBI internet Banking site <https://www.onlinesbi.com/>
2. Select "**SB Collect**" from Top Menu, that will lead to the next page.
3. "**Proceed**" will lead to the next page.
4. Select "**All India**" in "State of Corporate/Institution" & select "**Commercial services**" in "Type of Corporate/Institution".
5. "**Go**" will lead to the next page.
6. Select "**SBI Infra Management Solutions**" in Commercial services name and "**Submit**".
7. Select "**Tender application fee**" in "Payment gateway" and enter the "**Tender ID**" exactly as we preloaded with characters in Uppercase only in place of Circle Codes.
8. The next page will be ready with few of the preloaded Tender details.
9. The Vendor will have to fill up the fields properly and upon making the payment a receipt will be generated with a reference No.

NOTE : Any type of Vendor/Contractor, whether dealing with SBI or other Bank can use this SB Collect facility. Even a Contractor/Vendor not dealing with any Bank, use this portal and generate challan and deposit by cash in any SBI branch. The Bank charges for cash deposit will be also borne by the vendor/contractor himself.

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## ELIGIBILITY CRITERIA FOR PRE-QUALIFICATION OF VENDORS:-

1. The applicant should be a well-established and reputed Indian Firm having experience in installation of at least one 20 KWp in single installation above capacity Grid Tied Solar Power Plant and allied work in anywhere in India.(Copy of work order showing an experience of the same must be Enclosed along with Photograph).

**NOTE:** (i) "similar" works under this clause shall mean "successful completion of SOLAR POWER PLANT under MNRE Roof top category.

(ii) "Cost of work" shall mean actual gross value of completed "similar" work including all the components executed under single contract. The applicant shall submit a copy of certificate of final bill of each project executed by them, during the said period.

(iii) All the above said completed works, should be for some Central / State Government / Autonomous Body / Central / State Public Sector undertaking / Bank / Financial Institutions etc.

(iv) "Applicant" means proprietary concern, partnership firm, private or public limited company applying for pre-qualification. "Employer" or "Client" or "Bank" means State Bank of India.

2. The applicant should have a solvency Certificate of minimum Rs. **10 Lacs** certified by Scheduled Bank. The Solvency Certificate should not have been obtained earlier than 31.03.2019. In case, the applicant is not able to provide the solvency certificate in original, the certificate shall be attested by a Notary on a Letter Head of Nationalized Bank Format.

3. The applicant should own adequate tools and equipment's required for the proper execution of the work on a fast track basis and the details of the same shall be furnished.

4. The applicant should have sufficient number of Technical and Administrative personnel on their Rolls for proper execution of the contract.

5. Firm should have full fledged registered service set up in India and should have at least 5 years of experience in handling similar types of job. Organization chart of the service set up and AMC Orders of such installations should be furnished duly signed by authorized signatory.

6. Firm should have qualified and trained manpower to do trouble shooting of Solar Plant being quoted.

7. Firm should have valid ISO 9001:2008 & 14001 2004 or latest certification. ISO certificate shall be furnished.

8. Firm must be MNRE approved channel partner (Validity period at least 2019) in the highest grades (SP1A/1B/1C/Govt. agencies/PSU) and tested their products as per IEC standard. (enclose copy).

9. Having good liaison with Bihar and Jharkhand Electricity Supply Authority for Net metering is desirable.

10. Having Valid Trade license, Service Tax, VAT registration etc.

11. Undertaking to submit "PERFORMANCE GUARANTEE" Certificate in the form of Bank Guarantee, if the vendor is finalised for the captioned work. (5% security deposit for 5 years may

be released on submission of performance Bank Guarantee from a scheduled/commercial Bank.)

12. The firm / sub contractor or technical agent has to produce valid Electrical Grade “A” license – proof to be submitted.

13. The firm, who has set up at least **Two** solar power plant of minimum **20kWp** or above capacity in the premises of reputed Government building and State or Central Universities or Financial institutes.(Proof to be submitted)

14. Vendor should submit a live presentation / demo on computer in computer screen in presence of Consultant and Bank’s official, if necessary. Delays in submission of proposal any part arising out of the postal irregularities/or any other at any stage will not be considered. Also, the Bank will not be responsible for damage in transit in case of Postal Delivery. 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 and venue.

15. Bank reserves the right to accept or reject any or all tenders/proposal without assigning any reasons, whatever be the cause of cancellation. In any case, the court of jurisdiction is at Patna. Only such contractors who fulfill the aforesaid eligibility criteria need to apply.

#### **EVALUATION CRITERIA FOR PRE-QUALIFICATION:**

For the purpose of pre qualification, applications will be evaluated in the following manner :

1. The initial eligibility criteria prescribed above (in respect of experience of similar nature of work completed) shall be first scrutinized and the applicant’s eligibility for pre qualification for the work will be determined.

2. Only the applicants who meet the initial eligibility criteria specified as above will be further evaluated on the basis of details furnished by them.

3. If necessary, the authorized representatives of Bank may visit few project sites which were recently executed or are being executed by the applicants, in order to evaluate the performance and quality of work. In such case, the applicant will be required to provide the Bank the necessary access/facilities and arrangements to visit the site as may found necessary.

4. On the basis of the pre qualification criteria mentioned above and after evaluation of applicants based on site visit report, credentials submitted by the applicants, confidential reports obtained from various clientele (wherever necessary), applications will be short-listed. The short-listed applicants will be considered for pre qualification subject to verification of relevant documents.

#### **EXPERIENCE IN SIMILAR WORKS HIGHLIGHTING MAJOR PROJECTS**

**Applicant should furnish the following: List of all “Similar” works successfully completed during the last Seven years.**

#### **ORGANISATIONAL INFORMATION - OTHERS**

1. Number of Technical and Administrative Employees in the organization and how they would be involved in this work.

2. Details of ISO certification or others.

### **CONSTRUCTION PLANT AND EQUIPMENTS:**

The applicant should furnish the list of tools, plant and equipment, which he proposes to use for carrying out the work on FAST TRACK basis.

### **TENDER PROCEDURE:**

1. After evaluation of applications for pre-qualification, list of qualified / short-listed contractors will be prepared. Thereafter, Price Bids of those shortlisted bidders will be opened.

Please Note: (a) SBIIMS, Circle Office, Patna reserves the right to verify the particulars furnished by the applicant. If any information furnished by the applicant is found incorrect at a later date, The Company or Firm or the person he shall be liable to be debarred from submitting tender/taking up of work in SBI. Whenever any information furnished by the applicant is found incorrect that a later stage, the tender submitted or work taken up by the applicant, if any, will be cancelled and in such case SBI will not pay any damage to the Company or Firm or the concerned person. Also de-barred for further participation in any tender in the SBI. Further, any breach of this condition by the applicant would also render him liable to be removed from the approved list of contractors of SBI.

(b) Even though an applicant may satisfy the above requirements, he would be liable to disqualification if he has:

(i) Made misleading or false representation or deliberately suppressed the information in the forms, statements prescribed in the prequalification document.

(ii) Record of poor performance such as, abandoning work, not properly completing the contract, or financial failures/ weaknesses etc.

2. Corrigendum / addendums (if any) to this notice shall only be available in SBI's website.

3. The applicants who have down-loaded the Tender document from the website, should read the following important instructions carefully before submitting the Tender:

a) The applicants should go through carefully & ensure that the complete TENDER document contains all pages of the document.

b) The applicant should ensure that no page in the down-loaded Tender document is missing.

c) The applicant should ensure that all pages in the down-loaded Tender document are legible & clear and are printed on a good quality paper.

d) The applicant should ensure that every page of the down-loaded Tender document is signed by applicant with stamp (seal) of the applicant company and all the blanks are filled by them, suitably.

e) The applicant should ensure that the down-loaded Tender document is properly bound and sealed before submitting the same and any correction / addition / alteration / omission, made in the Tender document by the applicant, shall be treated as non-responsive and the application shall be summarily rejected.

f) The applicant shall furnish a declaration as per the format to the effect that no addition/ deletion / corrections have been made in the Tender document submitted and it is identical to the Tender document appearing on Website.

g) The applicant who has downloaded the Tender document from website should read carefully & sign the declaration given on the Form before submitting the same.

h) In case of any doubt in the down-loaded Tender document, the same should got clarified from SBI or Consultant before submitting the final Tender document.

4. The applicant (principal contractor) shall also intimate the names of person/s who are working with him in any capacity or are subsequently employed by him or who are near relative to any executive employee in the STATE BANK OF INDIA.

\* Efforts on the part of the applicants or his agent to exercise influence or to pressurize the employer would result in rejection of application. Canvassing of any kind is prohibited.

#### **GENERAL TERMS & CONDITION:-**

1. Time is the essence of the contract. Accordingly, it should be planned to complete the work in 30 days time failing which liquidated damage clause will be imposed as per tender conditions.

2. The tenderer are advised to visit the site of installation and acquaint themselves site condition and satisfy themselves before quoting the rate and clear doubts if any before submitting the final Tender documents. No deviation in condition or specification or additional items shall be entertained at a later date.

3. The tender form must be filled in English and all entries must be made by hand and written in ink.

4 The tenders must be submitted in the prescribed format only. The tenderer must quote the rates and amount in the BOQ. The rates should be written both in words and figures without any erasures and alteration. In case of any discrepancy the amount in words shall be considered

5. However, if any errors are made, the wrong figures or words must be neatly scored out under full signature of the tenderer. Overwriting is not permitted

6. Each and every page of the tender documents must be signed by an authorized person.

7. Errors in the bill of quantities (BOQ), rates and amount shall be dealt with in the following manner;

i) In the event of a discrepancy between the rates quoted in words and the rates in figures, the quotient of the total amount divided by the quantity shall be taken into consideration.

ii) All errors in totaling the amount column and in carrying forward, the totals shall be corrected.

iii) In the event of an error occurring in the amount columns as a result of wrong multiplication and extension of unit rate and quantities, the unit shall be taken into consideration.

8. The quantities indicated in the BOQ are only probable quantities and are liable to alteration by omission, reduction or addition. Payment shall be made on the basis of actual quantities of work done at the accepted rates.

9. No alterations which are made by the tenderer in the drawings, specification or in probable quantities accompanying the tender will be recognized and the tender is likely to be invalidated. Remarks and explanations should be given in a separate cover and will become binding only if specially accepted in writing by the Bank at the time of acceptance of tender.

10. The tenderer must obtain for himself in his own responsibility and at his own expenses all the information necessary for the purpose of filling the tender and to enter into a contract with the bank, he must examine the drawings, specifications, conditions etc. and must inspect the site of work and acquaint himself with all the local conditions and matters pertaining thereto.

11. The tender will be rejected if any tender is with conditional tender.

12. The scope of work shall include the following:

(a) Design and Delivery of all equipment's materials for the captioned work, to Bank's site at Patna including packing, handling, transporting, loading/unloading etc. at site.

(b) Erection, Testing, commission of solar Power Plant and handing over the system to Bank including NET metering arrangement from supply authority.

(c) Providing regular upkeeps & Maintenance inclusive of periodic services including all spares during warranty period.

### **13. SECURITY DEPOSIT (SD)**

The security deposit will 5% of the contract amount and will be deducted from the bill and will be released after Defect Liability Period of 60 months. The security deposit amount may be released on submission of Bank Guarantee of equivalent amount. The amount of BG will be valid till completion of the defect liability period of Five years.

### **14. DEFECT LIABILITY PERIOD.**

60 (sixty) months from the date of completion. The contractor has undertake to attend repairs/rectifying the defects within 48 hours whatsoever during the defects liability period.

### **15. LIQUIDATED DAMAGES**

If the work is not completed in the specified time the contractor will be levied liquidated damages @0.5% of the quoted value per week subject to maximum of 5 % of the contract value will be applied for delay in completion of the work.

### **16. LABOUR LAWS**

The vendor shall adhere to various provision of the contract Labour( Regulation& Abolition) Act 1970, if applicable under the said contract, and fulfill all the statutory requirements.

### **17. TERMS OF PAYMENT:**

a) Full and Final Payment will be made after verified by consultant of the project as well as Bank's Engineer. No advance will be payable.

i) Manufacture's Inspection and Test certificate. Payment shall be made after completion of completion of the work and tested.

ii) Contractor's certificate that all components, parts, sub system consumable's etc. for successful installation, commissioning and testing of the systems including maintenance have

been received site in good condition and if any shortfall is notice during installation, commissioning and testing they will be supplied free of the Bank.

iii) Policies of insurance covering all the risks during transit, storage, installation, commissioning, testing and handing over including party liabilities

18. Work shall be done during working and holidays of the Bank. No inconvenience shall be done at the office. The premises will be made neat and clean after completion of the work. All the debris should be removed within 3 days of the completion of the work.

19. The tenderer should indicate in his tender the complete description of the working of the system/sub systems and their power requirements with all relevant brochures/literature etc. in addition to those called for the Tender specifications.

20. The Bank is not bound to accept the lowest or any tender or to assign any reason for non-acceptance.

21. The equipment shall be properly and securely packed in box and multiple handle transportation by sea /air/rail/road under Indian condition. All equipment's /components shall be delivered at the Bank`s office building at site of Dumka Branch building.

22. Before starting the job, vendor should prepare drawing & design of SPV roof top power plant for each roof top of the complex and same should be vetted by Consultant of the project as well as bank`s engineer.

23. On receipt of intimation from the bank of the acceptance of his/their tenders, the successful tenderer shall be bound to implement contract and within seven days thereof. The successful tenderer shall sign an agreement in accordance with the draft agreement which will include the NIT, out come of pre-bid meeting, conditions, other papers therein, special conditions, all drawing and specification etc. but his liabilities will commence from the date of the written acceptance of the tender whether the formal in accordance with the draft agreement written acceptance of the tender whether the formal agreement is drawn or not.

24. The contractor shall bear all expenses in connection with the execution of the said agreement including fees for stamps and registration of documents as required/ applicable in State of Jharkhand.

25. On acceptance of the tender the vendor shall in writing inform the Banks names of his accredited representative who will be responsible to take instructions from the Bank on other work/sub work in connection with the work.

26. The contractor is required to comply withal acts of Government relating to labour and the rules and regulation made there under from time to time and submit at the times all particulars and settlements required to be furnished to the labour authorities.

27. The work shall be carried out under the direction and supervision of and subject to the approval in all respects by the Bank`s consultants.

28. The contractor shall be required to cooperate and work in accordance with other agencies/specialist as may be employed by the Bank on other work/sub work in connection with the Bank.

29. TAX DEDUCTION AT SOURCE: IT & WCT and any other applicable taxes will be deducted at source as per the rate prevalent at the time of payment of the bill.

30. No advance will be paid for the above project.

31. All debris shall be removed and transported to remote place outside of the premises.

32. The work shall be carried in such a way that no inconvenience is caused to the staff during office hours.

33. RESPONSIBILITY FOR SAFETY OF THE BUILDING: The vendor shall be responsible for the safety of the works (including the materials temporary buildings and plants) until they are taken over by the employer and they shall stand at their risk and be in the sole charge of the vendor who shall be responsible for and must with all possible speed make good all damage from whatever causes.

34. The vendor shall obtain insurance cover of the works under "contractor all risk policy".

### **35 GUARANTEES AND PERFORMANCE**

The vendor shall guarantee the design, materials and workmanship as well as satisfactory operation of all items of the plant, machinery and equipment offered, by him, with respect to all individual items and collective items comprising a group of equipment and for the whole plant and equipment in accordance with the performance requirements indicated in the tender documents. In this respect, the tenderer shall indicate clearly in his offer the details of various outputs, accuracy, consumption and performance test procedure as well as guarantees for the plant and equipment offered, the Penalties payable in case of non-fulfillment of performance guarantees up to acceptable tolerance limits.

### **WARRANTY**

The vendor shall undertake to rectify at its expense any defect coming from an error in the design, raw material or manufacturing of the equipment within period of **60 months** from the date of commissioning or **60 months** from the date of dispatch, whichever is earlier.

### **INSURANCE**

Transit insurance up to the arrival at destination and for 30 days storage thereafter, shall be arranged by the VENDOR and shall communicate details of goods as soon as these are dispatched. The VENDOR shall be solely responsible and held liable to pay for the loss incurred during transit.

### **FORCE MAJEURE:-**

Neither party shall be held responsible for any losses, if the fulfillment of any terms or provisions of the PURCHASE ORDER are delayed or prevented by acts of lawful Government, revolutions and other disorders, wars (declared or undeclared), acts of enemies, strikes, fires, floods, acts of God and, without limiting the foregoing, any other cause not within the control of the party whose performance is interfered with and which, by the exercise of reasonable diligence, he is unable to prevent.

**36.** Before starting the job vendor should submit the Bar Chart showing start and completion of all activities related to completion of the project.

I/We have read and understood the above conditions and requirements of SBI in the proposed Design, supply, installation, testing and commissioning solar power installation of 40 Kwp capacity in Ranchi Main Branch building and agree for all the terms and conditions and agree to the same.

## **TECHNICAL SPECIFICATIONS**

### **1.1 INTRODUCTION**

**Tenderer are advised to Inspect the site in consultation with the Bank's Electrical Engineers before submission of the tender in order to acquainted with the proposed work and Site conditions.**

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

### **1.2 QUALITY AND WORKMANSHIP**

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

### **1.3 DEFINITION**

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

- \* Solar PV modules consisting of required number of efficient Crystalline PV modules
- \* Grid interactive Power Conditioning Unit with Remote Monitoring System
- \* Galvanised Mounting structures.

- \* Junction Boxes.
- \* Earthing and lightening protections.
- \* IR/UV protected PVC Cables, pipes and accessories.

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

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

- \* For the PV modules to be used in a highly corrosive atmosphere throughout their lifetime, they must qualify to IEC 61701/IS 61701
- \* The total solar PV array capacity should not be less than allocated capacity (kWp) and should comprise of solar crystalline modules of minimum 300Wp and above wattage. Module capacity less than minimum 300 watts should not be accepted.
- \* Protective devices against surges at the PV module shall be provided. Low voltage drop bypass diodes shall be provided.
- \* PV modules must be tested and approved by one of the IEC authorized test centers.
- \* The module frame shall be made of corrosion resistant materials, preferably having anodized aluminum.
- \* The bidder shall carefully design & accommodate requisite numbers of the modules to achieve the rated power in his bid. Bank shall allow only minor changes at the time of execution.
- \* Other general requirement for the PV modules and subsystems shall be the Following:
- \* The rated output power of any supplied module shall have 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.
- \* 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, weather proof lid with captive screws and cable gland entry points or may be of sealed type and IP-65 rated.
- \* IV curves at STC should be provided by bidder

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

- \* Name of the manufacturer of the PV module
- \* Name of the manufacturer of Solar Cells.
- \* Month & year of the manufacture (separate for solar cells and modules)
- \* Country of origin (separately for solar cells and module)
- \* I-V curve for the module Wattage,  $I_m$ ,  $V_m$  and FF for the module
- \* Unique Serial No and Model No of the module
- \* Date and year of obtaining IEC PV module qualification certificate.
- \* Name of the test lab issuing IEC certificate.
- \* Other relevant information on traceability of solar cells and module as per ISO 9001 and ISO 14001

#### 1.4.4 Warranties:

- \* Material Warranty:
- \* 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 five (05) years from the date of sale to the Bank.
- \* Defects and/or failures due to manufacturing
- \* 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 repair or replace the solar module(s), at the Owners sole option.
- \* Performance Warranty:
- \* The predicted electrical degradation of power generated not exceeding 20% of the minimum rated power over the 25 year period and not more than 10% after ten years period of the full rated original output.

#### 1.5 ARRAY STRUCTURE

- \* Hot dip galvanized MS 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. However to accommodate more capacity the angle inclination may be reduced until the plant meets the specified performance ratio requirements.
- \* 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 (like Delhi-wind speed of 150 km/ hour). It may be ensured that the design has been certified by a recognized Lab/ Institution in this regard and submit wind loading calculation sheet to Bank. Suitable fastening arrangement such as grouting and calming should be provided to secure the installation against the specific wind speed.
- \* The mounting structure steel shall be as per latest IS 2062: 1992 and galvanization of the mounting structure shall be in compliance of latest IS 4759.
- \* Structural material shall be corrosion resistant and electrolytic ally 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.
- \* 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
- \* Regarding civil structures the bidder need to take care of the load baring 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 60 kg/m<sup>2</sup>.
- \* The minimum clearance of the structure from the roof level should be 300 mm.

#### 1.6 JUNCTION BOXES (JBs)

- \* The junction boxes are to be provided in the PV array for termination of connecting cables. The J. Boxes (JBs) shall be made of GRP/FRP/Powder Coated Aluminium /cast aluminium alloy with full dust, water & vermin proof arrangement. All wires/cables must be terminated through cable lugs. The JB's shall be such that input & output termination can be made through suitable cable glands.

- \* Copper bus bars/terminal blocks housed in the junction box with suitable termination threads Conforming to IP65 standard and IEC 62208 Hinged door with EPDM rubber gasket to prevent water entry. Single / double compression cable glands. Provision of earthings. It should be placed at 5 feet height or above for ease of accessibility.
- \* 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.
- \* 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

**1.7 DC DISTRIBUTION BOARD:**

- \* DC Distribution panel to receive the DC output from the array field.
- \* DC DPBs shall have sheet from enclosure of dust & vermin proof conform to IP 65 protection. The bus bars are made of copper of desired size. Suitable capacity MCBs/MCCB shall be provided for controlling the DC power output to the PCU along with necessary surge arrestors.

**1.8 AC DISTRIBUTION PANEL BOARD:**

- \* AC Distribution Panel Board (DPB) shall control the AC power from PCU/ inverter, and should have necessary surge arrestors. Interconnection from ACDB to mains at LT Bus bar while in grid tied mode.
- \* All switches and the circuit breakers, connectors should conform to IEC 60947, part I, II and III/ IS60947 part I, II and III.
- \* The 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, 50 Hz.
- \* The panels shall be designed for minimum expected ambient temperature of 45 degree 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 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

Varaition in supply voltage	+/- 10%
Varaition in supply frequesncy	+/- 3 HZ

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

- \* The combined wattage of all inverters should not be less than rated capacity of power plant under STC.
- \* Maximum power point tracker shall be integrated in the PCU/inverter to maximize energy drawn from the array.

### 1.10 PCU/ 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. Typical technical features of the inverter shall be as follows:

- \* Switching devices : IGBT/MOSFET
- \* Control : Microprocessor /DSP
- \* Nominal AC output voltage and frequency: 415V, 3 Phase, 50 Hz (In case single phase inverters are offered, suitable arrangement for balancing the phases must be made.)
- \* Output frequency : 50 Hz
- \* Grid Frequency Synchronization range : + 3 Hz or more
- \* Ambient temperature considered : -20o C to 50o C
- \* Humidity : 95 % Non-condensing
- \* Protection of Enclosure: IP-20(Minimum) for indoor.
- \* Grid Frequency Tolerance range : + 3 or more
- \* Grid Voltage tolerance : - 20% & + 15 %
- \* No-load losses : Less than 1% of rated power
- \* Inverter efficiency(minimum) : >93% ( In case of 10kW or above )
- \* Inverter efficiency (minimum ) : > 90% (In case of less than 10 kW)
- \* THD : < 3%
- \* PF : > 0.9
- \* 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 can be used.
- \* PCU/inverter shall be capable of complete automatic operation including wake-up, synchronization & shutdown.
- \* 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.
- \* Built-in meter and data logger to monitor plant performance through external computer shall be provided.
- \* The power conditioning units / inverters should comply with applicable IEC/ equivalent BIS standard for efficiency measurements and environmental tests as per standard codes IEC 61683/IS 61683 and IEC 60068-2(1,2,14,30) /Equivalent BIS Std and submit the calculations.
- \* The charge controller (if any) / MPPT units environmental testing should qualify IEC 60068-2(1, 2, 14, 30)/Equivalent BIS std. The junction boxes/ enclosures should be IP 65(for outdoor)/ IP 54 (indoor) and as per IEC 529 specifications.
- \* The PCU/ inverters should be tested from the MNRE approved test centers / NABL /BIS /IEC accredited testing- calibration laboratories. In case of imported power conditioning units, these should be approved by international test houses.

### 1.11 INTEGRATION OF PV POWER WITH GRID:

The output power from SPV would be fed to the inverters which converts DC produced by SPV array to AC and feeds it into the main electricity grid after synchronization. In case of grid failure, or low or high voltage, solar PV system shall be out of synchronization and shall be disconnected from the grid. Once the DG set comes into service PV system shall again be synchronized with DG supply and load requirement would be met to the extent of availability of power. 4 pole isolation of inverter output with respect to the grid/ DG power connection need to be provided

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

- \* Data Acquisition System shall be provided for each of the solar PV plant.
- \* Data Logging Provision for plant control and monitoring, time and date stamped system data logs for analysis with the high quality, suitable PC. Metering and Instrumentation for display of systems parameters and status indication to be provided.
- \* Solar Irradiance: An integrating Pyranometer / Solar cell based irradiation sensor (along with calibration certificate) provided, with the sensor mounted in the plane of the array. Readout integrated with data logging system.
- \* Temperature: Temperature probes for recording the Solar panel temperature and/or ambient temperature to be provided complete with readouts integrated with the data logging system
- \* The following parameters are accessible via the operating interface display in real time separately for solar power plant.
  - a. AC Voltage.
- \* AC Output current.
- \* Output Power
- \* Power factor.
- \* DC Input Voltage.
  
- \* DC Input Current.
- \* Time Active.
- \* Time disabled.
- \* Time Idle.
- \* Power produced
- \* Protective function limits (Viz-AC Over voltage, AC Under voltage, Over frequency, Under frequency ground fault, PV starting voltage, PV stopping voltage.
- \* All major parameters available on the digital bus and logging facility for energy auditing through the internal microprocessor and read on the digital front panel at any time) and logging facility (the current values, previous values for up to a month and the average values) should be made available for energy auditing through the internal microprocessor and should be read on the digital front panel.
- \* PV array energy production: Digital Energy Meters to log the actual value of AC/ DC voltage, Current & Energy generated by the PV system provided. Energy meter along with CT/PT should be of 0.5 accuracy class.
- \* Computerized DC String/Array monitoring and AC output monitoring shall be provided as part of the inverter and/or string/array combiner box or separately.
- \* String and array DC Voltage, Current and Power, Inverter AC output voltage and current (All 3 phases and lines), AC power (Active, Reactive and Apparent), Power Factor and AC energy (All 3 phases and cumulative) and frequency shall be monitored.
- \* Computerized AC energy monitoring shall be in addition to the digital AC energy meter.

- \* The data shall be recorded in a common work sheet chronologically date wise. The data file shall be MS Excel compatible. The data shall be represented in both tabular and graphical form.
- \* All instantaneous data shall be shown on the computer screen.
- \* Software shall be provided for USB download and analysis of DC and AC parametric data for individual plant.
- \* Provision for Internet monitoring and download of data shall be also incorporated.
- \* 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.
- \* Ambient / Solar PV module back surface temperature shall be also monitored on continuous basis.
- \* Simultaneous monitoring of DC and AC electrical voltage, current, power, energy and other data of the plant for correlation with solar and environment data shall be provided.
- \* Remote Monitoring and data acquisition through Remote Monitoring System software at the Bank location with latest software/hardware configuration and service connectivity for online / real time data monitoring/control complete to be supplied and operation and maintenance/control to be ensured by the supplier. Provision for interfacing these data on [NAME OF THE ORGANISATION] server and portal in future shall be kept.

### **1.13 TRANSFORMER “IF REQUIRED” & METERING:**

- \* Dry/oil type relevant kVA, 11kV/415V, 50 Hz Step up along with all protections, switchgears, Vacuum circuit breakers, cables etc. along with required civil work. (in this case Not Applicable).
- \* The bidirectional electronic energy meteras per the statutory requirements of DISCOMs shall be installed for the measurement of import/Export of energy. ( getting statutory requirements and installation of bi-directional meter is installer scope with free of ost)
- \* The bidder must take approval/NOC from the Concerned DISCOM for the connectivity, technical feasibility, and synchronization of SPV plant with distribution network and submit the same to SBPDCL before commissioning of SPV plant.
- \* Reverse power relay shall be provided by bidder (if necessary), as per the local DISCOM requirement.

### **1.14 POWER CONSUMPTION:**

- \* Regarding the generated power consumption, priority need to give for internal consumption first and thereafter any excess power can be exported to grid. Finalization of tariff is not under the purview of MNRE. Decisions of appropriate authority like DISCOM, state regulator may be followed.

### **1.15 PROTECTIONS**

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

#### **1.15.1 LIGHTNING PROTECTION**

The SPV power plants shall be provided with lightning & overvoltage protection. The main aim in this protection shall be to reduce the over voltage to a tolerable value before it reaches the

PV or other sub system components. The source of over voltage can be lightning, atmosphere disturbances etc. The entire space occupying the SPV array shall be suitably protected against Lightning by deploying required number of Lightning Arrestors. Lightning protection should be provided as per IEC 62305 standard. 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.

### 1.15.2 SURGE PROTECTION

Internal surge protection shall consist of three MOV type surge-arrestors connected from +ve and –ve terminals to earth (via Y arrangement)

### 1.15.3 EARTHING PROTECTION

- \* 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 Bank engineer as and when required after earthing by calibrated earth tester. PCU, ACDB and DCDB should also be earthed properly.
- \* Earth resistance shall not be more than 5 ohms. It shall be ensured that all the earthing points are bonded together to make them at the same potential.

### 1.16 GRID ISLANDING:

- \* In the event of a power failure on the electric grid, it is required that any independent power-producing inverters attached to the grid turn off in a short period of time. This prevents the DC-to-AC inverters from continuing to feed power into small sections of the grid, known as “islands.” Powered islands present a risk to workers who may expect the area to be unpowered, and they may also damage grid-tied equipment. The Rooftop PV system shall be equipped with islanding protection. In addition to disconnection from the grid (due to islanding protection) disconnection due to under and over voltage conditions shall also be provided.
- \* 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

### 1.17 CABLES

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

- \* Shall meet IEC 60227/IS 694, IEC 60502/IS1554 standards
- \* Temp. Range: –10oC to +80oC.
- \* Voltage rating 660/1000V
- \* Excellent resistance to heat, cold, water, oil, abrasion, UV radiation
- \* Flexible 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.
- \* Cable Routing/ Marking: All cable/wires are to be routed in a GI cable tray and suitably tagged and marked with proper manner by good quality ferule or by other means so that the cable easily identified.

- \* The Cable should be so selected that it should be compatible up to the life of the solar PV panels i.e. 25years.
- \* The ratings given are approximate. Bidder to indicate size and length as per system design requirement. All the cables required for the plant provided by the bidder. Any change in cabling sizes if desired by the bidder/approved after citing appropriate reasons. All cable schedules/layout drawings approved prior to installation.
- \* Multi Strand, Annealed high conductivity copper conductor PVC type „A“ pressure extruded insulation or XLPE insulation. Overall PVC/XLPE insulation for UV protection Armoured cable for underground laying. All cable trays including covers to be provided. All cables conform to latest edition of IEC/ equivalent BIS Standards as specified below: BoS item / component Standard Description Standard Number Cables General Test and measuring methods and including 1100V, UV resistant for outdoor installation IS/IEC 69947.
- \* 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%.
- \* The size of each type of AC cable selected shall be based on minimum voltage drop however; the maximum drop shall be limited to 2 %.

### 1.18 CONNECTIVITY

The maximum capacity for interconnection with the grid at a specific voltage level shall be as specified in the Distribution Code/Supply Code of the State and amended from time to time. Following criteria have been suggested for selection of voltage level in the distribution system for ready reference of the solar suppliers.

Plant Capacity	Connecting Voltage
Upto 10KW	240V-single phase or 415V –three phase at the option of the consumer.
Above 0KW and upto 100KW	415V- Three Phase
Above 100KW	AT HT/EHT level (11KV/33KV/66KV) as per DISCOM rules

- \* The maximum permissible capacity for rooftop shall be 1 MW for a single net metering point.
- \* Utilities may have voltage levels other than above, DISCOMS may be consulted before finalization of the voltage level and specification be made accordingly.
- \* For large PV system (Above 100 kW) for commercial installation having large load, the solar power can be generated at low voltage levels and stepped up to 11 kV level through the step up transformer. The transformers and associated switchgear would require to be provided by the SPV bidders.

### 1.19 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. List of tools and tackles to be supplied by the bidder for approval of specifications and make from BANK
- \* A list of requisite spares in case of PCU/inverter comprising of a set of control logic cards, IGBT driver cards etc. Junction Boxes. Fuses, MOVs / arrestors, MCCBs etc along with

spare set of PV modules be indicated, which shall be supplied along with the equipment. A minimum set of spares shall be maintained in the plant itself for the entire period of warranty and Operation & Maintenance which upon its use shall be replenished

### **1.20 DANGER BOARDS AND SIGNAGES:**

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

### **1.21 DRAWINGS & MANUALS:**

- \* Two sets of Engineering, electrical drawings and Installation and O&M manuals SOP are to be supplied. Bidders shall provide complete technical data sheets for each equipment giving details of the specifications along with make/makes in their bid along with basic design of the power plant and power evacuation, synchronization along with protection equipment.
- \* Approved ISI and reputed makes for equipment be used.
- \* For complete electro-mechanical works, bidders shall supply complete design, details and drawings for approval to Bank before progressing with the installation work

### **1.22 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 labour. The bidder should submit the array layout drawings along with Shadow Analysis Report to Bank for approval.
- \* Bank reserves the right to modify the landscaping design, Layout and specification of sub-systems and components at any stage as per local site conditions/requirements.
- \* The bidder shall submit preliminary drawing for approval & based on any modification or recommendation, if any. The bidders submit three sets and soft copy in CD of final drawing for formal approval to proceed with construction work.

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

- \* The Contractor shall furnish the following drawings Award/Intent and obtain approval  
General arrangement and dimensioned layout
- \* Schematic drawing showing the requirement of SV panel, Power conditioning Unit(s)/ inverter, Junction Boxes, AC and DC Distribution Boards, meters etc.
- \* Structural drawing along with foundation details for the structure.
- \* Itemized bill of material for complete SV plant covering all the components and associated accessories.
- \* Layout of solar Power Array Shadow analysis of the roof

### **1.24 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 upto 90% of 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.

### **1.25 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.

### **1.26 TEST CERTIFICATES AND REPORTS TO BE FURNISHED**

Test Certificates / Reports from IECQ / NABL accredited laboratory for relevant IEC / equivalent BIS standard for quoted components shall 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.

### **1.27 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.

### **1.28 MAINTENANCE OF THE SOLAR SYSTEM:-**

#### **A. CLEANING OF SOLAR MODULE / PLATES:-**

Cleaning of solar module using water will be the part of Maintenance of the solar power plant. Module should be cleaned in interval of every 15 days.

#### **B. BREAKDOWN MAINTENANCE:**

The firm has to attend to the unscheduled service calls as and when required for locating the faults and rectify the same within 04 hours. In case of any break down or any abnormal functioning of the equipment, the same has to be brought to the notice of the Engineer-in-Charge immediately and necessary remedial measures would be taken immediately as required / advised.

### **RECOMMENDED MAKES:**

S.No.	EQUIPMENT	RECOMMENDED
1	PV modules	Panasonic/Solar world/Trina/ Yingli /or Equivalent
2	Inverters:	SMA/ Kaco /Rafisol/ ABB /DELTA or Equivalent
3	DC cables	LAPP/ Polycab/Tyco /or Equivalent

4	AC Distribution Board	I Logicon/ Lotus / Greensol/Equivalent / or Equivalent
5	DC Distribution Board	Any reputed make
6	LV Switchgear	ABB/L&T/Schneider/ or Equivalent
7	String Combiner Box	Robotina/Trinity Touch/Hensel/Cape Electric or Equivalent
8	Weather Monitoring station Pyranometer	Kipp &Zonnen or Equivalent
9	Conduits &Cable trays	Elcon/Profab/ or Equivalent
10	Earthing System	Citel/Erico/Dehnguard or Equivalent
11	Lighting Arrestor	Indelec/Inmbus/Liva Equivalent or Equivalent
12	Communication Cable	Any reputed make or Equivalent
13	Energy Meter	Secure/L&T or Equivalent
14	Connectors MC4/or Equivalent	Reputed Make or Equivalent
15	Fire fighting &Detection System	Reputed Make or Equivalent

**PROPOSED LIST OF MATERIAL WITH QUANTITY( BOQ ):-**

- \* The tenderer are advised to visit the site of installation and acquaint themselves with the site condition and satisfy themselves before quoting the rate and clear doubts if any. No deviation in condition or specification or additional items shall be entertained at a later date.
- \* The BOQ form must be filled in English and should be printed by Computer Machine
- \* The tenders must be submit the proposed material in the prescribed format as below. Bidder can add the necessary items in the prescribed format.
- \* The quantities indicated in the BOQ are only probable quantities and are liable to alteration by omission, reduction or addition. Payment shall be made on the basis of actual quantities of work done at the accepted rates.

**FORMAT FOR SCHEDULE OF WORK /BOQ (ALL ITEMS OF THE PROJECT MUST BE FILLED IN PRESCRIBED FORMAT)**

S.N.	DESCRIPTION OF THE ITEMS	MAKE	UOM	QUANTITY		TOTAL NOS. QUANTITY.
				LHO BUILDING	MAIN BR. BUILDING	
1	PV modules					
2	Inverters:					
3	DC cables					
4	AC Distribution Board					
5	DC Distribution Board					
6	LV Switchgear					
7	String Combiner Box					
8	Weather Monitoring station Pyranometer					
9	Conduits & Cable trays					
10	Earthing System					
11	Lighting Arrestor					
12	Communication Cable					
13	Energy Meter					
14	Connectors MC4/or Equivalent					
15	Fire fighting & Detection System					
16	Module Mounting Structure					
17	NUT & BOLT					
18	ALUMINIUM CABLES					
19	Wires					
20	<b>ARRAY JUNCTION BOXES</b>					
21	ACDB					
22	DCDB					

23	MCBs					
24	MCCBs					
25	GLANDS					
26	ENRGY METERS					
27	REVERSE POWERPROTECTION RELAY					
28	OVER VOLTAGE / UNDER VOLTAGE PROTECTION RELAY					
29	DATA MONITORING SYSTEM (COMPUTER WITH CPU / SEPERATE HMI SYSTEM)					
30	LED LIGHT					
31	Maintenance Tool					
32	Danger Boards					
33	System Name plates					
34	All necessary accessories					
35	Others (Please add if required)					

### **ARTICLES OF AGREEMENT**

**(on Rs.1000/- non-judicial stamp paper)**

ARTICLES OF AGREEMENT made the ..... day of ..... 20....  
between ..... STATE BANK OF INDIA, .....  
(hereinafter called the "Employer") of the one part

AND

M/s -----(hereinafter called "The Contractor") of the other part, where as the Employer is desirous of getting the work of (Name of the work ) ..... executed and has caused drawings, conditions of contract, specifications and schedule of quantities etc., describing the works prepared by SBIIMS Patna.

AND WHEREAS the SAID DRAWINGS numbered as per list attached inclusive of and the conditions of contract, specifications and schedule of quantities etc., have been signed by or on behalf of the parties hereto.

AND WHEREAS THE CONTRACTOR has agreed to execute upon and subject to the conditions set forth in the Schedule hereto (hereinafter referred to as "Said Conditions") the works shown upon the said drawings and described in the same specifications and included in the said schedule of quantities for such sum as may be ascertained to be

payable in terms of the Bills of Quantities, and which sum is estimated to be Rs. \_\_\_\_\_ (Rupees \_\_\_\_\_) (here in after referred to as "Said Contract Amount").

**NOW IT IS HEREBY AGREED AS FOLLOWS:**

In consideration of the said sum to be paid at the times and in the manner set forth in the said conditions, the contractor shall upon and subject to the said conditions, execute and complete the work shown in the said drawings and described in the said specifications.

1. The Employer shall pay the contractor the above said sum or such sums as shall become payable hereunder at the times and in the manner specified in the said conditions.
2. The term "Employer" in the said conditions shall mean the said M/s State Bank of India , or in the event of their ceasing to be the Employer for the purpose of this contract, such other person as shall be nominated for that purpose by the Employer, not being a person to whom the contractor shall object for reasons considered to be sufficient by the Arbitrator mentioned in the said conditions provided always that no persons subsequently appointed to be the Employer under this contract shall be entitled to disregard or over-rule any previous decision or approval or direction given or expressed by the Employer.
3. Tender documents containing work order Notice to the Contractor, Conditions of Contract, Appendix thereto, Special Conditions of Contract, Specifications and Schedule of Quantities with the rates entered therein, shall be read and studied as forming part of this agreement and the parties hereto shall respectively abide by and submit themselves to the conditions and stipulations and perform the agreement on their part respectively in such conditions contained.
4. The contract is neither a fixed lump sum contract or a piece work contract, but is a contract to carry out work in respect of the entire works to be paid for according to actual measured quantities, including variations from BOQ at the rates contained in the Schedule of rates and Probable bill of quantities or as provided in the said conditions.
5. The Employer through the Architect, reserves to himself the right of altering the drawings and natures of the work, of adding/substitution to or omitting any items of work or having portions of the same carried out through alternate agencies without prejudice to this contract.
6. Time shall be considered a the essence of this agreement and the contractor hereby agrees to commence the work soon after the site is handed over to him or date of issue of work order to execute the work, as provided for in the said conditions and complete the entire work in 1 month subject to nevertheless to the provisions for extension of time.
7. This agreement and contract shall be deemed to have been made in Patna and any questions or dispute rising out of or in any way connected with this Agreement and Contract shall be deemed to have arisen in Patna and only the courts in Patna shall have jurisdiction to determine the same. The limitation period will be 90 days from the date of dispute having arisen.
8. The contract may also be put to an end at any time by the Bank upon giving seven days notice to the Installer. The Installer agrees for Supply, Installation, and Commissioning of 40 KWp SPV Rooftop with 60 months warranty as per clause and as per the Terms & Conditions given below.
9. Installation & Completion Schedule: The entire work involving Supply, Installation and Commissioning of SPV Rooftop shall be completed within 30 days from the date of issue of work order by the purchaser
10. Service: Empanelled Installer shall have minimum of one service centre in Patna / Ranchi. The Installer shall visit the site at least once in a month, to attend routine maintenance, during the 5 years warranty period. However, in case of malfunctioning of the system, the tenderer/bidder shall attend for rectification of defects within 3 working days from the date of lodging complaint.

11. Installation and Commissioning location: The Grid Connected Solar Rooftop Power Plants shall be installed and commissioned at ..... under Net Metering Scheme.

12. The validity of tender and the price accepted will be for 3 months.

13. The following documents shall be deemed to form and be read and constructed as part of this Contract. (A) Technical Specifications. (B) Tender General Terms and Conditions. (C) Detailed final offer of the Successful Bidder.

AS WITNESS our hand this \_\_\_\_\_ day of \_\_\_\_\_ 2017

Signed by the said in the presence of:

WITNESS :  
EMPLOYER SIGNATURE  
NAME :  
ADDRESS:

SIGNATURE

**APPLICATION FORM:-**

1	Name of the organization :	
2	Address:	
3	Name Telephone Nos. Mobile : e-mail id of contact person	
4	Fax No. :	
5	Status of the Firm (whether Public or Private Ltd Company / Firm /	

	Proprietary) :	
6	Year of Establishment: (Supporting document to be submitted) :	
7	Whether the applicant or their Sub- Contractor for allied Electrical Work possess the valid Electrical Contractor's License issued by or Acceptable to Directorate of Electricity, Government of West Bengal for execution of Electrical Work allied with Proposed Solar work. (Photocopy of such License to be furnished with the application)	
8	Whether registered with the Registrar of Companies / Registrar of firms. (if so, mention number and date and supporting documents to be submitted) :	
9	Registration with Government/Statutory Authorities (Photocopies to be furnished)	
10	Income Tax (PAN) No.	
11	Service Tax Registration No	
12	EPF Registration. No.	
13	ESI Registration. No.	
14	TIN / VAT No.	
15	Trade License Particulars :	
16	Names of Directors / Proprietor / Partners / Associates	
17	Bio-data of Directors / Partners / Associates as per format given in Page:-	
18	Details of "Similar" Nature of works : completed during the last 7 years. (Details may be attach in separate sheet)	
19	Details of „Similar" nature of works on hand : Under execution / awarded. (Details may be attach in separate sheet)	
20	List of Professionals / Technical / Non-technical Personnel employed Permanently (Details may be attach in separate sheet)	
21	Details of Plant & Machinery /Manufacturing :	

	unit/ tools / equipments owned by the company (Details may be attach in separate sheet)	
22	Banker's Name & address : (Enclose solvency certificate in sealed envelope from the Bankers)	
23	Latest Income Tax Clearance Certificate/ : (Copies of Last 3 years IT Return submitted to be enclosed)	
24	List of empanelment / enlistment / registration with other Organizations / statutory bodies etc If so, furnish their names, category and date of registration :	
25	Annual turnover for the last 3 financial years (year-wise) ending 31.03.2019 as per Audited Balance Sheet :	
	Financial Year Annual Turn Over	
	FY 2018-19	
	FY 2017-18	
	FY 2016-17	
26	Name and address of persons who will be in a position to certify about the quality as well as performance of applicant firm :	

**Signature of Applicant**

**PART-B “FINANCIAL BID”**

**TENDER ID: PAT202001046**

**SUPPLY, INSTALLATION, TESTING, COMMISSIONING AND MAINTENANCE OF 20KWp ROOF TOP GRID CONNECTED PHOTOVOLTAIC SOLAR POWER PLANT (WITHOUT BATTERY) WITH NET METERING PROVISION ON TURN-KEY BASIS INCLUDING 5 (FIVE) YEARS GUARANTEE/WARANTEE AND OPERATION & MAINTENANCE CONTRACT FOR CAPTIVE CONSUMPTION AT SBI, DUMKA BRANCH BUILDING**

<b>S.No.</b>	<b>Description</b>	<b>Qty.</b>	<b>Total Amount (Rs.)</b>
1	Supply of 20kwp Grid Tied Solar PV Power Plant With Net Metering Provision on turn-key basis as per the specifications mentioned at this NIT including 5 (five) years Warranty / Guarantee and Operation& Maintenance Contract from the date of successfully installation.	01 Set	
2	Comprehensive Annual Maintenance Contract (CAMC) for 5 (five) years after Guarantee / Warranty period.	Lot	
3	GST		
4	Total		

Amount in words:

Signature of the authorized person:

Name of the authorized person:

Designation:

The cost of SPV power plants shall include their respective components as per their respective technical specification, including cables, MCBs, switches, fuses, earthing and lightning arrestors etc., as per the site requirement and shall be a lump-sum turnkey price:

- \* Total cost quoted above is without deducting CFA from MNRE. Subsidy amount will be retaining with client. The scope includes liaising/coordination with all concerned departments to release subsidy to Bank.
- \* The quoted price is inclusive of all taxes, duties, freight with insurance up to site, for installation within the State of Patna.
- \* The price quoted shall be in both figures and words, rounded to one decimal point. Price quoted after first decimal point, if any, shall not be considered.
- \* In case of discrepancy in the Price quoted between Words and Figures, the lower of the two shall be considered.
- \* PV modules must be tested and approved by one of the IEC authorized test centers which is acceptable to the Bank and the testing has to be done in the presence of Bank's Engineer. If the material received in one lot successful bidder has to test 4 PV modules or if received in number of lots bidder has to test one at each lot and total testing of the modules should be minimum four
- \* The scope of work includes supply & installation of earthing & lightning arrestors on each building and supply of Bi-Directional meter with free of cost. Getting the approvals from the various departments to get the subsidy and installation of Bi-Directional meter with his cost.
- \* bidder has to interlock all the PV modules structures with 50X50X4 mm MS angle to avoid damages due to wind flow
- \* Amount payable to the successful bidder is based on the installed capacity.
- \* Provision with surge protection for LAN port to access & view the parameters which are displayed in the inverter in internet.
- \* Successful bidder has to make suitable arrangements for installation of sensors and it will be used to cut off the generation of solar power during Electricity board supply fails or generation of solar power has to fail during flowing of reverse power to DG set.
- \* Successful bidder has to give efficiency warranty for generation. i.e 4-5 units per KWp. And efficiency of the plant should be minimum 80% of installed capacity.

Signature of the authorized person:

Name of the authorized person:

Designation: